CENTRE PARK OF WEST CHESTER
PHASE 2 PROPOSED CONDITIONS FLOODPLAIN AND CONDITIONAL LETTER OF MAP REVISION FOR THE TRIBUTARY TO EAST FORK MILL CREEK IN BUTLER COUNTY, OHIO

Prepared for:

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September 8, 2008

In my opinion, this report is consistent with the standards of the Butler County Flood Damage Prevention Regulations.

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SUBJECT

HiFive Development Services proposes a commercial development in Butler County, Ohio. Proposed post-project work will revise the floodway delineation through the site and otherwise maintain or reduce the floodway and floodplain delineations and the flood profiles. The ownership parcel for this development site includes approximately 29.6 acres. The site as indicated on the USGS Quadrangle and Aerial Map is located at the southwest corner of the intersection of Union Center Boulevard and Cincinnati-Dayton Road, and is bounded to the south by the Tributary to East Fork Mill Creek and to the west by East Fork Mill Creek. The Flood Insurance Rate Map indicates there is both floodplain and floodway of both the East Fork Mill Creek and the Tributary to East Fork Mill Creek within the limits of the parcel. The property is within the southeast and southwest ¼'s of Section 27 Township 3 North Range 2 East of the Third Principal Meridian.

The proposed development will include hotels and retail businesses, stormwater management ponds, and compensatory floodplain storage area. The development parcel includes two existing residences and has an inactive concrete plant on the south bank of the Tributary to East Fork Mill Creek. The Existing Floodplain Exhibit indicates the topography, the Flood Insurance Rate Map floodplain delineation, and existing conditions floodplain limits based on topography, the floodway and stream buffers.

Proposed work consists of two phases:

- Phase 1 includes removal of an existing on-site bridge deck, construction of a detention pond at the on-site confluence of the two watercourses, and grading outside of the effective regulatory floodway. The excavation of the Phase 1 detention pond at the confluence of the two on-site floodways. Phase 1 was within the flood fringe areas of both the East Fork Mill Creek and the Tributary to East Fork Mill Creek.
- Proposed Phase 2 work will include no additional grading within the East Fork Mill Creek floodplain. It will include a pilot channel to provide additional conveyance and storage for the Tributary to the East Fork Mill Creek, grading within its floodway and flood fringe, and a revised floodway delineation and base flood profile. The planned Phase 2 work will involve relocating the floodway of the Tributary to East Fork Mill Creek in a manner that will correct the floodway location based on existing topography, modify the overbank area with a pilot channel in a manner that will reduce the base flood profile, and facilitate development at the southeasterly portion of the development parcel.

The Phase 2 Floodplain Exhibit compares the pre-project and post-project conditions floodplains. Construction of the large detention pond on the westerly portion of the development parcel, grading in the overbank area, and the pilot channel will combine to restore the proposed base flood profile to the effective regulatory condition flood profile. The work proposed in more detail under separate cover for Phase 1 modified the floodplains of both the Tributary to East Fork Mill Creek and East Fork Mill Creek. The work on this pond will take place at the confluence of the two floodways. The excavation of the pond will provide for added conveyance and floodplain storage above the top of berm elevation. Post-project grades on this pond berm is entirely at or below the existing pre-project conditions grade.

No work on the East Fork Mill Creek requires a LOMR and Phase 2 proposed post-project work does not include any further work in the floodplain of the East Fork Mill Creek.

PURPOSE

The purpose of this report is to demonstrate the permissibility of the proposed Phase 2 conditions and to support the requested Conditional Letter of Map Revision (CLOMR). Phase 1 proposed conditions stayed outside the floodway and did not require revision to the effective regulatory conditions indicated on the Flood Insurance Rate Map. The additional work proposed in Phase 2 will provide a floodplain pilot channel within the south overbank of the Tributary to East Fork Mill Creek and allow a greater area of land for development above the floodplain. The revised floodway throughout the reach of the proposed pilot channel will be coincident – as wide as – the floodplain. The revised floodplain will allow for approximately one acre of land to be regraded and removed from the proposed floodway and floodplain areas.

Note that the existing (-x) conditions and models included in this report is a pre-project condition that does not include work proposed in phase 1 (and which did not require revision to the FIRM). The phase 1 work is included in the phase 2 Conditions presented in this report. In Phase 1, the marginal conveyance increase in the East Fork Mill Creek did not have significant effect on reducing the flood profiles nor the plan view floodplain delineation.

The proposed floodplain pilot channel in the overbank is constructed outside the buffer limit approximately one-foot above the 2-year frequency flood limits and preserves the channel and overbank area within the buffer.

Floodplain volumes are maintained for both of the two watercourses between the existing pre-project and proposed phase 2 post-project conditions. Off-site floodplain limits are maintained or reduced. Floodplain profiles of

REGULATORY CONDITIONS

The January 21, 1998 Flood Insurance Rate Map was revised by a September 20, 2004 Letter of Map Revision in accordance with a study of the East Fork Mill Creek prepared by Evans, Mechwart, Hambleton & Tilton to reflect construction activity along East Fork Mill Creek from Allen Road north to Beckett Road. This revised condition is what is shown on the Flood Insurance Rate Map exhibit in this report. The Existing Floodplain Exhibit includes line work labeled "Floodplain Delineation shown on FIRM" and is actually the floodplain delineation reflect on this Letter of Map Revision. The effective regulatory condition on the Flood Insurance Rate Map for the Tributary to the East Fork Mill Creek is reflected on the 1998 Flood Insurance Rate Map and was not revised with the Letter of Map Revision.

The East Fork Mill Creek and the Tributary to the East Fork Mill Creek converge within the western portion of the project site. The January 21, 1998 Flood Insurance Rate Map indicates that at the confluence of the two watercourses the tributary area to the East Fork Mill Creek is 8.0 square miles and the tributary area to the Tributary to East Fork Mill Creek is 2.8 square miles.

A portion of the channel of the Tributary to East Fork Mill Creek is physically located outside of the effective regulatory floodway indicated on the Flood Insurance Rate Map.

EXISTING CONDITIONS

The existing conditions of the subject site include an inactive concrete plant. Fill has been placed within the floodplain of the Tributary to the East Fork Mill Creek in a manner that makes the existing conditions floodplain of the site inconsistent with the mapped floodplain indicated on the effective Flood Insurance Rate Map. The tributary's floodplain is narrowed and the flood profile raised within

the project reach as a result of the fill that was placed within the floodplain of the Tributary to East Fork Mill Creek.

An existing on-site bridge crosses the Tributary to the East Fork Mill Creek as shown on the Existing Floodplain Exhibit at cross-section 3.20. Photographs and surveyed data of the bridge are included in Appendix B of this report. The topography on Existing Floodplain Exhibit has the off-site as-built topography the work map topography is the county Geographic Information System with a 0.56-foot adjustment to match the FEMA model datum.

The Existing Floodplain Exhibit includes the effective regulatory floodway limits. The Letter of Map Revision delineation of the floodplain is indicated on the exhibit. The existing conditions and corrected-effective conditions base flood profile elevations are indicated at each cross-section of the hydraulic modeling. The existing conditions floodplain per the model profile is delineated.

PROPOSED CONDITIONS

Proposed Phase 2 post-project conditions will include commercial development, hotels, and two detention ponds. One pond will be located at the confluence with the East Fork Mill Creek and the Tributary to East Fork Mill Creek. The top of berming of the proposed pond will be located below the existing grade. Accordingly above the detention pond storage the pond areas will provide floodplain storage and additional conveyance. The second pond will be located south of the channel of the Tributary to East Fork Mill Creek and within its floodplain.

The Phase 1 proposed work includes removal of the existing bridge over the Tributary to the East Fork Mill Creek. The bridge abutments will remain in place. This proposed condition is reflected in the Phase 2 model conditions.

A construction limit one foot above the 2-year frequency flood profile was located in order to preserve the steam channel corridor. Beyond this construction limit the proposed grading slopes up above the floodplain at a 3:1 grade on the north bank channel overbank area. A 440-foot retaining wall will line the north overbank area of the tributary from a point approximately 180 feet downstream of the existing bridge abutments and extending approximately 240 feet upstream of the existing abutments.

The Phase 2 Floodplain Exhibit include3 the effective regulatory floodway limits. The existing conditions floodplain per the model flood profile is delineated. The proposed Phase 2 conditions floodplain per the Phase 2 conditions flood profile is delineated on the exhibit. The existing conditions, corrected-effective conditions, and proposed Phase 2 base flood profile elevations are indicated at each cross-section of the hydraulic modeling. The floodway and floodplain throughout the reach of the overbank floodplain pilot channel are the same line. The proposed post-project conditions Phase 2 floodway along the pilot channel will provide a floodway as much as 85 feet more narrow than the effective regulatory floodway indicated on the FIRM.

Additionally, the Phase 2 post-project conditions floodway and floodplain lines have been delineated to include the channel and real floodplain conditions at cross-section 5.20.

The existing conditions, corrected-effective conditions, and proposed Phase 2 base flood profile elevations are indicated at each cross-section of the hydraulic modeling.

REGULATORY CONDITIONS ANALYSES

The regulatory hydraulics models of the East Fork Mill Creek and the Tributary to the East Fork Mill Creek were obtained both from Butler County and the Federal Emergency Management Agency. Both models were prepared by Evans, Mechwart, Hambleton & Tilton.

The East Fork Mill Creek was modeled using the U.S. Army Corps of Engineers HEC-RAS river hydraulics modeling program to obtain the September 30, 2004 Letter of Map Revision. The Tributary East Fork Mill Creek was modeled using the U.S. Army Corps of Engineers HEC-2 hydraulics modeling program.

Both from the Federal Emergency Management Agency were used as the base models to create the "Corrected-Effective" models. The Corrected-Effective models are identical to the regulatory models except for the input values of the reach lengths between cross-sections. Appendix B includes the existing conditions work map. The measurements for downstream reach lengths on the work map are what were used in the Corrected-Effective modeling.

EXISTING CONDITIONS ANALYSIS

The base models for the existing conditions hydraulics analyses are the corrected-effective models. Six cross-sections were added to the corrected-effective model of the Tributary to the East Fork Mill Creek: 2.30, 2.60, 3.15, 3.35, 5.20, and 5.40. Cross-sections 2.30 and 2.60 are required to model the impact in the proposed conditions of the excavation of the proposed detention pond at the confluence of the two watercourses. Cross-section 3.15 was added to model the impact of the proposed conditions retaining wall and grading in the north overbank area. Cross-section 3.35 was added to more accurately model the existing bridge. Cross-sections 5.20 and 5.40 were added in order add accuracy to the flood profile determination in the portion of the subject reach where the channel is actually located outside of the effective regulatory floodway.

The existing conditions modeling on-site floodplain geometry was coded from the surveyed on-site topography. The coding is shown on the existing conditions work map is included in Appendix B.

The existing modeling flow rates are from the regulatory modeling obtained from Butler County and the Federal Emergency Management Agency.

The existing and corrected-effective conditions base flood profile elevations are summarized below in Table 1.

TABLE 1: EXISTING AND CORRECTED-EFFECTIVE CONDITIONS BASE FLOOD PROFILES

CROSS-SECTION	CORRECTED-EFFECTIVE	EXISTING CONDITIONS
2.00	603.2	603.1
3.10	606.6	606.8
3.20	609.3	608.0
3.30	612.9	609.4
3.40	612.9	612.1
4.20	612.9	612.1
4.30	613.2	612.1
4.40	613.3	612.1
4.50	613.3	612.2
4.60	613.7	612.5
4.61	614.0	614.5

CROSS-SECTION	CORRECTED-EFFECTIVE	EXISTING CONDITIONS
5.00	615.4	615.6
6.10	618.9	618.9
6.20	619.9	619.9
6.30	619.9	619.9

The abutments for the on-site bridge narrow flood flow which is actually contained within the abutments and which is lower than the existing bridge low-chord. Flood profiles and floodplain limits of the existing conditions very closely match those of the corrected-effective modeling.

The HEC-RAS input files for the existing conditions have been included on a CD-ROM in Appendix F. Hard copies of the on-site flood profiles, summary tables, and cross-section plots are included in Appendix B.

PROPOSED CONDITIONS ANALYSIS

The base models for the proposed conditions hydraulics analysis is the existing conditions model. The proposed post-project conditions model for the Tributary to the East Fork Mill Creek have cross-sections at the same locations as the existing conditions. The proposed conditions modeling was coded from the proposed Phase 2 grading plan. The proposed post-project Phase 2 grading is indicated on the Phase 2 Floodplain Exhibit. The coding for the Phase 2 modeling is annotated on the proposed conditions work map included in Appendix B.

Note that the work map indicates proposed Phase 2 grading on the south overbank of the Tributary to East Fork Mill Creek. The grading shown is a first iteration of a pilot channel design that was iterated with HEC-RAS modeling for a desired flood profile and floodplain storage volume.

All work proposed in Phase 1 is included in this Phase 2 modeling.

Note that the CD-ROM HEC-RAS files in Appendix F include the intermediate Phase 1 (-p1) condition. No approval is requested of this condition in this report. Rather the Phase 1 plan is included for a clear graphic cross-section geometry comparison of Phase 1 and Phase 2.

The proposed modeling flow rates match the existing and regulatory model flow rates.

The corrected-effective, existing, and Phase 2 proposed conditions base flood profile elevations are summarized below in Table 2.

TABLE 2: CORRECTED-EFFECTIVE, EXISTING, AND PROPOSED POST-PROJECT PHASE 2 BASE FLOOD PROFILES

CROSS-SECTION	CORRECTED-EFFECTIVE	EXISTING CONDITIONS	PROPOSED CONDITIONS
2.00	603.2	603.1	603.1
2.30	--	603.8	603.6
2.60	--	605.4	605.4
3.10	606.6	606.8	606.7
3.15	--	607.1	607.0
3.20	609.3	608.0	608.0
3.30	612.9	609.4	608.5
3.35	--	612.0	612.1
3.40	612.9	612.1	612.1

CROSS-SECTION	CORRECTED-EFFECTIVE	EXISTING CONDITIONS	PROPOSED CONDITIONS
4.20	612.9	612.1	612.2
4.30	613.2	612.1	612.2
4.40	613.3	612.1	612.2
4.50	613.3	612.2	612.3
4.60	613.7	612.5	612.4
4.61	614.0	614.5	614.6
5.00	615.4	615.6	614.9
5.20	–	617.5	616.0
5.40	–	617.2	616.2
6.10	618.9	618.9	618.2
6.20	619.9	619.9	619.4
6.30	619.9	619.9	619.4

Post-project construction proposes removal of the existing on-site bridge deck. As the low-chord of the bridge deck is actually above the flood profile, it has no effect on the proposed flood profiles and could be left if deemed preferable for maintenance access.

The HEC-RAS input files for the post-project Phase 2 conditions have been included on a CD-ROM in Appendix F. Hard copies of the on-site flood profiles, summary tables and cross-section plots are included in Appendix B.

Existing and proposed floodplain storage volumes were determined with AutoCAD surfaces of the existing and proposed base flood profiles and ground for both the Tributary to the East Fork Mill Creek and the East Fork Mill Creek. Documentation is provided in Appendix C. Floodplain volumes are summarized in Table 3.

TABLE 3: FLOODPLAIN STORAGE VOLUMES

WATERCOURSE	EXISTING-CONDITIONS	PROPOSED CONDITIONS	DIFFERENCE
TRIBUTARY TO EAST FORK MILL CREEK	45.7	46.8	1.1
EAST FORK MILL CREEK	15.8	16.5	0.7

CONCLUSION

This report supports a Conditional Letter of Map Revision for the Tributary to East Fork Mill Creek.

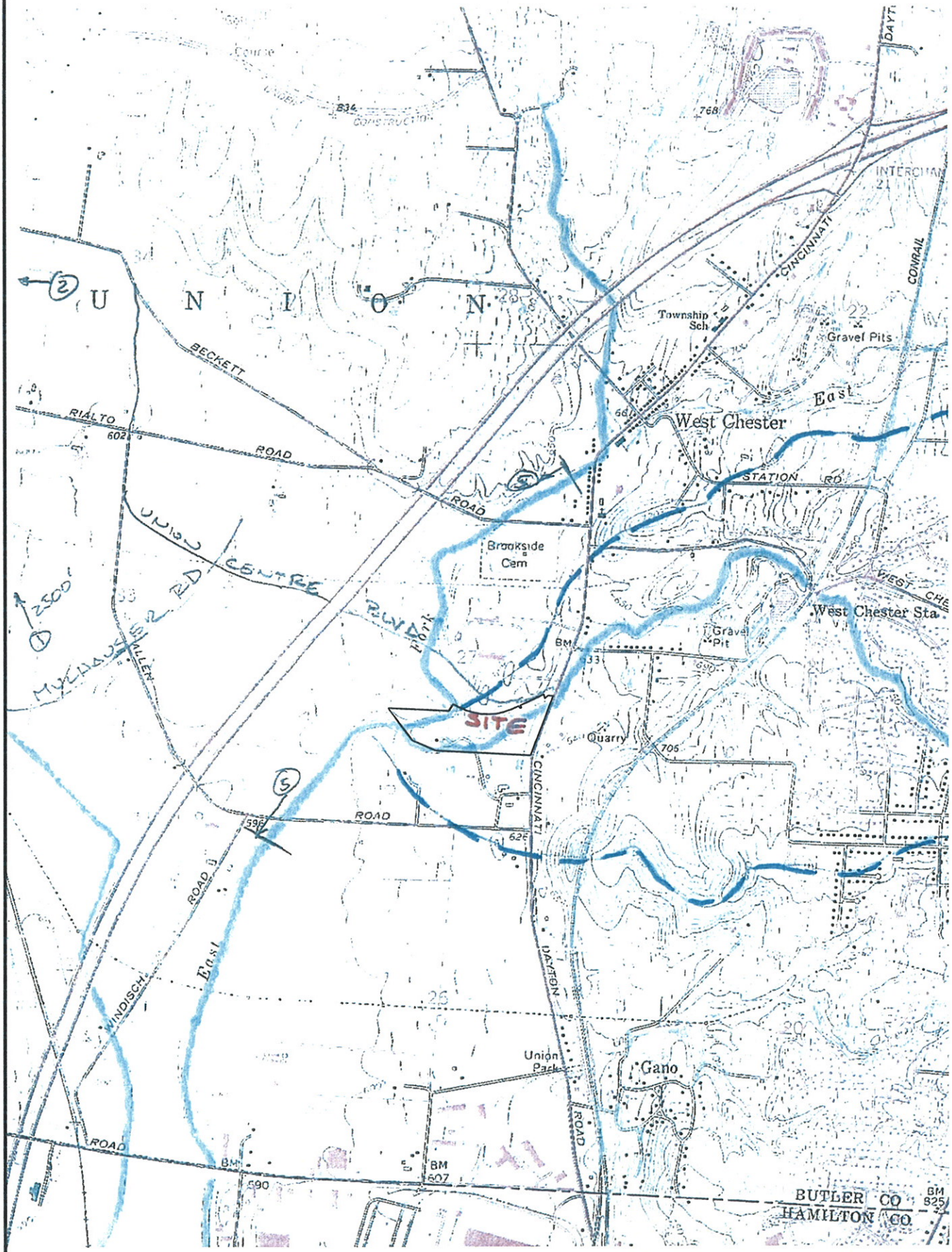
This report demonstrates the permissibility of the proposed Phases 1 and 2 post-project construction of the Centre Park of West Chester with respect to the required standards for development within the floodplain and floodway of the East Fork Mill Creek.

The Phase 1 report under separate cover demonstrates the permissibility of the proposed Phase 1.

Regulatory hydraulics models input was obtained from Butler County and the Federal Emergency Management Agency. The regulatory model output was duplicated as a base model. A corrected-effective model was prepared of each watercourse with reach lengths from the base models revised to agree with the cross-section alignment and topography indicated on the floodplain exhibits and work maps. The existing conditions modeling was prepared form the corrected-effective modeling

by coding the surveyed topographic data in inputting it into the baseline floodplain modeling. The proposed bridge removal and grading was coded from the proposed post-project plan and was input into the Phase 2 hydraulics model.

The proposed Phase 2 post-project construction maintains or reduces off-site flood profiles and maintains the existing floodplain storage volumes.



HENDERSON · AND · BODWELL · L.L.P.

USGS MAP
UNION CENTRE DEVELOPMENT
HIFIVE DEVELOPMENT
WEST CHESTER, OHIO

Scale: 1" = 2000' | DATE: 04/10/08

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AERIAL MAP
UNION CENTRE DEVELOPMENT
HIFIVE DEVELOPMENT
WEST CHESTER, OHIO

Scale: 1"= 300'

DATE: 04/10/08

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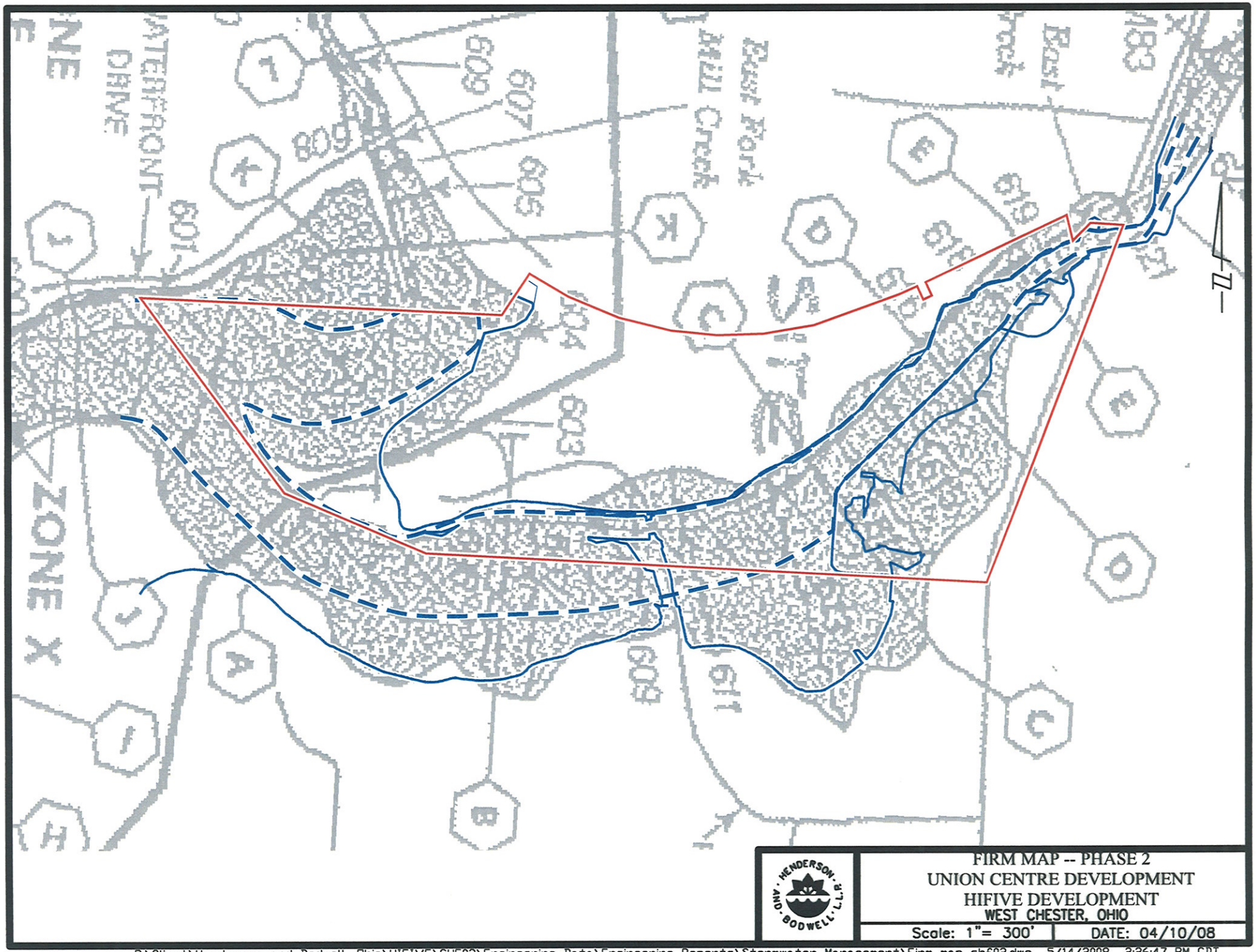

FIRM MAP -- PHASE 2
UNION CENTRE DEVELOPMENT
HIFIVE DEVELOPMENT
WEST CHESTER, OHIO

Scale: 1"= 300' | DATE: 04/10/08

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary to East Fork Mill Creek								
A-2.00	600	185	614 ~~428~~	3.6 ~~5.2~~	603.1 ~~603.2~~	603.1 ~~603.2~~	604.0 ~~604.1~~	0.9
B-3.10	1109 ~~1,100~~	263	769 ~~293~~	2.9 ~~2.8~~	606.7 ~~606.6~~	606.7 ~~606.6~~	607.1 ~~607.6~~	0.4 ~~1.0~~
C-4.60	1,910 ~~1,860~~	238 ~~180~~	368 ~~243~~	6.0 ~~3.0~~	612.4 ~~613.3~~	612.4 ~~613.3~~	613.1 ~~614.2~~	0.7 0.9
D-5.00	2,310 ~~2,260~~	91 ~~169~~	260 ~~283~~	8.5 ~~7.8~~	614.9 ~~615.4~~	614.9 ~~615.4~~	614.9 ~~615.4~~	0.0
E-6.10	2,678 ~~2,610~~	60	244 ~~286~~	9.1 ~~7.7~~	618.2 ~~618.8~~	618.2 ~~618.8~~	618.1 ~~618.9~~	-0.1 ~~0.1~~
F	3,380	78	227	9.7	625.6	625.6	625.7	0.1
G	3,680	39	231	9.6	629.7	629.7	630.0	0.3
H	4,080	45	239	9.2	632.7	632.7	633.2	0.5
I	4,380	50	225	9.8	637.8	637.8	637.8	0.0
J	4,680	56	381	5.8	642.0	642.0	642.7	0.7
K	4,980	50	245	9.0	644.1	644.1	644.9	0.8
L	5,380	52	276	8.0	649.2	649.2	649.6	0.4
M	5,550	65	332	6.6	650.7	650.7	651.3	0.6

[1]Feet above confluence with East Fork Mill Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TRIBUTARY TO EAST FORK MILL CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS-SECTION	DISTANCE1	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary to East Fork Mill Creek								
A	600	185	614	3.6	603.1	603.1	604.0	0.9
B	1,109	263	769	2.9	606.7	606.7	607.1	0.4
C	1,910	238	368	6.0	612.4	612.4	613.1	0.7
D	2,310	91	260	8.5	614.9	614.9	614.9	0.0
E	2,678	60	244	9.1	618.2	618.2	618.1	-0.1
F	3,380	78	227	9.7	625.6	625.6	625.7	0.1
G	3,680	39	231	9.6	629.7	629.7	630.0	0.3
H	4,080	45	239	9.2	632.7	632.7	633.2	0.5
I	4,380	50	225	9.8	637.8	637.8	637.8	0.0
J	4,680	56	381	5.8	642.0	642.0	642.7	0.7
K	4,980	50	245	9.0	644.1	644.1	644.9	0.8
L	5,380	52	276	8.0	649.2	649.2	649.6	0.4
M	5,550	65	332	6.6	650.7	650.7	651.3	0.6

[1] Feet above confluence with East Fork Mill Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TRIBUTARY TO EAST FORK MILL CREEK

FLOOD PROFILES

TRIBUTARY TO EAST FORK MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH
(UNINCORPORATED AREAS)

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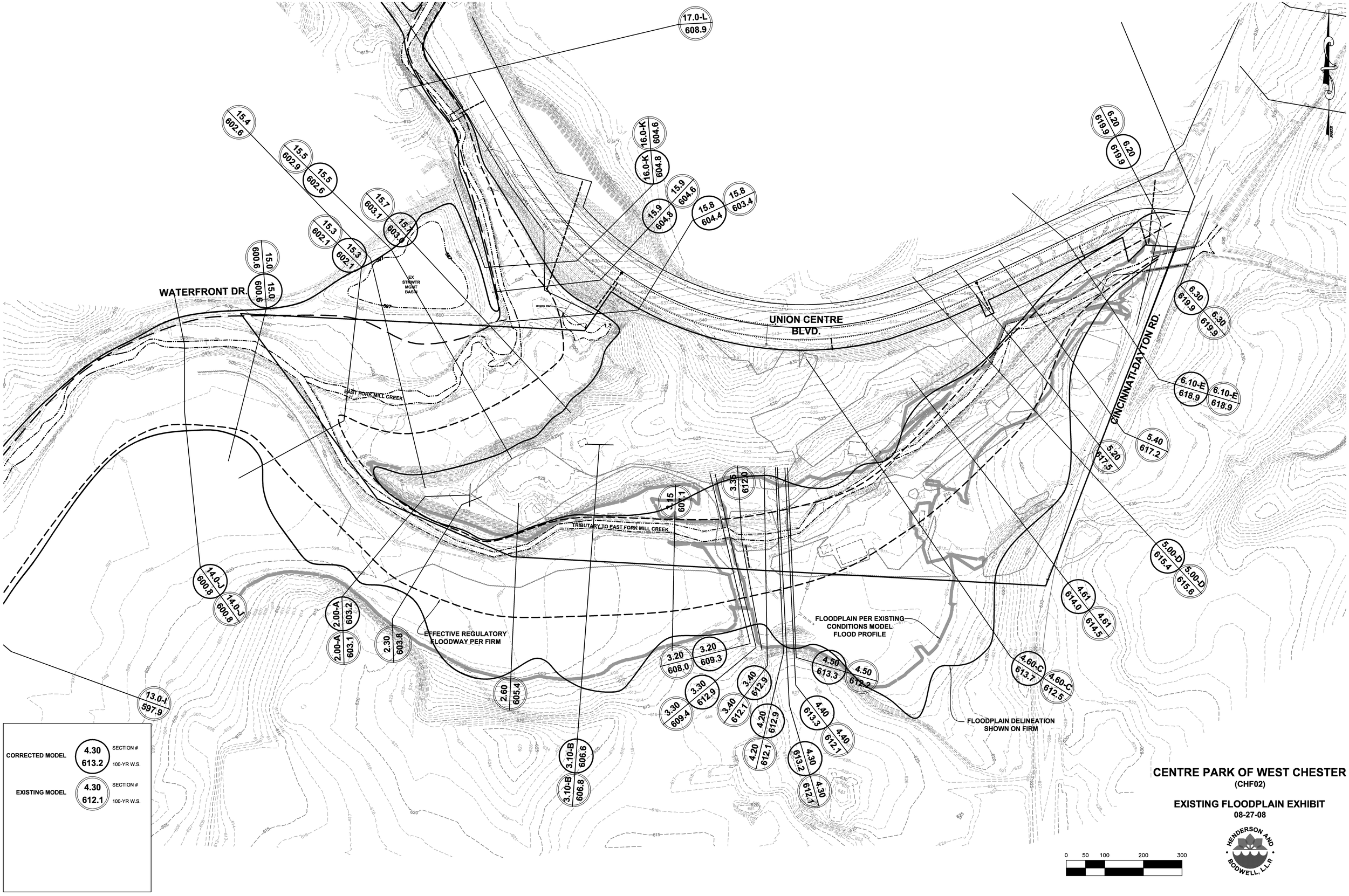

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WATERFRONT DR.

UNION CENTRE BLVD.

CINCINNATI-DAYTON RD.

EX STRMWTR MGMT BASIN

RETAINING WALL

EAST FORK MILL CREEK

RETAINING WALL

TRIBUTARY TO EAST FORK MILL CREEK

PHASE 2 FLOODWAY

FLOODPLAIN PER EXISTING CONDITIONS MODEL FLOOD PROFILE

FLOODPLAIN PER PHASE 2 CONDITIONS FLOOD PROFILE

LEGEND

CORRECTED MODEL	4.30 / 613.2	SECTION # / 100-YR W.S.
EXISTING MODEL	4.30 / 612.1	SECTION # / 100-YR W.S.
PHASE 1 MODEL	4.30 / 612.2	SECTION # / 100-YR W.S.
PHASE 2 MODEL	4.30 / 612.2	SECTION # / 100-YR W.S.

0 50 100 200 300

CENTRE PARK OF WEST CHESTER

(CHF02)

PHASE 2 FLOODPLAIN EXHIBIT

08-27-08

HENDERSON AND BODWELL, L.L.P.

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APPENDIX:

A. Flood Insurance Study Data
   - Summary of Discharges
   - Manning's Roughness Coefficients
   - Annotated, Revised Tributary to East Fork Mill Creek Floodway Data
   - Tributary to East Fork Mill Creek Floodway Data
   - Annotated, Revised Tributary to East Fork Mill Creek Flood Profiles
   - Tributary to East Fork Mill Creek Flood Profiles

FLOOD INSURANCE STUDY

BUTLER COUNTY, OHIO
(UNINCORPORATED AREAS)

REVISED:
JANUARY 21, 1998

Federal Emergency Management Agency

COMMUNITY NUMBER - 390037

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
INDIAN CREEK					
At mouth	109	12,900	19,035	21,830	28,000
Just upstream of Reily-Millville Road	56	7,865	11,690	13,435	17,600
GREGORY CREEK					
At mouth	30	5,500	8,190	9,420	12,000
Upstream of Coldwater Creek	24	4,760	7,100	8,170	10,500
At Hamilton Mason Road	6.4	2,426	3,833	4,323	5,454
1,000 feet northwest of Dayton Road	3.6	1,565	2,520	2,505	3,132
ELK CREEK					
At mouth	47.7	6,625	10,025	11,585	15,000
Just upstream of State Route 122	37.3	5,510	8,370	9,675	12,500
COLDWATER CREEK					
At mouth	5.26	1,720	2,640	3,060	3,950
BROWNS RUN					
At mouth	11.5	2,790	4,330	5,050	6,800
BEALS RUN					
At mouth	6.98	2,335	3,490	4,070	5,250
MILL CREEK					
At Crescentville Road	24.3	1,804	2,817	3,192	4,494
Downstream of State Route 747	18.2	2,467	4,009	4,465	6,335
At Tylersville Road	5.3	1,513	2,396	2,706	3,723
TRIBUTARY TO EAST FORK MILL CREEK					
At confluence with East Fork Mill Creek	2.8	1,213	1,951	2,210	3,065

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

This Revision

Cross sections for the flooding sources studied by detailed methods were obtained from Butler County topographic maps and were supplemented with field survey, bridge plans, and grading plans for various subdivision and industrial developments (References 18, 19, and 20).

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 16). Starting water-surface elevations for Mill Creek and East Fork Mill Creek were taken from an addendum to a FIS for the City of Sharonville (Reference 21). Starting water-surface elevations for Tributary to East Fork Mill Creek were set to be at the corresponding flood stages at East Fork Mill Creek. It is likely that peak flows for the two streams will coincide. Starting water-surface elevations for Gregory Creek were taken from the previously printed FIS for the unincorporated areas of Butler County (Reference 22).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment from characteristics of historical floods in the study reach and existing floodplain conditions. The Butler County aerial photographs were used in conjunction with field observations to characterize the floodplain conditions for determination of roughness factors for each study area. The tabulation below shows the channel and overbank "n" values for all of the streams studied by detailed methods:

Stream	Channel "n"	Overbank "n"
Great Miami River	0.030	0.040-0.100
Dry Fork Whitewater River	0.055	0.040-0.100
Four Mile Creek	0.055	0.040-0.100
Sevenmile Creek	0.055	0.040-0.100
Indian Creek	0.055	0.040-0.100
East Fork Mill Creek	0.030-0.050	0.060-0.150
Gregory Creek	0.012-0.050	0.060-0.150
Elk Creek	0.055	0.040-0.100
Coldwater Creek	0.055	0.040-0.100
Browns Run	0.055	0.040-0.100
Beals Run	0.055	0.040-0.100
Mill Creek	0.030-0.055	0.060-1.000
Tributary To East Fork Mill Creek	0.040-0.050	0.060-0.150

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS generally provides 100-year flood elevations and delineations of the 100- and 500-year floodplains and floodway to assist in developing floodplain management measures.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary to East Fork Mill Creek								
A-2.00	600	185	614 ~~428~~	36 ~~5.2~~	603.1 ~~603.2~~	603.1 ~~603.2~~	604.0 ~~604.1~~	0.9
B-3.10	1109 ~~1,100~~	263	769 ~~293~~	29 ~~2.8~~	606.7 ~~606.6~~	606.7 ~~606.6~~	607.1 ~~607.6~~	0.4 ~~1.0~~
C-4.60	1,910 ~~1,860~~	238 ~~180~~	368 ~~243~~	60 ~~3.0~~	612.4 ~~613.3~~	612.4 ~~613.3~~	613.1 ~~614.2~~	0.7 0.9
D-5.00	2,310 ~~2,260~~	91 ~~169~~	260 ~~283~~	8.5 ~~7.8~~	614.9 ~~615.4~~	614.9 ~~615.4~~	614.9 ~~615.4~~	0.0
E-6.10	2,678 ~~2,610~~	60	244 ~~286~~	9.1 ~~7.7~~	618.2 ~~618.8~~	618.2 ~~618.8~~	618.1 ~~618.9~~	~~0.1~~ 0.1
F	3,380	78	227	9.7	625.6	625.6	625.7	0.1
G	3,680	39	231	9.6	629.7	629.7	630.0	0.3
H	4,080	45	239	9.2	632.7	632.7	633.2	0.5
I	4,380	50	225	9.8	637.8	637.8	637.8	0.0
J	4,680	56	381	5.8	642.0	642.0	642.7	0.7
K	4,980	50	245	9.0	644.1	644.1	644.9	0.8
L	5,380	52	276	8.0	649.2	649.2	649.6	0.4
M	5,550	65	332	6.6	650.7	650.7	651.3	0.6

[1]Feet above confluence with East Fork Mill Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TRIBUTARY TO EAST FORK MILL CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary to East Fork Mill Creek								
A	600	185	428	5.2	603.2	603.2	604.1	0.9
B	1,100	263	793	2.8	606.6	606.6	607.6	1.0
C	1,860	180	743	3.0	613.3	613.3	614.2	0.9
D	2,260	169	283	7.8	615.4	615.4	615.4	0.0
E	2,610	60	286	7.7	618.8	618.8	618.9	0.1
F	3,380	78	227	9.7	625.6	625.6	625.7	0.1
G	3,680	39	231	9.6	629.7	629.7	630.0	0.3
H	4,080	45	239	9.2	632.7	632.7	633.2	0.5
I	4,380	50	225	9.8	637.8	637.8	637.8	0.0
J	4,680	56	381	5.8	642.0	642.0	642.7	0.7
K	4,980	50	245	9.0	644.1	644.1	644.9	0.8
L	5,380	52	276	8.0	649.2	649.2	649.6	0.4
M	5,550	65	332	6.6	650.7	650.7	651.3	0.6

[1]Feet above confluence with East Fork Mill Creek

TABLE 2

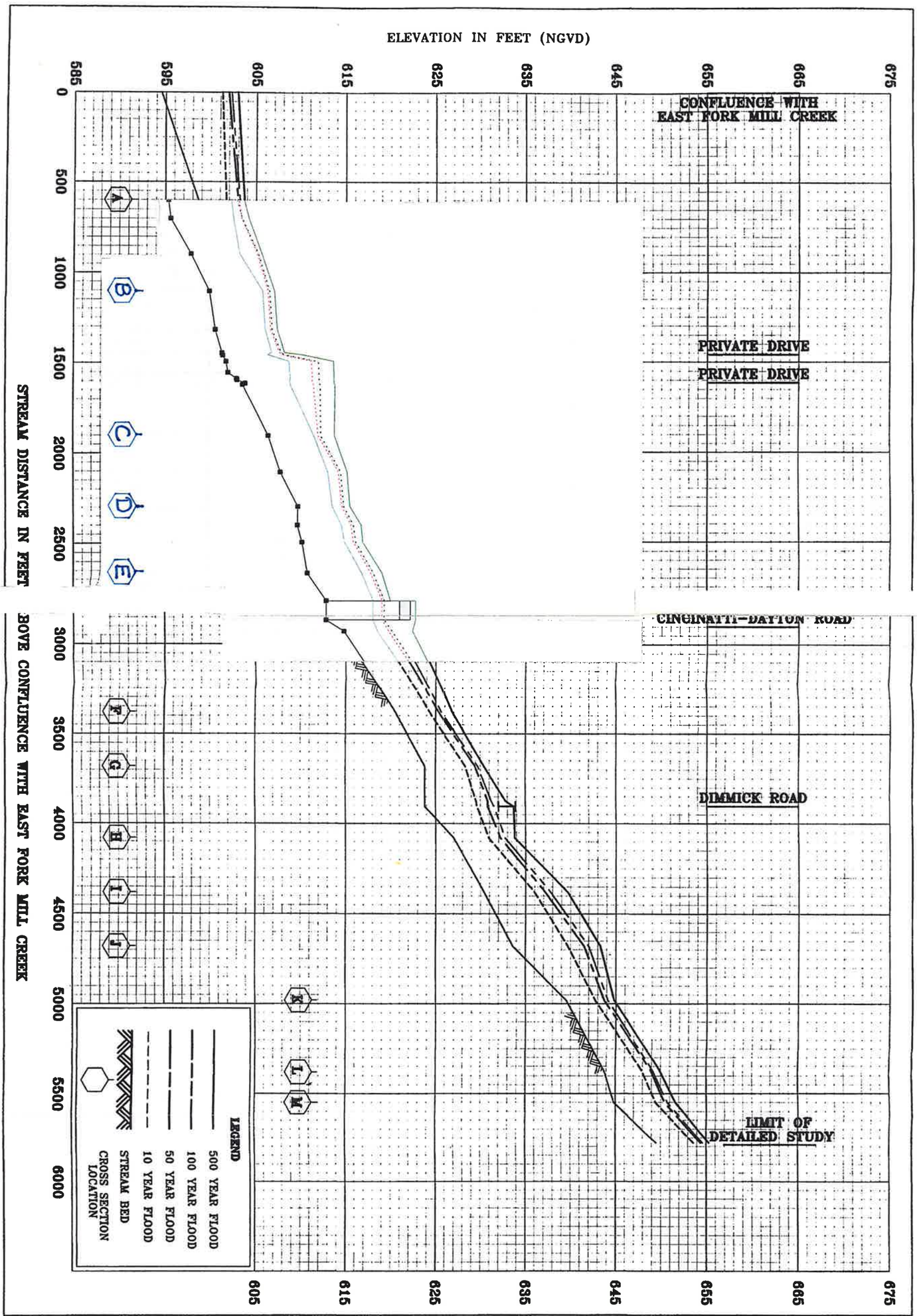
FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TRIBUTARY TO EAST FORK MILL CREEK

EFFECTIVE JANUARY 21, 1998



47P

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH

(UNINCORPORATED AREAS)

FLOOD PROFILES

TRIBUTARY TO EAST FORK MILL CREEK

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

COMMUNITY REMINDERS

We based this determination on the 1% annual chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State law have been obtained. State or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

We have enclosed a document, titled *List of Current Flood Insurance Study Data*, which includes this letter, to help your community maintain all information for floodplain management and flood insurance. If any of the items in that document are not filed in your community's map repository, please contact the FEMA Map Assistance Center at the number listed below for information on how to obtain those items.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the FEMA MCC Services, 12101 Indian Creek Court, Beltsville, MD 20705. Additional information about the NFIP is available on our web site at http://www.fema.gov/nfip.

Michael B. Godesky, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

COMMUNITY REMINDERS (continued)
We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Ken Hinterlong
Regional Engineer
Federal Emergency Management Agency, Region V
536 South Clark Street, Sixth Floor
Chicago, Illinois 60605
(312) 408-5529

STATUS OF THE COMMUNITY NFIP MAPS
We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the FEMA MCC Services, 12101 Indian Creek Court, Beltsville, MD 20705. Additional information about the NFIP is available on our web site at http://www.fema.gov/nfip.

Michael B. Godesky, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

SEP 3 0 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Charles R. Furmon
President, Board of Commissioners, Butler County
315 High Street, 4th Floor
Government Services Center
Hamilton, OH 45011

IN REPLY REFER TO:

Case Number: **03-05-5177P**
Community Name: Butler County, Ohio (Unincorporated Areas)
Community Number: 390037
Effective Date of this Revision: JAN 2 7 2005

Dear Mr. Furmon:

The Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed that provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer (CCO) for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Federal Emergency Management Agency (FEMA) in Chicago, Illinois, at (312) 408-5548, or the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our web site at http://www.fema.gov/nfip.

Sincerely,

Michael B. Godesky, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

List of Enclosures:
Letter of Map Revision Determination Document
Annotated Flood Insurance Study Report
Annotated Flood Insurance Rate Map
List of Current Flood Insurance Study Data

cc: [redacted] Zoning and Drainage Inspector, Butler County
[redacted] Executive Director, Butler County Transportation Improvement Division
[redacted] EMH&T, Inc.
Community Map Repository

FROM FEMA WEB

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	BUTLER COUNTY, OHIO (UNINCORPORATED AREAS)	BRIDGE	HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA BASE MAP CHANGES
	COMMUNITY NO.: 390037		
IDENTIFIER	UNION CENTRE BOULEVARD	APPROXIMATE LATITUDE & LONGITUDE: 39.3181, 84.4174 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
FLOODING SOURCE & REVISED REACH	EAST FORK MILL CREEK - from approximately 1,350 feet upstream of Beckett Road to approximately 250 feet downstream of Allen Road		

SUMMARY OF REVISIONS

Effective Flooding:	Zone AE	BFEs*	Floodway	X (shaded)
Revised Flooding:	Zone AE	BFEs*	Floodway	X (shaded)
Increases:	YES	YES	YES	YES
Decreases:	YES	YES	YES	YES

* BFEs - Base Flood Elevations

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO: 390037 0050 C Date: January 21, 1998	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: January 21, 1998 FLOODWAY DATA TABLE PROFILE: 31P AND 32P

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

DETERMINATION

This document provides the determination from the Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the FEMA MCC Services, 12101 Indian Creek Court, Beltsville, MD 20705. Additional information about the NFIP is available on our web site at http://www.fema.gov/nfip.

Michael B. Godesky, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Version 1.0 382304.05 0067

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period elapses and we resolve any appeals that we receive during this appeal period. Until this LOMR is effective, the revised BFEs presented in this LOMR may be changed.

This information will be published in the *Federal Register* and your local newspaper as detailed below.

LOCAL NEWSPAPER Name: *The Journal-News*
Dates: 10/21/2004 10/28/2004

PUBLIC NOTIFICATION				
FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD)		MAP PANEL NUMBER
		EFFECTIVE	REVISED	
EAST FORK MILL CREEK	Approximately 300 feet upstream of Beckett Road	623	624	390037 0050 C
	Approximately 2,350 feet upstream of Allen Road	602	601	390037 0050 C

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the FEMA MCC Services, 12101 Indian Creek Court, Beltsville, MD 20705. Additional information about the NFIP is available on our web site at http://www.fema.gov/nfip.

Michael B. Godesky, CFM, Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

LIST OF CURRENT FLOOD INSURANCE STUDY DATA

This list is provided to document all information currently effective for your community for insurance and floodplain management.

Date: SEP 30 2004

Community: Butler County, Ohio (Unincorporated Areas)

Community Number: 390037

CURRENT EFFECTIVE FLOOD INSURANCE STUDY DATE: January 21, 1998

FLOOD INSURANCE RATE MAP

Map Index	Effective Date
390037 IND0	January 21, 1998
Panel Numbers	**Effective Date**
0010 B, 0015 B, 0035 B, 0060 B, 0080 B, 0085 B, 0090 B, 0095 B, 0100 B, 0105 B, 0110 B, 0115 B, 0120 B, 0125 B, 0130 B, 0135 B, 0150 B, and 0155 B	November 4, 1981
0040 C, 0065 C, 0140 C, and 0145 C	November 16, 1983
0020 C, 0045 C, 0050 C, 0070 C, and 0075 C	January 21, 1998

LETTERS OF MAP REVISION

Panel Numbers	Effective Date
0040 C	August 25, 2004
0045 C	August 25, 2004
0050 C	July 15, 1998 October 27, 2003

JAN 27 2005

LETTERS OF MAP AMENDMENT AND MAP REVISION BASED ON FILL

Panel Numbers	Effective Date
0015 B	July 6, 2000

LETTERS OF MAP AMENDMENT AND MAP REVISION BASED ON FILL *(continued)*

Panel Numbers	Effective Date
0035 B	March 7, 2003
	April 2, 2004
0040 C	October 21, 1998
	July 6, 1999
0045 C	August 1, 2001
	August 15, 2001
	November 30, 2001
	June 12, 2002
	July 25, 2003
0050 C	August 17, 2001
	May 28, 2003
	June 18, 2003
0060 B	October 15, 1999
0065 C	September 20, 1996
0070 C	January 22, 1998
	July 2, 1998
	September 30, 1998
	November 17, 1998
	December 2, 1998
	December 16, 1998
	December 18, 1998
	December 30, 1998
	January 6, 1999
	January 8, 1999
	January 27, 1999
	January 28, 1999
	March 5, 1999
	September 15, 1999
	September 29, 1999
	May 25, 2000
	June 16, 2000
	June 23, 2000
	September 6, 2000
	May 4, 2001
	September 5, 2001

LETTERS OF MAP AMENDMENT AND MAP REVISION BASED ON FILL *(continued)*

Panel Numbers	Effective Date
0085 B	May 1, 1996 August 22, 1996 January 7, 1998 June 10, 1998
0110 B	February 19, 1997
0115 B	March 31, 2004
0120 B	June 4, 1996
0130 B	April 21, 1997 May 19, 2000
0150 B	June 20, 2001

BEST AVAILABLE DATA LETTERS

None

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE UNINCORPORATED AREAS OF BUTLER COUNTY, OHIO, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On January 21, 1998, the Department of Homeland Security's Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the Unincorporated Areas of Butler County, Ohio, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Division has determined that modification of the elevations of the flood having a 1% chance of being equaled or exceeded in any given year (base or 100-year flood) for certain locations in this community is appropriate. The modified Base Flood Elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate a new bridge and associated fill and has resulted in a revised delineation of the floodway and SFHA, and revised BFEs for East Fork Mill Creek from approximately 1,350 feet upstream of Beckett Road to approximately 250 feet downstream of Allen Road. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
Approximately 300 feet upstream of Beckett Road	623	624
Approximately 2,350 feet upstream of Allen Road	602	601

*National Geodetic Vertical Datum, rounded to nearest whole foot

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Division must develop criteria for floodplain management. For the community to participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Division reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are

on notice that until the 90-day period elapses, the Mitigation Division's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

Charles R. Furmon
President, Board of Commissioners, Butler County
315 High Street, 4th Floor
Government Services Center
Hamilton, OH 45011

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
East Fork Mill Creek								
A	4,349	120	659	4.5	586.3	586.3	586.7	0.4
B	5,164	121	482	6.7	587.7	587.7	588.1	0.4
C	6,344	265	1,677	2.7	590.4	590.4	591.4	1.0
D	6,944	532	3,962	1.2	591.2	591.2	592.2	1.0
E	7,544	556	3,161	1.5	591.5	591.5	592.4	0.9
F	8,864	450	1,796	2.7	592.7	592.7	593.6	0.9
Q G	9,844	400	1,806	2.7	595.6	595.6	596.4	0.8
4855 H	10,950	347	2,111	2.3	597.6	597.6	598.7	1.0
4882 I	11,270	246	1,575	3.1	597.9	597.9	598.8	0.9
4862 J	12,316	235	1,389	3.5	600.8	600.8	601.0	0.1
3203 K	13,508	85	478	6.7	604.7	604.7	605.1	0.4
3218 L	14,026	40	346	9.3	608.9	608.9	609.7	0.8
M	14,556	305	1,970	1.6	611.9	611.9	612.5	0.6
N	14,973	226	1,373	2.4	612.3	612.3	612.8	0.5
O	15,767	121	466	6.9	613.9	613.9	614.2	0.2
P	16,684	166	843	3.8	618.9	618.9	619.7	0.8
Q	17,945	200	764	4.2	624.9	624.9	625.7	0.9
R	18,635	190	572	5.6	629.3	* 629.3	629.6	0.4
S	19,215	120	328	9.8	634.6	634.6	634.6	0.0
T	19,895	103	582	5.5	641.3	641.3	642.1	0.8
U	20,397	61	446	7.2	647.1	647.1	647.1	0.0
V	20,897	63	323	10.0	651.3	651.3	651.5	0.2
W	21,712	41	283	11.4	660.6	660.6	661.0	0.4

REVISED AREA

[1] Feet above confluence with Mill Creek

JAN 2 7 2005

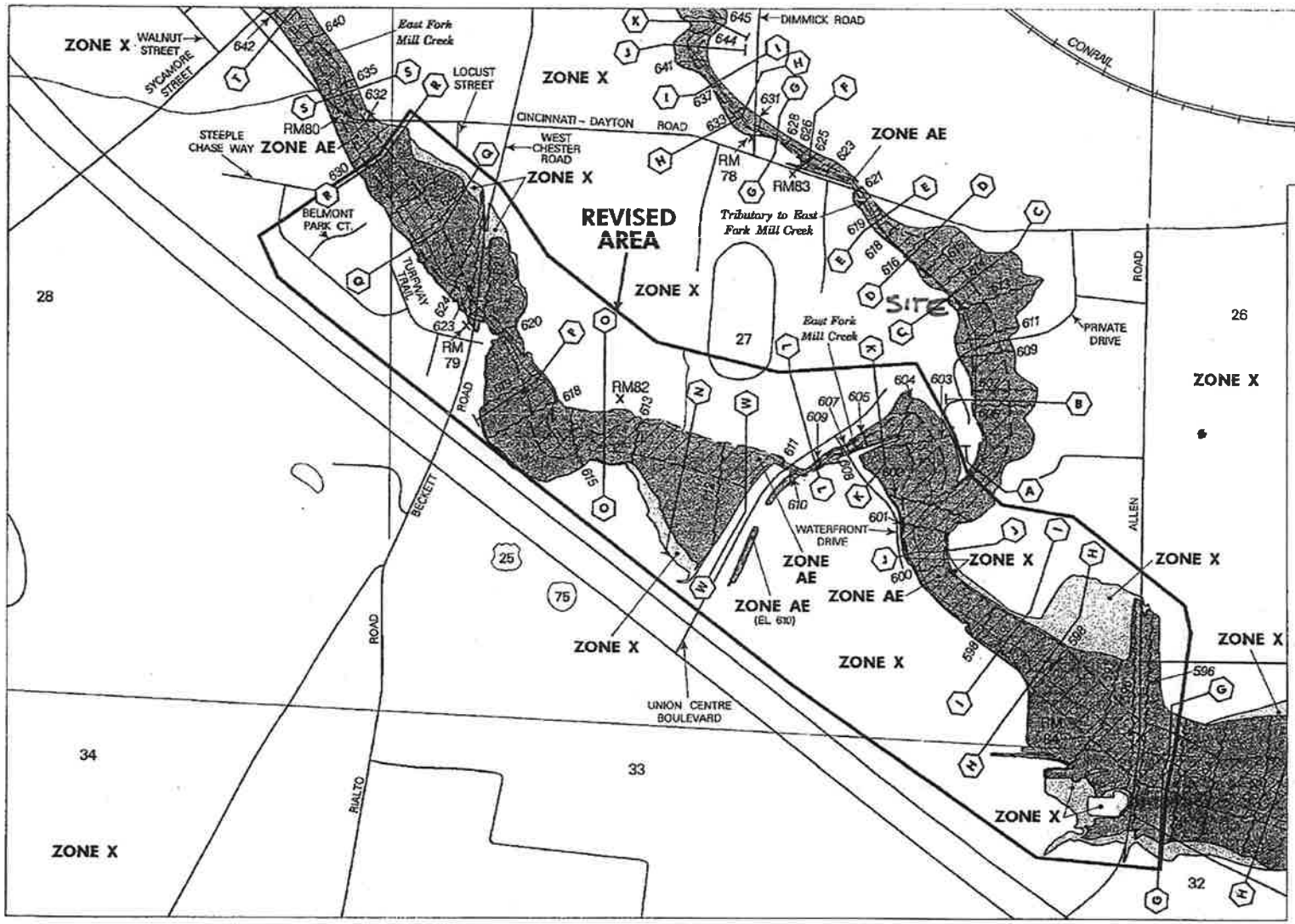
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BUTLER COUNTY, OH (UNINCORPORATED AREAS)

FLOODWAY DATA

EAST FORK MILL CREEK



APPROXIMATE SCALE IN FEET

600 0 600

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BUTLER COUNTY, OHIO
(UNINCORPORATED AREAS)

PANEL 50 OF 155
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY–PANEL NUMBER
390037 0050 C

MAP REVISED:
JANUARY 21, 1998

JAN 27 2005

Federal Emergency Management Agency

31P
FEDERAL EMERGENCY MANAGEMENT AGENCY
BUTLER COUNTY, OH
(UNINCORPORATED AREAS)
FLOOD PROFILES
EAST FORK MILL CREEK
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
JAN 2 5 2005
UNION CENTRE BOULEVARD
WATERFRONT DRIVE
CONFLUENCE OF TRIBUTARY TO EAST FORK MILL CREEK
ALLEN ROAD
REVISED AREA
CORPORATE LIMITS
EAST CRESCENTVILLE ROAD
ELEVATION IN FEET (NGVD)
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
BUTLER COUNTY, OH
(UNINCORPORATED AREAS)
32P
FLOOD PROFILES
EAST FORK MILL CREEK
JAN 27 2005
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
REVISED AREA
BECKETT ROAD
CINCINNATI-DAYTON ROAD
STATION ROAD
LIMIT OF DETAILED STUDY
STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH MILL CREEK
ELEVATION IN FEET (NGVD)

APPENDIX:

B. HEC-RAS Analysis

- Work Maps – Existing and Proposed
- Base Flood Elevations Sketch
- Survey Sketch of On-Site Bridge
- Flow Rate Computation for 2-Year Frequency Flood
- HEC-RAS Base Flood Profiles of Regulatory, Corrected-Effective, Existing, and Proposed Conditions
- HEC-RAS Summary of Converted Regulatory, Corrected-Effective, Existing, and Proposed Base Flood Profiles
- Duplicate of Effective Regulatory HEC-2
- Cross-Sections Plots of Corrected-Effective and Existing Conditions
- Cross-Sections Plots of Existing and Proposed Conditions

UNION CENTRE BOULEVARD

EAST FORK MILL CREEK

MATCH LINE - REFERENCE SHEET 19

Basin #1
W.P. = 597.0
Bottom = 587.0

WORKMAP
UNION CENTRE DEVELOPMENT
CHFOZ GB 4-11-08

7-1-08 EAST FORK TOPO SPLICED

NOTE: GIS TOPOGRAPHY CONVERSION TO FEMA DATUM ON THIS WORKMAP REQUIRES: +0.56 FOOT. GIS TOPOGRAPHY IS THE AERIE AND RED CONTOURS.

ADD 0.56' TO GIS CONTOUR. REMOVE PEDESTRIAN BRIDGE AND JUST X-SEC STATIONS TO MATCH EFFECTIVE SHARON ALIGNMENT

FEMA MODEL FLOOD MANAGEMENT ZONE AE WITH FIRM PANEL AT: X-SECS: 32, 33, 34, 41, 42, 43, 44, 45

X-SEC 20 IN MODEL IS 185 UPSTREAM BUT IS MAPPED 165 FEET WIDE — DOESN'T AFFECT SUBJECT PROPERTY BECAUSE FLOODWAY IS AT THE FLOODPLAIN LIMIT AT X-SEC 20

SD BRIDGE CROSSING
AREA: (33.3+26.5)/2 x (609.00-602.91) = 209.8 SQ FT
WIDTH: 3 PIERS x 2' = 6.0'

SYMBOLS: ADD 2.5' TO ADJUST TO BANKER

EAST FORK MILL CREEK

Basin #1
M.P. = 597.0
Bottom = 587.0

4'Wx6'Lx2.5'D Dumped Rock Fill, Type C

8'Wx8'Lx2.5'D Dumped Rock Fill, Type C

75 L.F. 4" Temporary Outlet @ 0.50% Slope

Temporary Swale @ 0.50% Slope

Sediment Control Structure, Ref. Detail Sheet 23.

Sediment Fence (Typ.)

Aggregate Check Dam

Existing Trees Typ.

GRADING ESMT.

FEMA Floodway

FEMA 100Yr Flood Elev.

EX. 21" Sanitary

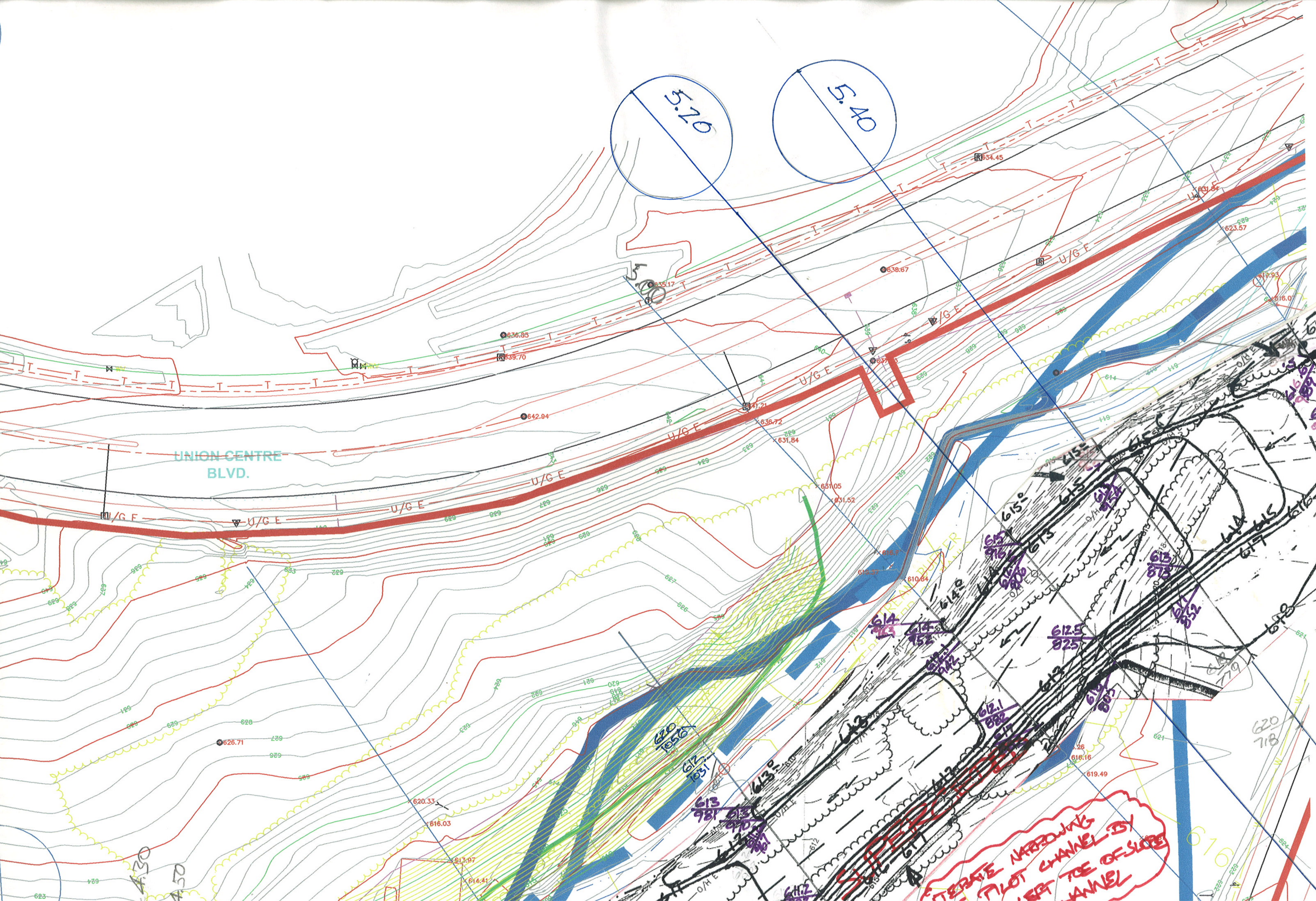
EAST FORK MILL CREEK

Denotes Temporary Swale Centerline Elevation

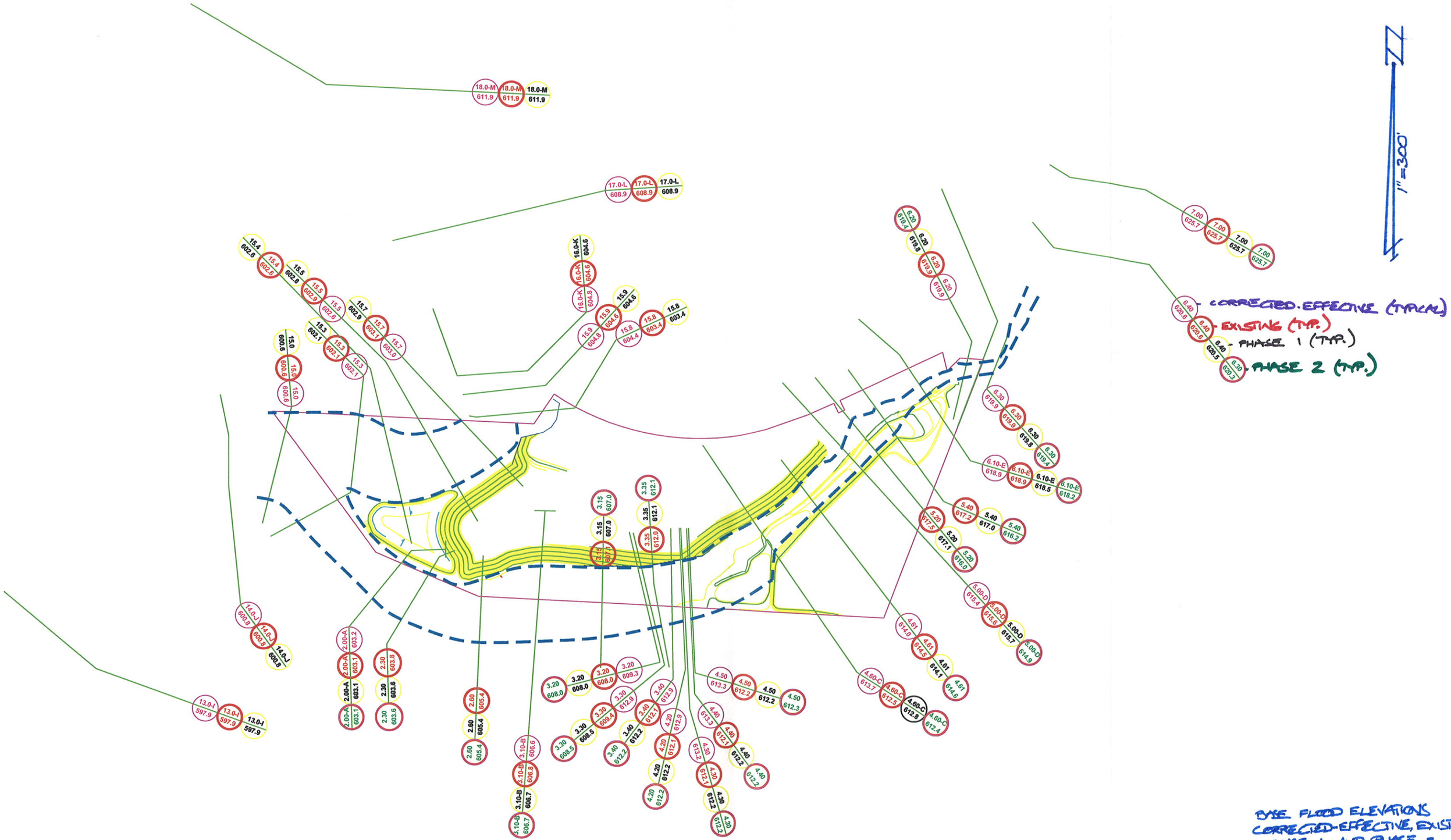
S03° 06'W 326.78'

N47°23'24"W 236.15'

N84°55'43"W 176.16'



UNION CENTRE
BLVD.
5.20
5.40

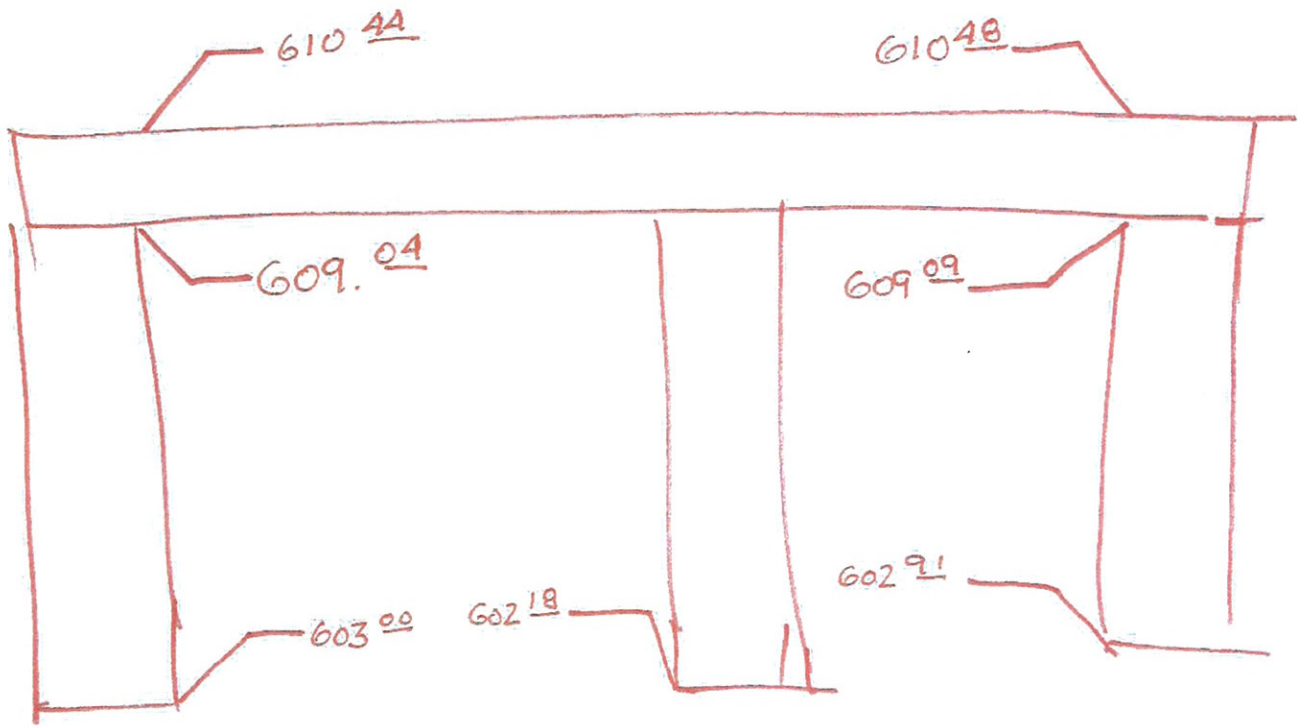


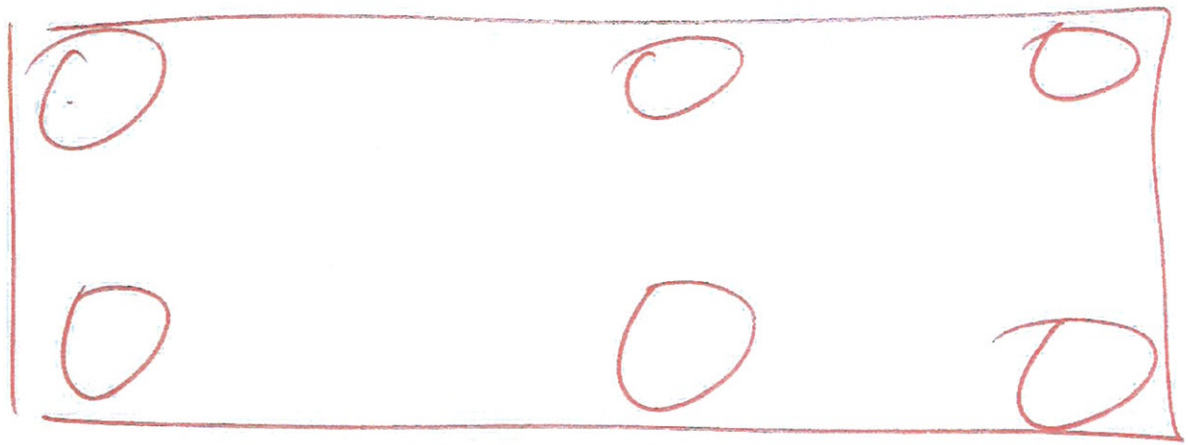
BASE FLOOD ELEVATIONS
CORRECTED-EFFECTIVE, EXISTING,
PHASE 1, AND PHASE 2

GB 9-8-08 CHFOZ

LOOKING UPSTREAM

LOOKING UPSTREAM





Tributary to the East Fork

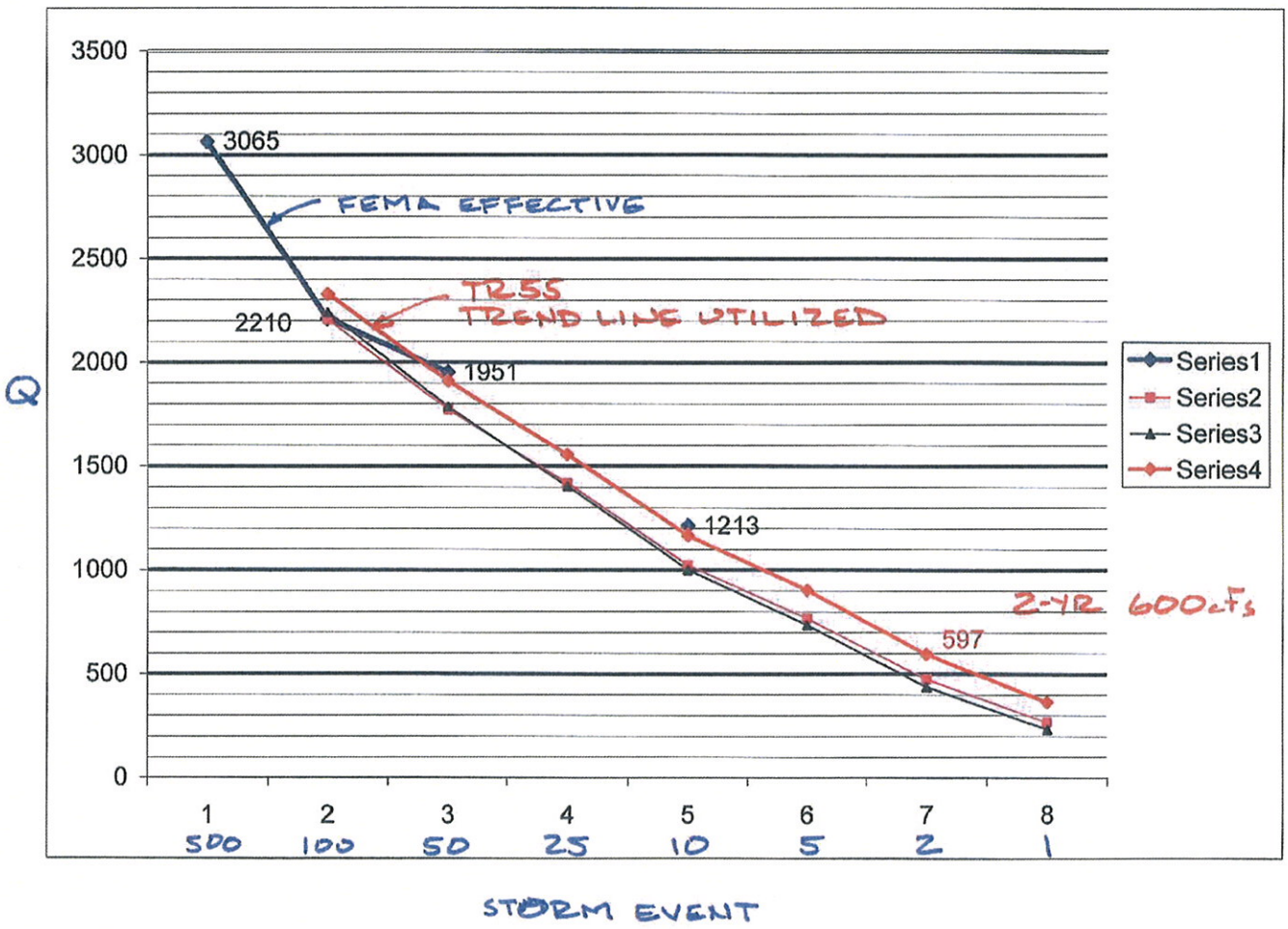
5/7/2008

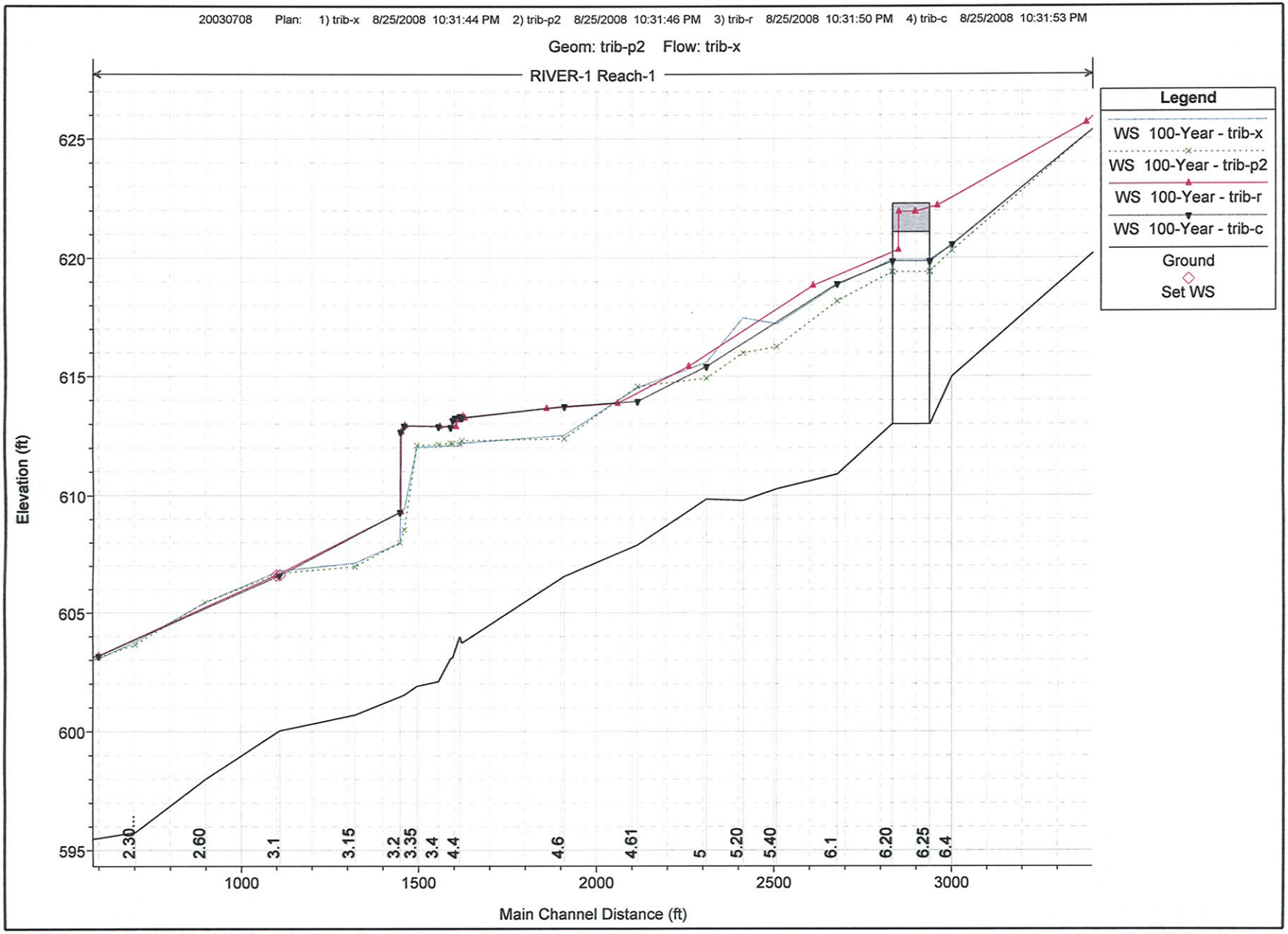
Based on TR55 Graph of Typical Storm Events

Comparative Trend Lines for Storm Events to Predict 2-yr Event Compared to FEMA Model Effective Flows Flows

Various TR55 Graphs for Trend Lines

Storm Event	Q Effective	TR-55	Compared to Effective	TR-55	Compared to Effective	TR-55	Compared to Effective
	cfs	cfs	%	cfs	%	cfs	%
500	**3065**						
100	**2210**	2205	99.8%	2239	101.3%	2328	105.3%
50	**1951**	1773	90.9%	1786	91.5%	1910	97.9%
25		1420		1404		1557	
10	**1213**	1025	84.5%	1002	82.6%	1167	96.2%
5		770		736		906	
2		478		439		597	
1		269		233		366	





1 in Horiz. = 400 ft 1 in Vert. = 6 ft

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year

Reach	River Sta	Profile	Plan	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)	
Reach-1	1	100-Year	trib-x	4845.00	594.50	602.19	600.60	602.47	0.001600	5.34	2132.99	787.94	0.36
Reach-1	1	100-Year	trib-p2	4845.00	594.50	602.19	600.60	602.47	0.001600	5.34	2132.99	787.94	0.36
Reach-1	1	100-Year	trib-r	4845.00	594.50	602.19	600.60	602.47	0.001600	5.34	2132.99	787.94	0.36
Reach-1	1	100-Year	trib-c	4845.00	594.50	602.19	600.60	602.47	0.001600	5.34	2132.99	787.94	0.36
Reach-1	2	100-Year	trib-x	2210.00	595.51	603.06		603.73	0.004745	7.38	501.56	224.39	0.57
Reach-1	2	100-Year	trib-p2	2210.00	595.51	603.11		603.63	0.003898	6.73	672.77	366.04	0.52
Reach-1	2	100-Year	trib-r	2210.00	598.60	603.17	603.17	604.20	0.009289	8.80	372.63	222.73	0.79
Reach-1	2	100-Year	trib-c	2210.00	598.60	603.17	603.17	604.20	0.009289	8.80	372.63	222.73	0.79
Reach-1	2.30	100-Year	trib-x	2210.00	595.76	603.75		604.19	0.003552	6.17	659.40	312.77	0.45
Reach-1	2.30	100-Year	trib-p2	2210.00	595.76	603.64		604.04	0.003501	6.05	773.10	398.95	0.45
Reach-1	2.60	100-Year	trib-x	2210.00	598.00	605.43	605.43	606.17	0.006536	8.33	572.21	366.57	0.61
Reach-1	2.60	100-Year	trib-p2	2210.00	598.00	605.44	605.44	606.16	0.006402	8.25	588.52	377.58	0.61
Reach-1	3.1	100-Year	trib-x	2210.00	600.04	606.79		606.91	0.002038	3.88	1036.79	442.84	0.30
Reach-1	3.1	100-Year	trib-p2	2210.00	600.04	606.69		606.85	0.001866	4.36	1006.59	443.27	0.36
Reach-1	3.1	100-Year	trib-r	2210.00	601.40	606.60		606.72	0.003268	3.78	940.37	436.60	0.31
Reach-1	3.1	100-Year	trib-c	2210.00	601.40	606.60		606.72	0.003268	3.78	940.37	436.60	0.31
Reach-1	3.15	100-Year	trib-x	2210.00	600.70	607.12		608.04	0.007083	8.35	459.98	410.19	0.63
Reach-1	3.15	100-Year	trib-p2	2210.00	600.70	606.97		608.03	0.008285	8.86	411.82	321.60	0.68
Reach-1	3.2	100-Year	trib-x	2210.00	601.46	607.98	606.82	609.34	0.010242	9.38	235.52	43.48	0.71
Reach-1	3.2	100-Year	trib-p2	2210.00	601.46	607.99	606.81	609.36	0.010344	9.41	234.83	42.47	0.71
Reach-1	3.2	100-Year	trib-r	2210.00	603.70	609.31	609.31	611.77	0.017960	12.58	175.74	332.10	1.00
Reach-1	3.2	100-Year	trib-c	2210.00	603.70	609.31	609.31	611.77	0.017960	12.58	175.74	332.10	1.00
Reach-1	3.25			Bridge									
Reach-1	3.3	100-Year	trib-x	2210.00	601.54	609.43	608.53	611.53	0.014189	11.62	193.14	147.78	0.83
Reach-1	3.3	100-Year	trib-p2	2210.00	601.54	608.54	608.54	611.39	0.021095	13.55	163.09	29.38	1.00
Reach-1	3.3	100-Year	trib-r	2210.00	603.70	612.93	609.31	612.97	0.000336	2.48	2056.01	480.71	0.15
Reach-1	3.3	100-Year	trib-c	2210.00	603.70	612.93	609.31	612.97	0.000336	2.48	2056.01	480.71	0.15
Reach-1	3.35	100-Year	trib-x	2210.00	601.90	612.03		612.17	0.000588	3.64	1380.17	440.89	0.22
Reach-1	3.35	100-Year	trib-p2	2210.00	601.90	612.10		612.26	0.000620	3.76	1179.57	341.07	0.23
Reach-1	3.4	100-Year	trib-x	2210.00	602.10	612.07		612.21	0.000655	3.69	1369.81	434.64	0.23
Reach-1	3.4	100-Year	trib-p2	2210.00	602.10	612.15		612.30	0.000677	3.77	1202.08	342.72	0.24
Reach-1	3.4	100-Year	trib-r	2210.00	604.60	612.90		613.10	0.000874	4.35	1203.81	417.93	0.27
Reach-1	3.4	100-Year	trib-c	2210.00	604.60	612.90		613.10	0.000875	4.35	1203.35	417.92	0.27
Reach-1	4.2	100-Year	trib-x	2210.00	603.06	612.09		612.24	0.000744	3.84	1333.95	425.31	0.25
Reach-1	4.2	100-Year	trib-p2	2210.00	603.06	612.19		612.33	0.000699	3.75	1278.03	352.95	0.24
Reach-1	4.2	100-Year	trib-r	2210.00	605.00	612.89	610.00	613.24	0.002456	7.30	1045.15	394.04	0.46
Reach-1	4.2	100-Year	trib-c	2210.00	605.00	612.87	610.00	613.23	0.002500	7.35	1037.72	393.43	0.46
Reach-1	4.3	100-Year	trib-x	2210.00	603.11	612.08		612.25	0.000945	4.28	1260.88	418.52	0.28
Reach-1	4.3	100-Year	trib-p2	2210.00	603.11	612.18		612.34	0.000874	4.16	1229.38	356.24	0.27
Reach-1	4.3	100-Year	trib-r	2210.00	605.50	613.17		613.31	0.003321	6.05	1089.15	402.95	0.40
Reach-1	4.3	100-Year	trib-c	2210.00	605.50	613.16		613.31	0.003349	6.07	1085.98	402.70	0.40
Reach-1	4.4	100-Year	trib-x	2210.00	604.00	612.08		612.30	0.001572	4.62	969.88	314.53	0.34
Reach-1	4.4	100-Year	trib-p2	2210.00	604.00	612.18		612.39	0.001472	4.52	934.24	259.33	0.33
Reach-1	4.4	100-Year	trib-r	2210.00	605.50	613.30	611.45	613.43	0.002892	5.72	1142.51	407.23	0.37
Reach-1	4.4	100-Year	trib-c	2210.00	605.50	613.31	611.45	613.44	0.002848	5.68	1148.60	407.72	0.37
Reach-1	4.5	100-Year	trib-x	2210.00	603.73	612.20		612.33	0.001031	4.67	1263.12	414.96	0.29
Reach-1	4.5	100-Year	trib-p2	2210.00	603.73	612.30		612.42	0.000922	4.46	1253.12	368.91	0.28
Reach-1	4.5	100-Year	trib-r	2210.00	605.00	613.25	610.00	613.50	0.001776	6.39	1188.16	405.67	0.39
Reach-1	4.5	100-Year	trib-c	2210.00	605.00	613.27	610.00	613.51	0.001748	6.35	1195.50	408.25	0.39
Reach-1	4.6	100-Year	trib-x	2210.00	606.56	612.52	612.52	613.71	0.010384	9.58	323.76	149.35	0.83
Reach-1	4.6	100-Year	trib-p2	2210.00	606.56	612.38		613.69	0.011438	10.03	287.75	107.12	0.87
Reach-1	4.6	100-Year	trib-r	2210.00	607.20	613.65		613.83	0.001081	3.68	868.10	411.26	0.28
Reach-1	4.6	100-Year	trib-c	2210.00	607.20	613.74		613.92	0.000993	3.57	909.83	427.19	0.27
Reach-1	4.61	100-Year	trib-x	2210.00	607.90	614.52		614.96	0.003608	5.91	548.08	207.84	0.45
Reach-1	4.61	100-Year	trib-p2	2210.00	607.90	614.57		615.15	0.004429	6.50	403.44	105.52	0.50
Reach-1	4.61	100-Year	trib-r	2210.00	608.60	613.86		614.26	0.003844	5.20	493.64	222.05	0.45
Reach-1	4.61	100-Year	trib-c	2210.00	608.60	613.95		614.33	0.003548	5.06	513.70	236.07	0.44
Reach-1	5	100-Year	trib-x	2210.00	609.86	615.59	615.59	617.28	0.009901	10.84	275.05	118.36	0.84
Reach-1	5	100-Year	trib-p2	2210.00	609.86	614.92	614.92	616.27	0.000667	10.26	259.94	90.93	0.85
Reach-1	5	100-Year	trib-r	2210.00	609.90	615.42	615.42	616.62	0.011026	9.02	282.94	143.38	0.89
Reach-1	5	100-Year	trib-c	2210.00	609.90	615.42	615.42	616.62	0.011026	9.02	282.94	143.38	0.89
Reach-1	5.20	100-Year	trib-x	2210.00	609.80	617.47		617.79	0.001980	4.78	588.89	168.19	0.34
Reach-1	5.20	100-Year	trib-p2	2210.00	609.80	615.99		616.49	0.004666	6.07	447.01	127.00	0.50
Reach-1	5.40	100-Year	trib-x	2210.00	610.29	617.21		618.39	0.008776	9.04	304.59	103.50	0.69

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year (Continued)

Reach	River Sta	Profile	Plan	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)	
Reach-1	5.40	100-Year	trib-p2	2210.00	610.29	616.24		617.34	0.012247	9.33	321.97	104.30	0.79
Reach-1	6.1	100-Year	trib-x	2210.00	610.90	618.85		619.79	0.007429	7.78	283.94	59.97	0.63
Reach-1	6.1	100-Year	trib-p2	2210.00	610.90	618.18	617.68	619.09	0.008563	8.09	360.53	141.85	0.67
Reach-1	6.1	100-Year	trib-r	2210.00	612.20	618.83	617.57	619.71	0.007067	7.64	335.82	150.43	0.62
Reach-1	6.1	100-Year	trib-c	2210.00	612.20	618.91	617.57	619.75	0.006631	7.49	348.19	156.05	0.60
Reach-1	6.20	100-Year	trib-x	2210.00	613.00	619.93	618.67	621.08	0.007810	8.64	255.88	199.87	0.66
Reach-1	6.20	100-Year	trib-p2	2210.00	613.00	619.42	618.67	620.84	0.010972	9.56	231.07	182.16	0.77
Reach-1	6.20	100-Year	trib-r	2210.00	613.00	620.34	618.67	621.33	0.006070	8.01	275.99	236.59	0.59
Reach-1	6.20	100-Year	trib-c	2210.00	613.00	619.87	618.67	621.05	0.008093	8.73	253.16	197.92	0.67
Reach-1	6.25			Bridge									
Reach-1	6.3	100-Year	trib-x	2210.00	613.00	619.94	618.67	621.09	0.006119	8.62	256.53	200.33	0.66
Reach-1	6.3	100-Year	trib-p2	2210.00	613.00	619.44	618.67	620.84	0.008538	9.52	232.13	182.92	0.77
Reach-1	6.3	100-Year	trib-r	2210.00	613.00	621.95	618.67	622.55	0.002089	6.24	354.14	355.79	0.41
Reach-1	6.3	100-Year	trib-c	2210.00	613.00	619.88	618.67	621.06	0.006338	8.71	253.84	198.41	0.67
Reach-1	6.4	100-Year	trib-x	2210.00	615.00	620.54		621.51	0.006698	8.09	317.19	80.16	0.63
Reach-1	6.4	100-Year	trib-p2	2210.00	615.00	620.31		621.39	0.007876	8.52	298.88	79.24	0.67
Reach-1	6.4	100-Year	trib-r	2210.00	615.00	622.20		622.72	0.002533	5.99	457.05	98.28	0.40
Reach-1	6.4	100-Year	trib-c	2210.00	615.00	620.58		621.53	0.006527	8.03	320.21	80.31	0.62
Reach-1	7	100-Year	trib-x	2210.00	620.50	625.67	625.67	627.44	0.017132	10.79	226.71	80.88	0.95
Reach-1	7	100-Year	trib-p2	2210.00	620.50	625.67	625.67	627.44	0.017127	10.79	226.74	80.88	0.95
Reach-1	7	100-Year	trib-r	2210.00	620.50	625.67	625.67	627.44	0.017115	10.78	226.81	80.90	0.95
Reach-1	7	100-Year	trib-c	2210.00	620.50	625.67	625.67	627.44	0.017127	10.79	226.74	80.88	0.95
Reach-1	8.1	100-Year	trib-x	2210.00	623.80	629.67		630.97	0.008369	9.44	322.65	99.31	0.70
Reach-1	8.1	100-Year	trib-p2	2210.00	623.80	629.67		630.97	0.008378	9.45	322.50	99.28	0.70
Reach-1	8.1	100-Year	trib-r	2210.00	623.80	629.67		630.97	0.008374	9.44	322.58	99.29	0.70
Reach-1	8.1	100-Year	trib-c	2210.00	623.80	629.67		630.97	0.008371	9.44	322.63	99.31	0.70
Reach-1	8.2	100-Year	trib-x	2210.00	623.80	631.20	629.65	632.50	0.007363	9.14	241.92	214.25	0.65
Reach-1	8.2	100-Year	trib-p2	2210.00	623.80	631.20	629.65	632.50	0.007362	9.13	241.93	214.25	0.65
Reach-1	8.2	100-Year	trib-r	2210.00	623.80	631.20	629.65	632.50	0.007362	9.13	241.93	214.25	0.65
Reach-1	8.2	100-Year	trib-c	2210.00	623.80	631.20	629.65	632.50	0.007363	9.14	241.92	214.25	0.65
Reach-1	8.25			Bridge									
Reach-1	8.3	100-Year	trib-x	2210.00	623.80	632.97	629.64	633.41	0.001699	5.84	796.07	252.99	0.36
Reach-1	8.3	100-Year	trib-p2	2210.00	623.80	632.97	629.64	633.41	0.001699	5.83	796.09	253.00	0.36
Reach-1	8.3	100-Year	trib-r	2210.00	623.80	632.97	629.64	633.41	0.001699	5.83	796.09	253.00	0.36
Reach-1	8.3	100-Year	trib-c	2210.00	623.80	632.97	629.64	633.41	0.001699	5.84	796.07	252.99	0.36
Reach-1	8.4	100-Year	trib-x	2210.00	627.00	633.16		634.46	0.010823	9.23	259.59	60.95	0.71
Reach-1	8.4	100-Year	trib-p2	2210.00	627.00	633.16		634.46	0.010823	9.23	259.60	60.95	0.71
Reach-1	8.4	100-Year	trib-r	2210.00	627.00	633.16		634.46	0.010823	9.23	259.60	60.95	0.71
Reach-1	8.4	100-Year	trib-c	2210.00	627.00	633.16		634.46	0.010823	9.23	259.59	60.95	0.71
Reach-1	9	100-Year	trib-x	2210.00	630.40	637.74	637.74	640.55	0.017962	14.21	248.53	70.24	0.95
Reach-1	9	100-Year	trib-p2	2210.00	630.40	637.74	637.74	640.55	0.017962	14.21	248.53	70.24	0.95
Reach-1	9	100-Year	trib-r	2210.00	630.40	637.74	637.74	640.55	0.017962	14.21	248.53	70.24	0.95
Reach-1	9	100-Year	trib-c	2210.00	630.40	637.74	637.74	640.55	0.017962	14.21	248.53	70.24	0.95
Reach-1	10	100-Year	trib-x	2210.00	633.60	642.24		642.79	0.003480	6.95	740.41	203.27	0.43
Reach-1	10	100-Year	trib-p2	2210.00	633.60	642.24		642.79	0.003480	6.95	740.41	203.27	0.43
Reach-1	10	100-Year	trib-r	2210.00	633.60	642.24		642.79	0.003480	6.95	740.41	203.27	0.43
Reach-1	10	100-Year	trib-c	2210.00	633.60	642.24		642.79	0.003480	6.95	740.41	203.27	0.43
Reach-1	11	100-Year	trib-x	2210.00	639.50	644.13	644.13	645.48	0.016577	9.77	344.95	173.29	0.85
Reach-1	11	100-Year	trib-p2	2210.00	639.50	644.13	644.13	645.48	0.016577	9.77	344.95	173.29	0.85
Reach-1	11	100-Year	trib-r	2210.00	639.50	644.13	644.13	645.48	0.016577	9.77	344.95	173.29	0.85
Reach-1	11	100-Year	trib-c	2210.00	639.50	644.13	644.13	645.48	0.016577	9.77	344.95	173.29	0.85
Reach-1	12	100-Year	trib-x	2210.00	643.80	649.17		649.95	0.007856	7.56	464.14	164.90	0.60
Reach-1	12	100-Year	trib-p2	2210.00	643.80	649.17		649.95	0.007856	7.56	464.14	164.90	0.60
Reach-1	12	100-Year	trib-r	2210.00	643.80	649.17		649.95	0.007856	7.56	464.14	164.90	0.60
Reach-1	12	100-Year	trib-c	2210.00	643.80	649.17		649.95	0.007856	7.56	464.14	164.90	0.60
Reach-1	13	100-Year	trib-x	2210.00	644.80	650.71		651.51	0.014246	9.57	556.06	176.50	0.76
Reach-1	13	100-Year	trib-p2	2210.00	644.80	650.71		651.51	0.014246	9.57	556.06	176.50	0.76
Reach-1	13	100-Year	trib-r	2210.00	644.80	650.71		651.51	0.014246	9.57	556.06	176.50	0.76
Reach-1	13	100-Year	trib-c	2210.00	644.80	650.71		651.51	0.014246	9.57	556.06	176.50	0.76
Reach-1	14	100-Year	trib-x	2210.00	649.50	654.73	654.70	656.01	0.026397	11.80	440.41	165.51	1.01
Reach-1	14	100-Year	trib-p2	2210.00	649.50	654.73	654.70	656.01	0.026397	11.80	440.41	165.51	1.01
Reach-1	14	100-Year	trib-r	2210.00	649.50	654.73	654.70	656.01	0.026397	11.80	440.41	165.51	1.01
Reach-1	14	100-Year	trib-c	2210.00	649.50	654.73	654.70	656.01	0.026397	11.80	440.41	165.51	1.01

```
1*****************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    31MAR08    TIME   08:34:29  *
*****************************************
```

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

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                       X
XXXXXXX  XXXX      X          XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

THIS RUN EXECUTED 31MAR08 08:34:29

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
```

```
T1 Flood Insurance Study - Butler County, Ohio - Contract EMW-C-93-4160
T2      100-Year Flood, Unnamed Tributary to East Fork Mill Creek   tribefmc.hc2
T3      East Fork Trib-4 Floods [Looking Downstream]                GB  3-28-08

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                4                                                           602.19

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150       200       38        39        66        42        1         40        41
  Confluence with East Fork Tributary

QT        5      2754      4304      4845      6617      4845
NC     0.08      0.12      0.04       0.1       0.3
ET                                                     7.1       790       1100
  Section 1.0, same as East Fork Section 15.0
X1      1.0        19      1000      1082       170       174       175
GR      604       490       602       521       600       587       599       750       600       980
GR      602       985       602       990       600       995       598      1000       596      1020
GR      595      1025     594.5      1030     594.5      1060       595      1070       596      1082
GR      598      1104       600      1132       602      1304       604      1325
   Peak Flow from MILL.HC1, Sub12B

QT        5      1213      1951      2210      3065      2211
NH        4      0.06       914      0.14      1000     0.040      1055      0.13      1090
ET                                                     7.1       870      1055
X1      2.0        18      1000      1055       400       500       600
GR      610       757       608       766       606       772       604       783       602       824
GR      602       914       604       990       604       998       602      1000       600      1010
GR    598.6      1015     598.6      1040       600      1055       602      1060       604      1065
GR      606      1070       608      1080       610      1090

NH        4      0.06       920      0.14      1000     0.040      1035      0.13      1077
ET                                                     7.1       780      1043
X1      3.1        15      1000      1043       500       500       500
X5                                  606.60               607.614
GR      610       578       608       618       606       622       604       630       604       750
GR      606       920       604      1000       602      1005     601.4      1010     601.4      1028
GR      602      1035       604      1043       606      1052       608      1070       610      1077
```

1


```
NC     0.07      0.13     0.045       0.3       0.5
   Data taken from field measurement and Butler Co. topos (1988).
ET                                                    10.4
X1      3.2        15      1000    1035.5       350       350       350
X3       10                                                          609.8     609.8
GR      618       640       616       665       612       713       610       732       608       900
GR      608      1000       606      1006       604      1008     603.7      1010     603.7      1030
GR      604    1035.5       608      1045       610      1162       614      1190       616      1200
   Private Drive Bridge
   Top of Road 612.8, LC 611.6
```

SB	0.9	1.6	2.0		35.5	1.8	212.3	0	605.3	605.3
X1	3.3				12	12	12			
X2			1	611.6	612.8					
X3	10							612.	612.	
BT	-13	665	616		713	615.5		732	615	
BT		900	612		1000	612.5		1010	612.8	
BT		1020	612.8		1035.5	612.8		1045	612.5	
BT		1060	612.5		1162	612		1190	614	
BT		1200	616							
NC	0.08	0.13	0.04							
X1	3.4	16	1003	1046	98	98	98			
GR	618	725	616	733	614	738	612	742	610	955
GR	608	1000	606	1003	604.6	1010	604.6	1030	606	1046
GR	608	1053	610	1070	612	1150	614	1168	616	1182
GR	618	1195								

Private Drive data taken from field dimensions and Butler Co. topos (1988).
Normal Bridge Cross Section 2

ET						7.1	925	1030		
X1	4.2	30	1000	1015	45	45	45			
X3	10							608.9	608.9	
GR	618	690	616	700	614	710	612	720	611.5	820
GR	610	950	608	985	606	990	605	1000	605	1003.0
GR	605	1003.75	605	1004.5	605	1005.25	605	1006.0	605	1006.75
GR	605	1007.5	605	1008.25	605	1009.0	605	1009.75	605	1010.5
GR	605	1011.25	605	1012.0	605	1015	606	1030	608	1040
GR	610	1053	612	1085	614	1140	616	1150	618	1165

Normal Bridge Cross Section 3
Private driveway culvert (3@ 36" pipe culvert)
Top of Road 609.3, LC 608.5

ET						7.1	925	1030		
X1	4.3	36	1003.0	1012.0	5	5	5			
BT	-36	690	618	618	700	616	616	710	614	614
BT		720	612	612	820	611.5	611.5	950	610	610
BT		985	609.3	608	990	609.3	607	1000	609.3	607
BT		1003.0	609.3	607	1003.25	609.3	607.75	1003.75	609.3	608.25
BT		1004.5	609.3	608.5	1005.25	609.3	608.25	1005.75	609.3	607.75
BT		1006.0	609.3	607.0	1006.25	609.3	607.75	1006.75	609.3	608.25
BT		1007.5	609.3	608.5	1008.25	609.3	608.25	1008.75	609.3	607.75
BT		1009.0	609.3	607.0	1009.25	609.3	607.75	1009.75	609.3	608.25

1

BT		1010.5	609.3	608.5	1011.25	609.3	608.25	1011.75	609.3	607.75
BT		1012.0	609.3	607.0	1015.0	609.3	607.0	1030.0	609.3	607.0
BT		1040.0	609.3	608.0	1053.0	610.0	610.0	1085	612	612
BT		1140	614	614	1150	616	616	1165	618	618
GR	618	690	616	700	614	710	612	720	611.5	820
GR	610	950	608	985	607	990	607	1000	607	1003.0
GR	606.25	1003.25	605.75	1003.75	605.5	1004.5	605.75	1005.25	606.25	1005.75
GR	607	1006.0	606.25	1006.25	605.75	1006.75	605.5	1007.5	605.75	1008.25
GR	606.25	1008.75	607	1009.0	606.25	1009.25	605.75	1009.75	605.5	1010.5
GR	605.75	1011.25	606.25	1011.75	607	1012.0	607	1015	607	1030
GR	608	1040	610	1053	612	1085	614	1140	616	1150
GR	618	1165								

Normal Bridge Cross Section 4

ET						7.1	925	1035		
X1	4.4				15	15	15			
X2							1			

Normal Bridge Cross Section 5

ET						7.1	925	1030		
X1	4.5	30	1000	1015	5	5	5			
X3	10							608.5	608.5	
GR	618	690	616	700	614	710	612	720	611.5	820
GR	610	950	608	985	606	990	605	1000	605	1003.0
GR	605	1003.75	605	1004.5	605	1005.25	605	1006.0	605	1006.75
GR	605	1007.5	605	1008.25	605	1009.0	605	1009.75	605	1010.5
GR	605	1011.25	605	1012.0	605	1015	606	1030	608	1040
GR	610	1053	612	1085	614	1140	616	1150	618	1165
NC	0.06	0.11	0.040							
ET						7.1	900	1080		
X1	4.6	16	-100	0 1100	230	230	230			
X5						614.235				
GR	620	510	618	535	616	550	614	665	612	960
GR	610	1000	608	1005	607.2	1010	607.2	1027	608	1043
GR	610	1100	612	1108	614	1133	616	1169	618	1181
GR	620	1210								
NC			0.045	0.1	0.3					
ET						7.1	900	1080		
X1	4.61				200	200	200		1.4	
NH	4	0.06	980	0.12	1000	0.04	1035	0.12	1110	
ET						7.1	870	1070		
X1	5.0	20	980	1063	200	200	200			
GR	624	675	622	679	620	686	618	730	616	882
GR	614	910	616	980	614	998	612	1000	610	1004
GR	609.9	1010	609.9	1020	610	1025	612	1035	614	1050

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GR      616       1063       618       1067       620       1074       622       1080       624       1110
1
    31MAR08       08:34:29                                                                                PAGE    4


NC     0.08       0.12      0.045
ET                                                          10.4
X1      6.1         14       1000       1060       350        350       350
GR      624        700        622        810       620        820       618       1000       616       1013
GR      614       1015      612.2       1020      612.2      1037       614       1048       616       1060
GR      618       1072        620       1082       622       1092       624       1108

NC     0.10       0.10      0.045        0.3        0.5
   Cincinatte-Dayton Road Bridge
   Top of Road 623.3, LC 620.8
   Cross Section/Bridge Data taken from field survey (1-14-94).
X1      6.2         13       1000     1048.6       220        255       240
X3       10                                                                        620.8     621.1
GR      626        500        624        600       622        740       621        785       620        875
GR    614.8       1000        613     1031.8     616.2     1034.2     616.5     1048.6     617.3       1055
GR    619.3       1070        624       1120     625.4       1230

NC                           0.040
SB      0.9        1.6        3.0                   48.6        0.1     291.6         0       615.1      615.1
X1      6.3                                          48         48        48
X2                                1       621.1     622.3
X3       10                                                                        622.3     623.8
BT      -11        500        626                   600        624                  740     622.6
BT                 785      622.4                   875      622.3                 1000     623.3
BT              1048.6      623.8                  1055      623.8                 1070     623.9
BT                1120      624.2                  1230      625.4

NC     0.08       0.12      0.045
ET                                                           7.1       979       1062
X1      6.4         13       1000       1050       100         30        62
GR      630        825        624        860       622        978       620        982       618        998
GR      616       1000      615.5       1005       615       1015       615       1025      615.5       1040
GR      616       1050        620       1060       625       1070

NC     0.12       0.10      0.045        0.1        0.3
ET                                                           7.1       992       1070
X1      7.0         12       1000       1050       420        420       420
GR      630        860        628        881       626        990       624       1000       622       1005
GR    620.5       1010      620.5       1030       622       1035       624       1050       626       1077
GR      628       1095        630       1280

NC     0.15       0.15      0.045
ET                                                          10.4
X1      8.1         17       1000       1039       300        300       300
GR      636        890        634        918       632        940       630        973       628        985
GR      626        990        625       1000       624       1006     623.8       1015     623.8       1030
GR      624       1035        626       1039       628       1045       630       1080       630       1180
GR      630       1200        632       1210
1
    31MAR08       08:34:29                                                                                PAGE    5


NC     0.15       0.15      0.045        0.3        0.5
X1      8.2         13       1000       1039        195        195       195
X3       10                                                                        633       632
GR      639        890        636        918       634        940       632        973       630        985
GR      629       1000      623.8       1009     623.8       1030       629       1039       630       1080
GR      630       1180        632       1200     632.6       1210
   Dimmick Road from Butler Co. Plans (Bridge #BUT-00.12, 1978)
   Top of Road 634, LC 632

NC                           0.04
SB      0.9        1.6        2.8                   25        0.1     279.8       0.9     623.8      623.8
X1      8.3                                          28         28        28
X2                                1       632     632.6
X3       10                                                                        634     632.8
BT       -8        890        639                   918      636.8                  940       636
BT                1000        634                  1039      633.8                 1080     632.8
BT                1180      632.6                  1210      632.6

NC     0.15       0.15      0.050
X1      8.4         14       1000       1045        153        197       177
GR      638        909        636        923       634        990       632        996       630       1000
GR      628       1011        627       1013       627       1030       628       1038       630       1045
GR      632       1050        634       1056       636       1065       638       1230

NC                                       0.1        0.3
ET                                                           7.1      1000       1050
X1      9.0          9       1000       1020        300        300       300
GR      640        990        632       1000     630.4       1003     630.4       1013       632       1020
GR      634       1030        636       1037       638       1067       640       1185

ET                                                          10.4
X1     10.0         13       1000       1028        300        300       300
GR      644        833        642        844       640        865       638        990       636       1000
GR      634       1003      633.6       1010     633.6       1018       634       1024       636       1028
GR      640       1032        642       1040       644       1090
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X1      11.0         11        1000        1050         300         300         300
GR       650         990         642        1000         640        1004       639.5        1010       639.5        1032
GR       640        1040         642        1050         644        1170         646        1180         648        1280
GR       650        1325

X1      12.0         12        1000        1052         400         400         400
GR       652         883         650         898         648         915         646        1000         644        1012
GR     643.8        1022       643.8        1038         644        1045         646        1052         648        1057
GR       650        1079         652        1165

X1      13.0         15        1000        1025         100         170         170
GR       656         765         654         780         652         830         650         860         648         905
GR       646        1000         645        1005       644.8        1010       644.8        1012         645        1015
GR       646        1016         648        1025         650        1025         654        1030         656        1032
   Repeat cross section 13.0 at a slope of 0.0206 (12-20-93).
1
   31MAR08      08:34:29                                                                                              PAGE    6


ET                                                                      7.1         950        1025
X1      14.0                                             230         230         230                      4.7
1
   31MAR08      08:34:29                                                                                              PAGE    7

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


 *PROF 1
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
      1.000       7.69     602.19        .00     602.19     602.45        .26        .00        .00     598.00
     4845.0     1573.5     2903.4      368.0     1164.8      559.8      408.4         .0         .0     596.00
        .00       1.35       5.19        .90        .080       .040       .120       .000     594.50     518.05
    .001511       170.       175.       174.          0          0          0        .00     787.94    1305.99


 1490 NH CARD USED
 *SECNO 2.000

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
      2.000       4.55     603.15     603.15        .00     604.19       1.04       1.26        .23     602.00
     2210.0      315.7     1874.1       20.2      143.6      212.5       12.4       13.7        5.2     600.00
        .02       2.20       8.82       1.62        .065       .040       .130       .000     598.60     800.33
    .009398       400.       600.       500.         20         14          0        .00     221.58    1062.89


 1490 NH CARD USED
 *SECNO 3.100
  WATER EL=X5 CARD=     606.600
 1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.73

      3.100       5.20     606.60        .00        .00     606.71        .11       2.51        .09     604.00
     2210.0     1459.9      737.2       12.9      725.2      199.2       16.0       21.3        9.0     604.00
        .07       2.01       3.70        .80        .066       .062       .130       .000     601.40     620.80
    .003126       500.       500.       500.          0          0          0        .00     436.60    1057.40


 CCHV=      .300 CEHV=      .500
1
   31MAR08      08:34:29                                                                                              PAGE    8

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


 *SECNO 3.200

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       609.80 ELREA=       609.80

      3.200       5.53     609.23     609.23        .00     611.77       2.55       2.22       1.22     608.00
```

2210.0	.0	2210.0	.0	.0	172.6	.0	25.7	10.9	604.00
.08	.00	12.80	.00	.000	.045	.000	.000	603.70	1000.00
.019059	350.	350.	350.	20	11	0	.00	35.50	1035.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.00	.00	35.50	1.80	212.30	.00	605.30	605.30

*SECNO 3.300

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

CLASS A LOW FLOW

3420 BRIDGE W.S.= 609.70 BRIDGE VELOCITY= 14.91 CALCULATED CHANNEL AREA= 148.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
611.92	612.25	1.58	0.	2210.	212.	212.	611.60	612.80	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 612.00 ELREA= 612.00

3.300	7.10	610.80	.00	.00	612.25	1.45	.48	.00	608.00
2210.0	.0	2210.0	.0	.0	228.7	.0	25.8	10.9	604.00
.08	.00	9.66	.00	.000	.045	.000	.000	603.70	1000.00
.007465	12.	12.	12.	0	0	0	.00	35.50	1035.50

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

*SECNO 3.400

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.89

3.400	8.00	612.60	.00	.00	612.84	.23	.22	.37	606.00
2210.0	535.0	1513.2	161.8	521.1	328.1	230.5	27.3	11.4	606.00
.09	1.03	4.61	.70	.080	.040	.130	.000	604.60	740.79
.001032	98.	98.	98.	3	0	0	.00	414.65	1155.44

*SECNO 4.200

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

4.200	7.64	612.64	.00	.00	612.94	.30	.07	.03	605.00
2210.0	993.3	797.5	419.1	562.1	114.6	268.7	28.3	11.8	605.00
.09	1.77	6.96	1.56	.080	.040	.130	.000	605.00	716.81
.002334	45.	45.	45.	2	0	0	.00	385.73	1102.54

*SECNO 4.300

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .56

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.300	7.39	612.89	.00	.00	613.01	.12	.02	.05	607.00
2210.0	1381.0	209.1	419.9	574.1	51.9	214.7	28.4	11.9	607.00
.09	2.75	4.03	1.96	.080	.040	.130	.000	605.50	715.52
.007359	5.	5.	5.	2	0	0	-140.45	394.14	1109.66

*SECNO 4.400

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.400	7.51	613.01	.00	.00	613.12	.11	.10	.00	607.00
2210.0	1593.2	200.3	416.5	606.5	52.9	225.8	28.7	12.0	607.00
.09	2.63	3.79	1.84	.080	.040	.130	.000	605.50	714.95
.006332	15.	15.	15.	2	0	0	-140.45	397.80	1112.76

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

*SECNO 4.500

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

4.500	7.96	612.96	.00	.00	613.19	.23	.02	.06	605.00
2210.0	1056.0	743.5	410.5	654.9	119.5	298.8	28.8	12.0	605.00
.10	1.61	6.22	1.37	.080	.040	.130	.000	605.00	715.18
.001764	5.	5.	5.	2	0	0	.00	396.35	1111.53

*SECNO 4.600

4.600	6.34	613.54	.00	.00	613.65	.12	.43	.03	620.00
2210.0	.0	2180.2	29.8	.0	790.6	35.2	33.8	14.1	610.00
.12	.00	2.76	.85	.000	.040	.110	.000	607.20	732.80
.001986	230.	230.	230.	2	0	0	.00	394.46	1127.25

CCHV= .100 CEHV= .300
*SECNO 4.610

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .60

4.610	5.45	614.05	.00	.00	614.32	.27	.62	.05	621.40
2210.0	.0	2190.4	19.6	.0	523.7	15.9	37.0	15.6	611.40
.13	.00	4.18	1.23	.000	.045	.110	.000	608.60	963.19
.005586	200.	200.	200.	2	0	0	.00	253.01	1116.20

1490 NH CARD USED
*SECNO 5.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5.000	5.53	615.43	615.43	.00	616.62	1.20	1.52	.28	616.00
2210.0	103.2	2106.8	.0	49.9	234.6	.0	38.8	16.5	616.00
.14	2.07	8.98	.00	.060	.037	.000	.000	609.90	890.01
.010921	200.	200.	200.	3	5	0	.00	144.09	1059.28

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

*SECNO 6.100

6.100	6.62	618.82	.00	.00	619.70	.89	3.05	.03	618.00
2210.0	25.8	2149.8	34.5	29.9	280.9	23.4	41.3	17.7	616.00
.15	.86	7.65	1.47	.080	.045	.120	.000	612.20	926.61
.007101	350.	350.	350.	2	0	0	.00	149.47	1076.08

CCHV= .300 CEHV= .500
*SECNO 6.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 620.80 ELREA= 621.10

6.200	7.34	620.34	.00	.00	621.33	1.00	1.57	.06	614.80
2210.0	.0	2210.0	.0	.0	275.9	.0	43.0	18.2	616.50
.16	.00	8.01	.00	.000	.045	.000	.000	613.00	1000.00
.006078	220.	240.	255.	4	0	0	.00	48.60	1048.60

SPECIAL BRIDGE

SB	XR	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	3.00	.00	48.60	.10	291.60	.00	615.10	615.10

*SECNO 6.300
PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
621.76	621.34	.01	0.	2210.	292.	291.	621.10	622.30	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 622.30 ELREA= 623.80

6.300	7.95	620.95	.00	.00	621.76	.81	.43	.00	614.80
2210.0	.0	2210.0	.0	.0	305.8	.0	43.3	18.3	616.50
.16	.00	7.23	.00	.000	.040	.000	.000	613.00	1000.00
.003405	48.	48.	48.	3	0	0	.00	48.60	1048.60

*SECNO 6.400

6.400	6.35	621.35	.00	.00	622.03	.68	.23	.04	616.00
2210.0	100.2	2053.2	56.6	48.2	300.1	35.4	43.8	18.4	616.00
.16	2.08	6.84	1.60	.080	.045	.120	.000	615.00	979.29
.003939	100.	62.	30.	2	0	0	.00	83.41	1062.71

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

CCHV= .100 CEHV= .300
*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

7.000	5.11	625.61	625.61	.00	627.44	1.83	3.07	.35	624.00
2210.0	9.2	2170.6	30.2	6.5	198.1	17.5	46.8	19.2	624.00
.18	1.42	10.96	1.72	.120	.045	.100	.000	620.50	991.94
.018018	420.	420.	420.	20	15	0	.00	79.81	1071.75

*SECNO 8.100

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

8.100	5.92	629.72	.00	.00	630.94	1.23	3.44	.06	625.00
2210.0	126.0	2036.4	47.6	64.6	220.4	42.1	48.6	19.8	626.00
.18	1.95	9.24	1.13	.150	.045	.150	.000	623.80	974.69
.007927	300.	300.	300.	3	0	0	.00	100.37	1075.06

CCHV= .300 CEHV= .500
*SECNO 8.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 633.00 ELREA= 632.00

8.200	7.38	631.19	.00	.00	632.48	1.31	1.50	.04	629.00
2210.0	.0	2210.0	.0	.0	240.9	.0	49.9	20.1	629.00
.19	.00	9.17	.00	.000	.045	.000	.000	623.80	1000.00
.007462	195.	195.	195.	5	0	0	.00	39.00	1039.00

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.80	.00	25.00	.10	278.80	.90	623.80	623.80

*SECNO 8.300
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
632.74	632.49	.02	5.	2194.	279.	265.	632.00	632.60	87.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 634.00 ELREA= 632.80

8.300	7.76	631.56	.00	.00	632.71	1.16	.23	.00	629.00
2210.0	.0	2210.0	.0	.0	255.8	.0	50.1	20.1	629.00
.19	.00	8.64	.00	.000	.040	.000	.000	623.80	1000.00
.004830	28.	28.	28.	3	0	2	.00	39.00	1039.00

*SECNO 8.400

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .58

8.400	5.73	632.73	.00	.00	634.29	1.56	1.37	.20	630.00
2210.0	11.5	2183.9	14.6	7.7	216.8	9.4	51.1	20.3	630.00
.20	1.49	10.07	1.54	.150	.050	.150	.000	627.00	993.81
.014432	153.	177.	197.	2	0	0	.00	58.38	1052.19

CCHV= .100 CEHV= .300
*SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.000	7.39	637.79	637.79	.00	640.33	2.55	4.63	.30	632.00
2210.0	45.9	1916.8	247.3	20.9	139.7	91.3	52.7	20.8	632.00
.20	2.20	13.72	2.71	.150	.050	.150	.000	630.40	992.77
.016575	300.	300.	300.	4	11	0	.00	71.02	1063.79

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

*SECNO 10.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.09

10.000	8.44	642.04	.00	.00	642.61	.58	2.08	.20	636.00
2210.0	588.4	1596.6	24.9	451.8	223.8	24.5	56.0	21.7	636.00
.22	1.30	7.13	1.02	.150	.050	.150	.000	633.60	843.80
.003794	300.	300.	300.	3	0	0	.00	197.12	1040.92

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.000	4.63	644.13	644.13	.00	645.48	1.35	2.08	.23	642.00
2210.0	3.2	2019.6	187.2	2.8	207.0	135.6	59.6	23.0	642.00
.23	1.13	9.76	1.38	.150	.050	.150	.000	639.50	997.34
.016522	300.	300.	300.	4	11	0	.00	173.31	1170.65

*SECNO 12.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

12.000	5.36	649.16	.00	.00	649.93	.77	4.39	.06	646.00
2210.0	273.3	1917.0	19.7	189.8	254.5	18.3	63.3	24.5	646.00
.24	1.44	7.53	1.07	.150	.050	.150	.000	643.80	905.10
.007819	400.	400.	400.	3	0	0	.00	164.72	1069.82

*SECNO 13.000

13.000	5.90	650.70	.00	.00	651.42	.71	1.48	.01	646.00
2210.0	1082.5	1127.3	.1	432.5	122.8	.3	64.8	25.0	650.00
.25	2.50	9.18	.48	.150	.050	.150	.000	644.80	849.42
.013117	100.	170.	170.	2	0	0	.00	176.46	1025.88

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

*SECNO 14.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

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3720 CRITICAL DEPTH ASSUMED
    14.000      5.09    654.59    654.59       .00    655.88      1.29      4.26       .17    650.70
    2210.0     988.3    1221.7        .0     314.7     102.4        .0      67.4      25.9     654.70
      .26      3.14     11.93       .00      .150      .050      .000      .000    649.50    862.48
   .028057      230.      230.      230.         4        15         0       .00    162.52   1025.00


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T1 Flood Insurance Study - Butler County, Ohio - Contract EMW-C-93-4160
T2 Unnamed Tributary to East Fork Mill Creek
T3      100-Year Floodway       (Looking Downstream)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                6                                                                  603.14         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      2                 -1


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


*PROF 2
0

CCHV=     .100 CEHV=     .300
*SECNO 1.000

3470 ENCROACHMENT STATIONS=      790.0    1100.0  TYPE=      1  TARGET=      310.000
     1.000      8.64    603.14       .00    602.19    603.50       .36       .00       .00    598.00
    4845.0    1160.3    3531.6     153.2     722.9     637.7     113.8        .0        .0    596.00
       .00      1.61      5.54      1.35      .080      .040      .120      .000    594.50    790.00
   .001448      170.      175.      174.         0         0         0       .00    310.00   1100.00


1490 NH CARD USED
*SECNO 2.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .24


3470 ENCROACHMENT STATIONS=      870.0    1055.0  TYPE=      1  TARGET=      185.000
     2.000      5.41    604.01       .00    603.15    604.73       .72      1.13       .11    602.00
    2211.0     312.4    1898.6        .0     168.0     259.8        .0      10.9       2.6 100000.00
       .02      1.86      7.31       .00      .076      .040      .000      .000    598.60    870.00
   .005416      400.      600.      500.         2         0         0       .00    185.00   1055.00


1490 NH CARD USED
*SECNO 3.100
 WATER EL=X5 CARD=    607.614
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3470 ENCROACHMENT STATIONS=      780.0    1043.0  TYPE=      1  TARGET=      263.000
     3.100      6.21    607.61       .00    606.60    607.77       .16      2.31       .06    604.00
    2211.0    1216.0     995.0        .0     550.4     242.8        .0      17.9       5.2 100000.00
       .07      2.21      4.10       .00      .077      .068      .000      .000    601.40    780.00
   .003976      500.      500.      500.         0         0         0       .00    263.00   1043.00


CCHV=     .300 CEHV=     .500
*SECNO 3.200
 2800 NAT Q1=     160.08  WSELK=     609.23  ENC Q1=     218.63  WSEL=     610.23  RATIO=   -.3658
 NAT Q1=     379.  RATIOS LOB, CH, ROB=    .3442   .5764   .0794  WSEL=     610.23
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1000.0    1035.5  TYPE=      4  TARGET=         .424

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       609.80 ELREA=       609.80
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3.200	5.58	609.28	609.28	609.23	611.77	2.49	2.74	1.17	608.00
2211.0	.0	2211.0	.0	.0	174.5	.0	21.8	6.4	604.00
.08	.00	12.67	.00	.000	.045	.000	.000	603.70	1000.00
.022001	350.	350.	350.	2	11	0	.00	35.50	1035.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.00	.00	35.50	1.80	212.30	.00	605.30	605.30

*SECNO 3.300
6840, FLOW IS BY WEIR AND LOW FLOW
2800 NAT Q1= 255.78 WSELK= 610.80 ENC Q1= 325.34 WSEL= 611.80 RATIO= -.2719
NAT Q1= 325. RATIOS LOB, CH, ROB= .0000 1.0000 .0000 WSEL= 611.80
WATER EL=CHANGE FROM NATURAL PROFILES BRIDGE

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

3470 ENCROACHMENT STATIONS= 1000.0 1035.5 TYPE= 4 TARGET= .000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 612.00 ELREA= 612.00

3.300	7.16	610.86	.00	610.80	612.29	1.43	.16	.32	608.00
2211.0	.0	2211.0	.0	.0	230.6	.0	21.9	6.4	604.00
.08	.00	9.59	.00	.000	.045	.000	.000	603.70	1000.00
.009134	12.	12.	12.	0	0	3	.00	35.50	1035.50

*SECNO 3.400
2800 NAT Q1= 687.86 WSELK= 612.60 ENC Q1= 687.86 WSEL= 613.60 RATIO= .0000
NAT Q1= 981. RATIOS LOB, CH, ROB= .3196 .5897 .0908 WSEL= 613.60

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

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.11

3470 ENCROACHMENT STATIONS= 956.7 1046.0 TYPE= 4 TARGET= .299

3.400	7.88	612.48	.00	612.60	612.94	.46	.37	.29	606.00
2211.0	322.8	1888.2	.0	168.8	322.8	.0	22.7	6.5	606.00
.08	1.91	5.85	.00	.080	.040	.000	.000	604.60	956.70
.002045	98.	98.	98.	3	0	0	.00	89.30	1046.00

*SECNO 4.200

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

3470 ENCROACHMENT STATIONS= 925.0 1030.0 TYPE= 1 TARGET= 105.000

4.200	7.45	612.45	.00	612.64	613.24	.79	.13	.16	605.00
2211.0	894.2	1083.2	233.6	275.5	111.8	104.3	23.2	6.6	605.00
.08	3.25	9.69	2.24	.080	.040	.130	.000	605.00	925.00
.004668	45.	45.	45.	2	0	0	.00	105.00	1030.00

*SECNO 4.300

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .35

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

3470 ENCROACHMENT STATIONS= 925.0 1030.0 TYPE= 1 TARGET= 105.000

4.300	6.99	612.49	.00	612.89	613.30	.81	.05	.01	607.00
2211.0	1536.9	423.1	251.0	215.7	48.2	57.5	23.2	6.6	607.00
.08	7.13	8.77	4.37	.080	.040	.130	.000	605.50	925.00
.038374	5.	5.	5.	2	0	0	-114.00	105.00	1030.00

*SECNO 4.400

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

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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.53


3370 NORMAL BRIDGE, NRD=  36 MIN ELTRD=   609.30 MAX ELLC=   608.50


3470 ENCROACHMENT STATIONS=      925.0    1035.0  TYPE=      1  TARGET=      110.000
     4.400      7.82    613.32       .00    613.01    613.77       .45       .36       .11    607.00
    2211.0    1541.1     351.7     318.2     280.0      55.7      92.4      23.4       6.7    607.00
       .09      5.50      6.32      3.44      .080      .040      .130      .000    605.50    925.00
   .016456       15.       15.       15.         3         0         0   -124.25    110.00   1035.00


*SECNO 4.500

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.37


3470 ENCROACHMENT STATIONS=      925.0    1030.0  TYPE=      1  TARGET=      105.000
     4.500      8.30    613.30       .00    612.96    613.85       .55       .03       .05    605.00
    2211.0     967.3    1025.5     218.2     338.8     124.5     117.0      23.4       6.7    605.00
       .09      2.85      8.24      1.87      .080      .040      .130      .000    605.00    925.00
   .002926         5.        5.        5.         2         0         0       .00    105.00   1030.00


*SECNO 4.600
 WATER EL=X5 CARD=    614.235

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.69


3470 ENCROACHMENT STATIONS=      900.0    1080.0  TYPE=      1  TARGET=      180.000
     4.600      7.03    614.23       .00    613.54    614.37       .14       .37       .12 100000.00
    2211.0        .0    2211.0        .0        .0     743.1        .0      26.9       7.4 100000.00
       .11       .00      2.98       .00      .000      .040      .000      .000    607.20    900.00
   .001021       230.      230.      230.         0         0         0       .00    180.00   1080.00


CCHV=     .100 CEHV=     .300
*SECNO 4.610
1
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .52


3470 ENCROACHMENT STATIONS=      900.0    1080.0  TYPE=      1  TARGET=      180.000
     4.610      5.90    614.50       .00    614.05    614.76       .26       .35       .04 100000.00
    2211.0        .0    2211.0        .0        .0     538.8        .0      29.9       8.3 100000.00
       .12       .00      4.10       .00      .000      .045      .000      .000    608.60    900.00
   .003714       200.      200.      200.         2         0         0       .00    180.00   1080.00


1490 NH CARD USED
*SECNO 5.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      870.0    1070.0  TYPE=      1  TARGET=      200.000
     5.000      5.52    615.42    615.42    615.43    616.63      1.21      1.19       .28    616.00
    2211.0     101.3    2109.7        .0      49.1     233.6        .0      31.8       9.0    616.00
       .13      2.07      9.03       .00      .060      .037      .000      .000    609.90    890.19
   .011049       200.      200.      200.        20        11         0       .00    143.27   1059.20


*SECNO 6.100
 2800 NAT Q1=     262.25  WSELK=     618.82  ENC Q1=     352.47  WSEL=     619.82  RATIO=   -.3440
 NAT Q1=     388.  RATIOS LOB, CH, ROB=    .0668   .9094   .0238  WSEL=     619.82

3470 ENCROACHMENT STATIONS=     1000.0    1060.0  TYPE=      4  TARGET=         .091
     6.100      6.72    618.92       .00    618.82    619.84       .93      3.19       .03    618.00
    2211.0        .0    2211.0        .0        .0     286.4        .0      34.0       9.8    616.00
       .14       .00      7.72       .00      .000      .045      .000      .000    612.20   1000.00
   .007629       350.      350.      350.         2         9         0       .00     60.00   1060.00


CCHV=     .300 CEHV=     .500
1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 6.200
2800 NAT Q1= 283.48 WSELK= 620.34 ENC Q1= 371.49 WSEL= 621.34 RATIO= -.3104
NAT Q1= 592. RATIOS LOB, CH, ROB= .3244 .6270 .0485 WSEL= 621.34

3470 ENCROACHMENT STATIONS= 1000.0 1048.6 TYPE= 4 TARGET= .373

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 620.80 ELREA= 621.10

6.200	7.53	620.53	.00	620.34	621.47	.93	1.62	.00	614.80
2211.0	.0	2211.0	.0	.0	285.3	.0	35.6	10.1	616.50
.15	.00	7.75	.00	.000	.045	.000	.000	613.00	1000.00
.006029	220.	240.	255.	2	0	0	.00	48.60	1048.60

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.60	3.00	.00	48.60	.10	291.60	.00	615.10	615.10

*SECNO 6.300
6790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 3012. DOES NOT EQUAL ACTUAL Q = 2211.

6790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 2524. DOES NOT EQUAL ACTUAL Q = 2211.

6840, FLOW IS BY WEIR AND LOW FLOW
2800 NAT Q1= 378.71 WSELK= 620.95 ENC Q1= 484.17 WSEL= 621.95 RATIO= -.2785
NAT Q1= 484. RATIOS LOB, CH, ROB= .0000 1.0000 .0000 WSEL= 621.95
WATER EL=CHANGE FROM NATURAL PROFILES BRIDGE

3470 ENCROACHMENT STATIONS= 1000.0 1048.6 TYPE= 4 TARGET= .000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 622.30 ELREA= 623.80

6.300	8.15	621.15	.00	620.95	621.91	.76	.22	.05	614.80
2211.0	.0	2211.0	.0	.0	315.4	.0	35.9	10.2	616.50
.15	.00	7.01	.00	.000	.040	.000	.000	613.00	1000.00
.003461	48.	48.	48.	0	0	20	.00	48.60	1048.60

*SECNO 6.400

3470 ENCROACHMENT STATIONS= 979.0 1062.0 TYPE= 1 TARGET= 83.000

6.400	6.54	621.54	.00	621.35	622.17	.83	.22	.04	616.00
2211.0	106.9	2045.3	58.8	52.1	309.5	37.5	36.5	10.3	616.00
.15	2.05	6.61	1.57	.080	.045	.120	.000	615.00	979.00
.003529	100.	62.	30.	2	0	0	.00	83.00	1062.00

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

CCHV= .100 CEHV= .300
*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 992.0 1070.0 TYPE= 1 TARGET= 78.000

7.000	5.17	625.67	625.67	625.61	627.44	1.77	2.80	.34	624.00
2211.0	10.1	2166.6	34.3	7.0	201.2	19.7	39.5	11.1	624.00
.16	1.45	10.77	1.84	.120	.045	.100	.000	620.50	992.00
.017042	420.	420.	420.	20	15	0	.00	78.00	1070.00

*SECNO 8.100
2800 NAT Q1= 248.22 WSELK= 629.72 ENC Q1= 300.05 WSEL= 630.72 RATIO= -.2088
NAT Q1= 343. RATIOS LOB, CH, ROB= .0664 .8737 .0598 WSEL= 630.72

3470 ENCROACHMENT STATIONS= 1000.0 1039.0 TYPE= 4 TARGET= .126

8.100	6.20	630.00	.00	629.72	631.42	1.42	3.94	.03	625.00
2211.0	.0	2211.0	.0	.0	231.4	.0	41.1	11.5	626.00
.17	.00	9.56	.00	.000	.045	.000	.000	623.80	1000.00
.010445	300.	300.	300.	3	0	0	.00	39.00	1039.00

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CCHV=     .300 CEHV=     .500
*SECNO 8.200
 2800 NAT Q1=     255.84  WSELK=     631.18  ENC Q1=     328.39  WSEL=     632.18  RATIO=    -.2836
 NAT Q1=     388.  RATIOS LOB, CH, ROB=    .0000   .8461   .1539  WSEL=     632.16

3470 ENCROACHMENT STATIONS=     1000.0    1039.0  TYPE=       4  TARGET=         .154

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       633.00 ELREA=       632.00

     8.200      8.14    631.94       .00    631.18    632.98      1.03      1.44       .12    629.00
    2211.0        .0    2211.0        .0        .0     271.1        .0      42.2      11.6    629.00
       .18       .00      8.16       .00      .000      .045      .000      .000    623.80   1000.00
   .005523      195.      195.      195.         2         0         0       .00     39.00   1039.00


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


 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .90      1.60      2.80       .00     25.00       .10    278.80       .90    623.80    623.80

 *SECNO 8.300
  2800 NAT Q1=     317.99  WSELK=     631.56  ENC Q1=     402.57  WSEL=     632.56  RATIO=    -.2660
  NAT Q1=     403.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     632.56
  WATER EL=CHANGE FROM NATURAL PROFILES BRIDGE

 3470 ENCROACHMENT STATIONS=     1000.0    1039.0  TYPE=       4  TARGET=         .000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       634.00 ELREA=       632.80

     8.300      8.52    632.32       .00    631.56    633.25       .93       .13       .03    629.00
    2211.0        .0    2211.0        .0        .0     285.6        .0      42.4      11.7    629.00
       .18       .00      7.74       .00      .000      .040      .000      .000    623.80   1000.00
   .003707      28.       28.       28.         0         0         2       .00     39.00   1039.00


 *SECNO 8.400
  2800 NAT Q1=     183.96  WSELK=     632.73  ENC Q1=     248.92  WSEL=     633.73  RATIO=    -.3531
  NAT Q1=     254.  RATIOS LOB, CH, ROB=    .0092   .9793   .0114  WSEL=     633.73

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .54


 3470 ENCROACHMENT STATIONS=     1000.0    1045.0  TYPE=       4  TARGET=         .021
     8.400      6.23    633.23       .00    632.73    634.56      1.32      1.11       .20    630.00
    2211.0        .0    2211.0        .0        .0     239.4        .0      43.4      11.8    630.00
       .19       .00      9.23       .00      .000      .050      .000      .000    627.00   1000.00
   .012672      153.      177.      197.         2         0         0       .00     45.00   1045.00


 CCHV=     .100 CEHV=     .300
 *SECNO 9.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     1000.0    1050.0  TYPE=       1  TARGET=       50.000
     9.000      7.39    637.79    637.79    637.79    640.36      2.57      5.02       .37    632.00
    2211.0        .0    1920.9     290.1        .0     139.8      85.0      45.0      12.2    632.00
       .19       .00     13.74      3.41      .000      .050      .150      .000    630.40   1000.00
   .023143      300.      300.      300.         4         8         0       .00     50.00   1050.00


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


 *SECNO 10.000
  2800 NAT Q1=     358.80  WSELK=     642.04  ENC Q1=     358.80  WSEL=     643.04  RATIO=     .0000
  NAT Q1=     477.  RATIOS LOB, CH, ROB=    .3215   .6616   .0169  WSEL=     643.04

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.03
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3470 ENCROACHMENT STATIONS=      971.9    1028.0  TYPE=       4  TARGET=          .248
    10.000      9.09    642.69       .00    642.04    643.56       .87      3.03       .17    636.00
    2211.0     278.4    1932.6        .0     139.2     242.1        .0      47.1      12.5    636.00
       .20      2.00      7.98       .00      .150      .050       .000      .000    633.60    971.90
   .005637      300.      300.      300.         3         0          0       .00     56.10   1028.00


*SECNO 11.000
 2800 NAT Q1=     171.93  WSELK=     644.13  ENC Q1=     225.35  WSEL=     645.13  RATIO=    -.3107
 NAT Q1=      268.  RATIOS LOB, CH, ROB=     .0026   .8404   .1571  WSEL=     645.13

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66


3470 ENCROACHMENT STATIONS=     1000.0    1050.0  TYPE=       4  TARGET=          .160
    11.000      5.38    644.88       .00    644.13    646.15       1.27      2.47       .12    642.00
    2211.0        .0    2211.0        .0        .0     244.6        .0      49.3      12.9    642.00
       .21       .00      9.04       .00      .000      .050       .000      .000    639.50   1000.00
   .013105      300.      300.      300.         2         0          0       .00     50.00   1050.00


*SECNO 12.000
 2800 NAT Q1=     249.92  WSELK=     649.16  ENC Q1=     295.46  WSEL=     650.16  RATIO=    -.1822
 NAT Q1=      361.  RATIOS LOB, CH, ROB=     .1650   .8183   .0167  WSEL=     650.16

3470 ENCROACHMENT STATIONS=     1000.0    1052.6  TYPE=       4  TARGET=          .182
    12.000      5.79    649.59       .00    649.16    650.58        .99      4.40       .03    646.00
    2211.0        .0    2211.0        .0        .0     276.3        .0      51.7      13.4    646.00
       .23       .00      8.00       .00      .000      .050       .000      .000    643.80   1000.00
   .009379      400.      400.      400.         3         0          0       .00     52.00   1052.00


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


*SECNO 13.000
 2800 NAT Q1=     192.97  WSELK=     650.70  ENC Q1=     192.97  WSEL=     651.70  RATIO=     .0000
 NAT Q1=      284.  RATIOS LOB, CH, ROB=     .5272   .4723   .0005  WSEL=     651.70

3470 ENCROACHMENT STATIONS=      960.2    1025.0  TYPE=       4  TARGET=          .320
    13.000      6.51    651.31       .00    650.70    652.68       1.38      1.99       .11    646.00
    2211.0     683.1    1527.9        .0     194.6     137.8        .0      52.7      13.6 100000.00
       .23      3.51     11.08       .00      .150      .050       .000      .000    644.80    960.16
   .017444      100.      170.      170.         3         0          0       .00     64.84   1025.00


*SECNO 14.000

3470 ENCROACHMENT STATIONS=      950.0    1025.0  TYPE=       1  TARGET=        75.000
    14.000      6.09    655.59       .00    654.59    656.95       1.36      4.26       .00    650.70
    2211.0     771.5    1439.5        .0     218.1     127.4        .0      54.5      13.9 100000.00
       .24      3.54     11.30       .00      .150      .050       .000      .000    649.50    950.00
   .019744      230.      230.      230.         2         0          0       .00     75.00   1025.00


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 T1 Flood Insurance Study - Butler County, Ohio - Contract EMW-C-93-4160
 T2 Unnamed Tributary to East Fork Mill Creek
 T3      10-Year Flood            [Looking Downstream]

 J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     NVINS      Q          WSEL       FQ

                  2                                                                          601.15         0

 J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

       2                    -1


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


 *PROF 3
0

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
```

3265 DIVIDED FLOW

1.000	6.65	601.15	.00	601.15	601.35	.20	.00	.00	598.00
2754.0	610.1	1981.8	162.1	684.3	474.6	208.4	.0	.0	596.00
.00	.89	4.18	.78	.080	.040	.120	.000	594.50	549.05
.001222	170.	175.	174.	0	0	0	.00	672.60	1230.90

1490 NH CARD USED
*SECNO 2.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.000	3.12	601.72	601.72	.00	602.98	1.26	1.17	.32	602.00
1213.0	.0	1208.2	4.8	.0	133.8	3.7	8.5	3.8	600.00
.02	.00	9.03	1.31	.000	.040	.130	.000	598.60	1001.40
.017649	400.	600.	500.	20	14	0	.00	57.89	1059.30

1490 NH CARD USED
*SECNO 3.100
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.51

3.100	4.47	605.87	.00	.00	605.96	.09	2.86	.12	604.00
1213.0	683.1	525.4	4.5	452.3	168.1	7.9	12.9	6.5	604.00
.08	1.51	3.13	.57	.064	.062	.130	.000	601.40	622.49
.002797	500.	500.	500.	6	0	0	.00	413.51	1051.44

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

CCHV= .300 CEHV= .500
*SECNO 3.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 609.80 ELREA= 609.80

3.200	3.92	607.62	607.62	.00	609.32	1.70	2.10	.81	608.00
1213.0	.0	1213.0	.0	.0	115.8	.0	15.9	8.3	604.00
.09	.00	10.47	.09	.000	.045	.000	.000	603.70	1001.14
.020765	350.	350.	350.	4	11	0	.00	34.36	1035.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.00	.00	35.50	1.80	212.30	.00	605.30	605.30

*SECNO 3.300

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.64

CLASS A LOW FLOW

3420 BRIDGE W.S.= 607.82 BRIDGE VELOCITY= 14.31 CALCULATED CHANNEL AREA= 85.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	609.73	1.19	0.	1213.	212.	212.	611.60	612.80	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 612.00 ELREA= 612.00

3.300	5.11	608.81	.00	.00	609.73	.92	.40	.00	608.00
1213.0	.0	1213.0	.0	.0	157.9	.0	16.0	8.4	604.00
.09	.00	7.68	.00	.000	.045	.000	.000	603.70	1000.00

.007735	12.	12.	12.	0	0	0	.00	35.50	1035.50

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

*SECNO 3.400

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.74

3.400	5.26	609.86	.00	.00	610.28	.42	.40	.15	606.00
1213.0	49.0	1133.2	30.7	47.3	209.9	34.6	16.5	8.5	606.00
.10	1.04	5.40	.89	.080	.040	.130	.000	604.60	958.24
.002566	98.	98.	98.	2	0	0	.00	110.53	1068.78

*SECNO 4.200

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

4.200	4.83	609.83	.00	.00	610.68	.85	.19	.21	605.00
1213.0	281.3	687.9	243.8	86.9	72.5	104.2	16.8	8.6	605.00
.10	3.24	9.49	2.34	.080	.040	.130	.000	605.00	952.92
.007983	45.	45.	45.	2	0	0	.00	98.99	1051.91

*SECNO 4.300

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4.300	5.57	611.07	611.07	.00	611.60	.53	.08	.10	607.00
1213.0	628.3	307.5	277.2	131.1	35.4	77.2	16.8	8.6	607.00
.10	4.79	8.68	3.59	.080	.040	.130	.000	605.50	857.29
.056717	5.	5.	5.	20	13	0	-140.45	212.82	1070.12

*SECNO 4.400

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.29

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.400	6.41	611.91	.00	.00	612.03	.12	.31	.12	607.00
1213.0	769.3	185.2	258.5	294.6	43.0	131.9	16.9	8.7	607.00
.10	2.61	4.31	1.96	.080	.040	.130	.000	605.50	737.33
.010771	15.	15.	15.	1	0	0	-140.45	346.28	1083.61

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

*SECNO 4.500

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.80

4.500	6.90	611.90	.00	.00	612.07	.18	.01	.03	605.00
1213.0	454.7	515.7	242.6	354.4	103.4	211.3	17.0	8.8	605.00
.10	1.28	4.99	1.15	.080	.040	.130	.000	605.00	740.87
.001372	5.	5.	5.	2	0	0	.00	342.46	1083.33

*SECNO 4.600

4.600	5.12	612.32	.00	.00	612.43	.11	.34	.02	620.00
1213.0	.0	1206.1	6.9	.0	453.3	11.3	20.0	10.2	610.00
.12	.00	2.66	.61	.000	.040	.110	.000	607.20	912.02
.001592	230.	230.	230.	3	0	0	.00	200.04	1112.07

CCHV= .100 CEHV= .300
*SECNO 4.610

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

4.610	4.13	612.73	.00	.00	612.96	.24	.49	.04	621.40
1213.0	.0	1210.7	2.3	.0	310.1	3.5	21.8	11.0	611.40
.14	.00	3.90	.66	.000	.045	.110	.000	609.60	973.50
.004254	200.	200.	200.	2	0	0	.00	131.80	1105.30

1490 NH CARD USED
*SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5.000	3.82	613.72	613.72	.00	615.07	1.34	1.45	.33	616.00
1213.0	.0	1213.0	.0	.0	130.5	.0	22.8	11.4	616.00
.14	.00	9.29	.00	.000	.037	.000	.000	609.90	998.28
.015150	200.	200.	200.	2	15	0	.00	49.65	1047.93

*SECNO 6.100

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

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.66

6.100	5.45	617.65	.00	.00	618.15	.51	3.01	.08	616.00
1213.0	.0	1206.5	6.5	.0	210.9	8.1	24.2	11.9	616.00
.16	.00	5.72	.80	.000	.045	.120	.000	612.20	1002.33
.005522	350.	350.	350.	2	0	0	.00	67.52	1069.85

CCHV= .300 CEHV= .500
*SECNO 6.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 620.80 ELREA= 621.10

6.200	5.88	618.88	.00	.00	619.42	.54	1.25	.02	614.80
1213.0	.0	1213.0	.0	.0	205.3	.0	25.4	12.2	616.50
.17	.00	5.91	.00	.000	.045	.000	.000	613.00	1000.00
.004904	220.	240.	255.	3	0	0	.00	48.60	1048.60

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	3.00	.00	48.60	.10	291.60	.00	615.10	615.10

*SECNO 6.300
CLASS A LOW FLOW

3420 BRIDGE W.S.= 618.88 BRIDGE VELOCITY= 6.62 CALCULATED CHANNEL AREA= 183.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	619.42	.00	0.	1213.	292.	291.	621.10	622.30	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 622.30 ELREA= 623.80

6.300	5.88	618.88	.00	.00	619.42	.54	.00	.00	614.80
1213.0	.0	1213.0	.0	.0	205.2	.0	25.6	12.2	616.50
.17	.00	5.91	.00	.000	.040	.000	.000	613.00	1000.00
.003881	48.	48.	48.	0	0	0	.00	48.60	1048.60

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

*SECNO 6.400

6.400	4.16	619.16	.00	.00	619.74	.59	.29	.02	616.00
1213.0	13.6	1184.0	15.4	9.7	190.7	12.5	25.9	12.3	616.00
.18	1.40	6.21	1.23	.080	.045	.120	.000	615.00	988.69
.005944	100.	62.	30.	0	0	0	.00	69.21	1057.91

CCHV= .100 CEHV= .300
*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

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7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     7.000      3.77    624.27    624.27       .00    625.60      1.33      4.34       .22    624.00
    1213.0        .1    1212.6        .3        .2    131.2         .5      27.5      12.9    624.00
       .19       .48      9.24       .59       .120     .045      .100      .000    620.50    998.63
   .022181      420.      420.      420.        13        11         0       .00     55.08   1053.71


*SECNO 8.100

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.82

     8.100      4.49    628.29       .00       .00    629.02       .73      3.36       .06    625.00
    1213.0      50.8    1154.9       7.4       34.6    164.7       8.5      28.7      13.3    626.00
       .20      1.47      7.01       .87       .150     .045      .150      .000    623.80    983.26
   .006731      300.      300.      300.          4         0         0       .00     66.81   1050.07


CCHV=      .300 CEHV=      .500
*SECNO 8.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       633.00 ELREA=       632.00

     8.200      5.75    628.55       .00       .00    630.28       .72      1.26       .00    629.00
    1213.0        .0    1213.0        .0        .0    177.8         .0      29.6      13.6    629.00
       .21       .00      6.82       .00       .000     .045      .000      .000    623.80   1000.00
   .006186      195.      195.      195.          2         0         0       .00     39.00   1039.00
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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 SPECIAL BRIDGE

 SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
        .90       1.60       2.80        .00      25.00        .10     278.80        .90     623.80     623.80

 *SECNO 8.300
 CLASS A LOW FLOW

 3420 BRIDGE W.S.=      629.55 BRIDGE VELOCITY=        7.01      CALCULATED CHANNEL AREA=        173.

  EGPRS      EGLWC        H3         QWEIR      QLOW       BAREA      TRAPEZOID AREA      ELLC       ELTRD      WEIRLN
         .00    630.28        .01          0.      1213.       279.       265.       632.00     632.60          0.


 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       634.00 ELREA=       632.80

     8.300      5.76    629.56       .00       .00    630.28       .72       .01       .00    629.00
    1213.0        .0    1213.0        .0        .0    177.9         .0      29.7      13.6    629.00
       .21       .00      6.82       .00       .000     .040      .000      .000    623.80   1000.00
   .004881       28.       28.       28.          0         0         0       .00     39.00   1039.00


 *SECNO 8.400

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .47

     8.400      3.89    630.89       .00       .00    632.16      1.27      1.60       .27    630.00
    1213.0        .6    1211.6        .8        .8    133.9         1.0      30.3      13.8    630.00
       .22       .80      9.04       .82       .150     .050      .150      .000    627.00    998.22
   .022117      153.      177.      197.          3         0         0       .00     48.99   1047.22


 CCHV=      .100 CEHV=      .300
 *SECNO 9.000
     9.000      5.62    636.02       .00       .00    637.65      1.63      5.38       .11    632.00
    1213.0      16.4    1113.4      93.2       10.1    104.2       37.2      31.3      14.1    632.00
       .23      1.63     10.68      2.24       .150     .050      .150      .000    630.40    994.98
   .014846      300.      300.      300.          3         0         0       .00     42.20   1037.18
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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
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TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 10.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

10.000	6.09	639.69	.00	.00	640.38	.70	2.64	.09	636.00
1213.0	98.9	1107.9	6.1	116.0	158.1	6.8	32.8	14.7	636.00
.24	.85	7.01	.90	.150	.050	.150	.000	633.60	884.48
.005825	300.	300.	300.	3	0	0	.00	147.21	1031.69

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.000	3.19	642.69	642.69	.00	643.91	1.22	3.15	.16	642.00
1213.0	.2	1201.9	10.9	.3	135.0	14.3	34.3	15.6	642.00
.25	.64	8.90	.76	.150	.050	.150	.000	639.50	999.14
.024312	300.	300.	300.	2	11	0	.00	92.28	1091.41

*SECNO 12.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

12.000	4.24	648.04	.00	.00	648.52	.49	4.54	.07	646.00
1213.0	72.9	1136.0	4.1	88.6	196.1	5.2	36.3	16.7	646.00
.27	.82	5.79	.78	.150	.050	.150	.000	643.80	914.64
.006549	400.	400.	400.	4	0	0	.00	142.82	1057.46

*SECNO 13.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .68

13.000	4.59	649.39	.00	.00	649.99	.60	1.43	.03	646.00
1213.0	501.6	711.4	.0	248.9	90.8	.0	37.3	17.1	650.00
.28	2.01	7.91	.00	.150	.050	.000	.000	644.80	873.70
.014310	100.	170.	170.	3	0	0	.00	151.30	1025.00

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

*SECNO 14.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14.000	4.10	653.60	653.60	.00	654.57	.97	4.35	.11	650.70
1213.0	451.4	761.6	.0	189.4	77.7	.0	38.9	17.8	654.70
.28	2.38	9.81	.00	.150	.050	.000	.000	649.50	884.78
.026141	230.	230.	230.	5	15	0	.00	140.22	1025.00

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T1 Flood Insurance Study - Butler County, Ohio - Contract EMW-C-93-4160
T2 Unnamed Tributary to East Fork Mill Creek
T3 50-Year Flood [Looking Downstream]

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3							602.19	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3		-1							

1

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

*PROF 4
0

CCHV= .100 CEHV= .300
*SECNO 1.000

1.000	7.69	602.19	.00	602.19	602.40	.21	.00	.00	598.00
4304.0	1397.8	2579.2	326.9	1164.8	559.8	408.4	.0	.0	596.00
.00	1.20	4.61	.80	.080	.040	.120	.000	594.50	618.05
.001193	170.	175.	174.	0	0	0	.00	787.94	1305.99

1490 NH CARD USED
*SECNO 2.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.000	4.36	602.96	602.96	.00	603.94	.98	1.03	.23	602.00
1951.0	224.8	1709.3	16.8	113.4	201.7	10.9	13.5	5.2	600.00
.02	1.98	8.48	1.54	.064	.040	.130	.000	598.80	804.38
.009310	400.	600.	500.	20	11	0	.00	209.35	1062.39

1490 NH CARD USED
*SECNO 3.100
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.73

3.100	5.02	606.42	.00	.00	606.52	.11	2.49	.09	604.00
1951.0	1252.2	688.5	10.4	658.8	191.7	13.6	20.3	8.9	604.00
.08	1.90	3.59	.76	.065	.062	.130	.000	601.40	621.15
.003100	500.	500.	500.	3	0	0	.00	434.67	1055.82

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

CCHV= .300 CEHV= .500
*SECNO 3.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 609.80 ELREA= 609.80

3.200	5.18	608.88	608.88	.00	611.18	2.29	2.20	1.09	608.00
1951.0	.0	1951.0	.0	.0	160.5	.0	24.5	10.7	604.00
.08	.00	12.15	.00	.000	.045	.000	.000	603.70	1000.00
.018925	350.	350.	350.	20	8	0	.00	35.50	1035.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.00	.00	38.50	1.80	212.30	.00	605.30	605.30

*SECNO 3.300

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.57

CLASS A LOW FLOW

3420 BRIDGE W.S.= 609.30 BRIDGE VELOCITY= 14.46 CALCULATED CHANNEL AREA= 135.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
610.98	611.62	1.41	0.	1951.	212.	212.	611.60	612.80	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 612.00 ELREA= 612.00

3.300	6.59	610.29	.00	.00	611.62	1.34	.45	.00	608.00
1951.0	.0	1951.0	.0	.0	210.4	.0	24.5	10.8	604.00
.08	.00	9.27	.00	.000	.045	.000	.000	603.70	1000.00
.007678	12.	12.	12.	0	0	0	.00	35.50	1035.50

1

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

*SECNO 3.400

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.35

3.400	7.30	611.90	.00	.00	612.20	.30	.27	.31	606.00
1951.0	339.5	1497.8	113.7	337.9	297.9	156.0	25.6	11.2	606.00
.09	1.00	5.03	.73	.080	.040	.130	.000	604.60	752.47
.001396	98.	98.	98.	2	0	0	.00	393.59	1146.07

*SECNO 4.200

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

4.200	6.92	611.92	.00	.00	612.37	.45	.09	.07	605.00
1951.0	736.3	825.2	389.5	361.0	103.8	213.0	26.4	11.6	605.00
.09	2.04	7.95	1.83	.080	.040	.130	.000	605.00	735.81
.003470	45.	45.	45.	2	0	0	.00	347.93	1083.74

*SECNO 4.300

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .50

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.300	6.80	612.30	.00	.00	612.48	.18	.03	.08	607.00
1951.0	1315.4	241.4	394.2	402.9	46.5	161.1	26.5	11.7	607.00
.09	3.26	5.19	2.45	.080	.040	.130	.000	605.50	718.51
.014135	5.	5.	5.	4	0	0	-140.45	374.69	1093.20

*SECNO 4.400

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.400	7.03	612.53	.00	.00	612.67	.14	.17	.01	607.00
1951.0	1352.3	215.4	383.4	469.8	48.6	189.9	26.7	11.8	607.00
.10	2.88	4.43	2.12	.080	.040	.130	.000	605.50	717.34
.009704	15.	15.	15.	2	0	0	-140.45	382.31	1099.65

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

*SECNO 4.500

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.16

4.500	7.49	612.49	.00	.00	612.75	.27	.02	.07	605.00
1951.0	848.9	728.1	374.0	519.1	112.3	255.8	26.8	11.8	605.00
.10	1.64	6.48	1.46	.080	.040	.130	.000	605.00	717.57
.002080	5.	5.	5.	2	0	0	.00	380.79	1098.36

*SECNO 4.600

4.600	5.96	613.16	.00	.00	613.29	.13	.50	.04	620.00
1951.0	.0	1929.0	22.0	.0	664.7	25.9	31.0	13.7	610.00
.12	.00	2.90	.85	.000	.040	.110	.000	607.20	787.45
.002236	230.	230.	230.	2	0	0	.00	335.18	1122.62

CCHV= .100 CEHV= .300
*SECNO 4.610

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

4.610	5.11	613.71	.00	.00	613.99	.29	.65	.05	621.40
1951.0	.0	1938.8	12.2	.0	450.1	11.1	33.6	14.9	611.40
.13	.00	4.31	1.10	.000	.045	.110	.000	608.60	914.59
.005236	200.	200.	200.	2	0	0	.00	197.26	1111.85

1490 NH CARD USED
*SECNO 5.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5.000	5.20	615.10	615.10	.00	616.32	1.23	1.48	.28	616.00
1951.0	51.8	1899.2	.0	29.4	210.8	.0	35.2	15.7	616.00
.14	1.76	9.01	.00	.060	.036	.000	.000	609.90	894.66
.011304	200.	200.	200.	3	5	0	.00	122.66	1057.12

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

*SECNO 6.100

6.100	6.38	618.58	.00	.00	619.37	.79	3.00	.04	618.00
1951.0	9.9	1915.0	26.1	14.9	266.5	19.7	37.4	16.7	616.00
.15	.66	7.18	1.32	.080	.045	.120	.000	612.20	948.18
.006714	350.	350.	350.	2	0	0	.00	126.70	1074.88

CCHV= .300 CEHV= .500
*SECNO 6.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 620.80 ELREA= 621.10

6.200	7.02	620.02	.00	.00	620.89	.87	1.49	.04	614.80
1951.0	.0	1951.0	.0	.0	260.7	.0	38.9	17.2	616.50
.16	.00	7.49	.00	.000	.045	.000	.000	613.00	1000.00
.005722	220.	240.	255.	3	0	0	.00	48.60	1048.60

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	3.00	.00	48.60	.10	291.60	.00	615.10	615.10

*SECNO 6.300
CLASS A LOW FLOW

3420 BRIDGE W.S.= 620.02 BRIDGE VELOCITY= 8.18 CALCULATED CHANNEL AREA= 239.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	620.90	.01	0.	1951.	292.	291.	621.10	622.30	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 622.30 ELREA= 623.80

6.300	7.03	620.03	.00	.00	620.90	.87	.00	.00	614.80
1951.0	.0	1951.0	.0	.0	260.9	.0	39.2	17.2	616.50
.16	.00	7.48	.00	.000	.040	.000	.000	613.00	1000.00
.004506	48.	48.	48.	0	0	0	.00	48.60	1048.60

*SECNO 6.400

6.400	5.45	620.45	.00	.00	621.23	.78	.31	.03	616.00
1951.0	58.3	1853.6	39.1	30.4	255.1	24.7	39.6	17.3	616.00
.16	1.92	7.27	1.58	.080	.045	.120	.000	615.00	981.09
.005518	100.	62.	30.	2	0	0	.00	79.81	1060.91

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

CCHV= .100 CEHV= .300
*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

7.000	4.82	625.32	625.32	.00	627.01	1.69	3.86	.27	624.00
1951.0	5.5	1927.5	18.0	4.4	183.7	11.8	42.1	18.1	624.00
.18	1.25	10.49	1.52	.120	.045	.100	.000	620.50	993.38
.018259	420.	420.	420.	20	11	0	.00	74.50	1067.88

*SECNO 8.100

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.53

8.100	5.57	629.37	.00	.00	630.48	1.11	3.41	.06	625.00
1951.0	104.4	1814.1	32.5	56.2	206.9	30.7	43.8	18.6	626.00
.19	1.86	8.77	1.06	.150	.045	.150	.000	623.80	976.77
.007763	300.	300.	300.	3	0	0	.00	92.25	1069.01

CCHV= .300 CEHV= .500
*SECNO 8.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 633.00 ELREA= 632.00

8.200	7.00	630.80	.00	.00	631.96	1.15	1.45	.02	629.00
1951.0	.0	1951.0	.0	.0	226.5	.0	45.0	18.9	629.00
.19	.00	8.62	.00	.000	.045	.000	.000	623.80	1000.00
.007150	195.	195.	195.	3	0	0	.00	39.00	1039.00

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

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.80	.00	25.00	.10	278.80	.90	623.80	623.80

*SECNO 8.300
CLASS A LOW FLOW

3420 BRIDGE W.S.= 630.80 BRIDGE VELOCITY= 8.94 CALCULATED CHANNEL AREA= 218.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	631.97	.01	0.	1951.	279.	265.	632.00	632.60	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 634.00 ELREA= 632.80

8.300	7.02	630.82	.00	.00	631.97	1.15	.01	.00	629.00
1951.0	.0	1951.0	.0	.0	226.8	.0	45.1	18.9	629.00
.19	.00	8.60	.00	.000	.040	.000	.000	623.80	1000.00
.005617	28.	28.	28.	0	0	0	.00	39.00	1039.00

*SECNO 8.400

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .58

8.400	5.21	632.21	.00	.00	633.75	1.54	1.59	.20	630.00
1951.0	6.5	1936.1	8.4	4.9	193.5	6.1	46.0	19.1	630.00
.20	1.33	10.01	1.36	.150	.050	.150	.000	627.00	995.37
.016574	153.	177.	197.	2	0	0	.00	55.27	1050.63

CCHV= .100 CEHV= .300
*SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.000	6.85	637.25	637.25	.00	639.72	2.46	5.10	.28	632.00
1951.0	36.5	1724.3	190.2	17.3	129.1	70.1	47.4	19.5	632.00
.20	2.11	13.36	2.71	.150	.050	.150	.000	630.40	993.43
.017466	300.	300.	300.	3	11	0	.00	62.38	1055.81

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

*SECNO 10.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.09

10.000	7.93	641.53	.00	.00	642.12	.59	2.22	.19	636.00
1951.0	453.2	1479.0	18.8	373.4	209.6	18.8	50.2	20.4	636.00
.22	1.21	7.06	1.00	.150	.050	.150	.000	633.60	848.97
.004055	300.	300.	300.	3	0	0	.00	189.14	1038.11

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.000	4.16	643.66	643.66	.00	645.15	1.48	2.33	.27	642.00
1951.0	1.8	1845.1	104.1	1.7	183.6	82.9	53.2	21.6	642.00
.23	1.06	10.05	1.26	.150	.050	.150	.000	639.50	997.92
.020561	300.	300.	300.	4	11	0	.00	151.80	1149.73

*SECNO 12.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

12.000	5.21	649.01	.00	.00	649.67	.66	4.44	.08	646.00
1951.0	226.4	1709.2	15.5	175.1	246.4	15.6	56.5	23.0	646.00
.25	1.29	6.94	.99	.150	.050	.150	.000	643.80	906.42
.006927	400.	400.	400.	3	0	0	.00	161.67	1068.10

*SECNO 13.000

13.000	5.59	650.39	.00	.00	651.08	.69	1.40	.01	646.00
1951.0	927.0	1024.0	.0	386.2	115.8	.1	57.9	23.5	650.00
.25	2.40	8.90	.01	.150	.050	.150	.000	644.80	854.11
.013470	100.	170.	170.	2	0	0	.00	171.39	1025.49

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

*SECNO 14.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

14.000	4.86	654.36	654.36	.00	655.57	1.22	4.30	.16	650.70
1951.0	843.6	1107.4	.0	283.6	96.7	.0	60.2	24.3	654.70
.26	2.98	11.45	.00	.150	.050	.000	.000	649.50	867.68
.027659	230.	230.	230.	9	15	0	.00	157.32	1025.00

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T1 Flood Insurance Study - Butler County, Ohio - Contract EMW-C-93-4160
T2 Unnamed Tributary to East Fork Mill Creek
T3 500-Year Flood [Looking Downstream]

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		5							602.91	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4		-1							

1

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

*PROF 5
0

CCHV= .100 CEHV= .300
*SECNO 1.000

1.000	8.41	602.91	.00	602.91	603.20	.29	.00	.00	598.00
6617.0	2472.0	3546.3	598.7	1515.8	618.9	572.4	.0	.0	596.00
.00	1.63	5.73	1.05	.080	.040	.120	.000	594.50	606.90
.001614	170.	175.	174.	0	0	0	.00	806.66	1313.55

1490 NH CARD USED
*SECNO 2.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2.000	5.11	603.71	603.71	.00	604.89	1.18	1.31	.27	602.00
3065.0	654.5	2378.8	31.7	240.6	243.0	17.2	17.4	5.5	600.00
.02	2.72	9.79	1.84	.067	.040	.130	.000	598.60	788.98
.009687	400.	600.	500.	3	14	0	.00	255.93	1064.27

1490 NH CARD USED
*SECNO 3.100
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.86

3.100	5.84	607.24	.00	.00	607.36	.12	2.36	.11	604.00
3065.0	2177.6	863.9	23.5	967.8	226.7	27.1	27.3	9.5	604.00
.07	2.25	3.81	.87	.066	.062	.130	.000	601.40	619.52
.002791	500.	500.	500.	3	0	0	.00	443.63	1063.15

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

CCHV= .300 CEHV= .500
*SECNO 3.200

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3.200	6.35	610.05	610.05	.00	610.89	.84	1.55	.36	608.00
3065.0	976.5	1863.5	225.0	381.4	201.9	161.3	35.2	13.0	604.00
.08	2.56	9.23	1.39	.070	.045	.130	.000	603.70	731.52
.009038	350.	350.	350.	20	8	0	.00	430.83	1162.35

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.60	2.00	.00	35.50	1.80	212.30	.00	605.30	605.30

*SECNO 3.300

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.04

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
615.23	613.60	.16	625.	2442.	212.	212.	611.60	612.80	356.

3.300	9.57	613.27	.00	.00	613.34	.06	2.45	.00	608.00

3065.0	1681.3	974.4	409.3	1298.5	316.4	606.7	35.6	13.1	604.00
.09	1.29	3.08	.67	.070	.045	.130	.000	603.70	697.71
.000492	12.	12.	12.	2	0	4	.00	487.21	1184.92

*SECNO 3.400

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3.400	8.64	613.24	.00	.00	613.52	.29	.07	.11	606.00
3065.0	901.8	1903.0	260.2	687.9	355.4	301.7	39.6	14.1	606.00
.09	1.31	5.36	.86	.080	.040	.130	.000	604.60	739.52
.001251	98.	98.	98.	2	0	0	.00	421.63	1161.15

*SECNO 4.200

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .69

4.200	8.29	613.29	.00	.00	613.63	.34	.08	.03	605.00
3065.0	1538.4	966.6	560.0	745.3	124.2	330.7	40.9	14.6	605.00
.10	2.06	7.78	1.69	.080	.040	.130	.000	605.00	713.59
.002618	45.	45.	45.	1	0	0	.00	406.64	1120.23

*SECNO 4.300

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.300	8.08	613.58	.00	.00	613.71	.13	.02	.06	607.00
3065.0	2272.7	230.1	562.2	772.6	58.0	288.2	41.0	14.6	607.00
.10	2.94	3.96	1.95	.080	.040	.130	.000	605.50	712.09
.006125	5.	5.	5.	2	0	0	-140.45	416.44	1128.53

*SECNO 4.400

3370 NORMAL BRIDGE, NRD= 36 MIN ELTRD= 609.30 MAX ELLC= 608.50

4.400	8.18	613.68	.00	.00	613.80	.12	.09	.00	607.00
3065.0	2280.3	224.0	560.7	800.1	58.9	299.3	41.4	14.8	607.00
.10	2.85	3.80	1.87	.080	.040	.130	.000	605.50	711.61
.005528	15.	15.	15.	2	0	0	-140.45	419.52	1131.13

*SECNO 4.500

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.66

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
4.500	8.62	613.62	.00	.00	613.88	.26	.02	.07	605.00
3065.0	1607.5	905.2	552.3	843.6	129.3	368.3	41.6	14.8	605.00
.10	1.91	7.00	1.50	.080	.040	.130	.000	605.00	711.88
.002006	5.	5.	5.	2	0	0	.00	417.75	1129.64

*SECNO 4.600

4.600	7.04	614.24	.00	.00	614.36	.12	.43	.04	620.00
3065.0	.0	3013.4	51.6	.0	1079.7	57.3	48.1	17.2	610.00
.12	.00	2.79	.90	.000	.040	.110	.000	607.20	651.38
.001753	230.	230.	230.	2	0	0	.00	485.86	1137.26

CCHV= .100 CEHV= .300
*SECNO 4.610

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .54

4.610	6.12	614.72	.00	.00	615.00	.28	.59	.05	621.40
3065.0	.0	3023.0	42.0	.0	713.4	29.5	52.4	19.1	611.40
.14	.00	4.24	1.43	.000	.045	.110	.000	608.60	765.26
.006017	200.	200.	200.	2	0	0	.00	359.24	1124.50

1490 NH CARD USED
*SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5.000	6.31	616.21	616.21	.00	617.38	1.16	1.57	.27	616.00
3065.0	347.9	2717.1	.0	120.7	297.3	.0	55.1	20.4	616.00
.14	2.88	9.14	.01	.060	.039	.120	.000	609.90	865.76
.010727	200.	200.	200.	20	8	0	.00	197.67	1063.43

*SECNO 6.100

6.100	7.27	619.47	618.69	.00	620.64	1.17	3.26	.00	618.00
3065.0	133.1	2867.0	64.9	97.3	320.2	35.1	58.6	22.1	616.00
.15	1.37	8.85	1.85	.080	.045	.120	.000	612.20	867.64
.008162	350.	350.	350.	4	8	0	.00	211.72	1079.35

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

CCHV= .300 CEHV= .500
*SECNO 6.200

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.86

6.200	8.51	621.51	.00	.00	621.84	.32	.95	.25	614.80
3065.0	1022.4	1888.2	154.5	611.5	333.1	103.8	62.6	23.5	616.50
.17	1.67	5.67	1.49	.100	.045	.100	.000	613.00	761.86
.002366	220.	240.	255.	2	0	0	.00	331.70	1093.56

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	3.00	.00	48.50	.10	291.60	.00	615.10	615.10

*SECNO 6.300

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.67

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
624.26	622.83	.00	550.	2489.	292.	291.	621.10	622.30	335.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 622.30 ELREA= 623.80

6.300	10.14	623.14	.00	.00	623.32	.19	1.49	.00	614.80
3065.0	1250.0	1815.0	.0	1073.6	412.0	.0	64.0	23.9	616.50
.17	1.16	4.41	.00	.100	.040	.000	.000	613.00	660.36
.000851	48.	48.	48.	2	0	2	.00	388.24	1048.60

*SECNO 6.400

3301 HV CHANGED MORE THAN HVINS

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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .52

6.400	7.98	622.98	.00	.00	623.69	.72	.10	.27	616.00
3065.0	228.2	2733.5	103.3	111.6	381.3	58.6	65.9	24.4	616.00
.18	2.04	7.17	1.76	.080	.045	.120	.000	615.00	920.39
.003144	100.	62.	30.	2	0	0	.00	145.57	1065.95

CCHV= .100 CEHV= .300
*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

7.000	6.25	626.75	626.75	.00	628.64	1.89	2.42	.35	624.00
3065.0	48.3	2894.4	122.2	33.0	255.2	49.9	70.2	25.8	624.00
.19	1.46	11.34	2.45	.120	.045	.100	.000	620.50	948.89
.013764	420.	420.	420.	20	16	0	.00	134.90	1083.79

*SECNO 8.100

8.100	6.61	630.41	630.00	.00	632.11	1.71	3.45	.02	625.00
3065.0	195.4	2738.3	131.3	84.5	247.4	119.6	72.9	27.1	626.00
.20	2.31	11.07	1.10	.150	.045	.150	.000	623.80	966.22
.009746	300.	300.	300.	4	5	0	.00	235.84	1202.05

CCHV= .300 CEHV= .500
*SECNO 8.200
3280 CROSS SECTION 8.20 EXTENDED .15 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.48

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 633.00 ELREA= 632.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
8.200	6.95	632.75	.00	.00	633.60	.85	1.23	.26	629.00
3065.0	.0	2482.7	582.3	.0	302.1	447.0	75.6	28.1	629.00
.20	.00	8.22	1.30	.000	.045	.150	.000	623.80	1000.00
.004431	195.	195.	195.	2	0	0	.00	210.00	1210.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.60	2.80	.00	25.00	.10	278.80	.90	623.80	623.80

*SECNO 8.300
3280 CROSS SECTION 8.30 EXTENDED 1.06 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
635.75	633.61	.01	873.	2188.	279.	265.	632.00	632.60	218.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 634.00 ELREA= 632.80

8.300	9.86	633.66	.00	.00	634.28	.61	.68	.00	629.00
3065.0	.0	2394.5	670.5	.0	337.8	603.7	76.2	28.2	629.00
.21	.00	7.09	1.11	.000	.040	.150	.000	623.80	1000.00
.002243	28.	28.	28.	4	0	2	.00	210.00	1210.00

*SECNO 8.400

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .40

8.400	6.82	633.82	.00	.00	635.75	1.93	.82	.66	630.00
3065.0	29.6	2998.9	36.5	16.3	266.2	19.1	78.8	28.8	630.00
.21	1.82	11.27	1.91	.150	.050	.150	.000	627.00	990.52
.013733	153.	177.	197.	2	0	0	.00	64.96	1055.48

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

CCHV= .100 CEHV= .300
*SECNO 9.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.000	9.25	639.65	639.65	.00	641.90	2.25	3.82	.10	632.00
3065.0	81.6	2399.6	583.8	36.5	176.9	258.3	81.5	29.6	632.00
.22	2.23	13.56	2.26	.150	.050	.150	.000	630.40	990.44
.011824	300.	300.	300.	7	11	0	.00	173.68	1164.12

*SECNO 10.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.80

10.000	9.67	643.27	.00	.00	643.88	.61	1.81	.16	636.00
3065.0	1017.3	1990.2	57.5	647.8	258.2	59.2	86.4	31.0	636.00
.23	1.57	7.71	.97	.150	.050	.150	.000	633.60	837.04
.003661	300.	300.	300.	2	0	0	.00	234.58	1071.63

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

11.000	5.35	644.85	644.85	.00	646.42	1.57	2.03	.29	642.80
3065.0	6.9	2631.6	426.4	5.1	243.1	224.0	91.4	32.4	642.00
.24	1.36	10.83	1.90	.150	.050	.150	.000	639.50	996.44
.016417	300.	300.	300.	4	11	0	.00	177.82	1174.26

*SECNO 12.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.43

12.000	6.20	650.00	.00	.00	650.93	.93	4.45	.06	646.00
3065.0	487.9	2530.9	46.2	272.7	298.3	37.2	96.4	34.1	646.00
.26	1.79	8.49	1.24	.150	.050	.150	.000	643.80	897.95
.008030	400.	400.	400.	2	0	0	.00	181.36	1079.31

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

*SECNO 13.000

13.000	6.79	651.59	.00	.00	652.40	.81	1.45	.01	646.00
3065.0	1604.6	1459.1	1.3	571.4	144.9	1.6	98.3	34.6	650.00
.26	2.81	10.07	.81	.150	.050	.150	.000	644.80	836.16
.012657	100.	170.	170.	2	0	0	.00	190.83	1026.99

*SECNO 14.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .67

14.000	5.78	655.28	655.25	.00	656.78	1.50	4.17	.20	650.70
3065.0	1483.6	1581.3	.1	413.4	119.6	.2	101.6	35.6	654.70
.27	3.59	13.22	.62	.150	.050	.150	.000	649.50	851.34
.028175	230.	230.	230.	5	15	0	.00	174.39	1025.72

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THIS RUN EXECUTED 31MAR08 08:34:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

East Fork Trib-4 Floods

SUMMARY PRINTOUT

	SECNO	XLCH	CUMDS	ELMIN	CWSEL	ELTRD	ELLC
	1.000	.00	.00	594.50	602.19	.00	.00
	1.000	.00	.00	594.50	603.14	.00	.00
	1.000	.00	.00	594.50	601.15	.00	.00
	1.000	.00	.00	594.50	602.19	.00	.00
	1.000	.00	.00	594.50	602.91	.00	.00
*	2.000	600.00	600.00	598.60	603.15	.00	.00
*	2.000	600.00	600.00	598.60	604.01	.00	.00
*	2.000	600.00	600.00	598.60	601.72	.00	.00
*	2.000	600.00	600.00	598.60	602.96	.00	.00
*	2.000	600.00	600.00	598.60	603.71	.00	.00
*	3.100	500.00	1100.00	601.40	606.60	.00	.00
*	3.100	500.00	1100.00	601.40	607.61	.00	.00
*	3.100	500.00	1100.00	601.40	605.87	.00	.00
*	3.100	500.00	1100.00	601.40	606.42	.00	.00
*	3.100	500.00	1100.00	601.40	607.24	.00	.00
*	3.200	350.00	1450.00	603.70	609.23	.00	.00
*	3.200	350.00	1450.00	603.70	609.28	.00	.00
*	3.200	350.00	1450.00	603.70	607.62	.00	.00
*	3.200	350.00	1450.00	603.70	608.88	.00	.00
*	3.200	350.00	1450.00	603.70	610.05	.00	.00
*	3.300	12.00	1462.00	603.70	610.80	612.80	611.60
*	3.300	12.00	1462.00	603.70	610.86	999999.00	.00
*	3.300	12.00	1462.00	603.70	608.81	612.80	611.60
*	3.300	12.00	1462.00	603.70	610.29	612.80	611.60
*	3.300	12.00	1462.00	603.70	613.27	612.80	611.60

	SECNO	XLCH	CUMDS	ELMIN	CWSEL	ELTRD	ELLC
*	3.400	98.00	1560.00	604.60	612.60	.00	.00
*	3.400	98.00	1560.00	604.60	612.49	.00	.00
*	3.400	98.00	1560.00	604.60	609.86	.00	.00
*	3.400	98.00	1560.00	604.60	611.90	.00	.00
*	3.400	98.00	1560.00	604.60	613.24	.00	.00
*	4.200	45.00	1605.00	605.00	612.64	.00	.00
*	4.200	45.00	1605.00	605.00	612.45	.00	.00
*	4.200	45.00	1605.00	605.00	609.83	.00	.00
*	4.200	45.00	1605.00	605.00	611.92	.00	.00
*	4.200	45.00	1605.00	605.00	613.29	.00	.00
*	4.300	5.00	1610.00	605.50	612.89	609.30	608.50
*	4.300	5.00	1610.00	605.50	612.49	609.30	608.50
*	4.300	5.00	1610.00	605.50	611.07	609.30	608.50
*	4.300	5.00	1610.00	605.50	612.30	609.30	608.50
*	4.300	5.00	1610.00	605.50	613.58	609.30	608.50
	4.400	15.00	1625.00	605.50	613.01	609.30	608.50
*	4.400	15.00	1625.00	605.50	613.32	609.30	608.50
*	4.400	15.00	1625.00	605.50	611.91	609.30	608.50
	4.400	15.00	1625.00	605.50	612.53	609.30	608.50
	4.400	15.00	1625.00	605.50	613.68	609.30	608.50
*	4.500	5.00	1630.00	605.00	612.96	.00	.00
*	4.500	5.00	1630.00	605.00	613.30	.00	.00
*	4.500	5.00	1630.00	605.00	611.90	.00	.00
*	4.500	5.00	1630.00	605.00	612.49	.00	.00
*	4.500	5.00	1630.00	605.00	613.62	.00	.00
	4.600	230.00	1860.00	607.20	613.54	.00	.00
*	4.600	230.00	1860.00	607.20	614.23	.00	.00
	4.600	230.00	1860.00	607.20	612.32	.00	.00
	4.600	230.00	1860.00	607.20	613.16	.00	.00
	4.600	230.00	1860.00	607.20	614.24	.00	.00
*	4.610	200.00	2060.00	608.60	614.05	.00	.00
*	4.610	200.00	2060.00	608.60	614.50	.00	.00
*	4.610	200.00	2060.00	608.60	612.73	.00	.00
*	4.610	200.00	2060.00	608.60	613.71	.00	.00
*	4.610	200.00	2060.00	608.60	614.72	.00	.00
*	5.000	200.00	2260.00	609.90	615.43	.00	.00
*	5.000	200.00	2260.00	609.90	615.42	.00	.00

*	5.000	200.00	2260.00	609.90	613.72	.00	.00
*	5.000	200.00	2260.00	609.90	615.10	.00	.00
*	5.000	200.00	2260.00	609.90	616.21	.00	.00

	SECNO	XLCH	CUMDS	ELMIN	CWSEL	ELTRD	ELLC
	6.100	350.00	2610.00	612.20	618.82	.00	.00
	6.100	350.00	2610.00	612.20	618.92	.00	.00
*	6.100	350.00	2610.00	612.20	617.65	.00	.00
	6.100	350.00	2610.00	612.20	618.58	.00	.00
	6.100	350.00	2610.00	612.20	619.47	.00	.00
	6.200	240.00	2850.00	613.00	620.34	.00	.00
	6.200	240.00	2850.00	613.00	620.53	.00	.00
	6.200	240.00	2850.00	613.00	618.88	.00	.00
	6.200	240.00	2850.00	613.00	620.02	.00	.00
*	6.200	240.00	2850.00	613.00	621.51	.00	.00
	6.300	48.00	2898.00	613.00	620.95	622.30	621.10
*	6.300	48.00	2898.00	613.00	621.15	999999.00	.00
	6.300	48.00	2898.00	613.00	618.88	622.30	621.10
	6.300	48.00	2898.00	613.00	620.03	622.30	621.10
*	6.300	48.00	2898.00	613.00	623.14	622.30	621.10
	6.400	62.00	2960.00	615.00	621.35	.00	.00
	6.400	62.00	2960.00	615.00	621.54	.00	.00
	6.400	62.00	2960.00	615.00	619.16	.00	.00
	6.400	62.00	2960.00	615.00	620.45	.00	.00
*	6.400	62.00	2960.00	615.00	622.98	.00	.00
*	7.000	420.00	3380.00	620.50	625.61	.00	.00
*	7.000	420.00	3380.00	620.50	625.67	.00	.00
*	7.000	420.00	3380.00	620.50	624.27	.00	.00
*	7.000	420.00	3380.00	620.50	625.32	.00	.00
*	7.000	420.00	3380.00	620.50	626.75	.00	.00
*	8.100	300.00	3680.00	623.80	629.72	.00	.00
	8.100	300.00	3680.00	623.80	630.00	.00	.00
*	8.100	300.00	3680.00	623.80	628.29	.00	.00
*	8.100	300.00	3680.00	623.80	629.37	.00	.00
	8.100	300.00	3680.00	623.80	630.41	.00	.00
	8.200	195.00	3875.00	623.80	631.18	.00	.00
	8.200	195.00	3875.00	623.80	631.94	.00	.00
	8.200	195.00	3875.00	623.80	629.55	.00	.00
	8.200	195.00	3875.00	623.80	630.80	.00	.00
*	8.200	195.00	3875.00	623.80	632.75	.00	.00
	8.300	28.00	3903.00	623.80	631.56	632.60	632.00
	8.300	28.00	3903.00	623.80	632.32	999999.00	.00
	8.300	28.00	3903.00	623.80	629.56	632.60	632.00
	8.300	28.00	3903.00	623.80	630.82	632.60	632.00
*	8.300	28.00	3903.00	623.80	633.66	632.60	632.00

	SECNO	XLCH	CUMDS	ELMIN	CWSEL	ELTRD	ELLC
*	8.400	177.00	4080.00	627.00	632.73	.00	.00
*	8.400	177.00	4080.00	627.00	633.23	.00	.00
*	8.400	177.00	4080.00	627.00	630.89	.00	.00
*	8.400	177.00	4080.00	627.00	632.21	.00	.00
*	8.400	177.00	4080.00	627.00	633.82	.00	.00
*	9.000	300.00	4380.00	630.40	637.79	.00	.00
*	9.000	300.00	4380.00	630.40	637.79	.00	.00
	9.000	300.00	4380.00	630.40	636.02	.00	.00
*	9.000	300.00	4380.00	630.40	637.25	.00	.00
*	9.000	300.00	4380.00	630.40	638.65	.00	.00
*	10.000	300.00	4680.00	633.60	642.04	.00	.00
*	10.000	300.00	4680.00	633.60	642.69	.00	.00
*	10.000	300.00	4680.00	633.60	639.69	.00	.00
*	10.000	300.00	4680.00	633.60	641.53	.00	.00
*	10.000	300.00	4680.00	633.60	643.27	.00	.00
*	11.000	300.00	4980.00	639.50	644.13	.00	.00
*	11.000	300.00	4980.00	639.50	644.88	.00	.00
*	11.000	300.00	4980.00	639.50	642.69	.00	.00
*	11.000	300.00	4980.00	639.50	643.66	.00	.00
*	11.000	300.00	4980.00	639.50	644.85	.00	.00
*	12.000	400.00	5380.00	643.80	649.16	.00	.00
	12.000	400.00	5380.00	643.80	649.59	.00	.00
*	12.000	400.00	5380.00	643.80	648.04	.00	.00
*	12.000	400.00	5380.00	643.80	649.01	.00	.00
*	12.000	400.00	5380.00	643.80	650.00	.00	.00
	13.000	170.00	5550.00	644.80	650.70	.00	.00

	13.000	170.00	5550.00	644.80	651.31	.00	.00
*	13.000	170.00	5550.00	644.80	649.39	.00	.00
	13.000	170.00	5550.00	644.80	650.39	.00	.00
	13.000	170.00	5550.00	644.80	651.59	.00	.00
*	14.000	230.00	5780.00	649.50	654.59	.00	.00
	14.000	230.00	5780.00	649.50	655.59	.00	.00
*	14.000	230.00	5780.00	649.50	653.60	.00	.00
*	14.000	230.00	5780.00	649.50	654.36	.00	.00
*	14.000	230.00	5780.00	649.50	655.28	.00	.00

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East Fork Trib-4 Floods

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	1.000	.00	.00	.00	594.50	4845.00	602.19	.00	602.45	15.11	5.19	2132.99	1246.25
	1.000	.00	.00	.00	594.50	4845.00	603.14	.00	603.50	14.48	5.54	1474.40	1273.08
	1.000	.00	.00	.00	594.50	2754.00	601.15	.00	601.35	12.22	4.18	1367.26	787.98
	1.000	.00	.00	.00	594.50	4304.00	602.19	.00	602.40	11.93	4.61	2132.99	1246.25
	1.000	.00	.00	.00	594.50	5617.00	602.91	.00	603.20	16.14	5.73	2707.02	1646.96
*	2.000	600.00	.00	.00	598.60	2210.00	603.15	603.15	604.19	93.98	8.82	368.49	227.96
*	2.000	600.00	.00	.00	598.60	2211.00	604.01	.00	604.73	54.16	7.31	427.79	300.43
*	2.000	600.00	.00	.00	598.60	1213.00	601.72	601.72	602.98	176.49	9.03	137.45	91.31
*	2.000	600.00	.00	.00	598.60	1951.00	602.96	602.96	603.94	93.10	8.48	326.00	202.20
*	2.000	600.00	.00	.00	598.60	3065.00	603.71	603.71	604.89	96.87	9.79	500.76	311.42
*	3.100	500.00	.00	.00	601.40	2210.00	606.60	.00	606.71	31.26	3.70	940.37	395.28
*	3.100	500.00	.00	.00	601.40	2211.00	607.61	.00	607.77	39.76	4.10	793.17	350.66
*	3.100	500.00	.00	.00	601.40	1213.00	605.87	.00	605.96	27.97	3.13	628.30	229.37
*	3.100	500.00	.00	.00	601.40	1951.00	606.42	.00	606.52	31.00	3.59	864.14	350.42
*	3.100	500.00	.00	.00	601.40	3065.00	607.24	.00	607.36	27.91	3.81	1221.48	580.21
*	3.200	350.00	.00	.00	603.70	2210.00	609.23	609.23	611.77	190.59	12.80	172.62	160.08
*	3.200	350.00	.00	.00	603.70	2211.00	609.28	609.28	611.77	220.01	12.87	174.53	149.06
*	3.200	350.00	.00	.00	603.70	1213.00	607.62	607.62	609.32	207.65	10.47	115.83	84.18
*	3.200	350.00	.00	.00	603.70	1951.00	608.88	608.88	611.19	189.25	12.15	160.52	141.82
*	3.200	350.00	.00	.00	603.70	3065.00	610.05	610.05	610.89	90.38	9.23	744.67	341.86
*	3.300	12.00	612.80	611.60	603.70	2210.00	610.80	.00	612.25	74.65	9.66	228.67	255.78
*	3.300	12.00	999999.00	.00	603.70	2211.00	610.86	.00	612.29	91.34	9.59	230.58	231.34
*	3.300	12.00	612.80	611.60	603.70	1213.00	608.81	.00	609.73	77.35	7.68	157.86	137.93
*	3.300	12.00	612.80	611.60	603.70	1951.00	610.29	.00	611.62	76.78	9.27	210.41	222.65
*	3.300	12.00	612.80	611.60	603.70	3065.00	613.27	.00	613.34	4.92	3.08	2221.61	1382.07
*	3.400	98.00	.00	.00	604.60	2210.00	612.60	.00	612.84	10.32	4.61	1079.72	687.86
*	3.400	98.00	.00	.00	604.60	2211.00	612.48	.00	612.94	20.45	5.85	491.61	488.87
*	3.400	98.00	.00	.00	604.60	1213.00	609.86	.00	610.28	25.66	3.40	291.86	239.46
*	3.400	98.00	.00	.00	604.60	1951.00	611.90	.00	612.20	13.96	5.03	791.69	522.22
*	3.400	98.00	.00	.00	604.60	3065.00	613.24	.00	613.52	12.51	5.36	1344.98	866.54
*	4.200	45.00	.00	.00	605.00	2210.00	612.64	.00	612.94	23.34	6.96	945.37	457.42
*	4.200	45.00	.00	.00	605.00	2211.00	612.45	.00	613.24	46.68	9.69	491.66	323.62
*	4.200	45.00	.00	.00	605.00	1213.00	609.83	.00	610.68	79.83	8.49	263.63	135.76
*	4.200	45.00	.00	.00	605.00	1951.00	611.92	.00	612.37	34.70	7.95	677.82	331.19
*	4.200	45.00	.00	.00	605.00	3065.00	613.29	.00	613.63	26.16	7.78	1200.28	598.98
*	4.300	5.00	609.30	608.50	605.50	2210.00	612.89	.00	613.01	73.59	4.03	840.63	257.63
*	4.300	5.00	609.30	608.50	605.50	2211.00	612.49	.00	613.30	383.74	8.77	321.41	112.87
*	4.300	5.00	609.30	608.50	605.50	1213.00	611.07	611.07	611.60	567.17	8.68	243.72	50.93
*	4.300	5.00	609.30	608.50	605.50	1951.00	612.30	.00	612.48	141.35	5.19	610.53	164.10
*	4.300	5.00	609.30	608.50	605.50	3065.00	613.58	.00	613.71	61.25	3.96	1118.77	391.63

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	4.400	15.00	609.30	608.50	605.50	2210.00	613.01	.00	613.12	63.32	3.79	885.26	277.73
*	4.400	15.00	609.30	608.50	605.50	2211.00	613.32	.00	613.77	164.56	6.32	428.07	172.36
*	4.400	15.00	609.30	608.50	605.50	1213.00	611.91	.00	612.03	107.71	4.31	469.48	116.88
	4.400	15.00	609.30	608.50	605.50	1951.00	612.53	.00	612.67	97.04	4.43	699.33	198.05
	4.400	15.00	609.30	608.50	605.50	3065.00	613.68	.00	613.80	55.28	3.80	1158.29	412.24
*	4.500	5.00	.00	.00	605.00	2210.00	612.96	.00	613.19	17.64	6.22	1073.20	526.20
*	4.500	5.00	.00	.00	605.00	2211.00	613.30	.00	613.85	29.26	8.24	580.30	408.73
*	4.500	5.00	.00	.00	605.00	1213.00	611.90	.00	612.07	13.72	4.99	669.08	327.47
*	4.500	5.00	.00	.00	605.00	1951.00	612.49	.00	612.75	20.80	6.48	887.19	427.76
*	4.500	5.00	.00	.00	605.00	3065.00	613.62	.00	613.88	20.06	7.00	1341.24	684.26
	4.600	230.00	.00	.00	607.20	2210.00	613.54	.00	613.65	19.66	2.76	825.78	495.96
*	4.600	230.00	.00	.00	607.20	2211.00	614.23	.00	614.37	10.21	2.98	743.07	691.82
	4.600	230.00	.00	.00	607.20	1213.00	612.32	.00	612.43	15.92	2.66	464.60	304.01
	4.600	230.00	.00	.00	607.20	1951.00	613.16	.00	613.29	22.36	2.90	690.63	412.56
	4.600	230.00	.00	.00	607.20	3065.00	614.24	.00	614.36	17.53	2.79	1136.98	732.04
*	4.610	200.00	.00	.00	608.60	2210.00	614.05	.00	614.32	55.86	4.18	539.59	295.68

*	4.610	200.00	.00	.00	608.60	2211.00	614.50	.00	614.76	37.14	4.10	538.76	362.78
*	4.610	200.00	.00	.00	608.60	1213.00	612.73	.00	612.96	42.54	3.90	313.59	185.98
*	4.610	200.00	.00	.00	608.60	1951.00	613.71	.00	613.99	52.36	4.31	461.15	269.62
*	4.610	200.00	.00	.00	608.60	3065.00	614.72	.00	615.00	60.17	4.24	742.84	395.13
*	5.000	200.00	.00	.00	609.90	2210.00	615.43	615.43	616.62	109.21	8.98	284.53	211.48
*	5.000	200.00	.00	.00	609.90	2211.00	615.42	615.42	616.63	110.49	9.03	282.71	210.34
*	5.000	200.00	.00	.00	609.90	1213.00	613.72	613.72	615.07	151.50	9.29	130.52	98.55
*	5.000	200.00	.00	.00	609.90	1951.00	615.10	615.10	616.32	113.04	9.01	240.21	183.51
*	5.000	200.00	.00	.00	609.90	3065.00	616.21	616.21	617.38	107.27	9.14	418.01	295.93
	6.100	350.00	.00	.00	612.20	2210.00	618.82	.00	619.70	71.01	7.65	334.29	262.25
	6.100	350.00	.00	.00	612.20	2211.00	618.92	.00	619.84	76.29	7.72	286.42	253.13
*	6.100	350.00	.00	.00	612.20	1213.00	617.65	.00	618.15	55.22	5.72	218.98	163.23
	6.100	350.00	.00	.00	612.20	1951.00	618.58	.00	619.37	67.14	7.18	301.20	238.11
	6.100	350.00	.00	.00	612.20	3065.00	619.47	618.69	620.64	81.62	8.95	452.63	339.27
	6.200	240.00	.00	.00	613.00	2210.00	620.34	.00	621.33	60.78	8.01	275.86	283.48
	6.200	240.00	.00	.00	613.00	2211.00	620.53	.00	621.47	60.29	7.75	285.26	284.74
	6.200	240.00	.00	.00	613.00	1213.00	618.88	.00	619.42	49.04	5.91	205.27	173.21
	6.200	240.00	.00	.00	613.00	1951.00	620.02	.00	620.89	57.22	7.49	260.65	257.92
*	6.200	240.00	.00	.00	613.00	3065.00	621.51	.00	621.84	23.66	5.67	1048.44	630.07
	6.300	48.00	622.30	621.10	613.00	2210.00	620.95	.00	621.76	34.05	7.23	305.82	378.71
*	6.300	48.00	999999.00	.00	613.00	2211.00	621.15	.00	621.91	34.61	7.01	315.38	375.82
	6.300	48.00	622.30	621.10	613.00	1213.00	618.88	.00	619.42	38.81	5.91	205.18	194.72
	6.300	48.00	622.30	621.10	613.00	1951.00	620.03	.00	620.90	45.06	7.48	260.91	290.64
*	6.300	48.00	622.30	621.10	613.00	3065.00	623.14	.00	623.32	8.51	4.41	1485.60	1050.91

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
6.400	62.00	.00	.00	615.00	2210.00	621.35	.00	622.03	39.39	6.84	383.68	352.11
6.400	62.00	.00	.00	615.00	2211.00	621.54	.00	622.17	35.29	6.61	399.05	372.19
6.400	62.00	.00	.00	615.00	1213.00	619.16	.00	619.74	59.44	6.21	212.91	157.33
6.400	62.00	.00	.00	615.00	1951.00	620.45	.00	621.23	55.18	7.27	310.23	262.65
* 6.400	62.00	.00	.00	615.00	3065.00	622.98	.00	623.69	31.44	7.17	551.56	546.67
* 7.000	420.00	.00	.00	620.50	2210.00	625.61	625.61	627.44	180.18	10.96	222.09	164.64
* 7.000	420.00	.00	.00	620.50	2211.00	625.67	625.67	627.44	170.42	10.77	226.84	169.37
* 7.000	420.00	.00	.00	620.50	1213.00	624.27	624.27	625.60	221.81	9.24	131.93	81.45
* 7.000	420.00	.00	.00	620.50	1951.00	625.32	625.32	627.01	182.59	10.49	199.94	144.38
* 7.000	420.00	.00	.00	620.50	3065.00	626.75	626.75	628.64	137.64	11.34	338.19	261.25
* 8.100	300.00	.00	.00	623.80	2210.00	629.72	.00	630.94	79.27	9.24	327.13	248.22
8.100	300.00	.00	.00	623.80	2211.00	630.00	.00	631.42	104.45	9.56	231.36	216.34
* 8.100	300.00	.00	.00	623.80	1213.00	628.29	.00	629.02	67.31	7.01	207.78	147.85
* 8.100	300.00	.00	.00	623.80	1951.00	629.37	.00	630.48	77.63	8.77	293.85	221.43
8.100	300.00	.00	.00	623.80	3065.00	630.41	630.00	632.11	97.46	11.07	451.50	310.47
8.200	195.00	.00	.00	623.80	2210.00	631.18	.00	632.48	74.62	9.17	240.94	255.84
8.200	195.00	.00	.00	623.80	2211.00	631.94	.00	632.98	55.23	8.16	271.07	297.51
8.200	195.00	.00	.00	623.80	1213.00	629.55	.00	630.28	61.86	6.82	177.83	154.22
8.200	195.00	.00	.00	623.80	1951.00	630.80	.00	631.96	71.50	8.62	226.46	230.73
* 8.200	195.00	.00	.00	623.80	3065.00	632.75	.00	633.60	44.31	8.22	749.06	460.43
8.300	28.00	632.60	632.00	623.80	2210.00	631.56	.00	632.71	48.30	8.64	255.79	317.99
8.300	28.00	999999.00	.00	623.80	2211.00	632.32	.00	633.25	37.07	7.74	285.61	363.14
8.300	28.00	632.60	632.00	623.80	1213.00	629.56	.00	630.28	48.81	6.82	177.90	173.62
8.300	28.00	632.60	632.00	623.80	1951.00	630.82	.00	631.97	56.17	8.60	226.85	260.32
* 8.300	28.00	632.60	632.00	623.80	3065.00	633.66	.00	634.28	22.43	7.09	941.52	647.11
* 8.400	177.00	.00	.00	627.00	2210.00	632.73	.00	634.29	144.32	10.07	233.97	183.96
* 8.400	177.00	.00	.00	627.00	2211.00	633.23	.00	634.56	126.72	9.23	239.44	196.41
* 8.400	177.00	.00	.00	627.00	1213.00	630.89	.00	632.16	221.17	9.04	135.72	81.56
* 8.400	177.00	.00	.00	627.00	1951.00	632.21	.00	633.75	165.74	10.01	204.53	151.55
* 8.400	177.00	.00	.00	627.00	3065.00	633.82	.00	635.75	137.33	11.27	301.63	261.55
* 9.000	300.00	.00	.00	630.40	2210.00	637.79	637.79	640.33	165.75	13.72	251.91	171.66
* 9.000	300.00	.00	.00	630.40	2211.00	637.79	637.79	640.36	231.43	13.74	224.75	145.34
9.000	300.00	.00	.00	630.40	1213.00	636.02	.00	637.65	148.46	10.68	151.51	99.55
* 9.000	300.00	.00	.00	630.40	1951.00	637.25	637.25	639.72	174.66	13.36	216.44	147.63
* 9.000	300.00	.00	.00	630.40	3065.00	639.65	639.65	641.90	118.24	13.56	471.77	281.87
* 10.000	300.00	.00	.00	633.60	2210.00	642.04	.00	642.61	37.94	7.13	700.05	358.80
* 10.000	300.00	.00	.00	633.60	2211.00	642.69	.00	643.56	56.37	7.98	381.30	294.48
* 10.000	300.00	.00	.00	633.60	1213.00	639.69	.00	640.38	58.25	7.01	280.83	158.94
* 10.000	300.00	.00	.00	633.60	1951.00	641.53	.00	642.12	40.55	7.06	601.71	306.38
* 10.000	300.00	.00	.00	633.60	3065.00	643.27	.00	643.88	36.61	7.71	965.16	506.59

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
* 11.000	300.00	.00	.00	639.50	2210.00	644.13	644.13	645.48	165.22	9.76	345.40	171.93
* 11.000	300.00	.00	.00	639.50	2211.00	644.88	.00	646.15	131.05	9.04	244.57	193.14
* 11.000	300.00	.00	.00	639.50	1213.00	642.69	642.69	643.91	243.12	8.90	149.60	77.80
* 11.000	300.00	.00	.00	639.50	1951.00	643.66	643.66	645.15	205.61	10.05	268.21	136.06
* 11.000	300.00	.00	.00	639.50	3065.00	644.85	644.85	646.42	164.17	10.83	472.13	239.21

*	12.000	400.00	.00	.00	643.80	2210.00	649.16	.00	649.93	78.19	7.53	462.61	249.92
	12.000	400.00	.00	.00	643.80	2211.00	648.59	.00	650.58	93.79	8.00	276.32	228.30
*	12.000	400.00	.00	.00	643.80	1213.00	648.04	.00	648.52	65.49	5.79	289.85	149.89
*	12.000	400.00	.00	.00	643.80	1951.00	649.01	.00	649.67	69.27	6.94	437.08	234.42
*	12.000	400.00	.00	.00	643.80	3065.00	650.00	.00	650.93	80.30	8.49	608.19	342.04
	13.000	170.00	.00	.00	644.80	2210.00	650.70	.00	651.42	131.17	9.18	555.61	192.97
	13.000	170.00	.00	.00	644.80	2211.00	651.31	.00	652.68	174.44	11.08	332.49	167.41
*	13.000	170.00	.00	.00	644.80	1213.00	649.39	.00	649.99	143.10	7.91	338.92	101.40
	13.000	170.00	.00	.00	644.80	1951.00	650.39	.00	651.08	134.70	8.90	501.29	168.10
	13.000	170.00	.00	.00	644.80	3065.00	651.59	.00	652.40	126.57	10.07	717.96	272.43
*	14.000	230.00	.00	.00	649.50	2210.00	654.59	654.59	655.88	280.57	11.93	417.16	131.94
	14.000	230.00	.00	.00	649.50	2211.00	655.59	.00	656.95	197.44	11.30	345.51	157.35
*	14.000	230.00	.00	.00	649.50	1213.00	653.60	653.60	654.57	261.41	9.81	267.11	75.02
*	14.000	230.00	.00	.00	649.50	1951.00	654.36	654.36	655.57	276.59	11.45	380.22	117.31
*	14.000	230.00	.00	.00	649.50	3065.00	655.28	655.25	656.78	281.75	13.22	533.21	182.60

East Fork Trib-4 Floods

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1.000	4845.00	602.19	.00	.00	.00	787.94	.00
	1.000	4845.00	603.14	.95	.00	.95	310.00	.00
	1.000	2754.00	601.15	-1.99	.00	.00	672.60	.00
	1.000	4304.00	602.19	1.04	.00	.00	787.94	.00
	1.000	6617.00	602.91	.72	.00	.00	806.66	.00
*	2.000	2210.00	603.15	.00	.96	.00	221.58	600.00
*	2.000	2211.00	604.01	.86	.87	.86	185.00	600.00
*	2.000	1213.00	601.72	-2.29	.57	.00	57.89	600.00
*	2.000	1951.00	602.96	1.24	.77	.00	209.35	600.00
*	2.000	3065.00	603.71	.75	.80	.00	255.93	600.00
*	3.100	2210.00	606.60	.00	3.45	.00	436.60	500.00
*	3.100	2211.00	607.61	1.01	3.60	1.01	263.00	500.00
*	3.100	1213.00	605.87	-1.74	4.16	.00	413.51	500.00
*	3.100	1951.00	606.42	.54	3.46	.00	434.67	500.00
*	3.100	3065.00	607.24	.82	3.53	.00	443.63	500.00
*	3.200	2210.00	609.23	.00	2.63	.00	35.50	350.00
*	3.200	2211.00	609.28	.05	1.66	.05	35.50	350.00
*	3.200	1213.00	607.62	-1.66	1.74	.00	34.36	350.00
*	3.200	1951.00	608.88	1.27	2.47	.00	35.50	350.00
*	3.200	3065.00	610.05	1.17	2.81	.00	430.83	350.00
*	3.300	2210.00	610.80	.00	1.58	.00	35.50	12.00
*	3.300	2211.00	610.86	.05	1.58	.05	35.50	12.00
*	3.300	1213.00	608.81	-2.05	1.19	.00	35.50	12.00
*	3.300	1951.00	610.29	1.48	1.41	.00	35.50	12.00
*	3.300	3065.00	613.27	2.98	3.22	.00	487.21	12.00
*	3.400	2210.00	612.60	.00	1.80	.00	414.65	98.00
*	3.400	2211.00	612.48	-.12	1.62	-.12	89.30	98.00
*	3.400	1213.00	609.86	-2.63	1.05	.00	110.53	98.00
*	3.400	1951.00	611.90	2.04	1.61	.00	393.59	98.00
*	3.400	3065.00	613.24	1.34	-.04	.00	421.63	98.00
*	4.200	2210.00	612.64	.00	.03	.00	385.73	45.00
*	4.200	2211.00	612.45	-.18	-.03	-.18	105.00	45.00
*	4.200	1213.00	609.83	-2.62	-.02	.00	98.99	45.00
*	4.200	1951.00	611.92	2.09	.02	.00	347.93	45.00
*	4.200	3065.00	613.29	1.37	.05	.00	406.64	45.00
*	4.300	2210.00	612.89	.00	.25	.00	394.14	5.00
*	4.300	2211.00	612.49	-.40	.04	-.40	105.00	5.00
*	4.300	1213.00	611.07	-1.42	1.24	.00	212.82	5.00
*	4.300	1951.00	612.30	1.23	.38	.00	374.69	5.00
*	4.300	3065.00	613.58	1.28	.29	.00	416.44	5.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	4.400	2210.00	613.01	.00	.12	.00	387.80	15.00
*	4.400	2211.00	613.32	.31	.82	.31	110.00	15.00
*	4.400	1213.00	611.91	-1.41	.84	.00	346.28	15.00
	4.400	1951.00	612.53	.62	.23	.00	382.31	15.00
	4.400	3065.00	613.68	1.15	.10	.00	419.52	15.00
*	4.500	2210.00	612.96	.00	-.04	.00	396.35	5.00
*	4.500	2211.00	613.30	.33	-.02	.33	105.00	5.00
*	4.500	1213.00	611.90	-1.40	-.01	.00	342.46	5.00
*	4.500	1951.00	612.49	.59	-.05	.00	380.79	5.00
*	4.500	3065.00	613.62	1.14	-.05	.00	417.75	5.00

	4.600	2210.00	613.54	.00	.57	.00	394.46	230.00
*	4.600	2211.00	614.23	.70	.94	.70	180.00	230.00
	4.600	1213.00	612.32	-1.91	.43	.00	200.04	230.00
	4.600	1951.00	613.16	.84	.68	.00	335.18	230.00
	4.600	3065.00	614.24	1.08	.61	.00	485.88	230.00
*	4.610	2210.00	614.05	.00	.52	.00	253.01	200.00
*	4.610	2211.00	614.50	.45	.26	.45	180.00	200.00
*	4.610	1213.00	612.73	-1.77	.40	.00	131.80	200.00
*	4.610	1951.00	613.71	.98	.54	.00	197.26	200.00
*	4.610	3065.00	614.72	1.01	.48	.00	359.24	200.00
*	5.000	2210.00	615.43	.00	1.37	.00	144.09	200.00
*	5.000	2211.00	615.42	-.01	.92	-.01	143.27	200.00
*	5.000	1213.00	613.72	-1.69	1.00	.00	49.65	200.00
*	5.000	1951.00	615.10	1.37	1.39	.00	122.66	200.00
*	5.000	3065.00	616.21	1.12	1.49	.00	197.67	200.00
	6.100	2210.00	618.82	.00	3.39	.00	149.47	350.00
	6.100	2211.00	618.92	.10	3.50	.10	60.00	350.00
*	6.100	1213.00	617.65	-1.27	3.92	.00	67.52	350.00
	6.100	1951.00	618.58	.93	3.48	.00	126.70	350.00
	6.100	3065.00	619.47	.89	3.26	.00	211.72	350.00
	6.200	2210.00	620.34	.00	1.52	.00	48.60	240.00
	6.200	2211.00	620.53	.20	1.62	.20	48.60	240.00
	6.200	1213.00	618.88	-1.65	1.23	.00	48.60	240.00
	6.200	1951.00	620.02	1.14	1.44	.00	48.60	240.00
*	6.200	3065.00	621.51	1.49	2.04	.00	331.70	240.00
	6.300	2210.00	620.95	.00	.62	.00	48.60	48.00
*	6.300	2211.00	621.15	.20	.62	.20	48.60	48.00
	6.300	1213.00	618.88	-2.27	.00	.00	48.60	48.00
	6.300	1951.00	620.03	1.15	.01	.00	48.60	48.00
*	6.300	3065.00	623.14	3.11	1.62	.00	388.24	48.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
6.400	2210.00	621.35	.00	.40	.00	83.41	62.00
6.400	2211.00	621.54	.19	.39	.19	83.00	62.00
6.400	1213.00	619.16	-2.38	.27	.00	69.21	62.00
6.400	1951.00	620.45	1.30	.42	.00	79.81	62.00
* 6.400	3065.00	622.98	2.52	-.16	.00	145.57	62.00
* 7.000	2210.00	625.61	.00	4.26	.00	79.81	420.00
* 7.000	2211.00	625.67	.06	4.13	.06	78.00	420.00
* 7.000	1213.00	624.27	-1.40	5.12	.00	55.08	420.00
* 7.000	1951.00	625.32	1.05	4.87	.00	74.50	420.00
* 7.000	3065.00	626.75	1.43	3.78	.00	134.90	420.00
* 8.100	2210.00	629.72	.00	4.11	.00	100.37	300.00
8.100	2211.00	630.00	.28	4.33	.28	38.00	300.00
* 8.100	1213.00	628.29	-1.71	4.01	.00	66.81	300.00
* 8.100	1951.00	629.37	1.08	4.05	.00	92.25	300.00
8.100	3065.00	630.41	1.04	3.65	.00	235.84	300.00
8.200	2210.00	631.18	.00	1.46	.00	39.00	195.00
8.200	2211.00	631.94	.77	1.94	.77	39.00	195.00
8.200	1213.00	629.55	-2.39	1.27	.00	39.00	195.00
8.200	1951.00	630.80	1.25	1.43	.00	39.00	195.00
* 8.200	3065.00	632.75	1.94	2.34	.00	210.00	195.00
8.300	2210.00	631.56	.00	.38	.00	39.00	28.00
8.300	2211.00	632.32	.77	.38	.77	39.00	28.00
8.300	1213.00	629.56	-2.76	.01	.00	39.00	28.00
8.300	1951.00	630.82	1.25	.01	.00	39.00	28.00
* 8.300	3065.00	633.66	2.85	.92	.00	210.00	28.00
* 8.400	2210.00	632.73	.00	1.17	.00	58.38	177.00
* 8.400	2211.00	633.23	.50	.91	.50	45.00	177.00
* 8.400	1213.00	630.89	-2.34	1.33	.00	48.99	177.00
* 8.400	1951.00	632.21	1.32	1.39	.00	55.27	177.00
* 8.400	3065.00	633.82	1.61	.16	.00	64.96	177.00
* 9.000	2210.00	637.79	.00	5.06	.00	71.02	300.00
* 9.000	2211.00	637.79	.00	4.56	.00	50.00	300.00
9.000	1213.00	636.02	-1.77	5.13	.00	42.20	300.00
* 9.000	1951.00	637.25	1.24	5.05	.00	62.38	300.00
* 9.000	3065.00	639.65	2.39	5.93	.00	173.68	300.00
* 10.000	2210.00	642.04	.00	4.25	.00	197.12	300.00
* 10.000	2211.00	642.69	.65	4.90	.65	56.10	300.00
* 10.000	1213.00	639.69	-3.00	3.67	.00	147.21	300.00
* 10.000	1951.00	641.53	1.84	4.27	.00	189.14	300.00
* 10.000	3065.00	643.27	1.74	3.62	.00	234.58	300.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

*	11.000	2210.00	644.13	.00	2.09	.00	173.31	300.00
*	11.000	2211.00	644.88	.75	2.19	.75	50.00	300.00
*	11.000	1213.00	642.69	-2.19	3.00	.00	92.28	300.00
*	11.000	1951.00	643.66	.97	2.14	.00	151.80	300.00
*	11.000	3065.00	644.85	1.19	1.59	.00	177.82	300.00
*	12.000	2210.00	649.16	.00	5.03	.00	164.72	400.00
	12.000	2211.00	649.59	.42	4.71	.42	52.00	400.00
*	12.000	1213.00	648.04	-1.55	5.35	.00	142.82	400.00
*	12.000	1951.00	649.01	.97	5.35	.00	161.67	400.00
*	12.000	3065.00	650.00	.99	5.15	.00	181.36	400.00
	13.000	2210.00	650.70	.00	1.54	.00	176.46	170.00
	13.000	2211.00	651.31	.60	1.72	.60	64.84	170.00
*	13.000	1213.00	649.39	-1.91	1.36	.00	151.30	170.00
	13.000	1951.00	650.39	1.00	1.38	.00	171.39	170.00
	13.000	3065.00	651.59	1.20	1.58	.00	190.83	170.00
*	14.000	2210.00	654.59	.00	3.89	.00	162.52	230.00
	14.000	2211.00	655.59	1.00	4.29	1.00	75.00	230.00
*	14.000	1213.00	653.60	-1.99	4.21	.00	140.22	230.00
*	14.000	1951.00	654.36	.76	3.97	.00	157.32	230.00
*	14.000	3065.00	655.28	.92	3.70	.00	174.39	230.00

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SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=      2.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      2.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=      2.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      2.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      2.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      2.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      2.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      2.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

NOTE    SECNO=      3.100  PROFILE=  1  WSEL BASED ON X5 CARD
WARNING SECNO=      3.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE    SECNO=      3.100  PROFILE=  2  WSEL BASED ON X5 CARD
WARNING SECNO=      3.100  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.100  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.100  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      3.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      3.200  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      3.200  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      3.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      3.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.400  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.400  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.400  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      4.200  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.200  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.200  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.200  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.200  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=      4.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      4.300  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.300  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.300  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
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WARNING SECNO=       4.300  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.300  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       4.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.400  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       4.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.500  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.500  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.500  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.500  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE    SECNO=       4.600  PROFILE=  2  WSEL BASED ON X5 CARD
WARNING SECNO=       4.600  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       4.610  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.610  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.610  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.610  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       4.610  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=       5.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       5.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       5.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       5.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       5.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=       5.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       5.000  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       5.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       5.000  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       5.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       5.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       5.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=       6.100  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       6.200  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=       6.300  PROFILE=  2  MINIMUM SPECIFIC ENERGY
WARNING SECNO=       6.300  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       6.400  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=       7.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       7.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       7.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=       7.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       7.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
1
   31MAR08      08:34:29                                                    PAGE   71


CAUTION SECNO=       7.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=       7.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       7.000  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       7.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       7.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       7.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=       7.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       7.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       7.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=       8.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.100  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.100  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       8.200  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       8.300  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=       8.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.400  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.400  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=       8.400  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=       9.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       9.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       9.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       9.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       9.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       9.000  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=       9.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=       9.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

WARNING SECNO=      10.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      10.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      10.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      10.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      10.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      11.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      11.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=      11.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      11.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 11.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 11.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 11.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 11.000 PROFILE= 5 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 11.000 PROFILE= 5 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 12.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 12.000 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 12.000 PROFILE= 4 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 12.000 PROFILE= 5 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 13.000 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 14.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 14.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 14.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 14.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 14.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 14.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 14.000 PROFILE= 5 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

FLOODWAY DATA, East Fork Trib-4 Floods
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
1.000	310.	1474.	3.3	603.2	602.2	1.0
2.000	185.	428.	5.2	604.1	603.2	.9
3.100	263.	793.	2.8	607.6	606.6	1.0
3.200	36.	175.	12.7	609.3	609.2	.1
3.300	36.	231.	9.6	610.9	610.8	.1
3.400	89.	492.	4.5	612.5	612.6	-.1
4.200	105.	492.	4.5	612.4	612.6	-.2
4.300	105.	321.	6.9	612.5	612.9	-.4
4.400	110.	428.	5.2	613.3	613.0	.3
4.500	105.	580.	3.8	613.3	613.0	.3
4.600	180.	743.	3.0	614.2	613.5	.7
4.610	180.	539.	4.1	614.5	614.1	.4
5.000	169.	283.	7.8	615.4	615.4	.0
6.100	60.	286.	7.7	618.9	618.8	.1
6.200	49.	285.	7.8	620.5	620.3	.2
6.300	49.	315.	7.0	621.2	621.0	.2
6.400	83.	399.	5.5	621.6	621.4	.2
7.000	78.	227.	9.7	625.7	625.6	.1
8.100	39.	231.	9.6	630.0	629.7	.3
8.200	39.	271.	8.2	632.0	631.2	.8
8.300	39.	286.	7.7	632.4	631.6	.8
8.400	45.	239.	9.2	633.2	632.7	.5
9.000	50.	225.	9.8	637.8	637.8	.0
10.000	56.	381.	5.8	642.7	642.0	.7
11.000	50.	245.	9.0	644.9	644.1	.8
12.000	52.	276.	8.0	649.6	649.2	.4
13.000	65.	332.	6.6	651.3	650.7	.6
14.000	75.	346.	6.4	655.6	654.6	1.0

FLOODWAY DATA, East Fork Trib-4 Floods
PROFILE NO. 3

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
1.000	682.	1367.	2.0	601.2	602.2	-1.0
2.000	58.	137.	8.8	601.7	603.2	-1.5
3.100	429.	628.	1.9	605.9	606.6	-.7
3.200	34.	116.	10.5	607.6	609.2	-1.6
3.300	36.	158.	7.7	608.8	610.8	-2.0
3.400	111.	292.	4.2	609.9	612.6	-2.7
4.200	99.	264.	4.6	609.8	612.6	-2.8
4.300	213.	244.	5.0	611.1	612.9	-1.8
4.400	346.	469.	2.6	611.9	613.0	-1.1
4.500	342.	669.	1.8	611.9	613.0	-1.1
4.600	200.	465.	2.6	612.3	613.5	-1.2
4.610	132.	314.	3.9	612.7	614.1	-1.4
5.000	50.	131.	9.3	613.7	615.4	-1.7
6.100	68.	219.	5.5	617.6	618.8	-1.2

6.200	49.	205.	5.9	618.9	620.3	-1.4
6.300	49.	205.	5.9	618.9	621.0	-2.1
6.400	69.	213.	5.7	619.2	621.4	-2.2
7.000	55.	132.	9.2	624.3	625.6	-1.3
8.100	67.	208.	5.8	628.3	629.7	-1.4
8.200	39.	178.	6.8	629.6	631.2	-1.6
8.300	39.	178.	6.6	629.6	631.6	-2.0
8.400	49.	136.	8.9	630.9	632.7	-1.8
9.000	42.	152.	8.0	636.0	637.8	-1.8
10.000	147.	281.	4.3	639.7	642.0	-2.3
11.000	92.	150.	8.1	642.7	644.1	-1.4
12.000	143.	290.	4.2	648.0	649.2	-1.2
13.000	151.	339.	3.6	649.4	650.7	-1.3
14.000	140.	267.	4.5	653.6	654.6	-1.0

1

FLOODWAY DATA, East Fork Trib-4 Floods
PROFILE NO. 4

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
1.000	786.	2133.	2.0	602.2	602.2	.0
2.000	258.	326.	6.0	603.0	603.2	-.2
3.100	435.	864.	2.3	606.4	606.6	-.2
3.200	36.	161.	12.2	608.9	609.2	-.3
3.300	36.	210.	9.3	610.3	610.8	-.5
3.400	394.	792.	2.5	611.9	612.6	-.7
4.200	348.	678.	2.9	611.9	612.6	-.7
4.300	375.	611.	3.2	612.3	612.9	-.6
4.400	382.	699.	2.8	612.5	613.0	-.5
4.500	381.	887.	2.2	612.5	613.0	-.5
4.600	335.	691.	2.8	613.2	613.5	-.3
4.610	197.	461.	4.2	613.7	614.1	-.4
5.000	162.	240.	8.1	615.1	615.4	-.3
6.100	127.	301.	6.5	618.6	618.8	-.2
6.200	49.	261.	7.5	620.0	620.3	-.3
6.300	49.	261.	7.5	620.0	621.0	-1.0
6.400	80.	310.	6.3	620.5	621.4	-.9
7.000	74.	200.	9.8	625.3	625.6	-.3
8.100	92.	294.	6.6	629.4	629.7	-.3
8.200	39.	226.	8.6	630.8	631.2	-.4
8.300	39.	227.	8.6	630.8	631.6	-.8
8.400	55.	205.	9.5	632.2	632.7	-.5
9.000	62.	216.	9.0	637.3	637.8	-.5
10.000	189.	602.	3.2	641.5	642.0	-.5
11.000	152.	268.	7.3	643.7	644.1	-.4
12.000	162.	437.	4.5	649.0	649.2	-.2
13.000	171.	501.	3.9	650.4	650.7	-.3
14.000	157.	380.	5.1	654.4	654.6	-.2

1

FLOODWAY DATA, East Fork Trib-4 Floods
PROFILE NO. 5

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
1.000	807.	2707.	2.4	602.9	602.2	.7
2.000	275.	501.	6.1	603.7	603.2	.5
3.100	444.	1221.	2.5	607.2	606.6	.6
3.200	431.	745.	4.1	610.1	609.2	.9
3.300	487.	2222.	1.4	613.3	610.8	2.5
3.400	422.	1345.	2.3	613.2	612.6	.6
4.200	407.	1200.	2.6	613.3	612.6	.7
4.300	416.	1119.	2.7	613.6	612.9	.7
4.400	420.	1158.	2.6	613.7	613.0	.7
4.500	418.	1341.	2.3	613.6	613.0	.6
4.600	486.	1137.	2.7	614.2	613.5	.7
4.610	359.	743.	4.1	614.7	614.1	.6
5.000	198.	418.	7.3	616.2	615.4	.8
6.100	212.	453.	6.8	619.5	618.8	.7
6.200	332.	1048.	2.9	621.5	620.3	1.2
6.300	388.	1486.	2.1	623.1	621.0	2.1
6.400	146.	552.	5.6	623.0	621.4	1.6
7.000	135.	338.	9.1	626.8	625.6	1.2
8.100	236.	452.	6.8	630.4	629.7	.7
8.200	210.	749.	4.1	632.7	631.2	1.5
8.300	210.	942.	3.3	633.7	631.6	2.1
8.400	65.	302.	10.2	633.8	632.7	1.1
9.000	174.	472.	6.5	639.6	637.8	1.8
10.000	235.	965.	3.2	643.3	642.0	1.3
11.000	178.	472.	6.5	644.9	644.1	.8

12.000	181.	608.	5.0	650.0	649.2	.8
13.000	191.	718.	4.3	651.6	650.7	.9
14.000	174.	533.	5.7	655.3	654.6	.7

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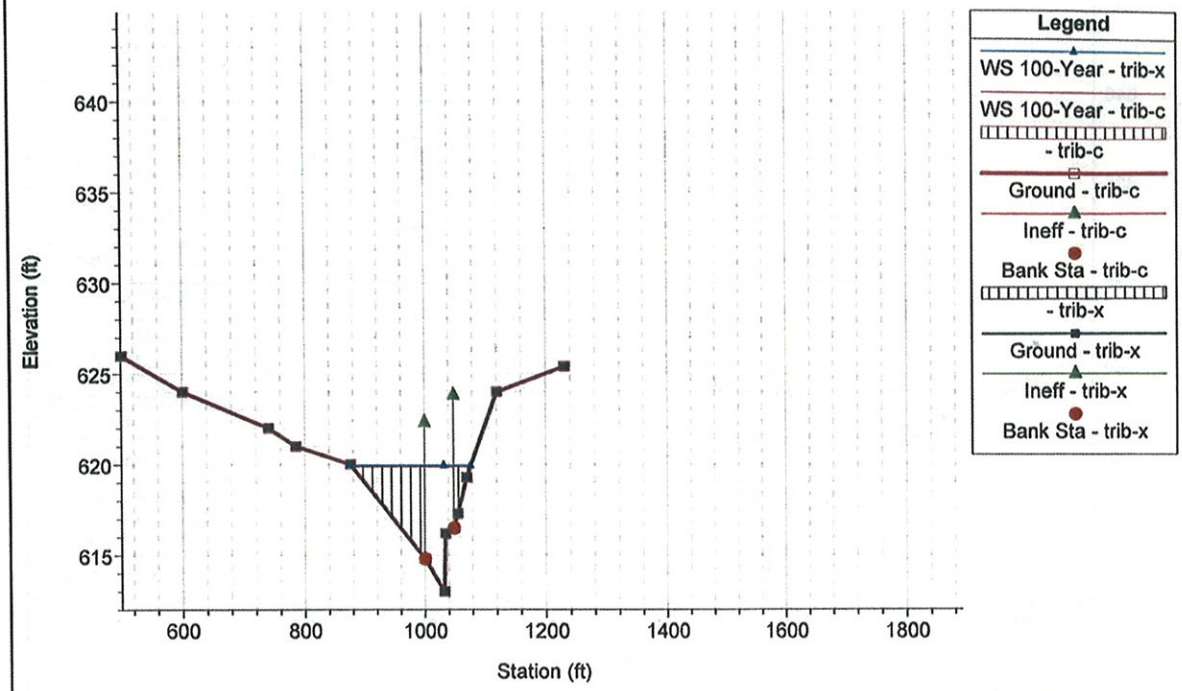
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM

Geom: trib-x Flow: trib-x

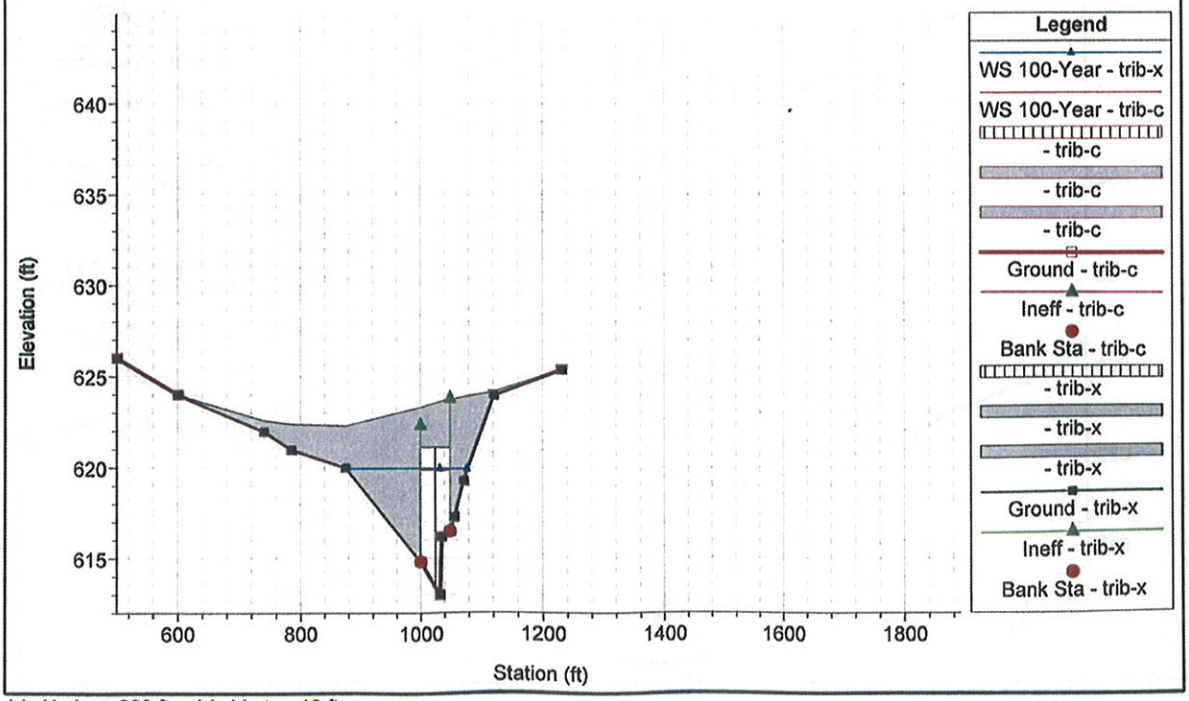
River = RIVER-1 Reach = Reach-1 RS = 6.3 This is a REPEATED section.



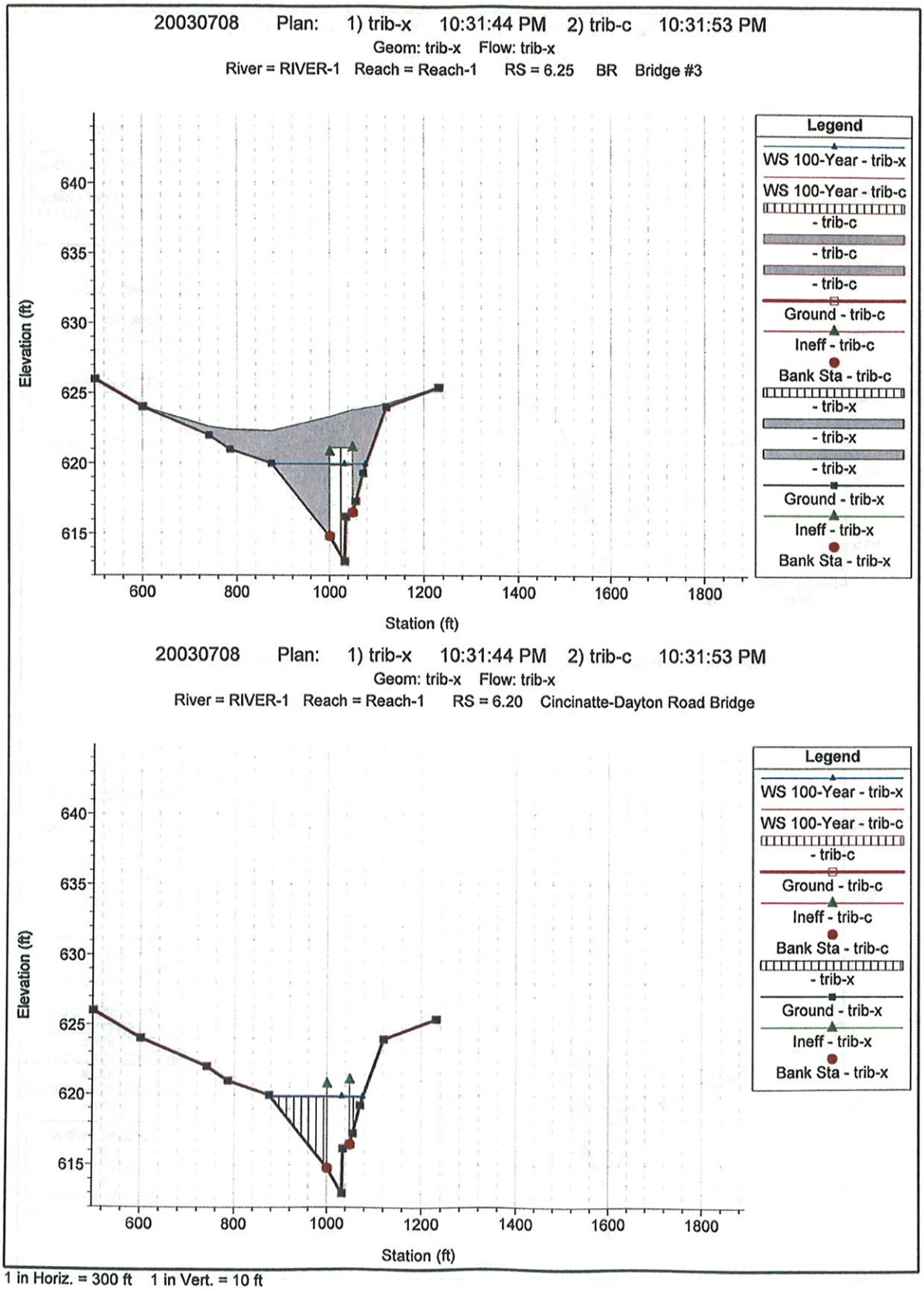
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM

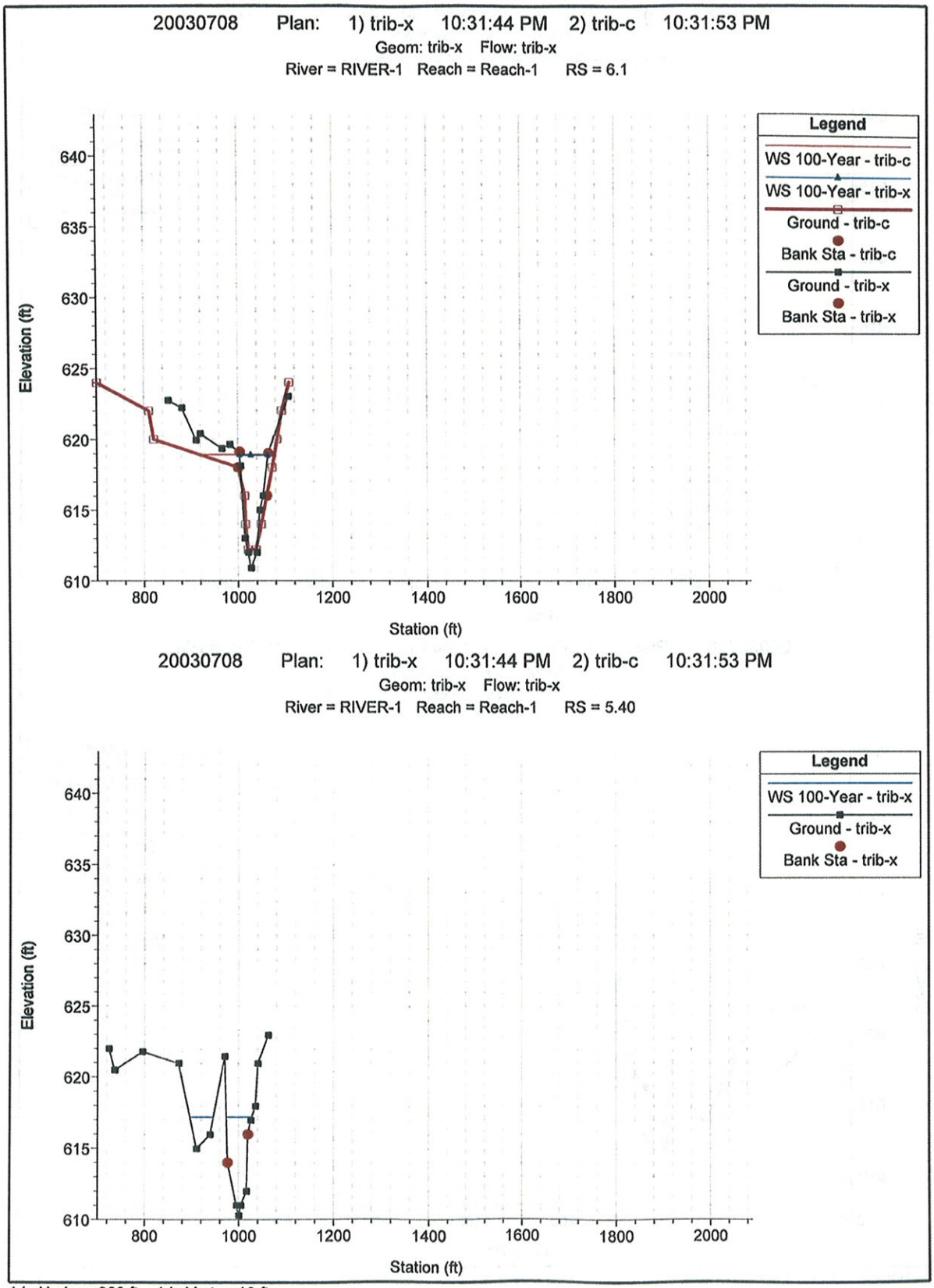
Geom: trib-x Flow: trib-x

River = RIVER-1 Reach = Reach-1 RS = 6.25 BR Bridge #3

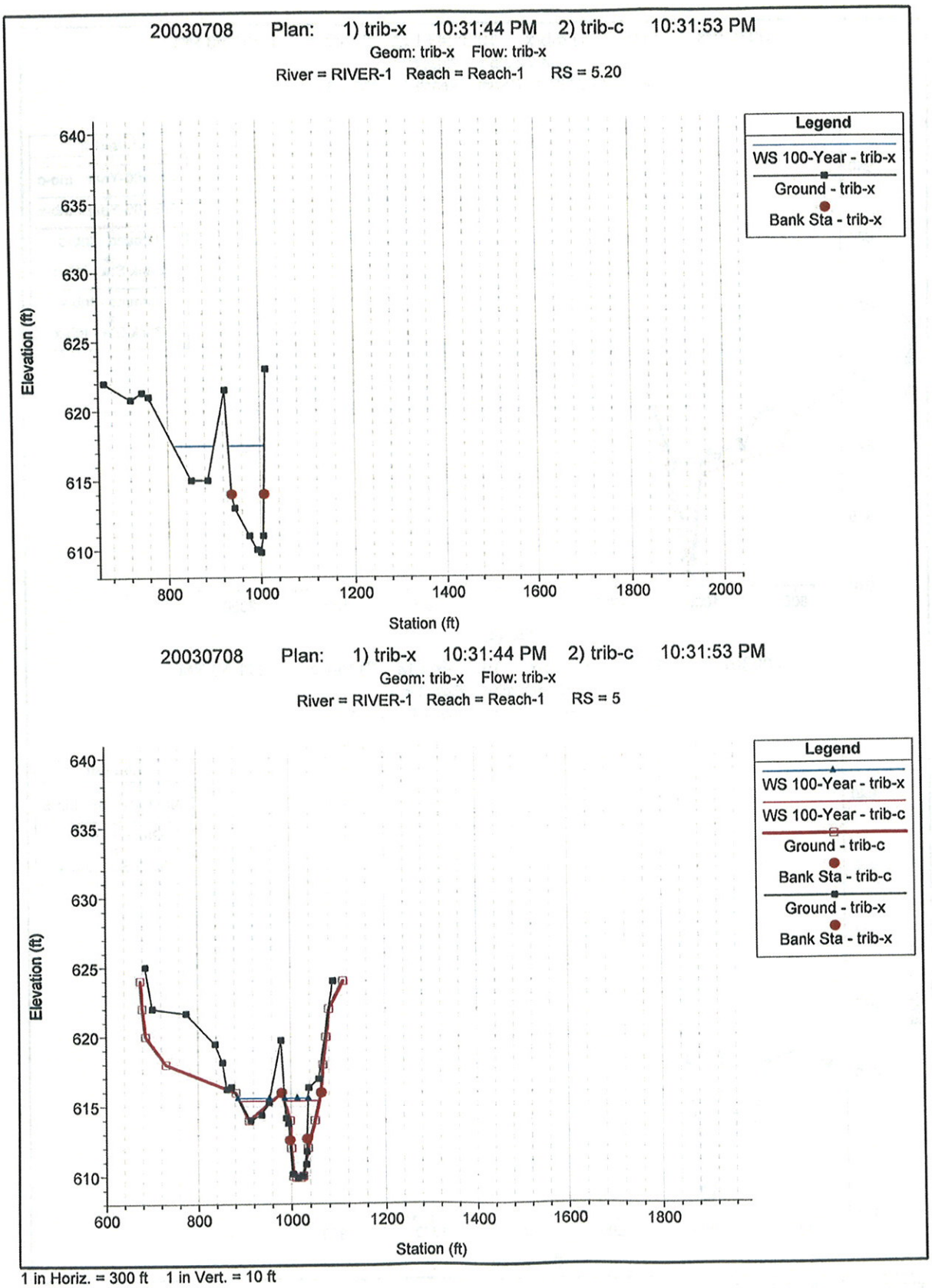


1 in Horiz. = 300 ft 1 in Vert. = 10 ft

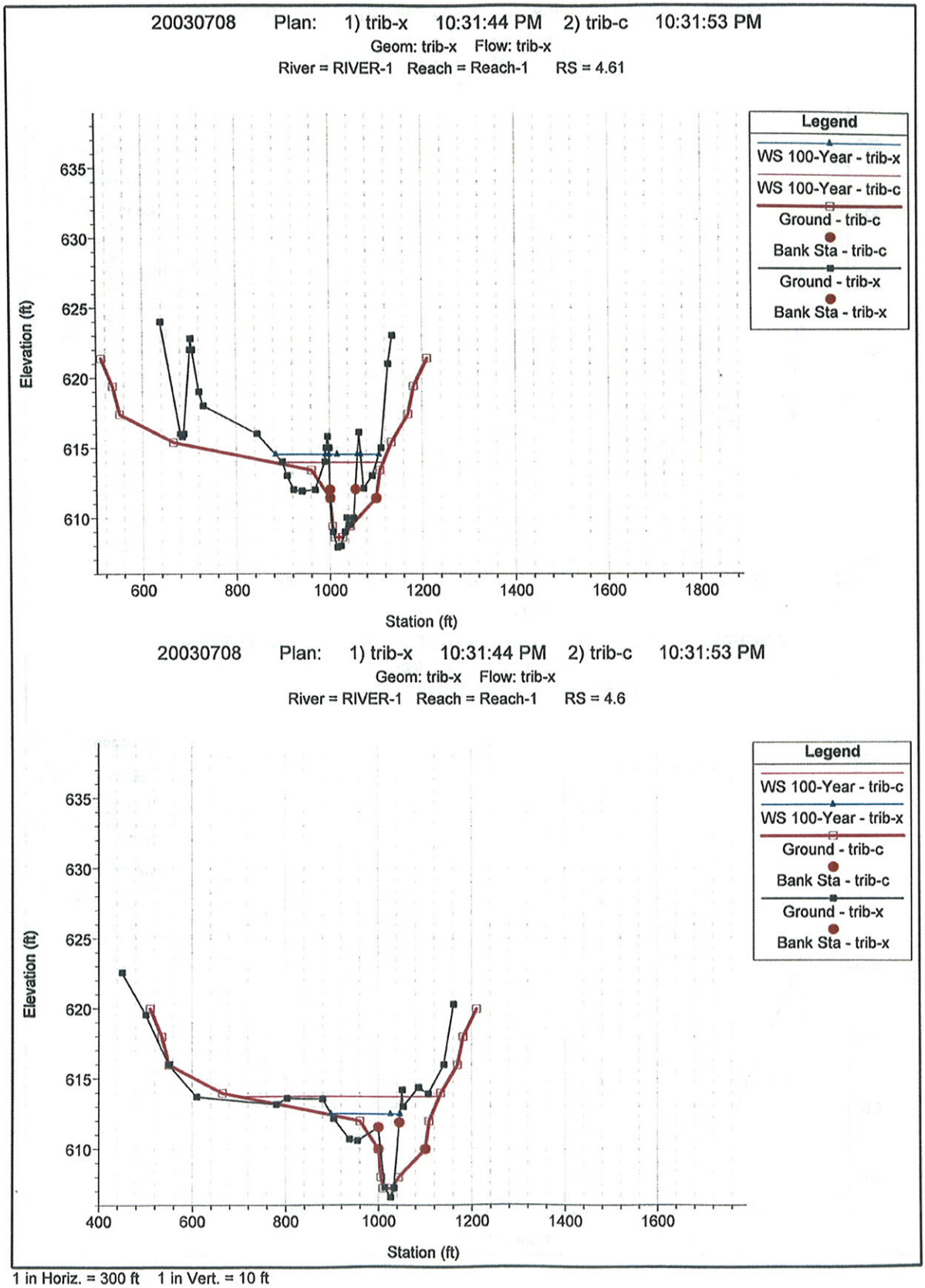

20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 6.25 BR Bridge #3
Legend
WS 100-Year - trib-x
WS 100-Year - trib-c
- trib-c
- trib-c
- trib-c
Ground - trib-c
Ineff - trib-c
Bank Sta - trib-c
- trib-x
- trib-x
- trib-x
Ground - trib-x
Ineff - trib-x
Bank Sta - trib-x
Elevation (ft)
640
635
630
625
620
615
600
800
1000
1200
1400
1600
1800
Station (ft)
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 6.20 Cincinatte-Dayton Road Bridge
Legend
WS 100-Year - trib-x
WS 100-Year - trib-c
- trib-c
Ground - trib-c
Ineff - trib-c
Bank Sta - trib-c
- trib-x
Ground - trib-x
Ineff - trib-x
Bank Sta - trib-x
Elevation (ft)
640
635
630
625
620
615
600
800
1000
1200
1400
1600
1800
Station (ft)
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



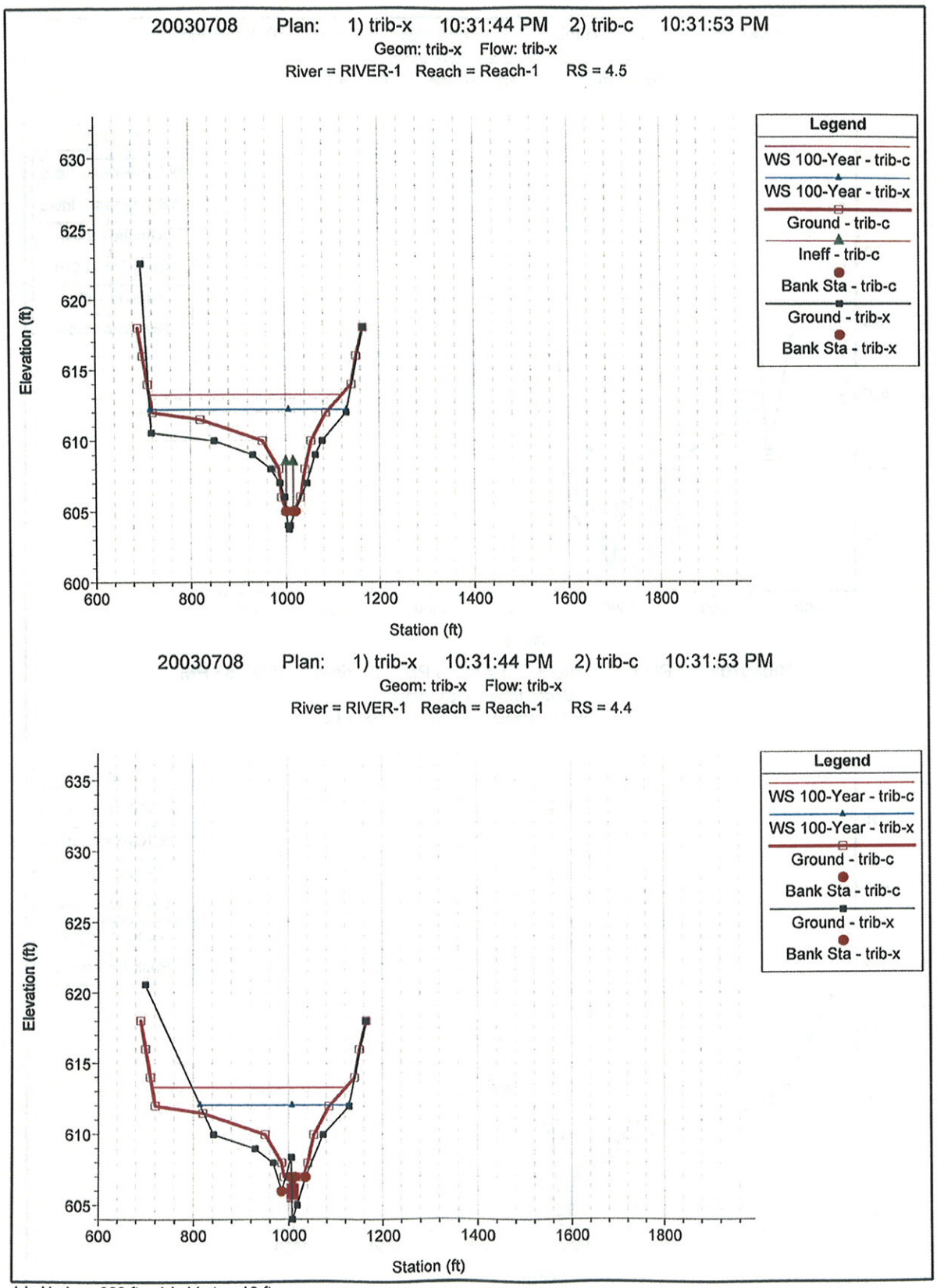
1 in Horiz. = 300 ft 1 in Vert. = 10 ft

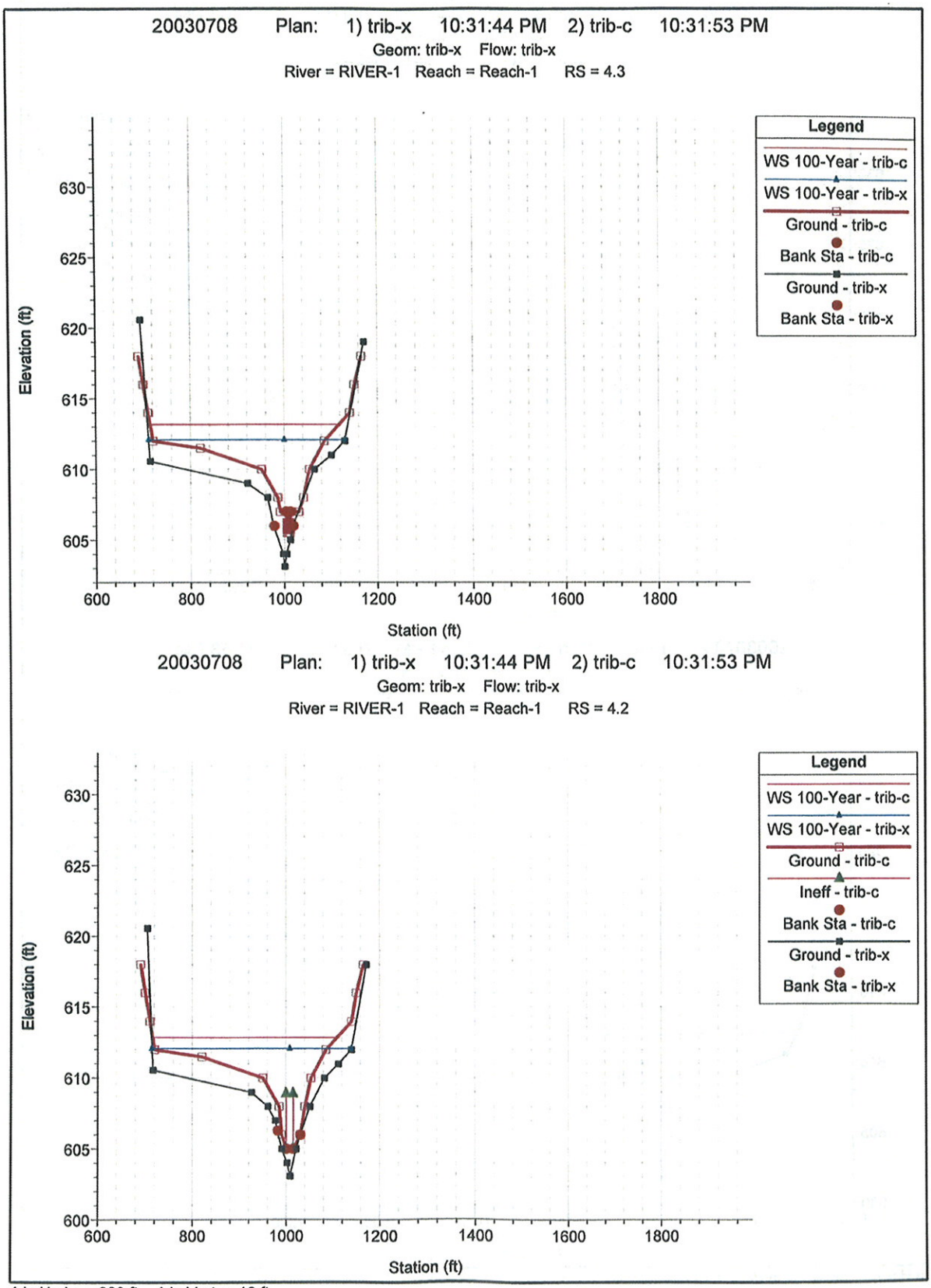


1 in Horiz. = 300 ft 1 in Vert. = 10 ft

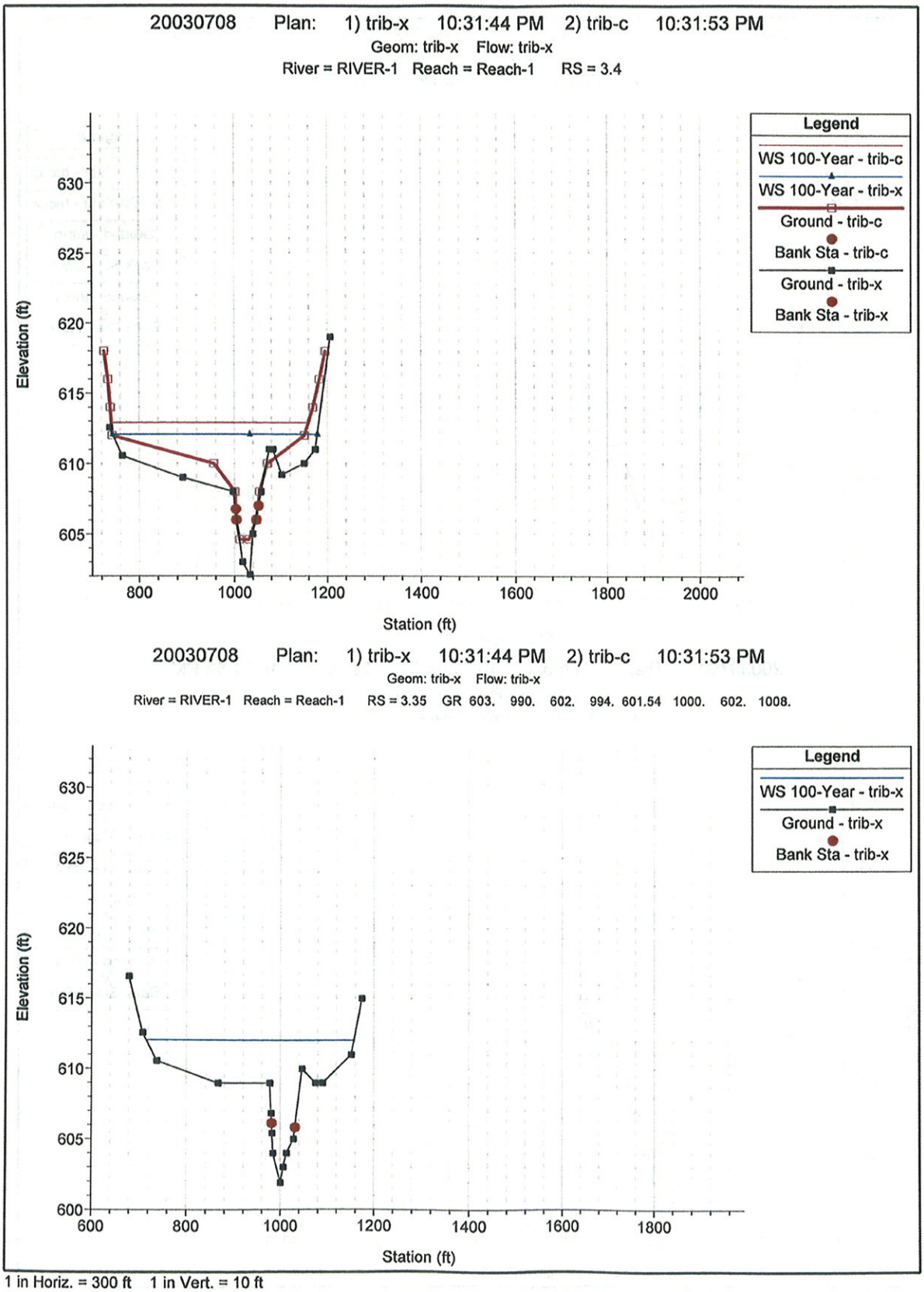


1 in Horiz. = 300 ft 1 in Vert. = 10 ft


20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 4.5
Legend
WS 100-Year - trib-c
WS 100-Year - trib-x
Ground - trib-c
Ineff - trib-c
Bank Sta - trib-c
Ground - trib-x
Bank Sta - trib-x
Elevation (ft)
630
625
620
615
610
605
600
600
800
1000
1200
1400
1600
1800
Station (ft)
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 4.4
Legend
WS 100-Year - trib-c
WS 100-Year - trib-x
Ground - trib-c
Bank Sta - trib-c
Ground - trib-x
Bank Sta - trib-x
Elevation (ft)
635
630
625
620
615
610
605
600
800
1000
1200
1400
1600
1800
Station (ft)
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft



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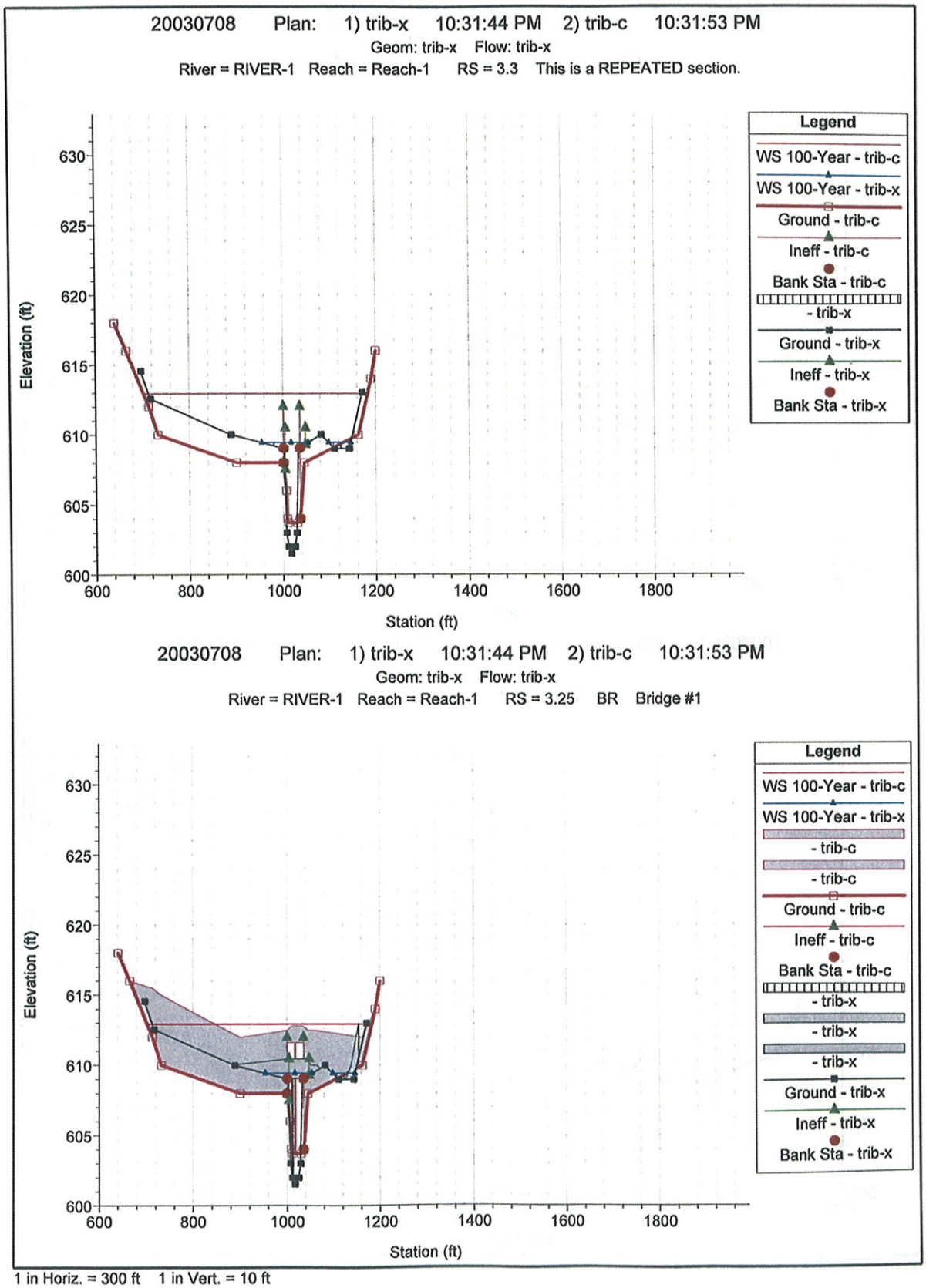

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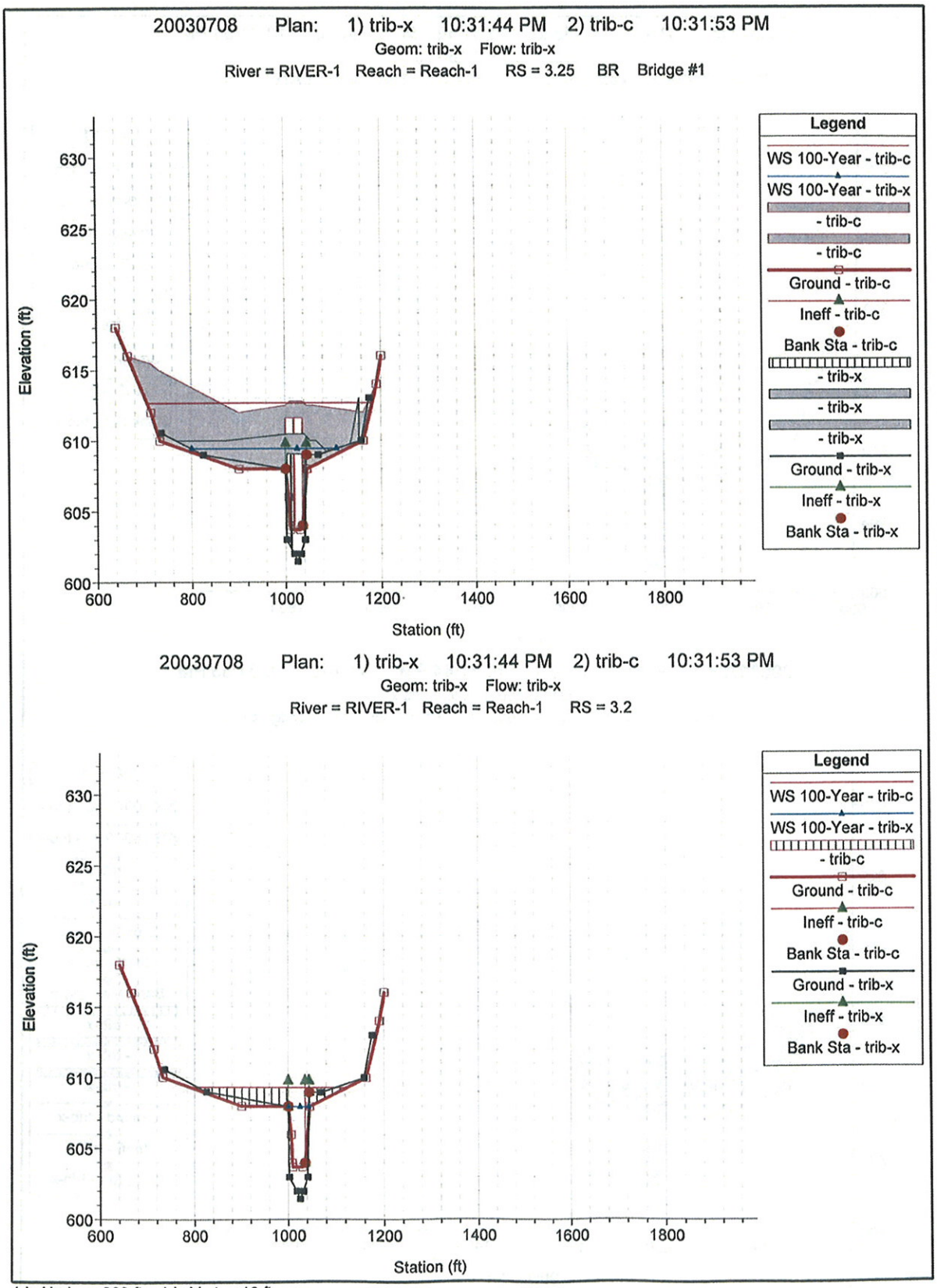
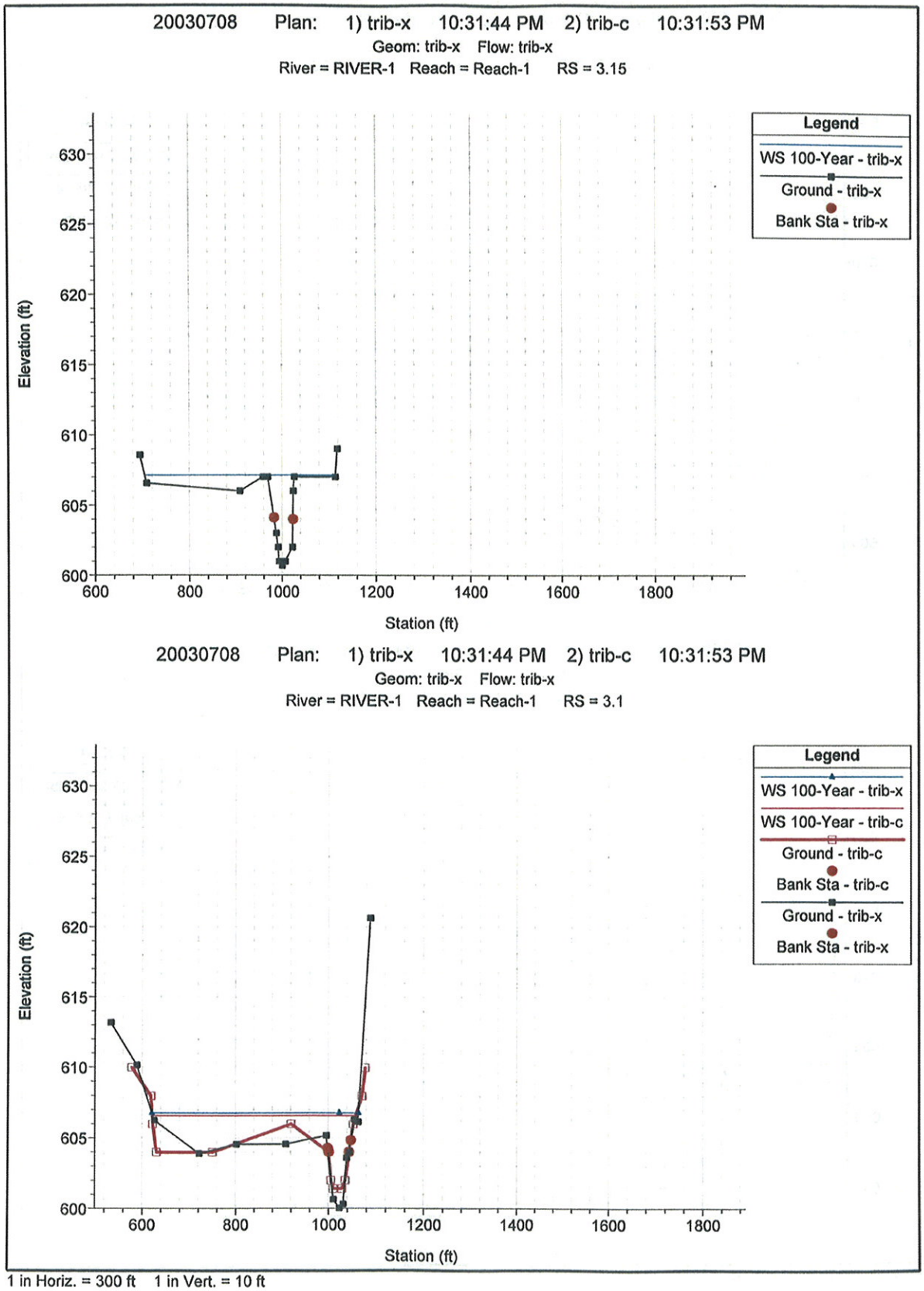

20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 3.25 BR Bridge #1
Legend
WS 100-Year - trib-c
WS 100-Year - trib-x
- trib-c
- trib-c
Ground - trib-c
Ineff - trib-c
Bank Sta - trib-c
- trib-x
- trib-x
- trib-x
Ground - trib-x
Ineff - trib-x
Bank Sta - trib-x
Elevation (ft)
630
625
620
615
610
605
600
600
800
1000
1200
1400
1600
1800
Station (ft)
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 3.2
Legend
WS 100-Year - trib-c
WS 100-Year - trib-x
- trib-c
Ground - trib-c
Ineff - trib-c
Bank Sta - trib-c
Ground - trib-x
Ineff - trib-x
Bank Sta - trib-x
Elevation (ft)
630
625
620
615
610
605
600
600
800
1000
1200
1400
1600
1800
Station (ft)
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



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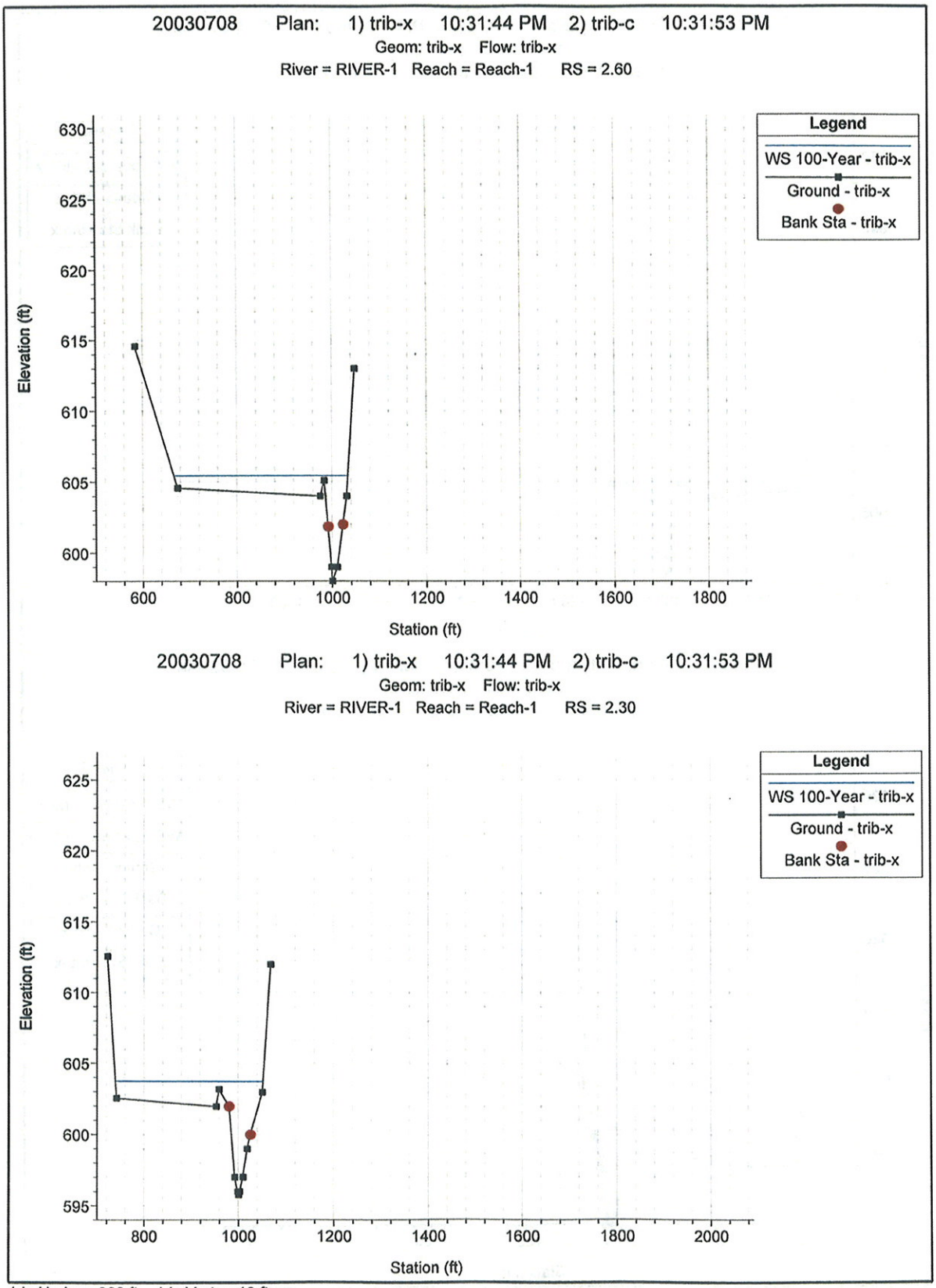
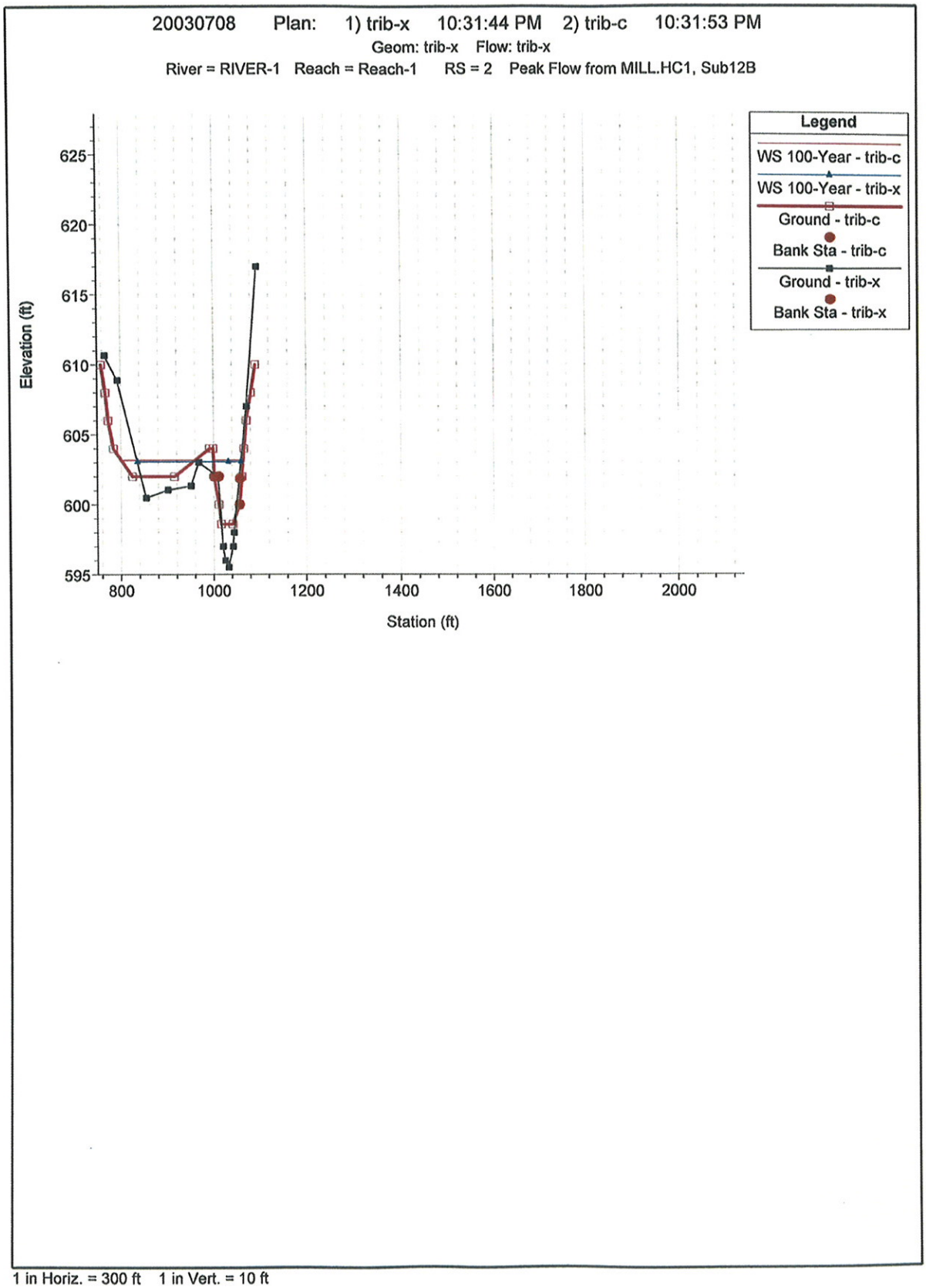

20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 2.60
Legend
WS 100-Year - trib-x
Ground - trib-x
Bank Sta - trib-x
Elevation (ft)
630
625
620
615
610
605
600
600
800
1000
1200
1400
1600
1800
Station (ft)
20030708 Plan: 1) trib-x 10:31:44 PM 2) trib-c 10:31:53 PM
Geom: trib-x Flow: trib-x
River = RIVER-1 Reach = Reach-1 RS = 2.30
Legend
WS 100-Year - trib-x
Ground - trib-x
Bank Sta - trib-x
Elevation (ft)
625
620
615
610
605
600
595
800
1000
1200
1400
1600
1800
2000
Station (ft)
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft

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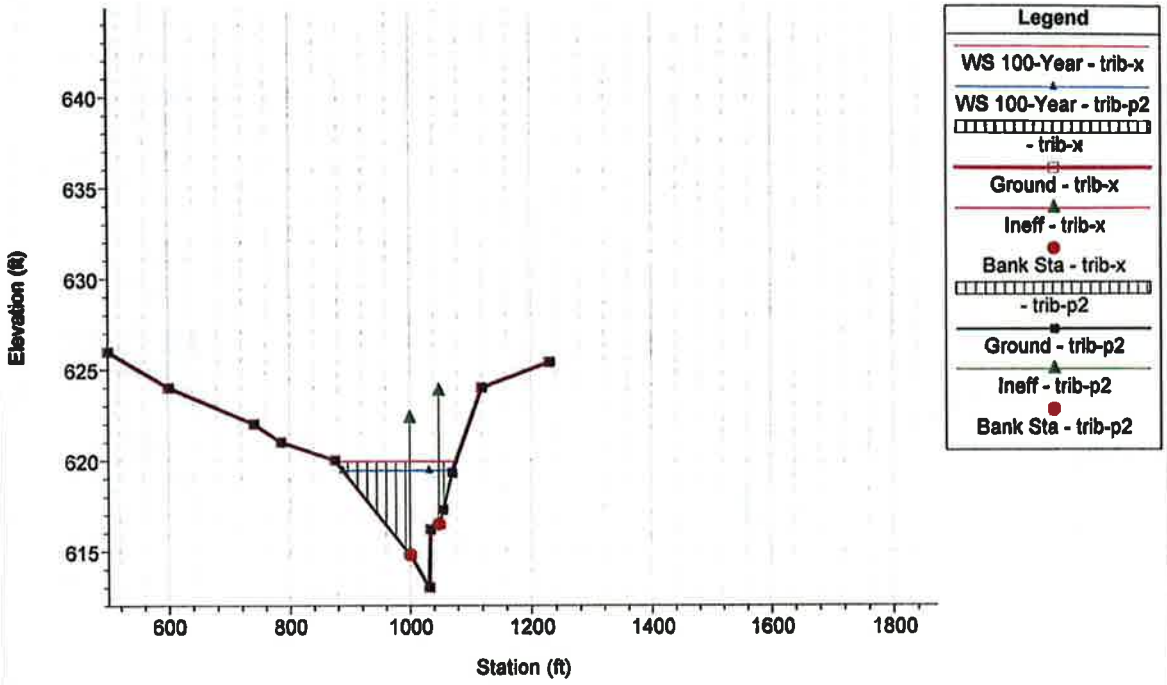
20030708 Plan: 1) trib-p2 10:31:46 PM 2) trib-x 10:31:44 PM

Geom: trib-p2 Flow: trib-x

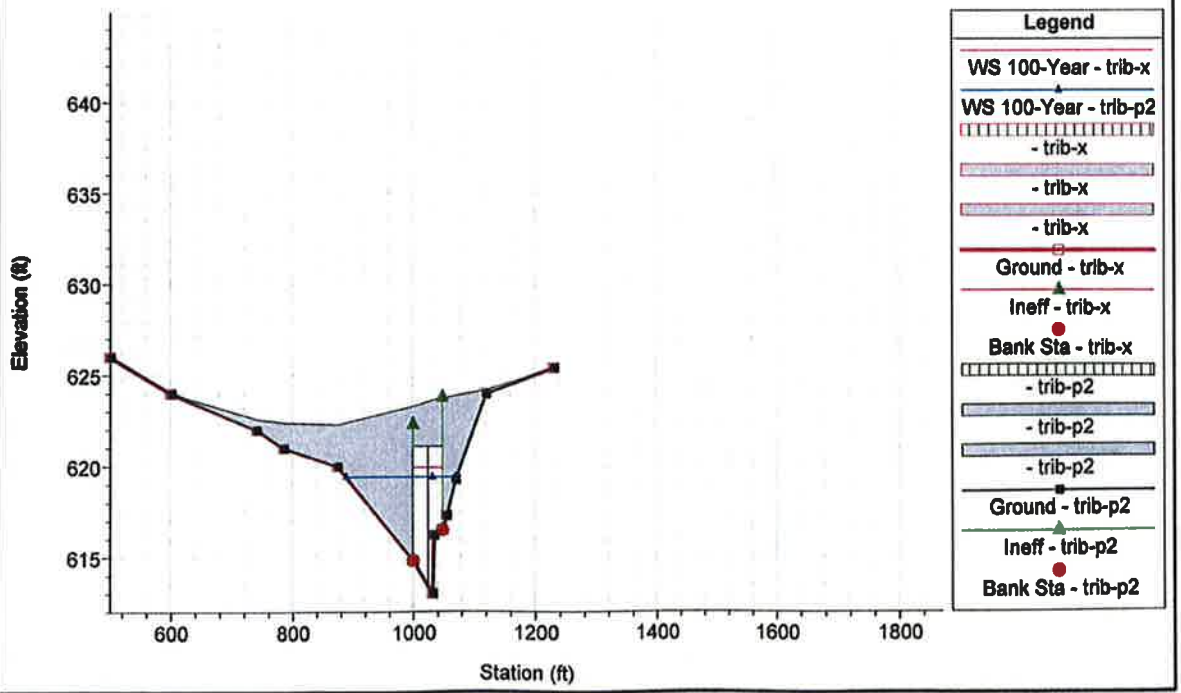
River = RIVER-1 Reach = Reach-1 RS = 6.3 This is a REPEATED section.



20030708 Plan: 1) trib-p2 10:31:46 PM 2) trib-x 10:31:44 PM

Geom: trib-p2 Flow: trib-x

River = RIVER-1 Reach = Reach-1 RS = 6.25 BR Bridge #3

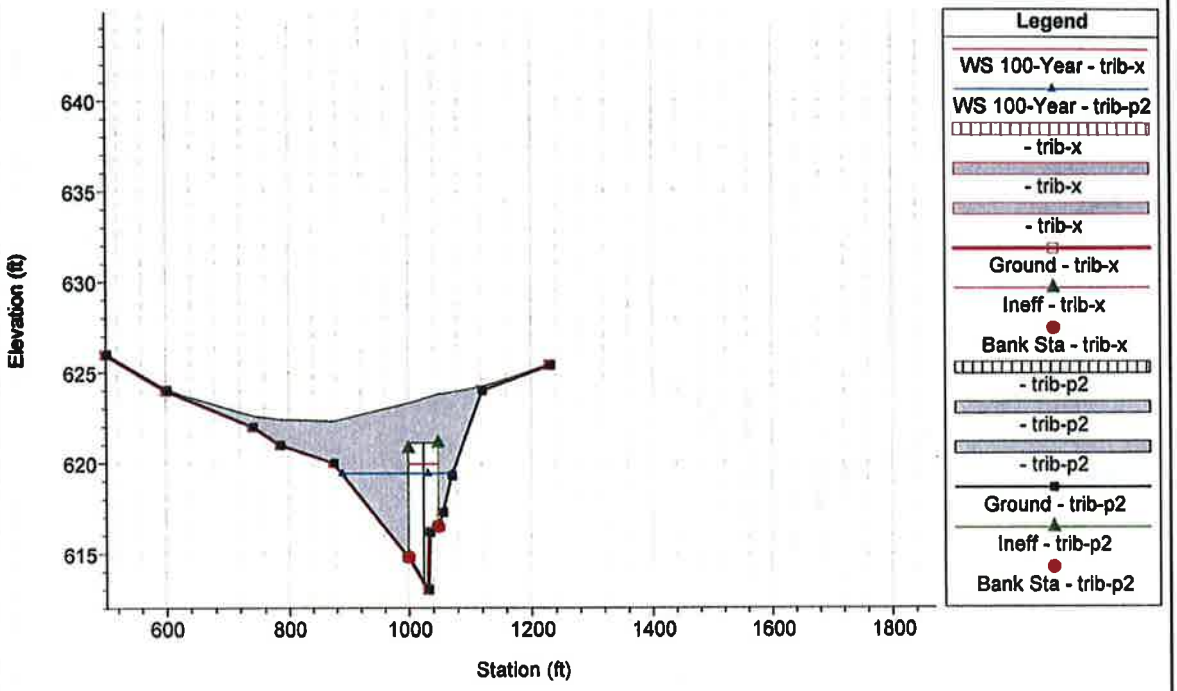


1 in Horiz. = 300 ft 1 in Vert. = 10 ft

20030708 Plan: 1) trib-p2 10:31:46 PM 2) trib-x 10:31:44 PM

Geom: trib-p2 Flow: trib-x

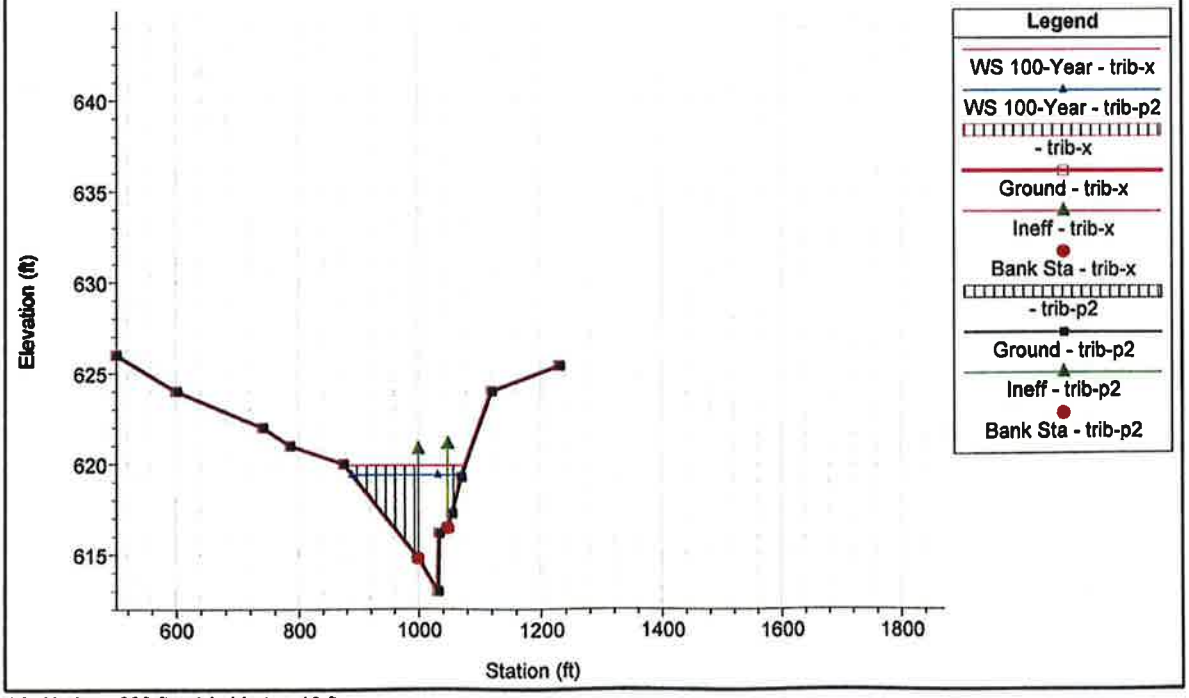
River = RIVER-1 Reach = Reach-1 RS = 6.25 BR Bridge #3



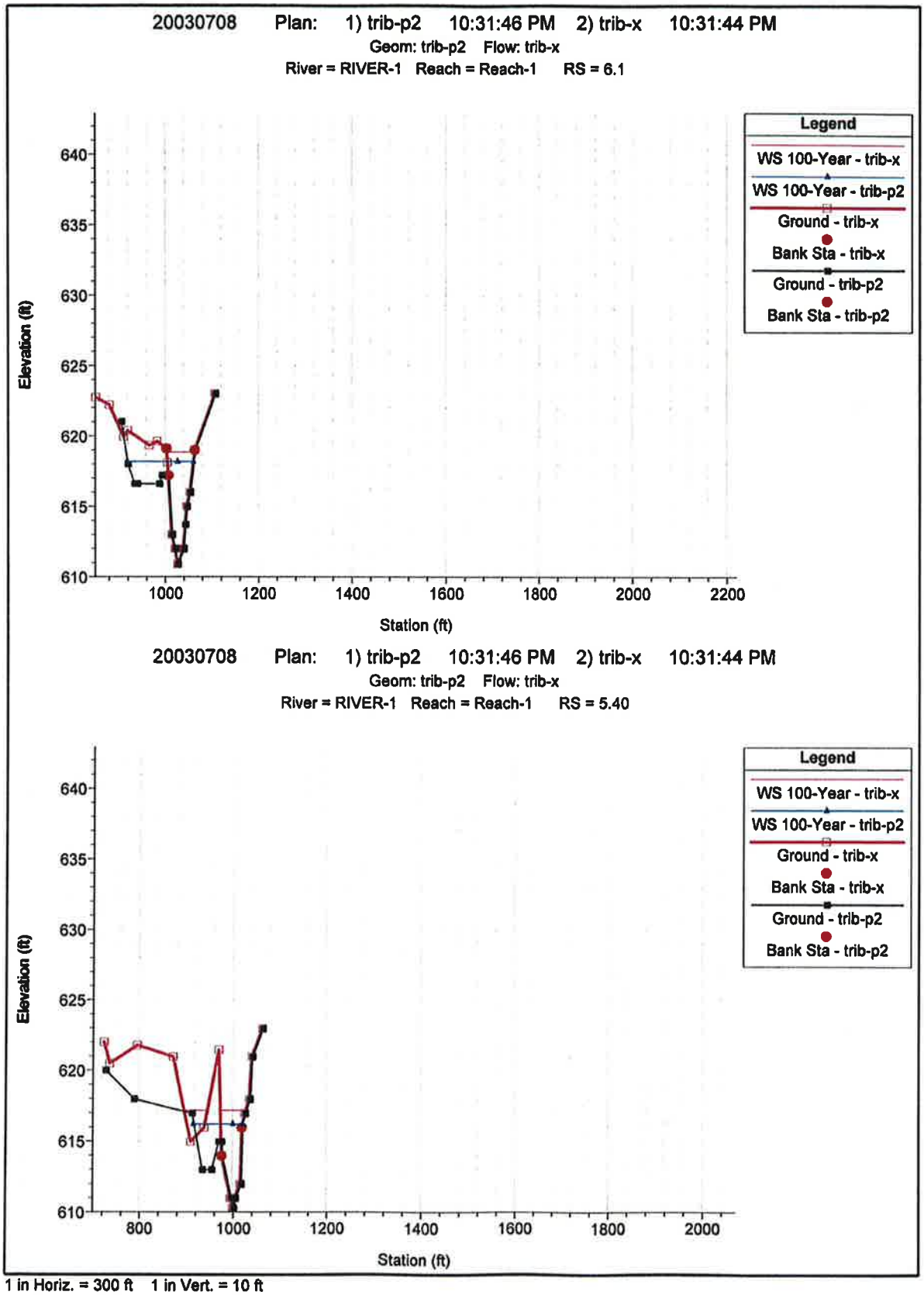
20030708 Plan: 1) trib-p2 10:31:46 PM 2) trib-x 10:31:44 PM

Geom: trib-p2 Flow: trib-x

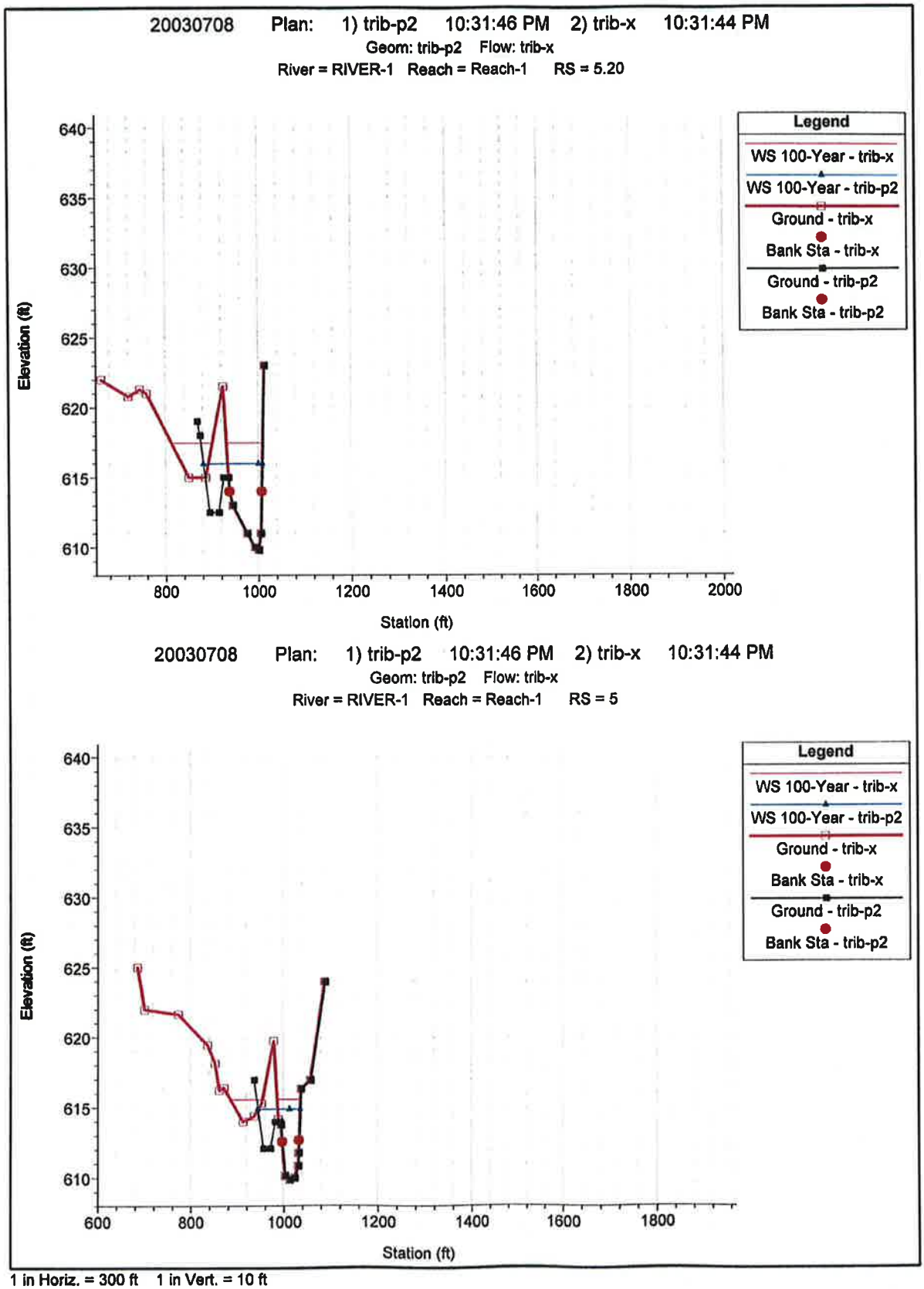
River = RIVER-1 Reach = Reach-1 RS = 6.20 Cincinatte-Dayton Road Bridge



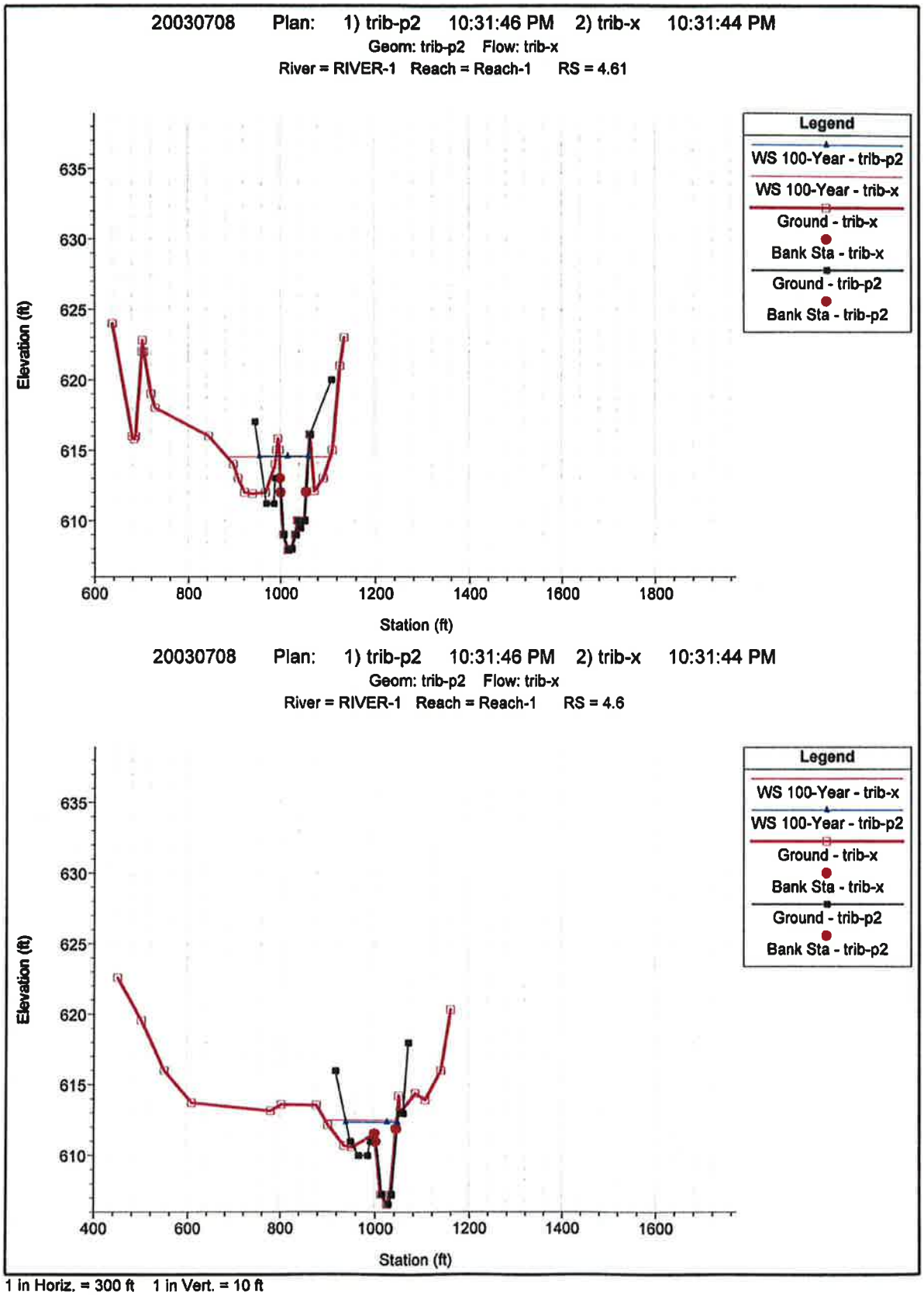
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



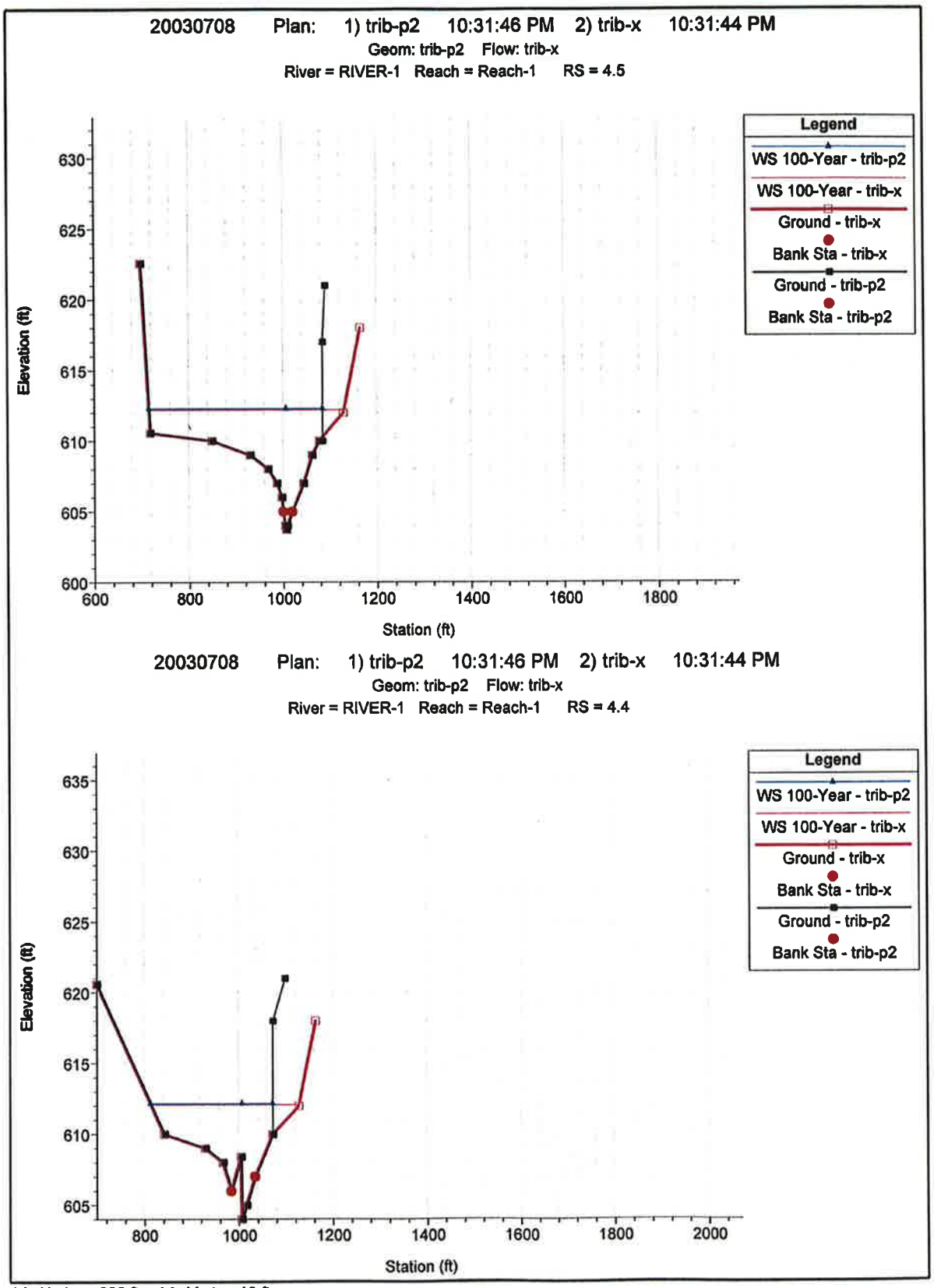
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



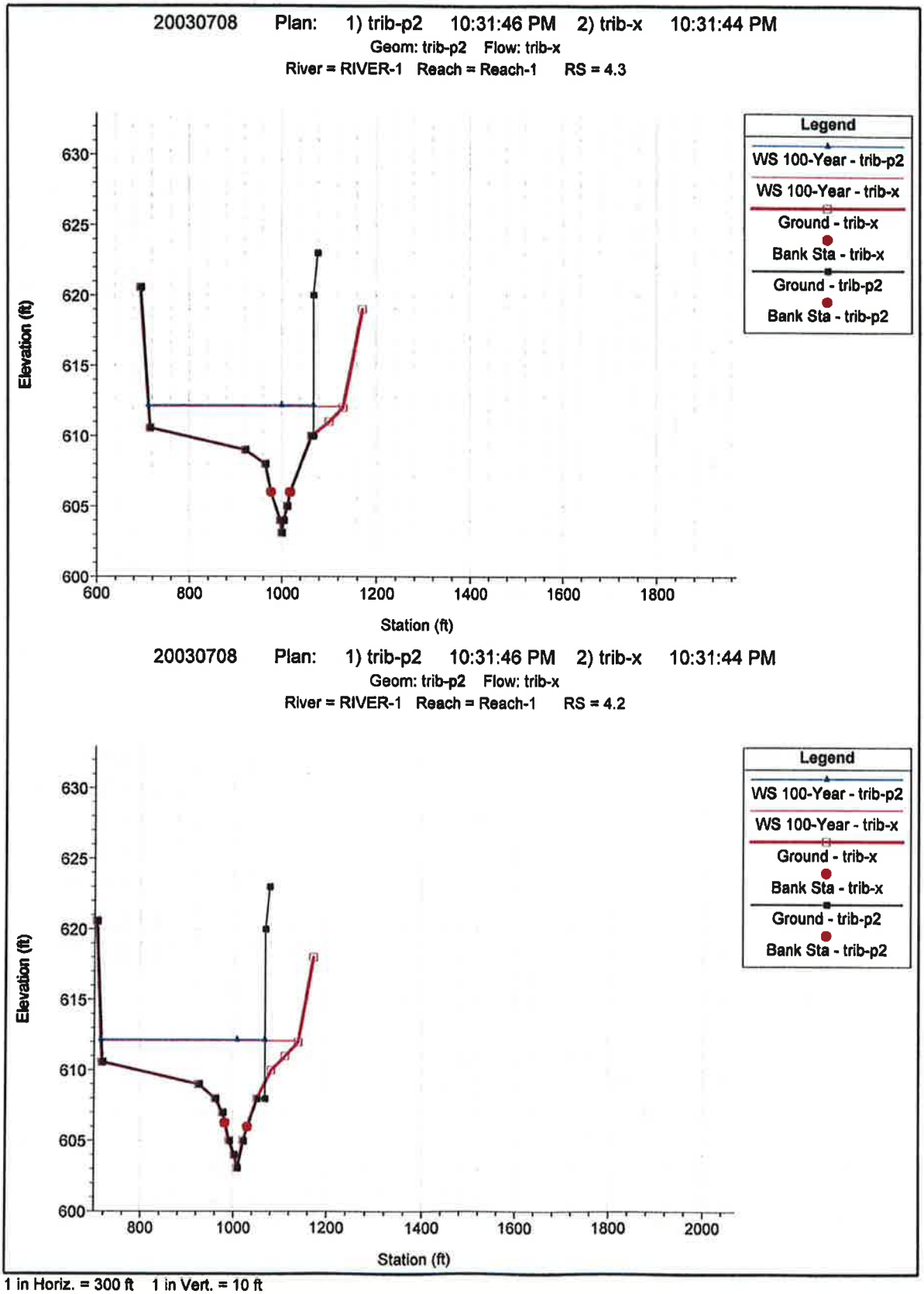
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft



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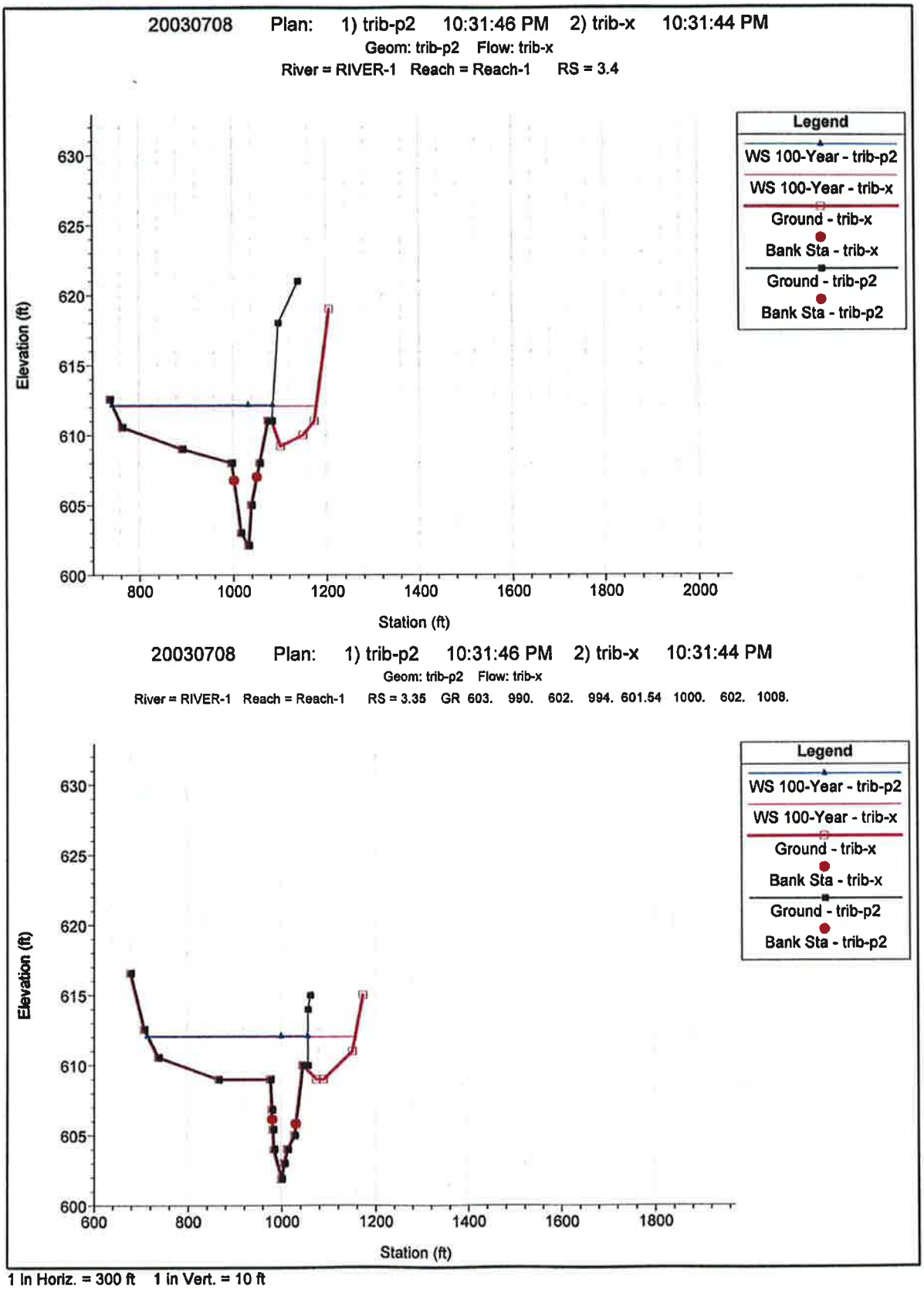
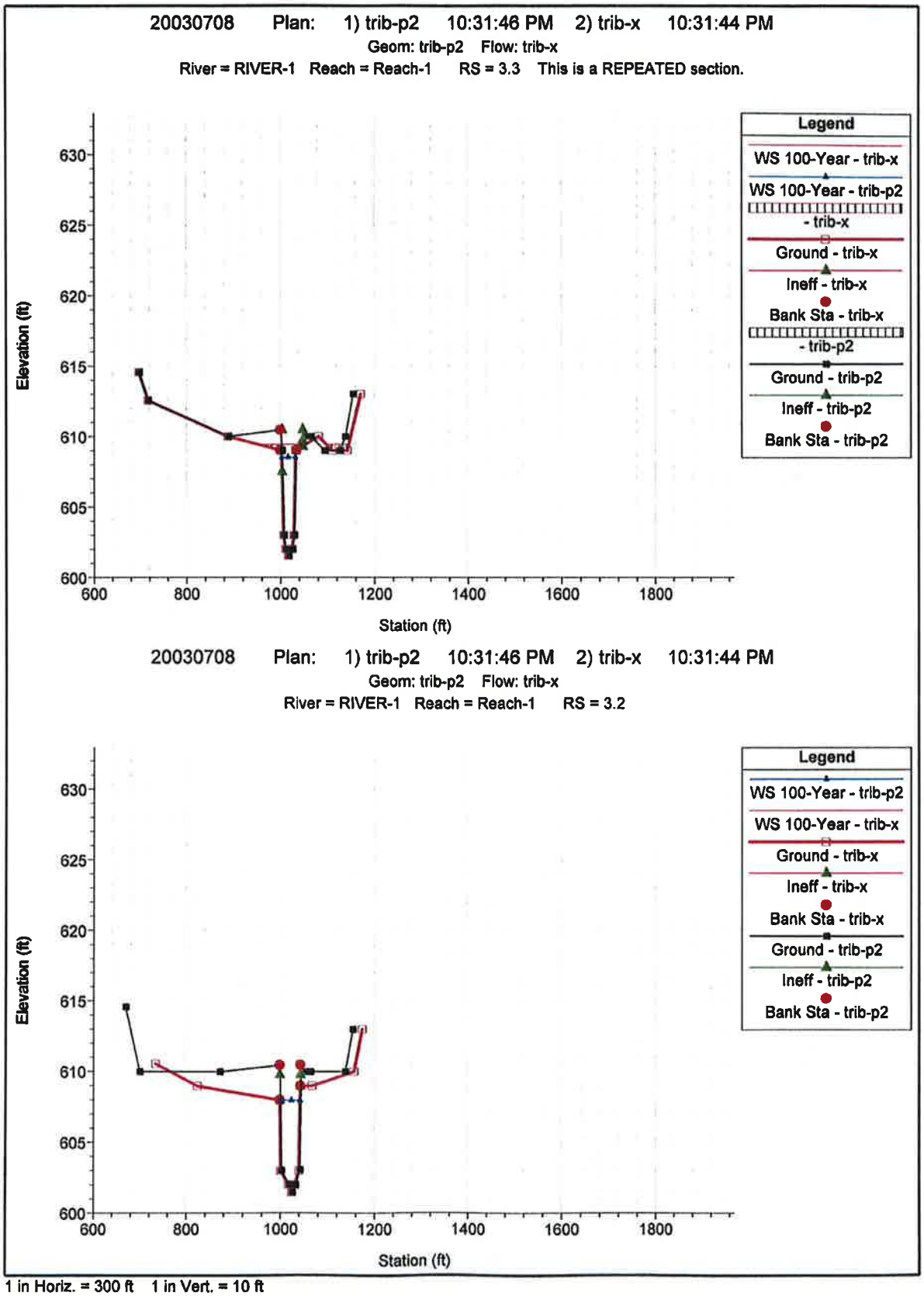
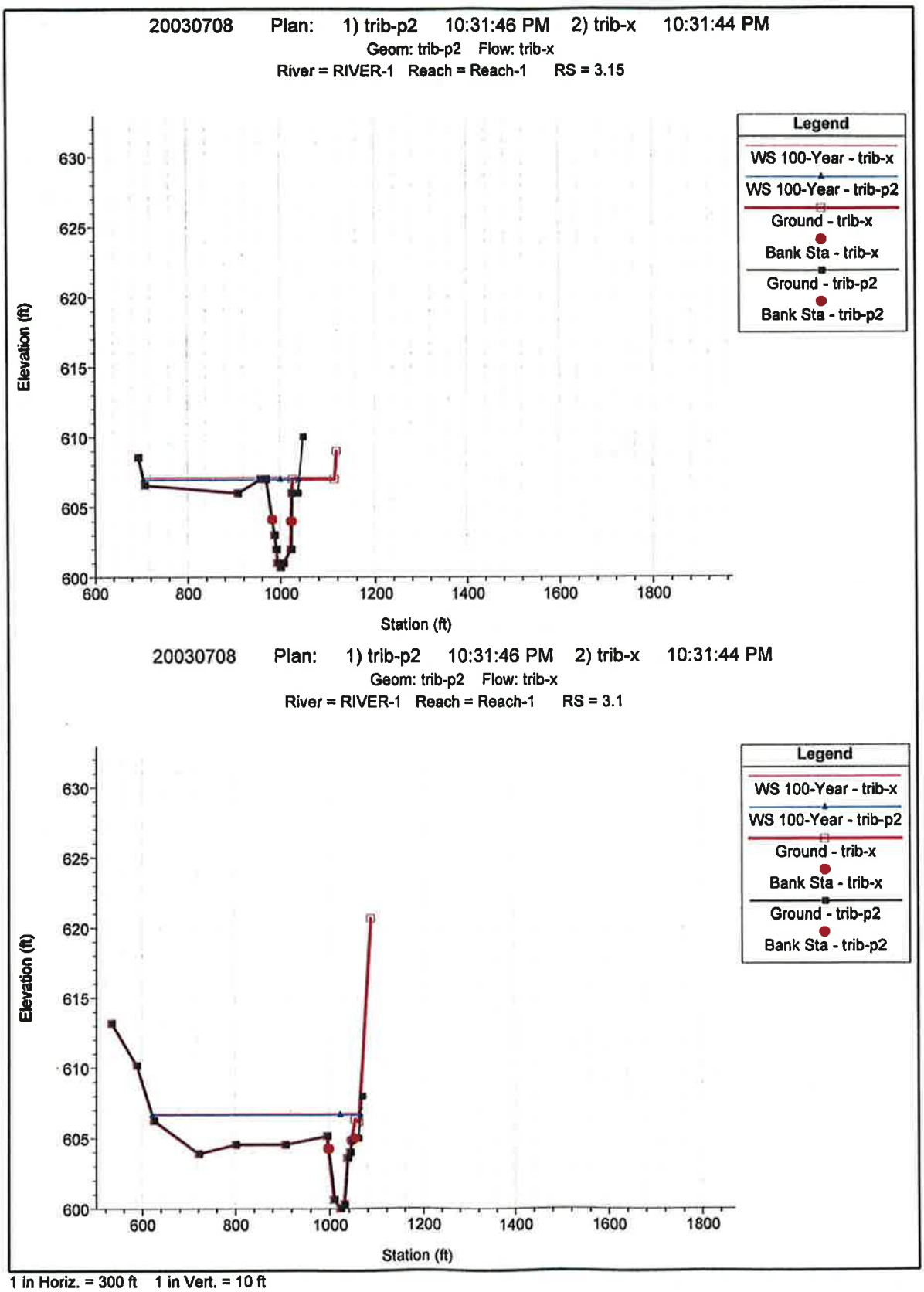


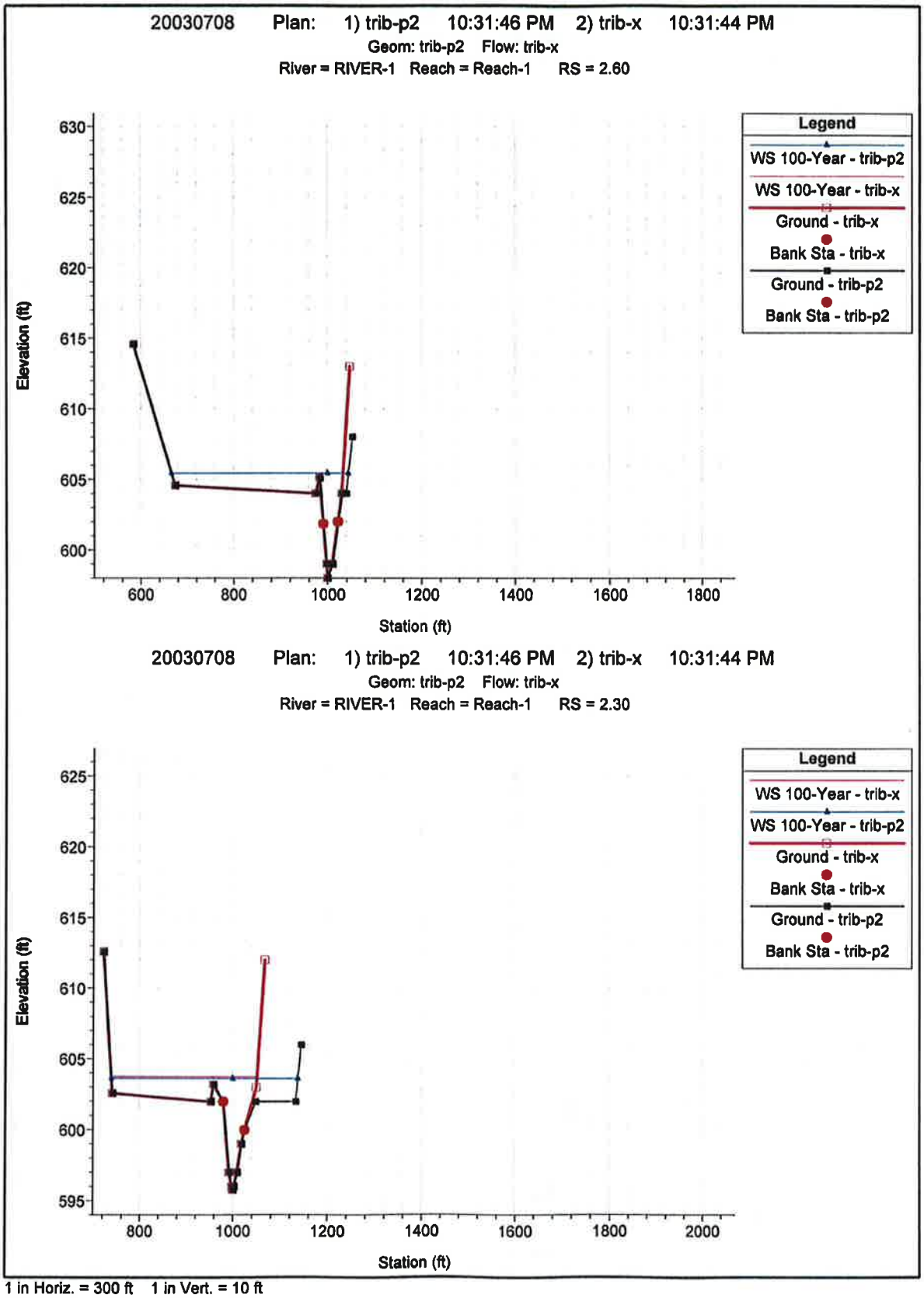
1 In Horiz. = 300 ft 1 in Vert. = 10 ft



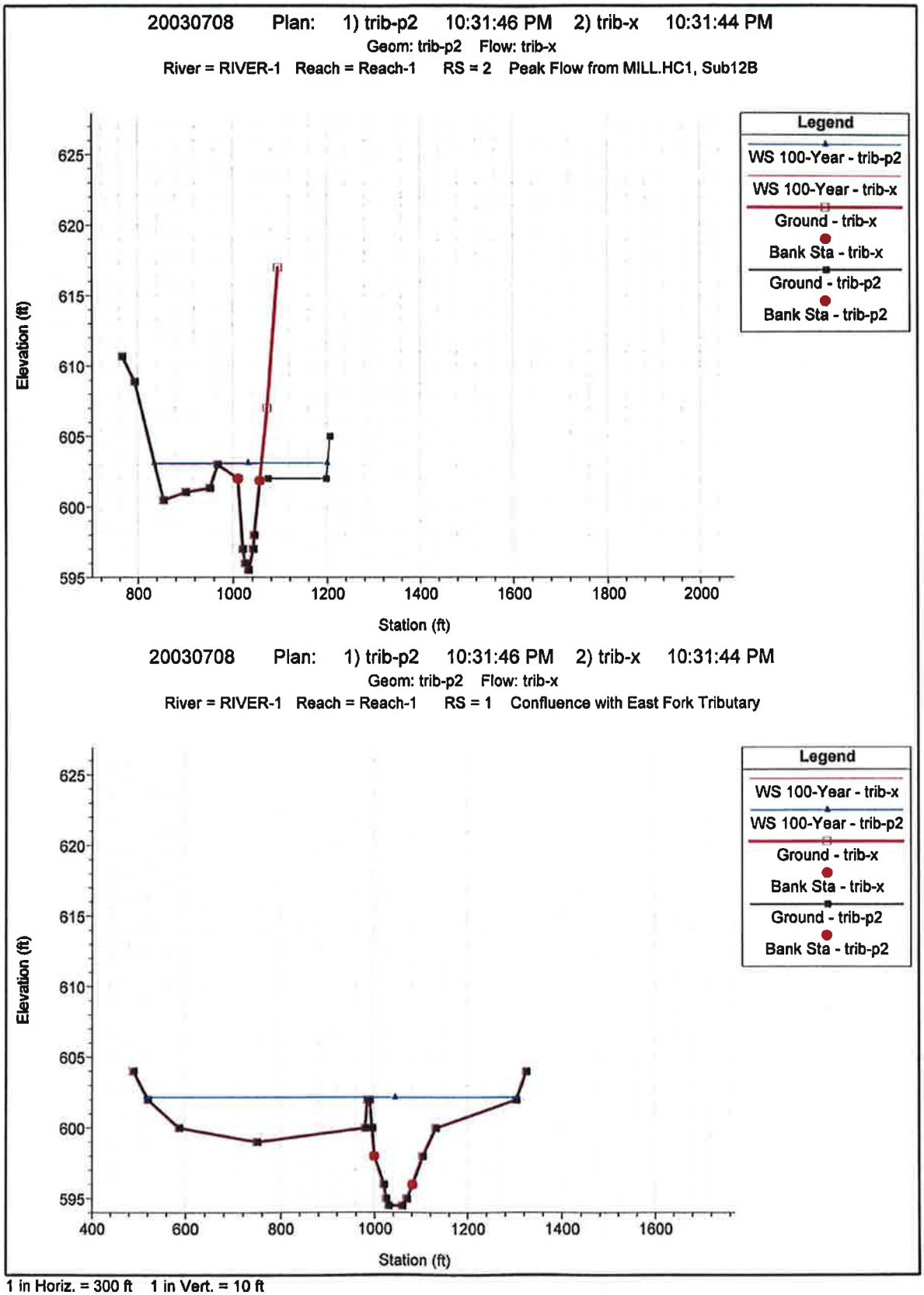
1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft



1 in Horiz. = 300 ft 1 in Vert. = 10 ft

APPENDIX:

C. Floodplain Storage Computations

Henderson and Bodwell, L.L.P.

Centre Park of West Chester
CHF02
8/18/2008

Compensatory Floodplain Volume

Volume between Flood Surface and Ground

		Proposed Surface (ac-ft)		Existing Surface (ac-ft)		Differential (ac-ft)	
Phase 1	East Fork	16.5	-	15.8	=	0.7	
Phase 1	Tributary	46.6	-	45.7	=	0.9	
							1.7 ac-ft Net Gain Phase 1
Phase 2	Tributary	46.8	-	45.7	=	1.1	
							1.1 ac-ft Net Gain Phase 2

Volume differential is calculated between the existing flood surface and the ground for the existing conditions vs the proposed flood surface and proposed grades. These caclulations are for existing, phase 1 and phase 2 conditions.

There is a net increase in storage volume for the East Fork Ph 1, Tributary Ph 1 and a net total gain on the tributary at completion of the project.

The total net gain in flood storage volume is: 0.7 ac-ft East Fork + 2.0 ac-ft Tributary = 2.8 ac-ft for the Project

Therefore this meets the Butler County requirements.

EARTHWORK PARCEL 1

EARTHWORK PARCEL 2

17.0-L 608.9

16.0-K 604.6

15.9 604.6

15.8 603.4

15.7 603.1

15.5 602.8

15.4 602.6

15.3 602.1

15.0 600.6

14.0-J 600.8

13.0-I 597.9

3.10-S 606.8

3.20 608.0

3.30 609.1

3.40 612.1

4.20 612.1

4.30 612.1

4.50 613.0

4.60-C 612.5

4.61 614.5

5.00-D 615.6

5.20 617.5

5.40 617.2

6.10-E 618.9

6.30 619.9

6.20 619.9

CENTRE PARK OF WEST CHESTER
(CHF02)

TRIB EXISTING
COMPENSATORY FLOOD VOLUME
CUT/FILL MAP
08-18-08

0 50 100 200 300

HENDERSON AND BODWELL, LLP

EARTHWORK PARCEL 1

EARTHWORK PARCEL 2

EXISTING FLOODPLAIN (100-YR)

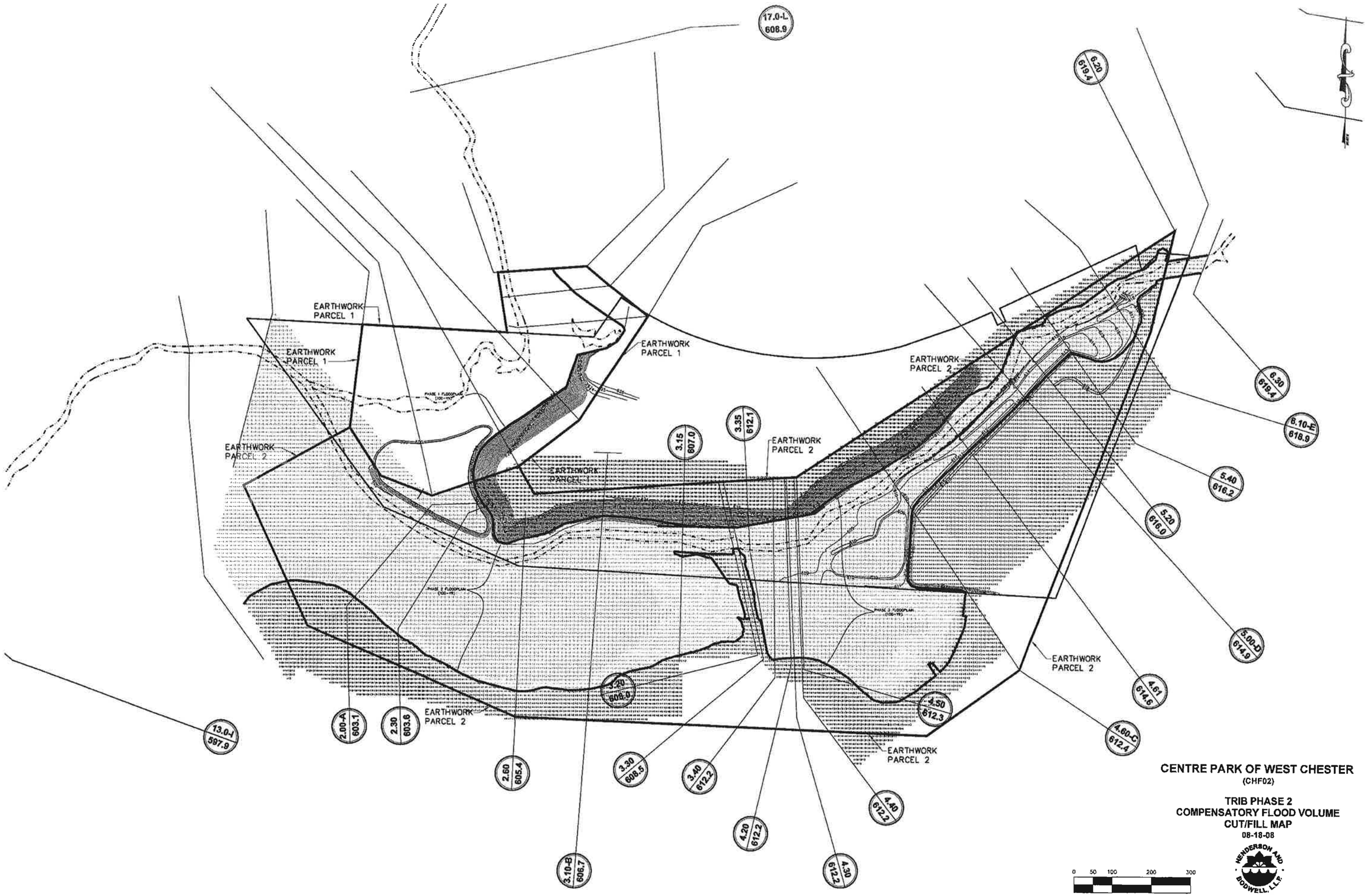
17.0-L 608.9
16.0-K 604.6
15.9 604.6
15.8 603.4
15.7 603.1
15.5 602.8
15.4 602.6
15.3 602.1
15.0 600.6
14.0-J 600.8
13.0-I 597.9
2.00-A 603.1
2.30 603.8
2.60 605.4
3.10-B 606.8
3.20 608.0
3.30 609.4
3.40 612.1
3.5 60.1
3.3 612.0
4.20 612.1
4.30 612.1
4.40 612.1
4.50 612.0
4.60-C 612.5
4.61 614.5
5.00-D 615.6
5.20 617.5
5.40 617.2
6.10-E 618.9
6.30 619.9
6.20 618.9

CENTRE PARK OF WEST CHESTER
(CHF02)

EAST FORK EXISTING
COMPENSATORY FLOOD VOLUME
CUT/FILL MAP
08-18-08

HENDERSON AND BOOWELL, LLP

0 50 100 200 300



CENTRE PARK OF WEST CHESTER
(CHF02)

TRIB PHASE 2
COMPENSATORY FLOOD VOLUME
CUT/FILL MAP
08-18-08

HENDERSON AND BODWELL, L.L.P.

P:\CHF02\Improvement Plans\dwg_CHF02_FLOODWAY ANALYSIS.dwg, CUT-FILL TRIB P2, 8/26/2008 12:56:26 PM, jcarey, 1:2.20117

EARTHWORK PARCEL 1

EARTHWORK PARCEL 1

EARTHWORK PARCEL 1

EARTHWORK PARCEL 2

EARTHWORK PARCEL 2

EARTHWORK PARCEL 2

EARTHWORK PARCEL 2

EARTHWORK PARCEL 2

EARTHWORK PARCEL 2

15.4 602.6

15.5 602.8

15.7 602.9

15.3 602.1

15.0 600.6

14.0-J 600.8

13.0-I 597.9

2.00-A 603.1

2.30 603.8

2.60 605.4

3.10-B 606.7

16.0-K 604.6

15.9 604.6

15.8 603.4

17.0-L 608.9

3.20 608.0

3.30 608.5

3.40 612.2

4.20 612.2

4.30 612.2

4.40 612.2

3.15 607.0

3.35 612.1

4.50 612.2

6.20 619.8

6.30 619.8

6.10-E 618.5

5.40 617.0

5.20 617.1

5.00-D 615.7

4.61 614.1

4.60-C 612.8

CENTRE PARK OF WEST CHESTER
(CHF02)

EAST FORK PHASE 1
COMPENSATORY FLOOD VOLUME
CUT/FILL MAP
08-18-08

0 50 100 200 300

HENDERSON AND BOGWELL, L.L.P.

APPENDIX:

D. Permit Application Form

APPENDIX:

E. Letter of Map Revision Forms

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
390037	Butler County	OH	390037	0050C	1-21-98

2. a. Flooding Source: Tributary to East Fork Mill Creek

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
   ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Centre Park of West Chester

4. FEMA zone designations affected: AE (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☐ Improved Methodology/Data ☒ Regulatory Floodway Revision ☐ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

   b. The area of revision encompasses the following structures (check all that apply)

   Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert
   ☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,400

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Greg Boehm, P.E.	Company: Henderson and Bodwell, L.L.P.	
Mailing Address: 124 West Diversey Avenue Elmhurst, IL 60126-3231	Daytime Telephone No.: (630)834-9406	Fax No.:
	E-Mail Address: gboehm@handb.com	
Signature of Requester (required):	Date: September 5, 2008	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Eric Pottenger	Community Name: Butler County	
Mailing Address: Buttler County Engineers Office 1921 Farigrove Ave Hamilton, OH 45011	Daytime Telephone No.: (513)785-4121	Fax No.: (513)867-5849
	E-Mail Address: pottengere@bceo.org	
Community Official's Signature (required):	Date:	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Greg Boehm, P.E.	License No.: ILPE062-049541	Expiration Date: 11-30-09
Company Name: Henderson and Bodwell, L.L.P.	Telephone No.: (630)834-9406	Fax No.: (630)834-0329
Signature:		Date: September 5, 2008

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Tributary to East Fork Mill Creek
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	confluence with East Fork Mill Creek	2.00	603.17	603.11
Upstream Limit	Cincinnati-Dayton Road	6.30	621.95	619.88

2. Hydraulic Method/Model Used

HEC-RAS – baseline converted from HEC-2 by HEC-RAS

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name: tribefmc.hc2	Plan Name:	File Name:	Plan Name:	NGVD 1929
Corrected Effective Model*	File Name: trib-c	Plan Name: .p13	File Name: trib-c	Plan Name: .p13	NGVD 1929
Existing or Pre-Project Conditions Model	File Name: trib-x	Plan Name: .p08	File Name: trib-x	Plan Name: .p08	NGVD 1929
Revised or Post-Project Conditions Model	File Name: trib-p2	Plan Name: .p09	File Name: trib-p2	Plan Name: .p09	NGVD 1929
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☐ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
      - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No
      If Yes, please attach **proof of property owner notification and acceptance (if available).** Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☒ Yes ☐ No

   If Yes, attach **evidence of regulatory floodway revision notification.** As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.

   For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Tributary to East Fork Mill Creek
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam/Basin .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

1. **Name of Structure: unnamed maintenance bridge**

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

   Location of Structure: on-site within development parcel approximately 1000 feet east of Cincinnati-Dayton Road

   Downstream Limit/Cross Section: 3.20

   Upstream Limit/Cross Section: 3.30

2. **Name of Structure: unnamed proposed floodplain pilot channel**

   Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

   Location of Structure: 900-foot south overbank pilot channel – Cincinatti-Dayton Road to 900 feet east of road

   Downstream Limit/Cross Section: 4.60

   Upstream Limit/Cross Section: 6.10

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Tributary to East Fork Mill Creek

Name of Structure: unnamed proposed floodplain pilot channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]
- ☒ Other (Describe): proposed 900-foot overbarnk floodplain pilot channel
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☒ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Tributary to East Fork Mill Creek

Name of Structure: unnamed on-site maintenance bridge

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
- ☒ Modified bridge/culvert previously modeled in the FIS
- ☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☐ Dimensions (height, width, span, radius, length)
- ☐ Shape (culverts only)
- ☐ Material
- ☐ Beveling or Rounding
- ☐ Wing Wall Angle
- ☐ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☐ Low Chord Elevations – Upstream and Downstream
- ☐ Top of Road Elevations – Upstream and Downstream
- ☐ Structure Invert Elevations – Upstream and Downstream
- ☐ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:

3. The Dam was permitted as (check one):

   a. ☐ Federal Dam ☐ State Dam

      Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

      Permit or ID number Permitting Agency or Organization

   b. ☐ Local Government Dam ☐ Private Dam

      Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm?

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

   Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name: Butler County, Ohio

Project Identifier: Centre Park of West Chester

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

☐ MT-1 application
☒ MT-2 application

FEMA
Fee Charge System Administrator
P.O. Box 22787
Alexandria, VA 22304
FAX (703) 317-3076

☐ EDR application

FEMA Project Library
3601 Eisenhower Avenue
Alexandria, VA 22304
FAX (703) 751-7391

Request No.: _____ (if known)

Amount: _____

☒ INITIAL FEE* ☐ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

CARD NUMBER

1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16

EXP. DATE

Month ____ Year ____

_____ Date

_____ Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(for your credit card receipt-please print or type) _____

DAYTIME PHONE: _____

APPENDIX:

F. CD-ROM