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**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY**

**DELINEATION OF SPILLWAY FLOWS  
FOR  
BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**FINAL REPORT  
AND  
TECHNICAL DATA NOTEBOOK**

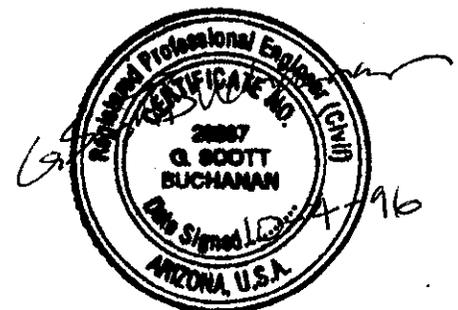
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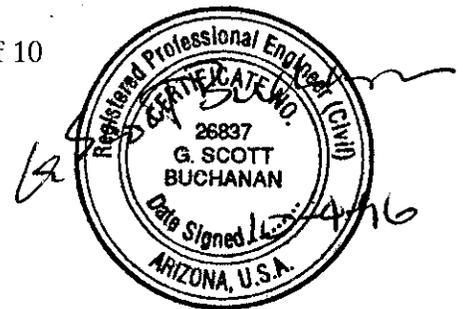
**PREPARED OCTOBER, 1996  
SCI #13084**



**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

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**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
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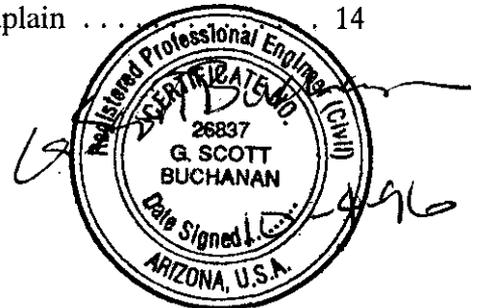
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**DELINEATION OF SPILLWAY FLOWS  
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## SECTION 1 - INTRODUCTION

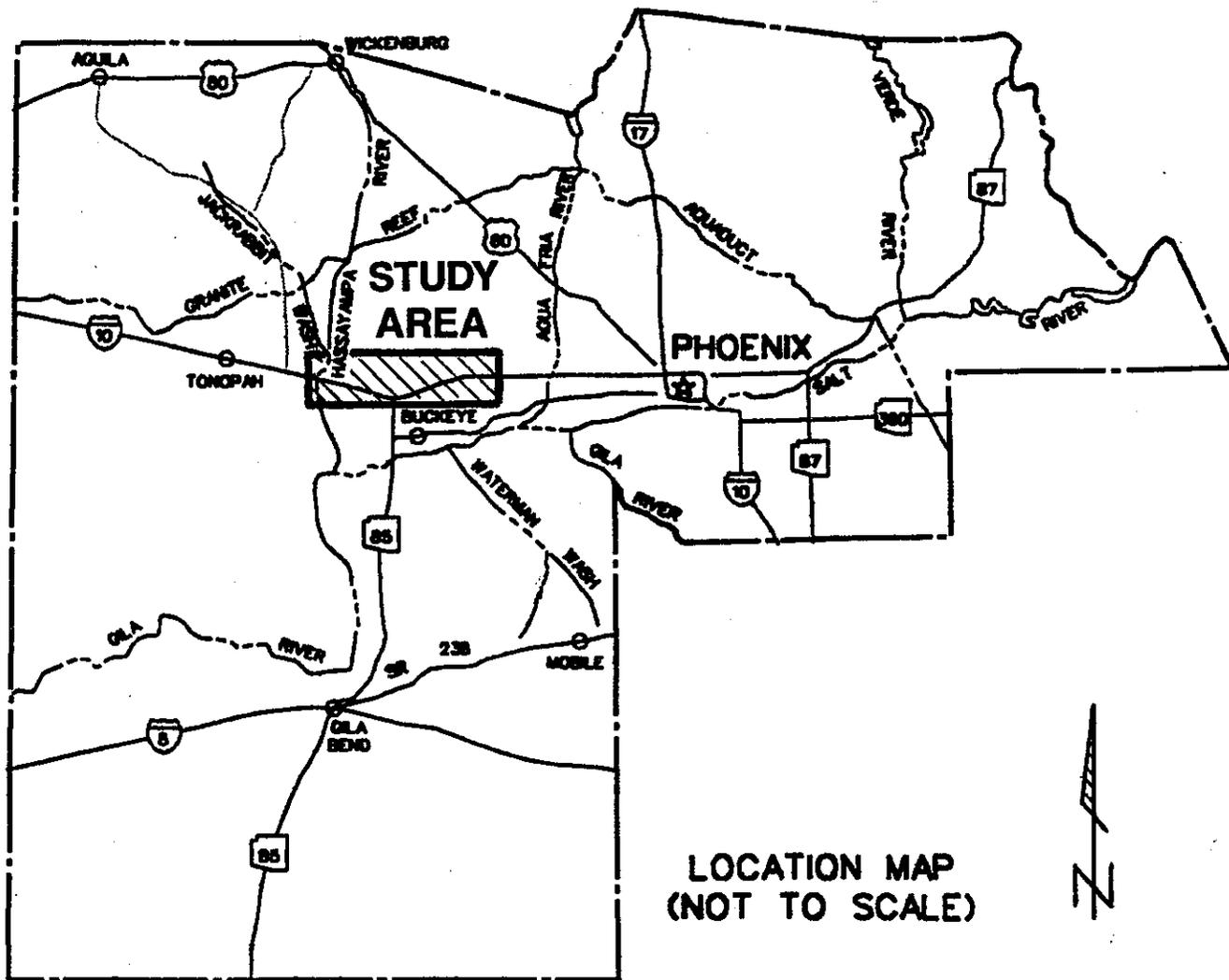
### 1.1 Purpose of Study

The purpose of this study is to delineate the limits of flooding below the emergency spillways of Buckeye Flood Retarding Structures 1, 2 and 3. The study area is in west-central Maricopa County. The Buckeye Structures are located along the north side of Interstate-10 from about the Airport Road alignment on the east to the Hassayampa River on the west. Refer to Figure 1 for the location of the study and Figure 2 for vicinity map and general study limits. This study was performed for the Flood Control District of Maricopa County under Contract FCD 95-34. It is intended to be used primarily for flood warning, emergency preparedness and evacuation and also for potential acquisition of flowage easements downstream from the emergency spillways.

The Buckeye Structures were constructed in the mid- 1970's as a joint project of the Flood Control District, Soil Conservation Service, and the Arizona Department of Transportation. These structures are connected in series and ultimately divert their contributing 100-year drainage west to the Hassayampa River. Each structure has a principal ungated outlet conduit designed for the 100-year discharge and an emergency free water surface spillway for runoff events greater than the 100-year discharge. The principal spillway of Buckeye Structure 3 discharges to Buckeye Structure 2, which in turn, discharges through its principal spillway to Buckeye Structure 1. Buckeye Structure 1 discharges through its principal spillway directly to the Hassayampa River main flow channel. The Buckeye Structures are owned and maintained by the Flood Control District.

Each of the three Buckeye Structures' emergency spillways potentially discharge out across the land downstream from them. There is no water course immediately downstream from any of the three emergency spillways that is capable of conveying their design discharge. Emergency spillway discharge from Buckeye Structure 1 would flow about one half mile across vacant desert land to the southwest where it would enter the floodplain of the Hassayampa River. Emergency spillway discharge from Buckeye Structures 2 and 3 would flow generally south about one mile across vacant desert land to Interstate-10. These flows continue south after crossing Interstate-10.

The land affected by emergency spillway discharge is, at least in part, privately owned. Land south of Buckeye Structures 2 and 3 becomes more and more developed further south near the Town of Buckeye where it contains numerous public and private improvements. The potential exists for continued development of currently vacant land within the area affected by emergency spillway discharges.



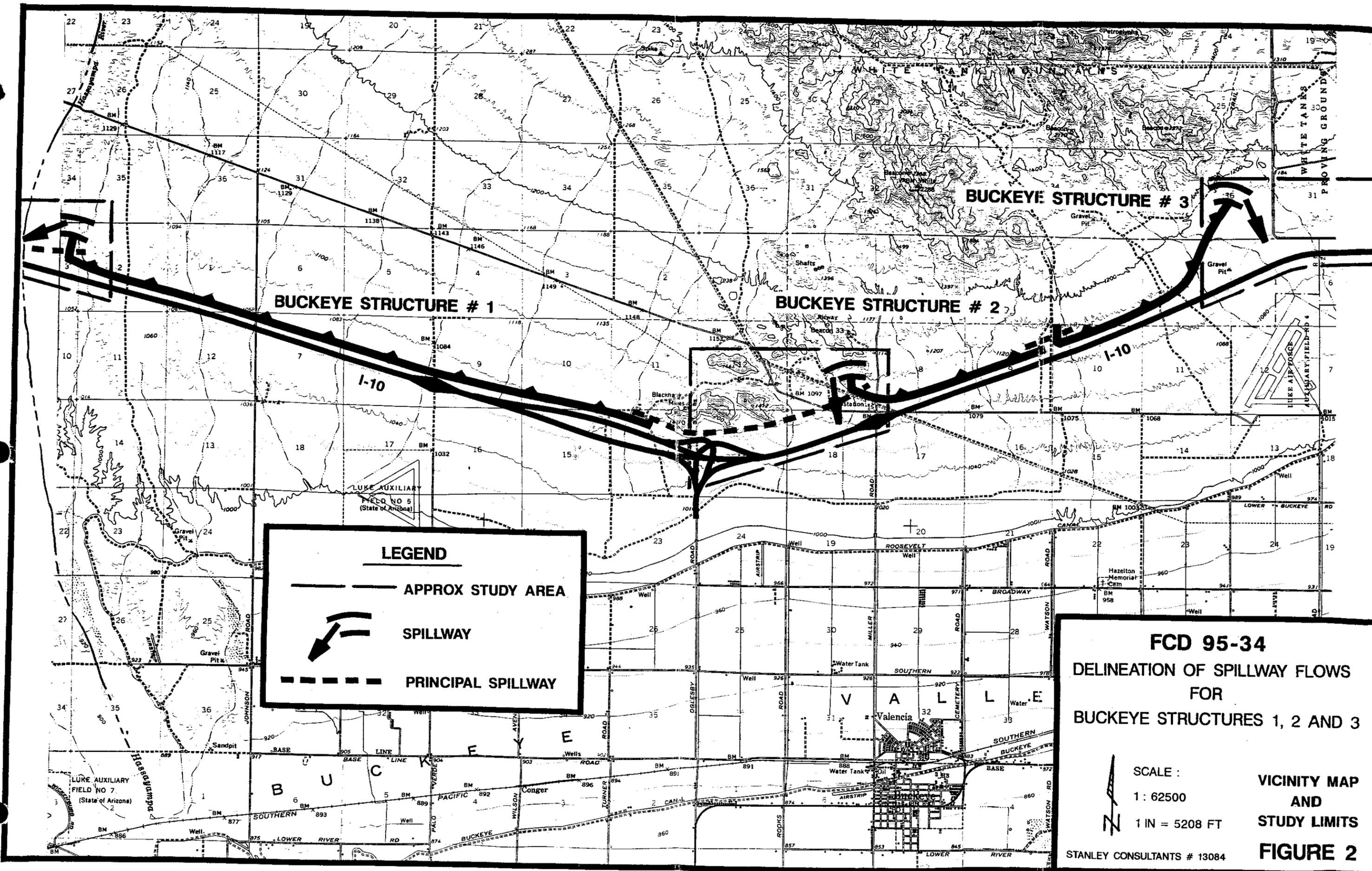
LOCATION MAP  
(NOT TO SCALE)

# MARICOPA COUNTY

**FCD 95-34**

DELINEATION OF SPILLWAY FLOWS  
FOR  
BUCKEYE STRUCTURES 1, 2 AND 3

LOCATION OF STUDY  
FIGURE 1



**LEGEND**

 APPROX STUDY AREA  
 SPILLWAY  
 PRINCIPAL SPILLWAY

**FCD 95-34**

**DELINEATION OF SPILLWAY FLOWS  
FOR  
BUCKEYE STRUCTURES 1, 2 AND 3**

SCALE :

1 : 62500

1 IN = 5208 FT

VICINITY MAP  
AND  
STUDY LIMITS  
**FIGURE 2**

STANLEY CONSULTANTS # 13084

## 1.2 Coordination and Notification

The area affected by emergency spillway flow is primarily unincorporated Maricopa County or Town of Buckeye. Notification of this study was made to the Development Director of the Town of Buckeye at the beginning to the study. This notification also included an invitation for input and comment on the study from the Town of Buckeye. A similar notification and invitation was made to the Arizona Department of Water Resources. Copies of the final study report will be provided to both the Town of Buckeye and the Arizona Department of Water Resources for their information when complete.

At the beginning of this study, it was mutually agreed by Stanley Consultants and the Flood Control District that notification of private property owners was unnecessary. Access to and around each structure was available via established roadways and the result of the study will not have any regulatory impacts on private property.

## SECTION 2 - AREA STUDIED

### 2.1 Scope of Study

The scope of this study is to delineate the limits of flooding associated with the emergency spillways of each of the three Buckeye Structures at three different levels of discharge. These discharge rates were provide by the Flood Control District from a previous hydrology and dam break analysis. Topography was also provided by the Flood control District from previous District contracts. Hydraulic models are to be developed in both HEC-2 and HEC-RAS formats. Final deliverables include this report with data tables showing water surface elevation, depths of flow, flow velocities and travel times; a set of delineation maps at a scale of 1" = 400' depicting the overflow limits for each emergency spillway at each of the three discharges; and digital data coverages consistent with the District's Hydrologic Information System. A complete scope of work and contract are found in Appendix A.

The upstream limit of study for each of the three areas delineated is the "top" of each spillway. This was later clarified to mean the center of the level crest of each emergency spillway. The location of this level spillway crest was approximated from the original Soil Conservation Service design plans. The downstream limit of study varies with each structure and for various reasons was difficult to define precisely.

The downstream limit of the Buckeye Structure 1 emergency spillway delineation is the Hassayampa River floodplain. The downstream limit of the Buckeye Structures 2 and 3 emergency spillway delineation is Interstate-10. However, the original scope of work for this study contains a companion criteria to the above-stated downstream limit. The intent was to carry the delineation downstream to a point where it is contained within an already delineated 100-year floodplain, or, where the maximum depth of flow is less than one foot. This criteria was complicated by the lack of topography for Buckeye Structures 1 and 2. This will be explained further in subsequent sections of this report. At this point, the downstream limit essentially remains the Hassayampa River and Interstate-10.

## 2.2 Flooding Characteristics

Each of the three emergency spillways is similar in form and function. Each spillway acts as a broad-crested weir. According to the original Soil Conservation Service design, the Structure 1 emergency spillway has a level bottom 800 feet in width; 2:1 side slopes and a level 100 foot broad crest. Downstream from the level crest, the emergency spillway drops at a slope of 0.005 ft/ft. This spillway is entirely earth cut with no lining or cutoff sill.

The Structure 2 emergency spillway has a level bottom 350 feet in width; 1:1 side slopes and a level 50 foot broad crest. A reinforced concrete cut-off sill has been constructed along the downstream edge of this level broad crest. Downstream from this concrete sill, the emergency spillway drops off at a slope of 0.027 ft/ft for a distance of about 100 feet, then flattens to a slope of 0.00167. The crest area of the Structure 2 emergency spillway has been excavated into a granitic sub-strata which appears to be somewhat scour resistant.

The Structure 3 emergency spillway has a level bottom 400 feet in width, 2:1 side slopes and a level 100 foot broad crest. Downstream from the level crest, the emergency spillway drops at a slope of 0.010 ft/ft. Rock rip-rap has been placed around the end of the Structure 3 dam embankment which forms the south side of the emergency spillway. There is no other lining at this spillway and no concrete cutoff sill. However, the granitic sub-strata into which the spillway has been cut appears to be somewhat resistant to scour. Reduced drawings of the original Soil Conservation Service design plans for the Buckeye Structures have been included in Appendix B of this report.

Because of the design criteria used to design the Buckeye Structure emergency spillways, they will only discharge flow under very rare and extreme hydrologic circumstances. Discharge from the emergency spillways has not occurred at any time in the 20 plus years since the Buckeye Structures were constructed. The magnitude of discharges associated with the emergency spillways will produce depths of flow in the range of 1 to 12 feet and flow velocities in the range of 1 to 24 feet per second within the limits of study.

Flow regime is expected to be predominantly subcritical with, perhaps, some intermittent supercritical cross sections. A hydraulically steep reach just downstream of the Structure 1 spillway is expected to be supercritical with very high flow velocities. Delineations for Structures 2 and 3 between their spillways and Interstate-10 are expected to be relatively uniform and subcritical with little or no

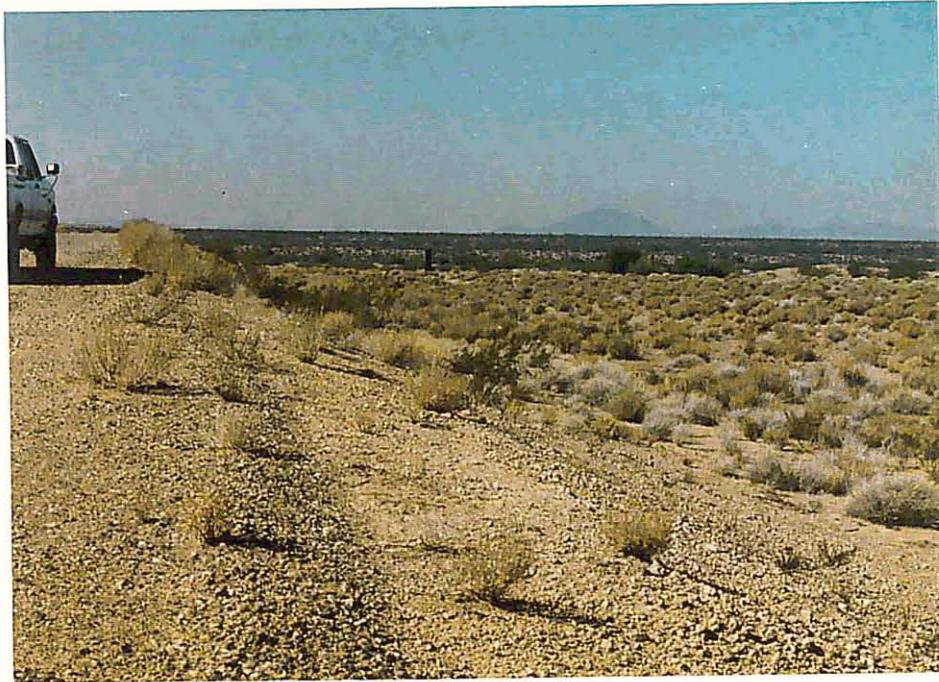
hydraulically ineffective flow area. Flow in these reaches will be in the predominant direction of existing local washes with generally no one main wash channel capable of carrying significant flow.

As flow from the Structure 2 and 3 emergency spillways approaches Interstate-10, the direction will gradually change approximately 75 degrees with flow being turned and forced to run parallel with the roadway. Interstate-10 is elevated from 4 to 10 feet above existing adjacent grade and would act as a diversion. Although numerous culvert pipes ranging in size from 24 inch to 48 inch diameter are found under the interstate, they collectively only convey a small portion of spillway flow. These culverts were only sized for local drainage of 50 or 100-year magnitude with the Buckeye Structures acting as the upstream limit of contributing area.

Flow from Buckeye Structure 1 and 2 emergency spillways will either overtop the Interstate-10 roadway as weir flow; pass under the roadway through existing culverts; or will be diverted along the interstate by the raised roadway embankment. Weir flow over the roadway will occur in the vicinity where the main flow path intersects the roadway for both Structure 2 and 3 emergency spillway discharges. The remaining flow is then diverted for about a mile along the roadway embankment. This diverted flow is traveling over local ridges and washes in a direction roughly perpendicular to the local drainage pattern. Flow along the interstate must also traverse a series of earthen training dikes which project north from the roadway embankment.

The lower study limit/outfall for the Buckeye Structure 2 emergency spillway is another weir overflow which occurs at a low point in the Interstate-10 roadway profile just east of the Interstate-10/State Route 85 interchange. The lower study limit/outfall for the Buckeye Structure 3 emergency spillway is Tuthill Dike Wash which is conveyed under Interstate-10 by a four-barrel 10 foot wide by 8 foot high concrete box culvert.

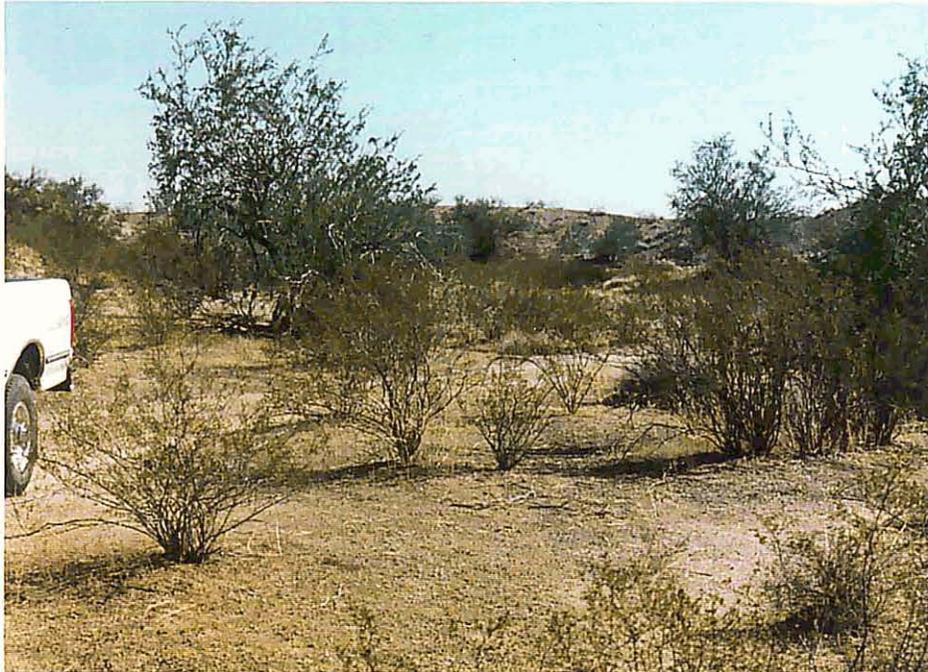
Photographs on the following pages illustrate the various portions of each delineated area described above.



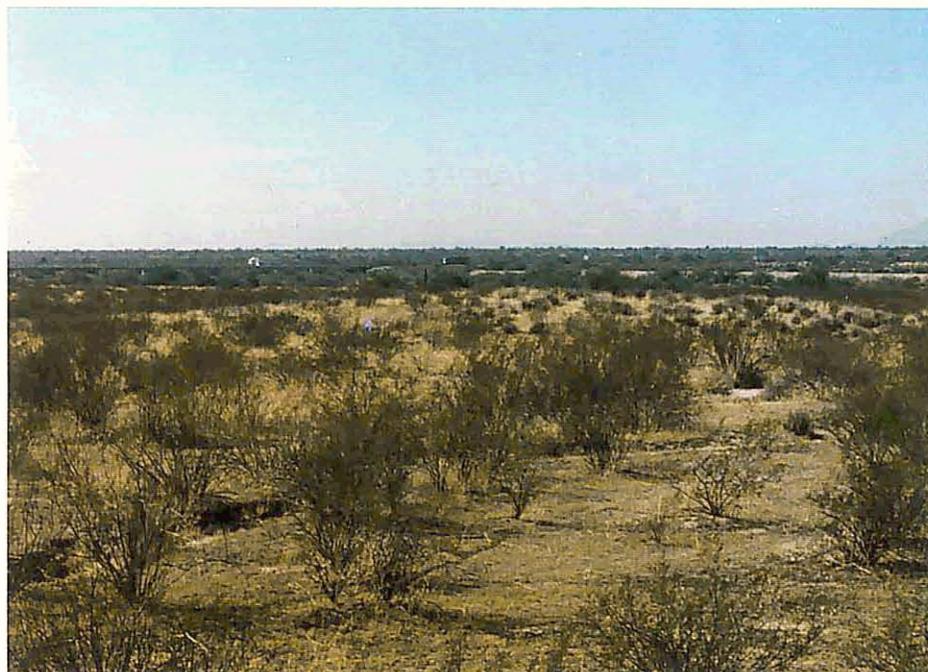
**PHOTOGRAPH #1** Buckeye Structure 1. Emergency spillway looking west (downstream) along south embankment near river mile 20.1.



**PHOTOGRAPH #2** Buckeye Structure 1. Emergency spillway looking north across spillway at north embankment from south embankment near river mile 20.0.



**PHOTOGRAPH #3** Buckeye Structure 1. Looking northeast or upstream toward the emergency spillway from about river mile 19.8. Note relatively steep hillslope in background which is just below west end of spillway.



**PHOTOGRAPH #4** Buckeye Structure 1. Looking southwest or downstream at emergency spillway floodplain. Photo is taken at approximately river mile 19.7 which is at about the mid-point of the Structure 1 study area. Hassayampa River and Interstate 10 bridge are in background.



**Photograph #5** Buckeye Structure 2. Looking northeast at the emergency spillway from its south side near river mile 20.0. Note concrete sill constructed across spillway.



**PHOTOGRAPH #6** Buckeye Structure 2. Floodplain below spillway looking west (downstream) along south embankment near river mile 20.1.



**PHOTOGRAPH #7** Buckeye Structure 2. Floodplain along Interstate-10. Photo is taken looking west or downstream at about river mile 18.5. Note training dike projecting north from roadway embankment in middle of photo.



**PHOTOGRAPH #8** Buckeye Structure 2. Outfall over Interstate-10 near SR-85. Photo is taken looking southwest from the small hill on the north side of the interstate near river mile 18.3.



**PHOTOGRAPH #9** Buckeye Structure 3. Emergency spillway looking east or downstream from within the flood pool area. The end of the embankment structure, which has been lined with rip-rap, is visible at right of photo.



**PHOTOGRAPH #10** Buckeye Structure 3. Floodplain below spillway. Photo is taken looking northwest or upstream from McDowell Road near the center of the emergency spillway floodplain.



**PHOTOGRAPH #11** Buckeye Structure 3. Floodplain along Interstate-10. Photo is looking east or downstream near river mile 18.8. This is where the emergency spillway flow first intersects the roadway embankment.



**PHOTOGRAPH #12** Buckeye Structure 3. Outfall at Tuthill Dike Wash floodplain. Photo is looking south from McDowell Road toward Interstate-10.

## SECTION 3 - TECHNICAL ANALYSIS

### 3.1 Hydrology

Discharge rates for this study were provided by the Flood Control District from a previous study done by Dames and Moore Engineers. This study established discharge rates at the emergency spillways of each structure. The hydrologic model from this study was used for dam break analysis performed by Dames and Moore in Volume II of their study. The discharge for each emergency spillway as determined by Dames & Moore has been designated in this delineation study as the "full flow" discharge.

In addition to the full flow, it was desired by the Flood Control District to delineate the floodplain limits for lesser discharges to provide a range of information for each structure. A simple ratio of one third and two thirds of the full flow was decided by the Flood control District to provide this range. Table 1 which follows summarizes the discharges used for each spillway. Table 3.1 from the Dames and Moore study, from which the full flow discharges were taken, is found in Appendix B.2. Discharges in Table 1 have been rounded to the nearest 100 cfs.

Table 1 - Summary of Flood Discharge Rates

	Full Discharge	2/3 Discharge	1/3 Discharge
Buckeye Structure 1	50,700 cfs	33,800 cfs	16,900 cfs
Buckeye Structure 2	13,200 cfs	8,800 cfs	4,400 cfs
Buckeye Structure 3	17,700 cfs	11,800 cfs	5,900 cfs

Because of the nature of flooding associated with this study, the intended use of the study and the scope of work, the following hydrologic assumptions have been made:

1. Local contributing areas below each emergency spillway will not produce discharges that are either concurrent in time or greater in magnitude than the spillway flows.
2. Emergency spillway flows will not experience any transmission or infiltration losses or any attenuation/storage routing losses.

It is also assumed that each of the three emergency spillways has a stable boundary that will not scour to a point that might impact the elevation vs. discharge relationship for each structure as analyzed by Dames and Moore.

Finally, in addition to the discharges listed in Table 1, 100-year flow rates were provided by the Flood Control District for the Hassayampa River and Tuthill Dike Wash, the outfalls for Buckeye Structures 1 and 3 emergency spillways, respectively. These flow rates were in the form of HEC-2 discharges from previous delineation studies. The Hassayampa River 100-year discharge at Interstate-10 is 75,164 cfs. The Tuthill Dike Wash 100-year discharge at Interstate-10 is 4,061 cfs.

### 3.2 Topography

Topography with a two-foot contour interval was available from previous Flood Control District contracts. This topography was in two separate coverages. McLain-Harbers topography with a photo date of 7-12-94, horizontal datum of NAD 83 and vertical datum of NAVD 88 covers the basic physical limits of all three Buckeye Structures and their spillways. It extends to about the middle of the Hassayampa River floodplain on the west, the Airport Road alignment on the east and just south of Interstate-10 on the south. This topography was available in three-dimensional format from the District.

The other topography was prepared by Cooper Aerial as part of the White Tanks / Agua Fria Area Drainage Master Study. It has a photo date of 12-22-89, a horizontal datum of NAD 27 and a vertical datum of NGVD 29. The western limit of this topography covers the entire east end of Buckeye Structure 3 including its emergency spillway and associated floodplain. It extends several miles to the south and east from Buckeye Structure 3. This topography was only available in two-dimensional format.

Because the Cooper Topography was more extensive than the McLain-Harbers topography with regard to Buckeye Structure 3, it was used exclusively to delineate the Structure 3 emergency spillway floodplain. The McLain-Harbers topography was used to delineate the Buckeye Structure 1 and 2 floodplains. Because it was desired to have all three delineations on the same horizontal datum, it was necessary to translate that portion of the Cooper Aerial - White Tanks / Agua Fria topography which encompasses the Buckeye Structure 3 floodplain through Arc Info to the McLain-Harbers horizontal datum. The difference in vertical datum between the two topographies is inconsequential because they were not used together in the same hydraulic model.

Limitations in the extent of the McLain-Harbers topography affected the delineations of both Buckeye Structures 1 and 2. Since the topography only extends a short distance south of Interstate-10, the downstream limit of the Structure 2 floodplain was essentially forced to be Interstate-10. This is the downstream limit originally envisioned in the scope of work for this study.

The downstream limit of the Structure 1 floodplain was originally envisioned as being the Hassayampa River floodplain. This remains the downstream limit of study although it is complicated by the fact that the McLain-Harbers topography does not extend far enough West to cover the entire width of the Hassayampa floodplain. This situation was somewhat alleviated by the availability of Hassayampa River floodplain topography and hydraulic models from a previous Flood Control District study contract. The contour interval of the Hassayampa topography was four feet and, although it appeared to be a good vertical match with the McLain-Harbers topography, its vertical datum was unknown. There were no common benchmarks between the Hassayampa and the Buckeye Structure topographies and no field survey was done as part of this study to confirm that they were on the same vertical datum. The significance of this as well as the model approach for the Structure 1 floodplain is discussed in a later sections of this report.

Finally, topographic contours are present on the Soil Conservation Service design plans for the Buckeye Structures. These plans were prepared in the mid-1970's. The contour interval is 4 feet and the cover sheet of these plans indicates the vertical datum to be "U.S.G.S.". There is no survey tie between the benchmarks used for this topography and the McLain-Harbers and Cooper topographies.

### 3.3 Hydraulic Analysis (General)

The scope of work for this study requires the development of hydraulic models in both HEC-2 and HEC-RAS formats. HEC-RAS possesses several features that are superior to HEC-2 such as the capability of running both subcritical and supercritical profiles in the same model; improved cross section plots; flow distribution analysis and special output data summary tables. However, it is still in the evolutionary stage and lacks certain HEC-2 capabilities such as the splitflow routine, which was necessary in the analysis of Buckeye Structure 2 and 3 floodplains. For these reasons, it was decided to develop the basic model geometry and subcritical models in HEC-2 format and then "import" these model files in to HEC-RAS for final models and output.

Hydraulic baselines for each delineation were established along the approximate hydraulic centerline or low point of each study reach. A significant degree of judgment was used to establish the alignment since there is generally no dominant channel or wash present which would be capable of conveying any significant flow. Hydraulic baseline milepost stationing uses the approximate centerline of the level crest of spillway for each structure and designates this as mile 20.00. Hydraulic cross sections are spaced at approximately 500 foot intervals. Closer spacing is used at certain locations that are hydraulically significant such as a change in slope or change in cross section width. Cross sections along Interstate-10 for the Structures 2 and 3 delineations generally correspond to the locations of existing drainage culverts. This was done to facilitate the future possibility of incorporating each culvert in the splitflow analysis that was performed along the I-10 portions of those reaches.

Cross section geometry data was based on McLain-Harbers and Cooper topographic maps. Since the McLain-Harbers topography was provided in three-dimensional format, there was an opportunity to extract cross section geometry data using the Boss International HEC-2 for AutoCad software. This approach was taken on the Buckeye Structure 2 delineation due to the number of cross-sections. Geometry data for Buckeye Structure 1 was extracted manually. Geometry data for Buckeye Structure 3 was also extracted manually. For Structure 3, this was essentially the only choice since the White Tanks/Agua Fria topography was only available in two-dimensional format.

Cross section geometry data within the emergency spillways which was extracted from the McLain-Harbers and Cooper topographies was compared to the original Soil Conservation Service design plans and topography. The basic geometry generally compared favorably with the original design.

Cross section geometry data points in all three cases are essentially based on topographic contours and spot elevations. At a few locations, where appropriate, intermediate points were interpolated from contours and spot elevations. For example, some of the elevations that define the overflow weir that occurs along Interstate-10 for Buckeye Structures 2 and 3 were able to be interpolated with comfortable accuracy because the roadway has a uniform grade and hard surface.

In most cases, the existing wash channels that occur within the delineated areas are relatively insignificant, hydraulically speaking. They have developed over time based on local runoff and would be completely overshadowed by the large emergency spillway discharges. For these reasons, and because the topography is generally not sufficiently detailed to describe the individual wash channels, they are typically not reflected in cross section geometry.

In all three areas delineated, it was difficult to assign a meaningful channel bank station on the basis of defined wash channels, since there was generally no dominant channel. The exception to this was within each of the three spillways themselves where the cross sections are all a relatively uniform trapezoid. All cross sections in this study generated from the McLain-Harbers and Cooper topography use the beginning and ending point as the left and right channel bank stations. This means there is no "overbank" area considered within the limits of this study.

The potential for Buckeye Structures 2 and 3 emergency spillway flow to overtop the Interstate-10 roadway was modeled in HEC-2 using the splitflow option. The entire reach of these two delineations adjacent to the interstate was modeled with weir flow. Typically, the earthen training dikes which project north from the roadway embankment were assumed to have scoured away and are not reflected in the channel geometry and, subsequently, in the splitflow analysis. In addition, the 24-inch to 48-inch diameter drainage culvert pipes under the interstate were considered to be minor hydraulic features in relation to the large magnitude emergency spillway flows and are not reflected in the splitflow analysis.

Weir length and elevation data along the interstate was estimated from topography. Elevations reflect the west-bound roadway surface. Weir hydraulics were assumed to not be influenced by the Interstate-10 median, which may act somewhat as an open channel or by the eastbound roadway which may introduce a slight submergence. All flow that weirs over the interstate where the main flow path intersects the elevated roadway is assumed to permanently leave the hydraulic model.

All split-flow analysis had to be performed using HEC-2 since HEC-RAS does not yet have this capability. To duplicate results of the HEC-2 splitflow in HEC-RAS, the discharge rates remaining in the main channel according to HEC-2 splitflow were simply entered into HEC-RAS at each cross section where the weir occurs.

Working HEC-2 models for each of the three delineations were imported into HEC-RAS. Ineffective flow areas were evaluated in preliminary HEC-RAS models using HEC-RAS cross section plots. Corresponding ineffective limits were then entered in the imported HEC-2 models as Type-1 encroachment. All HEC-2 models in this study were run as subcritical only. All HEC-RAS models are run in both the subcritical and "mixed" (sub-critical/super-critical) flow regimes. All delineation limits and tabular flow data shown on delineation map exhibits are based on HEC-RAS mixed flow regime profiles. The upstream boundary condition of all HEC-RAS mixed flow regime models assumes critical depth. Hydraulic conveyance in all HEC-RAS models uses the same method as HEC-2.

Finally, it should be recognized that, with any HEC-2 or HEC-RAS model, a fixed-boundary assumption is inherent. Although flow characteristics associated with the emergency spillways can potentially produce scour and transport of the boundary, these models are considered adequate for the purpose of this study.

### 3.4 Buckeye Structure 1 Delineation

The lower study limit/outfall for the Buckeye Structure 1 emergency spillway delineation is the Hassayampa River floodplain. The Hassayampa River 100-year floodplain was delineated in 1989, by Cella Barr Associates for the Flood Control District. This delineation provided a "known" water surface profile to use at the downstream limit of the emergency spillway delineation. However, there were two problems associated with using this profile. The first problem is that there was no confirmation available that the Hassayampa and Buckeye Structure topographies were on the same vertical datum.

The second problem associated with using the water surface profile provided by the delineation is that the water surface profile from Cella Barr HEC-2 model HASS.R3, which includes this segment of the Hassayampa, does not match the water surface elevations shown at each cross section on the Cella Barr Flood Insurance Study work map sheet 7 of 27. The discrepancy in water surface elevations begins at cross section 11.09, which is the first cross section upstream from the Interstate-10 bridge where the HEC-2 model HASS.R3 water surface is about one foot lower in elevation than the water surface shown on the work map. The difference in profiles diminishes in the upstream direction and, upstream of cross section 11.43 (inclusive), the profiles match. This discrepancy could not be explained. Because of these problems, the Hassayampa River HEC-2 model HASS.R3 was only used to estimate the downstream energy slope for use in the slope-area starting option.

The Cella Barr Hassayampa floodplain delineation also presented an opportunity to approximate a more comprehensive lower study limit for the spillway delineation. Hassayampa topography and floodplain limits were superimposed on the McLain-Harbers topography to make a composite coverage. The water surface profiles from Hassayampa HEC-2 model 13084HAS, using the full,  $\frac{2}{3}$  and  $\frac{1}{3}$  flow, were also used in conjunction with the Buckeye Structure 1 hydraulic model profiles. This approach assumes that Hassayampa River and Buckeye Structure topographies are on the same, or at least similar, vertical datum.

Right side floodplain limits for the Buckeye Structure 1 emergency spillway delineation downstream from cross section 19.779 and left side limits downstream from cross section 19.416 are approximated from Hassayampa River topography. These approximate limits are extended downstream to Hassayampa River cross section 11.00, which is at the upstream side of the Interstate-10 bridge.

Ineffective flow area was blocked out on the right side of cross sections 19.416, 19.512 and 19.606. The cross section stations for this ineffective flow were established using a 4:1 flow spread approximation in the downstream direction starting from the small hill that defines the right limit of cross section 19.701. This approach was used in lieu of a two-dimensional flow analysis which would probably better assess what occurs in this area than HEC-2 or HEC-RAS. In reality, flow is not really ineffective here but free to expand and spread west into the Hassayampa River. Here, emergency spillway flow is unconfined due to the orientation of these three cross sections and the limitation of McLain-Harbers topographic coverage. The ineffective flow approach gives a conservatively higher water surface profile and the actual right side floodplain limit for these three cross sections is somewhat academic since it is contained within the Hassayama River 100-year floodplain.

HEC-2 and HEC-RAS hydraulic models were developed as described in the Hydraulic Analysis Section of this report. An 11" x 17" reduction of the full,  $\frac{2}{3}$  and  $\frac{1}{3}$  delineation exhibits and supporting HEC-2 and HEC-RAS computer printout is found in Appendix C of this report.

### 3.5 Buckeye Structure 2 Delineation

The lower study limit/outfall for the Buckeye Structure 2 emergency spillway delineation is Interstate-10 near the SR-85 interchange. The hydraulic section at the downstream limit is an overflow of the south edge of the eastbound roadway of I-10. Just downstream from this section, flow is expected to be supercritical as it travels down the roadway embankment. HEC-2 and HEC-RAS models start at the downstream cross section assuming critical depth.

First, a working HEC-2 model was developed in the subcritical flow regime in which the splitflow along Interstate-10 was modeled. This HEC-2 model was then imported to HEC-RAS. HEC-RAS steady flow data reflects changes in discharge based on the working HEC-2 flow split model with discharges rounded to the nearest 100 cfs.

Final HEC-RAS models were developed as described in the Hydraulic Analysis Section of this report. An 11" x 17" reduction of the full,  $\frac{2}{3}$  and  $\frac{1}{3}$  delineation exhibits and supporting HEC-2 and HEC-RAS computer printout is found in Appendix D of this report.

### **3.6 Buckeye Structure 3 Delineation**

The lower study limit/outfall for the Buckeye Structure 3 emergency spillway delineation is Tuthill Dike Wash at Interstate-10. The WLB White Tanks / Agua Fria Tuthill Dike Wash HEC-2 model was used to develop starting downstream conditions for subcritical models. A working HEC-2 model was developed using the WLB Tuthill Dike Wash model 5.H2I which extended all the way from the downstream limit of that model to the Buckeye Structure 3 emergency spillway.

The HEC-RAS option that allows the user to specify a portion of a study reach for computation is not yet available. Because of this, the reach downstream of Interstate-10 was eliminated to create a separate but otherwise identical HEC-2 model prior to import into HEC-RAS. The starting water surface elevations at the downstream end of subcritical HEC-RAS profiles is based on calculated water surface elevations from the first working HEC-2 model.

The rest of the import and model development for the Structure 3 delineation is similar to the Structure 2 delineation process and is also described in the Hydraulic Analysis Section of this report. The limits of flooding at the downstream limit of study simply match the Tuthill Dike Wash 100-year limits just upstream from the Interstate-10 culvert. An 11" x 17" reduction and supporting HEC-2 and HEC-RAS computer printout is found in Appendix E of this report.

### 3.7 Conclusions

HEC-RAS models in this study seemed to show good agreement with their HEC-2 counterparts. At those cross sections where multiple Manning "n" values had been used in HEC-2 models, these values were generally imported and composited by HEC-RAS consistent with HEC-2 compositing. Subcritical water surface profiles generally agreed within about one or two tenths of a foot between HEC-2 and HEC-RAS.

With regard to the splitflow analysis along Interstate-10 for Buckeye Structures 2 and 3, disregarding the existing pipe culverts under Interstate-10 may tend to overestimate the portion of flow that weirs over the roadway. On the other hand, disregarding the earth dikes that project north from the roadway embankment may tend to underestimate the portion of flow that weirs over the roadway if, in fact, these dikes do not wash out completely. The amount of discharge estimated to weir over the Interstate-10 roadway is illustrated in appropriate locations on the delineation exhibits. Intermediate HEC-2 runs which were done for sensitivity analysis indicate that Interstate-10 splitflow is very sensitive to changes in cross section and weir geometry and Manning "n" values.

Emergency spillway flow from Buckeye Structures 2 and 3 that weirs over Interstate-10 and that passes through the existing 24-inch to 48-inch culvert pipes will continue in a southerly direction. There are no significant washes or other topographic features immediately south of the interstate that would contain this flow. It is anticipated that this flow would be shallow and spread out in character. No attempt has been made to quantify the depth, velocity, travel time or limits of this flow as it continues to the south. Further downstream, it may collect or concentrate along irrigation canal banks, roadway embankments or other raised features.

The discharges and associated depths of weir flow over Interstate-10 for the Structures 2 and 3 floodplains varies depending on location. The maximum Structure 2 emergency spillway flow that weirs over Interstate-10 is 2800 cfs under the full discharge scenario. This occurs between consecutive HEC-2 cross section 19.151 and 19.061. The depth associated with this weir flow is approximately 1.6 feet. The maximum Structure 3 emergency spillway flow that weirs over Interstate-10 is 4500 cfs under the full discharge scenario. This occurs between consecutive HEC-2 cross sections 18.892 and 18.818. The depth associated with this weir flow is 1.8 feet.

The original WLB Tuthill Dike Wash HEC-2 model contains a weir that occurs on the east side of Tuthill Dike Wash just north of Interstate-10. Because of the amount of Buckeye Structure 3 emergency spillway flow that is lost over the interstate upstream of this location, the water surface never reaches the crest of this spillway. All flows that remain along Interstate-10 entering Tuthill Dike Wash are less in magnitude than the 100-year discharge in Tuthill Dike Wash and are completely contained within its floodplain. In a similar way, at the other end of the study, all emergency spillway flows for Buckeye Structure 1 are less in magnitude than the 100-year discharge in the Hassayampa River and are completely contained within its floodplain.

According to the water surface profiles, minor breakouts of flow potentially occur on the right side flood limits of the Structure 1 floodplain just downstream from cross section 19.779, the Structure 2 floodplain just upstream from cross section 19.590 and the Structure 3 floodplain downstream from cross section 19.156. These flows would be temporarily separated from the main flow path and would rejoin the major floodplain just downstream from where they break away. None of these breakouts was considered significant enough to analyze in a detailed splitflow. Limits of these breakouts have been approximated on the delineation maps.

## **SECTION 4 - FLOOD WARNING APPLICATIONS**

### **4.1 Limits of Flooding**

Limits of flooding in this study have been illustrated on a series of exhibits. These exhibits are provided in reduced size format in Appendices C, D, and E of this report. The exhibits are also provided under separate cover in full size 24" x 36" sheets. In addition to the limits of emergency spillway flooding from the Buckeye Structures, these exhibits display, for information purposes, the 100-year floodplain limits of the Hassayampa River and Tuthill Dike Wash as they relate to Buckeye Structures 1 and 3 respectively.

### **4.2 Flow Depth, Velocity, Travel Time**

Incorporated on the emergency spillway flood limit exhibits are tabular data including water surface elevation, discharge, flow depth, flow velocity and travel time. This information is provided in summary format on the exhibits to make them more complete and stand-alone. For more detailed information, refer to HEC-2 and HEC-RAS printouts in Appendices C, D, and E. All travel times in this study are estimated on a simple basis of flow velocity and length of travel. Times are always stated in terms of the upstream limit of study which is the emergency spillway. Travel times ranged from a short of about 5 minutes for full discharge flows from the Structure 1 emergency spillway to reach the Hassayampa River to a long of about 60 minutes for 1/3 flows from the Structure 3 emergency spillway to reach Tuthill Dike Wash at Interstate-10.

## SECTION 5 - HYDROLOGIC INFORMATION SYSTEM

Data coverages in ARC-INFO format were provided by subconsultant Cooper Aerial of Phoenix in accordance with the FCD 95-34 scope of work and the District's Hydrologic Information System Data Delivery Specifications, Revision 2.1. The data coverages provided will add important information to the District's database within the area studied and is intended for potential use in flood warning, emergency preparedness and evacuation and also for potential acquisition of flowage easements. Data coverages were provided under separate cover from this report to the Flood Control District. Coverages included hydraulic baseline, cross sections, floodplain limits, flow distribution data, project boundary and data quality. The McLain-Harbers and Cooper topography and planimetrics used for this delineation study have previously been translated to ARC-INFO database.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**SECTION 6 - BIBLIOGRAPHY AND REFERENCES**

1. Aerial Topography, Buckeye FRS No. 1, 2 & 3 - McLain Harbers Co., Inc.; Ground Control - Collins Pina Consulting Engineers Survey Company; Photo Date - July 12, 1994; National Map Accuracy Standards - 1" = 200' (Horizontal), 2-Foot Contours; Vertical Datum - NAVD 88; Horizontal Datum - NAD 83; Mapping provided to FCD under Contract FCD93-51.
2. Aerial Topography, White Tanks/Agua Fria Area Drainage Master Study - Cooper Aerial of Phoenix, Inc. and Western Air Maps, Inc. of Lenexa Kansas; Ground Control - The WLB Group; Photo Date - December 22, 1989; National Map Accuracy Standards - 1" = 400' (Horizontal), 2-Foot Contours; Vertical Datum - NGVD 29; Horizontal Datum - NAD 27; Mapping provided to FCD under Contract FCD 89-50.
3. Aerial Topography, Hassayampa River - Cooper Aerial Survey Co.; Photo Date - March 18, 1988; 1" = 400' Horizontal Scale; 4-Foot Contours; Vertical Datum - Unknown.
4. 7.5 Minute Series Topographic Maps (Scale - 1:24,000); Buckeye NW, Valencia; United States Department of the Interior, Geological Survey.
5. 15 Minute Series Topographic Maps (Scale - 1:62,500); Arlington, Buckeye; United States Department of the Interior, Geological Survey.
6. "Phase I Report, Hydrologic Analysis, Buckeye Floodwater Retarding Structures #1, #2, and #3 for Flood Control District of Maricopa County"; Dames & Moore; FCD Project 88-63; January 23, 1990.
7. "Phase II Report, Volume I, Dam Break Analysis, Buckeye Floodwater Retarding Structures #1, #2, and #3 for the Flood Control District of Maricopa County"; Dames & Moore; FCD Project 88-63; June 28, 1990.
8. "White Tanks/Agua Fria Area Drainage Master Study"; The WLB Group for the Flood Control District of Maricopa; Contract FCD 89-50; October, 1992.
9. Hassayampa River Floodplain Delineation, "Flood Insurance Re-Study for Various Streams in Maricopa County, Arizona"; Cella Barr Associates for the Flood Control District of Maricopa County; Contract FCD (unknown); October, 1989.
10. "Buckeye Watershed Protection and Flood Prevention Project, Maricopa County, Arizona, Plans for the Construction of Site I Diversion Structure"; United States Department of Agriculture, Soil Conservation Service; July, 1971.
11. Contract for Consulting Service (Contract FCD 95-34) Approved by FCD Board of Directors February 21, 1996 and Scope of Work FCD 95-34, Delineation of Spillway Flows for Buckeye Structures #1, #2, and #3.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**SECTION 6 - BIBLIOGRAPHY AND REFERENCES (Continued)**

12. "Data Delivery Specifications: The Hydrologic Information System (H.I.S.)"; Flood Control District of Maricopa County; Revision 2.1; February 14, 1996.
13. "Instructions for Organizing and Submitting Technical Documentation for Flood Studies"; State of Arizona Department of Water Resources, Engineering Division; August, 1990, Revised September 1991.
14. "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona"; Prepared for Flood Control District of Maricopa County by the U.S. Geological Survey, Water Resources Division; April 1991.
15. "HEC-2 Water Surface Profiles User's Manual; United States Army Corps of Engineers Hydrologic Engineering Center; September 1990.
16. HEC-2 Water Surface Profiles Computer Model, Version 4.6.2 from NTIS; U.S. Army Corps of Engineers, Hydrologic Engineering Center; May 1991.
17. "HEC-RAS River Analysis System User's Manual, Version 1.0"; United States Army Corps of Engineers Hydrologic Engineering Center; July 1995.
18. "HEC-RAS River Analysis System Hydraulic Reference Manual, Version 1.0"; United States Army Corps of Engineers Hydrologic Engineering Center; July 1995.
19. HEC-RAS River Analysis System Computer Model, Version 1.2; United States Army Corps of Engineers Hydrologic Engineering Center; April, 1996.
20. Boss HEC-2 for AutoCAD Standard Version, Boss International; 1995.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**SECTION 7 - LIST OF HYDRAULIC MODEL COMPUTER FILES**

<u>Filename</u>	<u>Description</u>
HASS.R3	Original Cella Barr Hassayampa HEC-2 model.
13084HAS.	Modified Cella Barr Hassayampa Model HASS.R3.
5.H2I	Original WLB White Tanks/Agua Fria Tuthill Dike Wash HEC-2 model.
13084TUT.	Modified WLB White Tanks / Agua Fria Tuthill Dike Wash model 5.H2I.
13084B1B.H2	Buckeye Structure 1 HEC-2 model input file for import to HEC-RAS.
13084B1B.PRJ, P01, G01, F01, etc. . . .	Buckeye Structure 1 HEC-RAS files associated with 13084B1B.H2.
13084B2C.H2	Buckeye Structure 2 HEC-2 model input file for import to HEC-RAS.
13084B2C.PRJ, P01, G01, F01, etc. . . .	Buckeye Structure 2 HEC-RAS files associated with 13084B2C.H2.
13084B3C.H2	Buckeye Structure 3 HEC-2 model with Tuthill Dike Wash and I-10 splitflow.
13084B3D.H2	Buckeye Structure 3 HEC-2 model input file for import to HEC-RAS. (Same as 13084B3C.H2 without Tuthill Dike Wash and I-10 splitflow).
13084B3D.PRJ, P01, G01, F01, etc. . . .	Buckeye Structure 3 HEC-RAS files associated with 13084B3D.H2.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**APPENDIX A**

**GENERAL DOCUMENTATION**

1. Scope of Work
2. Contract
3. Correspondence
4. Transmittals
5. Meeting Minutes
6. Telephone Reports

**EXHIBIT "A"**  
**SCOPE OF WORK**  
**CONTRACT FCD 95-34**

**GENERAL**

The purpose of this study is to delineate the inundation limits of the 1/3, 2/3, and full spillway discharge values for Buckeye Structures 1, 2, and 3. The study limits will be from the top of the spillways to a point downstream where the maximum depth of flow is less than 1 foot in depth, or contained within an existing 100-year floodplain. The anticipated downstream study limit for each spillway is either Interstate-10 or the Hassayampa River. Using the anticipated downstream study limits, there is approximately three total linear miles of emergency spillway delineations. The consultant will determine the inundation limits using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model or if applicable their HEC-RAS River Analysis System computer model. The consultant must use sound engineering judgement in the development of the computer models. The results of the computer models must be analyzed carefully and refinements made to the input parameters in order to obtain the most realistic results. All reports and drawings shall be sealed by persons of appropriate registration responsible for the work. All work under this Scope must be completed within 240 calendar days from the Notice to Proceed, including 60 days for District reviews.

**COORDINATION**

The consultant will update the project schedule submitted during the proposal stage. The project schedule shall show when coordination meetings are to occur and the completion dates for each of the tasks in the scope. The consultant shall update and resubmit this project schedule whenever changes in the schedule occur.

The consultant shall submit a quarterly estimation of the projected billing within 14 days of Notice To Proceed. Thereafter, this estimation will be updated and submitted to the District's Project Manager at least 10 days prior to the end of each quarter.

The consultant will obtain any necessary Rights of Entry. The consultant will furnish the District with a list of all property owners notified and a sample Right of Entry letter.

The consultant shall meet with officials from Town of Buckeye. The purpose of this meeting is to notify them about the study and obtain information on current or planned public works projects in the study area. A coordination meeting will also be held with representatives from the Arizona Department of Water Resources (ADWR)

**DATA COLLECTION**

The District will supply the topographic data for this study in either a GIS or AutoCAD format. The source of this mapping is the Buckeye FRS 1, 2, & 3 Elevation Capacity Curves Aerial Topography (FCD 93-51). This mapping was originally developed at a scale of 1" = 200' with a contour interval of 2 feet. The District will supply the three discharge values to be modeled for each spillway. These values are from the spillway rating curves.

The consultant will conduct a field reconnaissance of the full study reach. This will include observation of channel and floodplain conditions for estimation of Manning's "n" values, photographic documentation of floodplain characteristics, determination of channel bank stations, observation of possible overflow and

split flow areas. A draft report on the field reconnaissance will be submitted to the District prior to beginning the HEC-2 modeling. The report will present the determination of channel and overbank "n" values along with color photographs (or color photocopies) of these areas. Photo locations, structures and "n" values will be displayed on reduced (usually 11" x 17") scale mapping and included in the final report.

## HYDRAULIC ANALYSIS

This analysis will be performed using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model, version 4.6.2, May 1991 or if applicable, their HEC-RAS River Analysis System computer model. The upstream end of each analysis will be the top of the spillway. The downstream limit will be where flows from the spillway are less than 1 foot in depth or contained within an existing 100-year floodplain. The hydraulic analysis will be done for the 1/3, 2/3, and full discharge value for each of the spillways.

The initial location and alignment of cross sections and channel centerline will be submitted for the District's review and approval prior to digitizing the cross section data. Cross section stationing will be from left to right looking downstream with the thalweg at station 10,000. Cross sections will be spaced approximately every 500 feet, unless geographic or structural constraints dictate closer spacing, and will extend the full width of the inundated area. The orientation of the cross sections may need to be altered after running the computer models to ensure that cross sections are perpendicular to flow.

Manning's "n" values are to be determined using the methodology in the USGS report, *Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*, April 1991.

The computer models will usually be developed for subcritical flow. However, in some cases supercritical flow may be experienced and have to be modeled. The computer models should be started far enough downstream to eliminate the affects of the starting conditions on the downstream limit of the study area; and reflect a minimized hazard from spillway flows.

For braided channels, each branch should be modeled with its highest anticipated discharge value. This might require more than one computer model to delineate the inundation limits in these areas. A rating curve must be determined and the discharge contained within the channel. The percentage of discharge in each overbank and the main channel must be closely assessed within the split flow area, as well as upstream and downstream of it.

Cross sections shall be plotted showing, computed water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing, and other pertinent information.

The consultant is to setup the computer models so that the cross sections are divided into as many segments as possible for determining depth and velocity along the cross section. The consultant will also need to calculate the time it takes for flows to travel from the spillway to each cross section.

The consultant is to make refinements to the computer models based on review of the model by the District and other interested agencies. Adjustments to the input parameters for obtaining the most realistic results is considered normal to the scope of work.

It may be necessary to update the supplied topographic mapping or do supplemental field surveys. None of this work shall be performed without approval from the District's Project Manager. All supplemental topographic and survey work shall be on the same horizontal and vertical datum as the supplied mapping.

## **FINAL PRODUCTS**

Develop the inundation limit exhibits using the supplied topographic data. The exhibits shall be on standard size sheets with a maximum dimension on one side of 36 inches. These exhibits will use the District's standard border, title block, and legend format. On these exhibits show the inundation limits for the three discharges modeled, cross section locations, thalweg location, supplied topographic data, any consultant developed topographic data or revisions, identify major roads and appropriate minor roads, and include elevation reference marks. This exhibit should be plotted at the same scale as the originally supplied topographic data. A table must be included on this exhibit showing the computed water surface elevation of each cross section for each discharge modeled, and possibly other pertinent information such as depth, velocity, and travel time from the spillway to the cross section. In the case of split or braided flow the maximum inundation limit should be shown and the maximum water surface elevation for each portion of the cross section listed. At the end of the study one (1) complete set of the inundation limit exhibits will be supplied on non-erasable mylar (3 mil or thicker) and shall be sealed by the engineer. No "sticky backs" or other types of tape products shall be applied to the mylars.

An overall final report for the study will be developed. This report will include a narrative description of the purpose of this study, what steps were undertaken to complete this study, any assumptions made, minutes of meetings, the field reconnaissance report, tables summarizing the results of the hydraulic analysis, and a copy of the inundation limit exhibits. Included as appendixes to this report should be printouts of the computer models, plot of the cross sections, supporting calculations for any other hydraulic analysis done, and a copy of any supplemental survey work performed.

The results of this study will also be submitted in a digital format for use in the District's Hydrologic Information System (HIS). Digital data will be prepared in conformance with the District's HIS Data Delivery Specifications, Revision 2.1. The following layers are the main layers that need to be completed for this project:

1. FCD Project Map Index
2. FCD Project Boundary
3. Data Quality
4. Spillway Baseline Route System
5. Spillway FCD Cross Section
6. Spillway FCD Zone
7. Velocity and depth results per cross section subdivision

The consultant is to completely fill out every item called for in the HIS specifications on the above layers. Since Arc-Cad will not work with some of the above layer's it can't be used on this project.

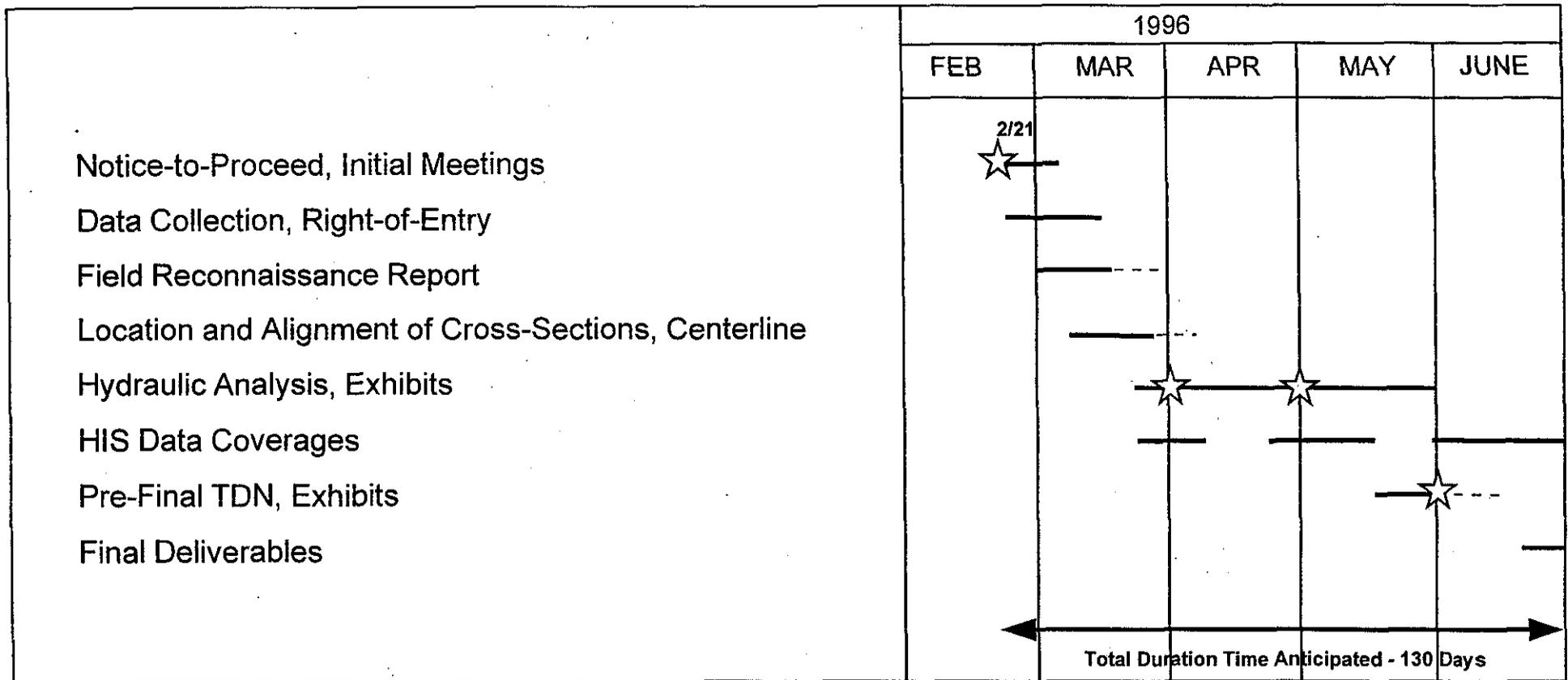
## **DELIVERABLES**

1. One set of sealed mylars (3 mil or thicker) of the inundation limit exhibit.
2. Four copies of the final report (sealed), inundation limit exhibits, and copies of HEC-2 models on diskette.
3. All of the HIS data called for in the Final Products section.

STANLEY CONSULTANTS

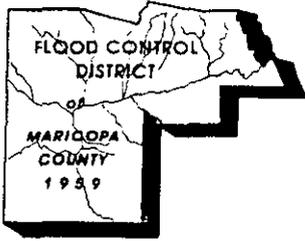
# Project Schedule (Revised 2/29/96)

Delineation of Spillway Flows for Buckeye Structures 1, 2 and 3  
 Contract FCD 95-34



☆ Designates Meeting  
 - - - Designates FCD Review Time

Total Contract Time Allowed - 240 Days



**FLOOD CONTROL DISTRICT**  
of  
**Maricopa County**

2801 West Durango Street • Phoenix, Arizona 85009  
Telephone (602) 506-1501  
Fax (602) 506-4601  
TT (602) 506-5859

RECEIVED

MAR - 1 1996

STANLEY CONSULTANTS

BOARD OF DIRECTORS

• Betsey Bayless  
• Ed King  
• Tom Rawles  
• Don Stapley  
Mary Rose Garrido Wilcox

Project No. \_\_\_\_\_  
Project Mgr. \_\_\_\_\_

February 27, 1996

Michael Hunzinger, Vice President  
Stanley Consultants, Inc.  
2929 East Camelback Road, Suite 130  
Phoenix, Arizona 85016

SUBJECT: FLOOD CONTROL DISTRICT CONTRACT FCD 95-35<sup>34</sup>

Dear Mr. Hunzinger:

Enclosed you will find an executed copy of contract FCD 95-35<sup>34</sup>, Delineation of Spillway Flows for Buckeye Structures 1, 2, and 3.

If you have any questions, please contact me at 506-1501.

Sincerely,

Donna M. Sanders  
Contracts Assistant

Enclosure

CONTRACT FOR CONSULTANT SERVICES

CONTRACT FCD 95-34

C-69-96-021-5

Pursuant to the provisions of the Arizona Revised Statutes Section 48-3603, the Board of Directors has the authority to enter into contracts.

The Flood Control District of Maricopa County, Arizona, hereinafter called the "DISTRICT," is desirous of having certain professional services performed in connection with Delineation of Spillway Flows for Buckeye Structures 1, 2, and 3 hereinafter called the "PROJECT" and as more fully described in Exhibit "A," Scope of Work, attached; and

Stanley Consultants, Inc., hereinafter called "CONSULTANT," is desirous of performing said services;

THEREFORE, the parties hereto mutually agree as follows:

SECTION I - SERVICES OF THE CONSULTANT

The CONSULTANT, under the general supervision of the Engineering Division Manager, shall prepare studies, reports, surveys, plans, drawings, specifications and cost estimates as are necessary for the PROJECT and according to the directions and designated standards of the DISTRICT and in accordance with Exhibit "A." It is understood and agreed that the DISTRICT's authorized representative shall be the Engineering Division Manager, or his duly authorized representative, hereinafter called the "AGENT" and that he/she shall be the sole contact for administering this contract.

The CONSULTANT shall meet periodically with the AGENT so as to keep the DISTRICT informed of the progress of the work in accordance with the schedule defined in Exhibit "A."

The CONSULTANT shall promptly advise the AGENT of any factors, which may develop during the PROJECT, that would likely result in construction or design costs in excess of budgetary constraints.

SECTION II - PERIOD OF SERVICE

The CONSULTANT shall complete all work per the schedule provided in Exhibit "A," Scope of Work within 180 calendar days after receipt of the Notice to Proceed, exclusive of DISTRICT review time. The DISTRICT is expected to require up to 60 calendar days for review time, for a total contract time period of 240 calendar days. Should extension of this contract period be necessary, and any such extension(s) continue the date of contract for a time period of more than one year from the date of contract expiration, adjustment(s) of the consultant's fee(s) may, upon agreement by both the DISTRICT and the CONSULTANT, be made in accordance with the Consumer Price Index for Urban Consumers, Western Division published by the U.S. Department of Labor, Bureau of Labor Statistics, using the published edition coinciding with the initial contract expiration date. Any such fee adjustment shall only apply to the extended contract time period.

SECTION III - PAYMENTS TO THE CONSULTANT

The CONSULTANT shall be paid for work under this Contract a lump sum of [REDACTED] plus any adjustments that have been approved in writing in accordance with the Maricopa County Procurement Code.

The DISTRICT shall pay the CONSULTANT upon completion of the work as accepted by the DISTRICT, except that progress payments may be made as billed by the CONSULTANT based on approved monthly progress reports subject to the limitations set forth in Exhibit "A," Scope of Work. Ten percent (10%) of all contract payments made on an interim basis shall be retained by the DISTRICT as insurance of proper performance of the contract or, at the option of the CONSULTANT, a substitute security may be provided by the CONSULTANT in an authorized form pursuant to procedures established by the DISTRICT. The CONSULTANT is entitled to all interest from any such substitute security.

When the contract is fifty percent (50%) completed, one-half (1/2) of the amount retained will be paid to the CONSULTANT provided the CONSULTANT is making satisfactory progress on the contract and there is no specific cause or claim requiring a greater amount to be retained. After the contract is fifty percent (50%) completed, no more than five percent (5%) of the amount of any subsequent progress payments shall be retained providing the CONSULTANT is making satisfactory progress on the project, except if at any time the DISTRICT determines satisfactory progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under the contract subsequent to the determination.

If the CONSULTANT desires a partial payment in accordance with the provisions above, the CONSULTANT will complete and forward, a DISTRICT provided form, indicating payment distribution to MBE/WBE firms.

Any retention shall be paid or substitute security returned or released, as applicable, to the CONSULTANT within forty-five (45) calendar days after: (1) final completion of all work per Exhibit A, (2) acceptance of work under the contract, (3) receipt of a completed "Certificate of Performance" form, (4) the CONSULTANT'S statement that no project disputes exist, (5) invoicing for any retained monies has been received by the DISTRICT, and (6) a document stating the total payments received by the prime as well as total payments the prime has made to MBE and WBE subcontractors, vendors, and suppliers.

#### SECTION IV - THE DISTRICT'S RESPONSIBILITIES

The DISTRICT shall furnish the CONSULTANT, at no cost to the CONSULTANT, the following information or services for this PROJECT:

- A. One copy of on-hand maps, records, survey ties, bench marks or other data pertinent to the PROJECT. This does not, however, relieve the CONSULTANT of the responsibility of searching records for additional information, for requesting specific information or for verification of that information provided. The DISTRICT does not warrant the accuracy or comprehensiveness of any such information.
- B. All available information and data relative to policies, standards, criteria, and studies, etc. impacting the PROJECT as identified by the CONSULTANT.
- C. Availability of staff for consultation with the CONSULTANT during the performance of studies and plan development in order to identify the problems, needs, and other functional aspects of the PROJECT.
- D. Examination of documents submitted by the CONSULTANT and rendering of decisions pertaining thereto promptly, to avoid unreasonable delay in the progress of the work by the CONSULTANT. The DISTRICT will keep the CONSULTANT advised concerning the progress of the DISTRICT'S review of work.

## SECTION V - ALTERATION IN SCOPE OF WORK

Any alteration in the scope of work that will result in a substantial change in the nature of the PROJECT so as to materially increase or decrease the contract fee will require negotiation of an amendment to the contract to be executed by the DISTRICT and the CONSULTANT. No work shall commence on the change until the contract amendment has been approved by the DISTRICT and the CONSULTANT has been notified to proceed by the AGENT. It is distinctly understood and agreed that no claim for extra work done or materials furnished by the CONSULTANT will be allowed by the DISTRICT except as provided herein, nor shall the CONSULTANT do any work or furnish any materials not covered by this agreement unless such work is first authorized in writing in accordance with the Maricopa County Procurement Code. Any such work or materials furnished by the CONSULTANT without such written authorization first being given shall be at his own risk, cost, and expense, and he hereby agrees that without such written authorization he will make no claim for compensation for such work or materials furnished.

## SECTION VI - RECORDS

Records of the CONSULTANT's payroll expense pertaining to this PROJECT and records of accounts between the DISTRICT and the CONSULTANT shall be kept on a generally recognized accounting basis and shall be available upon request to the DISTRICT or its authorized representative for audit during normal business hours. The records shall be subject to audit by appropriate grantor agency if the PROJECT is funded all or in part by a grant.

## SECTION VII - PROJECT COMPLETION

If during the course of this contract situations arise which prevent completion within the allotted time, an extension may be granted by the AGENT.

## SECTION VIII - TERMINATION

The DISTRICT may terminate this contract at any time upon reimbursement to the CONSULTANT of expenses which include reasonable charges for time and material for the percentage of work satisfactorily completed and turned over to the DISTRICT.

The DISTRICT reserves the right to postpone, terminate or abandon this PROJECT for the CONSULTANT's failure to complete the PROJECT on time, or failure to comply with the provisions of the contract. The DISTRICT also reserves the right to terminate any or all parts of this contract for its own convenience as the DISTRICT may determine at its sole discretion.

The DISTRICT hereby gives notice that pursuant to A.R.S. Section 38-511 "A" this contract may be cancelled without penalty or further obligation within three years after execution if any person significantly involved in initiation, negotiation, securing, drafting, or creating this contract on behalf of the DISTRICT is, at any time while the contract or any extension of the contract is in effect, an employee or agent of any other party to the contract in any capacity or a consultant to any other party of the contract with respect to the subject matter of the contract. Cancellation under this section shall be effective when written notice from the Chief Engineer and General Manager is received by all of the parties of the contract. In addition, the DISTRICT may recoup any fee or commission paid or due to any person significantly involved in initiation, negotiation, securing, drafting, or creating the contract on behalf of the DISTRICT from any other party to the contract arising as a result of the contract.

The CONSULTANT may terminate this contract in the event of nonpayment of fees as specified in Section III, PAYMENTS TO THE CONSULTANT.

### SECTION IX - OWNERSHIP OF DOCUMENTS

All original documents including, but not limited to studies, reports, tracings, drawings, physical and computer models, estimates, field notes, investigations, design analyses, calculations, computer software, and specifications, prepared in the performance of this Contract are to be and remain the property of the DISTRICT and are to be delivered to the AGENT before final payment is made to the CONSULTANT. The DISTRICT reserves the right to reuse the documents as it sees fit. However, the DISTRICT will not reuse, alter, or modify these documents without noting such alterations, modifications, or intent of their reuse, and will hold the CONSULTANT harmless from any claims arising from the reuse, alteration, or modification of the documents. The CONSULTANT may retain reproducible copies of all such documents delivered to the DISTRICT.

### SECTION X - COMPLIANCE WITH LAWS

The CONSULTANT is required to comply with all Federal, State and local laws, local ordinances and regulations. The CONSULTANT's signature on this contract certifies compliance with the provisions of the I-9 requirements of the Immigration Reform and Control Act of 1986 for all personnel that the CONSULTANT and any subconsultants employ to complete this PROJECT. It is understood that the DISTRICT shall conduct itself in accordance with the provisions of the Maricopa County Procurement Code.

### SECTION XI - GENERAL CONSIDERATIONS

- A. Prior to beginning the work, the CONSULTANT shall furnish the DISTRICT for approval the names of its key employees, and of its sub-consultants and their key employees to be used on this PROJECT. Any subsequent changes are subject to the written approval of the DISTRICT.

The CONSULTANT in replacing a MBE/WBE subcontractor should attempt to contract with another MBE/WBE.

- B. The failure of either party to enforce any of the provisions of this Contract or to require performance of the other party of any of the provisions hereof shall not be construed to be a waiver of such provisions, nor shall it affect the validity of this Contract or any part thereof, or the right of either party to thereafter enforce each and every provision.
- C. The CONSULTANT shall be responsible for the cost of any additional design, field layout, testing, construction and supervision necessary to correct those errors or omissions attributable to the CONSULTANT and for any damage incurred by the DISTRICT as a result of additional construction costs caused by such CONSULTANT errors or omissions.
- D. The fact that the DISTRICT has accepted or approved the CONSULTANT's work shall in no way relieve the CONSULTANT's responsibility.
- E. It is mutually understood and agreed that this Contract shall be governed by the laws of the State of Arizona, both as to interpretation and performance. Any action at law, suit in equity, or judicial proceeding for the enforcement of this Contract, or any provision thereof, shall be instituted only in the courts of the State of Arizona.

## SECTION XII - SUCCESSORS AND ASSIGNS

This Contract shall not be assigned by either party without prior written approval of the other except that the CONSULTANT may use in the performance of this Contract without prior approval of the DISTRICT, personnel or services of its related entities and affiliated companies as if they were an integral part of the CONSULTANT; and it shall extend to and be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

## SECTION XIII - NO KICK-BACK CERTIFICATION

The CONSULTANT warrants that no person has been employed or retained to solicit or secure this Contract upon any agreement or understanding for a commission, percentage, brokerage, or contingent fee; and that no member of the Board of Directors/Supervisors or any employee of the DISTRICT has any interest, financially or otherwise, in the CONSULTANT firm.

For breach or violation of this warranty, the DISTRICT shall have the right to annul this Contract without liability, or at its discretion to deduct from the Contract price or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

## SECTION XIV - ANTI-DISCRIMINATION PROVISION

The Flood Control District of Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to the Flood Control District of Maricopa County without being discriminated against on the grounds of race, religion, sex, age, or national origin.

The CONSULTANT agrees not to discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, or disability and further agrees not to engage in any unlawful employment practices. The CONSULTANT further agrees to insert the foregoing provisions in all subcontracts hereunder.

## SECTION XV - AMENDMENTS

This Contract may be amended by mutual written agreement of the DISTRICT and the CONSULTANT.

## SECTION XVI - INDEMNIFICATION AND INSURANCE

A. The CONSULTANT shall provide and maintain the following minimum insurance requirements:

1. Professional Liability. The CONSULTANT shall show evidence of maintaining continuous insurance for the past three (3) years with a minimum coverage limit of \$1,000,000.00 each claim and/or in the aggregate.

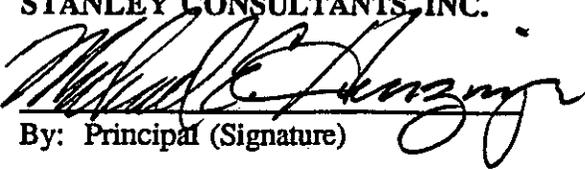
The CONSULTANT shall provide and maintain Professional Liability Insurance with a minimum single limit of \$1,000,000.00 for each claim made and an aggregate limit of \$1,000,000.00 for all claims made through this contract's completion date or the policy's life, whichever is longer.

2. **Commercial General Liability.** Commercial general liability insurance with a minimum single limit of \$1,000,000.00 for each coverage/occurrence. The policy shall include coverage for bodily injury and personal injury, broad form property damage and blanket contractual coverage.
3. **Automobile Liability.** Automobile liability insurance, with an individual single limit for bodily injury and property damage of no less than \$1,000,000.00, each occurrence, with respects to CONSULTANT's vehicles (whether owned, hired, non-owned), assigned to or used in the performance of this contract.
4. **Workers' Compensation Insurance.** This insurance shall be maintained during the life of the contract.
5. **Additional Insured.** The policies, except professional liability and workers' compensation, required by this section shall name the DISTRICT as Additional Insured, and shall specify that insurance afforded the CONSULTANT shall be primary insurance, and that any insurance coverage carried by the DISTRICT or its employees shall be excess coverage, and not contributory coverage to that provided by the CONSULTANT. No policy issued under this contract shall lapse, be cancelled, allowed to expire, or be materially changed to affect the coverage available to the DISTRICT without thirty (30) days written notice to the DISTRICT.
6. DISTRICT approved documentation outlining the coverages specified in this section shall be filed with the DISTRICT prior to issuance of the Notice to Proceed.

B. The CONSULTANT agrees to indemnify and save harmless the DISTRICT, any of its departments, agencies, officers, or employees from all suits, including attorney's fees and costs of litigation, actions, loss, damage, expense, cost or claims, of any character or any nature arising out of the CONSULTANT's wanton, willful or negligent acts, errors or omissions in the performance of work under this Contract, and any wanton, willful or negligent acts, errors or omissions by any subconsultant or other agent used by the CONSULTANT in the performance of work under this Contract.

IN WITNESS WHEREOF, the parties herein have executed this Contract.

STANLEY CONSULTANTS, INC.



By: Principal (Signature)

Michael E. Hunzinger

Printed Name

Vice President

Title

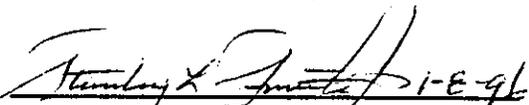
Date: January 3, 1996

42-1320758

Federal Tax Identification Number

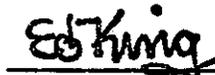
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY:



Stanley L. Smith, Jr., P.E.  
Interim Chief Engineer and General Manager

ACCEPTED AND APPROVED:



Chairman, Board of Directors

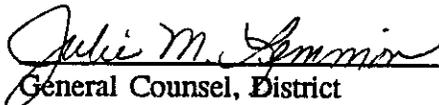
ATTEST:



Clerk of the Board

Date: FEB 21 1996

Approved as to form and within the powers and authority granted under the laws of the State of Arizona to the Flood Control District of Maricopa County.



General Counsel, District

Date: 1/10/96



March 15, 1996

ARIZONA DEPARTMENT  
OF WATER RESOURCES  
500 North 3rd Street  
Phoenix, Arizona 85004

Attn: Bill Jenkins, P.E.

RE: Delineation of Spillway Flows  
For Buckeye Structures 1, 2, & 3

Stanley Consultants has been retained by the Flood Control District of Maricopa County to conduct a floodplain delineation study of the Buckeye Flood Retarding Structures overflow spillways. These structures are located north and west of the Town of Buckeye along the north side of Interstate-10 from about the Dean Road alignment west to the Hassayampa River. These structures protect Interstate-10, the Town of Buckeye, and numerous agricultural, residential and transportation improvements from runoff originating in the White Tank Mountains. A location and vicinity map are enclosed showing the approximate location of Buckeye structures and their overflow spillways.

The purpose of this study is to identify the limits of flooding associated with spillway overflow for the primary purpose of flood warning and emergency preparedness. This is not a Flood Insurance Study, and will not be used for any regulatory purpose. Overflow spillways only operate under extremely severe and rare circumstances. The study will delineate the limits of flooding associated with 1/3, 2/3 and 100% of the currently estimated overflow discharge rates for these structures. Flow depth and travel time from each spillway will also be estimated as part of the study to assist the District in identifying warning and evacuation needs. Currently, the down-stream limit of study is envisioned to extend only to Interstate 10. This may be extended further south depending on initial study results.

Stanley Consultants and the Flood Control District would like to extend to you the opportunity of providing input or comments regarding the study. The final study documents will be in the form of overflow limit exhibit maps and a Technical Data Notebook. This information will be made available to you if you would like it.



Please call me at (602) 912-6500 and tell me whether this study is of any interest to you, and , if so, what level of involvement, input, or comment you would like to be provided. I am available to meet with you or your designated representative if you desire.

Thank you.

Sincerely,

STANLEY CONSULTANTS, INC.

Scott Buchanan

Enclosures

gsb/mmh:MAR038.60:13084

cc: FCD - Tim Murphy  
Project File (13084)



March 15, 1996

TOWN OF BUCKEYE  
100 North Apache Road  
Buckeye, Arizona 85326

Attn: Richard Bagley, Development Director

RE: Delineation of Spillway Flows  
For Buckeye Structures 1, 2, & 3

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Please call me at (602) 912-6500 and tell me whether this study is of any interest to you, and , if so, what level of involvement, input, or comment you would like to be provided. I am available to meet with you or your designated representative if you desire. This includes your Town Engineer or Public Works Director.

Thank you.

Sincerely,

STANLEY CONSULTANTS, INC.

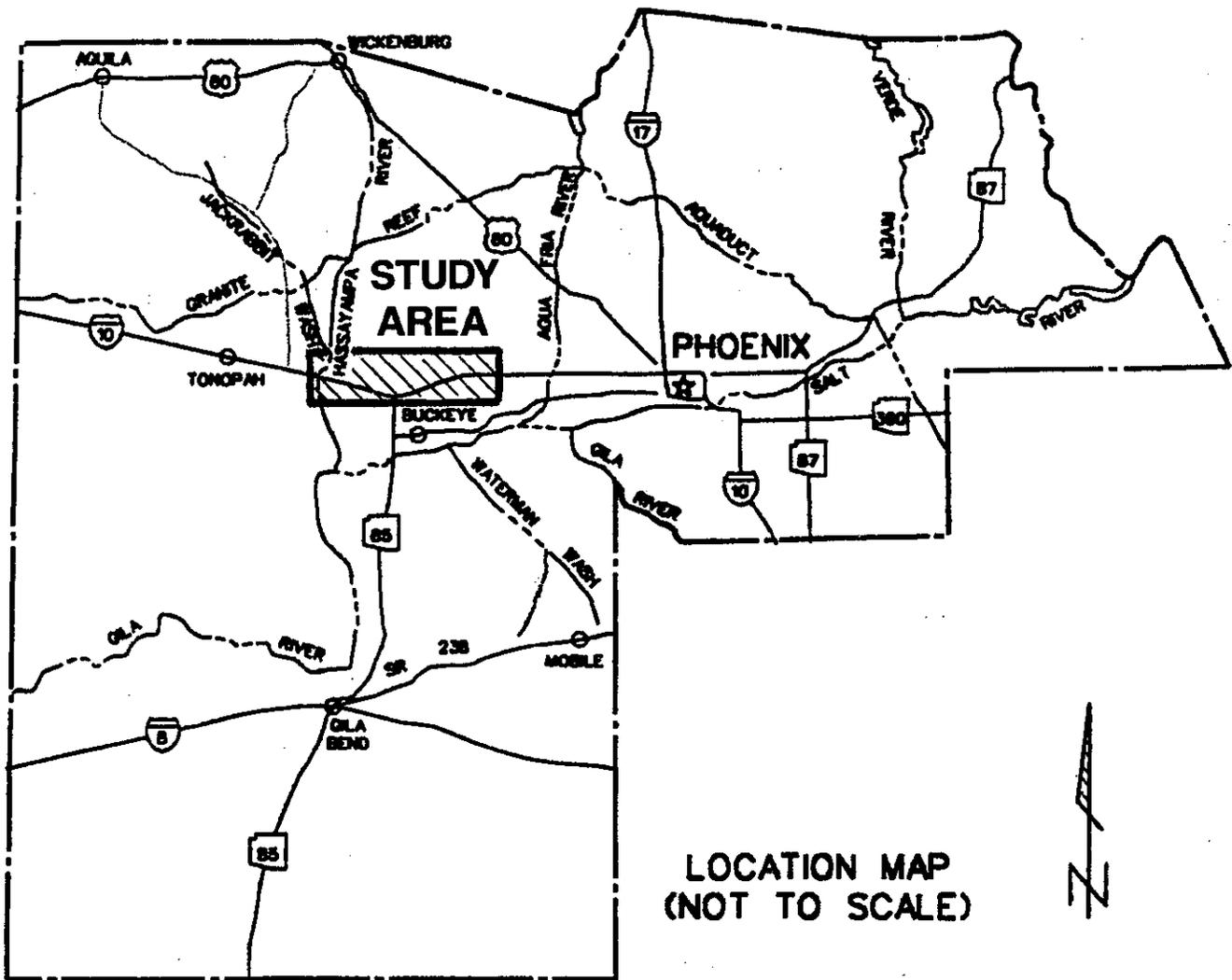


Scott Buchanan

Enclosures

gsb/mmh:MAR039.60:13084

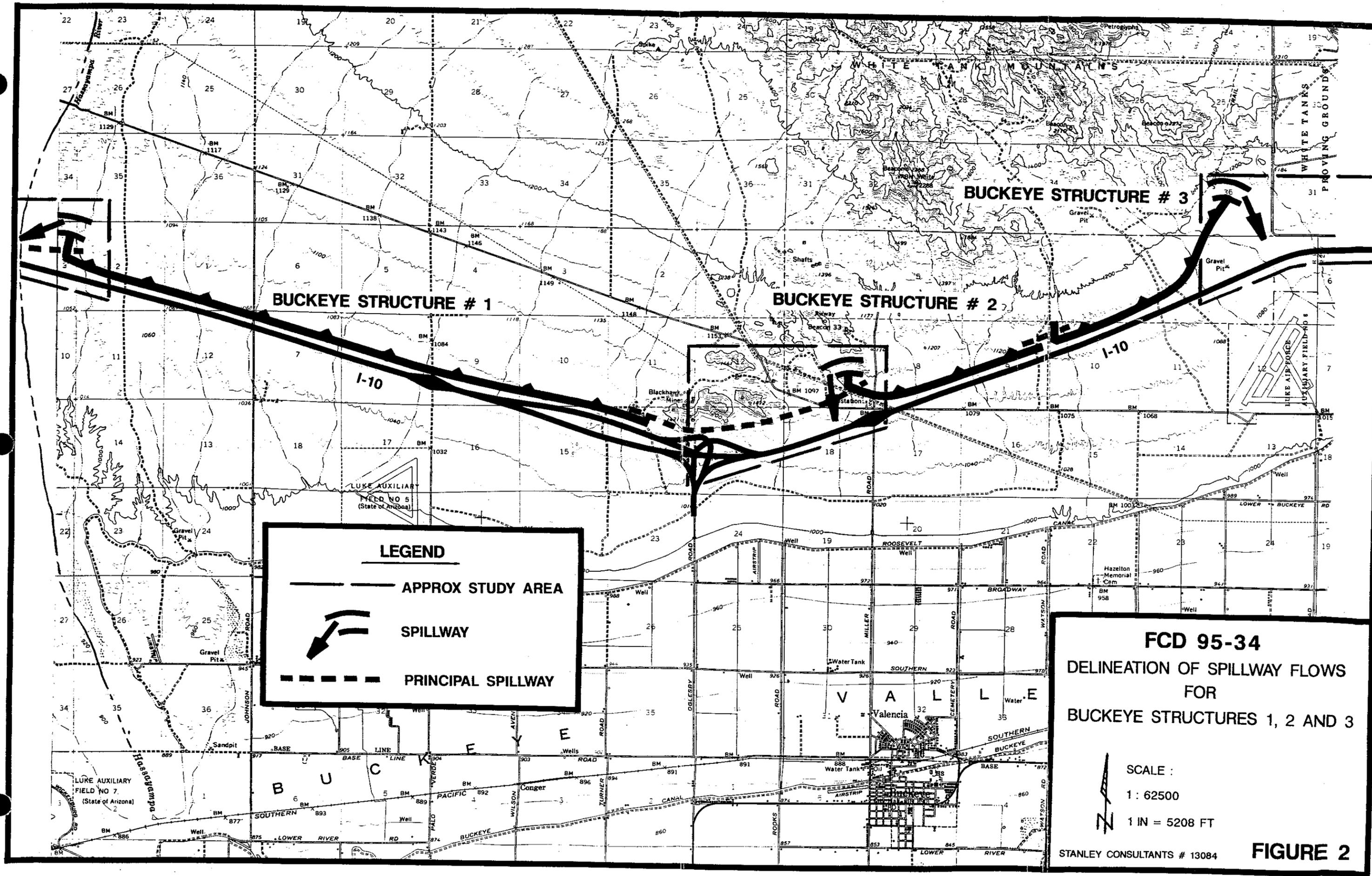
cc: FCD - Tim Murphy  
Project File (13084)



# MARICOPA COUNTY

**FCD 95-34**

DELINEATION OF SPILLWAY FLOWS  
FOR  
BUCKEYE STRUCTURES 1, 2 AND 3



**LEGEND**

 APPROX STUDY AREA  
 SPILLWAY  
 PRINCIPAL SPILLWAY

**FCD 95-34**  
 DELINEATION OF SPILLWAY FLOWS  
 FOR  
 BUCKEYE STRUCTURES 1, 2 AND 3

SCALE :  
 1 : 62500  
 1 IN = 5208 FT

  
 STANLEY CONSULTANTS # 13084

**FIGURE 2**

# DELIVERY TO STANLEY CONSULTANTS, INC.

7 FLOPPY DISKS CONTAINING  
ONE ZIP FILE, BUCKFRS.ZIP  
USE PKUNZIP TO EXTRACT

## FILES AND CONTENTS:

1830C.DGN

INDEX AND INTERMEDIATE CONTOURS.  
SIZE = 6666752K

1830PLAN.DGN

ALL MAP FEATURE PLANIMETRICS.  
SIZE = 2739200K

1830SHT.DGN

GEOREFERENCED MAPSHEET BOUNDARIES  
SIZE = 17920K

1830DTM.DGN

APPEARS TO BE BREAKLINES FOR TOPOGRAPHIC PROCESSING  
ALSO APPEARS TO CONTAIN STUDY AREA CONTROL POINTS  
SIZE = 5856768K

LINEAGE: The data on these files is from FCD contract 93-51,  
the BUCKEYE FRS. The mapping was performed by McLain  
Harbors, Inc.

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY**

2801 West Durango Street  
Phoenix, Arizona 85009

(602) 506-1501

**LETTER OF TRANSMITTAL**

DATE <b>2-28-96</b>	JOB NO.
ATTENTION	
RE <b>FCD 95-34</b>	
<b>BUCKEYE STRUCTURES 1, 2, 3</b>	

TO  
**SCOTT BUCHANAN**  
**STANLEY CONSULTANTS, INC.**

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings       Prints       Plans       Samples       Specifications  
 Copy of letter       Change order       \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
			<b>DAMES &amp; MOORE PHASE I REPORT</b>
			<b>DAMES &amp; MOORE PHASE II REPORT</b>
			<b>BUCKEYE #1 PLANS SHEETS 1-7 &amp; 14</b>
			<b>BUCKEYE 2 &amp; 3 PLANS SHEETS 1-6, 17, 28-30</b>

THESE ARE TRANSMITTED as checked below:

- For approval       Approved as submitted       Resubmit \_\_\_\_\_ copies for approval  
 For your use       Approved as noted       Submit \_\_\_\_\_ copies for distribution  
 As requested       Returned for corrections       Return \_\_\_\_\_ corrected prints  
 For review and comment       \_\_\_\_\_  
 FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_\_  PRINTS RETURNED AFTER LOAN TO US

REMARKS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

COPY TO \_\_\_\_\_

SIGNED: *T. J. [Signature]*

**FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY**

2801 West Durango Street  
Phoenix, Arizona 85009

(602) 506-1501

TO Scott Buchanan

**LETTER OF TRANSMITTAL**

DATE	10-30-95	JOB NO
ATTENTION		
RE		

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

- Shop drawings       Prints       Plans       Samples       Specifications  
 Copy of letter       Change order       \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
		①	Sheets 6, 7 & 8 of the Hassayampa River FIS
		②	Sheets 40 & 47 of the White Tanks ADMS
		③	Sheets 1-28 of the Buckeye 1, 2 & 3 Mapping

THESE ARE TRANSMITTED as checked below:

- For approval       Approved as submitted       Resubmit \_\_\_\_\_ copies for approval  
 For your use       Approved as noted       Submit \_\_\_\_\_ copies for distribution  
 As requested       Returned for corrections       Return \_\_\_\_\_ corrected prints  
 For review and comment       \_\_\_\_\_  
 FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_\_  PRINTS RETURNED AFTER LOAN TO US

REMARKS \_\_\_\_\_  
 \_\_\_\_\_  
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 \_\_\_\_\_  
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 \_\_\_\_\_  
 \_\_\_\_\_

COPY TO \_\_\_\_\_

SIGNED: Tim Mays



March 14, 1996

Mr. Tim Murphy  
FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
2801 W. Durango Street  
Phoenix, Arizona 85009

RE: FCD 95-34  
Delineation of Spillway Flows for  
Buckeye Structures 1, 2 and 3

Dear Mr. Murphy:

The following is a brief summary of items discussed or resolved as a result of our kick-off meeting held at the District office on February 28, 1996.

- The project schedule originally submitted as part of Stanley's fee proposal will be revised to reflect a start date of February 21, 1996 and completion date of June 30, 1996. A copy of the new project schedule dated revised February 29, 1996 is enclosed.
- A format for Stanley's monthly invoice was agreed on. Stanley will execute a standard MBE/WBE Participation Affidavit stating that the District has waived the participation requirement. No monthly MBE/WBE form will be required to be submitted with monthly invoices. Progress reports will be verbal or in the form of milestone or review meetings.
- It was mutually agreed that formal right of entry/public notification will not be required for this project because a) the results of the study will not have any regulatory impact on private property b) all land involved in field reconnaissance is vacant and accessible by public right-of-way, District land or established roadways.
- Stanley will contact the City of Buckeye Land Planning Department and City Engineer to inform them of the study and solicit their input with regard to future land use plans and public improvements. This input will be coordinated with the District and summarized by Stanley to be included in final report documents.
- The District will provide topography and base mapping to Stanley in the form of GIS coverages. All mapping provided by the District will have been rotated and translated to one common horizontal datum. Vertical datum will differ between the two base mapping coverages provided. Each sheet of the final floodplain exhibits will have a reference to the applicable vertical datum.
- The District provided discharge rates from the Dames and Moore Dam Break Analysis for Stanley to use. Discharges will be rounded to the nearest 100 cfs.



March 14, 1996  
FCD 95-34  
Page 2

- A format for the "n" value report was agreed to. A draft of the report will be submitted to the District prior to any hydraulic modeling.
- A breakdown of the area covered by each exhibit sheet, draft sheet border and title block and draft cover sheet will be submitted to the District for review before drafting is started. The desire is to have each spillway delineation contained on one final exhibit sheet. This may require a 36" x 42" sheet format. Each sheet will show the 1/3, 2/3 and full flow delineation limits.
- District staff has already assembled the property ownership and property boundary information from County Assessor records.
- The GIS coverages to be provided were reviewed. Afterward, it was agreed that Stanley's subconsultant, Cooper Aerial, who will be providing the required coverages, will meet with GIS staff members Marta Dent and Mark Brewer directly at the beginning of the study to review technical details. Coverages "FCD Project Map Index", "FCD Project Boundary" and "Data Quality" will be submitted very early in the study with the remaining coverages provided near the end of the study.
- A draft table of contents for the Technical Data Notebook (TDN) will be submitted by Stanley for approval by the District. The target schedule for this draft will be concurrent with the "n" value report. Various sections of the TDN will be submitted to the District for review as they are assembled.
- A field reconnaissance of the study area was conducted by Scott Buchanan of Stanley and Tim Murphy of the District on March 6, 1996. Of particular concern were the downstream limits of the study areas for Structures 2 and 3. The I-10 roadway and its associated drainage facilities will have a significant effect on the downstream limit and starting water surface assumptions. The number and hydraulic significance of existing roadway cross culverts and the location and extent of the downstream limit of study at structures 2 and 3 were probably underestimated in previously agreed to assumptions.

This concludes the summary of initial items and issues to the best of my recollection. If your understanding of these items and issues is different than I have stated, or if you would like to add comments or have any questions, please call me.

Sincerely,

STANLEY CONSULTANTS, INC.



G. Scott Buchanan  
Project Manager



# TELEPHONE CALL REPORT

Date: 3-18-96 Time: 10:00 Job No. 13084

To: DAVE CREIGHTON, RICHARD BAGLEY At: ADWR, TOWN OF BUCKEYE

From: SCOTT BUCHANAN At: SCI

Subject: FCD 95-34; DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES

I spoke with these two individuals about our study and told them they could expect letters soon explaining what we were doing and soliciting their input. The ADWR letter is addressed to Bill Jenkins but Dave Creighton said he would be the contact. The Buckeye letter is addressed to Richard Bagley, the Development Director for the Town of Buckeye but also solicits input from their Town Engineer. The Buckeye Town Engineer is Woody Scouten and he is not on Buckeye staff so we have to request his input thru Richard and Richard will decide whether it is appropriate for the Town to spend Woody's hourly fee to be involved.

Dave Creighton said that since the Buckeye structures are of State jurisdictional size, ADWR would be interested in receiving the final TDN for their record. It sounds as though Dave may have some review and comment of a technical nature that he intends to provide. If this occurs, I will recommend that Dave direct his comment to FCD for response as appropriate. Richard said he would appreciate a copy of the final TDN but did not say whether it would be forwarded to Woody for review. At this point, unless I hear otherwise from them, neither ADWR nor Buckeye seem to be interested in providing an intermedite review of the study but both would like a final copy of the TDN for their record.

Further Attention Required: Yes \_\_\_\_\_

No X

By

Scott Buchanan Date 3-18-96

DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)

APPENDIX B.1

HYDRAULIC PARAMETER ESTIMATION

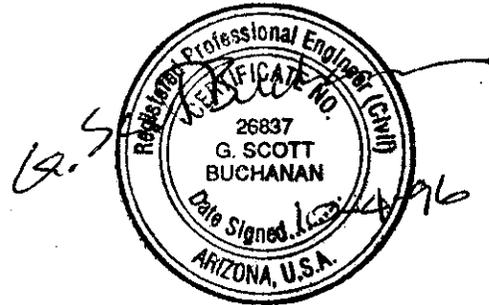


**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**HYDRAULIC PARAMETER ESTIMATION**

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## INTRODUCTION

This section is prepared in support of the hydraulic analysis for the Delineation of Spillway Flows for Buckeye Structures 1, 2 and 3 (FCD 95-34). It presents the basis for the estimation and use of Manning "n" values or "roughness coefficients" and for estimating expansion and contraction coefficients which are an integral part of the hydraulic analysis performed for each spillway overflow. A field reconnaissance trip in support of this section was made to the study area with Flood Control District staff on March 6, 1996.

The Buckeye Flood Retarding Structures 1, 2 and 3 are located in a primarily undeveloped desert area of west-central Maricopa County. The emergency spillways of these three structures were designed for very large, very rare floods. The full design discharge of these spillways is much greater in magnitude than the predominant local discharges which have formed, over time, the existing natural wash channels which receive this flow. Aside from the Interstate-10 roadway, there are little or no man-made improvements within the study limits that would significantly influence discharges from the emergency spillways. The I-10 improvements have been considered here in terms of their potential impact on flow characteristics. Depths of flow associated with the relatively large spillway discharges have been initially approximated to assist in the estimate of "n" values since "n" values can vary considerably with depth.

Due to the magnitude of flow, only a small portion will be conveyed within or in close proximity to existing wash channels. The bulk of the flow is anticipated to occur in overbank areas at depths ranging from one to perhaps eight feet. All three overflow spillway study areas are typically covered by a variety of native trees, brush, cacti and annual grasses including palo verde, mesquite, creosote, sage, desert broom and saguaro. Soils are predominantly fine-grained in texture. Natural wash channels generally have beds of coarse sand with some gravel and cobbles present. All three spillways are generally similar to each other in configuration and surface roughness.

## METHODOLOGY

The basic methodology used in this report for estimating Manning's roughness coefficients is presented in the primary reference:

**Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona; Prepared for Flood Control District of Maricopa County by the U.S. Geological Survey, Water Resources Division, April 1991.**

This reference contains methodology for estimating Manning's "n" for characteristic segments of floodplain channels and overbanks. It also presents suggested criteria for the subdivision of floodplain cross sections into primary components based on such considerations as channel geometry, flow depth, flow velocity and vegetation. This reference and its methodology is required under the scope of work for the Delineation of Spillway Flows for Buckeye Structures 1, 2 and 3. Although use of this reference will provide for greater consistency of results among different studies and eliminate some of the subjectivity involved in this aspect of floodplain hydraulics, a good deal of judgement and experience is still required and some degree of subjectivity remains.

The method for estimating Manning "n" values involves subdividing the study into areas and assigning an estimated, representative "n" value. In a floodplain delineation study, "n" values are required at each hydraulic cross section. Typically, they are provided as input data in one of two ways. For a conventional cross section where there is a single distinct channel and left and right overbank, each being substantially uniform in flow, surface material, vegetation, etc., three "n" values are provided. One "n" value is provided for each overbank and one for the channel. When the cross section has more than one channel or needs more than three "n" values to properly reflect roughness, the cross section is subdivided into segments and an "n" value is estimated for each segment. These segments are defined on the basis of cross section plots, aerial photographs and field reconnaissance with consideration to flow depth, channel bed or ground surface material, degree of uniformity, degree of obstruction and degree of vegetation. When a cross section is broken into "n" value segments, these "n" values are automatically composited in each model by computer algorithms.

In this study, there are generally no defined channel banks that would be of any significance to flows of emergency spillway magnitude. The entire cross section from beginning to ending station is considered "channel" in terms of HEC-2 and HEC-RAS hydraulic analysis. There is no left or right overbank.

According to the USGS roughness coefficient reference, the "n" value assigned to each segment of each cross section is an adjusted estimate which uses a base "n" value to which adjustment factors are added. The base "n" value depends on the type of channel bed or ground surface material. Adjustment "n" values are added to account for the degree of irregularity, effects of obstruction and effects of vegetation. In this format, the base "n" value is designed  $n_b$  and the adjustment "n" values for irregularity, obstruction and vegetation are termed  $n_1$ ,  $n_2$  and  $n_3$ , respectively.

A series of photographs are presented in this section to document representative channel and overbank "n" values that were used for each spillway delineation. Each photograph is captioned with a description and approximate location. Alongside each photograph is a breakdown of the estimated base and adjustment "n" values. These photographs were used as guidelines throughout the study area in the selection of the representative "n" values. Figures 3, 4, and 5 in this section show the location and direction of each photograph.

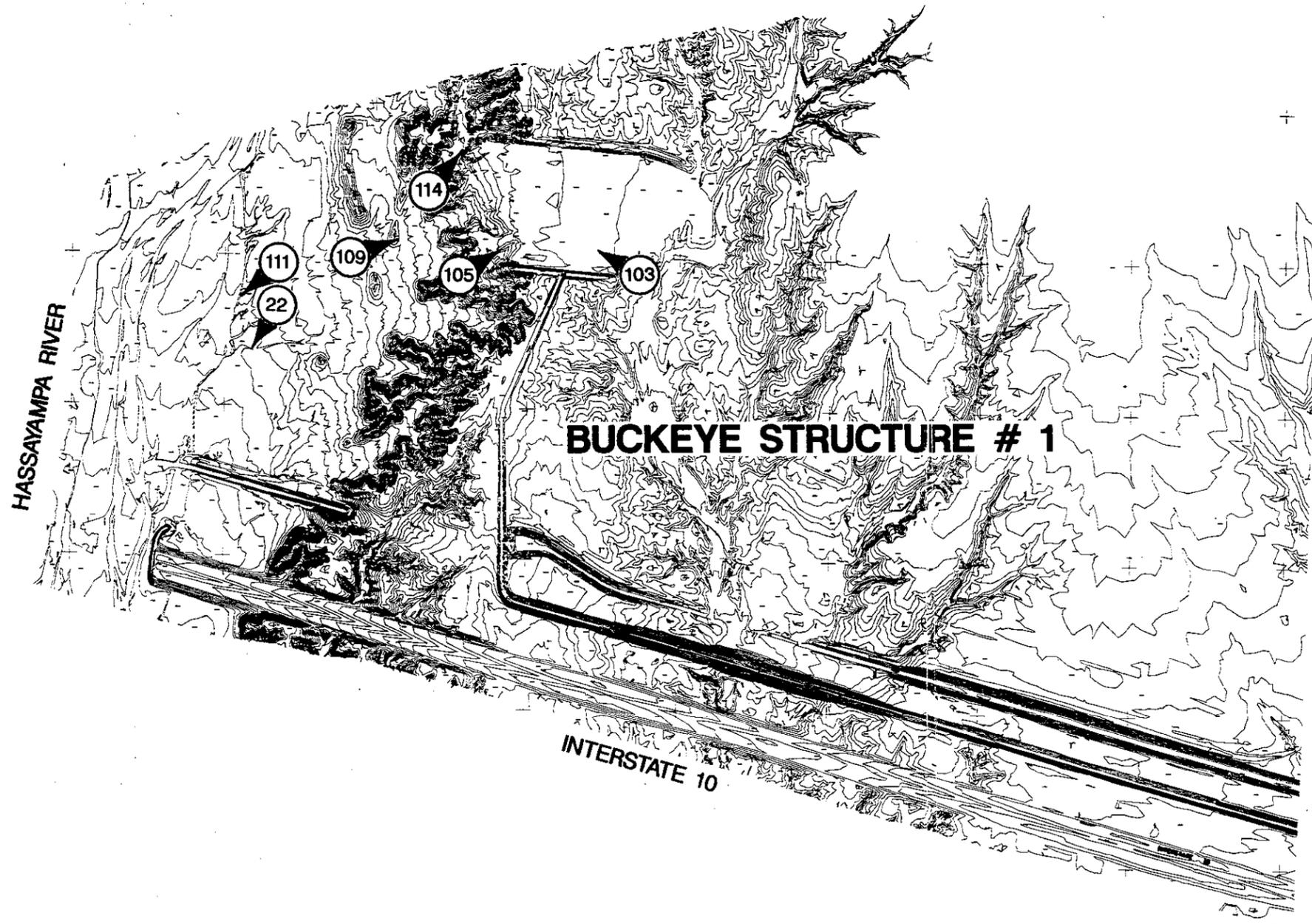
Many of the hydraulic sections in this study are fairly uniform in terms of roughness. At many sections, even where there are defined wash channels, a single "n" value can be estimated to represent the entire section. This is because the "n" values for wash channels and their adjacent areas in this study do not typically differ significantly. Also, channels typically only make up a small portion of the overall wetted perimeter of the cross section.

The approach involving a single "n" value that represents the entire cross section was used for most of this study. The "n" value varies, depending on the cross section and ranges from a low of 0.034 for a spillway cross section to a high of 0.048 for areas below the spillway. This approach was used for the entire Structure 1 delineation and for the Structures 2 and 3 delineations from their spillways down to Interstate-10. Cross sections for the #2 and #3 reaches along Interstate-10 have generally been divided into segments because "n" values differ significantly along each section.

In addition to roughness coefficients, the other data required for hydraulic analysis are coefficients for contraction and expansion of flow. Contraction and expansion coefficients of 0.1 and 0.3, respectively, were chosen and applied to areas within each spillway overflow that exhibited relatively uniform configuration of floodplain cross sections and where there was little influence by natural or man-made constrictions.

## RESULTS

A review of the hydraulic model results indicates a reasonable water surface profile for each spillway overflow area using the estimated "n" values considering what was anticipated based on general field observations. A review of calculated flow velocities in each hydraulic model also indicates that they fall in a reasonable range that one would anticipate given the physical characteristics of the study area.

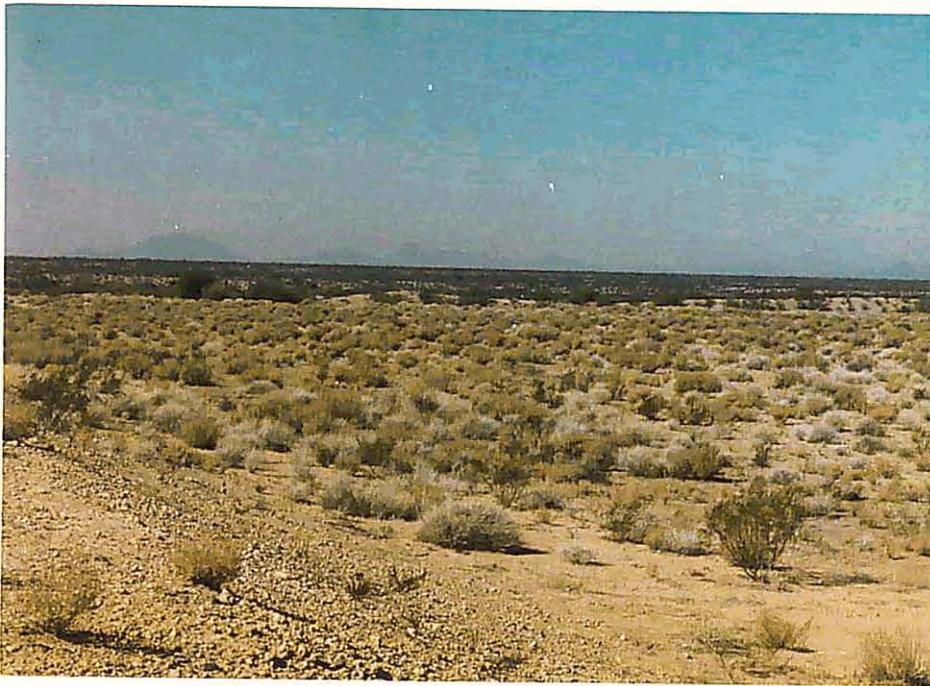


**FCD 95-34**  
**DELINEATION OF SPILLWAY FLOWS**  
**FOR**  
**BUCKEYE STRUCTURES 1, 2 AND 3**

 NOT  
 TO  
 SCALE

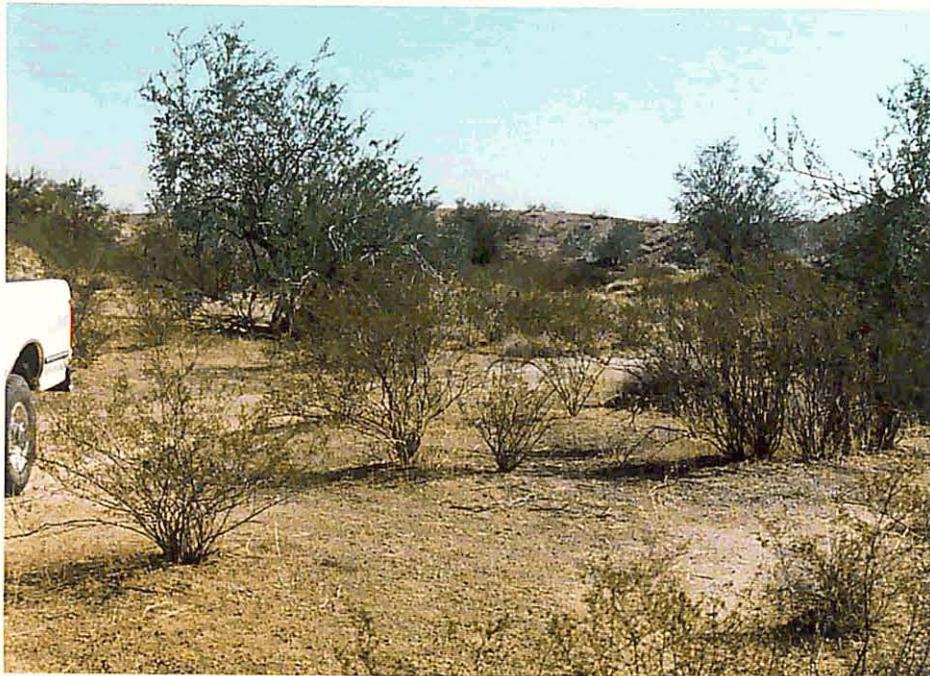
BUCKEYE STRUCTURE # 1  
 "n" VALUE PHOTO LOCATIONS

STANLEY CONSULTANTS # 13084 **FIGURE 3**



$n_b = 0.031$   
 $n_1 = 0.001$   
 $n_2 = 0.002$   
 $n_3 = 0.003$   
 Adjusted "n" = 0.037

**PHOTOGRAPH #103** Buckeye Structure #1. Emergency spillway looking northwest from the south bank. Cross section is uniform trapezoidal with a light to moderate growth of sage and creosote. Bottom width is about 800 feet with 2:1 sides. Expected depth of flow is on the order of 2 to 6 feet. Bed material is a firm gravelly soil with small angular cobbles present. Bank material is similar to bed material.

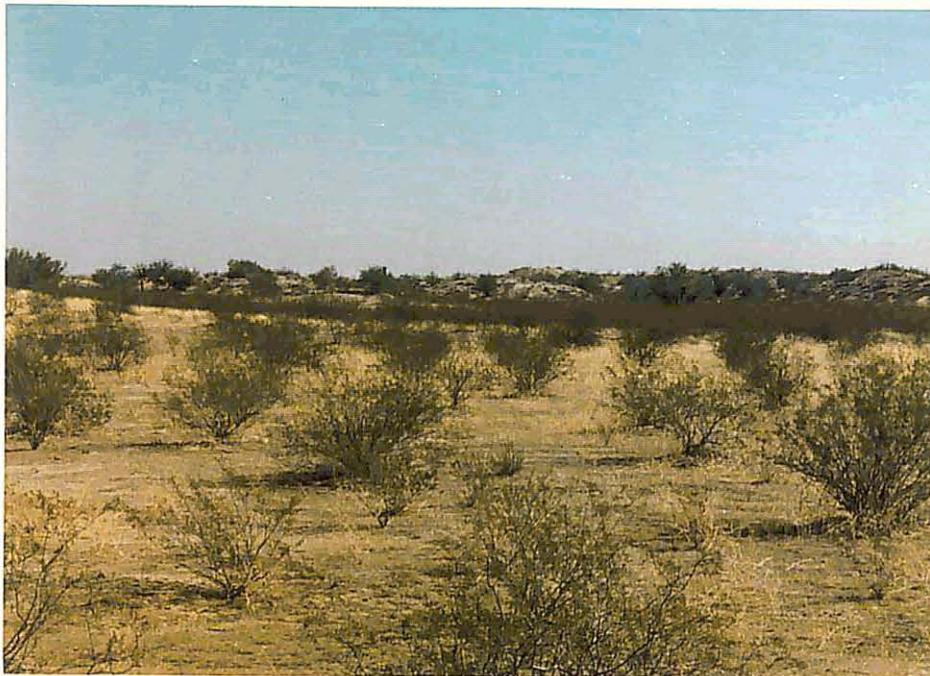


$n_b = 0.029$   
 $n_1 = 0.005$   
 $n_2 = 0.005$   
 $n_3 = 0.006$   
 Adjusted "n" = 0.045

**PHOTOGRAPH #105** Buckeye Structure #1. Typical overbank area immediately downstream from south side of spillway looking northeast. Vegetation is primarily creosote bush, native grass and ironwood trees. This is typical of the area just downstream from the spillway. Small wash channels are present but are insignificant in a hydraulic sense. Expected depth of flow is on the order of 2 to 6 feet. Soils are predominantly fine-grained.



**PHOTOGRAPH #114** Buckeye Structure #1. The area in this photo is almost identical to that in Photo #105 only it was taken near the north side of the spillway looking northeast. The same adjusted "n" value of 0.045 will be used.



**PHOTOGRAPH #109** Buckeye Structure #1. The area in this photo is almost identical to the area depicted in Photo #105 and Photo #114 with fewer trees. The same adjusted "n" value of 0.045 will be used.

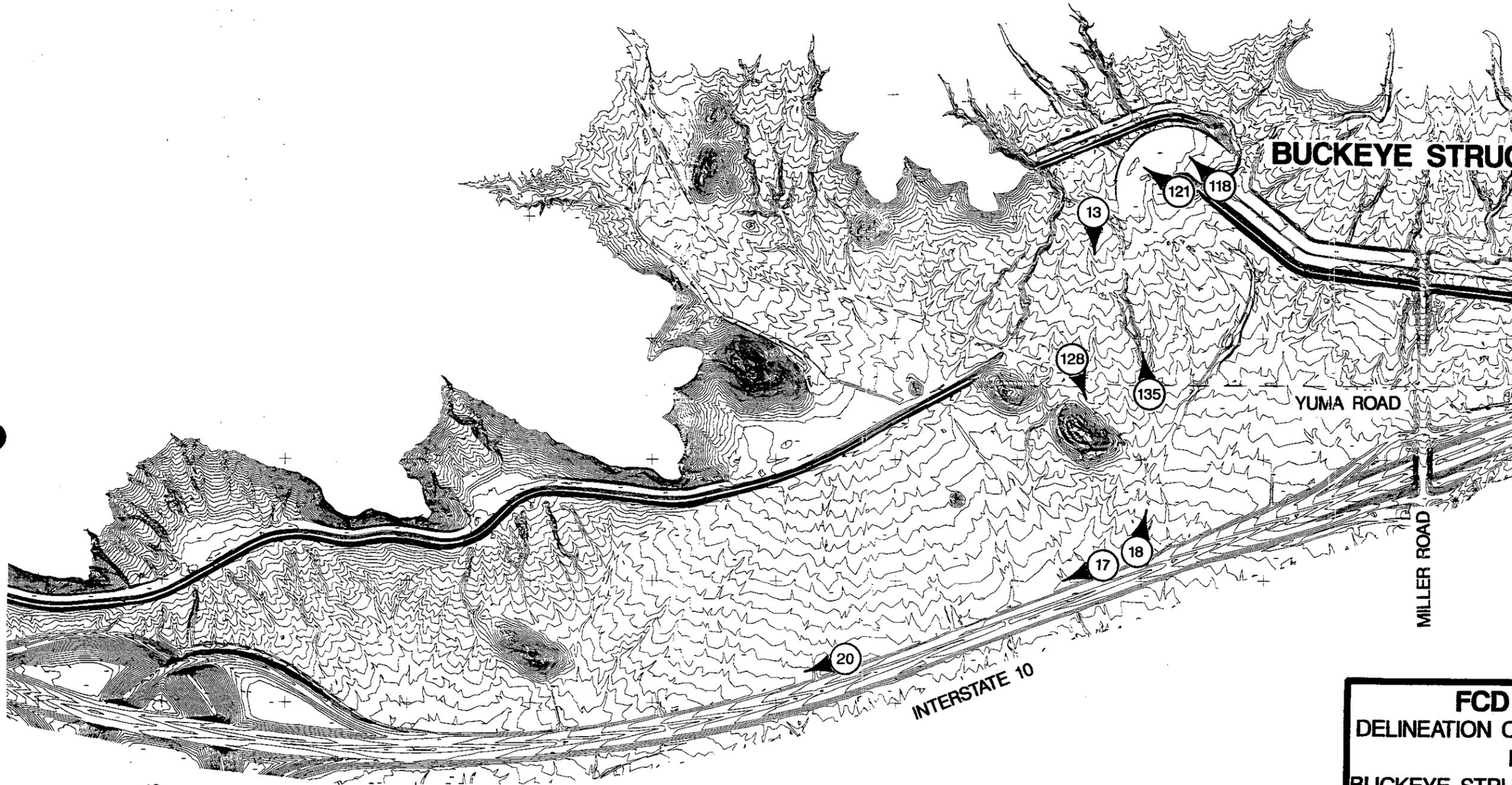


$n_b = 0.029$   
 $n_1 = 0.006$   
 $n_2 = 0.006$   
 $n_3 = 0.008$   
Adjusted "n" = 0.049

**PHOTOGRAPH #111** Buckeye Structure #1. Looking southwest near the 100-year floodplain limit of the Hassayampa River. Palo verde trees in the background are in the Hassayampa floodplain. Small wash channels are head-cutting up from the Hassayampa. Irregularity in the ground surface and the amount of vegetation are both greater than in the previous three photos. Flow is expected to be more shallow and spread out than it is near the spillway.



**PHOTOGRAPH #22** Buckeye Structure #1. The area in this photo is almost identical to the area depicted in Photo #111. The same adjusted "n" value of 0.049 will be used.



**BUCKEYE STRUCTURE # 2**

YUMA ROAD

MILLER ROAD

INTERSTATE 10

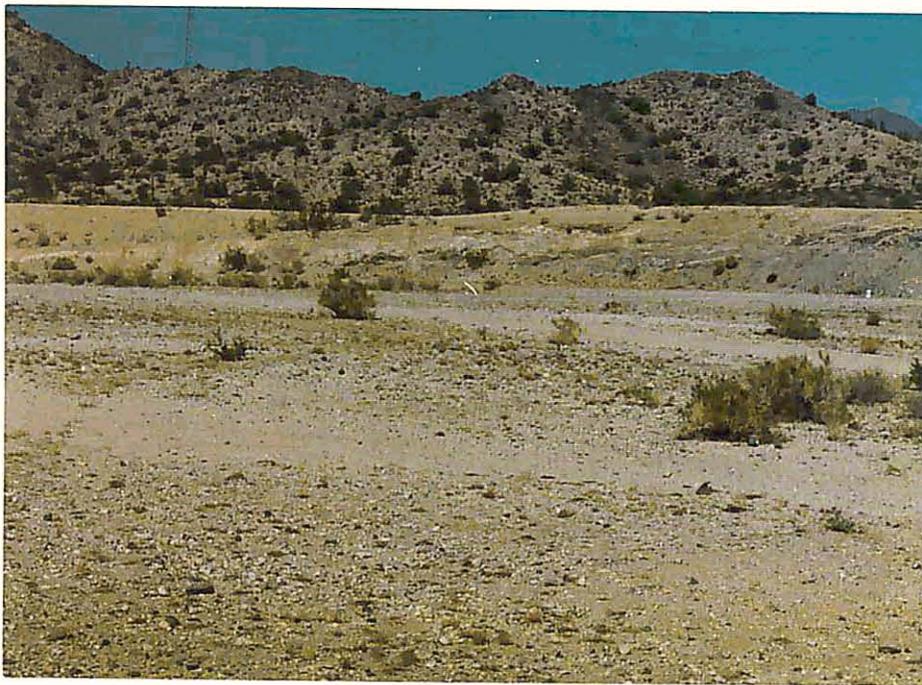
SR 85

**FCD 95-34**  
**DELINEATION OF SPILLWAY FLOWS**  
**FOR**  
**BUCKEYE STRUCTURES 1, 2 AND 3**

 NOT  
 TO  
 SCALE

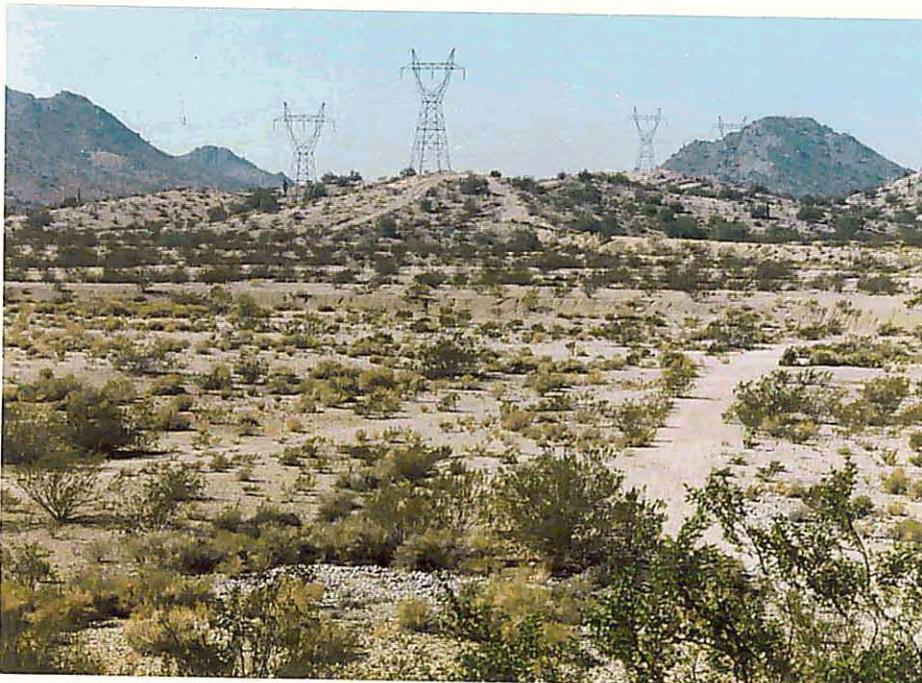
BUCKEYE STRUCTURE # 2  
 "n" VALUE PHOTO LOCATIONS

STANLEY CONSULTANTS # 13084 **FIGURE 4**



$n_b = 0.031$   
 $n_1 = 0.001$   
 $n_2 = 0.001$   
 $n_3 = 0.001$   
 Adjusted "n" = 0.034

**PHOTOGRAPH #118** Buckeye Structure #2. Emergency spillway looking northwest from south bank. Cross section is uniform trapezoidal and relatively free from obstruction and vegetation. Bottom width is about 350 feet. Expected depth of flow is on the order of 1 to 4 feet. Bed material is a firm gravelly soil with some cobbles present. Bank material is either similar to that found in the bed or consists of uniform, relatively smooth rock cut.



$n_b = 0.029$   
 $n_1 = 0.004$   
 $n_2 = 0.004$   
 $n_3 = 0.004$   
 Adjusted "n" = 0.041

**PHOTOGRAPH #121** Buckeye Structure #2. Emergency spillway looking west across lower end of spillway. Cross section is relatively uniform but more vegetation is present and small wash channels and minor bed irregularities are present compared to Photo #118. Adjusted "n" of 0.041 is intended as a composite value representative of the entire spillway cross section. Expected depth of flow is on the order of 1 to 4 feet. Soils are finer grained and less **cobby** than in Photo #118.



$n_b = 0.029$   
 $n_1 = 0.005$   
 $n_2 = 0.005$   
 $n_3 = 0.005$   
 Adjusted "n" = 0.044

**PHOTOGRAPH #13** Buckeye Structure #2. Looking south (or downstream) at typical overbank in the reach between the overflow spillway and about Yuma Road. Vegetation is primarily creosote with a slightly higher density than Photo #121. The "n" value for this overbank would need to be composite with channel "n" values found in this reach. Anticipated depth of flow in this area is on the order of 0 to 2 feet.



$n_b = 0.029$   
 $n_1 = 0.005$   
 $n_2 = 0.005$   
 $n_3 = 0.008$   
 Adjusted "n" = 0.047

**PHOTOGRAPH #128** Buckeye Structure #2. Looking south (or downstream) at typical overbank in the reach between about Yuma Road and just north of I-10. Adjustment for vegetation is slightly higher than in Photo #13 because of slight increase in vegetation density. Generally, soils seem to remain relatively uniform throughout the study reach with the exception of the spillway itself and the bed material found in wash channels which differ only slightly in terms of roughness. Vegetation density generally seems to increase slightly in the downstream direction from the spillway.

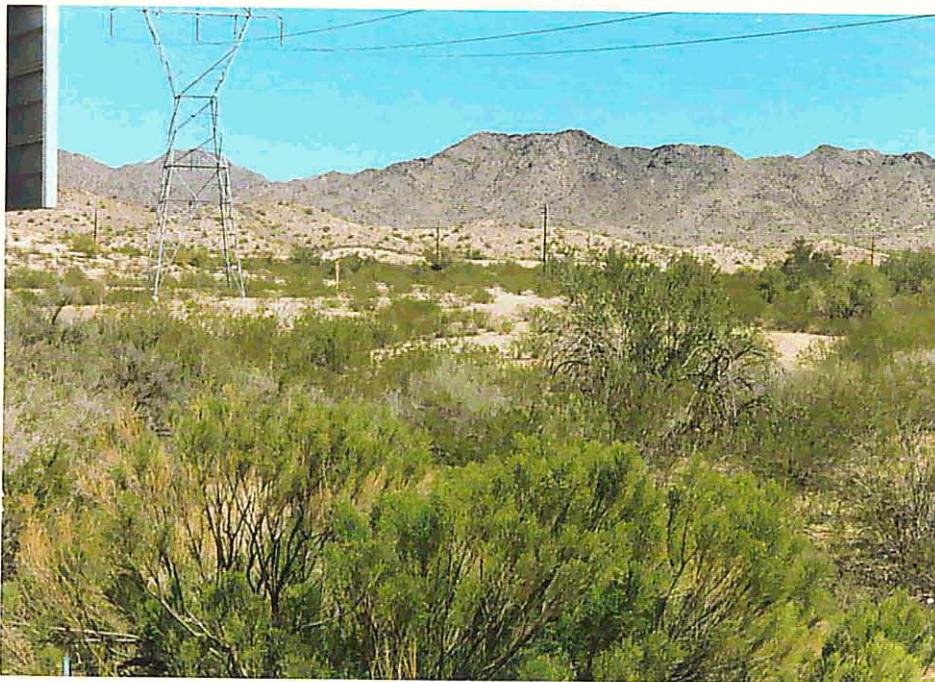


Overbank  
 $n_b = 0.029$   
 $n_1 = 0.007$   
 $n_2 = 0.007$   
 $n_3 = 0.013$   
 Adjusted "n" = 0.056

Channel  
 $n_b = 0.031$   
 $n_1 = 0.004$   
 $n_2 = 0.003$   
 $n_3 = 0.002$   
 Adjusted "n" = 0.040

Composite "n" = 0.048

**PHOTOGRAPH #135** Buckeye Structure #2. Looking north (upstream) within one of the main defined wash channels. Yuma Road crosses this wash channel in the middle of the photo. This channel is typical of the main flow channels beginning about 1000 feet south of the spillway and continuing downstream to I-10. Channel bottom ranges from 10 to 25 feet in width and the depth of channel ranges from 1 to 2 feet. Channel bed material consists of coarse sand with gravel and small cobbles. Expected depth of flow ranges from 1 to 4 feet. Composite "n" of 0.048 is based on the channel comprising an estimated half the wetted perimeter and the adjacent overbank comprising the other half.



$n_b = 0.029$   
 $n_1 = 0.007$   
 $n_2 = 0.007$   
 $n_3 = 0.011$   
 Adjusted "n" = 0.054

**PHOTOGRAPH #18** Buckeye Structure #2. Looking north (upstream) from I-10 where it intersects with one of the main wash channels. Vegetation is heavier than to the north and contains more variety. Main flow channel is hidden by vegetation. Heaviest concentrations of vegetation are within about 200 feet of I-10. Flows larger than capacity of I-10 culverts will be deflected to the southwest at this location by I-10 roadway embankment which is elevated from 5 to 8 feet higher than existing ground. Expected depth of flow is 4 to 6 feet.



Roadway Surface

"n" = 0.016

Roadway Embankment

$n_b = 0.029$

$n_1 = 0.002$

$n_2 = 0.002$

$n_3 = 0.002$

Adjusted "n" = 0.035

Right Overbank

$n_b = 0.029$

$n_1 = 0.008$

$n_2 = 0.007$

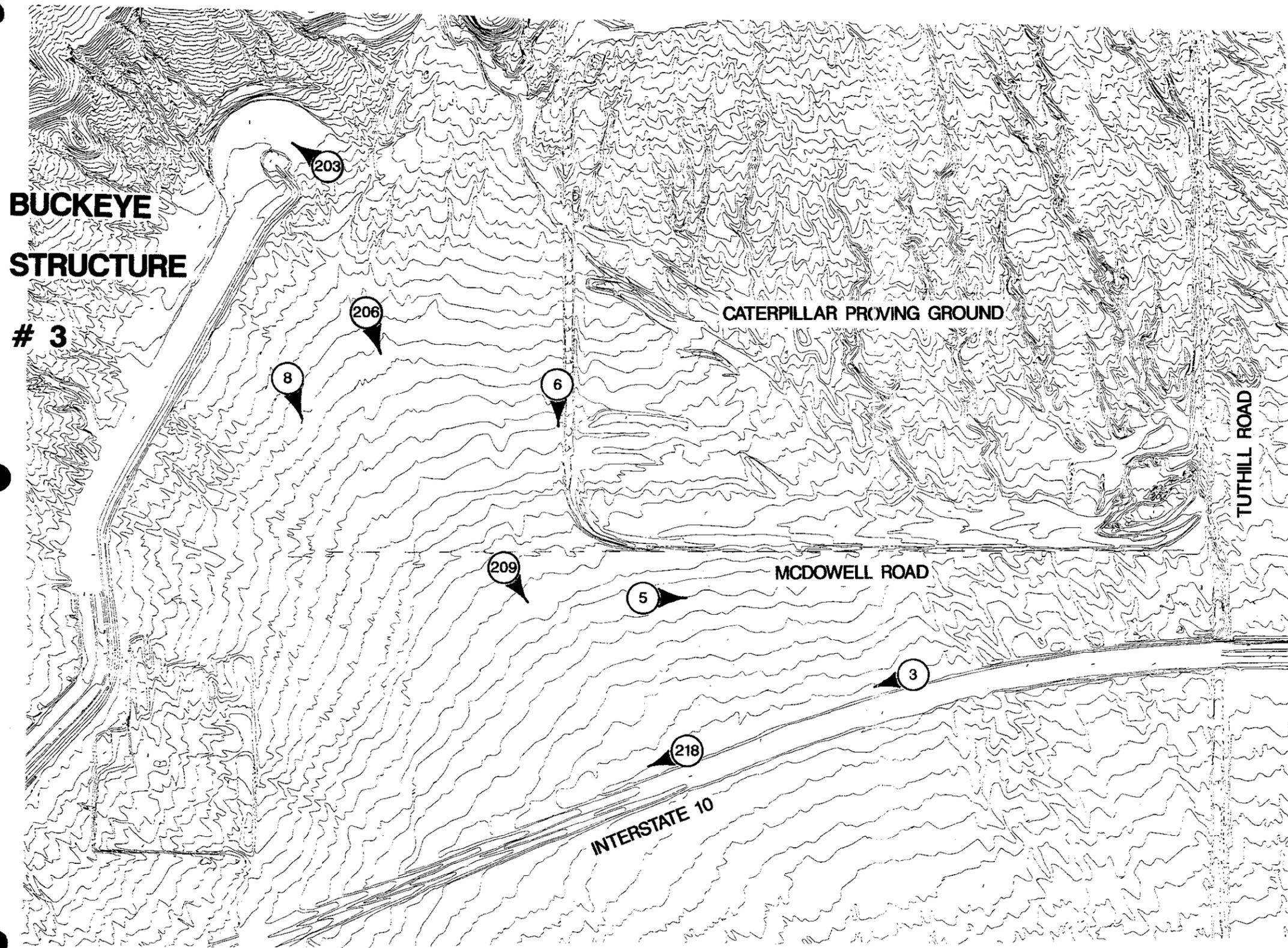
$n_3 = 0.009$

Adjusted "n" = 0.053

**PHOTOGRAPH #17** Buckeye Structure #2. Looking southwest (or downstream) along I-10 roadway embankment. Flows diverted along the roadway embankment go essentially perpendicular to the fall of the land and must cross wash beds and ridges of high ground between washes creating local irregularity in slope and cross section configuration. Vegetation would have a higher than normal adjustment since it is aligned in hedges along the wash channels and would be essentially perpendicular to spillway overflow. Existing barbed wire I-10 right-of-way fence runs parallel to flow but may present some additional obstruction due to debris caught on it.



**PHOTOGRAPH #20** Buckeye Structure #2. Looking southwest (or downstream) along the I-10 roadway embankment. Similar observations and description as in Photo #17. Note existing auxiliary earthen dike projecting north from roadway embankment at center of photo. Top of earthen dike is approximately 4 feet above the toe of the roadway embankment slope. These dikes are part of the I-10 offsite drainage system and are intended to hydraulically segregate each cross drainage culvert. Use same "n" value breakdown as in Photo #17.



**FCD 95-34**  
**DELINEATION OF SPILLWAY FLOWS**  
**FOR**  
**BUCKEYE STRUCTURES 1, 2 AND 3**

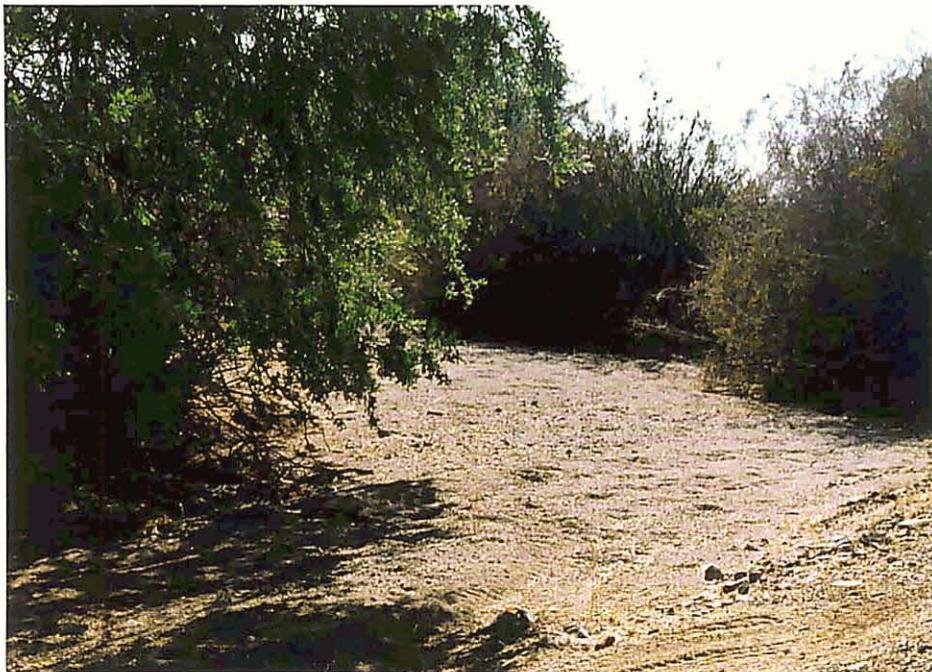
NOT  
 TO  
 SCALE

BUCKEYE STRUCTURE # 3  
 "n" VALUE PHOTO LOCATIONS



$n_b = 0.031$   
 $n_1 = 0.001$   
 $n_2 = 0.001$   
 $n_3 = 0.001$   
 Adjusted "n" = 0.034

**PHOTOGRAPH #203** Buckeye Structure #3. Emergency spillway looking north from the south bank. Cross section is uniform trapezoidal with virtually no vegetation. Bottom width is about 400 feet with 2:1 side slopes. Expected depth of flow is on the order of 2 to 5 feet. Bed and bank material both are firm gravelly soil with small cobbles. South side of spillway is armored with rip-rap.



Overbank  
 $n_b = 0.029$   
 $n_1 = 0.007$   
 $n_2 = 0.007$   
 $n_3 = 0.013$   
 Adjusted "n" = 0.056

Channel  
 $n_b = 0.031$   
 $n_1 = 0.004$   
 $n_2 = 0.003$   
 $n_3 = 0.002$   
 Adjusted "n" = 0.040

Composite "n" = 0.048

**PHOTOGRAPH #206** Buckeye Structure #3. Main flow channel looking south at a point about 1000 feet downstream of spillway. This channel is fairly typical of the main flow path from the spillway to McDowell Road. Channel bottom ranges from 10 to 25 feet in width and the depth of channel ranges from 1 to 2 feet. Channel bed material consists of coarse sand with gravel and small cobbles. Expected depth of flow ranges from 1 to 4 feet. Composite "n" value of 0.048 is based on the channel comprising an estimated half the wetted perimeter and the adjacent overbank comprising the other half.



Overbank  
 $n_b = 0.031$   
 $n_1 = 0.005$   
 $n_2 = 0.006$   
 $n_3 = 0.011$   
 Adjusted "n" = 0.053

Channel  
 $n_b = 0.029$   
 $n_1 = 0.003$   
 $n_2 = 0.003$   
 $n_3 = 0.002$   
 Adjusted "n" = 0.037

Composite "n" = 0.045

**PHOTOGRAPH #6** Buckeye Structure #3. Looking south (or downstream) along the earth embankment which provides drainage protection for the Caterpillar Proving Ground. The roadway in center of photo doubles as drainage conveyance along with the channel at left of photo. Both may carry spillway overflows on the far east side of hydraulic sections in the vicinity of McDowell Road. Composite "n" value of 0.045 is based on the channel comprising an estimated half the wetted perimeter and the adjacent overbank comprising the other half.



$n_b = 0.031$   
 $n_1 = 0.005$   
 $n_2 = 0.005$   
 $n_3 = 0.005$   
 Adjusted "n" = 0.046

**PHOTOGRAPH #8** Buckeye Structure #3. Looking south (or downstream) at the right overbank area. This photo represents typical overbank in the reach from the spillway to about McDowell Road. The expected depth of flow in this area ranges from 0 to about 3 feet. Soils are gravelly-sandy.



$n_b = 0.030$   
 $n_1 = 0.008$   
 $n_2 = 0.008$   
 $n_3 = 0.011$   
 Adjusted "n" = 0.057

**PHOTOGRAPH #209** Buckeye Structure #3. Looking southeast (or downstream) within the main flow area around McDowell Road. There is no "main" channel here but a series of small channels with beds of gravel and coarse sand which meander through the brush and trees. Vegetation is fairly heavy in the vicinity of these small washes. This wash system is perhaps 100-200 feet in width and located at the middle of the hydraulic section. Depths of flow here are expected to be on the order of 1 to 4 feet.



$n_b = 0.029$   
 $n_1 = 0.005$   
 $n_2 = 0.005$   
 $n_3 = 0.005$   
 Adjusted "n" = 0.044

**PHOTOGRAPH #5** Buckeye Structure #3. Looking east (or downstream) in the overbank area between McDowell Road and Interstate-10. This is the left, or north overbank. McDowell Road is at left side of photo. Soils are fine textured. Vegetation is primarily creosote. Depth of flow is expected to be on the order of 0 to 3 feet.



**PHOTOGRAPH #218** Buckeye Structure #3. Looking west (or upstream) along I-10 roadway embankment. This area is similar in nature to the area depicted in Photo #17, Buckeye Structure #2. Expected depth of flow is on the order of 2 to 5 feet. This area will utilize the same adjusted "n" values as in Photo #17. Roadway surface = 0.016; roadway embankment = 0.035 and overbank = 0.053.



**PHOTOGRAPH #3** Buckeye Structure #3. Looking west (or upstream) along the north side of I-10. This area will use the same "n" values as the area in Photo #17, Buckeye Structure #2 and Photo #218; Buckeye Structure #3.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**APPENDIX B.2**

**DATA FROM OTHER RELATED STUDIES**

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PHASE I REPORT

HYDROLOGIC ANALYSIS  
BUCKEYE FLOODWATER RETARDING  
STRUCTURES #1, #2, AND #3  
FOR  
FLOOD CONTROL DISTRICT  
OF  
MARICOPA COUNTY  
FCD PROJECT 88-63

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 **DAMES & MOORE**

D&M Job No. 15448-003-022  
January 23, 1990

Table 3.1

SUMMARY OF RESERVOIR ROUTING ANALYSES  
FOR BUCKEYE FRS SYSTEM

Units	Buckeye FRS #1			Buckeye FRS #2			Buckeye FRS #3			
	100-Year Storm	6-Hour FMP	72-Hour FMP	100-Year Storm	6-Hour FMP	72-Hour FMP	100-Year Storm	6-Hour FMP	72-Hour FMP	
<b>Reservoir Physical Parameters</b>										
Embankment Crest Elevation	feet	1088.0 <sup>a</sup>	1088.0 <sup>a</sup>	1088.0 <sup>a</sup>	1117.0	1117.0	1117.0	1170.0	1170.0	1170.0
Emergency Spillway Crest Elevation	feet	1079.8	1079.8	1079.8	1111.2	1111.2	1111.2	1163.2	1163.2	1163.2
Storage Volume Below Emergency Spillway Crest Elevation	acft	8,200	8,200	8,200	780	780	780	1,220	1,220	1,220
<b>Reservoir Inflow</b>										
Volume	acft	8,826	53,711	67,819	740	4,130	5,209	1,212	6,275	7,895
Peak Flow Rate	cfs	21,297	144,648	84,550	6,714	42,243	16,845	9,147	54,275	20,157
Time of Peak	hrs <sup>b</sup>	16.2	7.2	40.3	12.4	3.5	36.7	13.1	4.2	37.3
<b>Reservoir Routing</b>										
Maximum Water Surface Elevation	feet	1080.3	1089.9	1088.7	1110.9	1117.6	1115.4	1163.2	1170.7	1168.0
Minimum Freeboard	feet	7.7	0.0	0.0	6.1	0.0	1.6	6.8	0.0	2.0
Maximum Reservoir Storage Volume	acft	8,710	24,697	21,847	740	2,035	1,530	1,212	3,215	2,501
Maximum Reservoir Storage Volume as a Percentage of Storage Volume Below Emergency Spillway Crest Elevation	%	106	301	266	95	261	196	99	264	205
Time That Embankment Crest Overtopping Starts	hrs <sup>b</sup>	—	6.3	40.6	—	3.5	—	—	4.3	—
Maximum Depth of Embankment Crest Overtopping	feet	0.0	1.9 <sup>a</sup>	0.7 <sup>a</sup>	0.0	0.6	0.0	0.0	0.7	0.0
Duration of Embankment Crest Overtopping	hrs	—	3.7	4.0	—	0.8	—	—	0.8	—
Emergency Spillway Capacity at Embankment Crest Elevation	cfs	50,719	50,719	50,719	13,229	13,229	13,229	17,732	17,732	17,732
Total Reservoir Discharge	cfs	787	137,708	66,653	0	28,203	8,138	0	45,452	10,650
Percent of Total Reservoir Discharge which can be Passed Through Emergency Spillway Below Embankment Crest Elevation	%	100	37	76	—	47	100	100	39	100

<sup>a</sup> Buckeye FRS #1 embankment crest includes a 5580-foot-long level section at elevation 1088.0 feet, a 31,500-foot-long level section at elevation 1089.5 feet and a 600-foot-long sloping transition section between the two level sections

<sup>b</sup> After start of storm

FLOOD STUDY  
TECHNICAL DATA NOTEBOOK

for

WHITE TANKS/AGUA FRIA  
AREA DRAINAGE MASTER STUDY

APPENDIX I  
VOLUME 10 OF 15

*STAGE-STORAGE-DISCHARGE TABLES*  
*DIVERSION TABLES*  
*EXISTING DRAINAGE STRUCTURES*

Prepared for:  
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Prepared by:  
THE WLB GROUP, INC.  
333 East Osborn Road, Suite 380  
Phoenix, Arizona 85012  
(602) 279-1016

May 28, 1992

Subject WHITE TANKS / AGUA FRIA ADMS

Prepared by JSE

Date 7-17-90

STAGE - STORAGE - DISCHARGE TABLE

(L-10)

STA 6306+85

4-10' x 8' RC'S

AT CP43

ELEVATION	AREA	VOLUME	DISCHARGE	DEFLT
1081.16	0	0	0	0
1085.18	.26	0.52	920	0
1087.60	3.41	4.33	1824	0
1090.19	5.77	16.22	2976	0
1091.5	Top of Dike 7.47	24.89	3396	0
1092.0	8.13	28.79	3536	177
1092.5	9.09	33.09	3676	500
1093.0	10.05	37.88	3816	918
1094.81	11.02	56.95	4368	2096 to E

$C = 2.5$  Length = 200'

(depth) at .5  $Q = 177$  cfs

at 1.0  $Q = 500$  cfs

at 1.5  $Q = 918$  cfs

C = Coefficient of weir flow -

~~XXXXXXXXXXXX~~

**STA 6366+85**  
 BOX CULVERT ANALYSIS  
 COMPUTATION OF CULVERT PERFORMANCE CURVE  
 July 13, 1990

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
	<b>4-10' x 8' B.C.'s</b>
Culvert Span (Width of Opening) (feet).....	10.00
Culvert Rise (Height of Opening) (feet).....	8.00
FHWA Chart Number (8, 9, 10, 11, 12 or 13).....	8
Scale Number on Chart (Type of Culvert Entrance).....	1
Manning's Roughness Coefficient (n-value).....	0.0120
Entrance Loss Coefficient of Culvert Opening.....	0.50
Culvert Length (feet).....	227.0
Culvert Slope (feet per foot).....	0.0111

PROGRAM RESULTS:

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater Inlet Control (ft)	Headwater Outlet Control (ft)	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
229.7	1.00	4.02	2.98	1.57	2.54	1.57	14.67
456.0	1.50	6.44	4.41	2.49	4.01	2.49	18.31
744.5	2.00	9.03	6.72	3.52	5.56	3.52	21.16
1092.1	2.50	13.65	10.36	4.66	7.18	4.66	23.46
1497.2	3.00	19.96	15.42	5.91	8.00	5.91	25.34
1959.0	3.50	29.57	22.49	7.28	8.00	7.28	26.92

BOX CULVERT ANALYSIS COMPUTER PROGRAM Version 1.4 Copyright (c) 1986  
 Dodson & Associates, Inc., 7015 W. Tidwell, #107, Houston, TX 77092  
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## I-10 DRAINAGE STRUCTURES

### Location Stations

Tuthill Road - Sta. 6367 + 50  
Jackrabbit Trail - Sta. 6419 + 30  
Perryville Road - Sta. 6472 + 14  
Citrus Road - Sta. 6525 + 19  
Cotton Lane - Sta. 6578 + 09  
Sarival Avenue - Sta. 6630 + 84  
Reems Road - Sta. 6682 + 82  
Bullard Avenue - Sta. 6736 + 89  
Litchfield Road - Sta. 6789 + 18  
Dysart Road - Sta. 6841 + 45

<u>Station</u>	<u>Structure</u>	<u>Slope</u> ft/ft	<u>Length</u> ft	<u>Invert</u> <u>Elevation</u>
6247+05	1-36" CMP	.0156	244	1135.24
6255+85	1-30" CMP	.0120	266	1133.45
6261+65	1-30" CMP	.0112	240	1132.74
6267+60	1-30" CMP	.0115	260	1128.67
6273+88	1-36" CMP	.0146	287	1124.36
6288+25	2-36" CMP	.0162	216	1112.69
6305+22	2-42" CMP	.0075	200	1099.16
6315+00	2-36" CMP	.0088	224	1994.67
6319+32	1-48" CMP	.0098	234	1092.92
6321+33	1-48" CMP	.0112	214	1091.55
6323+05	1-48" CMP	.0078	218	1091.69
6324+32	2-48" CMP	.0080	212	1091.70
6326+40	1-36" CMP	.0096	208	1092.03
6330+50	1-36" CMP	.0086	208	1092.81
6335+25	1-36" CMP	.0098	204	1093.01
6340+10	1-36" CMP	.0081	198	1092.84
6343+25	1-36" CMP	.0081	200	1092.84

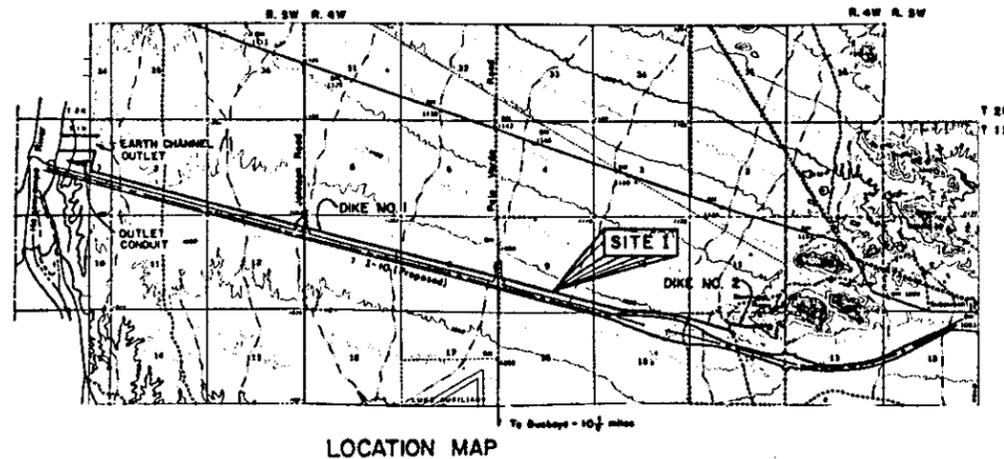
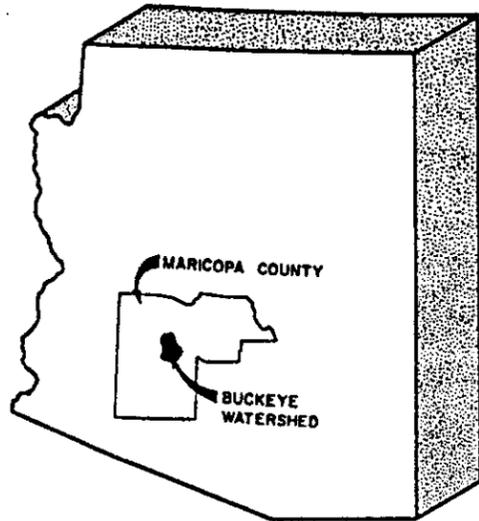
6345+65	1-36" CMP	.0120	210	1092.98
6349+45	1-36" CMP	.0121	280	1089.76
6354+00	1-36" CMP	.0154	254	1089.27
6357+00	1-36" CMP	.0116	266	1087.57
6360+85	1-36" CMP	.0054	258	1085.13
6366+63-6367+07	4-10'x8' BC	.0111	227	1081.16
6368+00	1-12'x12' BC	.0190	194	1083.98
6370+30	2-42" CMP	.0088	260	1084.26
6373+00	2-36" CMP	.0032	256	1083.11
6375+20	1-36" CMP	.0083	254	1084.37
6379+84	2-36" CMP	.0104	260	1083.43
6381+45	1-36" CMP	.0117	252	1083.45
6384+25	2-36" CMP	.0067	252	1081.82
6388+55	2-36" CMP	.0071	240	1081.16
6390+50	2-36" CMP	.0089	224	1082.94
6395+75	2-36" CMP	.0088	226	1080.00
6400+60	3-36" CMP	.0083	217	1078.36
6419+30	5-10'x4' BC	.0055	52	1065.41
6452+84-6453+48	5-10'x3' BC	.008	223	1053.60
6472+14	Perryville Road Bridge; BW = 68' SS = 2:1	.0167	165	1043.50
6486+00	4-36" RCP	.00675	256	1037.63
6498+35	3-36" CMP	.0049	206	1032.96
6525+19	Citrus Road Bridge; BW = 68' SS = 2:1	.0105	165	1022.10
6529+19	1-24" CMP	.0045	315	1023.33
6538+10	4-36" CMP	.0050	246	1020.36

6538+28	1-24" CMP	.0045	314	1020.36
6546+59	1-24" CMP	.0040	314	1017.20
6559+90	1-24" CMP	.0040	322	1012.50
6562+00	5-29"x45" HERCP	.00403	269	1014.93
6577+15	2-36" CMP	.0018	538	1009.20
6603+86 to 6606+68	4-Span Bridge over RID Canal; BW = 50' SS = 2:1	.0018	165	1007.00
6630+44	36" RGRCP	.0020	373	996.65
6630+84	Sarival Avenue Bridge; BW = 68' SS = 2:1	.0023	165	1001.70
6631+22	30" RGRCP	.0020	372	997.15
6653+00	5-29"x45" HERCP	.0054	228	1006.90
6656+10	24" CMP	.0054	308	1005.50
6656+50	24" CMP	.0054	308	1005.50
6664+91	30" RGRCP	.0010	303	1005.47
6665+37	6'x4' BC	.00028	359	999.70
6670+45	30" RGRCP	.0020	458	1000.70
6682+82	Reems Road Bridge; BW = 95' SS = 2:1	.0028	165	1002.50
6683+25	5'x4' BC	.0010	273	997.62
6706+84 to 6708+86	7-Span Bridge over Bullard Wash BW = 165' SS = 2:1	.0028	108	988.00
6750+35 to 6836+65	Detention Basin	-----	---	-----
6776+00 to 6777+14	48" RCP Between Detention Basins	.000837	114	975.71
6789+18 350' Lt.	2-77"x121" HERCP Across Litchfield Road Between Basins	.000337	182	974.58

# BUCKEYE WATERSHED PROTECTION AND FLOOD PREVENTION PROJECT MARICOPA COUNTY, ARIZONA

## PLANS FOR THE CONSTRUCTION OF SITE I DIVERSION STRUCTURE

PREPARED FOR THE FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
BY  
SOIL CONSERVATION SERVICE  
U.S. DEPARTMENT OF AGRICULTURE



### INDEX OF DRAWINGS

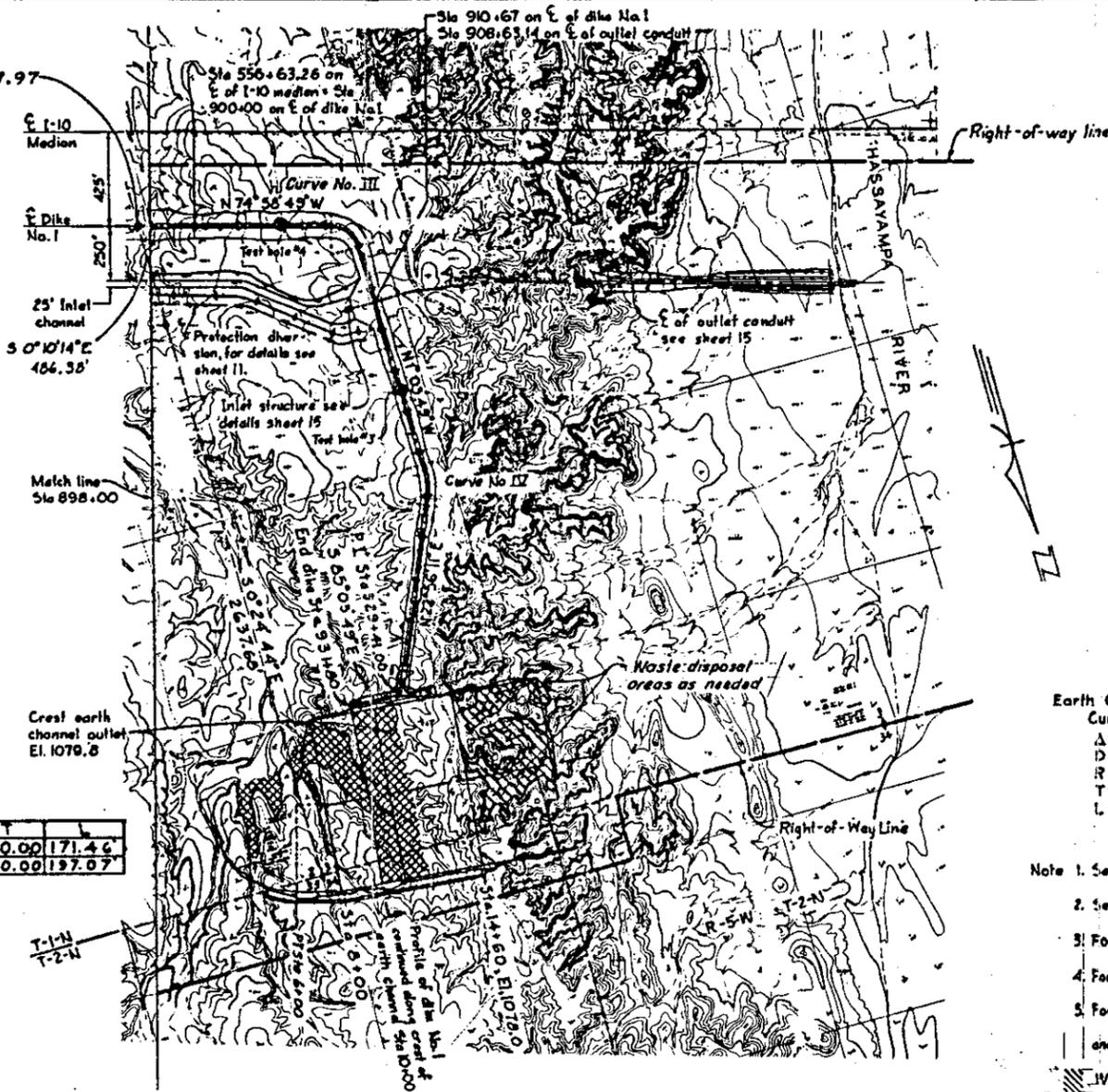
DRWG. NO.	SHT. NO.	TITLE	GENERAL NOTES	STRUCTURAL NOTES	DESIGN DATA	LEGEND
7-E-22084	1.	INDEX OF DRAWINGS	1. Elevations are in feet above mean sea level U.S.G.S. datum.	1. Exposed concrete edges shall be chamfered one inch or rounded.	Class 3,000 concrete f <sub>c</sub> = 3,000 psi f <sub>c</sub> = 1,200 psi f <sub>s</sub> = 20,000 psi n = 9 v = 60 psi	
	2-7.	PLAN & PROFILE OF DIKE NO. 1	2. All stationing refers to centerline of construction and is the measured horizontal distance.	2. Reinforcing bar spacing is center to center of bars. Bar cover is clear distance between surface of bar and face of concrete and shall be two inches for formed and top surfaces and three inches for surfaces placed against the earth unless otherwise shown.		
	8.	TYPICAL & MAXIMUM CROSS SECTIONS OF DIKE NO. 1	3. Soils are classified in accordance with the Unified Soils Classification System. Field logs are available in the Project Office, in Buckeye, Arizona.	3. In sections with a single mat of reinforcing, the steel shall be positioned in the center of the section unless otherwise shown.		
	9.	DETAILS OF DIKE NO. 2	4. All bearings are referenced to True North.	4. Reinforcing bars shall be continuous or spliced from floor and walls into adjacent floor and walls.		
	10.	PROTECTION DIVERSION STA 562+00 TO STA 605+00		5. Bar splices shall be lapped a minimum of 30 bar diameters but not less than 12 inches, unless specifically shown otherwise.		
	11.	PROTECTION DIVERSION STA 830+00 TO STA 910+00		6. All metal including anchor bolts, nuts, washers, etc. shall be galvanized steel unless otherwise noted.		
	12.	PALO VERDE ROAD RAMP DETAILS				
	13.	JOHNSON ROAD RAMP DETAILS				
	14.	EARTH CHANNEL OUTLET DETAILS				
	15.	PLAN AND PROFILE OF OUTLET CONDUIT				
	16.	ANTISEEP COLLAR LAYOUT AND DETAILS				
	17.	INLET STRUCTURE LAYOUT				
	18.	INLET STRUCTURE DETAILS				
	19.	OUTLET CONDUIT DETAILS				
	20.	PWD OUTLET STRUCTURE AND LAYOUT DETAILS				
	21.	CROSS SECTIONS OF INLET CHANNEL, OUTLET CONDUIT AND OUTLET CHANNEL				
	22.	IRRIGATION BORDER PLAN & PROFILE DETAILS OF OUTLETS				
	23-24.	GATED OUTLET DETAILS AT DIKE NO. 1 STA. 710+00 & STA. 817+00				
	25.	GATE STEM ASSEMBLY DETAILS AT DIKE NO. 1 STA. 710+00 & STA. 817+00				
	26.	PWD OUTLET STRUCTURES AT DIKE NO. 1 STA. 710+00 & STA. 817+00				
	27.	PLAN & PROFILE OF GEOLOGIC INVESTIGATIONS ON CONDUIT & EARTH CHANNEL OUTLETS				
	28-29.	PLAN & PROFILE OF GEOLOGIC INVESTIGATIONS ON E OF DIKE NO. 1				
	30-31.	PLAN & PROFILE OF GEOLOGIC INVESTIGATIONS ON BORROW				

**CENTRAL FILES**  
**DRAWINGS 211**

BUCKEYE WATERSHED SITE I  
DIVERSION STRUCTURE  
CONSTRUCTION PLANS  
7-E-22084

INDEX OF DRAWINGS BUCKEYE WATERSHED MARICOPA COUNTY, ARIZONA	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed... Soil Conservation Service... 7-71	Approved by... <i>Paula P. [Signature]</i>
Drawn... Soil Conservation Service... 7-71	Checked... <i>[Signature]</i>
Traced... <i>[Signature]</i>	Sheet No. 1 of 31
Checked... <i>[Signature]</i>	Drawing No. 7-E-22084

POS. Sta 897+37.97

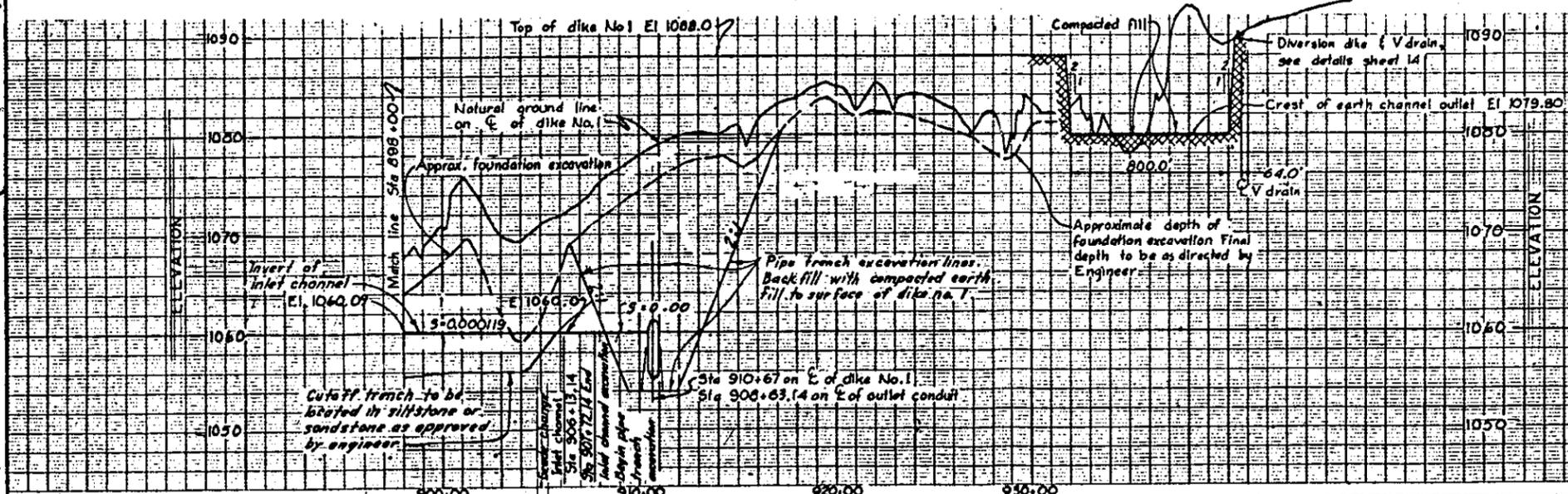


**DIKE No. 1 CURVE DATA**

Curve No.	P.C. Sta.	P.T. Sta.	P.T. Sta.	Δ	D	R	T	L
III	906+30.00	907+30.00	908+01.46	73°55'00"	43°06'31"	132.91	100.00	171.46
IV	916+51.46	919+51.46	920+48.53	24°00'00"	12°10'43"	470.46	100.00	197.07

**Earth Channel Outlet**  
 Curve Data  
 Δ = 80°00'  
 D = 14°19'26"  
 R = 400.00'  
 T = 335.64'  
 L = 558.51'

- Note 1. See sheet 14 for details of earth channel outlet.  
 2. See sheet 15 for details of inlet channel and outlet conduit.  
 3. For geologic profile on E Dike No. 1, see sheet 29.  
 4. For test hole locations and geologic profile of borrow, see sheet 31.  
 5. For test hole locations and geologic profile of E of outlet conduit and earth channel outlet, see sheet 27.
- Waste disposal areas as needed (see sheet 14)
- Compacted earth fill

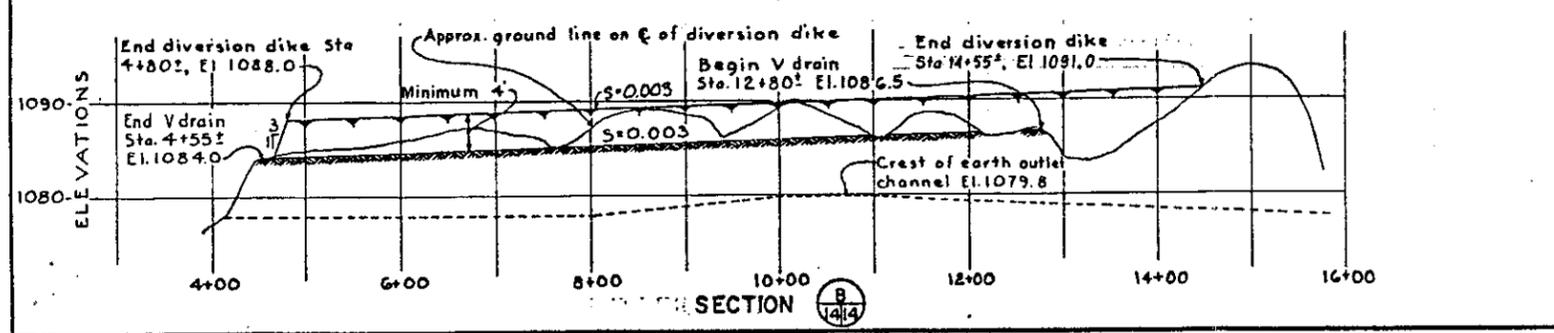
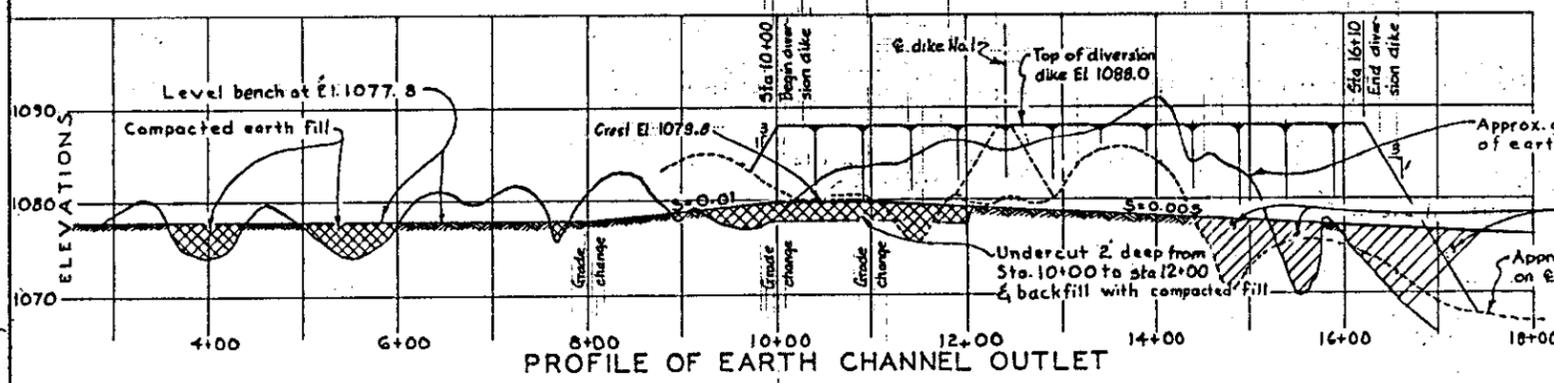
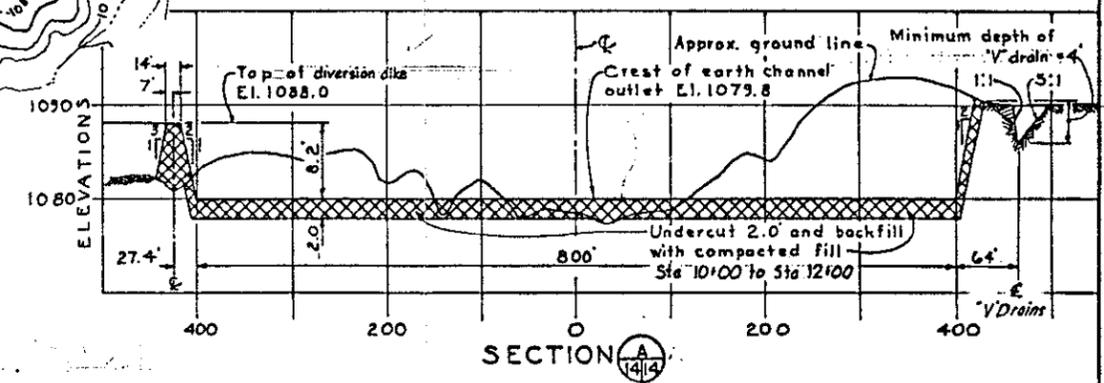
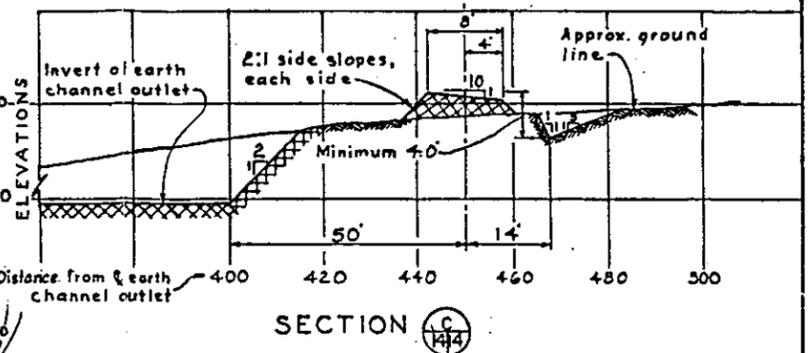
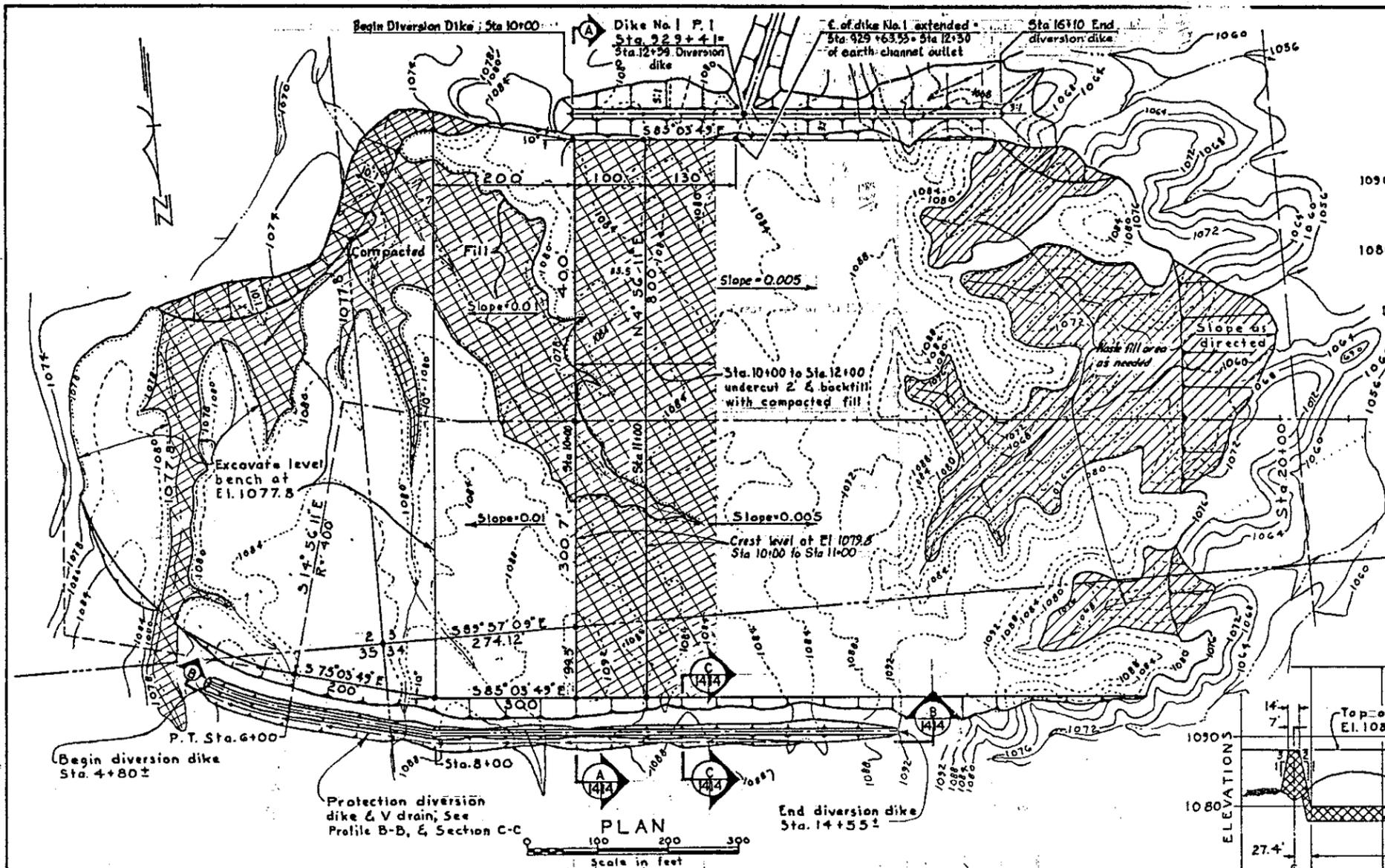


**PLAN & PROFILE ON DIKE NO. 1**  
 SITE 1

BUCKEYE, W. P. P.  
 MARICOPA COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE**  
**SOIL CONSERVATION SERVICE**

Designed <b>G. WATT</b>	Date	Approved by
Drawn <b>G. HANLEY</b>	5-24-71	Title
Checked <b>G.M.C. D.E.W.</b>	J-73	Sheet No. 7 of 31
		Drawing No. <b>7-E-22084</b>



- SYMBOLS**
- Waste fill
  - Compacted earth fill, undercut as shown
  - Finished excavated surface

**EARTH CHANNEL OUTLET DETAILS**

**SITE 1**

BUCKEYE W.P.P.  
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Designed G. WATT	Date	Approved by
Drawn G. HANLEY	3-11-71	Title
Traced		Title
Checked G.M.G., D.E.W.	1-78	Sheet No. 14 of 37
		Drawing No. 7-E-22084

REPRODUCTION

# BUCKEYE WATERSHED

## PROTECTION AND FLOOD PREVENTION PROJECT

### MARICOPA COUNTY, ARIZONA

# PLANS FOR THE CONSTRUCTION OF

# FLOODWATER RETARDING STRUCTURES 2 & 3

PREPARED FOR THE FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
BY  
SOIL CONSERVATION SERVICE  
U. S. DEPARTMENT OF AGRICULTURE

#### INDEX OF DRAWINGS

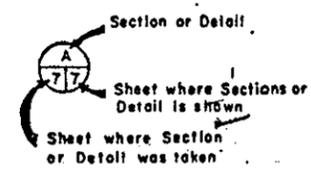
SHT. NO.	TITLE	SHT. NO.	TITLE
1.	INDEX OF DRAWINGS	32.	PRINCIPAL SPILLWAY DETAILS DAM NO. 2
2.	LOCATION MAP	33.	INLET STRUCTURE LAYOUT DAM NO. 2
3.	PLAN & PROFILE OF DAM NO. 3	34.	INLET STRUCTURE DETAILS DAM NO. 2
4.	PLAN & PROFILE OF DAM NO. 3	35.	CONDUIT DETAILS DAM NO. 2 & FLOODWAY NO. 2
5.	PLAN & PROFILE OF DAM NO. 3	36.	GATED OUTLET DETAILS DAM NO. 2
6.	EMERGENCY SPILLWAY DETAILS DAM NO. 3	37.	IRRIGATION BORDER OUTLET CROSS SECTIONS & PROFILES DAM NO. 2 & FLOODWAY NO. 2
7.	TYPICAL & MAXIMUM CROSS SECTIONS OF DAM NO. 3	38.	PRINCIPAL SPILLWAY & FLOODWAY PAYLINES
8.	PRINCIPAL SPILLWAY DETAILS DAM NO. 3	39.	PLAN & PROFILE OF FLOODWAY NO. 2
9.	INLET STRUCTURE & TRASH RACK DAM NO. 3	40.	PLAN & PROFILE OF FLOODWAY NO. 2
10.	INLET STRUCTURE DAM NO. 3	41.	PLAN & PROFILE OF FLOODWAY NO. 2
11.	CONDUIT DETAILS DAM NO. 3 & FLOODWAY NO. 3	42.	TYPICAL CROSS SECTIONS OF FLOODWAY NO. 2
12.	GATED OUTLET DETAILS DAM NO. 3	43.	TYPICAL CROSS SECTIONS OF FLOODWAY NO. 2
13.	IRRIGATION BORDER OUTLET CROSS SECTIONS & PROFILES DAM NO. 3 & FW NO. 3	44.	R.W.D. OUTLET STRUCTURE DAM NO. 2
14.	GATED OUTLET DETAILS DAMS NO. 2 & 3	45.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS DAM NO. 2
15.	GATE STEM ASSEMBLY DETAILS DAMS NO. 2 & 3	46.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS DAM NO. 2 & EMERGENCY SPILLWAY
16.	R.W.D. OUTLET STRUCTURE DAMS NO. 2 & 3	47.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS PRINCIPAL SPILLWAY & FLOODWAY NO. 2
17.	PLAN & PROFILE OF FLOODWAY NO. 3	48.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS FLOODWAY NO. 2
18.	IMPACT BASIN DETAILS FLOODWAY NO. 3	49.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS FLOODWAY NO. 2
19.	IMPACT BASIN DETAILS FLOODWAY NO. 3	50.	FENCE INSTALLATION PLAN DAM NO. 3
20.	IMPACT BASIN DETAILS FLOODWAY NO. 3	51.	FENCE INSTALLATION PLAN DAM NO. 2
21.	IMPACT BASIN DETAILS FLOODWAY NO. 3	52.	FENCE INSTALLATION PLAN FLOODWAY NO. 2
22.	IMPACT BASIN DETAILS FLOODWAY NO. 3	53.	FENCE INSTALLATION PLAN SITE 1
23.	BAFFLE CHUTE FLOODWAY NO. 3	54.	FENCE INSTALLATION PLAN SITE 1
24.	BAFFLE CHUTE FLOODWAY NO. 3	55.	FENCE INSTALLATION PLAN SITE 1
25.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS DAM NO. 3	56.	FENCE DETAILS
26.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS DAM NO. 3	57.	IDENTIFICATION SIGN
27.	PLAN & PROFILES FOR GEOLOGIC INVESTIGATIONS DAM NO. 3 & FLOODWAY NO. 3		
28.	PLAN & PROFILE OF DAM NO. 2		
29.	PLAN & PROFILE OF DAM NO. 2		
30.	EMERGENCY SPILLWAY DETAILS DAM NO. 2		
31.	TYPICAL CROSS SECTIONS OF DAM NO. 2		

#### GENERAL NOTES

1. Elevations are in feet above mean sea level U.S.G.S. datum.
2. All stationing refers to centerline of construction and is the measured horizontal distance.
3. Soils are classified in accordance with the Unified Soils Classification System. Field logs are available in the Project Office, in Buckeye, Arizona.
4. All bearings are referenced to True North.

#### STRUCTURAL NOTES

1. Exposed concrete edges shall be chamfered one inch or rounded.
2. Reinforcing bar spacing is center to center of bars. Bar cover is clear distance between surface of bar and face of concrete and shall be two inches for formed and top surfaces and three inches for surfaces placed against the earth unless otherwise shown.
3. In sections with a single mat of reinforcing, the steel shall be positioned in the center of the section unless otherwise shown.
4. Reinforcing bars shall be continuous or spliced from floor and walls into adjacent floor and walls.
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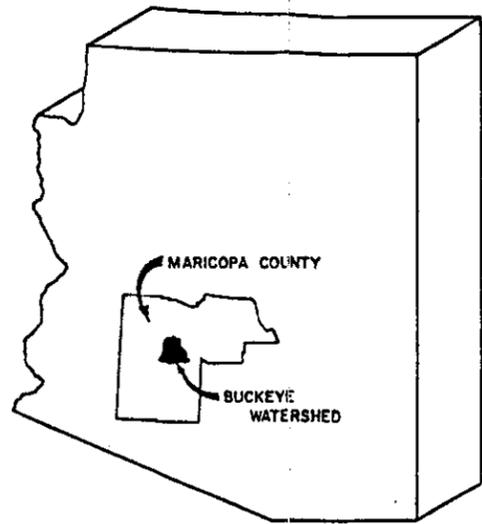
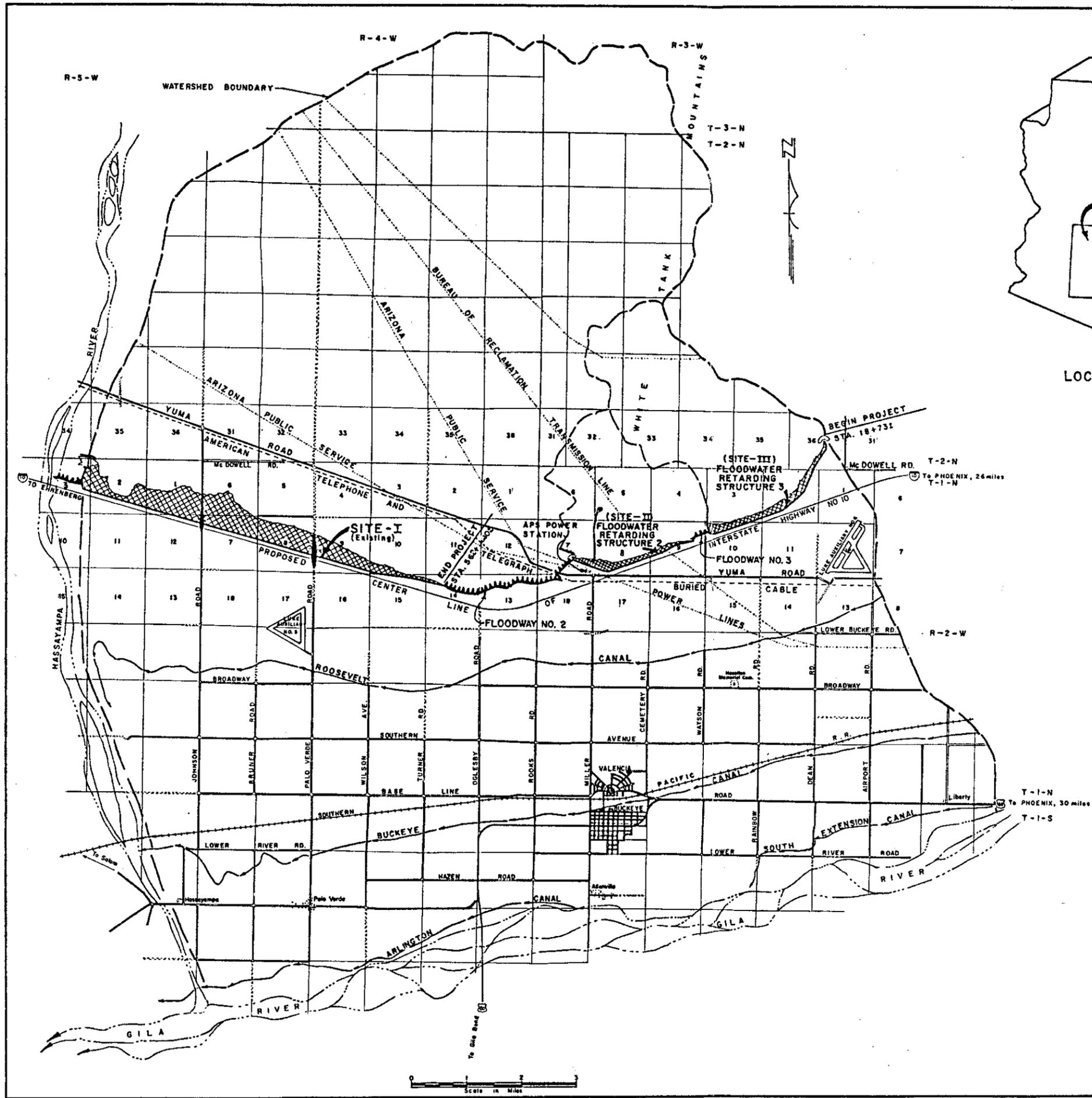


FILE COPY

Buckeye FRS 2 & 3  
Construction Plans 1974  
7-E-23079

211

INDEX OF DRAWINGS			
BUCKEYE FLOODWATER RETARDING STRUCTURES 2 & 3			
BUCKEYE W. P. P.			
MARICOPA COUNTY, ARIZONA			
U.S. DEPARTMENT OF AGRICULTURE			
SOIL CONSERVATION SERVICE			
DESIGNED	DATE	DRAWN BY	
Soil Conservation Service	1-74	David M. Amington	
DRAWN	DATE	CHECKED BY	
Soil Conservation Service	1-74	David M. Amington	
TITLE	SHEET NO.		
BUCKEYE W. P. P.	474		
CHECKED	DATE	DRAWING NO.	
474	1-74	7-E-23079	



LOCATION MAP

**LEGEND**

- Floodwater Retarding Structure
- Floodway
- Existing Road Ramp Crossings



LOCATION MAP  
**BUCKEYE FLOODWATER  
 RETARDING STRUCTURES 2 & 3**  
 BUCKEYE W. P. P.  
 MARICOPA COUNTY, ARIZONA

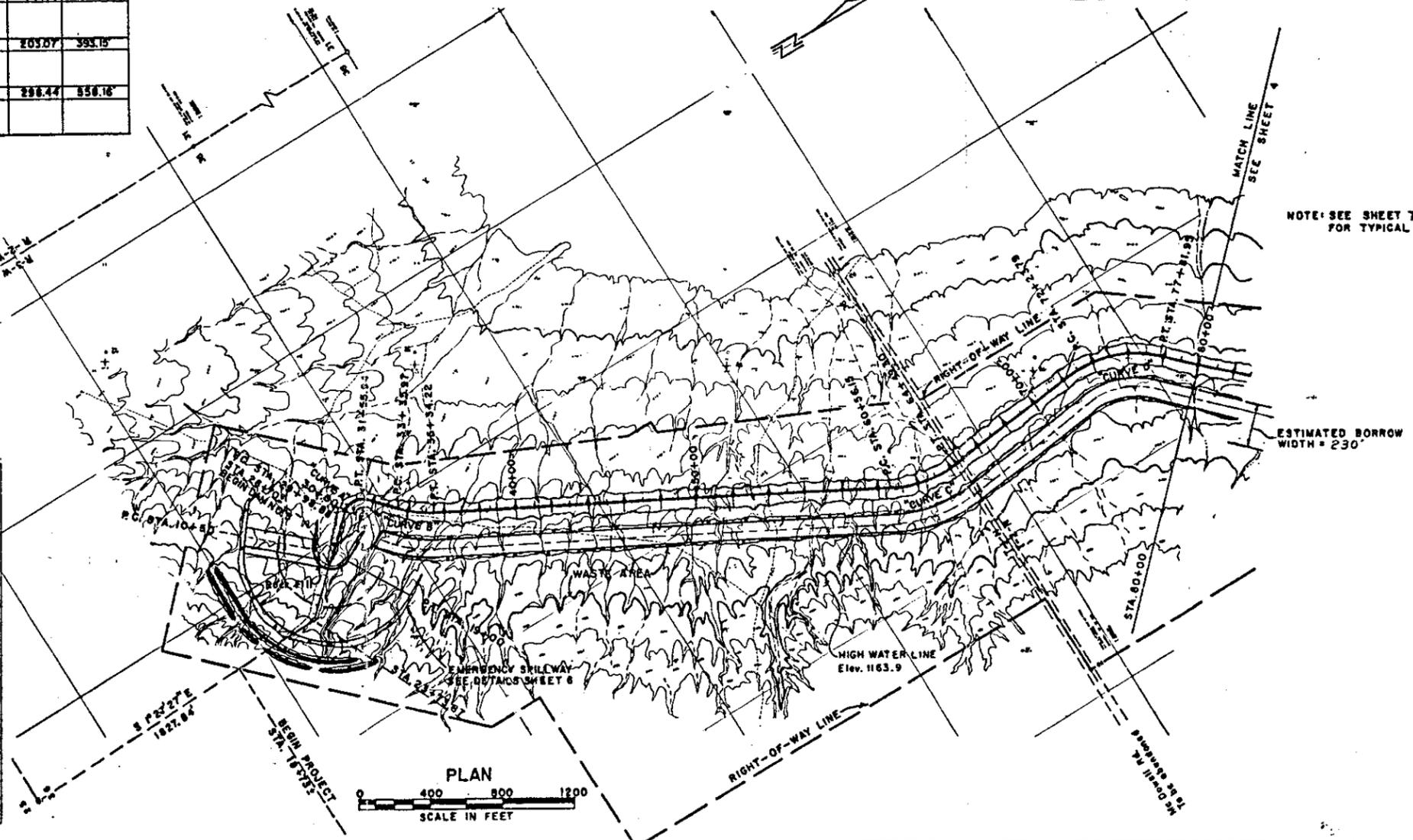
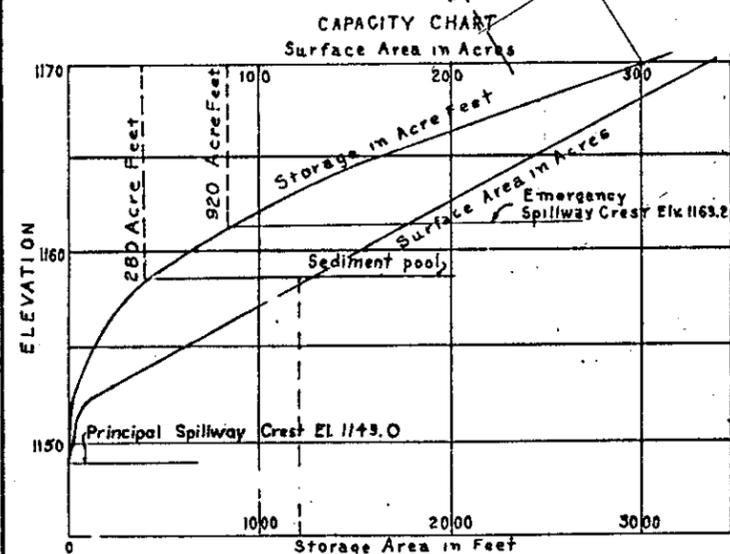
**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed <b>G. WATT</b>	Date <b>5-71</b>	Approved by _____
Drawn <b>G. HANLEY</b>	Date <b>6-71</b>	Title _____
Traced _____	Title _____	Sheet _____
Checked <b>J.L.S., P.J.M.</b>	Date <b>2-74</b>	Drawing No. <b>7E-23079</b>

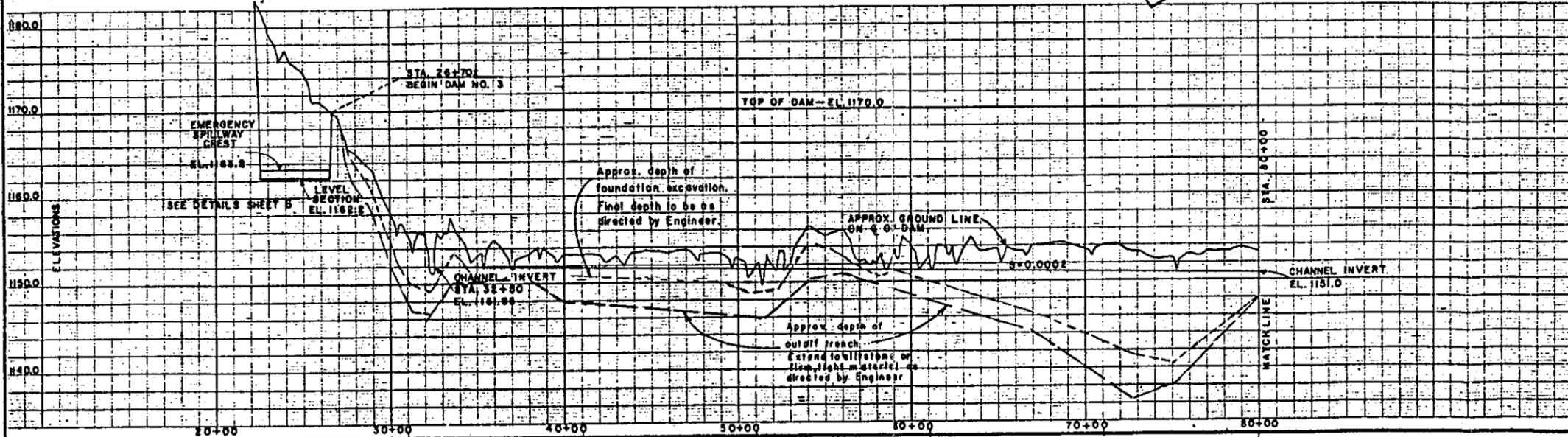
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DESCRIPTION				DAM CURVE DATA					
CURVE	STATION	POINT	BEARING	DISTANCE	Δ	D	R	T	L
	23+73.87	BEGIN	S 42° 37' 37" E	725.0'					
A	29+98.88	P.C.			90° 01' 10"	37° 18' 47"	99.97'	100.00'	157.07'
	31+55.94	R.T.	S 47° 03' 13" W	380.03'					
B	33+35.97	P.C.			18° 31' 40"	9° 20' 44"	613.09'	100.00'	198.25'
	34+35.97	R.T.							
	35+34.22	R.T.	S 28° 31' 33" W	2828.00'					
C	40+36.15	P.C.			35° 22' 40"	8° 59' 54"	636.73'	203.07'	393.15'
	42+36.22	R.T.							
	44+49.30	R.T.	S 6° 51' 07" E	1276.00'					
D	72+23.78	P.C.			50° 15' 40"	0° 59' 55"	636.70'	288.44'	556.16'
	75+22.23	R.T.							
	77+81.95	R.T.	S 43° 22' 33" W	516.49'					
	80+00.00	M.L.							

CHANNEL CURVE DATA					
CURVE	Δ	D	R	T	L
B	18° 31' 40"	7° 02' 48"	813.09'	132.62'	262.93'
C	35° 22' 40"	6° 50' 35"	636.73'	266.06'	516.65'
D	50° 15' 40"	13° 07' 13"	436.70'	204.69'	582.83'



NOTE: SEE SHEET 7 FOR TYPICAL SECTION



PLAN & PROFILE OF DAM NO. 3  
BUCKEYE FLOODWATER  
RETARDING STRUCTURES 2 & 3  
BUCKEYE W.P.P.  
MARICOPA COUNTY, ARIZONA

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

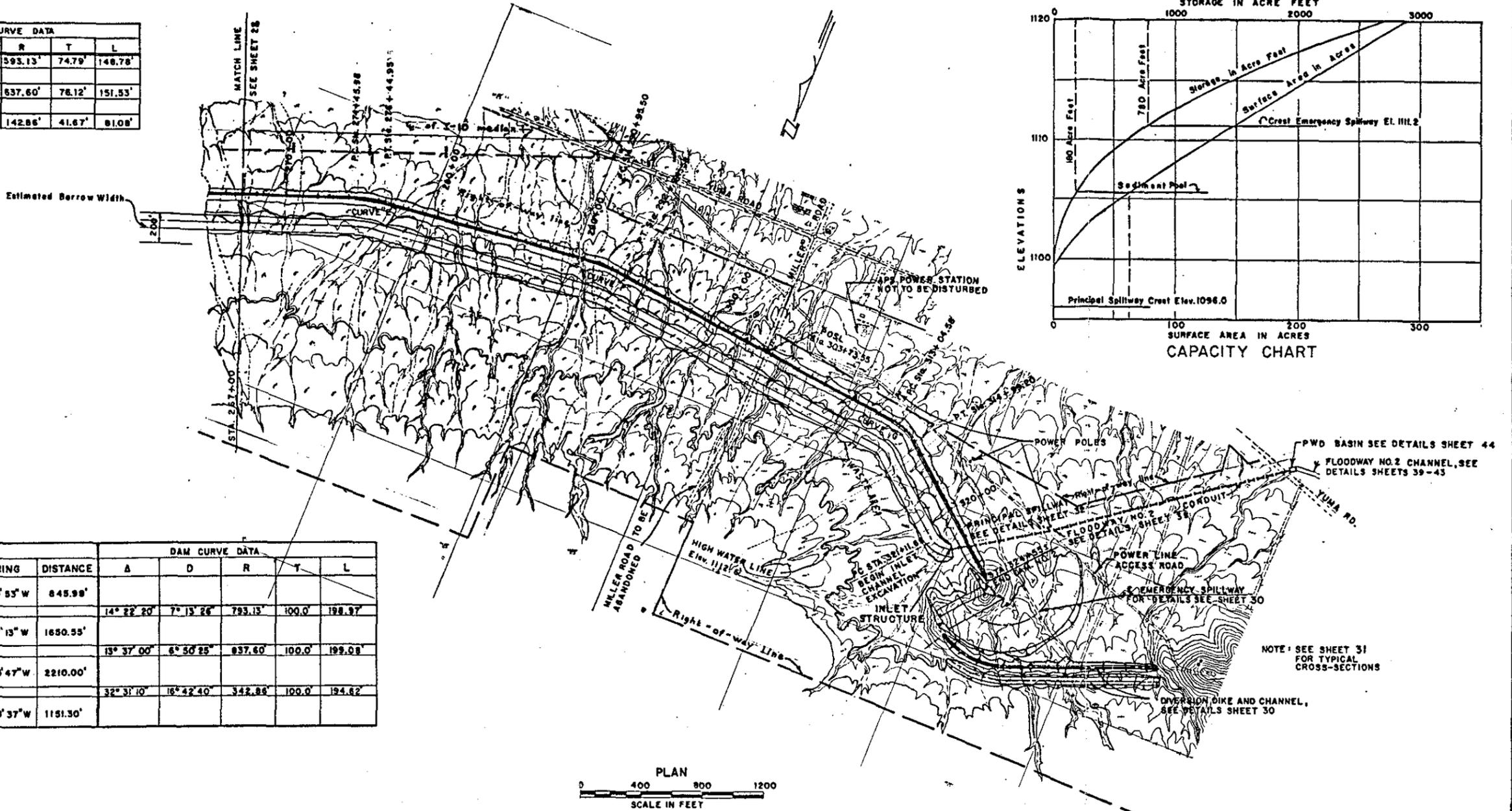
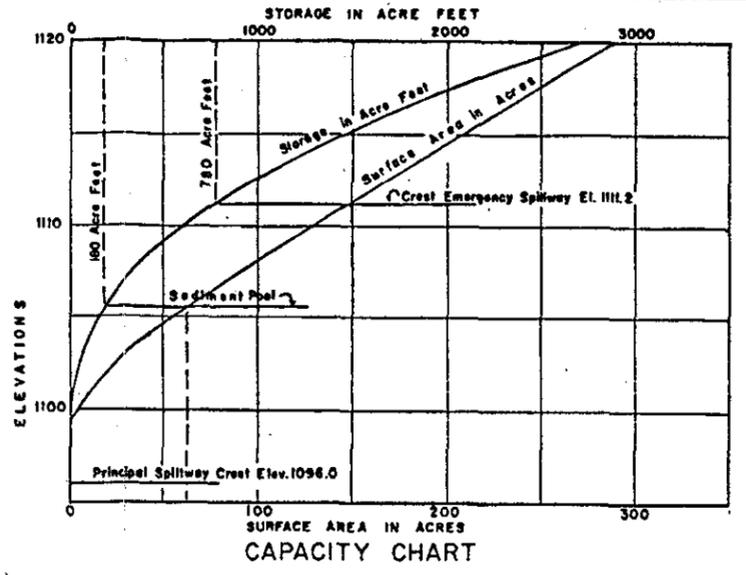
Designed by G. WATT Date 6-72  
Drawn by R. SLOCUM Date 6-72  
Checked by J.L.S. P.J.M. Date 1-74

Approved by \_\_\_\_\_  
Title \_\_\_\_\_  
Sheet No. 3 of 3  
Drawing No. 7E-23079

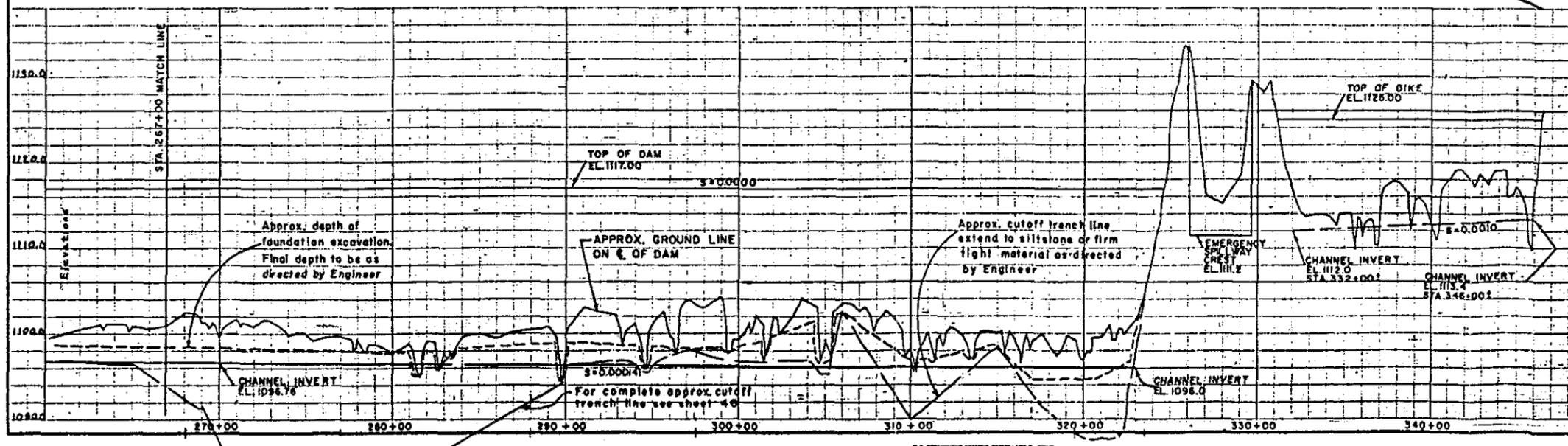
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CHANNEL CURVE DATA					
CURVE	A	D	R	T	L
"E"	14° 22' 20"	9° 39' 36"	393.13'	74.79'	146.78'
"F"	13° 37' 00"	8° 59' 10"	637.60'	78.12'	151.53'
"G"	32° 31' 10"	40° 06' 22"	142.86'	41.67'	81.08'



DESCRIPTION					DAM CURVE DATA				
CURVE	STATION	POINT	BEARING	DISTANCE	A	D	R	T	L
	267+00.00	M.L.							
	274+45.98	P.C.	S68°34'53"W	845.98'					
"E"	275+45.98	P.I.			14° 22' 20"	7° 13' 26"	393.13'	100.0'	198.97'
	276+44.95	P.T.							
	290+85.50	P.C.	S83°17'13"W	1650.55'					
"F"	291+85.50	P.I.			13° 37' 00"	6° 50' 25"	637.60'	100.0'	199.08'
	292+84.58	P.T.							
	313+04.98	P.C.	N83°05'47"W	2210.00'					
"G"	314+04.98	P.I.			32° 31' 10"	16° 42' 40"	142.86'	100.0'	194.62'
	314+99.20	P.T.							
	328+80.80		N80°34'37"W	1151.30'					



**PLAN & PROFILE OF DAM NO. 2  
 BUCKEYE FLOODWATER  
 RETARDING STRUCTURES 2 & 3  
 BUCKEYE W.P.P.  
 MARICOPA COUNTY, ARIZONA**

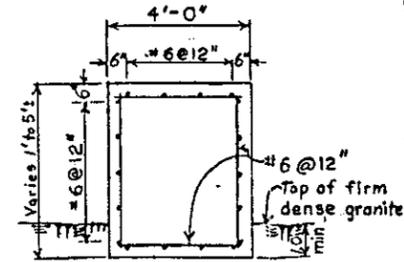
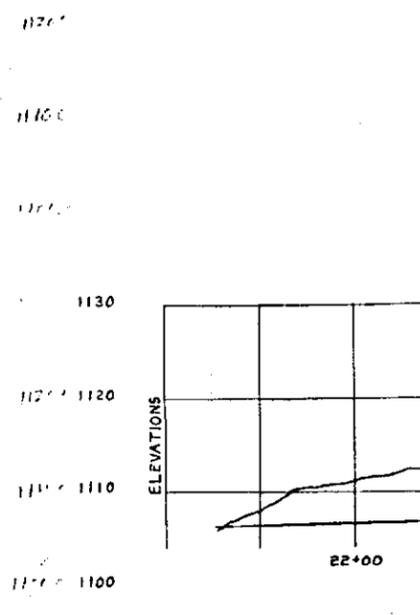
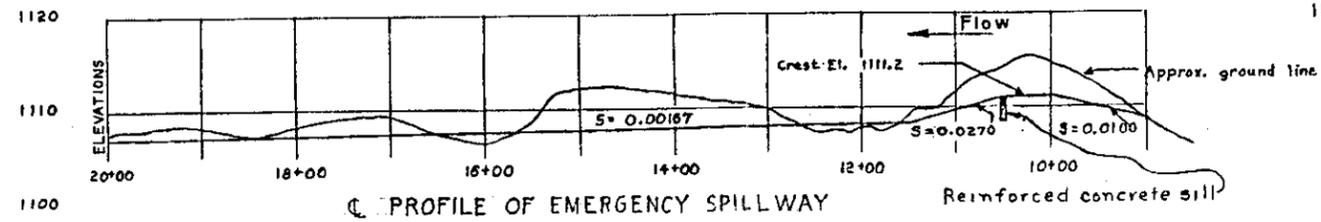
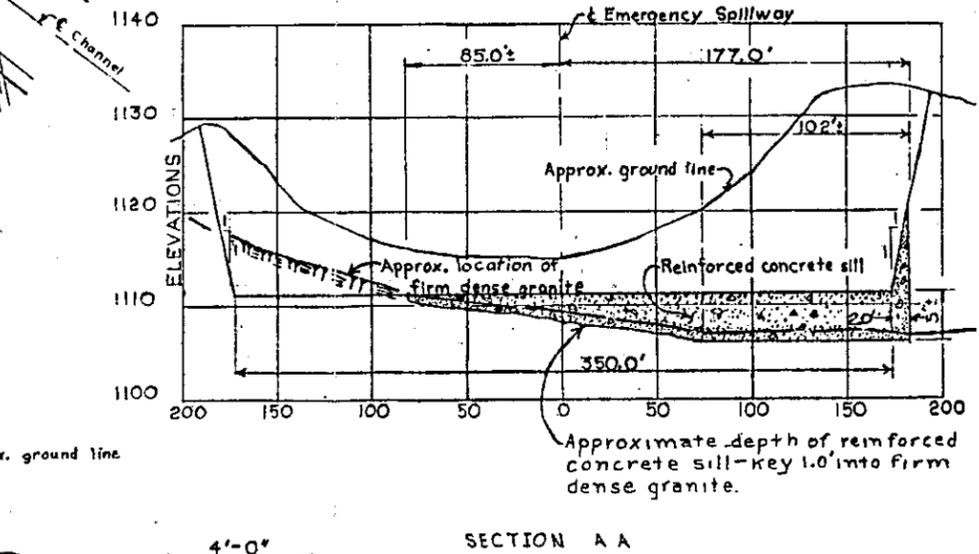
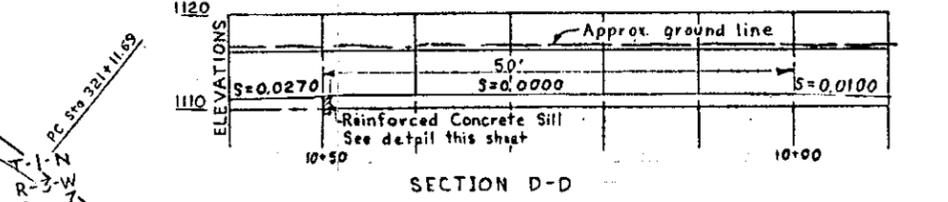
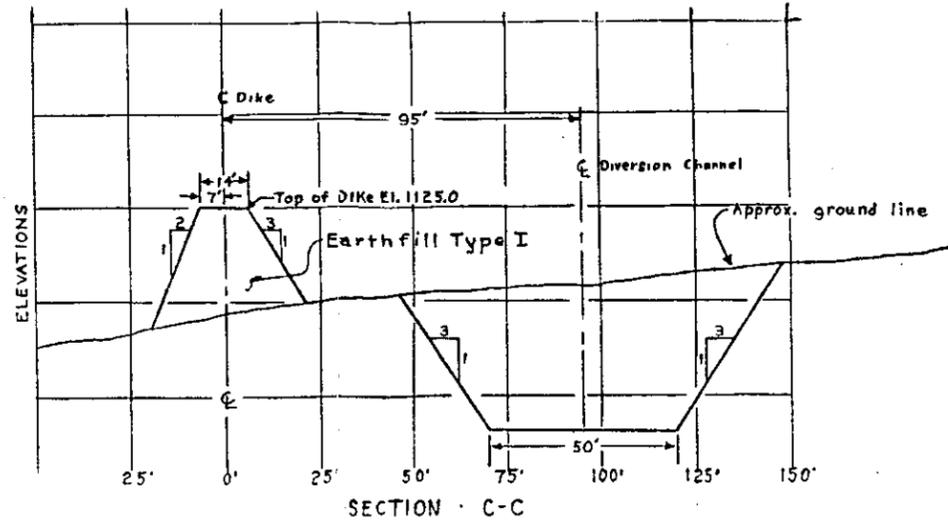
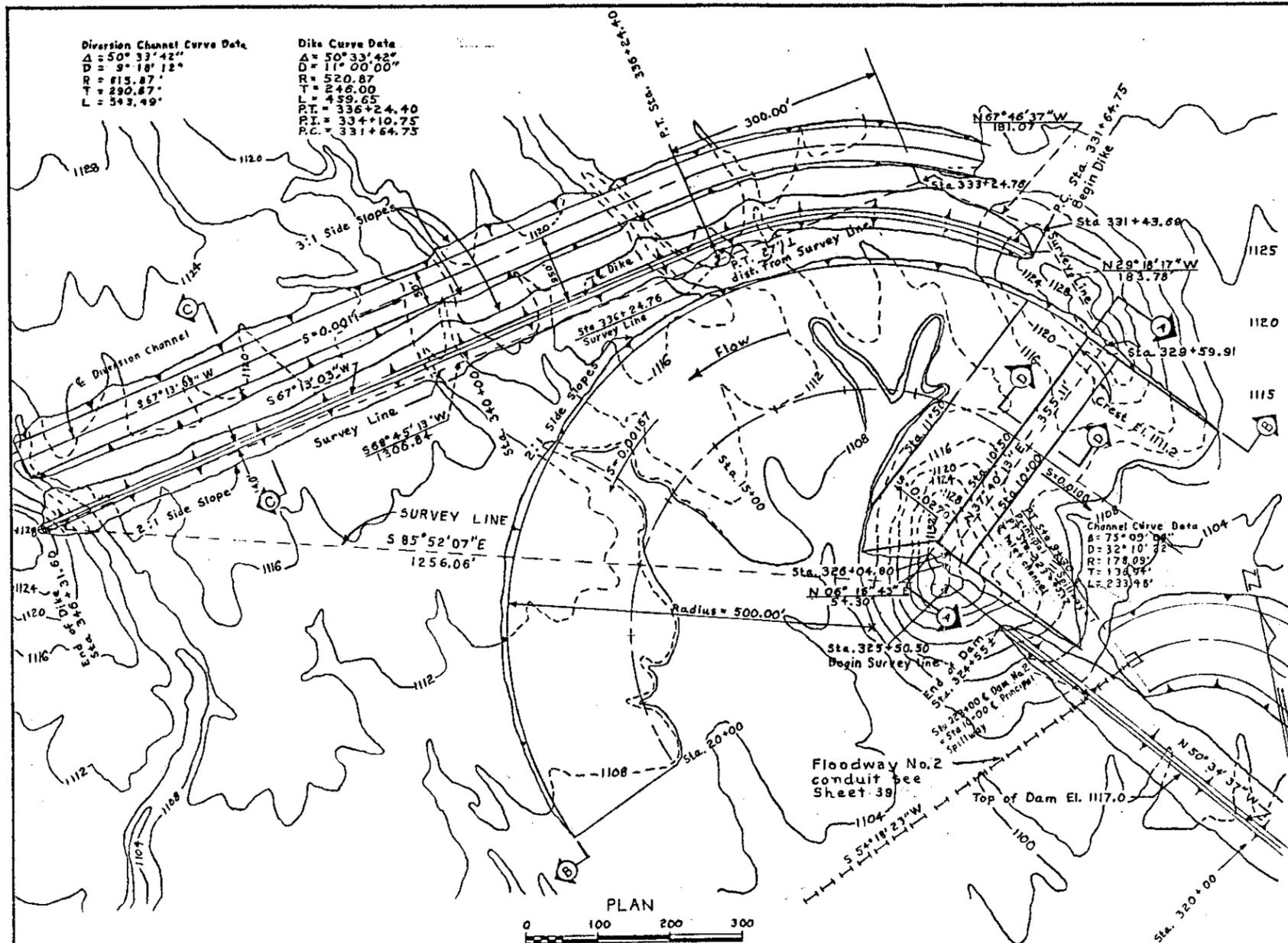
**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Designed	G. WATT	Date	4-72	Approved by	
Drawn	G. HANLEY			Title	
Checked	B. CUTLER		4-26-72		
Checked	J.L.S., P.J.M.		1-74	Sheet No. 29 of 57	Drawing No. 7-E-23079

FILE COPY

Diversion Channel Curve Data  
 $\Delta = 50^\circ 33' 42''$   
 $D = 9^\circ 18' 12''$   
 $R = 815.87'$   
 $T = 290.87'$   
 $L = 543.49'$

Dike Curve Data  
 $\Delta = 50^\circ 33' 42''$   
 $D = 11^\circ 00' 00''$   
 $R = 520.87'$   
 $T = 246.00'$   
 $L = 459.65'$   
 $PT = 336+24.40$   
 $PI = 331+10.75$   
 $PC = 331+64.75$



EMERGENCY SPILLWAY DETAILS DAM NO. 2 BUCKEYE FLOODWATER RETARDING STRUCTURES 2 & 3 BUCKEYE W.P.P. MARICOPA COUNTY, ARIZONA			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed G. WATT	Date 4-72	Approved by	
Drawn R. SLOCUM	4-20-72	Title	
Traced		Sheet	Drawing No.
Checked V. S.	P.J.M. 1-74	No. 30	7E-23079
		of 57	

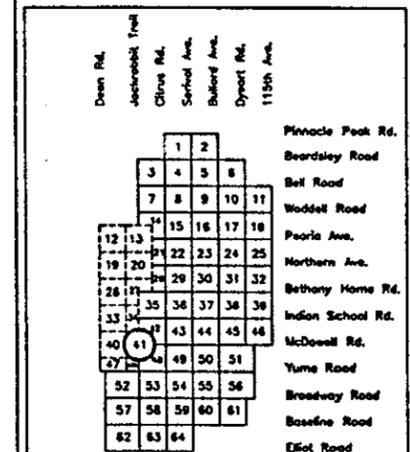
FILE COPY

# WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY

FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY

### REFERENCE MARKS (RM'S)

NO.	ELEVATION	DESCRIPTION
176	1125.87	40' Nail in Southwest Face of Power Pole CP 17710 at Northeast Corner of Intersection of Jackrabbit Tr. and Thomas Rd.
177	1082.47	Iron Pipe in Patch, Perryville Rd. and Thomas Rd.
191	1031.34	Brass Cap in Hand Hole, Perryville Rd. and McDowell Rd.
208	1044.41	Galton Pickler Sign in Power Pole Southwest Corner of Intersection of Tuttle Rd. and Van Buren St.
209	1030.91	1/2" Open Pipe in Hand Hole, Jackrabbit Tr. and Van Buren St.
210	1012.47	Brass Cap in Hand Hole, Perryville Rd. and Van Buren St.
521	1176.94	3" Aluminum Cap in Top of Barn on West Side of Tuttle Rd. at Intersection of Road to Southwest 1200' South of Northwest Corner Section 32
523	1100.43	3" Iron Pipe at Center of Pavement on McDowell Rd. 125' East of Barricade at Flood Control Channel Intersection of McDowell Rd. and Jackrabbit Tr.
524	1079.43	Brass Cap in Hand Hole Centerline Intersection of McDowell Rd. and Jackrabbit Tr.



400 200 0 400 800 1200  
BASE MAP: WHITE TANKS/AGUA FRIA AREA TOPOGRAPHIC MAPS  
CONTOUR INTERVAL: 2'

### LEGEND

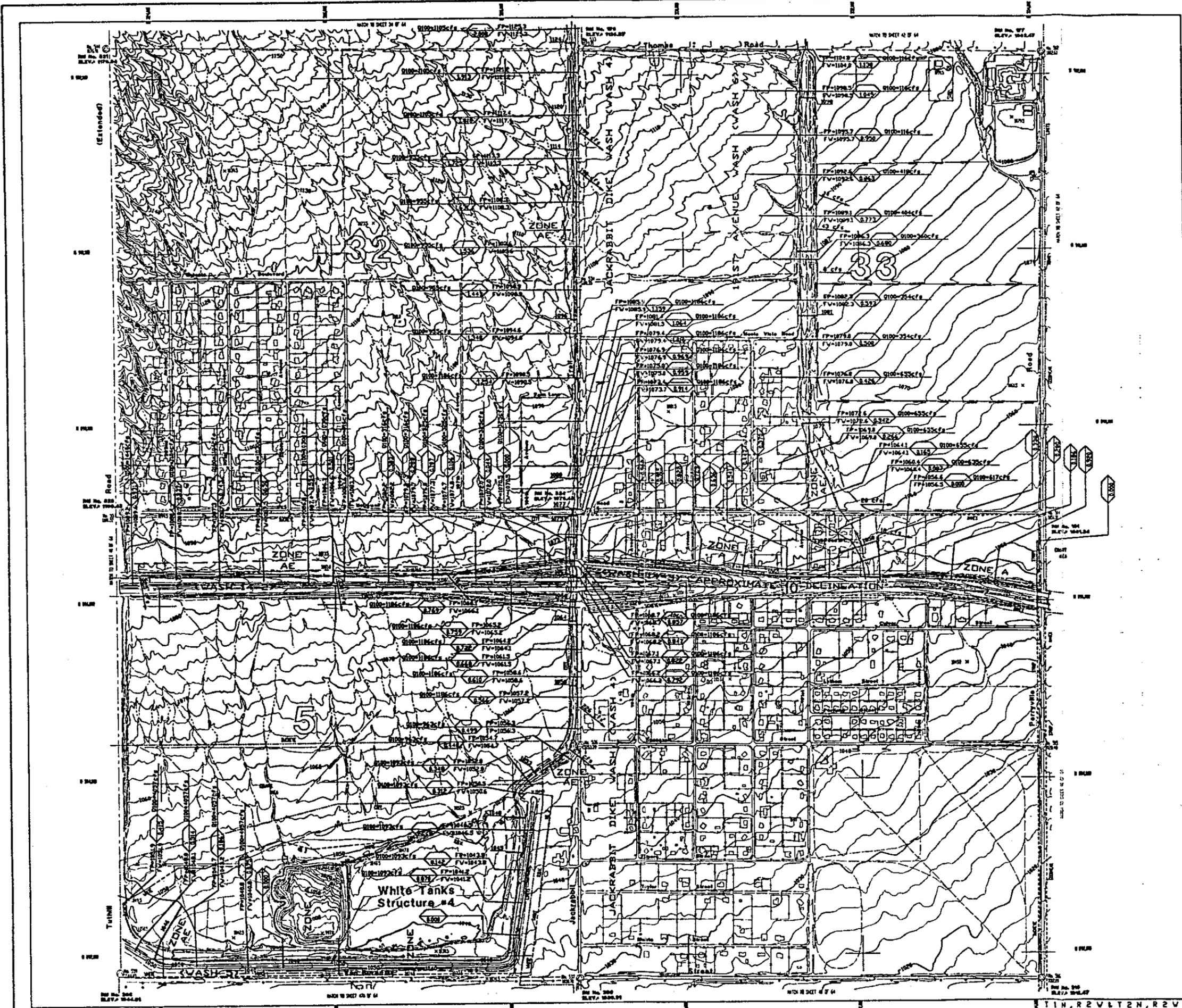
- CROSS SECTION NUMBER
- FLOODPLAIN WATER SURFACE ELEVATION = 1158.9
- FLOODWAY WATER SURFACE ELEVATION = 1159.8
- 100-YEAR PEAK DISCHARGE = 764 CUBIC FEET PER SEC.
- BASE FLOOD ELEVATION
- STREAM CENTERLINE
- FLOODWAY BOUNDARY
- FLOODPLAIN BOUNDARY
- ELEVATION REFERENCE MARK
- FLOOD INSURANCE RATE ZONE

SHEET TITLE:  
**FLOODPLAIN MAP**

STUDY CONSULTANT:  
**The WLB Group Inc.**

MAPPING COMPANY:  
**Cooper Aerial of Phoenix, Inc.**

SHEET 41 OF 64 DATE PLOTTED 12/22/89



T1N, R2W, T2N, R2W  
FIRM PANEL NO. 2055



**LEGEND**

- CROSS SECTION
- BASE FLOOD ELEVATION
- FLOODWAY ELEVATION
- BASE FLOOD ELEVATION
- ELEVATION REFERENCE MARK
- 100 - YEAR FLOOD BOUNDARY
- FLOODWAY BOUNDARY
- FLOOD INSURANCE RATE ZONE
- RIVER CENTER LWE
- SECTION CORNER
- QUARTER SECTION

ENC. 05 1001.30  
 Brass cap staked, Arizona Highway Department, ET 1941.16, 1974, set on the west end of a 12' x 1' x 3' high bridge abutment at the northeast corner of the I-10 bridge for east bound traffic over the Hassayampa River.

**TZU TIN**

**FLOOD INSURANCE RE-STUDY FOR VARIOUS STREAMS IN MARICOPA COUNTY, ARIZONA**

**WORK MAP**

Stream: HASSAYAMPA RIVER

Sheet 7 of 27

Mapping By: Cooper Aerial Survey Co. Date of Flight: 3/18/88

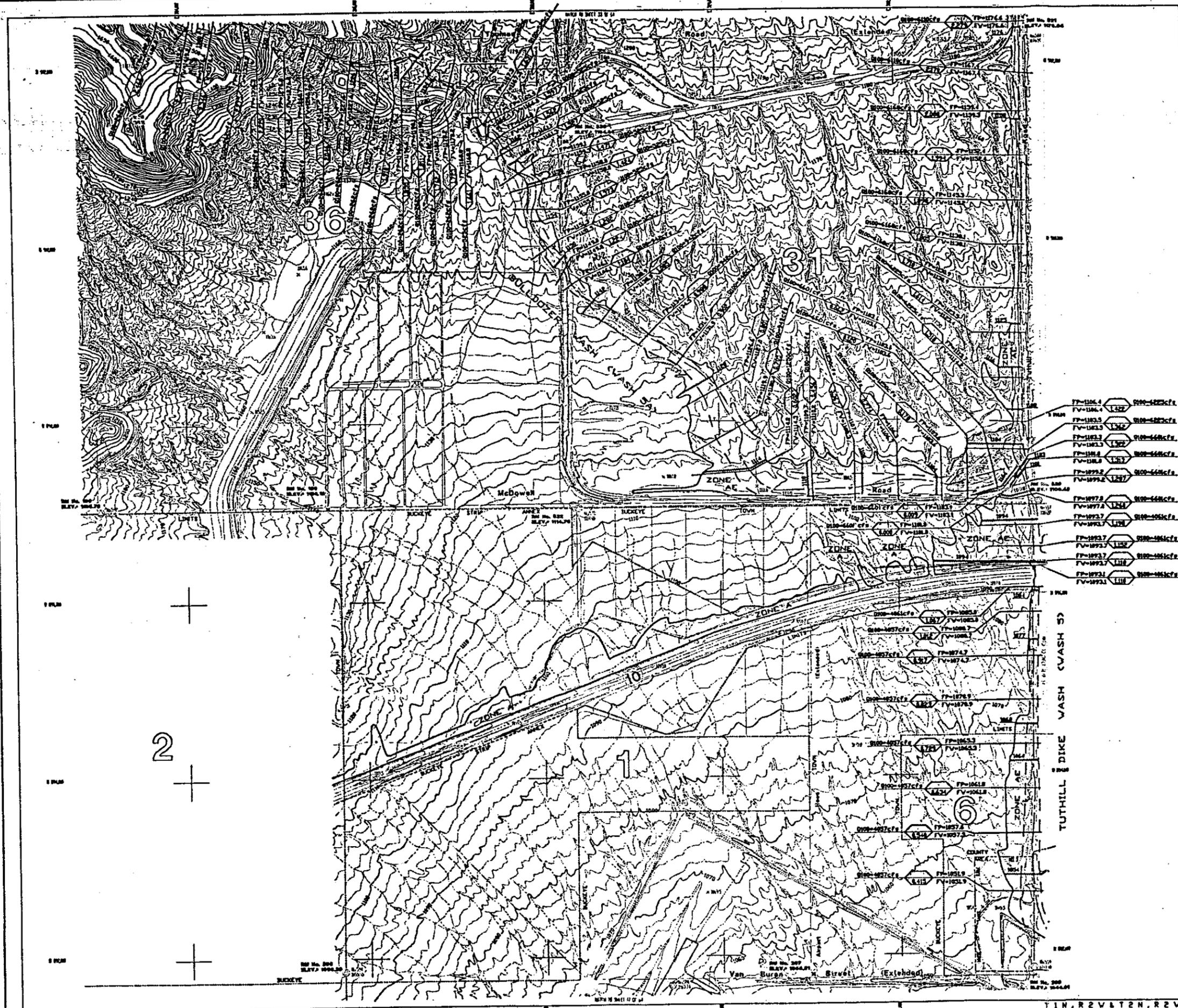
Scale: 1" = 400 Feet  
 Contour Interval: 4 Feet

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

**CBA CELIA BARR ASSOCIATES**

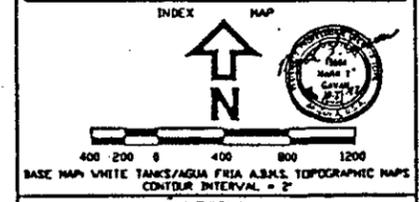
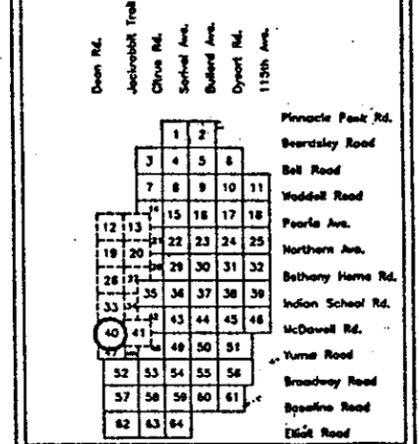
CBA FILE NO. 0-856-07-77

**WHITE TANKS/AGUA FRIA  
AREA DRAINAGE MASTER STUDY**  
FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY



**REFERENCE MARKS (RM'S)**

NO.	ELEVATION	DESCRIPTION
189	1185.75	1/2" Rebar on McDowell Rd. 1/2 Mile East of Ramboe Rd.
190	1138.12	3/4" Open Pipe, Dean Rd. and McDowell Rd.
206	1098.28	Top of 1" Post Next to Section Corner 22' Above Ground Dean Rd. and Van Buren St.
207	1053.81	Stone at the Southeast Corner of Section 1
208	1044.61	Cotton Picker Spindle in Power Pole Southwest Corner of Intersection of Tuthill Rd. and Van Buren St.
520	1184.64	3" Aluminum Cap at West Side of dirt Rd. along West line of Section 31 at Intersection with Dirt Rd. to Northwest 1/200' South of the Northwest corner of Section 31
521	1176.94	3" Aluminum Cap on Top of Barn on West Side of Tuthill Rd. at Intersection of Road to the Southwest 1/200' South of Northwest Corner Section 32
522	1114.76	5" Cast Iron Pipe Below Surface at Southwest Corner of Section 31
523	1100.43	3" Iron Pipe at Center of Pavement on McDowell Rd. 1/2 Mile East of Barricade at Flood Control Channel



**LEGEND**

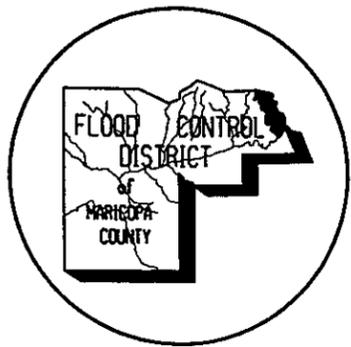
	CROSS SECTION NUMBER
	FLOODPLAIN WATER SURFACE ELEVATION = 1158.9
	FLOODWAY WATER SURFACE ELEVATION = 1159.8
	100-YEAR PEAK DISCHARGE = 764 CUBIC FEET PER SEC.
	BASE FLOOD ELEVATION
	STREAM CENTERLINE
	FLOODWAY BOUNDARY
	FLOODPLAIN BOUNDARY
	ELEVATION REFERENCE MARK
	FLOOD INSURANCE RATE ZONE

SHEET TITLE:  
**FLOODPLAIN MAP**

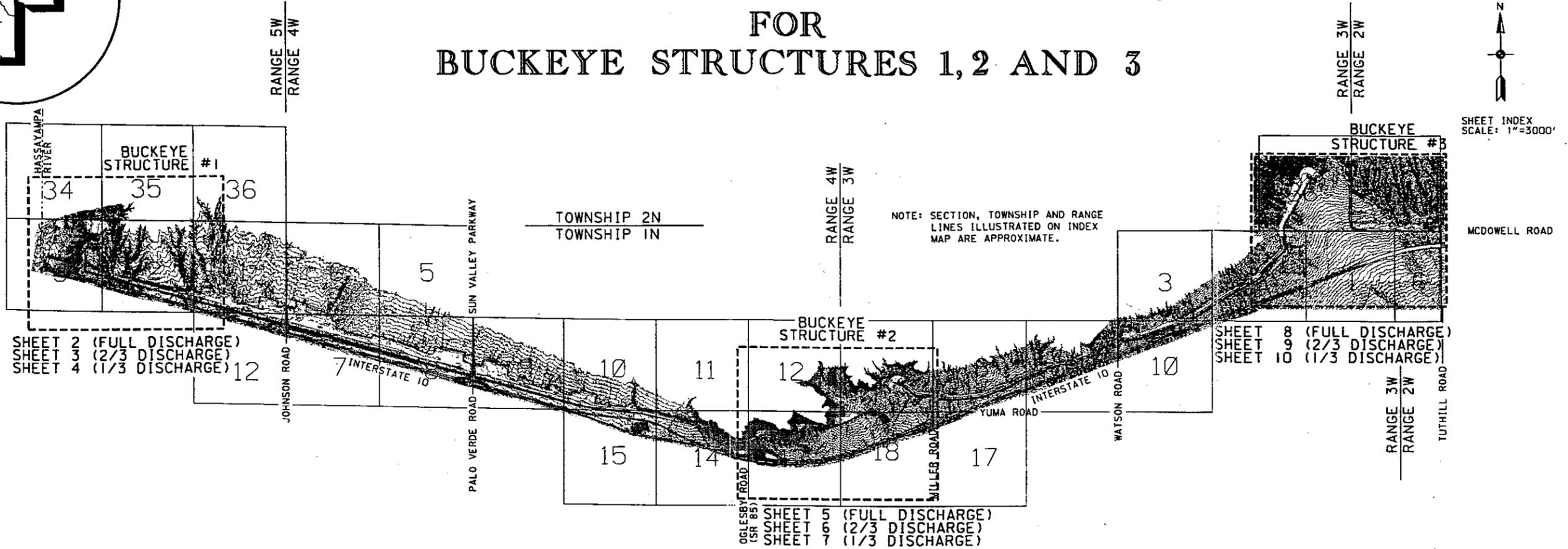
STUDY CONSULTANT:  
**The WLB Group, INC.**

MAPPING COMPANY:  
**Cooper Aerial of Phoenix, Inc.**

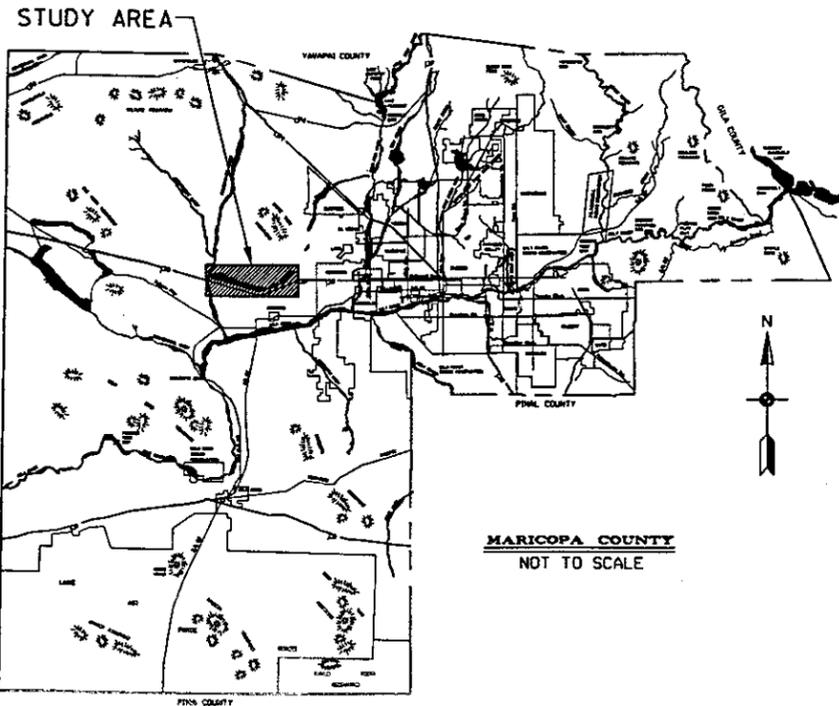
SHEET 40 OF 64      DATE PLOTTED 12/22/99



# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3



N  
SHEET INDEX  
SCALE: 1"=3000'



### TOPOGRAPHY

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1 AND 2 WAS PREPARED BY MCLAIN HARBERS CO., INC. FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCD) UNDER FCD CONTRACT 93-51. GROUND CONTROL FOR THE MAPPING WAS PROVIDED BY COLLINS-PINA CONSULTING ENGINEERS - SURVEYING CO. PHOTO DATE WAS 7-12-94. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 200 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NAVD 88 (NORTH AMERICAN VERTICAL DATUM OF 1988). HORIZONTAL DATUM IS NAD 83 (NORTH AMERICAN DATUM OF 1983).

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURE 3 WAS PREPARED BY COOPER AERIAL OF PHOENIX, INC. AND WESTERN AIR MAPS INC. OF LENEXA KANSAS FOR FCD. THIS MAPPING WAS PREPARED FOR THE WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY DONE BY THE WLB GROUP, INC. UNDER FCD CONTRACT 89-50. GROUND CONTROL FOR THE MAPPING WAS DONE UNDER THE SUPERVISION OF THE WLB GROUP. PHOTO DATE WAS 12-22-89. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 400 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NGVD 29 (NATIONAL GEODETIC VERTICAL DATUM OF 1929). ORIGINAL HORIZONTAL DATUM WAS NAD 27 (NORTH AMERICAN DATUM OF 1927). HOWEVER, THE WHITE TANKS/AGUA FRIA MAPPING HAS BEEN TRANSLATED FOR THIS STUDY TO NAD 83 DATUM TO BE CONSISTENT WITH THE MCLAIN HARBERS MAPPING.

### DISCHARGE RATES

DISCHARGES USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WERE OBTAINED FROM PHASE 1 REPORT, HYDROLOGIC ANALYSIS BUCKEYE FLOODWATER RETARDING STRUCTURES #1, #2, AND #3 FOR FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, FCD PROJECT 88-63, PREPARED BY DAMES & MOORE, AND DATED JANUARY 23, 1990. THE FULL SPILLWAY DISCHARGES ESTIMATED IN THAT REPORT ALONG WITH THE 2/3 AND 1/3 SPILLWAY DISCHARGES ARE PRESENTED BELOW. DISCHARGES HAVE BEEN ROUNDED TO THE NEAREST 100 CFS.

	FULL DISCHARGE	2/3 DISCHARGE	1/3 DISCHARGE
BUCKEYE STRUCTURE #1	50,700 CFS	33,800 CFS	16,900 CFS
BUCKEYE STRUCTURE #2	13,200 CFS	8,800 CFS	4,400 CFS
BUCKEYE STRUCTURE #3	17,700 CFS	11,800 CFS	5,900 CFS

### LEGEND

- 2800 CFS WEIR OVERFLOW OF INTERSTATE-10
- MP 120 APPROXIMATE INTERSTATE-10 MILE POST
- ELEVATION REFERENCE MARK
- EXISTING INTERSTATE-10 DRAINAGE CULVERT

### CERTIFICATION

THIS IS TO CERTIFY THAT ALL WORK PERFORMED IN ASSOCIATION WITH THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WAS DONE IN ACCORDANCE WITH THE GENERAL PROVISIONS OF FCD CONTRACT 95-34 AND ALL AMENDMENTS THERETO, TOGETHER WITH ALL SUCH MODIFICATIONS, EITHER WRITTEN OR ORAL AS THE FCD CONTRACTING OFFICER OR THEIR REPRESENTATIVES HAVE DIRECTED, AS SUCH MODIFICATIONS AFFECT THIS CONTRACT, AND THAT ALL SUCH WORK HAS BEEN ACCOMPLISHED IN ACCORDANCE WITH SOUND AND ACCEPTED ENGINEERING PRACTICE WITHIN THE CONTRACT PROVISIONS FOR RESPECTIVE PHASES OF THE WORK.

<b>STANLEY CONSULTANTS</b> 2375 EAST CAMELBACK ROAD, SUITE 130 PHOENIX, ARIZONA 85016 (602) 912-6500			
<b>STANLEY CONSULTANTS PROJECT #13084</b>			
DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRN	10-15-96	
PLANS	-	-	RECOMMENDED BY: DATE
PLANS CHK.	-	-	APPROVED BY: DATE
SUBMITTED BY:			CHEF ENGINEER AND GENERAL MANAGER
			SHEET 1 OF 10

FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
DELINEATION OF SPILLWAY  
FLOWS FOR BUCKEYE STRUCTURES  
1, 2 AND 3  
F.C.D. 95-34  
LEGEND

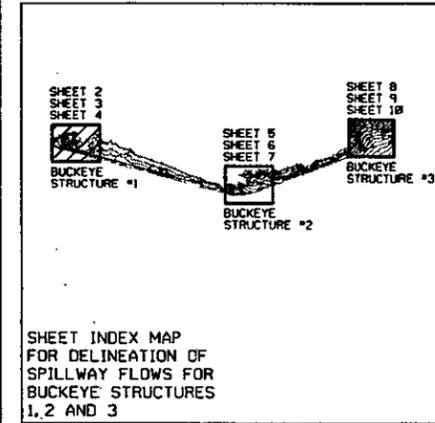
HYDRAULIC BASE LINE (WITH RIVER MILE) M19.8  
NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.

HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123  
LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) FULL DISCHARGE  
APPROX. LIMIT OF FLOODING

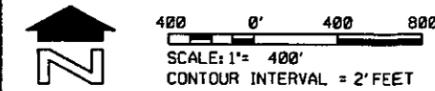
ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
58	1081.21	1/2" IRON ROD SET AT THE NE CORNER OF THE HASSAYAMPA RIVER SPILLWAY
59	1076.00	1/2" IRON ROD SET AT THE NW CORNER OF THE HASSAYAMPA RIVER SPILLWAY
60	1088.99	1/2" IRON ROD SET ON CENTER LINE OF BUCKEYE DAM #1 WHERE E/W DIRECTION ENDS AND N/S DIRECTION BEGINS. STA. 906+92
61	1038.67	SET PK NAIL IN THE JOINT BETWEEN THE EASTBOUND BRIDGE STRUCTURE AND ITS EASTERN ABUTMENT, MIDWAY BETWEEN THE SOUTH BARRIER WALL AND THE WHITE STRIPE MARKING THE SOUTH EDGE OF THE SOUTH LANE

INDEX MAP



SHEET INDEX MAP FOR DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3



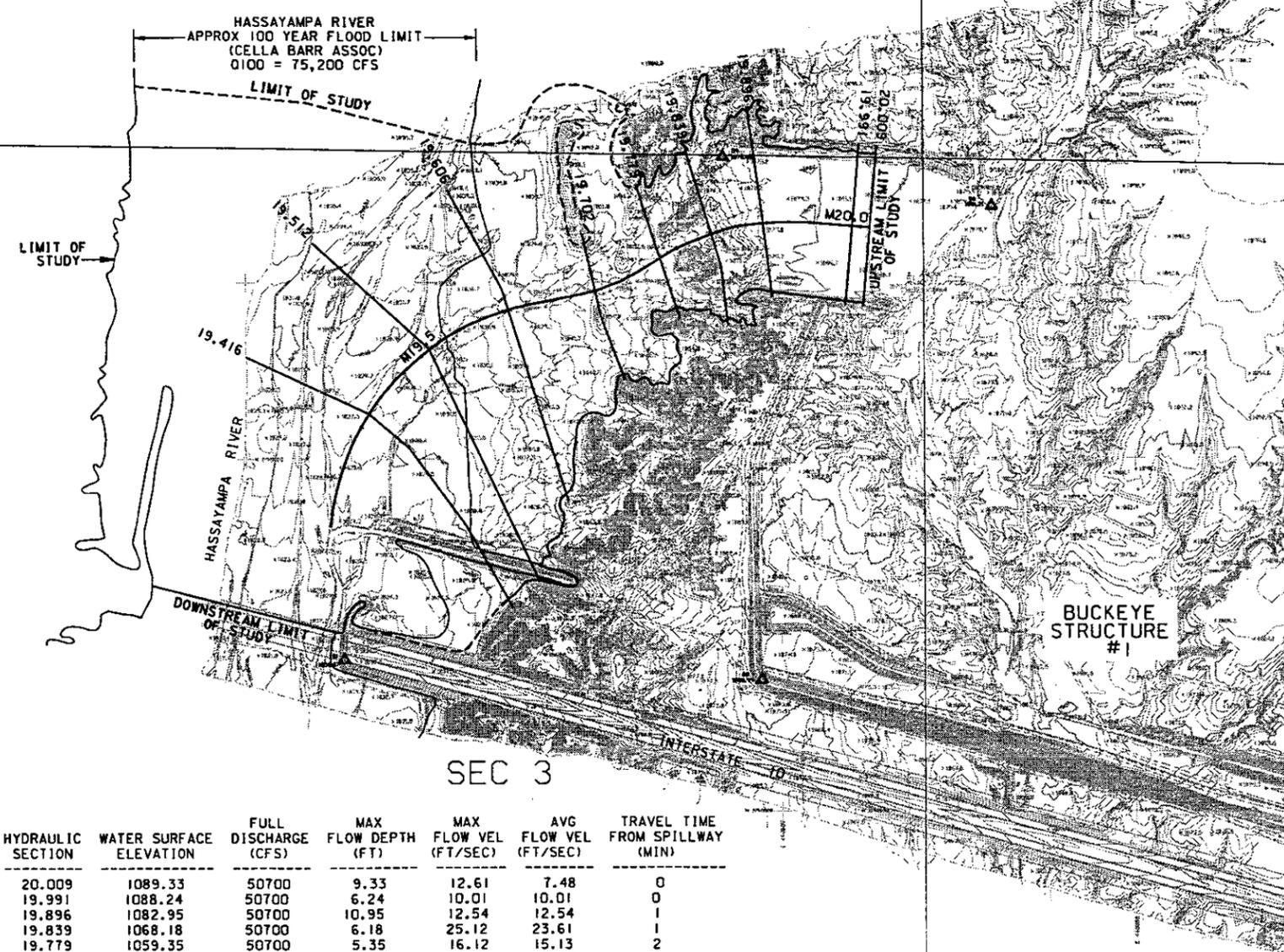
<b>STANLEY CONSULTANTS</b> 2929 EAST CAMELBACK ROAD, SUITE 130 PHOENIX, ARIZONA 85016 (602)912-6500			
DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	RECOMMENDED BY: _____ DATE: _____
PLANS	- -	- -	APPROVED BY: _____ DATE: _____
PLANS CHK.	- -	- -	CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY:	DATE:	SHEET 2 OF 10	

BUCKEYE STRUCTURE #1  
FULL SPILLWAY DISCHARGE

SEC 34

SEC 35

TOWNSHIP 2N  
TOWNSHIP 1N



SEC 3

SEC 2

RANGE 5W

HYDRAULIC SECTION	WATER SURFACE ELEVATION	FULL DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1089.33	50700	9.33	12.61	7.48	0
19.991	1088.24	50700	6.24	10.01	10.01	0
19.896	1082.95	50700	10.95	12.54	12.54	1
19.839	1068.18	50700	6.18	25.12	23.61	1
19.779	1059.35	50700	5.35	16.12	15.13	2
19.702	1052.82	50700	6.82	15.27	13.05	2
19.606	1041.74	50700	5.74	15.24	13.54	2
19.512	1036.27	50700	12.27	12.38	7.18	4
19.416	1033.87	50700	10.87	6.51	5.48	5

- NOTES:
1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B1B (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
  2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
  3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 1 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
  4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.

NOTE: SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS 1"=200' HORIZONTAL SCALE AND 2" CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY DATA PROVIDED BY COLLINS - PINA

13084\308402.dgn

AERIAL TOPOGRAPHY: MCLAIN HARBERS  
PHOTO DATE: 7-12-94  
VERTICAL DATUM: NAVD 88

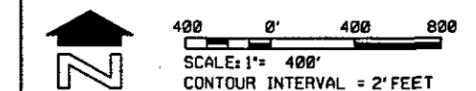
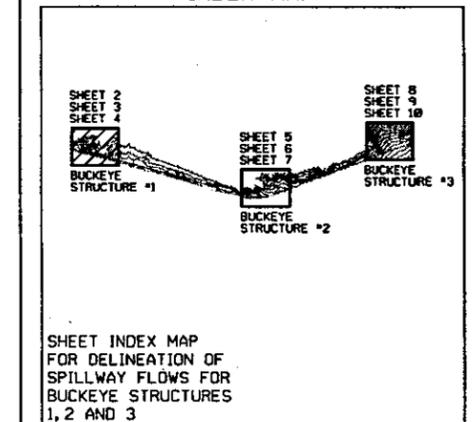
FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
DELINEATION OF SPILLWAY  
FLOWS FOR BUCKEYE STRUCTURES  
1, 2 AND 3  
F.C.D. 95-34  
LEGEND

HYDRAULIC BASE LINE (WITH RIVER MILE) M19.0  
 NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.  
 HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123  
 LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) 2/3 DISCHARGE  
 APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEV	DESCRIPTION
58	1881.21	1/2" IRON ROD SET AT THE NE CORNER OF THE HASSAYAMPA RIVER SPILLWAY
59	1876.88	1/2" IRON ROD SET AT THE NW CORNER OF THE HASSAYAMPA RIVER SPILLWAY
60	1888.99	1/2" IRON ROD SET ON CENTER LINE OF BUCKEYE DAM #1 WHERE E/W DIRECTION ENDS AND N/S DIRECTION BEGINS. STA. 986+92
61	1838.67	SET PK NAIL IN THE JOINT BETWEEN THE EASTBOUND BRIDGE STRUCTURE AND ITS EASTERN ABUTMENT, MIDWAY BETWEEN THE SOUTH BARRIER WALL AND THE WHITE STRIPE MARKING THE SOUTH EDGE OF THE SOUTH LANE

INDEX MAP



**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

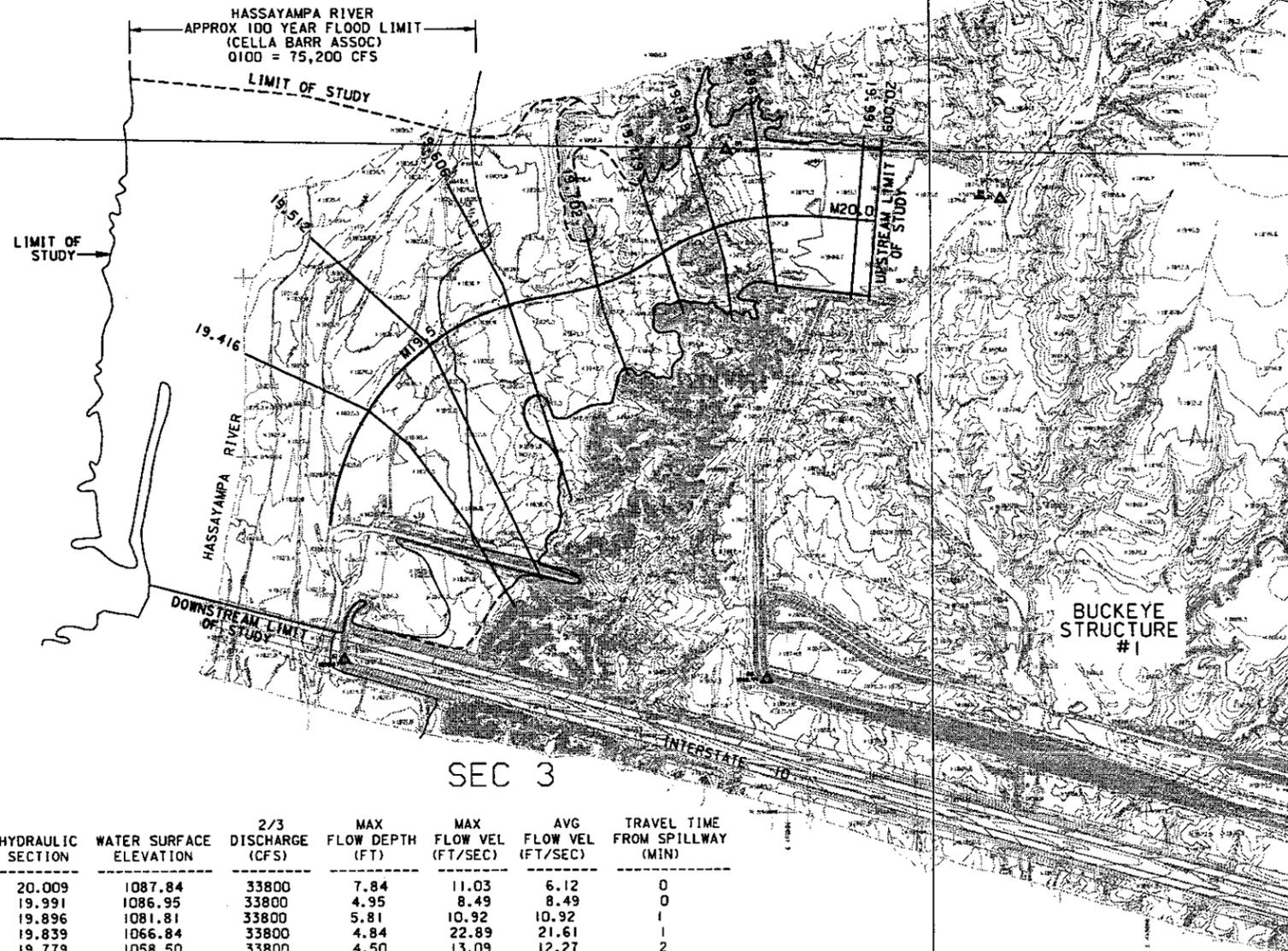
DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	
PLANS	-	-	RECOMMENDED BY: _____ DATE: _____
PLANS CHK.	-	-	APPROVED BY: _____ DATE: _____
SUBMITTED BY: _____	DATE: _____	CHIEF ENGINEER AND GENERAL MANAGER	
			SHEET 3 OF 10

BUCKEYE STRUCTURE #1  
2/3 SPILLWAY DISCHARGE

SEC 34

SEC 35

TOWNSHIP 2N  
TOWNSHIP 1N



HYDRAULIC SECTION	WATER SURFACE ELEVATION	2/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1087.84	33800	7.84	11.03	6.12	0
19.991	1086.95	33800	4.95	8.49	8.49	0
19.896	1081.81	33800	5.81	10.92	10.92	1
19.839	1066.84	33800	4.84	22.89	21.61	1
19.779	1058.50	33800	4.50	13.09	12.27	2
19.702	1051.43	33800	5.43	13.58	11.68	2
19.606	1041.03	33800	5.03	12.72	11.06	3
19.512	1035.27	33800	7.27	10.92	6.29	4
19.416	1032.66	33800	6.66	5.83	4.74	5

- NOTES:
1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B1B (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
  2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
  3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 1 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
  4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.

SEC 2

RANGE 5W

NOTE: SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS 1"=200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY DATA PROVIDED BY COLLINS - PINA

AERIAL TOPOGRAPHY: MCLAIN HARBERS  
PHOTO DATE: 7-12-94  
VERTICAL DATUM: NAVD 88

IN 130841\_308405.dgn

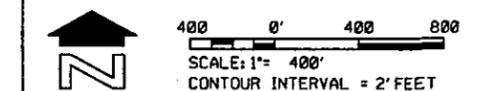
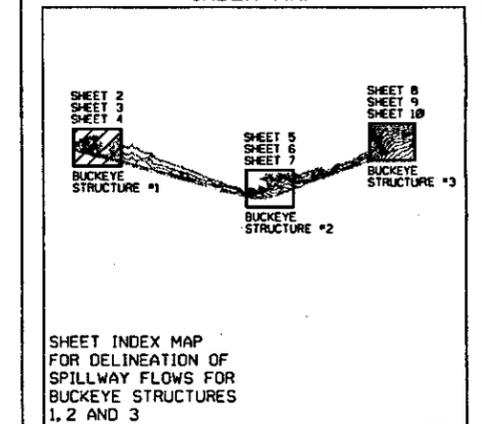
FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
DELINEATION OF SPILLWAY  
FLOWS FOR BUCKEYE STRUCTURES  
1, 2 AND 3  
F.C.D. 95-34  
LEGEND

HYDRAULIC BASE LINE (WITH RIVER MILE) M19.8  
NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.  
HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123  
LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) 1/3 DISCHARGE  
APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEV	DESCRIPTION
58	1001.21	1/2" IRON ROD SET AT THE NE CORNER OF THE HASSAYAMPA RIVER SPILLWAY
59	1076.88	1/2" IRON ROD SET AT THE NW CORNER OF THE HASSAYAMPA RIVER SPILLWAY
60	1088.99	1/2" IRON ROD SET ON CENTER LINE OF BUCKEYE DAM #1 WHERE E/W DIRECTION ENDS AND N/S DIRECTION BEGINS. STA. 986+92
61	1838.67	SET PK NAIL IN THE JOINT BETWEEN THE EASTBOUND BRIDGE STRUCTURE AND ITS EASTERN ABUTMENT, MIDWAY BETWEEN THE SOUTH BARRIER WALL AND THE WHITE STRIPE MARKING THE SOUTH EDGE OF THE SOUTH LANE

INDEX MAP



**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

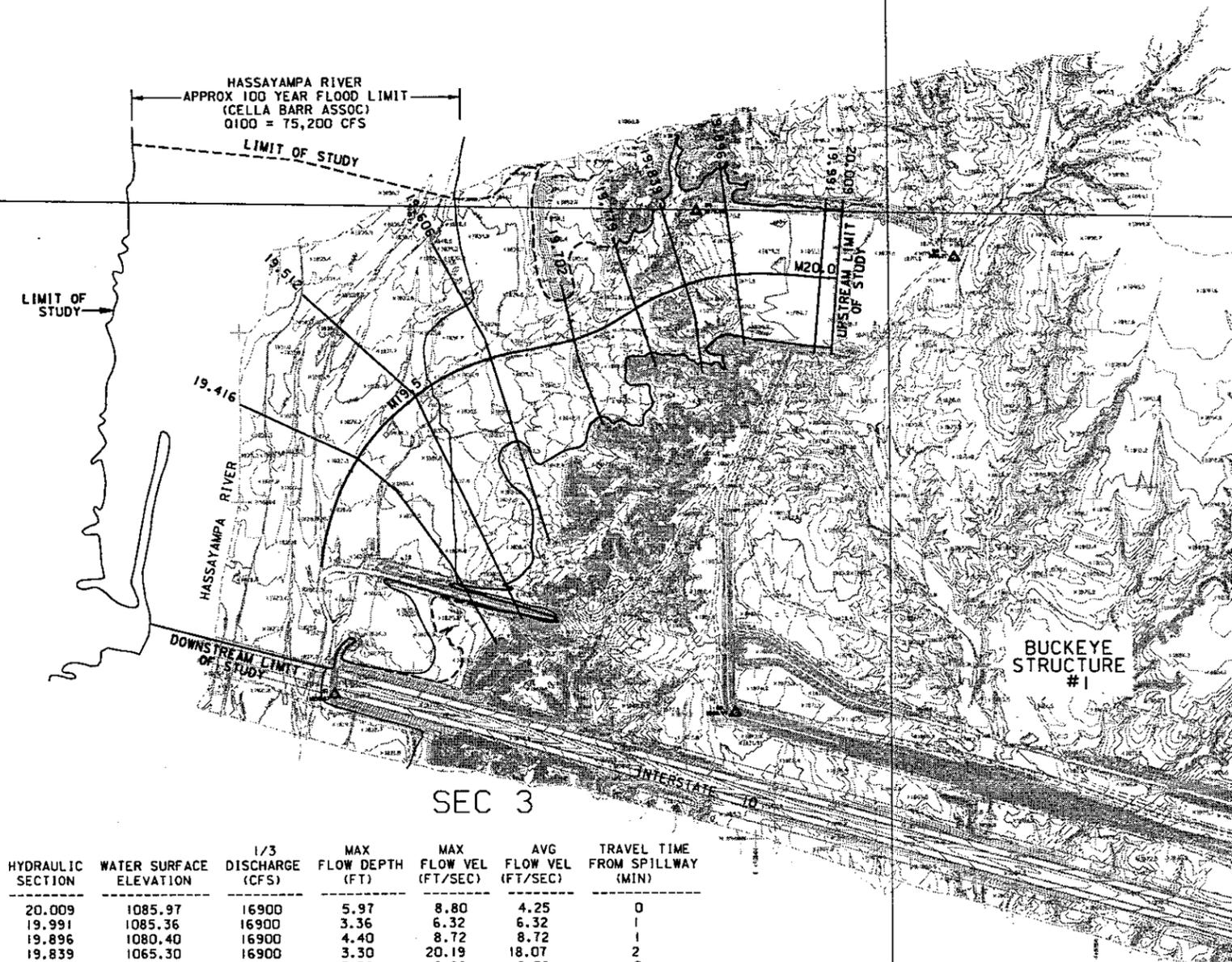
DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	DATE 10-15-96	RECOMMENDED BY: _____ DATE: _____
PLANS	- -	- -	APPROVED BY: _____ DATE: _____
PLANS CHK.	- -	- -	CHEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY:	DATE:	SHEET 4	OF 10

BUCKEYE STRUCTURE #1  
1/3 SPILLWAY DISCHARGE

SEC 34

SEC 35

TOWNSHIP 2N  
TOWNSHIP 1N



HYDRAULIC SECTION	WATER SURFACE ELEVATION	1/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1085.97	16900	5.97	8.80	4.25	0
19.991	1085.36	16900	3.36	6.32	6.32	1
19.896	1080.40	16900	4.40	8.72	8.72	1
19.839	1065.30	16900	3.30	20.19	18.07	2
19.779	1057.36	16900	3.36	9.99	8.56	2
19.702	1049.63	16900	3.63	11.10	9.72	3
19.606	1040.15	16900	4.15	9.90	7.64	4
19.512	1034.08	16900	6.08	6.15	4.94	5
19.416	1031.22	16900	5.22	4.70	3.67	7

NOTES:

1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 1308481B (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE #1 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.

RANGE 5W

NOTE: SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.

**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

**APPENDIX C**

**BUCKEYE STRUCTURE 1**

1. Delineation Map Exhibits (11" x 17")
2. HEC-2 and HEC-RAS Printout
3. HEC-RAS Cross Section Plots

HEC-RAS Reach: BUCKEYE # 1

River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Tme Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
20.009	B1 MIXED	1089.33		50700.00	9.33	8.00	6776.98	7.48	0.08	0.037	9570.00	10417.50
20.009	SUBCRIT	1089.33		50700.00	9.33	8.00	6776.98	7.48	0.08	0.037	9570.00	10417.50
20.009	B1 MIXED	1087.84		33800.00	7.84	6.64	5520.66	6.12	0.09	0.037	9580.54	10411.89
20.009	SUBCRIT	1087.84		33800.00	7.84	6.64	5520.66	6.12	0.10	0.037	9580.54	10411.89
20.009	B1 MIXED	1085.97		16900.00	5.97	4.86	3977.62	4.25	0.12	0.037	9586.78	10404.88
20.009	SUBCRIT	1085.97		16900.00	5.97	4.86	3977.62	4.25	0.12	0.037	9586.78	10404.88
19.991	B1 MIXED	1088.24		50700.00	6.24	6.00	5065.86	10.01	0.08	0.037	9574.18	10418.06
19.991	SUBCRIT	1088.24		50700.00	6.24	6.00	5065.86	10.01	0.08	0.037	9574.18	10418.06
19.991	B1 MIXED	1086.95		33800.00	4.95	4.80	3983.27	8.49	0.09	0.037	9579.38	10408.87
19.991	SUBCRIT	1086.95		33800.00	4.95	4.80	3983.27	8.49	0.09	0.037	9579.38	10408.87
19.991	B1 MIXED	1085.36		16900.00	3.36	3.29	2674.95	6.32	0.11	0.037	9586.01	10399.58
19.991	SUBCRIT	1085.36		16900.00	3.36	3.29	2674.95	6.32	0.12	0.037	9586.01	10399.58
19.896	B1 MIXED	1082.95	1082.95	50700.00	10.95	4.85	4984.49	12.54	0.06	0.041	9610.77	10641.97
19.896	SUBCRIT	1082.95	1082.95	50700.00	10.95	4.85	4984.49	12.54	0.07	0.041	9610.77	10641.97
19.896	B1 MIXED	1081.81	1081.81	33800.00	5.81	3.75	3095.06	10.92	0.07	0.041	9614.34	10439.05
19.896	SUBCRIT	1081.81	1081.81	33800.00	5.81	3.75	3095.06	10.92	0.08	0.041	9614.34	10439.05
19.896	B1 MIXED	1080.40	1080.40	16900.00	4.40	2.38	1938.38	8.72	0.10	0.041	9618.75	10431.99
19.896	SUBCRIT	1080.40	1080.40	16900.00	4.40	2.38	1938.38	8.72	0.10	0.041	9618.75	10431.99
19.839	B1 MIXED	1068.18	1070.95	50700.00	6.18	4.76	2532.01	23.61	0.06	0.045	9509.12	10480.88
19.839	SUBCRIT	1070.91	1070.91	50700.00	8.91	6.53	4111.51	14.54	0.06	0.045	9495.43	10494.57
19.839	B1 MIXED	1066.84	1069.09	33800.00	4.84	3.69	1564.07	21.61	0.07	0.045	9590.00	10474.20
19.839	SUBCRIT	1069.06	1069.06	33800.00	7.06	5.39	2559.10	13.21	0.07	0.045	9590.00	10485.32
19.839	B1 MIXED	1065.30	1066.83	16900.00	3.30	2.41	935.26	18.07	0.09	0.045	9590.00	10466.49
19.839	SUBCRIT	1066.80	1066.80	16900.00	4.80	3.66	1546.76	10.93	0.09	0.045	9590.00	10474.00
19.779	B1 MIXED	1059.35	1060.03	50700.00	5.35	4.74	3351.32	15.13	0.05	0.045	9708.26	10415.11
19.779	SUBCRIT	1060.03	1060.03	50700.00	6.03	5.37	3837.26	13.21	0.06	0.045	9704.92	10420.16
19.779	B1 MIXED	1058.50	1058.71	33800.00	4.50	3.96	2755.03	12.27	0.06	0.045	9712.51	10408.73
19.779	SUBCRIT	1058.79	1058.71	33800.00	4.79	4.23	2958.09	11.43	0.06	0.045	9711.06	10410.92
19.779	B1 MIXED	1057.36		16900.00	3.36	2.94	1975.03	8.56	0.08	0.045	9716.60	10387.42
19.779	SUBCRIT	1057.36		16900.00	3.36	2.94	1975.03	8.56	0.08	0.045	9716.60	10387.42
19.702	B1 MIXED	1052.82	1052.82	50700.00	6.82	5.23	3884.03	13.05	0.05	0.045	9495.89	10271.90
19.702	SUBCRIT	1052.82	1052.82	50700.00	6.82	5.23	3884.03	13.05	0.05	0.045	9495.89	10271.90
19.702	B1 MIXED	1051.43	1051.43	33800.00	5.43	4.24	2893.08	11.68	0.05	0.045	9502.83	10261.12
19.702	SUBCRIT	1051.43	1051.43	33800.00	5.43	4.24	2893.08	11.68	0.05	0.045	9502.83	10261.12
19.702	B1 MIXED	1049.63	1049.63	16900.00	3.63	2.90	1739.57	9.72	0.07	0.045	9512.74	10246.35
19.702	SUBCRIT	1049.63	1049.63	16900.00	3.63	2.90	1739.57	9.72	0.07	0.045	9512.74	10246.35

HEC-RAS Reach: BUCKEYE # 1 (continued)

2 of 2

River Sta.	Plan	W.S. Elev. (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
19.606	B1 MIXED	1041.74	1042.29	50700.00	5.74	3.87	5278.72	13.54	0.04	0.045	8907.83	10770.00
19.606	SUBCRIT	1042.25	1042.25	50700.00	6.25	4.37	6158.92	11.95	0.04	0.045	8892.99	10770.00
19.606	B1 MIXED	1041.03	1041.21	33800.00	5.03	3.17	3055.31	11.06	0.04	0.045	9472.27	10435.00
19.606	SUBCRIT	1041.23	1041.21	33800.00	5.23	3.38	3256.55	10.38	0.04	0.045	9470.70	10435.00
19.606	B1 MIXED	1040.15	1039.98	16900.00	4.15	2.31	2211.49	7.64	0.05	0.045	9478.90	10435.00
19.606	SUBCRIT	1040.15	1039.98	16900.00	4.15	2.31	2211.49	7.64	0.05	0.045	9478.90	10435.00
19.512	B1 MIXED	1036.27	1035.11	50700.00	12.27	4.13	9292.06	7.18	0.02	0.049	8547.46	10885.00
19.512	SUBCRIT	1036.27	1035.11	50700.00	12.27	4.13	9292.06	7.18	0.02	0.049	8547.46	10885.00
19.512	B1 MIXED	1035.27	1034.35	33800.00	7.27	3.23	5372.93	6.29	0.03	0.049	8988.75	10650.00
19.512	SUBCRIT	1035.27	1034.35	33800.00	7.27	3.23	5372.93	6.29	0.03	0.049	8988.75	10650.00
19.512	B1 MIXED	1034.08	1033.20	16900.00	6.08	2.11	3421.72	4.94	0.03	0.049	9027.37	10650.00
19.512	SUBCRIT	1034.08	1033.20	16900.00	6.08	2.11	3421.72	4.94	0.03	0.049	9027.37	10650.00
19.416	B1 MIXED	1033.87	1031.53	50700.00	10.87	5.25	10483.94	5.48	0.00	0.049	8674.69	10760.00
19.416	SUBCRIT	1033.87	1031.53	50700.00	10.87	5.25	10483.94	5.48	0.00	0.049	8674.69	10760.00
19.416	B1 MIXED	1032.66	1030.85	33800.00	6.66	4.05	7132.51	4.74	0.00	0.049	9000.00	10760.00
19.416	SUBCRIT	1032.66	1030.85	33800.00	6.66	4.05	7132.51	4.74	0.00	0.049	9000.00	10760.00
19.416	B1 MIXED	1031.22	1029.58	16900.00	5.22	2.65	4609.30	3.67	0.00	0.049	9020.42	10760.00
19.416	SUBCRIT	1031.22	1029.58	16900.00	5.22	2.65	4609.30	3.67	0.00	0.049	9020.42	10760.00

## NOTE

The following HEC-RAS flow distribution printouts are based on mixed flow regime. Hydraulic data in these tables may not be consistent with the mixed flow regime water surface elevations from the HEC-RAS summary table at some cross sections due to possible HEC-RAS data errors.

Flow. DIST 1 of 6

FULL FLOW 1 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 20.009 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10420.00	100.00	4020.57	819.79	466092.3	4.91	12.61

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.991 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10440.00	100.00	5065.86	845.14	671320.8	6.00	10.01

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.896 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9595.00	10660.00	100.00	4041.75	835.10	419116.2	4.85	12.54

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.839 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9490.00	9692.00	24.02	484.90	92.72	48242.4	5.27	25.12
9692.00	9894.00						
9894.00	10096.00	30.39	655.11	138.22	61037.7	4.76	23.52
10096.00	10298.00	5.36	140.94	40.01	10773.7	3.57	19.30
10298.00	10500.00	40.22	866.88	182.88	80774.6	4.77	23.52

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.779 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9700.00	9846.00	15.91	585.10	138.28	50543.7	4.25	13.79
9846.00	9992.00	24.82	780.78	146.00	78842.0	5.35	16.12
9992.00	10138.00	24.82	780.78	146.00	78842.0	5.35	16.12
10138.00	10284.00	24.82	780.78	146.00	78842.0	5.35	16.12
10284.00	10430.00	9.63	423.89	131.26	30580.5	3.23	11.51

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.702 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9460.00	9636.00	16.99	697.51	140.54	67015.2	4.98	12.35
9636.00	9812.00	23.15	919.17	176.18	91301.0	5.22	12.77
9812.00	9988.00	10.60	528.99	142.91	41797.4	3.71	10.16
9988.00	10164.00	36.16	1200.74	176.00	142622.9	6.82	15.27
10164.00	10340.00	13.10	537.63	108.28	51668.3	4.98	12.35

Flow DIST 2 of 6

FULL FLOW 2 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.606 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9422.50	9615.00	10.56	461.18	148.25	32450.7	3.11	11.61
9615.00	9807.50	18.63	719.78	192.50	57257.5	3.74	13.12
9807.50	10000.00	18.63	719.78	192.50	57257.5	3.74	13.12
10000.00	10192.50	18.63	719.78	192.50	57257.5	3.74	13.12
10192.50	10385.00	27.09	901.15	192.52	83263.7	4.68	15.24
10385.00	10577.50	6.46	222.34	50.03	19846.6	4.45	14.73

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.512 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8774.50	9009.00	0.01	3.49	15.08	40.0	0.23	1.60
9009.00	9243.50	2.27	256.33	234.51	8248.1	1.09	4.50
9243.50	9478.00	4.79	400.74	234.50	17370.4	1.71	6.06
9478.00	9712.50	9.70	612.24	234.50	35202.5	2.61	8.04
9712.50	9947.00	12.98	729.07	234.50	47095.7	3.11	9.03
9947.00	10181.50	21.35	982.61	234.52	77442.3	4.19	11.02
10181.50	10416.00	20.29	953.10	234.51	73608.3	4.06	10.79
10416.00	10650.50	28.60	1170.92	234.47	103742.3	5.00	12.38

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.416 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8861.00	9072.00	1.90	243.35	72.14	16597.6	3.38	3.96
9072.00	9283.00	6.22	762.02	211.00	54393.7	3.61	4.14
9283.00	9494.00	7.81	873.03	211.00	68232.1	4.14	4.53
9494.00	9705.00	7.18	830.17	211.00	62741.2	3.93	4.38
9705.00	9916.00	10.04	1016.04	211.20	87804.0	4.82	5.01
9916.00	10127.00	13.97	1237.74	211.00	122085.1	5.87	5.72
10127.00	10338.00	18.40	1460.36	211.04	160811.0	6.92	6.39
10338.00	10549.00	14.41	1261.13	211.00	125953.2	5.98	5.79
10549.00	10760.00	20.08	1562.74	219.25	175516.4	7.41	6.51

Flow DIST 3 of 6  
 2/3 FLOW 1 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 20.009 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10420.00	100.00	3063.13	811.13	298313.8	3.78	11.03

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.991 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10440.00	100.00	3983.27	830.50	454951.5	4.80	8.49

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.896 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9595.00	10660.00	100.00	3095.06	825.53	270709.6	3.75	10.92

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.839 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9490.00	9692.00	24.77	365.83	91.56	30416.7	4.25	22.89
9692.00	9894.00						
9894.00	10096.00	30.39	476.56	130.53	37311.7	3.66	21.55
10096.00	10298.00	4.46	90.46	36.41	5479.0	2.51	16.67
10298.00	10500.00	40.38	631.22	172.04	49582.1	3.68	21.62

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.779 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9700.00	9846.00	15.41	469.83	133.94	35815.7	3.52	11.09
9846.00	9992.00	25.43	656.68	146.00	59083.9	4.50	13.09
9992.00	10138.00	25.43	656.68	146.00	59083.9	4.50	13.09
10138.00	10284.00	25.43	656.68	146.00	59083.9	4.50	13.09
10284.00	10430.00	8.30	315.16	124.83	19295.4	2.53	8.91

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.702 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9460.00	9636.00	16.09	507.74	133.45	40860.3	3.81	10.71
9636.00	9812.00	21.76	675.02	172.84	55276.0	3.91	10.90
9812.00	9988.00	10.65	358.75	103.97	27049.8	3.46	10.03
9988.00	10164.00	38.43	956.31	176.00	97597.9	5.43	13.58
10164.00	10340.00	13.07	395.26	97.41	33202.8	4.07	11.18

Flow DIST 4 of 6  
 2/3 FLOW 2 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.606 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9422.50	9615.00	9.89	357.44	142.83	21755.6	2.50	9.35
9615.00	9807.50	18.29	582.46	192.50	40234.9	3.03	10.62
9807.50	10000.00	18.29	582.46	192.50	40234.9	3.03	10.62
10000.00	10192.50	18.29	582.46	192.50	40234.9	3.03	10.62
10192.50	10385.00	28.74	763.82	192.52	63209.6	3.97	12.72
10385.00	10577.50	6.49	186.67	52.95	14277.9	3.73	11.75

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.512 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9009.00	9243.50	0.51	80.55	225.02	1231.4	0.36	2.12
9243.50	9478.00	2.70	223.58	234.50	6567.8	0.95	4.08
9478.00	9712.50	8.19	435.08	234.50	19921.2	1.86	6.36
9712.50	9947.00	12.17	551.90	234.50	29612.4	2.35	7.45
9947.00	10181.50	22.85	805.44	234.52	55599.4	3.43	9.59
10181.50	10416.00	21.47	775.94	234.51	52248.5	3.31	9.35
10416.00	10650.50	32.11	994.14	238.32	78120.5	4.25	10.92

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.416 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8861.00	9072.00	1.37	156.86	72.31	7971.6	2.18	2.96
9072.00	9283.00	4.77	508.57	211.00	27724.1	2.41	3.17
9283.00	9494.00	6.63	619.58	211.00	38527.5	2.94	3.62
9494.00	9705.00	5.88	576.72	211.00	34189.0	2.73	3.45
9705.00	9916.00	9.37	762.59	211.20	54427.3	3.61	4.15
9916.00	10127.00	14.34	984.30	211.00	83333.8	4.66	4.92
10127.00	10338.00	20.14	1206.91	211.04	117042.1	5.72	5.64
10338.00	10549.00	14.91	1007.69	211.00	86659.5	4.78	5.00
10549.00	10760.00	22.57	1309.30	218.05	131167.3	6.21	5.83

Flow DIST 5 of 6

1/3 Flow 1 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 20.009 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10420.00	100.00	1920.03	800.68	138143.9	2.40	8.80

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.991 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9570.00	10440.00	100.00	2674.95	814.26	237399.4	3.29	6.32

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.896 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9595.00	10660.00	100.00	1938.38	813.70	125304.6	2.38	8.72

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.839 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9490.00	9692.00	28.44	238.10	83.10	15861.3	3.00	20.19
9692.00	9894.00						
9894.00	10096.00	29.03	281.67	122.66	16188.1	2.30	17.42
10096.00	10298.00	2.82	38.98	28.83	1573.7	1.36	12.23
10298.00	10500.00	39.71	376.51	158.33	22149.9	2.38	17.83

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.779 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9700.00	9846.00	13.64	287.64	128.99	16211.8	2.23	8.01
9846.00	9992.00	26.78	453.20	146.00	31844.5	3.10	9.99
9992.00	10138.00	26.78	453.20	146.00	31844.5	3.10	9.99
10138.00	10284.00	26.78	453.20	146.00	31844.5	3.10	9.99
10284.00	10430.00	6.01	156.63	96.41	7147.7	1.63	6.49

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.702 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9460.00	9636.00	13.15	276.47	123.38	15632.3	2.24	8.04
9636.00	9812.00	22.18	396.45	138.65	26372.8	2.86	9.46
9812.00	9988.00	9.70	193.64	79.92	11535.2	2.43	8.47
9988.00	10164.00	42.01	639.74	176.00	49939.8	3.63	11.10
10164.00	10340.00	12.95	233.27	82.53	15397.9	2.83	9.38

FLOW DIST 6 of 6

1/3 Flow 2 of 2

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.606 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9422.50	9615.00	8.23	211.94	134.41	9481.0	1.58	6.57
9615.00	9807.50	17.20	380.63	192.50	19800.0	1.98	7.64
9807.50	10000.00	17.20	380.63	192.50	19800.0	1.98	7.64
10000.00	10192.50	17.20	380.63	192.50	19800.0	1.98	7.64
10192.50	10385.00	32.92	561.99	192.52	37903.7	2.92	9.90
10385.00	10577.50	7.25	134.25	51.90	8353.0	2.68	9.13

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.512 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9009.00	9243.50	0.06	20.24	216.13	126.5	0.09	0.51
9243.50	9478.00	1.81	159.46	234.50	3739.2	0.68	1.92
9478.00	9712.50	7.38	370.96	234.50	15272.5	1.58	3.36
9712.50	9947.00	11.65	487.78	234.50	24103.4	2.08	4.04
9947.00	10181.50	23.40	741.32	234.52	48419.9	3.16	5.34
10181.50	10416.00	21.87	711.82	234.51	45252.4	3.04	5.19
10416.00	10650.50	33.82	930.15	238.05	69975.1	3.98	6.15

Plan: B1 MIXED Reach: BUCKEYE # 1 Riv Sta: 19.416 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8861.00	9072.00	0.78	66.14	51.69	2363.9	1.28	1.99
9072.00	9283.00	2.00	204.51	211.00	6073.9	0.97	1.65
9283.00	9494.00	4.12	315.52	211.00	12511.8	1.50	2.21
9494.00	9705.00	3.23	272.66	211.00	9809.6	1.29	2.00
9705.00	9916.00	7.68	458.53	211.20	23313.7	2.17	2.83
9916.00	10127.00	14.82	680.24	211.00	45017.3	3.22	3.68
10127.00	10338.00	23.76	902.85	211.04	72151.3	4.28	4.45
10338.00	10549.00	15.68	703.63	211.00	47626.0	3.33	3.77
10549.00	10760.00	27.93	1005.24	216.61	84813.1	4.76	4.70



X1	10.02	27	1707.8	2025.2	0	0	0	1295.0	1000.2	1448.0
GR	1033.4	1000.0	1015.8	1047.8	1016.6	1081.0	1002.0	1858.5	997.6	1913.8
GR	1000.9	1542.3	1001.8	1707.8	995.8	1759.3	995.9	2044.2	999.5	2126.5
GR	997.1	1968.5	996.0	2003.8	996.8	2025.2	998.7	2879.0	1000.4	3175.1
GR	1000.1	2536.2	1001.4	2758.1	997.6	2780.7	997.5	4056.0	1008.2	4394.1
GR	999.5	3460.9	998.9	3747.3	1005.8	3773.1	1006.4	0.0	0.0	0.0
GR	1012.7	4750.8	1016.6	5036.6	0.0	0.0	0.0	0.0	0.0	0.0

X1	10.12	25	1589.7	1919.1	515.0	505.0	500.0	1527.7	998.6	1589.7
GR	1042.4	1000.0	1040.9	1038.3	1007.8	1159.2	1002.5	1870.6	1000.6	1919.1
GR	999.4	1663.3	999.0	1788.8	998.8	1836.9	998.7	2649.0	1000.1	2747.1
GR	1000.8	2213.9	1003.6	2333.1	1002.4	2638.8	999.4	3669.4	1009.6	3690.0
GR	1001.6	2874.4	1002.5	3094.2	1001.1	3474.2	1001.8	4800.4	1019.8	5021.7
GR	1009.9	4034.7	1012.2	4368.0	1015.9	4650.6	1018.7	0.0	0.0	0.0

X1	10.21	28	1805.5	2075.0	620.0	235.0	500.0	1602.2	1004.3	1617.1
GR	1016.6	1000.0	1012.5	1223.0	1006.6	1494.2	1001.3	1985.5	1000.8	2075.0
GR	1005.5	1791.6	1001.3	1805.5	1000.4	1923.0	1001.1	2791.5	1000.8	2811.1
GR	1003.4	2087.4	1003.2	2366.3	1004.8	2616.5	1005.0	3703.2	1009.9	3741.1
GR	1003.2	2971.8	1004.3	3183.0	1003.7	3398.3	1002.2	4439.3	1015.6	4778.6
GR	1007.8	3791.3	1010.1	3841.2	1010.1	4088.7	1013.1	0.0	0.0	0.0
GR	1021.1	5097.9	1024.3	5278.7	1028.5	5380.5	0.0	0.0	0.0	0.0

NC	0	0	0	.2	.4					
X1	10.31	29	1860.4	2184.8	580.0	330.0	500.0	1667.5	1008.9	1812.9
GR	1020.8	1000.0	1012.5	1323.7	1007.9	1490.9	1008.2	1959.4	1003.7	2037.9
GR	1009.0	1837.5	1002.6	1860.4	1002.8	1943.1	1004.1	2382.0	1006.6	2604.1
GR	1003.2	2124.1	1003.2	2171.4	1006.4	2184.8	1006.0	3132.1	1003.7	3369.7
GR	1007.2	2762.9	1003.2	2844.2	1003.9	2989.7	1005.5	3825.2	1011.5	4058.0
GR	1003.0	3633.9	1010.4	3662.9	1010.3	3763.5	1011.4	5271.9	0.0	0.0
GR	1012.9	4145.6	1015.6	4520.9	1021.4	5101.1	1026.4	0.0	0.0	0.0

X1	10.40	37	2005.9	2403.9	520.0	470.0	500.0	1294.2	1017.9	1362.4
GR	1045.4	1000.0	1036.2	1097.4	1019.7	1201.8	1026.1	1738.5	1011.5	1850.9
GR	1011.3	1390.5	1009.8	1552.3	1010.4	1650.2	1011.5	2321.1	1005.6	2366.3
GR	1007.2	1989.4	1004.8	2005.9	1006.0	2156.3	1005.3	2729.8	1005.3	2911.5
GR	1006.5	2403.9	1005.8	2520.4	1008.8	2544.3	1009.6	3528.8	1011.1	3561.4
GR	1005.7	2937.2	1007.1	3124.3	1006.2	3268.7	1005.4	3838.5	1015.1	4087.7
GR	1011.3	3636.5	1007.8	3690.3	1013.4	3717.0	1012.9	0.0	0.0	0.0

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GR	1018.5	4440.9	1019.0	4769.4	1020.7	4861.1	1024.5	4893.5	1026.1	5101.5
GR	1027.0	5203.0	1031.3	5234.5	0.0	0.0	0.0	0.0	0.0	0.0

X1	10.50	30	2310.0	2727.4	410.0	575.0	500.0	1557.1	1014.5	1683.1
GR	1045.9	1000.0	1048.6	1020.6	1020.8	1110.9	1013.0	2033.6	1012.6	2080.1
GR	1012.2	1753.5	1014.3	1883.7	1014.3	1968.7	1012.0	2219.9	1009.9	2300.4
GR	1014.3	2117.4	1010.4	2157.2	1010.6	2197.1	1009.2	2650.3	1008.7	2707.7
GR	1007.1	2310.0	1008.1	2477.7	1008.8	2586.3	1008.2	3103.4	1010.6	3151.0
GR	1010.1	2727.4	1010.8	2945.1	1010.6	3056.0	1008.5	3456.6	1017.0	3550.0
GR	1009.1	3295.2	1012.0	3345.5	1011.1	3423.3	1008.5	0.0	0.0	0.0

X1	10.59	41	2464.2	3001.7	290.0	650.0	500.0	1618.2	1016.6	1763.6
GR	1051.7	1000.0	1021.3	1092.9	1020.4	1157.9	1015.0	2287.5	1011.6	2455.1
GR	1015.2	1839.5	1016.0	1952.8	1015.4	2129.8	1012.5	2714.6	1010.1	2801.3
GR	1009.2	2464.2	1009.2	2564.5	1011.5	2667.0	1010.2	3249.4	1013.5	3350.6
GR	1010.4	2825.7	1011.4	3001.7	1015.9	3148.4	1015.0	3678.1	1020.1	3769.9
GR	1017.4	3430.7	1016.1	3504.5	1014.2	3546.3	1020.0	4129.7	1020.5	4172.1
GR	1020.1	3882.3	1017.9	3957.4	1021.5	4003.9	1021.3	4426.0	1020.6	4484.6
GR	1022.2	4210.0	1022.2	4333.3	1020.5	4371.4	1021.3	4916.5	1033.7	5001.3
GR	1023.0	4505.5	1023.1	4617.1	1026.4	4819.9	1033.8	0.0	0.0	0.0
GR	1036.9	5171.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	10.69	41	2091.2	2693.0	340.0	575.0	500.0	1140.1	1016.6	1267.4
GR	1031.3	1000.0	1031.3	1000.1	1025.5	1055.7	1020.1	2091.2	1011.7	2108.6
GR	1017.8	1459.8	1017.2	1691.6	1017.6	1880.2	1015.5	2455.1	1013.1	2512.5
GR	1012.0	2195.7	1013.6	2220.1	1013.8	2358.8	1012.4	2905.9	1019.9	2969.6
GR	1011.7	2568.0	1012.7	2677.8	1016.9	2693.0	1016.3	3513.7	1025.2	3621.3
GR	1019.9	3137.5	1018.8	3175.7	1019.0	3400.0	1020.3	3850.4	1026.7	3975.4
GR	1025.3	3675.9	1027.6	3725.0	1026.4	3838.2	1024.9	4251.2	1028.7	4275.8
GR	1025.0	3998.7	1027.2	4026.1	1028.3	4227.7	1026.6	4627.2	1029.3	4652.6
GR	1028.0	4316.3	1026.7	4386.9	1028.8	4608.3	1025.6	0.0	0.0	0.0
GR	1029.9	4727.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	10.73	13	1800.0	2620.0	230.0	270.0	250.0	1540.0	1014.0	1800.0
GR	1040.0	1000.0	1024.0	1042.0	1020.0	1080.0	1016.0	3080.0	1024.0	3580.0
GR	1013.0	2450.0	1016.0	2620.0	1020.0	2880.0	1020.0	0.0	0.0	0.0
GR	1028.0	3715.0	1028.0	4000.0	1030.0	4420.0	0.0	0.0	0.0	0.0

NH	5	.04	1751.7	.03	1826.2	.04	2201.4	.03	2694.4	.04
NH	4453.9									
X1	10.78	36	1751.7	2694.4	230.0	2700.0	250.0	1545.5	1016.3	1566.2
GR	1047.5	1000.0	1047.5	1031.4	1023.0	1144.4	1019.9	1871.8	1015.6	1984.9
GR	1017.3	1751.7	1014.0	1766.0	1014.8	1826.2	1015.7	2450.5	1014.5	2515.4
GR	1016.1	2142.0	1015.2	2201.4	1016.2	2353.5	1015.8	2808.4	1019.7	2989.4
GR	1014.6	2574.0	1016.2	2694.4	1015.9	2793.3	1019.3	3315.0	1024.3	3447.0
GR	1021.8	3066.6	1021.9	3141.2	1024.6	3211.1	1024.7	3885.7	1031.7	3996.9
GR	1025.2	3564.9	1024.4	3670.1	1030.6	3829.2	1030.6	4208.8	1032.0	4328.0
GR	1029.9	4103.3	1031.4	4120.1	1031.1	4189.8	1029.0	0.0	0.0	0.0
GR	1033.2	4453.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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NH	5	.04	1971.0	.03	2074.4	.04	2430.4	.03	3167.6	.04
NH	4239.3									
X1	10.87	29	1971.0	3167.6	465.0	520.0	500.0	0.0	0.0	0.0

GR	1068.0	1000.0	1066.6	1041.0	1032.4	1163.5	1020.7	1496.3	1023.4	1766.0
GR	1017.8	1800.1	1019.6	1865.9	1019.2	1971.0	1016.6	1982.7	1017.9	2074.4
GR	1018.6	2105.4	1017.8	2269.9	1019.2	2303.1	1019.7	2430.4	1018.0	2560.5
GR	1017.1	2693.9	1017.1	2799.9	1017.2	2879.1	1017.8	2986.1	1018.9	3167.6
GR	1021.5	3222.1	1021.7	3391.4	1024.1	3430.5	1027.9	3547.1	1031.8	3626.7
GR	1031.3	3771.7	1032.0	3898.6	1029.9	4103.7	1033.3	4239.3	0.0	0.0

QT	3	50700	33800	16900	75164					
NH	5	.04	1455.7	.03	1495.7	.04	1988.6	.03	2524.0	.04
NH	2829.9									

DUAL BRIDGES OVER INTERSTATE 10  
 SKEW ADJUSTMENT - COSINE OF 10 DEGREES WAS NOT SKEWED  
 BWP OF SB CARD WAS INCREASED BY A FACTOR OF 2 FOR CLOGGING ADJUSTMENT

X1	10.98	23	1455.7	2524.0	400.0	580.0	550.0			
X3	10							1035.0	1035.7	
GR	1039.7	1000.0	1038.8	1153.8	1037.8	1365.5	1021.5	1433.0	1019.5	1455.7
GR	1019.4	1495.7	1021.4	1571.1	1019.9	1650.7	1020.1	1697.7	1022.0	1759.9
GR	1022.0	1834.2	1021.5	1953.6	1020.0	1988.6	1020.4	2063.9	1021.4	2094.5
GR	1021.4	2176.9	1020.7	2261.2	1020.6	2375.3	1020.6	2448.5	1020.6	2524.0
GR	1036.9	2563.8	1037.8	2805.0	1037.8	2829.9	0.0	0.0	0.0	0.0

SB	.9	1.6	2.6	0	1080.0	56	12430.	2.5	1020.6	1020.0
NH	5	.04	1455.7	.03	1495.7	.04	1988.6	.03	2524.0	.04
NH	2829.9									

X1	11.00	0	0	0	135.0	135.0	135.0			
X2			1	1032.9	1038.3					
X3	10							1037.8	1038.4	
BT	5	1000	1039.7	0	1153.8	1038.8	0	1365.5	1037.8	0
BT	2563.8	1038.4	0	2829.9	1938.4	0				

NH	6	1.0	1420.0	.04	2527.9	.03	2749.2	.04	2963.6	.03
NH	3636.8	1.0	4561.3							

X1	11.09	36	2527.9	3620.9	630.0	430.0	440.0			
GR	1068.0	1000.0	1068.0	1140.0	1040.0	1180.0	1036.0	1420.0	1032.0	1700.0
GR	1028.0	1950.0	1022.2	2313.8	1021.7	2449.1	1023.4	2494.9	1022.0	2508.4
GR	1023.3	2527.9	1022.0	2574.2	1022.9	2607.2	1022.1	2749.2	1024.1	2780.0
GR	1024.3	2963.6	1022.0	2976.8	1022.2	3049.7	1022.9	3121.3	1023.0	3253.2
GR	1022.7	3393.3	1022.3	3486.6	1022.4	3594.7	1032.5	3620.9	1032.5	3636.8
GR	1023.4	3666.1	1023.2	3770.9	1024.8	3795.0	1025.1	3851.8	1029.9	3875.4
GR	1033.6	3965.8	1035.0	4165.8	1042.6	4306.0	1037.6	4419.8	1043.8	4537.8
GR	1042.2	4561.3								

NC	0	0	0	.1	.3					
NH	5	.04	2553.8	.03	2728.9	.04	2872.4	.03	3545.3	1.0
NH	4506.4									

X1	11.16	36	2553.8	3495.8	415.0	390.0	395.0			
GR	1062.2	1000.0	1045.5	1080.6	1036.2	1444.4	1032.6	1697.5	1028.6	1998.9
GR	1029.1	2218.2	1025.3	2231.6	1025.7	2443.9	1025.1	2553.8	1024.1	2659.3
GR	1023.4	2728.9	1025.2	2741.3	1026.5	2860.7	1024.5	2872.4	1024.3	3018.9
GR	1024.8	3060.3	1025.0	3217.8	1024.1	3375.7	1023.6	3436.0	1023.6	3495.8

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PAGE 5

GR	1030.8	3516.7	1030.8	3545.3	1024.8	3562.2	1024.7	3616.0	1026.9	3635.4
GR	1026.9	3718.1	1028.7	3816.9	1038.2	3864.6	1045.0	3942.3	1038.8	4007.5
GR	1043.6	4081.5	1044.0	4134.6	1038.1	4216.5	1048.1	4277.2	1051.1	4505.7
GR	1051.1	4506.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NH	5	.04	2880.0	.03	3186.7	.04	3342.1	.03	3920.5	.04
NH	4918.1									

X1	11.24	40	2880.0	3920.5	420.0	400.0	400.0			
GR	1081.0	1000.0	1072.5	1071.6	1062.4	1133.6	1045.8	1421.7	1040.6	1799.3
GR	1043.2	1839.2	1036.1	2006.5	1033.1	2256.4	1031.2	2281.4	1032.0	2328.1
GR	1030.8	2398.2	1031.0	2441.1	1029.4	2465.6	1028.5	2585.0	1028.7	2648.6
GR	1027.8	2719.2	1025.9	2760.6	1028.3	2880.0	1025.1	3120.9	1025.1	3163.7
GR	1027.8	3186.7	1028.2	3324.1	1025.2	3342.1	1025.2	3399.2	1026.2	3436.0
GR	1026.6	3583.7	1025.1	3787.8	1025.2	3833.8	1025.6	3885.6	1029.5	3920.5
GR	1028.2	4074.8	1031.7	4281.5	1035.2	4366.8	1039.4	4435.9	1036.4	4481.7
GR	1050.1	4575.5	1050.9	4630.3	1045.7	4657.4	1052.7	4698.6	1053.6	4918.1

NH	5	.04	2729.4	.03	3035.2	.04	3219.0	.03	3834.5	.04
NH	4587.7									

X1	11.33	42	2729.4	3743.2	490.0	495.0	500.0			
GR	1072.9	1000.0	1059.4	1084.2	1050.0	1130.8	1051.9	1385.1	1043.6	1479.9
GR	1037.3	1904.5	1035.2	2090.6	1034.1	2254.9	1030.4	2290.7	1031.3	2383.4
GR	1028.7	2395.9	1029.0	2424.1	1030.4	2467.2	1030.5	2682.0	1029.0	2729.4
GR	1029.7	2791.9	1028.6	2861.0	1029.1	2912.7	1027.0	3035.2	1029.5	3058.6
GR	1029.7	3115.6	1028.6	3205.8	1027.6	3219.0	1027.8	3389.3	1028.7	3494.8
GR	1027.2	3560.0	1027.1	3610.7	1027.4	3659.7	1029.4	3674.1	1029.4	3720.1
GR	1027.6	3743.2	1027.6	3801.9	1030.4	3834.5	1027.7	3862.8	1032.2	3885.4
GR	1031.5	4033.1	1037.9	4190.0	1043.6	4287.2	1042.9	4313.6	1050.2	4418.0
GR	1056.1	4535.3	1059.8	4587.7	0.0	0.0	0.0	0.0	0.0	0.0

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PAGE 6

T1 HASSAYAMPA RIVER 2/3 SPILL

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.005	0	0	0	0	
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1							

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PAGE 7

T1 HASSAYAMPA RIVER 1/3 SPILL

```

J1 ICHECK  INQ    NINV   IDIR   STRT   METRIC  HVINS   Q      WSEL   FQ
    0      4      0      0     0.005   0       0       0      0      0
J2 NPROF    IPLOT  PRFVS  XSECV  XSECH  FN      ALLDC  IBW    CHNIM  ITRACE
    3      0     -1
1 30APR96   10:32:13
    
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T1 HASSAYAMPA RIVER 100YR

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J1 ICHECK  INQ    NINV   IDIR   STRT   METRIC  HVINS   Q      WSEL   FQ
    0      5      0      0     0.005   0       0       0      0      0
J2 NPROF    IPLOT  PRFVS  XSECV  XSECH  FN      ALLDC  IBW    CHNIM  ITRACE
    4      0     -1
1 30APR96   10:32:13
    
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THIS RUN EXECUTED 30APR96 10:32:16

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*****
HEC-2 WATER SURFACE PROFILES
Version 4.6.2; May 1991
*****
    
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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

YAMPA RIVER JOB #04856-0

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10*KS	VCH	AREA	.01K
10.020	.00	.00	.00	995.80	50700.00	1002.49	.00	1003.52	49.88	11.06	7525.44	7178.5
10.020	.00	.00	.00	995.80	33800.00	1001.70	.00	1002.59	49.96	10.03	5575.39	4781.8
* 10.020	.00	.00	.00	995.80	16900.00	1000.64	1000.64	1001.37	46.18	8.37	3232.60	2486.9
10.020	.00	.00	.00	995.80	74970.00	1003.43	.00	1004.65	49.69	12.24	9846.86	10635.3
10.120	500.00	.00	.00	998.60	50700.00	1004.91	.00	1005.72	38.07	9.84	8076.35	8216.8
10.120	500.00	.00	.00	998.60	33800.00	1004.08	.00	1004.74	36.02	8.64	6198.45	5631.4
10.120	500.00	.00	.00	998.60	16900.00	1002.91	.00	1003.41	35.51	7.16	3672.29	2835.9
10.120	500.00	.00	.00	998.60	74970.00	1005.86	.00	1006.91	40.26	11.21	10330.07	11815.0
10.210	500.00	.00	.00	1000.40	50700.00	1006.33	.00	1007.61	67.43	12.62	6682.69	6174.3
* 10.210	500.00	.00	.00	1000.40	33800.00	1005.67	1005.67	1006.67	59.33	10.88	5235.53	4388.1
* 10.210	500.00	.00	.00	1000.40	16900.00	1004.67	1004.67	1005.43	54.02	8.88	3125.71	2299.3
10.210	500.00	.00	.00	1000.40	74970.00	1007.29	.00	1008.77	64.43	13.75	8834.86	9339.7
10.310	500.00	.00	.00	1002.60	50700.00	1008.86	.00	1009.68	37.97	9.47	7656.64	8228.2
10.310	500.00	.00	.00	1002.60	33800.00	1007.96	.00	1008.58	36.15	8.19	5802.60	5621.7
10.310	500.00	.00	.00	1002.60	16900.00	1006.79	.00	1007.17	30.77	6.20	3712.21	3046.4
10.310	500.00	.00	.00	1002.60	74970.00	1009.79	.00	1010.91	42.74	11.15	9705.02	11467.8
10.400	500.00	.00	.00	1004.80	50700.00	1010.75	.00	1011.74	45.04	9.96	6969.42	7554.2
10.400	500.00	.00	.00	1004.80	33800.00	1009.81	.00	1010.57	44.68	8.67	5228.05	5056.6
10.400	500.00	.00	.00	1004.80	16900.00	1008.51	.00	1009.01	45.63	6.86	3235.81	2501.9
10.400	500.00	.00	.00	1004.80	74970.00	1011.83	.00	1013.07	45.12	11.31	9314.24	11161.4
* 10.500	500.00	.00	.00	1007.10	50700.00	1013.60	1013.60	1015.28	67.66	12.59	5636.26	6163.5
* 10.500	500.00	.00	.00	1007.10	33800.00	1012.67	1012.67	1014.05	67.78	11.14	4179.29	4105.5
* 10.500	500.00	.00	.00	1007.10	16900.00	1011.45	1011.45	1012.45	67.99	9.04	2507.32	2049.5
* 10.500	500.00	.00	.00	1007.10	74970.00	1014.73	1014.73	1016.67	63.76	13.87	7799.86	9388.8
10.590	500.00	.00	.00	1009.20	50700.00	1016.49	1016.44	1018.11	47.26	11.46	5972.63	7375.0
10.590	500.00	.00	.00	1009.20	33800.00	1015.50	.00	1016.81	45.02	9.95	4177.05	5037.2
* 10.590	500.00	.00	.00	1009.20	16900.00	1014.16	.00	1014.90	35.76	7.25	2662.20	2825.9
* 10.590	500.00	.00	.00	1009.20	74970.00	1017.58	1017.58	1019.49	48.48	12.93	8283.77	10767.8

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10*KS	VCH	AREA	.01K
* 10.690	500.00	.00	.00	1011.70	50700.00	1019.03	1019.03	1020.69	45.28	11.23	5990.78	7534.3
* 10.690	500.00	.00	.00	1011.70	33800.00	1017.94	1017.94	1019.43	48.21	10.18	4048.17	4868.0
* 10.690	500.00	.00	.00	1011.70	16900.00	1016.16	.00	1017.27	58.34	8.44	2020.93	2212.5
* 10.690	500.00	.00	.00	1011.70	74970.00	1020.22	1020.22	1022.06	43.55	12.37	8540.05	11360.4
* 10.730	250.00	.00	.00	1013.00	50700.00	1020.91	.00	1021.44	12.35	6.49	9770.06	14428.9
* 10.730	250.00	.00	.00	1013.00	33800.00	1019.76	.00	1020.15	10.99	5.46	7477.38	10194.0

*	10.730	250.00	.00	.00	1013.00	16900.00	1017.74	.00	1018.02	12.66	4.46	4285.38	4750.6
*	10.730	250.00	.00	.00	1013.00	74970.00	1022.11	.00	1022.85	14.26	7.73	12426.62	19855.5
	10.780	250.00	.00	.00	1014.00	50700.00	1021.48	.00	1022.21	24.34	7.31	7761.45	10277.2
*	10.780	250.00	.00	.00	1014.00	33800.00	1020.23	.00	1020.81	25.29	6.39	5755.94	6721.3
*	10.780	250.00	.00	.00	1014.00	16900.00	1018.30	.00	1018.77	40.14	5.71	3164.56	2667.4
	10.780	250.00	.00	.00	1014.00	74970.00	1022.84	.00	1023.78	24.70	8.42	10299.17	15086.1
	10.870	500.00	.00	.00	1016.60	50700.00	1022.83	.00	1023.73	35.45	7.91	7080.41	8514.8
	10.870	500.00	.00	.00	1016.60	33800.00	1021.70	.00	1022.46	41.00	7.16	5017.69	5278.4
	10.870	500.00	.00	.00	1016.60	16900.00	1020.41	.00	1020.91	45.43	5.74	3069.99	2507.4
	10.870	500.00	.00	.00	1016.60	74970.00	1024.16	.00	1025.21	31.53	8.73	9714.23	13350.8
*	10.980	550.00	.00	.00	1019.40	50700.00	1025.13	.00	1027.05	90.19	11.11	4562.94	5338.5
	10.980	550.00	.00	.00	1019.40	33800.00	1024.37	.00	1025.63	75.82	8.99	3760.29	3881.7
	10.980	550.00	.00	.00	1019.40	16900.00	1023.27	.00	1023.94	65.79	6.57	2571.55	2083.6
*	10.980	550.00	.00	.00	1019.40	75164.00	1026.19	1026.19	1028.90	95.43	13.20	5693.06	7694.2
	11.000	135.00	1038.30	1032.90	1019.40	50700.00	1025.85	.00	1027.25	54.07	9.52	5327.53	6894.7
	11.000	135.00	1038.30	1032.90	1019.40	33800.00	1024.74	.00	1025.77	54.93	8.15	4147.20	4560.6
	11.000	135.00	1038.30	1032.90	1019.40	16900.00	1023.42	.00	1024.01	54.14	6.19	2729.87	2296.7
*	11.000	135.00	1038.30	1032.90	1019.40	75164.00	1027.43	.00	1029.21	47.76	10.71	7016.83	10876.0
*	11.090	440.00	.00	.00	1021.70	50700.00	1028.26	.00	1028.88	20.99	6.74	9104.81	11066.0
*	11.090	440.00	.00	.00	1021.70	33800.00	1026.96	.00	1027.46	23.38	5.98	6712.91	6990.1
*	11.090	440.00	.00	.00	1021.70	16900.00	1025.43	.00	1025.76	26.44	4.79	4044.23	3286.8
*	11.090	440.00	.00	.00	1021.70	75164.00	1029.95	.00	1030.70	18.00	7.43	12401.77	17714.6
*	11.160	395.00	.00	.00	1023.40	50700.00	1029.01	.00	1030.46	61.00	10.22	6011.12	6491.2
*	11.160	395.00	.00	.00	1023.40	33800.00	1027.97	.00	1029.14	67.90	9.10	4378.15	4101.9
*	11.160	395.00	.00	.00	1023.40	16900.00	1026.78	.00	1027.56	75.88	7.36	2631.32	1940.1
*	11.160	395.00	.00	.00	1023.40	75164.00	1030.45	.00	1032.07	48.75	10.96	8713.74	10765.6
	11.240	400.00	.00	.00	1025.10	50700.00	1031.36	.00	1032.23	31.25	8.01	7327.29	9069.1
*	11.240	400.00	.00	.00	1025.10	33800.00	1030.32	.00	1031.02	32.75	7.08	5428.46	5906.6
*	11.240	400.00	.00	.00	1025.10	16900.00	1029.04	.00	1029.50	32.59	5.61	3267.98	2960.2
	11.240	400.00	.00	.00	1025.10	75164.00	1032.57	.00	1033.66	30.59	9.09	9733.73	13589.0
	11.330	500.00	.00	.00	1027.00	50700.00	1033.03	.00	1033.99	38.85	8.35	6798.88	8133.9
	11.330	500.00	.00	.00	1027.00	33800.00	1032.08	.00	1032.84	39.74	7.29	5093.51	5362.0
	11.330	500.00	.00	.00	1027.00	16900.00	1030.84	.00	1031.34	41.56	5.78	3079.89	2621.3
	11.330	500.00	.00	.00	1027.00	75164.00	1034.18	.00	1035.40	38.25	9.56	8887.76	12153.1

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PAGE 11

YAMPA RIVER JOB #04856-0

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10.020	50700.00	1002.49	.00	.00	.00	2472.91	.00
10.020	33800.00	1001.70	-.79	.00	.00	2417.43	.00
*	10.020	16900.00	1000.64	-1.05	.00	2000.08	.00
10.020	74970.00	1003.43	2.78	.00	.00	2490.12	.00
10.120	50700.00	1004.91	.00	2.42	.00	2317.17	500.00
10.120	33800.00	1004.08	-.82	2.39	.00	2257.93	500.00
10.120	16900.00	1002.91	-1.17	2.27	.00	1969.10	500.00
10.120	74970.00	1005.86	2.95	2.44	.00	2386.33	500.00
10.210	50700.00	1006.33	.00	1.42	.00	2223.77	500.00
10.210	33800.00	1005.67	-.65	1.59	.00	2207.24	500.00
*	10.210	16900.00	1004.67	-1.00	1.76	1861.82	500.00
10.210	74970.00	1007.29	2.62	1.42	.00	2265.65	500.00
10.310	50700.00	1008.86	.00	2.53	.00	2167.90	500.00
10.310	33800.00	1007.96	-.90	2.28	.00	1845.41	500.00
10.310	16900.00	1006.79	-1.17	2.12	.00	1684.69	500.00
10.310	74970.00	1009.79	3.00	2.50	.00	2238.14	500.00
10.400	50700.00	1010.75	.00	1.89	.00	1972.99	500.00
10.400	33800.00	1009.81	-.95	1.85	.00	1691.00	500.00
10.400	16900.00	1008.51	-1.29	1.72	.00	1379.55	500.00
10.400	74970.00	1011.83	3.32	2.05	.00	2321.34	500.00
* 10.500	50700.00	1013.60	.00	2.84	.00	1714.60	500.00
* 10.500	33800.00	1012.67	-.92	2.87	.00	1479.57	500.00
* 10.500	16900.00	1011.45	-1.22	2.94	.00	1286.06	500.00
* 10.500	74970.00	1014.73	3.27	2.90	.00	2066.90	500.00
10.590	50700.00	1016.49	.00	2.89	.00	2023.52	500.00
10.590	33800.00	1015.50	-.99	2.82	.00	1438.18	500.00
10.590	16900.00	1014.16	-1.34	2.71	.00	951.37	500.00
* 10.590	74970.00	1017.58	3.42	2.85	.00	2224.80	500.00
* 10.690	50700.00	1019.03	.00	2.55	.00	2010.77	500.00
* 10.690	33800.00	1017.94	-1.09	2.44	.00	1716.19	500.00
10.690	16900.00	1016.16	-1.78	2.00	.00	665.49	500.00
* 10.690	74970.00	1020.22	4.05	2.64	.00	2368.01	500.00
* 10.730	50700.00	1020.91	.00	1.87	.00	2122.04	250.00
* 10.730	33800.00	1019.76	-1.15	1.82	.00	1757.23	250.00
* 10.730	16900.00	1017.74	-2.02	1.58	.00	1392.39	250.00
* 10.730	74970.00	1022.11	4.38	1.90	.00	2284.22	250.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.780	50700.00	1021.48	.00	.57	.00	1714.36	250.00
*	10.780	33800.00	1020.23	-1.25	.47	.00	1507.52	250.00
*	10.780	16900.00	1018.30	-1.94	.56	.00	1249.21	250.00
	10.780	74970.00	1022.84	4.55	.73	.00	1999.97	250.00
	10.870	50700.00	1022.83	.00	1.35	.00	1914.33	500.00
	10.870	33800.00	1021.70	-1.13	1.47	.00	1744.39	500.00
	10.870	16900.00	1020.41	-1.29	2.12	.00	1414.90	500.00
	10.870	74970.00	1024.16	3.74	1.31	.00	2034.29	500.00
*	10.980	50700.00	1025.13	.00	2.30	.00	1068.30	550.00
	10.980	33800.00	1024.37	-.76	2.67	.00	1068.30	550.00
	10.980	16900.00	1023.27	-1.11	2.86	.00	1068.30	550.00
*	10.980	75164.00	1026.19	2.92	2.03	.00	1068.30	550.00
	11.000	50700.00	1025.85	.00	.72	.00	1068.30	135.00
	11.000	33800.00	1024.74	-1.10	.37	.00	1068.30	135.00
	11.000	16900.00	1023.42	-1.33	.15	.00	1068.30	135.00
*	11.000	75164.00	1027.43	4.01	1.24	.00	1068.30	135.00
*	11.090	50700.00	1028.26	.00	2.41	.00	1893.12	440.00
*	11.090	33800.00	1026.96	-1.30	2.22	.00	1797.98	440.00
*	11.090	16900.00	1025.43	-1.53	2.02	.00	1685.43	440.00
*	11.090	75164.00	1029.95	4.52	2.52	.00	2017.55	440.00
*	11.160	50700.00	1029.01	.00	.74	.00	1770.10	395.00
*	11.160	33800.00	1027.97	-1.03	1.01	.00	1510.16	395.00
*	11.160	16900.00	1026.78	-1.20	1.35	.00	1356.39	395.00
*	11.160	75164.00	1030.45	3.67	.50	.00	1935.61	395.00
	11.240	50700.00	1031.36	.00	2.36	.00	1908.88	400.00
*	11.240	33800.00	1030.32	-1.04	2.35	.00	1748.65	400.00
*	11.240	16900.00	1029.04	-1.29	2.26	.00	1552.19	400.00
	11.240	75164.00	1032.57	3.54	2.13	.00	2039.47	400.00
	11.330	50700.00	1033.03	.00	1.67	.00	1805.54	500.00
	11.330	33800.00	1032.08	-.95	1.76	.00	1747.29	500.00
	11.330	16900.00	1030.84	-1.24	1.80	.00	1542.72	500.00
	11.330	75164.00	1034.18	3.34	1.61	.00	1855.78	500.00

1

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 10.020 PROFILE= 3 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.210 PROFILE= 2 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.210 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.210 PROFILE= 3 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.210 PROFILE= 3 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.500 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.500 PROFILE= 2 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.500 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.500 PROFILE= 3 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.500 PROFILE= 3 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.500 PROFILE= 4 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.500 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.590 PROFILE= 4 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.590 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.690 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.690 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.690 PROFILE= 2 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.690 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.690 PROFILE= 4 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.690 PROFILE= 4 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 10.730 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.730 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.730 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.730 PROFILE= 4 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.780 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.780 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.980 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 10.980 PROFILE= 4 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 10.980 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 11.000 PROFILE= 4 HYDRAULIC JUMP D.S.

WARNING SECNO= 11.000 PROFILE= 4 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.090 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.090 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.090 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.090 PROFILE= 4 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.160 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 11.160 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 11.160 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 11.160 PROFILE= 4 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO= 11.240 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 11.240 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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FLOODWAY DATA, YAMPA RIVER JOB #04856-0  
 PROFILE NO. 2

STATION	WIDTH	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION		DIFFERENCE
				WITH FLOODWAY	WITHOUT FLOODWAY	
10.020	2437.	5575.	6.1	1001.7	1002.5	-.8
10.120	2258.	6198.	5.5	1004.1	1004.9	-.8
10.210	2207.	5236.	6.5	1005.6	1006.3	-.7
10.310	2164.	5803.	5.8	1008.0	1008.9	-.9
10.400	2148.	5228.	6.5	1009.9	1010.8	-.9
10.500	1763.	4179.	8.1	1012.7	1013.6	-.9
10.590	2000.	4177.	8.1	1015.5	1016.5	-1.0
10.690	1716.	4048.	8.3	1017.9	1019.0	-1.1
10.730	1757.	7477.	4.5	1019.8	1020.9	-1.1
10.780	1508.	5756.	5.9	1020.3	1021.5	-1.2
10.870	1924.	5018.	6.7	1021.7	1022.8	-1.1
10.980	1068.	3760.	9.0	1024.3	1025.1	-.8
11.000	1068.	4147.	8.2	1024.7	1025.8	-1.1
11.090	1846.	6713.	5.0	1027.0	1028.3	-1.3
11.160	1555.	4378.	7.7	1028.0	1029.0	-1.0
11.240	1749.	5428.	6.2	1030.4	1031.4	-1.0
11.330	1773.	5094.	6.6	1032.0	1033.0	-1.0

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FLOODWAY DATA, YAMPA RIVER JOB #04856-0  
 PROFILE NO. 3

STATION	WIDTH	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION		DIFFERENCE
				WITH FLOODWAY	WITHOUT FLOODWAY	
10.020	2344.	3233.	5.2	1000.6	1002.5	-1.9
10.120	2173.	3672.	4.6	1002.9	1004.9	-2.0
10.210	2182.	3126.	5.4	1004.7	1006.3	-1.6
10.310	1803.	3712.	4.6	1006.8	1008.9	-2.1
10.400	1746.	3236.	5.2	1008.5	1010.8	-2.3
10.500	1343.	2507.	6.7	1011.5	1013.6	-2.1
10.590	1166.	2662.	6.3	1014.2	1016.5	-2.3
10.690	665.	2021.	8.4	1016.2	1019.0	-2.8
10.730	1392.	4285.	3.9	1017.7	1020.9	-3.2
10.780	1249.	3165.	5.3	1018.3	1021.5	-3.2
10.870	1415.	3070.	5.5	1020.4	1022.8	-2.4
10.980	1068.	2572.	6.6	1023.3	1025.1	-1.8
11.000	1068.	2730.	6.2	1023.4	1025.8	-2.4
11.090	1742.	4044.	4.2	1025.4	1028.3	-2.9
11.160	1408.	2631.	6.4	1026.8	1029.0	-2.2
11.240	1611.	3268.	5.2	1029.0	1031.4	-2.4
11.330	1592.	3080.	5.5	1030.8	1033.0	-2.2

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FLOODWAY DATA, YAMPA RIVER JOB #04856-0  
 PROFILE NO. 4

STATION	WIDTH	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION		DIFFERENCE
				WITH FLOODWAY	WITHOUT FLOODWAY	
10.020	2490.	9847.	7.6	1003.4	1002.5	.9
10.120	2386.	10330.	7.3	1005.9	1004.9	1.0
10.210	2266.	8835.	8.5	1007.3	1006.3	1.0
10.310	2238.	9705.	7.7	1009.8	1008.9	.9
10.400	2321.	9314.	8.0	1011.8	1010.8	1.0
10.500	2067.	7800.	9.6	1014.7	1013.6	1.1
10.590	2225.	8284.	9.1	1017.6	1016.5	1.1
10.690	2368.	8540.	8.8	1020.2	1019.0	1.2
10.730	2284.	12427.	6.0	1022.1	1020.9	1.2
10.780	2000.	10299.	7.3	1022.8	1021.5	1.3
10.870	2034.	9714.	7.7	1024.2	1022.8	1.4
10.980	1068.	5693.	13.2	1026.2	1025.1	1.1

11.000	1068.	7017.	10.7	1027.4	1025.8	1.6
11.090	2048.	12402.	6.1	1030.0	1028.3	1.7
11.160	1966.	8714.	8.6	1030.4	1029.0	1.4
11.240	2039.	9734.	7.7	1032.6	1031.4	1.2
11.330	1856.	8888.	8.5	1034.2	1033.0	1.2

1\*\*\*\*\*  
 \* HEC-2 WATER SURFACE PROFILES \*  
 \* \*  
 \* Version 4.6.2; May 1991 \*  
 \* \*  
 \* RUN DATE 27JUL96 TIME 10:12:08 \*  
 \*\*\*\*\*

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

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X   X  XXXXXXX  XXXXX          XXXXX
X   X  X   X   X   X   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   X   X   X
X   X  XXXXXXX  XXXXX          XXXXXXX
  
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THIS RUN EXECUTED 27JUL96 10:12:08

\*\*\*\*\*  
 HEC-2 WATER SURFACE PROFILES  
 Version 4.6.2; May 1991  
 \*\*\*\*\*

*BUCKEYE STRUCTURE 1*

T1 DELINEATION OF SPILLWAY FLOWS  
 T2 FOR BUCKEYE STRUCTURES 1, 2 AND 3  
 T3 BUCKEYE STRUCTURE 1

STANLEY CONSULTANTS # 13084  
 CONTRACT FCD 95-34  
 INPUT FILENAME: 13084B1B.H2

T4 PURPOSE OF MODEL IS TO PROVIDE BASIC MODEL GEOMETRY AND ASSOCIATED DATA  
 T4 FOR THE ENTIRE STUDY REACH IN HEC-2 FORMAT AS REQUIRED BY SCOPE OF WORK.

T4 MODEL ASSUMPTIONS AS FOLLOWS:  
 T4 1. STARTING WATER SURFACE ELEVATION USES SLOPE-AREA OPTION WITH SLOPE  
 T4 ESTIMATED FROM HASSAYAMPA RIVER MODEL "13084HAS".

T4 GENERAL MODEL NOTES:  
 T4 1. CROSS SECTION DATA DEVELOPED FROM MCLAIN HARBERS 2 FT CONTOUR  
 T4 MAPPING FOR BUCKEYE STRUCTURES (FCD 93-51). VERT DATUM: NAVD 88.  
 T4 HORIZ DATUM: MAD 83.  
 T4 2. CROSS SECTIONS ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.  
 T4 3. CENTER LINE OF LEVEL BUCKEYE STRUCTURE SPILLWAY CREST (ACCORDING TO  
 T4 ORIGINAL SCS CONSTRUCTION PLANS) CORRESPONDS TO RIVER MILE 20.000.  
 T4 4. HYDRAULIC BASELINE CORRESPONDS TO CROSS SECTION GR STA 10,000.  
 T4 5. PROFILE 1: FULL SPILLWAY DISCHARGE  
 T4 PROFILE 2: 2/3 SPILLWAY DISCHARGE  
 T4 PROFILE 3: 1/3 SPILLWAY DISCHARGE  
 T4

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.0036					
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1		-1							
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	38	43	1	2	13	55	16	14	26	17
	15	56	18		38	43	1	25	42	8
	39	27	53	54	28	4	37		38	43
	1	68	50	3	61	27	21	23	24	22

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J5	LPRNT	NUMSEC	*****REQUESTED SECTION NUMBERS*****							
	-10	-10								
NC			.049	.1	.3					
ET		9.1	9.1	9.1				9000	10760	
QT	3	50700	33800	16900						
X1	19.416	26	8650	10760			0			
GR	1036.0	8650	1034.0	8670	1032.0	8740	1031.0	8785	1032.0	8840
GR	1032.5	8875	1023.0	8920	1023.0	8945	1032.5	9000	1030.0	9040
GR	1029.0	9055	1030.0	9070	1030.5	9175	1030.0	9285	1029.5	9470
GR	1030.5	9770	1030.0	9795	1028.0	9805	1028.0	10130	1026.0	10265
GR	1026.0	10280	1027.2	10305	1028.0	10420	1028.0	10595	1026.0	10600
GR	1026.0	10760								
ET		9.1	9.1	9.1				8930	10650	
X1	19.512	32	8540	10890			500			
GR	1040.0	8540	1030.0	8560	1024.0	8590	1024.0	8605	1036.0	8645
GR	1034.0	8740	1036.0	8770	1034.0	8795	1036.0	8890	1036.4	8930
GR	1036.0	8965	1034.0	9030	1034.0	9140	1034.0	9205	1032.0	9725

GR	1032.0	9745	1032.0	9830	1032.0	9940	1031.6	10035	1030.0	10105
GR	1030.0	10155	1032.0	10430	1030.0	10445	1030.0	10470	1030.0	10550
GR	1030.0	10595	1028.0	10610	1030.0	10620	1030.5	10650	1030.0	10680
GR	1032.0	10790	1032.0	10885						
NC			.045							
ET		9.1	9.1	9.1					9425	10435
X1	19.606	21	8845	10770			500			
GR	1044.0	8845	1042.0	8900	1040.0	8960	1040.0	9160	1042.0	9305
GR	1044.0	9370	1046.0	9400	1047.3	9425	1040.0	9480	1038.0	9535
GR	1038.0	9605	1038.0	9990	1038.0	10080	1038.0	10225	1036.0	10360
GR	1036.0	10370	1038.1	10435	1038.0	10470	1038.0	10590	1040.0	10740
GR	1040.6	10770								
X1	19.702	17	9460	10340			505			
GR	1062.0	9460	1054.0	9490	1052.0	9500	1050.0	9510	1048.0	9525
GR	1046.0	9670	1046.0	9720	1048.0	9750	1050.0	9780	1052.0	9820
GR	1054.0	9850	1048.0	9930	1046.0	9965	1046.0	10130	1046.0	10210
GR	1050.0	10250	1061.6	10340						
X1	19.779	10	9700	10430			405			
GR	1062.0	9700	1060.0	9705	1058.0	9715	1056.0	9720	1054.0	9825
GR	1054.0	10285	1056.0	10350	1058.0	10405	1060.0	10420	1062.0	10430
ET		9.1	9.1	9.1					9590	10500
X1	19.839	30	9490	10500			315			
GR	1072.0	9490	1070.0	9500	1068.0	9510	1066.0	9520	1064.0	9530
GR	1062.0	9560	1062.0	9630	1062.0	9655	1070.0	9690	1072.0	9715
GR	1072.0	9920	1070.0	9940	1068.0	9960	1066.0	9970	1064.0	9980
GR	1062.0	10070	1064.0	10115	1066.0	10130	1068.0	10135	1070.0	10140

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GR	1072.0	10150	1072.0	10280	1070.0	10290	1068.0	10300	1066.0	10305
GR	1064.0	10315	1062.0	10400	1062.0	10435	1064.0	10460	1072.0	10500
NC			.041							
ET		9.1	9.1	9.1					9595	10445
X1	19.896	16	9595	10660			300			
GR	1088.0	9595	1080.0	9620	1078.0	9715	1076.0	9765	1076.0	9780
GR	1078.0	9800	1078.0	10420	1080.0	10430	1082.0	10440	1083.0	10445
GR	1082.0	10450	1072.0	10495	1082.0	10555	1082.0	10580	1074.0	10610
GR	1088.0	10660								
NC			.037							
X1	19.991	6	9570	10440			500			
GR	1089.5	9570	1088.0	9575	1082.0	9600	1082.0	10380	1088.0	10415
GR	1090.0	10440								
X1	20.009	9	9570	10420			100			
GR	1088.8	9570	1088.0	9580	1082.0	9600	1080.0	9610	1080.0	9640
GR	1081.2	9990	1081.2	10160	1082.0	10390	1090.0	10420		

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3			0.0038					
J2	NPROF	IPLLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		4			0.0040					
J2	NPROF	IPLLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3		-1							

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THIS RUN EXECUTED 27JUL96 10:12:09

\*\*\*\*\*  
 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

BUCKEYE STRUCTURE 1

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XL	QCH	VCH	K*XLCH	QROB	VROB	K*XL
	19.416	50700.00	1033.87	.00	.00	.00	.00	50700.00	5.48	49.00	.00	.00	.0
	19.416	33800.00	1032.67	.00	.00	.00	.00	33800.00	4.73	49.00	.00	.00	.0
	19.416	16900.00	1031.23	.00	.00	.00	.00	16900.00	3.66	49.00	.00	.00	.0
*	19.512	50700.00	1036.28	.00	.00	.00	.00	50700.00	7.18	49.00	.00	.00	.0
*	19.512	33800.00	1035.27	.00	.00	.00	.00	33800.00	6.29	49.00	.00	.00	.0
*	19.512	16900.00	1034.09	.00	.00	.00	.00	16900.00	4.94	49.00	.00	.00	.0
*	19.606	50700.00	1042.28	1042.28	.00	.00	.00	50700.00	11.88	45.00	.00	.00	.0
*	19.606	33800.00	1041.19	1041.19	.00	.00	.00	33800.00	10.51	45.00	.00	.00	.0
*	19.606	16900.00	1040.15	1039.94	.00	.00	.00	16900.00	7.64	45.00	.00	.00	.0
*	19.702	50700.00	1052.82	1052.82	.00	.00	.00	50700.00	13.06	45.00	.00	.00	.0
*	19.702	33800.00	1051.41	1051.41	.00	.00	.00	33800.00	11.74	45.00	.00	.00	.0
*	19.702	16900.00	1049.64	1049.64	.00	.00	.00	16900.00	9.71	45.00	.00	.00	.0
*	19.779	50700.00	1060.03	1060.03	.00	.00	.00	50700.00	13.22	45.00	.00	.00	.0
*	19.779	33800.00	1058.81	1058.72	.00	.00	.00	33800.00	11.37	45.00	.00	.00	.0
*	19.779	16900.00	1057.36	1057.10	.00	.00	.00	16900.00	8.57	45.00	.00	.00	.0
*	19.839	50700.00	1070.93	1070.93	.00	.00	.00	50700.00	14.50	45.00	.00	.00	.0
*	19.839	33800.00	1069.08	1069.08	.00	.00	.00	33800.00	13.18	45.00	.00	.00	.0
*	19.839	16900.00	1066.81	1066.81	.00	.00	.00	16900.00	10.88	45.00	.00	.00	.0
*	19.896	50700.00	1082.88	1082.88	.00	.00	.00	50700.00	12.72	41.00	.00	.00	.0
*	19.896	33800.00	1081.74	1081.74	.00	.00	.00	33800.00	11.14	41.00	.00	.00	.0
*	19.896	16900.00	1080.37	1080.37	.00	.00	.00	16900.00	8.81	41.00	.00	.00	.0
*	19.991	50700.00	1088.30	.00	.00	.00	.00	50700.00	9.93	37.00	.00	.00	.0
*	19.991	33800.00	1087.00	.00	.00	.00	.00	33800.00	8.40	37.00	.00	.00	.0
*	19.991	16900.00	1085.38	.00	.00	.00	.00	16900.00	6.29	37.00	.00	.00	.0

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	SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XL	QCH	VCH	K*XLCH	QROB	VROB	K*XL
*	20.009	50700.00	1089.36	.00	.00	.00	.00	50700.00	7.46	37.00	.00	.00	.0
*	20.009	33800.00	1087.86	.00	.00	.00	.00	33800.00	6.10	37.00	.00	.00	.0
*	20.009	16900.00	1085.98	.00	.00	.00	.00	16900.00	4.24	37.00	.00	.00	.0

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BUCKEYE STRUCTURE 1

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
	19.416	50700.00	1033.87	9253.01	1023.00	10.87	.00	9000.00	9000.00	10760.00	10760.00	1760.00	.0
	19.416	33800.00	1032.67	7140.88	1023.00	9.67	.00	9000.00	9000.00	10760.00	10760.00	1760.00	.0
	19.416	16900.00	1031.23	4612.70	1023.00	8.23	.00	9000.00	9020.39	10760.00	10760.00	1739.61	.0
*	19.512	50700.00	1036.28	7064.93	1024.00	12.28	500.00	8930.00	8940.80	10650.00	10650.00	1709.20	19.9
*	19.512	33800.00	1035.27	5375.76	1024.00	11.27	500.00	8930.00	8988.69	10650.00	10650.00	1661.31	19.6
*	19.512	16900.00	1034.09	3422.90	1024.00	10.09	500.00	8930.00	9027.35	10650.00	10650.00	1622.65	19.3
*	19.606	50700.00	1042.28	4267.57	1036.00	6.28	500.00	9425.00	9462.83	10435.00	10435.00	972.17	35.3
*	19.606	33800.00	1041.19	3217.01	1036.00	5.19	500.00	9425.00	9471.01	10435.00	10435.00	963.99	34.7
*	19.606	16900.00	1040.15	2211.60	1036.00	4.15	500.00	9425.00	9478.90	10435.00	10435.00	956.10	34.1
*	19.702	50700.00	1052.82	3882.67	1046.00	6.82	505.00	.00	9495.90	10271.88	.00	742.57	45.2
*	19.702	33800.00	1051.41	2878.59	1046.00	5.41	505.00	.00	9502.94	10260.96	.00	681.76	44.2
*	19.702	16900.00	1049.64	1740.52	1046.00	3.64	505.00	.00	9512.73	10246.37	.00	600.00	43.1
*	19.779	50700.00	1060.03	3835.69	1054.00	6.03	405.00	.00	9704.93	10420.14	.00	715.22	52.0
*	19.779	33800.00	1058.81	2971.85	1054.00	4.81	405.00	.00	9710.96	10411.06	.00	700.10	50.6
*	19.779	16900.00	1057.36	1973.14	1054.00	3.36	405.00	.00	9716.61	10387.34	.00	670.74	49.0
*	19.839	50700.00	1070.93	3496.57	1062.00	8.93	315.00	9590.00	9590.00	10494.65	10500.00	534.90	56.5
*	19.839	33800.00	1069.08	2564.78	1062.00	7.08	315.00	9590.00	9590.00	10485.38	10500.00	475.18	54.9
*	19.839	16900.00	1066.81	1553.21	1062.00	4.81	315.00	9590.00	9590.00	10474.07	10500.00	423.27	52.9
*	19.896	50700.00	1082.88	3984.55	1072.00	10.88	300.00	9595.00	9610.99	10444.42	10445.00	833.43	61.2
*	19.896	33800.00	1081.74	3033.07	1072.00	9.74	300.00	9595.00	9614.58	10438.68	10445.00	824.10	59.3
*	19.896	16900.00	1080.37	1917.44	1072.00	8.37	300.00	9595.00	9618.83	10431.86	10445.00	813.03	57.2
*	19.991	50700.00	1088.30	5107.49	1082.00	6.30	500.00	.00	9574.02	10418.67	.00	844.65	70.8
*	19.991	33800.00	1087.00	4026.01	1082.00	5.00	500.00	.00	9579.16	10409.17	.00	830.01	68.8
*	19.991	16900.00	1085.38	2687.47	1082.00	3.38	500.00	.00	9585.95	10399.67	.00	813.73	66.5
*	20.009	50700.00	1089.36	6796.95	1080.00	9.36	100.00	.00	9570.00	10417.58	.00	847.58	72.8
*	20.009	33800.00	1087.86	5545.02	1080.00	7.86	100.00	.00	9580.44	10412.00	.00	831.56	70.7
*	20.009	16900.00	1085.98	3986.51	1080.00	5.98	100.00	.00	9586.74	10404.92	.00	818.18	68.4

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BUCKEYE STRUCTURE 1

SUMMARY PRINTOUT

SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
19.416	50700.00	1033.87	.42	.00	1034.34	.00	9000.00	8650.00	100000.00	100000.00	10760.00	10760.0
19.416	33800.00	1032.67	.41	-1.20	1033.02	-1.32	9000.00	8650.00	100000.00	100000.00	10760.00	10760.0
19.416	16900.00	1031.23	.40	-1.44	1031.43	-2.90	9000.00	8650.00	100000.00	100000.00	10760.00	10760.0
*	19.512	50700.00	.62	.00	1037.07	.00	8930.00	8540.00	100000.00	100000.00	10885.00	10650.0
*	19.512	33800.00	.62	-1.00	1035.89	-1.19	8930.00	8540.00	100000.00	100000.00	10885.00	10650.0
*	19.512	16900.00	.60	-1.19	1034.47	-2.61	8930.00	8540.00	100000.00	100000.00	10885.00	10650.0
*	19.606	50700.00	1.00	.00	1044.47	.00	9425.00	8845.00	100000.00	100000.00	10770.00	10435.0
*	19.606	33800.00	1.01	-1.09	1042.91	-1.56	9425.00	8845.00	100000.00	100000.00	10770.00	10435.0
*	19.606	16900.00	.89	-1.04	1041.06	-3.41	9425.00	8845.00	100000.00	100000.00	10770.00	10435.0
*	19.702	50700.00	1.03	.00	1055.47	.00	.00	9460.00	1062.00	1061.60	10340.00	.0
*	19.702	33800.00	1.06	-1.41	1053.55	-1.92	.00	9460.00	1062.00	1061.60	10340.00	.0
*	19.702	16900.00	1.11	-1.78	1051.10	-4.37	.00	9460.00	1062.00	1061.60	10340.00	.0
*	19.779	50700.00	1.01	.00	1062.74	.00	.00	9700.00	1062.00	1062.00	10430.00	.0
*	19.779	33800.00	.97	-1.22	1060.82	-1.93	.00	9700.00	1062.00	1062.00	10430.00	.0
*	19.779	16900.00	.88	-1.44	1058.50	-4.24	.00	9700.00	1062.00	1062.00	10430.00	.0
*	19.839	50700.00	1.30	.00	1074.20	.00	9590.00	9490.00	100000.00	100000.00	10500.00	10500.0
*	19.839	33800.00	1.37	-1.85	1071.77	-2.42	9590.00	9490.00	100000.00	100000.00	10500.00	10500.0
*	19.839	16900.00	1.45	-2.26	1068.65	-5.54	9590.00	9490.00	100000.00	100000.00	10500.00	10500.0
*	19.896	50700.00	1.03	.00	1085.40	.00	9595.00	9595.00	1138.00	100000.00	10660.00	10445.0
*	19.896	33800.00	1.02	-1.15	1083.66	-1.73	9595.00	9595.00	1138.00	100000.00	10660.00	10445.0
*	19.896	16900.00	1.01	-1.36	1081.58	-3.82	9595.00	9595.00	1138.00	100000.00	10660.00	10445.0
*	19.991	50700.00	.71	.00	1089.83	.00	.00	9570.00	1089.50	1090.00	10440.00	.0
*	19.991	33800.00	.67	-1.29	1088.10	-1.73	.00	9570.00	1089.50	1090.00	10440.00	.0
*	19.991	16900.00	.61	-1.63	1085.99	-3.84	.00	9570.00	1089.50	1090.00	10440.00	.0
*	20.009	50700.00	.46	.00	1090.22	.00	.00	9570.00	1088.80	1090.00	10420.00	.0
*	20.009	33800.00	.42	-1.49	1088.44	-1.78	.00	9570.00	1088.80	1090.00	10420.00	.0
*	20.009	16900.00	.34	-1.89	1086.26	-3.96	.00	9570.00	1088.80	1090.00	10420.00	.0

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 19.512 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 19.512 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 19.512 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 19.606 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.606 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.606 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.606 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.606 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 19.702 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.702 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.702 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.702 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.702 PROFILE= 3 CRITICAL DEPTH ASSUMED  
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CAUTION SECNO= 19.779 PROFILE= 1 CRITICAL DEPTH ASSUMED  
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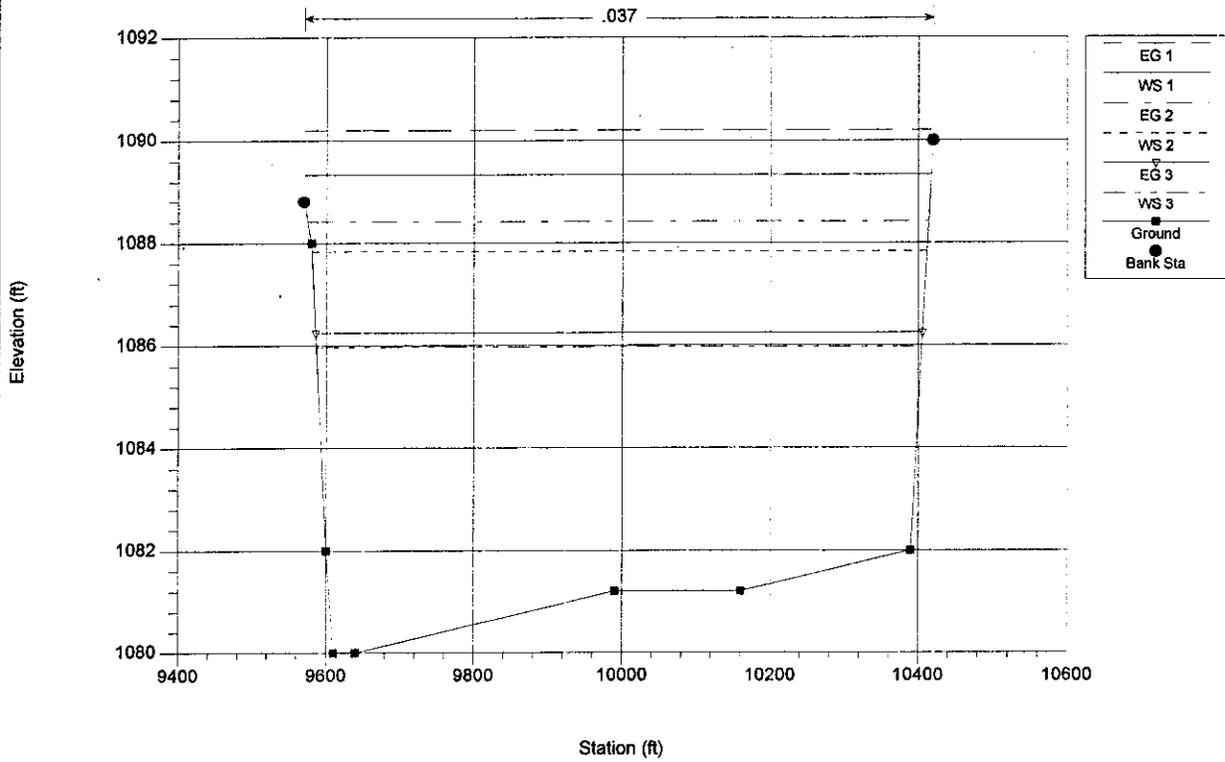
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 CAUTION SECNO= 19.839 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.839 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.839 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO= 19.839 PROFILE= 3 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.839 PROFILE= 3 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.839 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 19.896 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.896 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.896 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO= 19.896 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO= 19.896 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 19.896 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO= 19.896 PROFILE= 3 CRITICAL DEPTH ASSUMED  
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 CAUTION SECNO= 19.896 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL

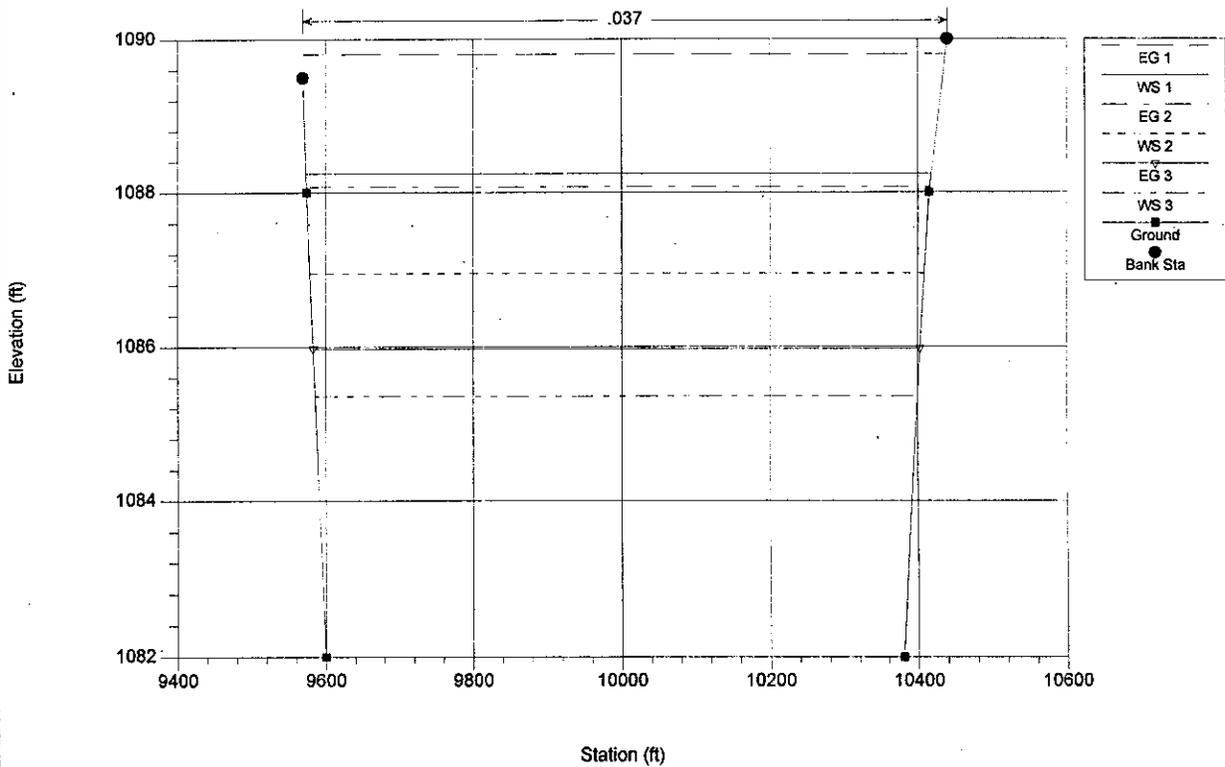
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 WARNING SECNO= 19.991 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.009 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 20.009 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 20.009 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 1 MIXED REGIME 7/28/96  
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Reach = BUCKEYE # 1 20.009

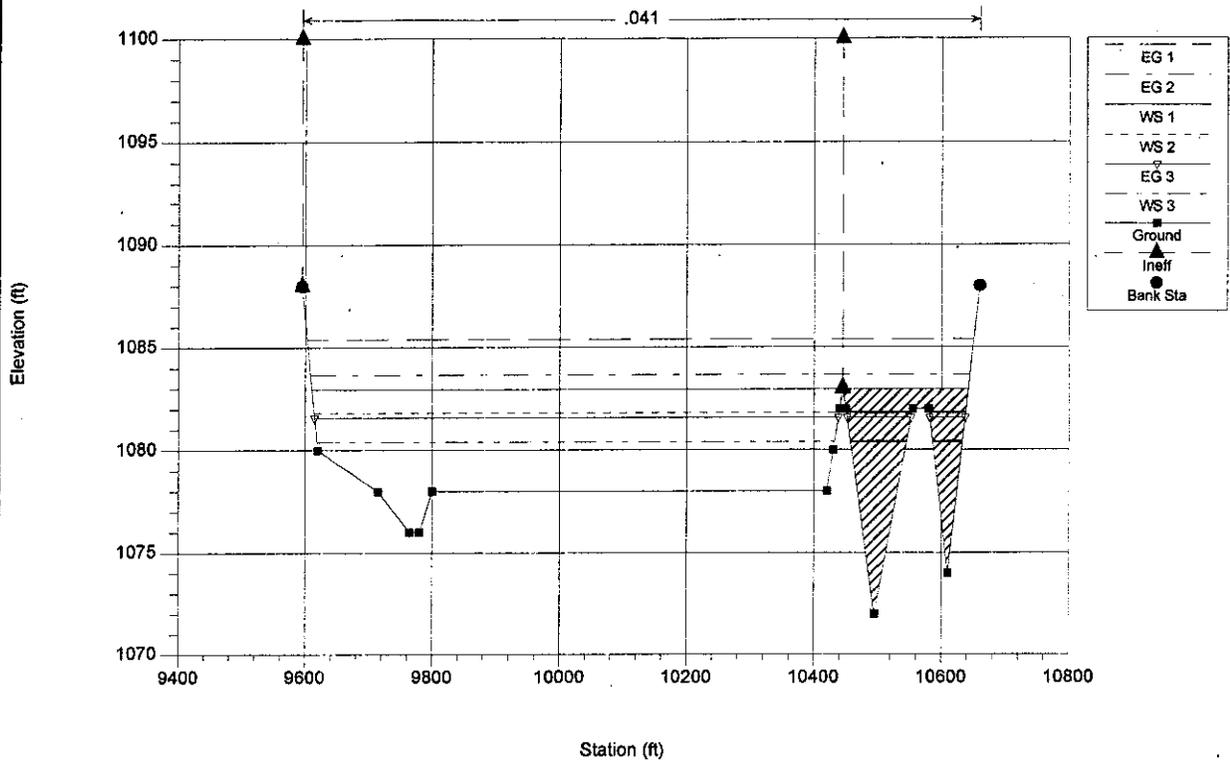


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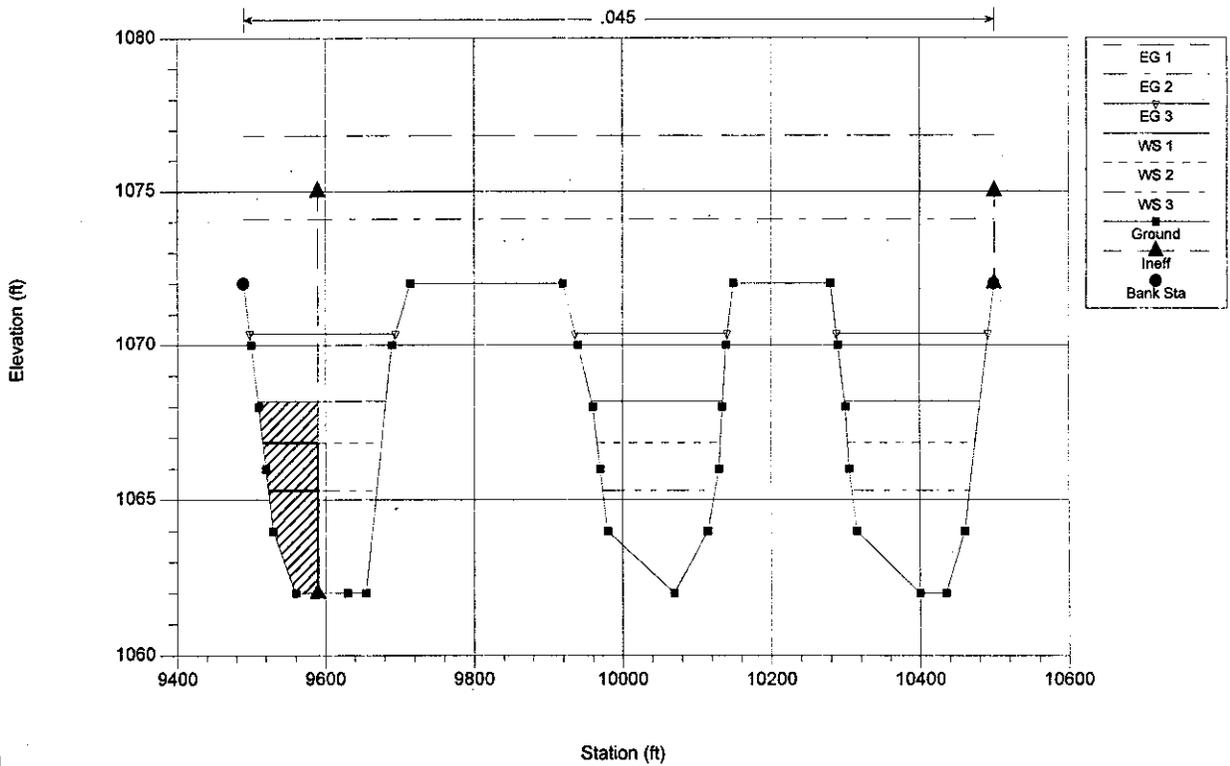


2 of 5

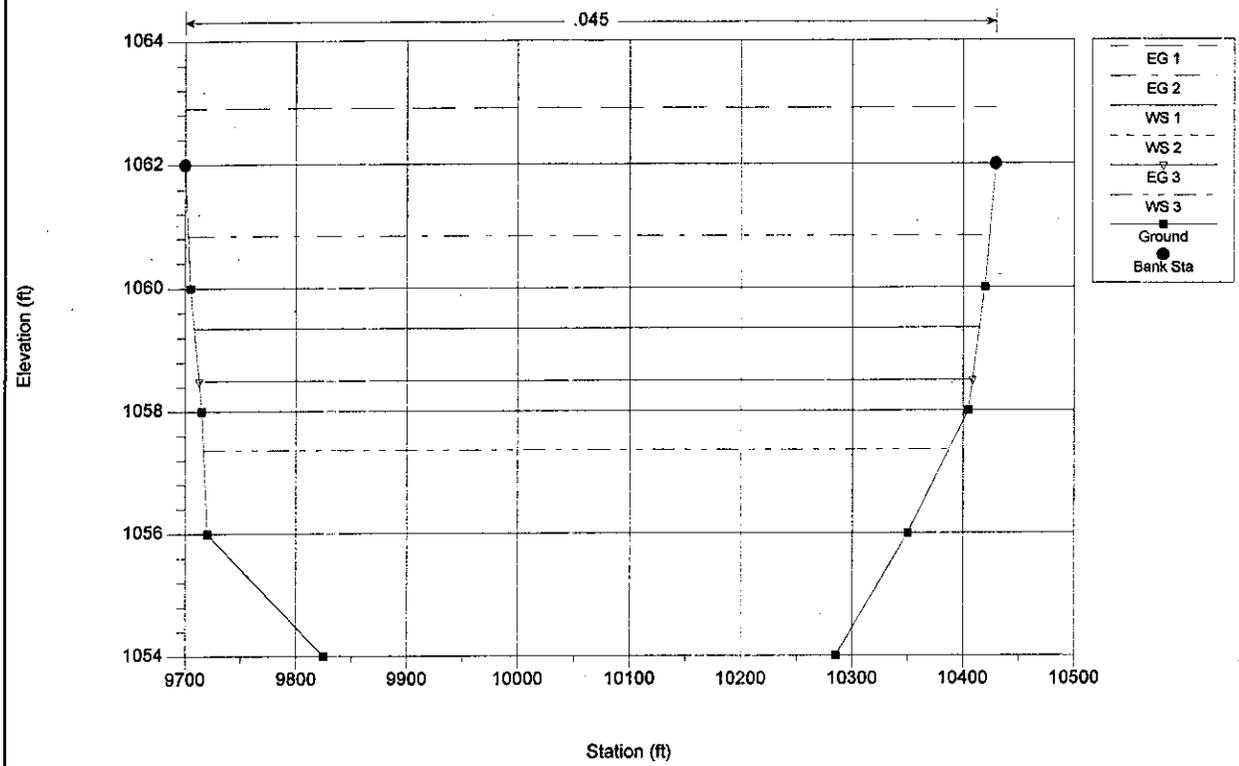
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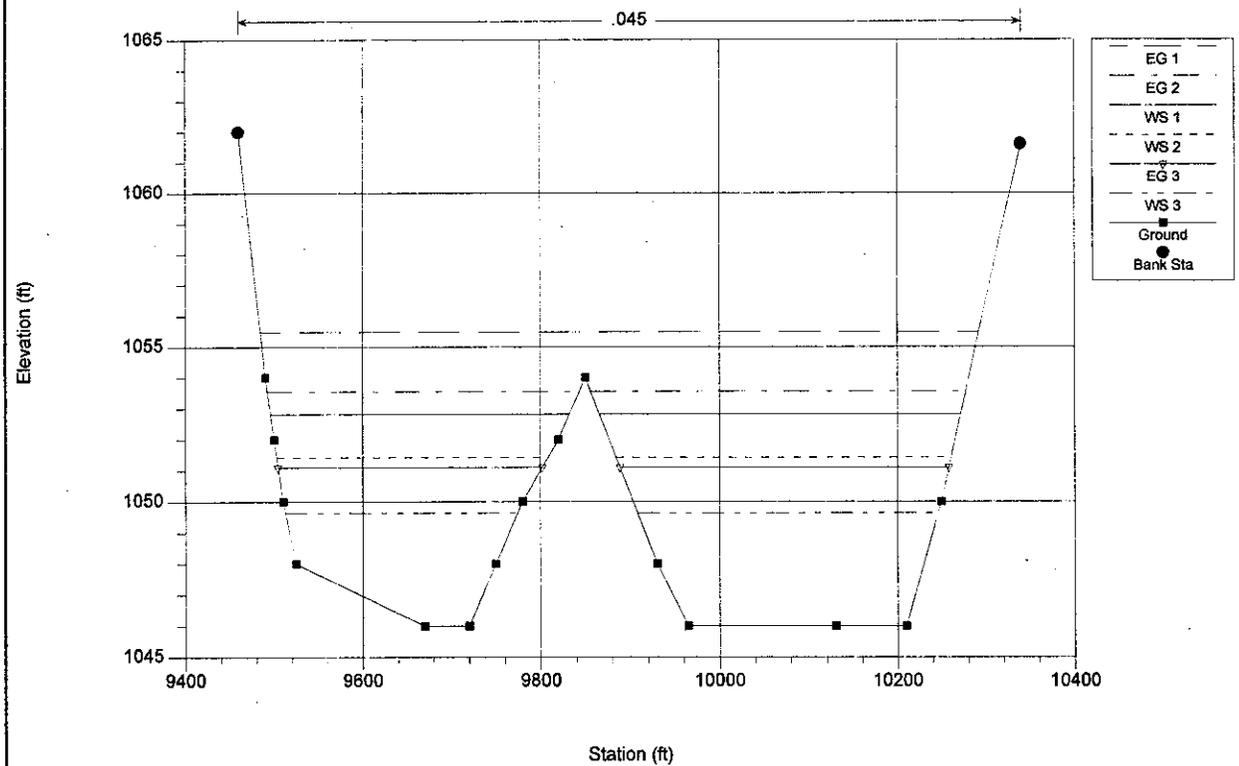
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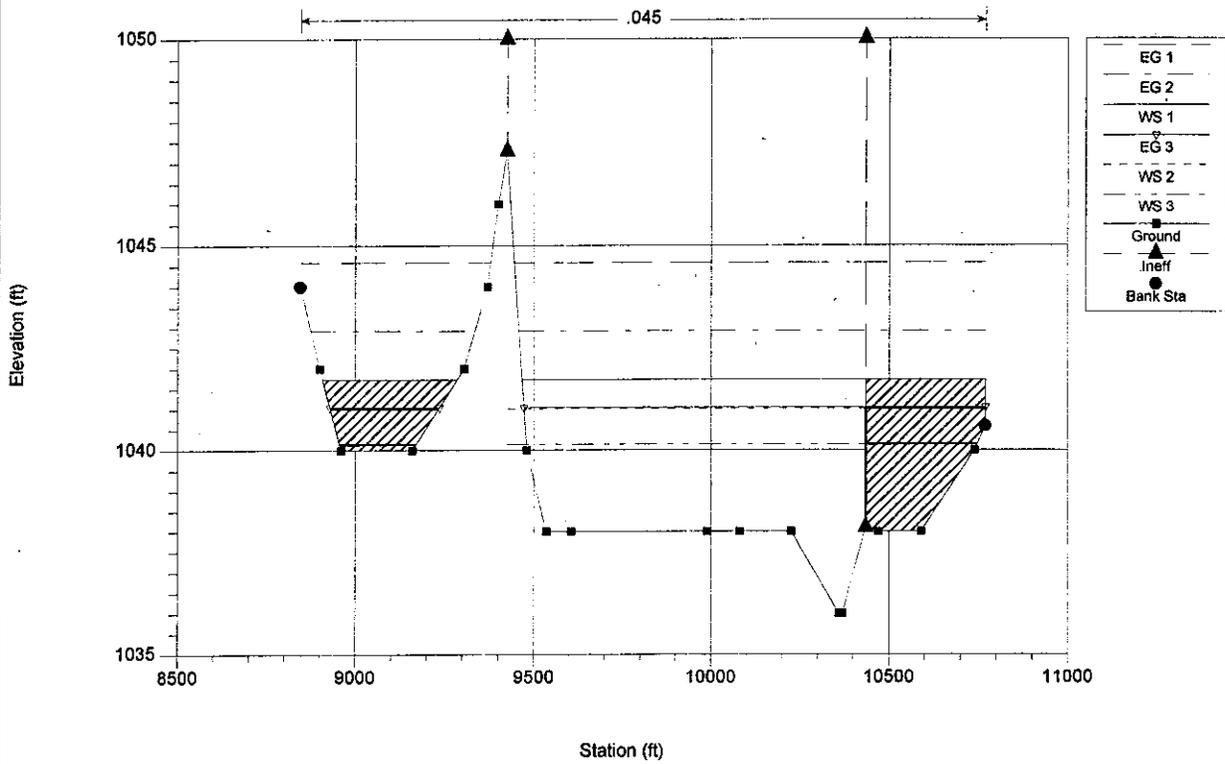
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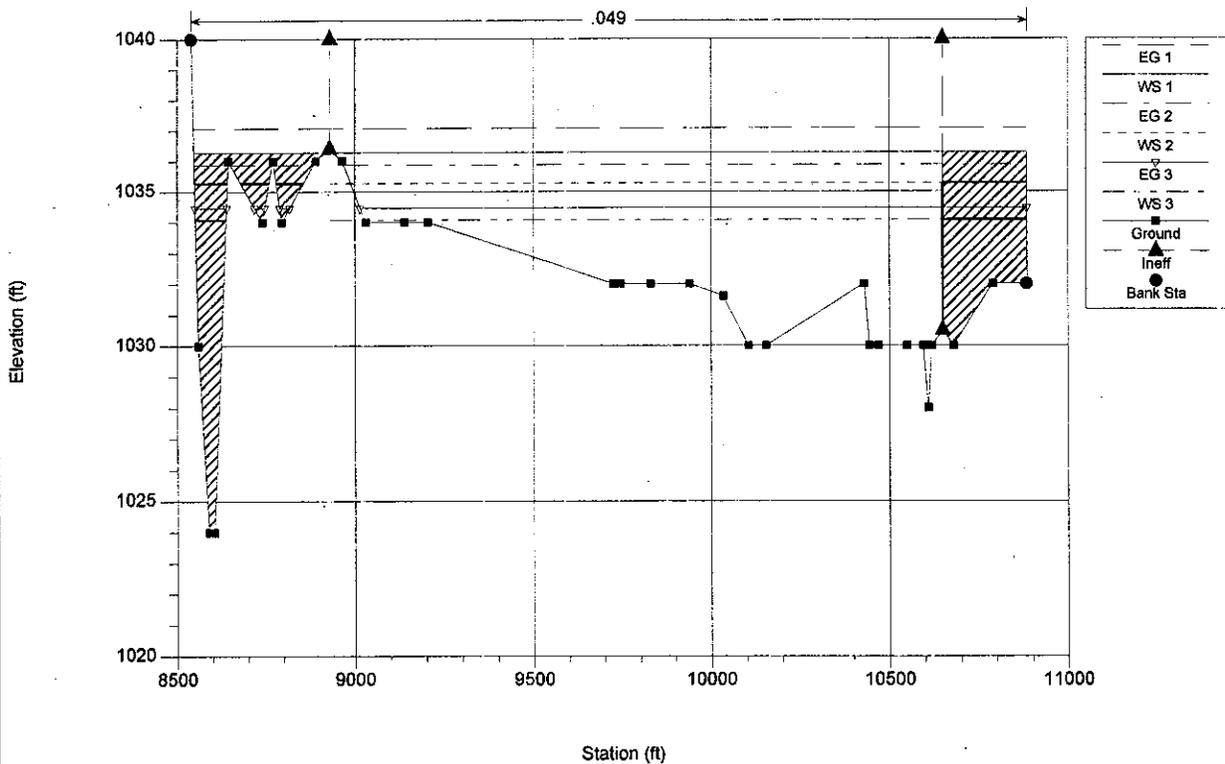
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Reach = BUCKEYE # 1 19.702



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 1 MIXED REGIME 7/28/96  
Geom: FROM 13084B1B.H2  
Reach = BUCKEYE # 1 19.606



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 1 MIXED REGIME 7/28/96  
Geom: FROM 13084B1B.H2  
Reach = BUCKEYE # 1 19.512



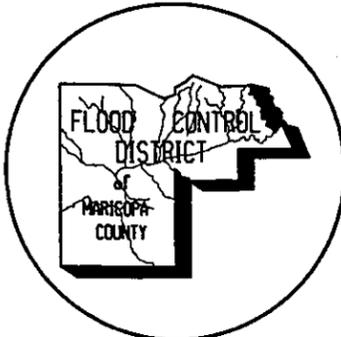


**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

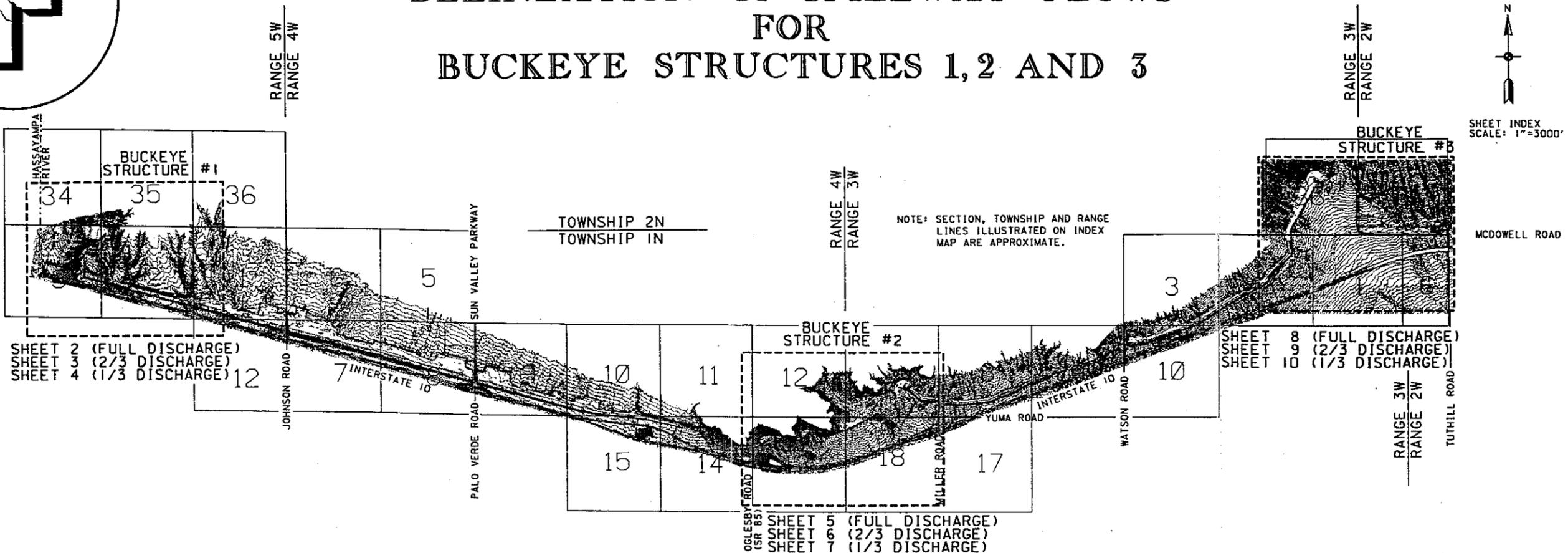
**APPENDIX D**

**BUCKEYE STRUCTURE 2**

1. Delineation Map Exhibits (11" x 17")
2. HEC-2 and HEC-RAS Printout
3. HEC-RAS Cross Section Plots



# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3



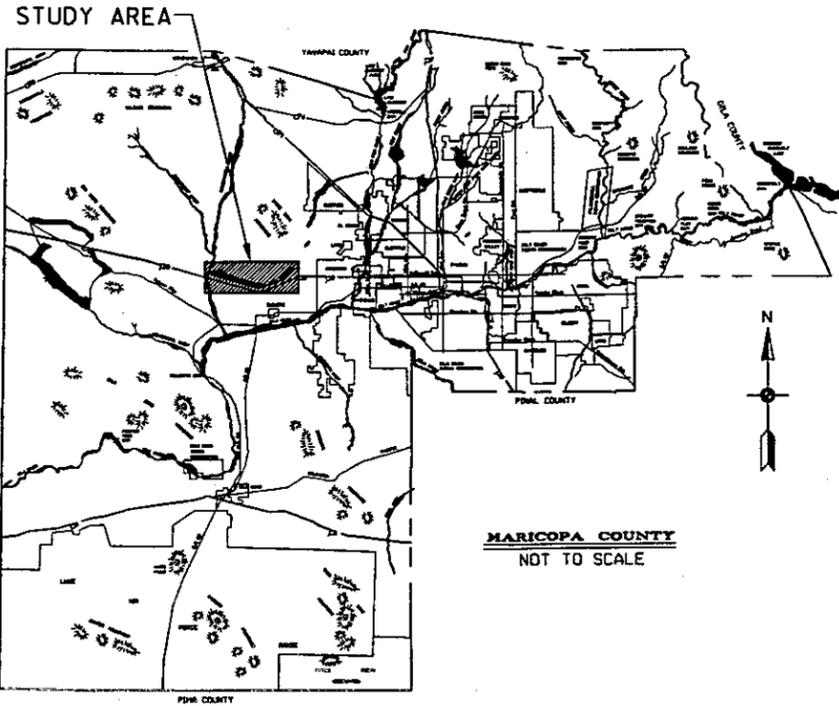
SHEET INDEX  
SCALE: 1"=3000'



SHEET 2 (FULL DISCHARGE)  
SHEET 3 (2/3 DISCHARGE)  
SHEET 4 (1/3 DISCHARGE)

SHEET 8 (FULL DISCHARGE)  
SHEET 9 (2/3 DISCHARGE)  
SHEET 10 (1/3 DISCHARGE)

SHEET 5 (FULL DISCHARGE)  
SHEET 6 (2/3 DISCHARGE)  
SHEET 7 (1/3 DISCHARGE)



MARICOPA COUNTY  
NOT TO SCALE

**TOPOGRAPHY**

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1 AND 2 WAS PREPARED BY MCLAIN HARBERS CO., INC. FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCD) UNDER FCD CONTRACT 93-51. GROUND CONTROL FOR THE MAPPING WAS PROVIDED BY COLLINS-PINA CONSULTING ENGINEERS - SURVEYING CO. PHOTO DATE WAS 7-12-94. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 200 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NAVD 88 (NORTH AMERICAN VERTICAL DATUM OF 1988). HORIZONTAL DATUM IS NAD 83 (NORTH AMERICAN DATUM OF 1983).

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURE 3 WAS PREPARED BY COOPER AERIAL OF PHOENIX, INC. AND WESTERN AIR MAPS INC. OF LENEXA KANSAS FOR FCD. THIS MAPPING WAS PREPARED FOR THE WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY DONE BY THE WLB GROUP, INC. UNDER FCD CONTRACT 89-50. GROUND CONTROL FOR THE MAPPING WAS DONE UNDER THE SUPERVISION OF THE WLB GROUP. PHOTO DATE WAS 12-22-89. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 400 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NGVD 29 (NATIONAL GEODETIC VERTICAL DATUM OF 1929). ORIGINAL HORIZONTAL DATUM WAS NAD 27 (NORTH AMERICAN DATUM OF 1927). HOWEVER, THE WHITE TANKS/AGUA FRIA MAPPING HAS BEEN TRANSLATED FOR THIS STUDY TO NAD 83 DATUM TO BE CONSISTENT WITH THE MCLAIN HARBERS MAPPING.

**DISCHARGE RATES**

DISCHARGES USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WERE OBTAINED FROM "PHASE I REPORT, HYDROLOGIC BUCKEYE FLOODWATER RETARDING STRUCTURES #1, #2, AND #3 FOR FLOOD CONTROL DISTRICT OF MARICOPA COUNTY," FCD PROJECT 88-63, PREPARED BY DAMES & MOORE, AND DATED JANUARY 23, 1990. THE FULL SPILLWAY DISCHARGES ESTIMATED IN THAT REPORT ALONG WITH THE 2/3 AND 1/3 SPILLWAY DISCHARGES ARE PRESENTED BELOW. DISCHARGES HAVE BEEN ROUNDED TO THE NEAREST 100 CFS.

	FULL DISCHARGE	2/3 DISCHARGE	1/3 DISCHARGE
BUCKEYE STRUCTURE #1	50,700 CFS	33,800 CFS	16,900 CFS
BUCKEYE STRUCTURE #2	13,200 CFS	8,800 CFS	4,400 CFS
BUCKEYE STRUCTURE #3	17,700 CFS	11,800 CFS	5,900 CFS

**LEGEND**

- 2800 CFS WEIR OVERFLOW OF INTERSTATE-10
- MP 1201 APPROXIMATE INTERSTATE-10 MILE POST
- 1071.55 ELEVATION REFERENCE MARK
- EXISTING INTERSTATE-10 DRAINAGE CULVERT

**CERTIFICATION**

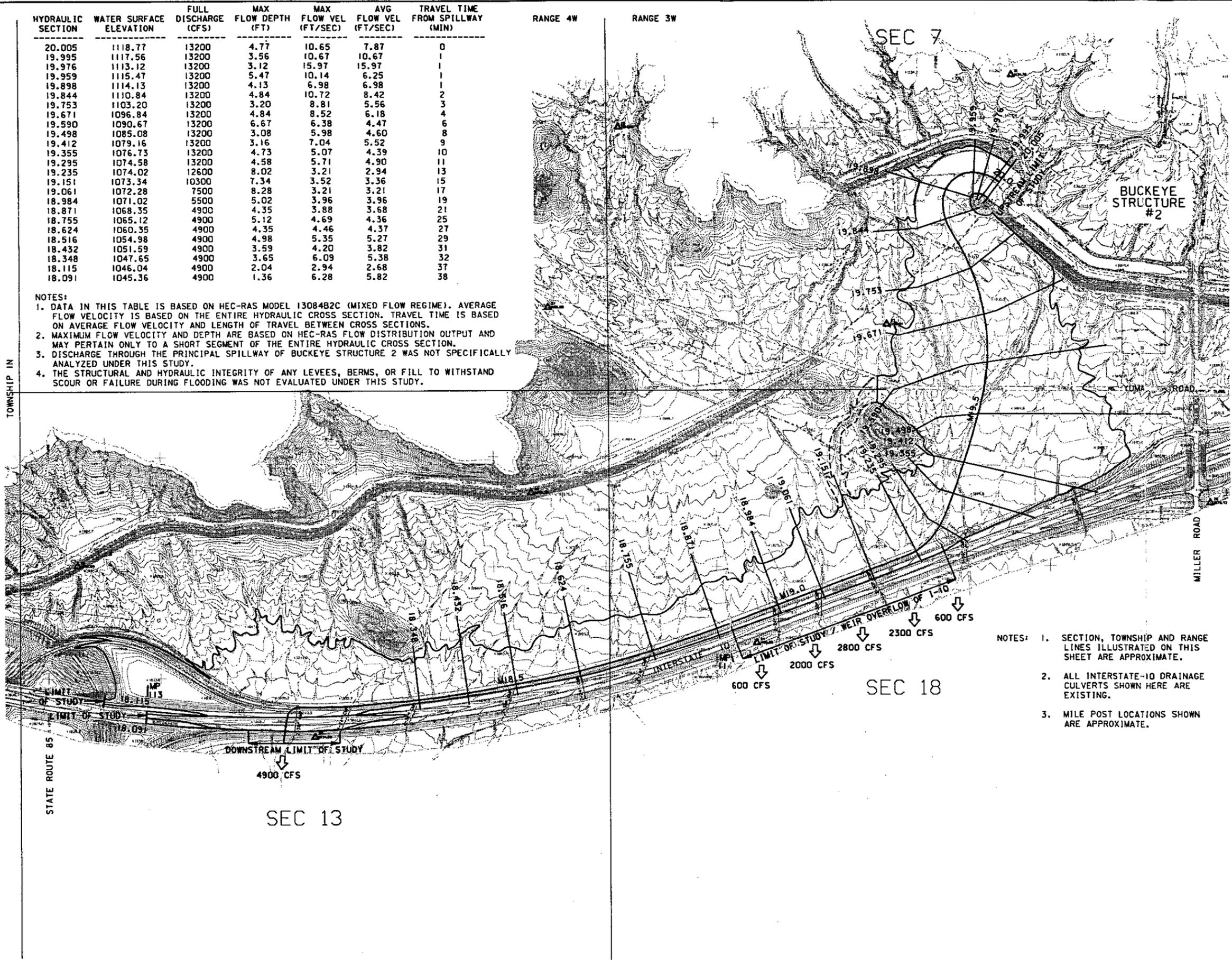
THIS IS TO CERTIFY THAT ALL WORK PERFORMED IN ASSOCIATION WITH THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WAS DONE IN ACCORDANCE WITH THE GENERAL PROVISIONS OF FCD CONTRACT 95-34 AND ALL AMENDMENTS THERETO. TOGETHER WITH ALL SUCH MODIFICATIONS, EITHER WRITTEN OR ORAL AS THE FCD CONTRACTING OFFICE OR THEIR REPRESENTATIVES HAVE DIRECTED, AS SUCH MODIFICATIONS AFFECT THIS CONTRACT, AND THAT ALL SUCH WORK HAS BEEN ACCOMPLISHED IN ACCORDANCE WITH SOUND AND ACCEPTED ENGINEERING PRACTICE WITHIN THE CONTRACT PROVISIONS FOR RESPECTIVE PHASES OF THE WORK.

<b>STANLEY CONSULTANTS</b> 2929 EAST CAMELBACK ROAD, SUITE 130 PHOENIX, ARIZONA 85016 (602) 912-6500			
<b>STANLEY CONSULTANTS PROJECT #13084</b>			
DESIGN	BY CSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	
PLANS	-	-	RECOMMENDED BY: DATE
PLANS CHK.	-	-	APPROVED BY: DATE
SUBMITTED BY:			CHIEF ENGINEER AND GENERAL MANAGER
			SHEET 1 OF 10

F.C.D. 95-34

HYDRAULIC SECTION	WATER SURFACE ELEVATION	FULL DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.005	1118.77	13200	4.77	10.65	7.87	0
19.995	1117.56	13200	3.56	10.67	10.67	1
19.976	1113.12	13200	3.12	15.97	15.97	1
19.959	1115.47	13200	5.47	10.14	6.25	1
19.898	1114.13	13200	4.13	6.98	6.98	1
19.844	1110.84	13200	4.84	10.72	8.42	2
19.753	1103.20	13200	3.20	8.81	5.56	3
19.671	1096.84	13200	4.84	8.52	6.18	4
19.590	1090.67	13200	6.67	6.38	4.47	6
19.498	1085.08	13200	3.08	5.98	4.60	8
19.412	1079.16	13200	3.16	7.04	5.52	9
19.355	1076.73	13200	4.73	5.07	4.39	10
19.295	1074.58	13200	4.58	5.71	4.90	11
19.235	1074.02	12600	8.02	3.21	2.94	13
19.151	1073.34	10300	7.34	3.52	3.36	15
19.061	1072.28	7500	8.28	3.21	3.21	17
18.984	1071.02	5500	5.02	3.96	3.96	19
18.871	1068.35	4900	4.35	3.88	3.68	21
18.755	1065.12	4900	5.12	4.69	4.36	25
18.624	1060.35	4900	4.35	4.46	4.37	27
18.516	1054.98	4900	4.98	5.35	5.27	29
18.432	1051.59	4900	3.59	4.20	3.82	31
18.348	1047.65	4900	3.65	6.09	5.38	32
18.115	1046.04	4900	2.04	2.94	2.68	37
18.091	1045.36	4900	1.36	6.28	5.82	38

NOTES:  
 1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B2C (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.  
 2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.  
 3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 2 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.  
 4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.

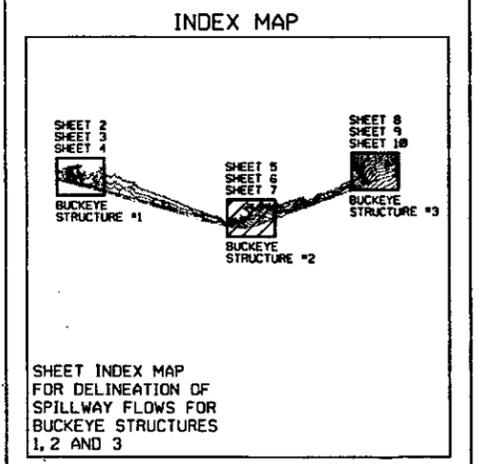


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3  
 F.C.D. 95-34  
 LEGEND

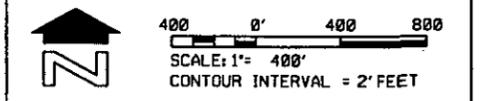
HYDRAULIC BASE LINE (WITH RIVER MILE) M19.0  
 NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.8 FOR THIS STUDY.  
 HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123  
 LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE)  
 APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
20	1078.93	1/4" IRON ROD SET BY (+/-) SOUTH OF THE EASTBOUND I-10 R/W FENCE AND 50' (+/-) EAST OF CENTER LINE OF MILLER ROAD
21	1134.76	1/4" IRON ROD SET 3230' (+/-) WSW OF THE NE CORNER OF SECTION 7, T1N, R3W
23	1188.34	1/4" IRON ROD SET 2469' (+/-) ENE OF THE SW CORNER OF SECTION 7, T1N, R3W
24	1061.26	1/4" IRON ROD SET 2875' (+/-) SSE OF THE NW CORNER OF SECTION 18, T1N, R3W SET 100' (+/-) SOUTH OF I-10
25	1124.82	1/4" IRON ROD SET 2877' (+/-) WNE OF THE SW CORNER OF SECTION 7, T1N, R3W
27	1186.68	1/4" IRON ROD SET 753' (+/-) WNW OF THE SE CORNER OF SECTION 12, T1N, R4W
28	1094.78	1/4" IRON ROD SET 1429' (+/-) SSW OF THE NE CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 455+88
29	1034.58	1/4" IRON ROD SET 280' (+/-) EAST OF THE END OF THE EASTBOUND ON-RAMP OF I-10 AT THE HWY 85 INTERCHANGE, 100' (+/-) SOUTH OF I-10
38	1092.89	1/4" IRON ROD SET 1873' (+/-) SSE OF THE NW CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 588+14



NOTES:  
 1. SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.  
 2. ALL INTERSTATE-10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.  
 3. MILE POST LOCATIONS SHOWN ARE APPROXIMATE.



**STANLEY CONSULTANTS**  
 2929 EAST CAMELBACK ROAD, SUITE 130  
 PHOENIX, ARIZONA 85016 (602)912-6500

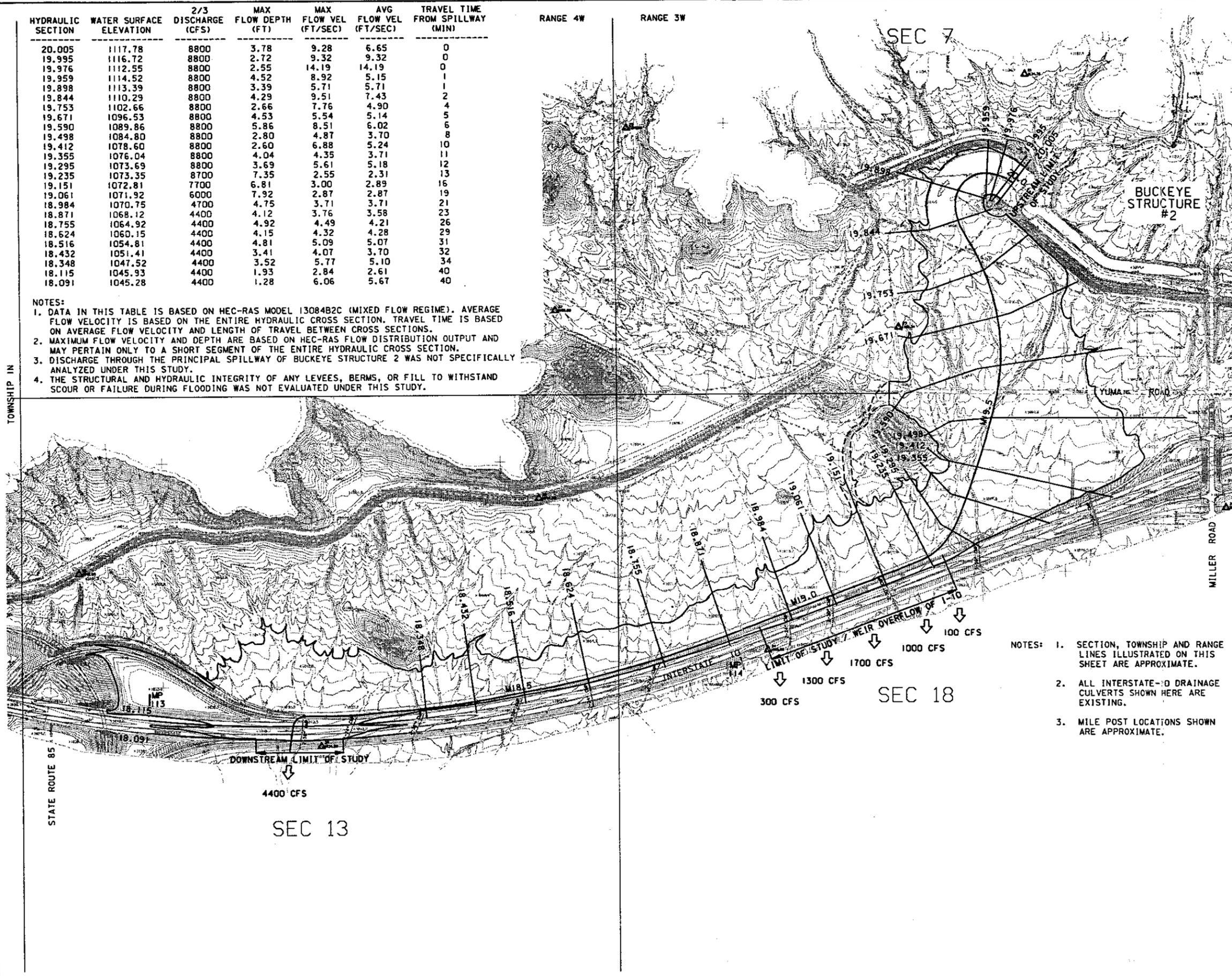
DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	
PLANS	-	-	RECOMMENDED BY: _____ DATE: _____
PLANS CHK.	-	-	APPROVED BY: _____ DATE: _____
SUBMITTED BY:	DATE: _____		CHIEF ENGINEER AND GENERAL MANAGER
			SHEET 5 OF 10

BUCKEYE STRUCTURE #2  
 FULL SPILLWAY DISCHARGE

130841\_308403.dwg

HYDRAULIC SECTION	WATER SURFACE ELEVATION	2/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.005	1117.78	8800	3.78	9.28	6.65	0
19.995	1116.72	8800	2.72	9.32	9.32	0
19.976	1112.55	8800	2.55	14.19	14.19	0
19.959	1114.52	8800	4.52	8.92	5.15	1
19.898	1113.39	8800	3.39	5.71	5.71	1
19.844	1110.29	8800	4.29	9.51	7.43	2
19.753	1102.66	8800	2.66	7.76	4.90	4
19.671	1096.53	8800	4.53	5.54	5.14	5
19.590	1089.86	8800	5.86	8.51	6.02	6
19.498	1084.80	8800	2.80	4.87	3.70	8
19.412	1078.60	8800	2.60	6.88	5.24	10
19.355	1076.04	8800	4.04	4.35	3.71	11
19.295	1073.69	8800	3.69	5.61	5.18	12
19.235	1073.35	8700	7.35	2.55	2.31	13
19.151	1072.81	7700	6.81	3.00	2.89	16
19.061	1071.92	6000	7.92	2.87	2.87	19
18.984	1070.75	4700	4.75	3.71	3.71	21
18.871	1068.12	4400	4.12	3.76	3.58	23
18.755	1064.92	4400	4.92	4.49	4.21	26
18.624	1060.15	4400	4.15	4.32	4.28	29
18.516	1054.81	4400	4.81	5.09	5.07	31
18.432	1051.41	4400	3.41	4.07	3.70	32
18.348	1047.52	4400	3.52	5.77	5.10	34
18.115	1045.93	4400	1.93	2.84	2.61	40
18.091	1045.28	4400	1.28	6.06	5.67	40

- NOTES:
- DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B2C (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
  - MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
  - DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 2 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
  - THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3  
 F.C.D. 95-34  
 LEGEND

HYDRAULIC BASE LINE (WITH RIVER MILE)  M19.0  
 NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.

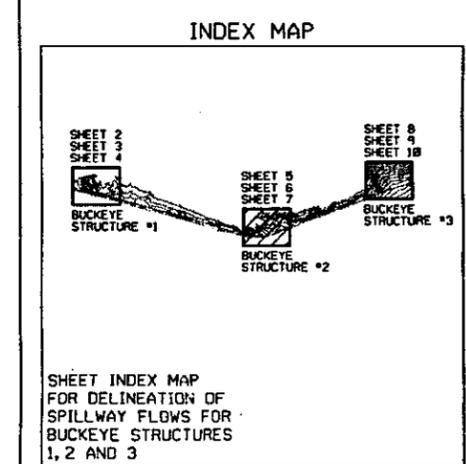
HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL)  19.123

LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE)  2/3 DISCHARGE

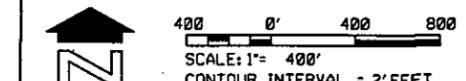
APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
20	1878.93	1/2" IRON ROD SET 3' (+/-) SOUTH OF THE EASTBOUND I-10 R/W FENCE AND 50' (+/-) EAST OF CENTER LINE OF MILLER ROAD
21	1134.76	1/2" IRON ROD SET 322' (+/-) WSW OF THE NE CORNER OF SECTION 7, T1N, R3W
23	1108.34	1/2" IRON ROD SET 246' (+/-) ENE OF THE SW CORNER OF SECTION 7, T1N, R3W
24	1061.26	1/2" IRON ROD SET 287' (+/-) SSE OF THE NW CORNER OF SECTION 18, T1N, R3W SET 100' (+/-) SOUTH OF I-10
25	1124.02	1/2" IRON ROD SET 287' (+/-) ENE OF THE SW CORNER OF SECTION 7, T1N, R3W
27	1186.68	1/2" IRON ROD SET 753' (+/-) WNW OF THE SE CORNER OF SECTION 12, T1N, R4W
28	1894.78	1/2" IRON ROD SET 142' (+/-) SSW OF THE NE CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 463+08
29	1834.58	1/2" IRON ROD SET 208' (+/-) EAST OF THE END OF THE EASTBOUND ON-RAMP OF I-10 AT THE HWY 85 INTERCHANGE, 188' (+/-) SOUTH OF I-10
30	1892.89	1/2" IRON ROD SET 187' (+/-) SSE OF THE NW CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 588+14



- NOTES:
- SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.
  - ALL INTERSTATE-10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.
  - MILE POST LOCATIONS SHOWN ARE APPROXIMATE.



**STANLEY CONSULTANTS**  
 2929 EAST CAMELBACK ROAD, SUITE 130  
 PHOENIX, ARIZONA 85016 (602)912-6500

DESIGN	BY GSB	DATE 12-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	12-15-96	
PLANS			RECOMMENDED BY: _____ DATE: _____
PLANS CHK.			APPROVED BY: _____ DATE: _____
SUBMITTED BY:			CHIEF ENGINEER AND GENERAL MANAGER
		DATE: _____	SHEET 6 OF 10

BUCKEYE STRUCTURE #2  
 2/3 SPILLWAY DISCHARGE

13084B 308407.dwg

AERIAL TOPOGRAPHY: MCLAIN HARBERS  
 PHOTO DATE: 7-12-94  
 VERTICAL DATUM: NAVD 88  
 THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS  
 1"=200' HORIZONTAL SCALE AND 2" CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY  
 DATA PROVIDED BY COLLINS - PINA

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

F.C.D. 95-34

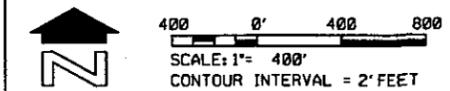
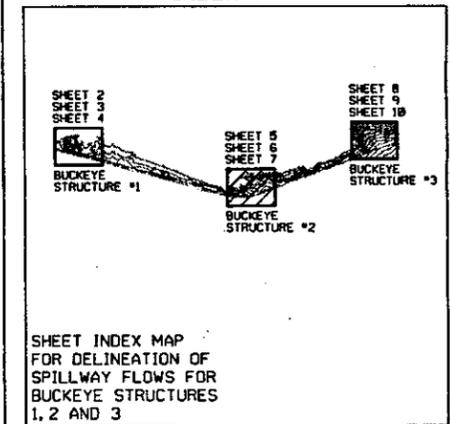
LEGEND

- HYDRAULIC BASE LINE (WITH RIVER MILE) M19.0
- NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.8 FOR THIS STUDY.
- HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123
- LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) 1/3 DISCHARGE
- APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
20	1878.93	1/4" IRON ROD SET 5' (1/2") SOUTH OF THE EASTBOUND I-10 R/W FENCE AND 50' (1/2") EAST OF CENTER LINE OF MILLER ROAD
21	1134.76	1/4" IRON ROD SET 3230' (1/2") WSW OF THE NE CORNER OF SECTION 7, T1N, R3W
23	1188.34	1/4" IRON ROD SET 2465' (1/2") ENE OF THE SW CORNER OF SECTION 7, T1N, R3W
24	1061.26	1/4" IRON ROD SET 2875' (1/2") SSE OF THE NW CORNER OF SECTION 18, T1N, R3W SET 100' (1/2") SOUTH OF I-10
25	1124.82	1/4" IRON ROD SET 2877' (1/2") WNE OF THE SW CORNER OF SECTION 7, T1N, R3W
27	1186.68	1/4" IRON ROD SET 753' (1/2") WNW OF THE SE CORNER OF SECTION 12, T1N, R4W
28	1094.78	1/4" IRON ROD SET 1429' (1/2") SSW OF THE NE CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 465+00
29	1034.50	1/4" IRON ROD SET 200' (1/2") EAST OF THE END OF THE EASTBOUND ON-RAMP OF I-10 AT THE HWY 85 INTERCHANGE, 180' (1/2") SOUTH OF I-10
30	1092.89	1/4" IRON ROD SET 1873' (1/2") SSE OF THE NW CORNER OF SECTION 13, T1N, R4W SET ON CENTER LINE OF BUCKEYE DAM #1 STA. 588+14

INDEX MAP



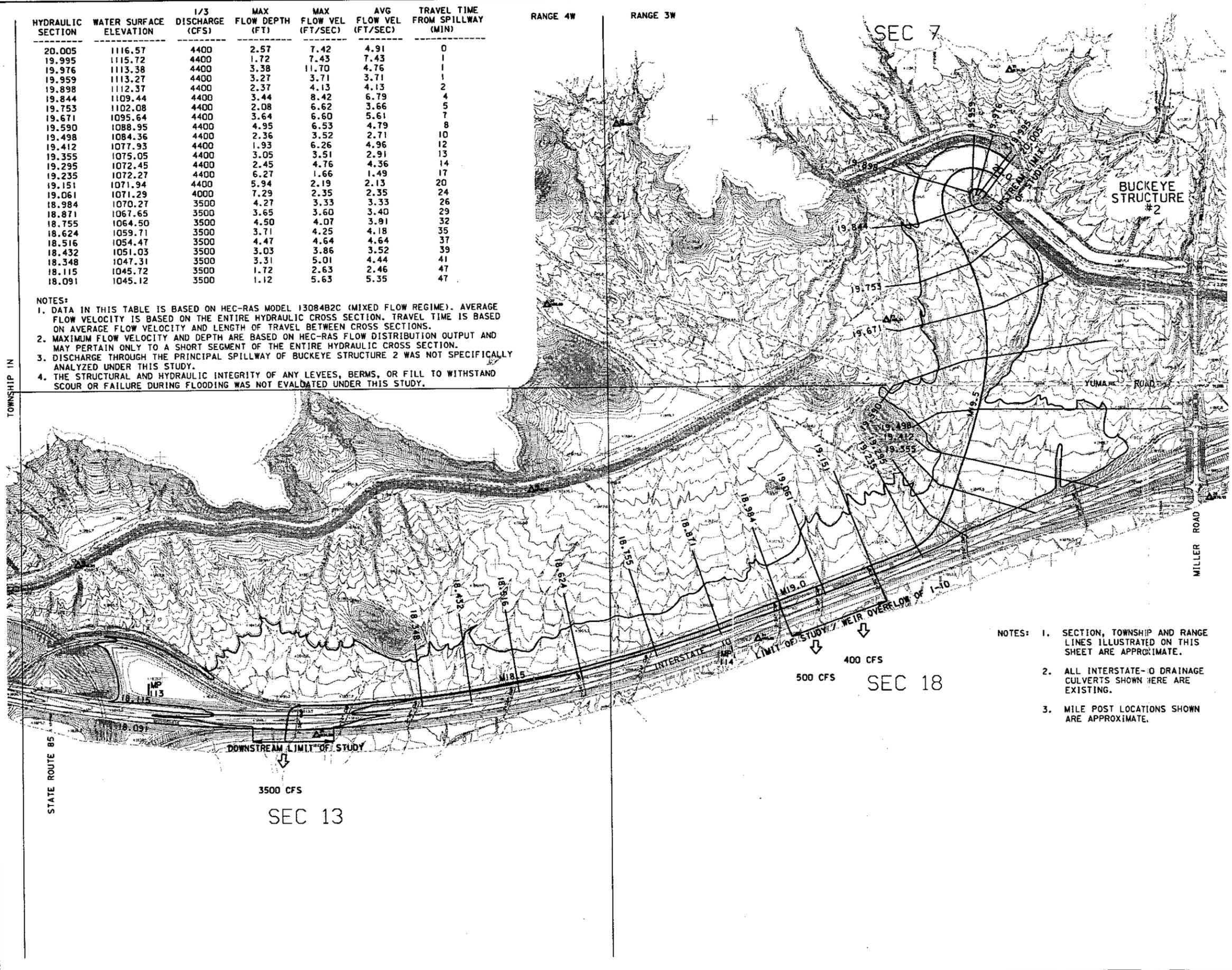
**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	18-15-96	
PLANS			RECOMMENDED BY: _____ DATE: _____
PLANS CHK.			APPROVED BY: _____ DATE: _____
SUBMITTED BY:			CHIEF ENGINEER AND GENERAL MANAGER
			SHEET 7 OF 10

BUCKEYE STRUCTURE #2  
1/3 SPILLWAY DISCHARGE

HYDRAULIC SECTION	WATER SURFACE ELEVATION	1/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.005	1116.57	4400	2.57	7.42	4.91	0
19.995	1115.72	4400	1.72	7.43	7.43	1
19.976	1113.38	4400	3.38	11.70	4.76	1
19.959	1113.27	4400	3.27	3.71	3.71	1
19.898	1112.37	4400	2.37	4.13	4.13	2
19.844	1109.44	4400	3.44	8.42	6.79	4
19.753	1102.08	4400	2.08	6.62	3.66	5
19.671	1095.64	4400	3.64	6.60	5.61	7
19.590	1088.95	4400	4.95	6.53	4.79	8
19.498	1084.36	4400	2.36	3.52	2.71	10
19.412	1077.93	4400	1.93	6.26	4.96	12
19.355	1075.05	4400	3.05	3.51	2.91	13
19.295	1072.45	4400	2.45	4.76	4.36	14
19.235	1072.27	4400	6.27	1.66	1.49	17
19.151	1071.94	4400	5.94	2.19	2.13	20
19.061	1071.29	4000	7.29	2.35	2.35	24
18.984	1070.27	3500	4.27	3.33	3.33	26
18.871	1067.65	3500	3.65	3.60	3.40	29
18.755	1064.50	3500	4.50	4.07	3.91	32
18.624	1059.71	3500	3.71	4.25	4.18	35
18.516	1054.47	3500	4.47	4.64	4.64	37
18.432	1051.03	3500	3.03	3.86	3.52	39
18.348	1047.31	3500	3.31	5.01	4.44	41
18.115	1045.72	3500	1.72	2.63	2.46	47
18.091	1045.12	3500	1.12	5.63	5.35	47

- NOTES:
- DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B2C (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
  - MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
  - DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 2 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
  - THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.



- NOTES:
- SECTION, TOWNSHIP AND RANGE LINES ILLUSTRATED ON THIS SHEET ARE APPROXIMATE.
  - ALL INTERSTATE-10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.
  - MILE POST LOCATIONS SHOWN ARE APPROXIMATE.

AERIAL TOPOGRAPHY: MCLAIN HARBERS  
PHOTO DATE: 7-12-94  
VERTICAL DATUM: NAVD 88

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS 1"=200' HORIZONTAL SCALE AND 2" CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY DATA PROVIDED BY COLLINS - PINA

IN 13084 308408.dgn

HEC-RAS Reach: BUCKEYE # 2

1 of 5

River Sta	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Tme Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
20.005	SUBCRIT	1118.77		13200.00	4.77	4.68	1676.25	7.87	0.63	0.034	9818.75	10176.57
20.005	B2 MIXED	1118.77		13200.00	4.77	4.68	1676.25	7.87	0.63	0.034	9818.75	10176.57
20.005	SUBCRIT	1117.78		8800.00	3.78	3.73	1324.30	6.65	0.67	0.034	9820.00	10175.31
20.005	B2 MIXED	1117.78		8800.00	3.78	3.73	1324.30	6.65	0.67	0.034	9820.00	10175.31
20.005	SUBCRIT	1116.57		4400.00	2.57	2.54	896.13	4.91	0.79	0.034	9821.53	10173.74
20.005	B2 MIXED	1116.57		4400.00	2.57	2.54	896.13	4.91	0.79	0.034	9821.53	10173.74
19.995	SUBCRIT	1117.56	1117.56	13200.00	3.56	3.51	1236.81	10.67	0.63	0.034	9823.85	10176.15
19.995	B2 MIXED	1117.56	1117.56	13200.00	3.56	3.51	1236.81	10.67	0.62	0.034	9823.85	10176.15
19.995	SUBCRIT	1116.72	1116.72	8800.00	2.72	2.70	944.20	9.32	0.67	0.034	9824.78	10174.92
19.995	B2 MIXED	1116.72	1116.72	8800.00	2.72	2.70	944.20	9.32	0.67	0.034	9824.78	10174.92
19.995	SUBCRIT	1115.72	1115.72	4400.00	1.72	1.70	592.35	7.43	0.78	0.034	9825.91	10173.43
19.995	B2 MIXED	1115.72	1115.72	4400.00	1.72	1.70	592.35	7.43	0.78	0.034	9825.91	10173.43
19.976	SUBCRIT	1115.54		13200.00	5.54	4.62	1719.18	7.68	0.62	0.034	9818.88	10190.87
19.976	B2 MIXED	1113.12	1114.29	13200.00	3.12	2.26	826.38	15.97	0.62	0.034	9821.26	10187.04
19.976	SUBCRIT	1114.62		8800.00	4.62	3.73	1379.74	6.38	0.67	0.034	9819.78	10189.50
19.976	B2 MIXED	1112.55	1113.47	8800.00	2.55	1.70	620.35	14.19	0.67	0.034	9821.81	10186.05
19.976	SUBCRIT	1113.38		4400.00	3.38	2.52	924.49	4.76	0.78	0.034	9820.99	10187.50
19.976	B2 MIXED	1113.38		4400.00	3.38	2.52	924.49	4.76	0.78	0.034	9820.99	10187.50
19.959	SUBCRIT	1115.47		13200.00	5.47	4.96	2111.69	6.25	0.62	0.034	9800.36	10226.52
19.959	B2 MIXED	1115.47		13200.00	5.47	4.96	2111.69	6.25	0.62	0.034	9800.36	10226.52
19.959	SUBCRIT	1114.52		8800.00	4.52	4.05	1709.45	5.15	0.66	0.034	9802.36	10223.93
19.959	B2 MIXED	1114.52		8800.00	4.52	4.05	1709.45	5.15	0.66	0.034	9802.36	10223.93
19.959	SUBCRIT	1113.27		4400.00	3.27	2.91	1185.25	3.71	0.77	0.034	9805.01	10212.47
19.959	B2 MIXED	1113.27		4400.00	3.27	2.91	1185.25	3.71	0.77	0.034	9805.01	10212.47
19.898	SUBCRIT	1114.13		13200.00	4.13	3.95	1890.21	6.98	0.61	0.041	9770.38	10248.92
19.898	B2 MIXED	1114.13		13200.00	4.13	3.95	1890.21	6.98	0.61	0.041	9770.38	10248.92
19.898	SUBCRIT	1113.39		8800.00	3.39	3.29	1540.33	5.71	0.85	0.041	9773.90	10242.71
19.898	B2 MIXED	1113.39		8800.00	3.39	3.29	1540.33	5.71	0.65	0.041	9773.90	10242.71
19.898	SUBCRIT	1112.37		4400.00	2.37	2.32	1066.61	4.13	0.75	0.041	9778.74	10238.89
19.898	B2 MIXED	1112.37		4400.00	2.37	2.32	1066.61	4.13	0.75	0.041	9778.74	10238.89
19.844	SUBCRIT	1110.84	1110.84	13200.00	4.84	2.22	1568.00	8.42	0.60	0.044	9740.17	10446.79
19.844	B2 MIXED	1110.84	1110.84	13200.00	4.84	2.22	1568.00	8.42	0.60	0.044	9740.17	10446.79
19.844	SUBCRIT	1110.29	1110.29	8800.00	4.29	1.71	1184.31	7.43	0.64	0.044	9743.31	10435.82
19.844	B2 MIXED	1110.29	1110.29	8800.00	4.29	1.71	1184.31	7.43	0.63	0.044	9743.31	10435.82
19.844	SUBCRIT	1109.44	1109.44	4400.00	3.44	1.41	680.82	6.79	0.73	0.044	9748.18	10420.23
19.844	B2 MIXED	1109.44	1109.44	4400.00	3.44	1.41	680.82	6.79	0.73	0.044	9748.18	10420.23

HEC-RAS Reach: BUCKEYE # 2 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
19.753	SUBCRIT	1103.20		13200.00	3.20	2.13	2375.18	5.56	0.58	0.046	9495.43	10610.83
19.753	B2 MIXED	1103.20		13200.00	3.20	2.13	2375.18	5.56	0.58	0.046	9495.43	10610.83
19.753	SUBCRIT	1102.66	1102.21	8800.00	2.66	1.71	1794.93	4.90	0.61	0.046	9496.71	10549.33
19.753	B2 MIXED	1102.66	1102.21	8800.00	2.66	1.71	1794.93	4.90	0.61	0.046	9496.71	10549.33
19.753	SUBCRIT	1102.08	1101.35	4400.00	2.08	1.22	1202.50	3.66	0.71	0.046	9498.10	10482.51
19.753	B2 MIXED	1102.08	1101.35	4400.00	2.08	1.22	1201.06	3.66	0.71	0.046	9498.11	10482.34
19.671	SUBCRIT	1096.84		13200.00	4.84	1.57	2134.64	6.18	0.56	0.046	9319.94	10825.63
19.671	B2 MIXED	1096.84		13200.00	4.84	1.57	2134.64	6.18	0.56	0.046	9319.94	10825.63
19.671	SUBCRIT	1096.53	1096.34	8800.00	4.53	1.29	1713.69	5.14	0.59	0.046	9324.38	10819.56
19.671	B2 MIXED	1096.53	1096.34	8800.00	4.53	1.29	1713.69	5.14	0.59	0.046	9324.38	10819.56
19.671	SUBCRIT	1095.63	1095.51	4400.00	3.63	1.26	783.11	5.62	0.68	0.046	9415.28	10564.08
19.671	B2 MIXED	1095.64	1095.51	4400.00	3.64	1.26	784.02	5.61	0.68	0.046	9415.26	10564.09
19.59	SUBCRIT	1090.67	1090.23	13200.00	6.67	1.58	2952.47	4.47	0.53	0.048	9172.15	11046.28
19.59	B2 MIXED	1090.67	1090.23	13200.00	6.67	1.58	2952.47	4.47	0.53	0.048	9172.15	11046.28
19.59	SUBCRIT	1089.86	1089.30	8800.00	5.86	2.25	1607.14	6.02	0.57	0.048	9670.30	11037.92
19.59	B2 MIXED	1089.86	1089.30	8800.00	5.86	2.25	1607.14	6.02	0.57	0.048	9670.30	11037.92
19.59	SUBCRIT	1088.95	1088.42	4400.00	4.95	1.71	978.28	4.78	0.66	0.048	9674.07	11027.73
19.59	B2 MIXED	1088.95	1088.42	4400.00	4.95	1.71	977.45	4.79	0.66	0.048	9674.08	11027.72
19.498	SUBCRIT	1085.08	1084.65	13200.00	3.08	1.62	2867.77	4.60	0.50	0.048	8824.27	10590.09
19.498	B2 MIXED	1085.08	1084.65	13200.00	3.08	1.62	2867.77	4.60	0.50	0.048	8824.27	10590.09
19.498	SUBCRIT	1084.80	1084.36	8800.00	2.80	1.36	2380.90	3.70	0.54	0.048	8838.36	10588.10
19.498	B2 MIXED	1084.80	1084.36	8800.00	2.80	1.36	2380.90	3.70	0.54	0.048	8838.36	10588.10
19.498	SUBCRIT	1084.36	1083.88	4400.00	2.36	0.94	1621.78	2.71	0.62	0.048	8860.58	10584.96
19.498	B2 MIXED	1084.36	1083.88	4400.00	2.36	0.94	1622.84	2.71	0.62	0.048	8860.55	10584.97
19.412	SUBCRIT	1079.16		13200.00	3.16	1.84	2392.43	5.52	0.48	0.048	8966.18	10282.55
19.412	B2 MIXED	1079.16		13200.00	3.16	1.84	2392.43	5.52	0.48	0.048	8966.18	10282.55
19.412	SUBCRIT	1078.60		8800.00	2.60	1.34	1680.71	5.24	0.51	0.048	8983.79	10253.47
19.412	B2 MIXED	1078.60		8800.00	2.60	1.34	1680.71	5.24	0.51	0.048	8983.79	10253.47
19.412	SUBCRIT	1077.93	1077.83	4400.00	1.93	0.99	886.46	4.96	0.59	0.048	9163.85	10169.28
19.412	B2 MIXED	1077.93	1077.83	4400.00	1.93	0.99	886.35	4.96	0.59	0.048	9163.88	10169.27
19.355	SUBCRIT	1076.73	1075.22	13200.00	4.73	3.21	3036.88	4.39	0.46	0.056	9368.16	10432.87
19.355	B2 MIXED	1076.73	1075.22	13200.00	4.73	3.21	3036.88	4.39	0.46	0.056	9368.16	10432.87
19.355	SUBCRIT	1076.04	1074.74	8800.00	4.04	2.66	2373.14	3.71	0.49	0.056	9373.67	10401.87
19.355	B2 MIXED	1076.04	1074.74	8800.00	4.04	2.66	2373.14	3.71	0.49	0.056	9373.67	10401.87
19.355	SUBCRIT	1075.05	1074.14	4400.00	3.05	1.81	1514.43	2.91	0.57	0.056	9381.60	10219.87
19.355	B2 MIXED	1075.05	1074.14	4400.00	3.05	1.81	1514.53	2.91	0.57	0.056	9381.60	10219.87

HEC-RAS Reach: BUCKEYE # 2 (continued)

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River Sta	Plan	W.S. Elev (ft)	Crit W.S (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
19.295	SUBCRIT	1074.58	1073.25	13200.00	4.58	3.05	2695.54	4.90	0.44	0.055	9758.79	10641.57
19.295	B2 MIXED	1074.58	1073.25	13200.00	4.58	3.05	2695.54	4.90	0.44	0.055	9758.79	10641.57
19.295	SUBCRIT	1073.69	1072.60	8800.00	3.69	2.95	1931.40	5.18	0.47	0.055	9766.76	10617.73
19.295	B2 MIXED	1073.69	1072.60	8800.00	3.69	2.95	1931.40	5.18	0.47	0.055	9766.76	10617.73
19.295	SUBCRIT	1072.45	1071.73	4400.00	2.45	1.88	1039.46	4.36	0.55	0.055	9777.92	10568.12
19.295	B2 MIXED	1072.45	1071.73	4400.00	2.45	1.88	1039.54	4.36	0.55	0.055	9777.92	10568.13
19.235	SUBCRIT	1074.02		12600.00	8.02	5.44	4285.44	2.94	0.42	0.051	9900.00	10688.29
19.235	B2 MIXED	1074.02		12600.00	8.02	5.44	4285.44	2.94	0.42	0.051	9900.00	10688.29
19.235	SUBCRIT	1073.35		8700.00	7.35	4.88	3761.01	2.31	0.45	0.052	9900.00	10670.12
19.235	B2 MIXED	1073.35		8700.00	7.35	4.88	3761.01	2.31	0.45	0.052	9900.00	10670.12
19.235	SUBCRIT	1072.27		4400.00	6.27	4.08	2945.07	1.49	0.51	0.052	9919.39	10640.65
19.235	B2 MIXED	1072.27		4400.00	6.27	4.08	2945.16	1.49	0.51	0.052	9919.38	10640.66
19.151	SUBCRIT	1073.34		10300.00	7.34	3.84	3066.22	3.36	0.38	0.052	9910.00	10707.91
19.151	B2 MIXED	1073.34		10300.00	7.34	3.84	3066.22	3.36	0.38	0.052	9910.00	10707.91
19.151	SUBCRIT	1072.81		7700.00	6.81	3.62	2661.80	2.89	0.40	0.053	9910.00	10645.55
19.151	B2 MIXED	1072.81		7700.00	6.81	3.62	2661.80	2.89	0.40	0.053	9910.00	10645.55
19.151	SUBCRIT	1071.94		4400.00	5.94	3.26	2065.22	2.13	0.45	0.054	9910.94	10543.61
19.151	B2 MIXED	1071.94		4400.00	5.94	3.26	2065.29	2.13	0.45	0.054	9910.94	10543.62
19.061	SUBCRIT	1072.28	1069.78	7500.00	8.28	3.41	2339.47	3.21	0.34	0.050	9920.00	10605.79
19.061	B2 MIXED	1072.28	1069.78	7500.00	8.28	3.41	2339.47	3.21	0.34	0.050	9920.00	10605.79
19.061	SUBCRIT	1071.92	1069.41	6000.00	7.92	3.20	2094.14	2.87	0.36	0.050	9920.00	10573.86
19.061	B2 MIXED	1071.92	1069.41	6000.00	7.92	3.20	2094.14	2.87	0.36	0.050	9920.00	10573.86
19.061	SUBCRIT	1071.29		4000.00	7.29	2.83	1700.17	2.35	0.39	0.051	9920.00	10521.46
19.061	B2 MIXED	1071.29		4000.00	7.29	2.83	1700.24	2.35	0.39	0.051	9920.00	10521.47
18.984	SUBCRIT	1071.02		5500.00	5.02	2.92	1389.20	3.96	0.31	0.053	9916.05	10392.61
18.984	B2 MIXED	1071.02		5500.00	5.02	2.92	1389.20	3.96	0.31	0.053	9916.05	10392.61
18.984	SUBCRIT	1070.75		4700.00	4.75	2.77	1265.21	3.71	0.32	0.053	9916.05	10373.51
18.984	B2 MIXED	1070.75		4700.00	4.75	2.77	1265.21	3.71	0.32	0.053	9916.05	10373.51
18.984	SUBCRIT	1070.27		3500.00	4.27	2.49	1052.22	3.33	0.35	0.054	9916.05	10338.69
18.984	B2 MIXED	1070.27		3500.00	4.27	2.49	1052.32	3.33	0.35	0.054	9916.05	10338.71
18.871	SUBCRIT	1068.35		4900.00	4.35	2.79	1332.51	3.68	0.27	0.055	9933.51	10411.30
18.871	B2 MIXED	1068.35		4900.00	4.35	2.79	1332.51	3.68	0.27	0.055	9933.51	10411.30
18.871	SUBCRIT	1068.12		4400.00	4.12	2.75	1227.58	3.58	0.28	0.055	9953.42	10399.94
18.871	B2 MIXED	1068.12		4400.00	4.12	2.75	1227.63	3.58	0.28	0.055	9953.41	10399.94
18.871	SUBCRIT	1067.65		3500.00	3.65	2.50	1028.02	3.40	0.30	0.055	9965.69	10376.95
18.871	B2 MIXED	1067.65		3500.00	3.65	2.50	1027.97	3.40	0.30	0.055	9965.69	10376.94

HEC-RAS Reach: BUCKEYE # 2 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
18.755	SUBCRIT	1065.12		4900.00	5.12	2.81	1124.42	4.36	0.22	0.054	9948.23	10348.84
18.755	B2 MIXED	1065.12		4900.00	5.12	2.81	1124.42	4.36	0.22	0.054	9948.23	10348.84
18.755	SUBCRIT	1064.92		4400.00	4.92	2.75	1046.25	4.21	0.23	0.054	9952.54	10333.37
18.755	B2 MIXED	1064.92		4400.00	4.92	2.75	1045.92	4.21	0.23	0.054	9952.56	10333.31
18.755	SUBCRIT	1064.50		3500.00	4.50	2.64	894.70	3.91	0.25	0.054	9961.60	10300.85
18.755	B2 MIXED	1064.50		3500.00	4.50	2.64	894.62	3.91	0.25	0.054	9961.60	10300.83
18.624	SUBCRIT	1060.35		4900.00	4.35	2.33	1121.59	4.37	0.18	0.054	9950.52	10431.18
18.624	B2 MIXED	1060.35		4900.00	4.35	2.33	1121.59	4.37	0.18	0.054	9950.52	10431.18
18.624	SUBCRIT	1060.15		4400.00	4.15	2.24	1027.25	4.28	0.19	0.054	9959.95	10419.45
18.624	B2 MIXED	1060.15		4400.00	4.15	2.24	1027.81	4.28	0.19	0.054	9959.89	10419.53
18.624	SUBCRIT	1059.71		3500.00	3.71	2.04	836.37	4.18	0.21	0.054	9969.19	10379.55
18.624	B2 MIXED	1059.71		3500.00	3.71	2.04	836.52	4.18	0.21	0.054	9969.19	10379.59
18.516	SUBCRIT	1054.98		4900.00	4.98	2.48	930.65	5.27	0.15	0.054	9963.55	10339.11
18.516	B2 MIXED	1054.98		4900.00	4.98	2.48	930.65	5.27	0.15	0.054	9963.55	10339.11
18.516	SUBCRIT	1054.81		4400.00	4.81	2.43	869.27	5.06	0.15	0.054	9964.73	10322.71
18.516	B2 MIXED	1054.81		4400.00	4.81	2.43	868.05	5.07	0.15	0.054	9964.75	10322.38
18.516	SUBCRIT	1054.47		3500.00	4.47	2.34	754.31	4.64	0.17	0.054	9967.12	10289.61
18.516	B2 MIXED	1054.47		3500.00	4.47	2.34	754.39	4.64	0.17	0.054	9967.12	10289.63
18.432	SUBCRIT	1051.59		4900.00	3.59	2.44	1284.19	3.82	0.12	0.055	9968.68	10495.83
18.432	B2 MIXED	1051.59		4900.00	3.59	2.44	1284.19	3.82	0.12	0.055	9968.68	10495.83
18.432	SUBCRIT	1051.40		4400.00	3.40	2.27	1187.46	3.71	0.13	0.055	9969.51	10491.92
18.432	B2 MIXED	1051.41		4400.00	3.41	2.28	1189.50	3.70	0.13	0.055	9969.50	10492.01
18.432	SUBCRIT	1051.03		3500.00	3.03	1.94	995.55	3.52	0.14	0.055	9971.20	10484.08
18.432	B2 MIXED	1051.03		3500.00	3.03	1.94	995.43	3.52	0.14	0.055	9971.20	10484.08
18.348	SUBCRIT	1047.65	1046.85	4900.00	3.65	2.46	910.40	5.38	0.09	0.055	9973.69	10343.85
18.348	B2 MIXED	1047.65	1046.85	4900.00	3.65	2.46	910.40	5.38	0.09	0.055	9973.69	10343.85
18.348	SUBCRIT	1047.53	1046.69	4400.00	3.53	2.38	865.88	5.08	0.10	0.055	9974.23	10338.66
18.348	B2 MIXED	1047.52	1046.69	4400.00	3.52	2.37	862.23	5.10	0.10	0.055	9974.27	10338.23
18.348	SUBCRIT	1047.31	1046.42	3500.00	3.31	2.22	787.94	4.44	0.11	0.055	9975.20	10329.36
18.348	B2 MIXED	1047.31	1046.42	3500.00	3.31	2.23	788.11	4.44	0.11	0.055	9975.19	10329.38
18.115	SUBCRIT	1046.04		4900.00	2.04	1.36	1829.00	2.68	0.01	0.016	9405.01	10754.03
18.115	B2 MIXED	1046.04		4900.00	2.04	1.36	1829.00	2.68	0.01	0.016	9405.01	10754.03
18.115	SUBCRIT	1045.92		4400.00	1.92	1.32	1677.33	2.62	0.01	0.016	9422.93	10691.56
18.115	B2 MIXED	1045.93		4400.00	1.93	1.33	1683.99	2.61	0.01	0.016	9422.04	10692.83
18.115	SUBCRIT	1045.72		3500.00	1.72	1.20	1424.10	2.46	0.01	0.016	9458.04	10641.47
18.115	B2 MIXED	1045.72		3500.00	1.72	1.20	1423.81	2.46	0.01	0.016	9458.08	10641.41

HEC-RAS Reach: BUCKEYE # 2 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
18.091	SUBCRIT	1045.36	1045.36	4900.00	1.36	1.04	841.95	5.82	0.00	0.016	9518.08	10328.26
18.091	B2 MIXED	1045.36	1045.36	4900.00	1.36	1.04	841.95	5.82	0.00	0.016	9518.08	10328.26
18.091	SUBCRIT	1045.29	1045.29	4400.00	1.29	0.99	786.74	5.59	0.00	0.016	9532.90	10323.77
18.091	B2 MIXED	1045.28	1045.28	4400.00	1.28	0.99	776.63	5.67	0.00	0.016	9535.66	10322.94
18.091	SUBCRIT	1045.11	1045.11	3500.00	1.11	0.88	653.31	5.36	0.00	0.016	9570.33	10312.46
18.091	B2 MIXED	1045.12	1045.12	3500.00	1.12	0.88	653.68	5.35	0.00	0.016	9570.22	10312.49

## NOTE

The following HEC-RAS flow distribution printouts are based on mixed flow regime. Hydraulic data in these tables may not be consistent with the mixed flow regime water surface elevations from the HEC-RAS summary table at some cross sections due to possible HEC-RAS data errors.

Flow DIST 1 of 17

FULL Flow 1 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 20.005 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9806.96	10183.23	100.00	1239.40	357.12	124164.9	3.49	10.65

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.995 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9807.78	10192.84	100.00	1236.81	354.75	124281.2	3.51	10.67

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.976 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9810.60	10230.52	100.00	826.38	366.59	62091.8	2.26	15.97

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.959 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9795.04	10233.44	100.00	1302.33	412.70	122451.2	3.16	10.14

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.898 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9752.00	10395.00	100.00	1890.21	479.49	170951.1	3.95	6.98

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.844 Profile: 1 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9682.95	9780.15	5.29	90.47	40.22	5244.9	2.26	7.71
9780.15	9877.35	18.84	275.95	97.20	18685.3	2.84	9.01
9877.35	9974.54	21.57	299.49	97.33	21397.3	3.08	9.51
9974.54	10071.74	29.11	358.34	97.23	28873.8	3.69	10.72
10071.74	10168.94	12.15	212.17	97.20	12056.7	2.18	7.56
10168.94	10266.14	5.16	126.90	97.20	5119.3	1.31	5.37
10266.14	10363.34	2.47	81.60	97.20	2452.5	0.84	4.00
10363.34	10460.53	5.42	123.07	83.66	5375.3	1.47	5.81

FLOW DIST 2 of 17

FULL FLOW 2 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.753 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9493.51	9614.45	14.00	246.15	117.87	12990.2	2.09	7.51
9614.45	9735.38	21.41	320.90	120.94	19867.5	2.65	8.81
9735.38	9856.32	21.41	320.90	120.94	19867.5	2.65	8.81
9856.32	9977.25	21.41	320.90	120.94	19867.4	2.65	8.81
9977.25	10098.19	7.04	164.72	121.07	6533.0	1.36	5.64
10098.19	10219.13	8.00	177.77	120.99	7421.7	1.47	5.94
10219.13	10340.06	2.07	79.03	120.94	1922.2	0.65	3.46
10340.06	10461.00	3.91	115.83	121.14	3631.7	0.96	4.46
10461.00	10581.93	0.76	38.08	87.21	708.1	0.44	2.64

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.671 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9237.75	9398.79	1.64	61.18	78.88	1668.4	0.78	3.53
9398.79	9559.82	16.90	330.99	162.00	17215.7	2.06	6.74
9559.82	9720.86	13.01	282.24	161.10	13249.1	1.75	6.08
9720.86	9881.89	3.81	135.13	161.04	3883.2	0.84	3.72
9881.89	10042.93	12.36	273.66	161.05	12587.5	1.70	5.96
10042.93	10203.97	30.26	468.52	161.29	30812.4	2.91	8.52
10203.97	10365.00	8.47	218.26	161.19	8629.3	1.36	5.12
10365.00	10526.04	9.77	238.12	161.91	9947.9	1.48	5.41
10526.04	10687.07	3.28	100.67	96.87	3336.2	1.05	4.30
10687.07	10848.11	0.50	25.87	53.84	512.6	0.48	2.57

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.59 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9149.70	9363.38	1.76	116.69	191.24	2598.7	0.61	1.99
9363.38	9577.06	2.29	142.86	213.68	3381.5	0.67	2.11
9577.06	9790.74	36.35	752.14	214.52	53736.0	3.52	6.38
9790.74	10004.41	23.40	576.51	213.73	34582.5	2.70	5.36
10004.41	10218.09	9.71	340.16	213.70	14356.1	1.59	3.77
10218.09	10431.77	11.91	384.71	213.97	17609.3	1.80	4.09
10431.77	10645.45	4.41	211.95	213.71	6525.3	0.99	2.75
10645.45	10859.13	2.29	142.86	213.68	3381.5	0.67	2.11
10859.13	11072.81	7.88	284.58	187.31	11642.8	1.52	3.65

FLOW DIST 3 of 17

FULL FLOW 3 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.498 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8607.11	8831.74	0.00	0.55	7.47	3.0	0.07	0.52
8831.74	9056.36	4.86	219.88	224.63	6710.4	0.98	2.92
9056.36	9280.98	5.70	241.87	224.62	7866.0	1.08	3.11
9280.98	9505.61	5.70	241.87	224.62	7866.0	1.08	3.11
9505.61	9730.23	5.70	241.87	224.62	7866.0	1.08	3.11
9730.23	9954.85	5.70	241.87	224.62	7866.0	1.08	3.11
9954.85	10179.47	27.51	622.20	224.86	37963.4	2.77	5.84
10179.47	10404.10	20.57	522.48	224.68	28389.4	2.33	5.20
10404.10	10628.72	24.26	535.19	186.27	33484.1	2.88	5.98

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.412 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8863.08	9024.13	1.02	45.92	57.97	1216.8	0.79	2.93
9024.13	9185.17	4.73	166.32	145.01	5641.7	1.15	3.76
9185.17	9346.22	9.67	266.34	161.05	11530.4	1.65	4.79
9346.22	9507.26	17.14	375.46	161.05	20435.4	2.33	6.03
9507.26	9668.31	25.30	474.28	161.05	30164.9	2.94	7.04
9668.31	9829.36	17.38	378.60	161.05	20721.4	2.35	6.06
9829.36	9990.40	7.05	220.36	161.05	8407.4	1.37	4.22
9990.40	10151.45	14.56	340.46	161.10	17356.6	2.11	5.65
10151.45	10312.49	3.13	124.72	131.13	3734.1	0.95	3.32

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.355 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9363.50	9492.00	9.91	349.93	124.02	18207.0	2.83	3.74
9492.00	9620.50	19.17	521.76	128.50	35235.1	4.06	4.85
9620.50	9749.00	21.45	558.16	128.50	39427.2	4.34	5.07
9749.00	9877.50	15.88	466.08	128.51	29192.8	3.63	4.50
9877.50	10006.00	16.73	480.79	128.54	30739.3	3.74	4.59
10006.00	10134.50	9.90	350.85	128.50	18186.1	2.73	3.72
10134.50	10263.00	6.00	259.81	128.52	11021.6	2.02	3.05
10263.00	10391.50	0.12	16.17	42.18	226.5	0.38	1.01

FLOW DIST 4 of 17  
 FULL FLOW 4 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.295 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9690.00	9791.00	2.13	57.63	32.41	3591.6	1.79	4.87
9791.00	9892.00	18.26	457.95	101.06	30820.3	4.53	5.26
9892.00	9993.00	15.02	389.09	101.10	25354.8	3.85	5.10
9993.00	10094.00	19.92	460.82	101.02	33633.0	4.56	5.71
10094.00	10195.00	19.51	455.10	101.01	32942.0	4.51	5.66
10195.00	10296.00	9.89	302.80	101.02	16703.8	3.00	4.31
10296.00	10397.00	3.35	158.27	101.07	5663.0	1.57	2.80
10397.00	10498.00	4.50	188.76	101.08	7595.6	1.87	3.15
10498.00	10599.00	4.62	191.81	101.04	7803.3	1.90	3.18
10599.00	10700.00	0.44	33.30	42.60	749.9	0.78	1.76

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.235 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9900.00	10066.15	9.14	925.19	168.07	38135.2	5.57	1.24
10066.15	10232.30	33.85	1330.48	166.16	141296.1	8.01	3.21
10232.30	10398.45	21.85	1023.23	166.19	91207.5	6.16	2.69
10398.45	10564.60	13.74	774.68	166.18	57361.6	4.66	2.23
10564.60	10730.75	2.24	231.87	123.73	9352.0	1.87	1.22

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.151 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10085.14	34.43	1072.97	176.91	87990.9	6.13	3.30
10085.14	10260.28	35.76	1046.28	175.15	91399.0	5.97	3.52
10260.28	10435.42	15.02	621.65	175.16	38379.5	3.55	2.49
10435.42	10610.56	4.10	285.24	175.15	10476.7	1.63	1.48
10610.56	10785.70	0.23	40.08	97.35	588.6	0.41	0.59

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.061 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10087.43	28.89	851.39	169.75	52718.5	5.09	2.54
10087.43	10254.86	32.12	787.10	167.44	58606.1	4.70	3.06
10254.86	10422.30	15.18	502.08	167.44	27702.5	3.00	2.27
10422.30	10589.73	3.20	197.44	167.44	5847.3	1.18	1.22
10589.73	10757.16	0.00	1.46	16.06	7.8	0.09	0.22

Flow DIST 5 of 17  
 Full Flow 5 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.984 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.05	10073.19	40.03	608.73	158.36	36458.0	3.87	3.62
10073.19	10230.33	41.41	589.10	157.16	37719.1	3.75	3.87
10230.33	10387.46	6.35	191.19	157.16	5781.2	1.22	1.83
10387.46	10544.60	0.00	0.18	5.15	0.5	0.04	0.17

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.871 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10071.85	32.94	432.31	138.71	26664.4	3.13	3.73
10071.85	10223.70	45.08	569.65	151.86	36492.0	3.75	3.88
10223.70	10375.55	17.03	317.68	151.87	13787.3	2.09	2.63
10375.55	10527.40	0.21	12.87	35.76	172.8	0.36	0.81

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.755 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9917.97	10048.70	27.43	353.12	100.79	19989.6	3.51	3.81
10048.70	10179.43	53.42	557.75	130.76	38925.2	4.27	4.69
10179.43	10310.16	9.98	203.87	130.75	7273.8	1.56	2.40
10310.16	10440.89	0.14	9.68	38.68	102.0	0.25	0.71

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.624 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10070.84	34.43	392.14	120.57	22129.3	3.26	4.30
10070.84	10221.68	44.99	494.09	150.86	28913.9	3.28	4.46
10221.68	10372.51	10.95	211.63	150.85	7037.4	1.40	2.54
10372.51	10523.35	0.54	23.73	58.67	344.3	0.40	1.11

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.516 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10040.21	31.14	301.67	77.07	17572.0	3.94	5.06
10040.21	10170.42	50.26	460.56	130.23	28366.5	3.54	5.35
10170.42	10300.63	8.71	160.87	130.23	4914.2	1.24	2.65
10300.63	10430.84	0.12	7.56	38.48	67.8	0.20	0.78

Flow DIST 6 of 17  
 FULL FLOW 6 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.432 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10078.81	30.26	363.06	110.47	20288.8	3.30	4.08
10078.81	10237.62	43.40	506.25	158.82	29094.4	3.19	4.20
10237.62	10396.44	16.53	283.69	158.82	11082.1	1.79	2.86
10396.44	10555.25	6.25	131.19	99.43	4187.8	1.32	2.33

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.348 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.54	10025.24	16.70	158.48	51.96	8097.8	3.07	5.16
10025.24	10133.94	46.26	372.15	108.70	22430.6	3.42	6.09
10133.94	10242.64	26.54	266.67	108.70	12870.3	2.45	4.88
10242.64	10351.34	6.66	113.10	101.23	3231.4	1.12	2.89

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.115 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9165.00	9582.00	2.45	94.12	177.00	5737.4	0.53	1.28
9582.00	9999.00	45.79	767.99	417.00	107161.3	1.84	2.92
9999.00	10416.00	46.57	775.79	417.00	108981.6	1.86	2.94
10416.00	10833.00	5.19	191.11	338.04	12134.7	0.57	1.33

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.091 Profile: 1 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9386.00	9702.00	4.87	78.67	183.93	4147.7	0.43	3.04
9702.00	10018.00	51.48	401.94	316.00	43820.5	1.27	6.28
10018.00	10334.00	43.64	361.35	310.27	37146.9	1.16	5.92

FLOW DIST 7 of 17

2/3 FLAW 1 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 20.005 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9806.96	10183.23	100.00	948.10	354.44	79844.6	2.69	9.28

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.995 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9807.76	10192.84	100.00	944.20	352.02	79661.5	2.70	9.32

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.976 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9810.60	10230.52	100.00	620.35	364.66	38635.5	1.70	14.19

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.959 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9795.04	10233.44	100.00	986.70	400.24	78694.9	2.47	8.92

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.898 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9752.00	10395.00	100.00	1540.33	469.61	123237.8	3.29	5.71

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.844 Profile: 2 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9682.95	9780.15	5.32	69.40	37.04	3562.4	1.88	6.75
9780.15	9877.35	19.51	222.64	97.20	13065.5	2.29	7.71
9877.35	9974.54	23.05	246.19	97.33	15434.0	2.53	8.24
9974.54	10071.74	32.97	305.03	97.23	22075.9	3.14	9.51
10071.74	10168.94	11.12	158.86	97.20	7443.6	1.63	6.16
10168.94	10266.14	3.08	73.59	97.20	2064.5	0.76	3.69
10266.14	10363.34	0.63	28.29	97.20	419.7	0.29	1.95
10363.34	10460.53	4.33	80.30	72.67	2898.4	1.11	4.74

FLOW DIST 8 of 17

2/3 FLOW 2 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.753 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9493.51	9614.45	14.22	194.62	116.73	8839.5	1.67	6.43
9614.45	9735.38	23.62	267.72	120.94	14689.5	2.21	7.76
9735.38	9856.32	23.62	267.72	120.94	14689.5	2.21	7.76
9856.32	9977.25	23.62	267.72	120.94	14689.4	2.21	7.76
9977.25	10098.19	5.49	111.54	121.07	3411.6	0.92	4.33
10098.19	10219.13	6.60	124.60	120.99	4104.3	1.03	4.66
10219.13	10340.06	0.48	25.85	120.94	298.5	0.21	1.63
10340.06	10461.00	2.10	62.66	121.14	1304.2	0.52	2.95
10461.00	10581.93	0.25	10.86	36.70	155.8	0.30	2.03

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.671 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9237.75	9398.79	1.02	37.12	74.43	754.2	0.50	2.42
9398.79	9559.82	17.65	280.43	162.00	13060.0	1.74	5.54
9559.82	9720.86	12.88	231.68	161.10	9534.6	1.44	4.89
9720.86	9881.89	2.40	84.57	161.04	1778.1	0.53	2.50
9881.89	10042.93	12.10	223.10	161.05	8955.5	1.39	4.77
10042.93	10203.97	34.42	417.96	161.29	25472.5	2.60	7.25
10203.97	10365.00	7.52	167.70	161.19	5562.1	1.04	3.94
10365.00	10526.04	9.03	187.56	161.91	6683.1	1.16	4.24
10526.04	10687.07	2.75	71.89	87.59	2035.8	0.83	3.37
10687.07	10848.11	0.24	11.67	36.63	175.9	0.32	1.79

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.59 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9577.06	9790.74	57.34	592.73	121.26	52848.9	4.92	8.51
9790.74	10004.41	20.77	404.36	213.73	19147.8	1.89	4.52
10004.41	10218.09	6.49	175.80	152.61	5980.1	1.15	3.25
10218.09	10431.77	13.47	228.24	98.05	12410.6	2.33	5.19
10431.77	10645.45	1.93	60.02	63.90	1781.9	0.94	2.83

FLOW DIST 9 of 17

2/3 FLOW 3 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.498 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8831.74	9056.36	3.71	158.09	218.01	3950.3	0.73	2.07
9056.36	9280.98	4.50	179.65	224.62	4792.0	0.80	2.20
9280.98	9505.61	4.50	179.65	224.62	4792.0	0.80	2.20
9505.61	9730.23	4.50	179.65	224.62	4792.0	0.80	2.20
9730.23	9954.85	4.50	179.65	224.62	4792.0	0.80	2.20
9954.85	10179.47	29.91	559.98	224.86	31849.9	2.49	4.70
10179.47	10404.10	21.59	460.26	224.68	22981.9	2.05	4.13
10404.10	10628.72	26.79	483.95	184.26	28518.7	2.63	4.87

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.412 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8863.08	9024.13	0.48	18.48	40.34	340.1	0.46	2.29
9024.13	9185.17	2.73	86.51	141.54	1928.6	0.61	2.78
9185.17	9346.22	8.21	176.44	161.05	5804.6	1.10	4.10
9346.22	9507.26	18.32	285.56	161.05	12950.0	1.77	5.65
9507.26	9668.31	30.07	384.38	161.05	21250.9	2.39	6.88
9668.31	9829.36	18.66	288.70	161.05	13188.5	1.79	5.69
9829.36	9990.40	4.97	130.46	161.05	3509.4	0.81	3.35
9990.40	10151.45	14.73	250.56	161.10	10412.1	1.56	5.17
10151.45	10312.49	1.83	59.65	102.04	1291.1	0.58	2.69

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.355 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9363.50	9492.00	9.46	266.52	118.46	12046.7	2.25	3.12
9492.00	9620.50	20.30	433.24	128.50	25847.0	3.37	4.12
9620.50	9749.00	23.22	469.65	128.50	29567.4	3.65	4.35
9749.00	9877.50	16.14	377.56	128.51	20550.6	2.94	3.76
9877.50	10006.00	17.20	392.27	128.54	21898.6	3.05	3.86
10006.00	10134.50	8.80	262.33	128.50	11202.0	2.04	2.95
10134.50	10263.00	4.32	171.29	128.52	5504.5	1.33	2.22
10263.00	10391.50	0.00	0.17	4.28	0.5	0.04	0.22

FLOW DIST 10 of 17

2/3 FLOW 4 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.295 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9690.00	9791.00	1.70	32.64	24.39	1683.2	1.35	4.57
9791.00	9892.00	21.71	368.53	101.06	21542.6	3.65	5.19
9892.00	9993.00	16.54	299.66	101.10	16407.4	2.97	4.86
9993.00	10094.00	23.66	371.40	101.02	23475.2	3.68	5.61
10094.00	10195.00	23.06	365.68	101.01	22877.1	3.62	5.55
10195.00	10296.00	9.40	213.38	101.02	9321.2	2.11	3.87
10296.00	10397.00	1.28	47.50	47.14	1266.8	1.01	2.37

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.235 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9900.00	10066.15	9.63	813.37	167.40	32955.6	4.90	1.03
10066.15	10232.30	35.67	1218.66	166.16	122064.8	7.33	2.55
10232.30	10398.45	21.98	911.41	166.19	75208.8	5.49	2.10
10398.45	10564.60	12.93	662.86	166.18	44237.8	3.99	1.70
10564.60	10730.75	1.55	154.70	105.55	5296.5	1.47	0.87

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.151 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10085.14	36.77	980.59	176.39	77630.1	5.60	2.89
10085.14	10260.28	37.11	953.90	175.15	78348.9	5.45	3.00
10260.28	10435.42	13.90	529.27	175.16	29353.0	3.02	2.02
10435.42	10610.56	2.58	192.86	175.15	5456.8	1.10	1.03
10610.56	10785.70	0.02	5.18	34.99	38.5	0.15	0.27

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.061 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10087.43	30.71	790.06	169.38	47916.0	4.72	2.33
10087.43	10254.86	32.81	725.76	167.44	51193.9	4.33	2.71
10254.86	10422.30	14.29	440.74	167.44	22295.0	2.63	1.95
10422.30	10589.73	2.19	137.59	151.58	3422.6	0.91	0.96

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.984 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.05	10073.19	41.74	567.01	158.10	33298.9	3.61	3.46
10073.19	10230.33	41.83	547.38	157.16	33372.9	3.48	3.59
10230.33	10387.46	5.19	150.82	143.20	4142.6	1.05	1.62

Flow DIST 11 of 17

2/3 FLOW 5 of 6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.871 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10071.85	33.94	403.17	118.82	24384.4	3.40	3.70
10071.85	10223.70	45.78	535.19	151.86	32887.5	3.52	3.76
10223.70	10375.55	15.85	283.22	151.87	11386.0	1.87	2.46
10375.55	10527.40	0.09	6.04	24.40	63.3	0.25	0.64

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.755 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9917.97	10048.70	28.21	333.37	96.46	18700.0	3.47	3.72
10048.70	10179.43	54.18	531.48	130.76	35918.1	4.07	4.49
10179.43	10310.16	8.72	177.60	130.75	5779.9	1.36	2.16
10310.16	10440.89	0.04	3.47	23.15	25.9	0.15	0.50

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.624 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10070.84	35.84	369.08	111.20	20464.3	3.33	4.27
10070.84	10221.68	45.61	464.00	150.86	26039.5	3.08	4.32
10221.68	10372.51	9.55	181.54	150.85	5450.2	1.20	2.31
10372.51	10523.35	0.26	13.19	47.01	149.9	0.28	0.88

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.516 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10040.21	32.13	288.68	75.86	16568.0	3.83	4.90
10040.21	10170.42	50.66	438.32	130.23	26120.7	3.37	5.09
10170.42	10300.63	7.44	138.63	130.23	3835.0	1.06	2.36
10300.63	10430.84	0.03	2.41	21.75	14.8	0.11	0.52

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.432 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10078.81	31.15	343.26	109.63	18617.4	3.14	3.99
10078.81	10237.62	44.17	477.59	158.82	26402.0	3.01	4.07
10237.62	10396.44	15.53	255.04	158.82	9280.2	1.61	2.68
10396.44	10555.25	5.66	113.60	95.61	3381.8	1.19	2.19

FLOW DIST 12 of 17  
 2/3 FLOW 60+6

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.348 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.54	10025.24	17.00	151.75	51.36	7618.7	2.98	4.93
10025.24	10133.94	46.90	357.89	108.70	21016.1	3.29	5.77
10133.94	10242.64	26.21	252.40	108.70	11743.5	2.32	4.57
10242.64	10351.34	6.12	100.19	95.61	2742.8	1.05	2.69

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.115 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9165.00	9582.00	2.02	75.26	159.97	4227.6	0.47	1.18
9582.00	9999.00	46.16	721.46	417.00	96561.3	1.73	2.82
9999.00	10416.00	46.99	729.26	417.00	98307.8	1.75	2.84
10416.00	10833.00	4.83	158.02	276.83	10097.8	0.57	1.34

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.091 Profile: 2 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9386.00	9702.00	4.19	64.35	166.34	3172.6	0.39	2.87
9702.00	10018.00	51.81	376.09	316.00	39225.7	1.19	6.06
10018.00	10334.00	44.00	336.19	304.95	33319.1	1.10	5.76

Flow DIST 13 of 17

1/3 Flow 1 of 5

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 20.005 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9806.96	10183.23	100.00	593.21	351.14	36773.9	1.69	7.42

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.995 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9807.78	10192.84	100.00	592.35	348.71	36855.7	1.70	7.43

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.976 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9810.60	10230.52	100.00	376.06	301.27	19053.1	1.25	11.70

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.959 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9795.04	10233.44	100.00	1185.25	408.12	105439.9	2.91	3.71

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.898 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9752.00	10395.00	100.00	1066.61	460.70	67651.4	2.32	4.13

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.844 Profile: 3 7/27/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9882.95	9780.15	5.12	40.07	32.09	1568.9	1.25	5.62
9780.15	9877.35	19.63	139.77	97.20	6013.4	1.44	6.18
9877.35	9974.54	25.42	163.31	97.33	7787.3	1.68	6.85
9974.54	10071.74	42.49	222.16	97.23	13014.8	2.29	8.42
10071.74	10168.94	7.11	75.98	97.20	2177.5	0.78	4.12
10168.94	10266.14	0.22	6.52	38.01	68.0	0.17	1.50

Flow DIST 14 of 17  
 1/3 Flow 2 of 5

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.753 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9493.51	9614.45	12.86	100.92	95.86	3373.8	1.05	5.61
9614.45	9735.38	24.58	163.35	120.94	6447.6	1.35	6.62
9735.38	9856.32	24.58	163.35	120.94	6447.6	1.35	6.62
9856.32	9977.25	24.58	163.35	120.94	6447.5	1.35	6.62
9977.25	10098.19	5.92	48.21	48.39	1553.4	1.00	5.41
10098.19	10219.13	5.33	50.76	64.43	1398.7	0.79	4.62
10219.13	10340.06						
10340.06	10461.00	2.11	19.76	24.40	554.6	0.81	4.71
10461.00	10581.93	0.02	0.52	3.70	4.6	0.14	1.47

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.671 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9398.79	9559.82	18.71	149.14	114.39	5749.8	1.31	5.52
9559.82	9720.86	13.39	112.20	92.84	4112.5	1.21	5.25
9720.86	9881.89						
9881.89	10042.93	8.16	91.19	116.24	2505.5	0.78	3.93
10042.93	10203.97	41.18	274.64	161.29	12650.6	1.71	6.60
10203.97	10365.00	4.67	52.74	68.15	1435.9	0.78	3.90
10365.00	10526.04	11.33	81.50	53.61	3480.4	1.54	6.12
10526.04	10687.07	2.57	22.61	20.14	789.2	1.15	5.00

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.59 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9577.06	9790.74	71.85	484.24	117.38	38559.2	4.15	6.53
9790.74	10004.41	11.86	208.81	213.73	6364.3	0.98	2.50
10004.41	10218.09	2.71	62.32	95.39	1452.7	0.65	1.91
10218.09	10431.77	13.03	147.82	78.26	6992.4	1.90	3.88
10431.77	10645.45	0.56	15.80	32.78	300.7	0.48	1.56

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.498 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8831.74	9056.36	1.57	67.80	195.81	1034.9	0.35	1.02
9056.36	9280.98	1.95	81.63	224.62	1286.8	0.36	1.05
9280.98	9505.61	1.95	81.63	224.62	1286.8	0.36	1.05
9505.61	9730.23	1.95	81.63	224.62	1286.8	0.36	1.05
9730.23	9954.85	1.95	81.63	224.62	1286.8	0.36	1.05
9954.85	10179.47	34.97	461.96	224.86	23111.0	2.06	3.33
10179.47	10404.10	23.33	362.24	224.68	15418.0	1.61	2.83
10404.10	10628.72	32.35	404.33	181.10	21381.5	2.24	3.52

Flow Dist 15 of 17

1/3 Flow 3 of 5

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.412 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9024.13	9185.17	0.01	0.95	21.29	3.7	0.04	0.55
9185.17	9346.22	3.88	68.98	161.05	1213.5	0.43	2.48
9346.22	9507.26	18.88	178.10	161.05	5896.0	1.11	4.66
9507.26	9668.31	39.39	276.92	161.05	12303.8	1.72	6.26
9668.31	9829.36	19.43	181.25	161.05	6070.5	1.13	4.72
9829.36	9990.40	1.22	27.42	91.58	379.9	0.30	1.95
9990.40	10151.45	16.84	146.10	116.45	5261.1	1.26	5.07
10151.45	10312.49	0.34	6.65	17.84	106.5	0.37	2.26

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.355 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9363.50	9492.00	7.94	153.12	110.47	5073.4	1.39	2.28
9492.00	9620.50	22.63	305.82	128.50	14464.8	2.38	3.26
9620.50	9749.00	27.30	342.23	128.50	17447.0	2.66	3.51
9749.00	9877.50	16.19	250.15	128.51	10347.4	1.95	2.85
9877.50	10006.00	17.80	264.85	128.54	11379.3	2.06	2.96
10006.00	10134.50	5.79	134.92	128.50	3698.1	1.05	1.89
10134.50	10263.00	2.16	63.45	85.38	1381.4	0.74	1.50

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.295 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9690.00	9791.00	0.73	9.50	13.16	324.7	0.73	3.38
9791.00	9892.00	24.51	243.27	101.06	10892.5	2.41	4.43
9892.00	9993.00	14.98	174.40	101.10	6656.2	1.73	3.78
9993.00	10094.00	26.61	246.13	101.02	11825.8	2.44	4.76
10094.00	10195.00	25.58	240.41	101.01	11371.9	2.38	4.68
10195.00	10296.00	4.80	88.12	101.02	2134.6	0.87	2.40
10296.00	10397.00	0.18	6.39	19.21	81.4	0.33	1.26

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.235 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9900.00	10066.15	10.59	635.67	147.16	25268.6	4.33	0.73
10066.15	10232.30	39.20	1038.72	166.16	93529.7	6.25	1.66
10232.30	10398.45	21.85	731.47	166.19	52128.1	4.40	1.31
10398.45	10564.60	10.94	482.92	166.18	26094.5	2.91	1.00
10564.60	10730.75	0.51	56.38	76.07	1225.1	0.74	0.40

FLOW DIST 16 OF 17

1/3 FLOW 4 of 5

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.151 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10085.14	41.24	827.88	174.63	61660.5	4.75	2.19
10085.14	10260.28	39.18	801.16	175.15	58577.5	4.57	2.15
10260.28	10435.42	11.13	376.54	175.16	16641.8	2.15	1.30
10435.42	10610.56	0.71	59.71	108.21	1065.8	0.55	0.53

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 19.061 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10087.43	34.45	684.98	168.75	40121.5	4.09	2.01
10087.43	10254.86	33.87	620.69	167.44	39447.2	3.71	2.18
10254.86	10422.30	12.16	335.67	167.44	14160.7	2.00	1.45
10422.30	10589.73	0.95	58.91	99.18	1104.5	0.59	0.64

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.984 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.06	10073.19	45.21	490.99	157.62	27841.5	3.12	3.22
10073.19	10230.33	42.24	471.36	157.16	26011.8	3.00	3.14
10230.33	10387.46	3.42	89.97	108.40	2108.5	0.83	1.33

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.871 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10071.85	36.19	352.15	106.50	19929.3	3.32	3.60
10071.85	10223.70	47.05	463.88	151.86	25913.6	3.05	3.55
10223.70	10375.55	12.75	211.91	151.87	7021.4	1.40	2.11
10375.55	10527.40	0.00	0.02	1.39	0.0	0.01	0.10

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.755 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9917.97	10048.70	29.81	294.86	87.41	16115.0	3.39	3.54
10048.70	10179.43	55.39	476.54	130.76	29945.2	3.65	4.07
10179.43	10310.16	6.11	123.22	121.42	3301.8	1.02	1.73

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.624 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10070.84	39.21	323.24	101.88	16984.2	3.18	4.25
10070.84	10221.68	46.50	397.76	150.86	20142.9	2.64	4.09
10221.68	10372.51	5.90	115.29	150.85	2557.3	0.76	1.79
10372.51	10523.35	0.00	0.23	7.08	0.6	0.03	0.22

FLOW DIST 17 of 17

1/3 FLOW 5 of 5

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.516 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9910.00	10040.21	34.15	263.86	73.47	14671.9	3.61	4.53
10040.21	10170.42	51.07	394.80	130.23	21943.0	3.03	4.53
10170.42	10300.63	5.11	95.73	119.23	2194.1	0.80	1.87

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.432 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10078.81	33.36	302.60	107.89	15331.2	2.81	3.86
10078.81	10237.62	46.02	418.06	158.82	21147.9	2.63	3.85
10237.62	10396.44	12.97	195.50	158.82	5958.5	1.23	2.32
10396.44	10555.25	4.28	79.26	87.66	1966.6	0.90	1.89

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.348 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9916.54	10025.24	17.52	141.33	50.41	6888.8	2.82	4.34
10025.24	10133.94	47.99	335.45	108.70	18866.3	3.09	5.01
10133.94	10242.64	25.58	229.96	108.70	10055.6	2.12	3.89
10242.64	10351.34	5.26	81.37	86.76	2068.8	0.94	2.26

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.115 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9165.00	9582.00	1.30	45.16	123.92	2139.8	0.36	1.01
9582.00	9999.00	47.10	633.04	417.00	77655.0	1.52	2.60
9999.00	10416.00	48.07	640.84	417.00	79256.4	1.54	2.63
10416.00	10833.00	3.54	104.77	225.41	5838.0	0.46	1.18

Plan: B2 MIXED Reach: BUCKEYE # 2 Riv Sta: 18.091 Profile: 3 7/27/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9386.00	9702.00	2.90	40.38	131.78	1704.7	0.31	2.51
9702.00	10018.00	52.33	325.29	316.00	30798.6	1.03	5.63
10018.00	10334.00	44.77	288.00	294.50	26352.2	0.98	5.44

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 \* HEC-2 WATER SURFACE PROFILES \*  
 \* \*  
 \* Version 4.6.2; May 1991 \*  
 \* \*  
 \* RUN DATE 27JUL96 TIME 10:34:20 \*  
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 \* U.S. ARMY CORPS OF ENGINEERS \*  
 \* HYDROLOGIC ENGINEERING CENTER \*  
 \* 609 SECOND STREET, SUITE D \*  
 \* DAVIS, CALIFORNIA 95616-4687 \*  
 \* (916) 756-1104 \*  
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X   X   XXXXXXX   XXXXX           XXXXX
X   X   X         X   X           X   X
X   X   X         X             X   X
XXXXXXX XXXX     X             XXXXX
X   X   X         X             X
X   X   X         X   X           X
X   X   XXXXXXX   XXXXX           XXXXXXX
  
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PAGE 1

THIS RUN EXECUTED 27JUL96 10:34:20

\*\*\*\*\*  
 HEC-2 WATER SURFACE PROFILES  
 Version 4.6.2; May 1991  
 \*\*\*\*\*

SPLIT FLOW BEING PERFORMED

*BUCKEYE STRUCTURE 2*

SF WEIR FLOW OVER INTERSTATE-10 FROM RIVER MILE 18.091 TO RIVER MILE 19.412

TW I-10 WEIR XSECTN 19.355 TO XSECTN 19.412  
 WS 2 19.355 19.412 -1 3.0  
 WC 0 1083.0 600 1087.5

TW I-10 WEIR XSECTN 19.295 TO XSECTN 19.355  
 WS 2 19.295 19.355 -1 3.0  
 WC 0 1076.0 600 1083.0

TW I-10 WEIR XSECTN 19.235 TO XSECTN 19.295  
 WS 2 19.235 19.295 -1 3.0  
 WC 0 1072.5 475 1076.0

TW I-10 WEIR XSECTN 19.151 TO XSECTN 19.235  
 WS 2 19.151 19.235 -1 3.0  
 WC 0 1072.0 445 1072.5

TW I-10 WEIR XSECTN 19.061 TO XSECTN 19.151  
 WS 2 19.061 19.151 -1 3.0  
 WC 0 1070.5 475 1072.0

TW I-10 WEIR XSECTN 18.984 TO XSECTN 19.061  
 WS 2 18.984 19.061 -1 3.0  
 WC 0 1070.0 405 1070.5

TW I-10 WEIR XSECTN 18.871 TO XSECTN 18.984  
 WS 2 18.871 18.984 -1 3.0  
 WC 0 1068.5 595 1070.0

TW I-10 WEIR XSECTN 18.755 TO XSECTN 18.871  
 WS 2 18.755 18.871 -1 3.0  
 WC 0 1066.0 610 1068.5

TW I-10 WEIR XSECTN 18.624 TO XSECTN 18.755  
 WS 2 18.624 18.755 -1 3.0  
 WC 0 1061.0 690 1066.0

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PAGE 2

TW I-10 WEIR XSECTN 18.516 TO XSECTN 18.624  
 WS 2 18.516 18.624 -1 3.0  
 WC 0 1057.0 575 1061.0

TW I-10 WEIR XSECTN 18.432 TO XSECTN 18.516  
 WS 2 18.432 18.516 -1 3.0  
 WC 0 1053.5 445 1057.0

TW I-10 WEIR XSECTN 18.348 TO XSECTN 18.432  
 WS 2 18.348 18.432 -1 3.0  
 WC 0 1050.0 445 1053.5

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PAGE 3

T4 PURPOSE OF MODEL IS TO:  
 T4 1. ANALYZE WEIR/SPLITFLOW ALONG I-10 FROM XSECTN 18.091 TO  
 T4 XSECTN 19.412. SPLITFLOW ANALYSIS USING HEC-2 IS NECESSARY BECAUSE  
 T4 CURRENT HEC-RAS DOES NOT HAVE THIS CAPABILITY. SPLITFLOW DISCHARGES  
 T4 FROM THIS MODEL OUTPUT WILL BE ROUNDED TO NEAREST 100 CFS AND INPUT  
 T4 INTO HEC-RAS DATA FILE.  
 T4 2. PROVIDE BASIC MODEL GEOMETRY AND ASSOCIATED DATA FOR THE ENTIRE  
 T4 STUDY REACH IN HEC-2 FORMAT AS REQUIRED BY SCOPE OF WORK.

T4 MODEL ASSUMPTIONS AND APPROACH AS FOLLOWS:  
 T4 1. EXIST CMP CULVERTS UNDER I-10 NOT REFLECTED IN SPLITFLOW ANALYSIS.  
 T4 2. EXIST EARTH DIKES PROJECTING NORTH FROM I-10 ASSUMED WASHED OUT.  
 T4 3. WEIR ELEVATIONS ESTIMATED ALONG SOUTH EDGE OF WESTBOUND LANES FROM  
 T4 BUCKEYE STRUCTURES TOPO.  
 T4 4. WEIR COEFF OVER I-10 = 3.0.  
 T4 5. I-10 WEIR ASSUMED NOT TO BE SUBMERGED.  
 T4 6. I-10 WEIR FLOW IN AREA WHERE MAIN FLOW PATH INTERSECTS I-10 ASSUMED  
 T4 NOT TO REJOIN MODEL DOWNSTREAM.  
 T4 7. STARTING WATER SURFACE ELEVATION IS CALCULATED USING CRITICAL DEPTH  
 T4 OPTION.  
 T4 8. CHANNEL BANK STATIONS CORRESPOND TO BEGINNING AND ENDING GR STATIONS  
 T4 9. "n" VALUES ENTERED VIA BOTH NH AND NC RECORD.  
 T4 10. TYPE 1 ENCROACHMENT USED TO BLOCK OUT INEFFECTIVE FLOW AREA.

T4 GENERAL MODEL NOTES:  
 T4 1. CROSS SECTION DATA DEVELOPED FROM MCLAIN HARBERS 2 FT CONTOUR  
 T4 MAPPING FOR BUCKEYE STRUCTURES (FCD 93-51). VERT DATUM: NAVD 88.  
 T4 HORIZ DATUM: NAD 83.  
 T4 2. CROSS SECTIONS ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.  
 T4 3. CENTER LINE OF LEVEL BUCKEYE STRUCTURE SPILLWAY CREST (ACCORDING TO  
 T4 ORIGINAL SCS CONSTRUCTION PLANS) CORRESPONDS TO RIVER MILE 20.000.  
 T4 4. HYDRAULIC BASELINE CORRESPONDS TO CROSS SECTION GR STA 10,000.  
 T4 5. PROFILE 1: FULL SPILLWAY DISCHARGE  
 T4 PROFILE 2: 2/3 SPILLWAY DISCHARGE  
 T4 PROFILE 3: 1/3 SPILLWAY DISCHARGE

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			-1					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1		-1							

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	2	13	55	16	14	26	17
27JUL96	10:34:20								
15	56	18		38	43	1	25	42	8
39	27	53	54	28	4	37		38	43
1	68	50	3	61	27	21	23	24	22
28									

J5 LPRNT NUMSEC \*\*\*\*\*REQUESTED SECTION NUMBERS\*\*\*\*\*

J5	LPRNT	NUMSEC	*****REQUESTED SECTION NUMBERS*****							
	-10	-10								
NC			0.016	0.3	0.5					
QT	3	13200	8800	4400						
X1	18.091	7	9070	10650			0			
GR	1048.5	9070	1046.0	9380	1044.0	9810	1044.0	10240	1046.0	10370
GR	1048.0	10500	1050.0	10650						
X1	18.115	6	9165	11250			125			
GR	1048.0	9165	1046.0	9410	1044.0	9750	1044.0	10225	1046.0	10710
GR	1046.5	11250								
NC			0.1	0.3						
NH	3	0.016	9945.62	0.035	9990	0.056	10460.04			
X1	18.348	13	9916.54	10460.04			1230			
GR	1050	9916.54	1050	9945.62	1048	9972.13	1044	9990	1044	9991.88
GR	1044	9995.8	1044	10000	1044	10061.49	1046	10273.07	1048	10358.77
GR	1050	10431.24	1052	10460	1052	10460.04				
NH	3	0.016	9960	0.035	9987.91	0.056	10714.06			
X1	18.432	14	9920	10714.06			445			
GR	1053.5	9920	1053.5	9960	1050	9975.89	1048	9987.91	1048	10129.24
GR	1050	10313.74	1050	10420.37	1050	10462.21	1052	10504.53	1052	10512.87
GR	1052	10544.22	1054	10575.67	1056	10673.23	1056	10714.06		
NH	3	0.016	9956.32	0.035	9993.73	0.056	10561.05			
X1	18.516	12	9910	10561.05			445			
GR	1057.0	9910	1056	9956.32	1054	9970.45	1052	9982.01	1050	9993.73
GR	1050	10023.34	1052	10137.67	1054	10243.4	1056	10439.34	1056	10469.95
GR	1056	10504.4	1058	10561.05						
NH	3	0.016	9966.98	0.035	9998.9	0.056	10674.19			
X1	18.624	9	9920	10674.19			575			
GR	1061.0	9920	1060	9966.98	1058	9982.3	1056	9998.9	1056	10089.73
GR	1058	10194.85	1060	10410.71	1062	10527.57	1064	10674.19		

NH	3	0.016	9929.35	0.035	9999.21	0.056	10571.62			
X1	18.755	10	9917.97	10571.62			690			
GR	1066	9917.97	1066	9929.35	1064	9972.39	1062	9984.65	1060	9999.21
GR	1060	10081.19	1062	10167.3	1064	10262.08	1066	10416.65	1068	10571.62
NH	3	0.016	9963.83	0.035	9985.02	0.056	10679.25			
X1	18.871	9	9920	10679.25			610			
GR	1068.5	9920	1068	9963.83	1066	9974.42	1064	9985.02	1064	10085.65
GR	1066	10296.78	1068	10393.99	1070	10494.11	1072	10679.25		
NH	3	0.016	9929.78	0.035	9979.71	0.056	10701.74			
X1	18.984	11	9916.05	10701.74			595			
GR	1070	9916.05	1070	9929.78	1068	9967.1	1066	9979.71	1066	10054.6
GR	1066	10060.22	1066	10077.34	1068	10194.47	1070	10319.51	1072	10463.4
GR	1074	10701.74								
NH	3	0.016	9963.19	0.035	10001.34	0.056	10757.16			
X1	19.061	11	9920	10757.16			405			
GR	1070.5	9920	1070	9963.19	1068	9976.87	1066	9989.79	1064	10001.34
GR	1064	10001.79	1066	10039.92	1068	10203.51	1070	10413.78	1072	10580.74
GR	1074	10757.16								
NH	3	0.016	9942.46	0.035	9963.99	0.056	10785.7			
X1	19.151	9	9910	10785.7			475			
GR	1072.0	9910	1070	9942.46	1068	9953.5	1066	9963.99	1066	10049.52
GR	1068	10231.35	1070	10353.18	1072	10549.27	1074	10785.7		
NH	3	0.016	9941.94	0.035	10021.47	0.056	10730.75			
X1	19.235	15	9900	10730.75			445			
GR	1072.5	9900	1072	9941.94	1070	9953.18	1068	9963.95	1066	10021.47
GR	1066	10045.85	1066	10197.07	1066	10221.48	1068	10262.45	1068	10384.64
GR	1068	10424.99	1070	10505.31	1072	10633.34	1074	10687.75	1076	10730.75
NH	3	0.016	9755	0.035	9800	0.056	10700			
ET		9.1	9.1	9.1					9690	10350
X1	19.295	16	9690	10700			320			
GR	1076.0	9690	1075.0	9755	1070.0	9800	1070.0	9925	1072.0	9970
GR	1070.0	10000	1070.0	10170	1072.0	10255	1072.0	10305	1074.0	10350
GR	1071.5	10425	1074.0	10480	1072.0	10550	1074.0	10630	1076.0	10670
GR	1078.0	10700								
NH	3	0.016	9330	0.035	9390	0.056	10520			
ET		9.1	9.1	9.1					9235	10320
X1	19.355	14	9235	10520			320			
GR	1083.0	9235	1081.5	9330	1074.0	9390	1072.0	9640	1073.5	9825
GR	1072.0	9900	1072.0	9920	1074.0	9970	1074.0	10170	1076.0	10265
GR	1077.0	10320	1076.0	10400	1078.0	10490	1080.0	10520		

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NC			0.048							
X1	19.412	25	8863.08	10473.54			300			
GR	1088	8863.08	1086	8886.17	1084	8903.51	1082	8920.86	1080	8939.56
GR	1078	9002.68	1078	9124.29	1080	9130.09	1080	9141.54	1078	9147.52
GR	1076	9622.9	1076	9625.61	1078	9931.46	1078	10032.77	1076	10099.14
GR	1076	10123.11	1078	10170.92	1078	10171.37	1078	10222.3	1080	10326.48
GR	1082	10404.57	1084	10434.04	1086	10457.93	1088	10465.26	1090	10473.54
X1	19.498	36	8382.49	10628.72			455			
GR	1088	8382.49	1086	8446.53	1086	8471.61	1086	8547.43	1086	8720.88
GR	1086	8777.32	1084	8879.03	1084	8903.6	1084	8949.34	1084	9060.16
GR	1084	9348.77	1084	9349.65	1084	9403.03	1084	9577.06	1084	9639.24
GR	1084	9673.21	1084	9808.66	1084	9850.27	1084	9897.73	1084	9965.04
GR	1084	9985.07	1082	9993.55	1082	10061.23	1082	10224.64	1082	10277.01
GR	1084	10346.38	1084	10377.51	1082	10421.24	1082	10427.42	1082	10571.08
GR	1082	10571.63	1084	10582.36	1086	10596.71	1088	10611.99	1090	10620.43
GR	1092	10628.72								
ET			9.1					8936.02		10550
X1	19.590	34	8936.02	11072.81			485			
GR	1094	8936.02	1092	9105.65	1090	9205.54	1090	9337.05	1090	9419.48
GR	1090	9489.94	1090	9669.74	1088	9677.98	1086	9686.06	1084	9695.49
GR	1084	9762.93	1086	9781.1	1088	9802.28	1088	10019.09	1088	10040.55
GR	1090	10165.58	1090	10331.05	1088	10374.25	1086	10389.09	1086	10391.91
GR	1086	10411.07	1086	10414.64	1088	10432.32	1090	10500.3	1090	10609.25
GR	1090	10644.95	1090	10714.92	1090	10822.67	1090	10922.1	1088	10972.76
GR	1088	11017.15	1090	11039.45	1092	11059.88	1094	11072.81		
NC			0.046							
X1	19.671	44	9237.75	10848.11			430			
GR	1100	9236.89	1100	9237.75	1098	9303.51	1096	9331.81	1096	9359.48
GR	1096	9412.3	1094	9428.55	1092	9436.77	1092	9455.45	1094	9461.67
GR	1096	9468.7	1096	9473.62	1094	9609.86	1094	9626.76	1096	9658.37
GR	1096	9740.96	1096	9793.8	1096	9899.67	1094	10047.82	1092	10064.02
GR	1092	10086.37	1094	10103.37	1096	10255.74	1096	10318.16	1094	10333.52
GR	1094	10340.03	1096	10388.82	1096	10477.63	1094	10486.54	1092	10495.46
GR	1092	10499.27	1094	10509.72	1096	10518.83	1096	10543.31	1094	10549.35
GR	1094	10557.33	1096	10565.6	1096	10583.4	1096	10597.53	1098	10656.65
GR	1098	10730.72	1096	10801.54	1096	10809.39	1098	10848.11		
X1	19.753	22	9493.51	10702.87			435			
GR	1104	9493.51	1102	9498.3	1100	9560.85	1100	9561.69	1100	9626.97
GR	1100	9654.31	1100	9876.62	1100	9877.29	1100	10004.07	1100	10005.8
GR	1102	10023.8	1102	10077.58	1100	10117.64	1100	10122.95	1102	10181.62
GR	1102	10312.42	1102	10325.84	1102	10432.74	1100	10445.08	1100	10447.18
GR	1102	10473.1	1104	10702.87						

ET	NC			0.044	9.1			9682.95	10270	
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X1	19.844	23	9682.95	10654.93			490			
GR	1120	9682.95	1118	9701.12	1116	9710.69	1114	9722.12	1112	9733.54
GR	1110	9744.97	1108	9756.39	1108	9773.55	1108	9955.25	1106	9970.3
GR	1106	9986.47	1108	10047.63	1110	10269.22	1110	10302.67	1110	10347.67
GR	1110	10374.76	1108	10390.38	1108	10395.22	1110	10430	1112	10470.03
GR	1114	10599.22	1114	10630.28	1114	10654.93				
NC			0.041							
X1	19.898	6	9752	10395			285			
GR	1118	9752	1110	9790	1110	10230	1114	10245	1116	10305
GR	1118	10395								
NC			0.034							
X1	19.959	11	9795.04	10233.44			325			
GR	1118	9787.28	1118	9795.04	1116	9799.25	1114	9803.46	1112	9807.68
GR	1110	9893.97	1110	10188.75	1112	10195.21	1114	10222.5	1116	10227.96
GR	1118	10233.44								
X1	19.976	18	9810.6	10230.52			90			
GR	1124	9810.6	1122	9812.56	1120	9814.51	1118	9816.47	1116	9818.43
GR	1114	9820.39	1112	9822.35	1112	9828.26	1112	9868.73	1110	9999.79
GR	1110	10103.4	1112	10185.09	1114	10188.58	1116	10191.56	1118	10194.54
GR	1120	10197.52	1122	10214.95	1124	10230.52				
X1	19.995	20	9807.78	10192.84			100			
GR	1132	9807.78	1130	9810.01	1128	9812.23	1126	9814.46	1124	9816.68
GR	1122	9818.91	1120	9821.14	1118	9823.36	1116	9825.59	1114	9827.81
GR	1114	10170.89	1116	10173.85	1118	10176.81	1118	10176.81	1120	10179.48
GR	1122	10182.15	1124	10184.83	1126	10187.5	1128	10190.17	1130	10192.84
X1	20.005	14	9806.96	10183.23			50			
GR	1128	9806.96	1126	9809.62	1124	9812.15	1122	9814.67	1120	9817.2
GR	1118	9819.72	1116	9822.25	1114	9824.77	1114	10170.3	1116	10173
GR	1118	10175.6	1120	10178.14	1122	10180.69	1124	10183.23		
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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3			-1					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		4			-1					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3		-1							

THIS RUN EXECUTED 27JUL96 10:34:38

\*\*\*\*\*  
 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

BUCKEYE STRUCTURE 2  
 SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRISWS	QLOB	VLOB	K*XL	QCH	VCH	K*VNCH	QROB	VROB	K*VN
*	18.091	4863.42	1045.35	1045.35	.00	.00	.00	4863.42	5.82	16.00	.00	.00	.0
*	18.091	4364.65	1045.27	1045.27	.00	.00	.00	4364.65	5.65	16.00	.00	.00	.0
*	18.091	3500.55	1045.11	1045.11	.00	.00	.00	3500.55	5.36	16.00	.00	.00	.0
*	18.115	4863.42	1046.03	.00	.00	.00	.00	4863.42	2.67	16.00	.00	.00	.0
*	18.115	4364.65	1045.92	.00	.00	.00	.00	4364.65	2.61	16.00	.00	.00	.0
*	18.115	3500.55	1045.72	.00	.00	.00	.00	3500.55	2.46	16.00	.00	.00	.0

*	18.348	4863.42	1047.64	1046.83	.00	.00	.00	4863.42	5.39	55.15	.00	.00	.0
*	18.348	4364.65	1047.52	1046.69	.00	.00	.00	4364.65	5.08	55.16	.00	.00	.0
*	18.348	3500.55	1047.32	1046.42	.00	.00	.00	3500.55	4.45	55.19	.00	.00	.0
*	18.432	4863.42	1051.59	.00	.00	.00	.00	4863.42	3.78	55.30	.00	.00	.0
	18.432	4364.65	1051.40	.00	.00	.00	.00	4364.65	3.68	55.32	.00	.00	.0
	18.432	3500.55	1051.04	.00	.00	.00	.00	3500.55	3.50	55.37	.00	.00	.0
	18.516	4863.42	1054.99	.00	.00	.00	.00	4863.42	5.22	54.45	.00	.00	.0
	18.516	4364.65	1054.81	.00	.00	.00	.00	4364.65	5.01	54.44	.00	.00	.0
	18.516	3500.55	1054.49	.00	.00	.00	.00	3500.55	4.61	54.41	.00	.00	.0
	18.624	4863.42	1060.37	.00	.00	.00	.00	4863.42	4.30	53.57	.00	.00	.0
	18.624	4364.65	1060.16	.00	.00	.00	.00	4364.65	4.22	54.14	.00	.00	.0
	18.624	3500.55	1059.74	.00	.00	.00	.00	3500.55	4.13	54.61	.00	.00	.0
	18.755	4863.42	1065.12	.00	.00	.00	.00	4863.42	4.34	53.56	.00	.00	.0
	18.755	4364.65	1064.92	.00	.00	.00	.00	4364.65	4.18	53.65	.00	.00	.0
	18.755	3500.55	1064.51	.00	.00	.00	.00	3500.55	3.90	53.86	.00	.00	.0
	18.871	4863.42	1068.35	.00	.00	.00	.00	4863.42	3.65	53.09	.00	.00	.0
	18.871	4364.65	1068.11	.00	.00	.00	.00	4364.65	3.56	54.37	.00	.00	.0
	18.871	3500.55	1067.65	.00	.00	.00	.00	3500.55	3.40	55.09	.00	.00	.0

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	SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XML	QCH	VCH	K*XMLCH	QROB	VROB	K*XMLN
	18.984	5493.96	1071.01	.00	.00	.00	.00	5493.96	3.97	52.26	.00	.00	.0
	18.984	4653.82	1070.73	.00	.00	.00	.00	4653.82	3.70	52.39	.00	.00	.0
	18.984	3525.04	1070.27	.00	.00	.00	.00	3525.04	3.35	52.46	.00	.00	.0
*	19.061	7524.83	1072.28	.00	.00	.00	.00	7524.83	3.22	48.88	.00	.00	.0
*	19.061	6012.91	1071.91	.00	.00	.00	.00	6012.91	2.88	49.12	.00	.00	.0
*	19.061	4013.50	1071.30	.00	.00	.00	.00	4013.50	2.35	49.48	.00	.00	.0
	19.151	10322.71	1073.35	.00	.00	.00	.00	10322.71	3.37	51.99	.00	.00	.0
	19.151	7679.83	1072.81	.00	.00	.00	.00	7679.83	2.89	52.31	.00	.00	.0
	19.151	4400.00	1071.96	.00	.00	.00	.00	4400.00	2.12	53.74	.00	.00	.0
*	19.235	12634.11	1074.03	.00	.00	.00	.00	12634.11	2.95	50.34	.00	.00	.0
*	19.235	8681.33	1073.34	.00	.00	.00	.00	8681.33	2.31	50.48	.00	.00	.0
*	19.235	4400.00	1072.30	.00	.00	.00	.00	4400.00	1.48	52.78	.00	.00	.0
*	19.295	13200.00	1074.59	.00	.00	.00	.00	13200.00	4.88	55.11	.00	.00	.0
*	19.295	8800.00	1073.69	.00	.00	.00	.00	8800.00	5.18	54.90	.00	.00	.0
*	19.295	4400.00	1072.50	.00	.00	.00	.00	4400.00	4.25	55.20	.00	.00	.0
	19.355	13200.00	1076.73	.00	.00	.00	.00	13200.00	4.39	55.55	.00	.00	.0
	19.355	8800.00	1076.04	.00	.00	.00	.00	8800.00	3.71	55.65	.00	.00	.0
	19.355	4400.00	1075.03	.00	.00	.00	.00	4400.00	2.93	55.81	.00	.00	.0
*	19.412	13200.00	1079.16	.00	.00	.00	.00	13200.00	5.50	48.00	.00	.00	.0
*	19.412	8800.00	1078.60	.00	.00	.00	.00	8800.00	5.21	48.00	.00	.00	.0
*	19.412	4400.00	1077.94	.00	.00	.00	.00	4400.00	4.91	48.00	.00	.00	.0
	19.498	13200.00	1085.08	.00	.00	.00	.00	13200.00	4.59	48.00	.00	.00	.0
*	19.498	8800.00	1084.79	.00	.00	.00	.00	8800.00	3.71	48.00	.00	.00	.0
*	19.498	4400.00	1084.36	.00	.00	.00	.00	4400.00	2.72	48.00	.00	.00	.0
	19.590	13200.00	1090.67	1090.21	.00	.00	.00	13200.00	4.48	48.00	.00	.00	.0
	19.590	8800.00	1089.82	1089.20	.00	.00	.00	8800.00	5.58	48.00	.00	.00	.0
	19.590	4400.00	1088.95	.00	.00	.00	.00	4400.00	4.78	48.00	.00	.00	.0
	19.671	13200.00	1096.84	.00	.00	.00	.00	13200.00	6.17	46.00	.00	.00	.0
	19.671	8800.00	1096.48	.00	.00	.00	.00	8800.00	5.30	46.00	.00	.00	.0
	19.671	4400.00	1095.63	.00	.00	.00	.00	4400.00	5.63	46.00	.00	.00	.0
	19.753	13200.00	1103.19	.00	.00	.00	.00	13200.00	5.56	46.00	.00	.00	.0
	19.753	8800.00	1102.70	.00	.00	.00	.00	8800.00	4.78	46.00	.00	.00	.0
*	19.753	4400.00	1101.88	.00	.00	.00	.00	4400.00	4.23	46.00	.00	.00	.0
*	19.844	13200.00	1110.81	1110.81	.00	.00	.00	13200.00	8.54	44.00	.00	.00	.0
*	19.844	8800.00	1110.26	1110.26	.00	.00	.00	8800.00	7.59	44.00	.00	.00	.0
*	19.844	4400.00	1109.42	1109.42	.00	.00	.00	4400.00	6.88	44.00	.00	.00	.0
*	19.898	13200.00	1114.16	.00	.00	.00	.00	13200.00	6.94	41.00	.00	.00	.0
*	19.898	8800.00	1113.41	.00	.00	.00	.00	8800.00	5.67	41.00	.00	.00	.0
*	19.898	4400.00	1112.38	.00	.00	.00	.00	4400.00	4.11	41.00	.00	.00	.0

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	SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XML	QCH	VCH	K*XMLCH	QROB	VROB	K*XMLN
*	19.959	13200.00	1115.48	.00	.00	.00	.00	13200.00	6.24	34.00	.00	.00	.0
*	19.959	8800.00	1114.53	.00	.00	.00	.00	8800.00	5.14	34.00	.00	.00	.0
*	19.959	4400.00	1113.27	.00	.00	.00	.00	4400.00	3.71	34.00	.00	.00	.0
	19.976	13200.00	1115.55	.00	.00	.00	.00	13200.00	7.66	34.00	.00	.00	.0
	19.976	8800.00	1114.62	.00	.00	.00	.00	8800.00	6.37	34.00	.00	.00	.0
	19.976	4400.00	1113.39	.00	.00	.00	.00	4400.00	4.75	34.00	.00	.00	.0
*	19.995	13200.00	1117.55	1117.55	.00	.00	.00	13200.00	10.68	34.00	.00	.00	.0
*	19.995	8800.00	1116.72	1116.72	.00	.00	.00	8800.00	9.32	34.00	.00	.00	.0
*	19.995	4400.00	1115.72	1115.72	.00	.00	.00	4400.00	7.42	34.00	.00	.00	.0

*	20.005	13200.00	1118.77	.00	.00	.00	.00	13200.00	7.87	34.00	.00	.00	.0
*	20.005	8800.00	1117.78	.00	.00	.00	.00	8800.00	6.65	34.00	.00	.00	.0
*	20.005	4400.00	1116.57	.00	.00	.00	.00	4400.00	4.92	34.00	.00	.00	.0

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BUCKEYE STRUCTURE 2  
SUMMARY PRINTOUT

	SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
*	18.091	4863.42	1045.35	836.22	1044.00	1.35	.00	.00	9519.60	10327.80	.00	808.20	.0
*	18.091	4364.65	1045.27	772.40	1044.00	1.27	.00	.00	9536.81	10322.59	.00	785.78	.0
*	18.091	3500.55	1045.11	652.68	1044.00	1.11	.00	.00	9570.51	10312.40	.00	741.89	.0
*	18.115	4863.42	1046.03	1821.61	1044.00	2.03	125.00	.00	9405.68	10748.10	.00	1342.42	3.0
*	18.115	4364.65	1045.92	1672.53	1044.00	1.92	125.00	.00	9423.57	10690.64	.00	1267.07	2.9
*	18.115	3500.55	1045.72	1424.68	1044.00	1.72	125.00	.00	9457.96	10641.59	.00	1183.63	2.7
*	18.348	4863.42	1047.64	901.56	1044.00	3.64	1230.00	.00	9973.79	10342.83	.00	369.03	27.2
*	18.348	4364.65	1047.52	858.73	1044.00	3.52	1230.00	.00	9974.31	10337.82	.00	363.50	25.9
*	18.348	3500.55	1047.32	786.51	1044.00	3.32	1230.00	.00	9975.21	10329.19	.00	353.98	24.4
*	18.432	4863.42	1051.59	1286.19	1048.00	3.59	445.00	.00	9968.66	10495.91	.00	527.25	31.8
	18.432	4364.65	1051.40	1186.76	1048.00	3.40	445.00	.00	9969.52	10491.90	.00	522.38	30.4
	18.432	3500.55	1051.04	1000.50	1048.00	3.04	445.00	.00	9971.15	10484.28	.00	513.13	28.9
	18.516	4863.42	1054.99	931.48	1050.00	4.99	445.00	.00	9963.53	10339.33	.00	375.79	36.4
	18.516	4364.65	1054.81	871.11	1050.00	4.81	445.00	.00	9964.69	10333.22	.00	358.52	34.9
	18.516	3500.55	1054.49	758.85	1050.00	4.49	445.00	.00	9967.02	10290.99	.00	323.97	33.1
	18.624	4863.42	1060.37	1132.17	1056.00	4.37	575.00	.00	9949.49	10432.46	.00	482.98	42.1
	18.624	4364.65	1060.16	1033.43	1056.00	4.16	575.00	.00	9959.32	10420.24	.00	460.92	40.4
	18.624	3500.55	1059.74	848.09	1056.00	3.74	575.00	.00	9968.97	10382.62	.00	413.65	38.0
	18.755	4863.42	1065.12	1120.90	1060.00	5.12	690.00	.00	9948.42	10348.16	.00	399.74	49.1
	18.755	4364.65	1064.92	1043.27	1060.00	4.92	690.00	.00	9952.71	10332.77	.00	380.06	47.0
	18.755	3500.55	1064.51	897.52	1060.00	4.51	690.00	.00	9961.42	10301.49	.00	340.07	44.0
	18.871	4863.42	1068.35	1333.67	1064.00	4.35	610.00	.00	9933.30	10411.42	.00	478.12	55.2
	18.871	4364.65	1068.11	1225.02	1064.00	4.11	610.00	.00	9953.92	10399.65	.00	445.73	52.8
	18.871	3500.55	1067.65	1030.78	1064.00	3.65	610.00	.00	9965.65	10377.28	.00	411.63	49.2
	18.984	5493.96	1071.01	1385.60	1066.00	5.01	595.00	.00	9916.05	10392.07	.00	476.02	61.7
	18.984	4653.82	1070.73	1256.79	1066.00	4.73	595.00	.00	9916.05	10372.19	.00	456.14	59.0
	18.984	3525.04	1070.27	1053.82	1066.00	4.27	595.00	.00	9916.05	10338.96	.00	422.91	54.9
*	19.061	7524.83	1072.28	2338.71	1064.00	8.28	405.00	.00	9920.00	10605.69	.00	685.69	67.1
*	19.061	6012.91	1071.91	2085.61	1064.00	7.91	405.00	.00	9920.00	10572.77	.00	652.77	64.1
*	19.061	4013.50	1071.30	1705.53	1064.00	7.30	405.00	.00	9920.00	10522.21	.00	602.21	59.7
	19.151	10322.71	1073.35	3062.91	1066.00	7.35	475.00	.00	9910.00	10707.41	.00	797.41	75.2
	19.151	7679.83	1072.81	2656.51	1066.00	6.81	475.00	.00	9910.00	10644.70	.00	734.70	71.7
	19.151	4400.00	1071.96	2075.81	1066.00	5.96	475.00	.00	9910.67	10545.25	.00	634.58	66.4
*	19.235	12634.11	1074.03	4286.98	1066.00	8.03	445.00	.00	9900.00	10688.33	.00	788.33	83.3
*	19.235	8681.33	1073.34	3751.99	1066.00	7.34	445.00	.00	9900.00	10669.80	.00	769.80	79.4
*	19.235	4400.00	1072.30	2965.01	1066.00	6.30	445.00	.00	9917.08	10641.40	.00	724.32	73.4

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	SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
*	19.295	13200.00	1074.59	2704.38	1070.00	4.59	320.00	.00	9758.70	10641.78	.00	883.07	89.4
*	19.295	8800.00	1073.69	1697.66	1070.00	3.69	320.00	9690.00	9766.78	10343.06	10350.00	576.28	84.3
*	19.295	4400.00	1072.50	1036.27	1070.00	2.50	320.00	9690.00	9777.45	10316.37	10350.00	538.92	78.0
	19.355	13200.00	1076.73	3006.06	1072.00	4.73	320.00	9235.00	9368.14	10305.32	10320.00	937.18	96.1
	19.355	8800.00	1076.04	2371.83	1072.00	4.04	320.00	9235.00	9373.68	10267.21	10320.00	893.53	89.7
	19.355	4400.00	1075.03	1503.38	1072.00	3.03	320.00	9235.00	9381.71	10219.24	10320.00	837.53	83.1
*	19.412	13200.00	1079.16	2398.78	1076.00	3.16	300.00	.00	8966.02	10282.80	.00	1300.39	103.8
*	19.412	8800.00	1078.60	1687.73	1076.00	2.60	300.00	.00	8983.62	10253.76	.00	1250.47	97.1
*	19.412	4400.00	1077.94	895.84	1076.00	1.94	300.00	.00	9161.36	10169.53	.00	896.02	89.0
	19.498	13200.00	1085.08	2872.73	1082.00	3.08	455.00	.00	8824.13	10590.11	.00	1765.98	119.8
*	19.498	8800.00	1084.79	2372.79	1082.00	2.79	455.00	.00	8838.59	10588.07	.00	1749.47	112.8
*	19.498	4400.00	1084.36	1619.26	1082.00	2.36	455.00	.00	8860.66	10584.95	.00	1724.30	102.7
	19.590	13200.00	1090.67	2946.98	1084.00	6.67	485.00	.00	9172.29	11046.25	.00	1873.96	140.1
	19.590	8800.00	1089.82	1576.26	1084.00	5.82	485.00	.00	9670.47	11037.47	.00	754.21	126.7
	19.590	4400.00	1088.95	921.35	1084.00	4.95	485.00	8936.02	9674.06	10464.68	10550.00	537.02	115.3
	19.671	13200.00	1096.84	2141.10	1092.00	4.84	430.00	.00	9319.87	10825.73	.00	1356.68	156.1
	19.671	8800.00	1096.48	1658.93	1092.00	4.48	430.00	.00	9324.96	10818.76	.00	1321.21	136.9
	19.671	4400.00	1095.63	781.13	1092.00	3.63	430.00	.00	9415.30	10564.07	.00	622.71	121.0
	19.753	13200.00	1103.19	2374.77	1100.00	3.19	435.00	.00	9495.43	10610.79	.00	1115.36	168.4
	19.753	8800.00	1102.70	1840.79	1100.00	2.70	435.00	.00	9496.61	10554.33	.00	1057.72	148.8
*	19.753	4400.00	1101.88	1039.37	1100.00	1.88	435.00	.00	9502.21	10471.48	.00	656.30	127.4
*	19.844	13200.00	1110.81	1544.98	1106.00	4.81	490.00	.00	9740.36	10446.14	.00	705.78	178.6
*	19.844	8800.00	1110.26	1159.64	1106.00	4.26	490.00	.00	9743.51	10435.10	.00	691.59	158.7

*	19.844	4400.00	1109.42	639.48	1106.00	3.42	490.00	9682.95	9748.28	10204.94	10270.00	456.65	133.7
*	19.898	13200.00	1114.16	1901.20	1110.00	4.16	285.00	.00	9770.27	10249.61	.00	479.34	182.5
*	19.898	8800.00	1113.41	1551.84	1110.00	3.41	285.00	.00	9773.78	10242.80	.00	469.02	162.5
*	19.898	4400.00	1112.38	1070.88	1110.00	2.38	285.00	.00	9778.70	10238.92	.00	460.22	136.7
*	19.959	13200.00	1115.48	2115.70	1110.00	5.48	325.00	.00	9800.34	10226.55	.00	426.21	185.9
*	19.959	8800.00	1114.53	1710.63	1110.00	4.53	325.00	.00	9802.35	10223.94	.00	421.59	165.8
*	19.959	4400.00	1113.27	1185.79	1110.00	3.27	325.00	.00	9805.01	10212.49	.00	407.49	139.9
	19.976	13200.00	1115.55	1722.81	1110.00	5.55	90.00	.00	9818.88	10190.88	.00	372.01	186.7
	19.976	8800.00	1114.62	1381.10	1110.00	4.62	90.00	.00	9819.78	10189.51	.00	369.73	166.6
	19.976	4400.00	1113.39	925.38	1110.00	3.39	90.00	.00	9820.99	10187.51	.00	366.52	140.7
*	19.995	13200.00	1117.55	1235.44	1114.00	3.55	100.00	.00	9823.86	10176.15	.00	352.29	187.6
*	19.995	8800.00	1116.72	944.50	1114.00	2.72	100.00	.00	9824.78	10174.92	.00	350.14	167.4
*	19.995	4400.00	1115.72	592.90	1114.00	1.72	100.00	.00	9825.90	10173.43	.00	347.53	141.5
*	20.005	13200.00	1118.77	1677.48	1114.00	4.77	50.00	.00	9818.75	10176.58	.00	357.83	188.0
*	20.005	8800.00	1117.78	1323.21	1114.00	3.78	50.00	.00	9820.00	10175.31	.00	355.31	167.8
*	20.005	4400.00	1116.57	894.41	1114.00	2.57	50.00	.00	9821.54	10173.73	.00	352.20	141.9

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BUCKEYE STRUCTURE 2  
SUMMARY PRINTOUT

	SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
*	18.091	4863.42	1045.35	1.01	.00	1045.88	.00	.00	9070.00	1048.50	1050.00	10650.00	.0
*	18.091	4364.65	1045.27	1.00	-.08	1045.77	-.11	.00	9070.00	1048.50	1050.00	10650.00	.0
*	18.091	3500.55	1045.11	1.01	-.16	1045.56	-.32	.00	9070.00	1048.50	1050.00	10650.00	.0
*	18.115	4863.42	1046.03	.40	.00	1046.14	.00	.00	9165.00	1048.00	1046.50	11250.00	.0
*	18.115	4364.65	1045.92	.40	-.11	1046.03	-.12	.00	9165.00	1048.00	1046.50	11250.00	.0
*	18.115	3500.55	1045.72	.39	-.20	1045.81	-.33	.00	9165.00	1048.00	1046.50	11250.00	.0
*	18.348	4863.42	1047.64	.61	.00	1048.09	.00	.00	9916.54	1050.00	1052.00	10460.04	.0
*	18.348	4364.65	1047.52	.58	-.12	1047.92	-.17	.00	9916.54	1050.00	1052.00	10460.04	.0
*	18.348	3500.55	1047.32	.53	-.20	1047.62	-.46	.00	9916.54	1050.00	1052.00	10460.04	.0
*	18.432	4863.42	1051.59	.43	.00	1051.81	.00	.00	9920.00	1053.50	1056.00	10714.06	.0
	18.432	4364.65	1051.40	.43	-.19	1051.61	-.20	.00	9920.00	1053.50	1056.00	10714.06	.0
	18.432	3500.55	1051.04	.44	-.37	1051.23	-.59	.00	9920.00	1053.50	1056.00	10714.06	.0
	18.516	4863.42	1054.99	.58	.00	1055.41	.00	.00	9910.00	1057.00	1058.00	10561.05	.0
	18.516	4364.65	1054.81	.57	-.18	1055.20	-.21	.00	9910.00	1057.00	1058.00	10561.05	.0
	18.516	3500.55	1054.49	.53	-.32	1054.82	-.59	.00	9910.00	1057.00	1058.00	10561.05	.0
	18.624	4863.42	1060.37	.49	.00	1060.66	.00	.00	9920.00	1061.00	1064.00	10674.19	.0
	18.624	4364.65	1060.16	.50	-.21	1060.44	-.22	.00	9920.00	1061.00	1064.00	10674.19	.0
	18.624	3500.55	1059.74	.51	-.42	1060.00	-.65	.00	9920.00	1061.00	1064.00	10674.19	.0
	18.755	4863.42	1065.12	.46	.00	1065.41	.00	.00	9917.97	1066.00	1068.00	10571.62	.0
	18.755	4364.65	1064.92	.44	-.20	1065.19	-.22	.00	9917.97	1066.00	1068.00	10571.62	.0
	18.755	3500.55	1064.51	.42	-.41	1064.75	-.67	.00	9917.97	1066.00	1068.00	10571.62	.0
	18.871	4863.42	1068.35	.38	.00	1068.55	.00	.00	9920.00	1068.50	1072.00	10679.25	.0
	18.871	4364.65	1068.11	.38	-.24	1068.31	-.24	.00	9920.00	1068.50	1072.00	10679.25	.0
	18.871	3500.55	1067.65	.38	-.46	1067.83	-.72	.00	9920.00	1068.50	1072.00	10679.25	.0
	18.984	5493.96	1071.01	.41	.00	1071.25	.00	.00	9916.05	1070.00	1074.00	10701.74	.0
	18.984	4653.82	1070.73	.39	-.28	1070.95	-.31	.00	9916.05	1070.00	1074.00	10701.74	.0
	18.984	3525.04	1070.27	.37	-.46	1070.44	-.81	.00	9916.05	1070.00	1074.00	10701.74	.0
*	19.061	7524.83	1072.28	.31	.00	1072.44	.00	.00	9920.00	1070.50	1074.00	10757.16	.0
*	19.061	6012.91	1071.91	.28	-.38	1072.03	-.41	.00	9920.00	1070.50	1074.00	10757.16	.0
*	19.061	4013.50	1071.30	.25	-.61	1071.38	-1.06	.00	9920.00	1070.50	1074.00	10757.16	.0
	19.151	10322.71	1073.35	.30	.00	1073.52	.00	.00	9910.00	1072.00	1074.00	10785.70	.0
	19.151	7679.83	1072.81	.27	-.54	1072.94	-.59	.00	9910.00	1072.00	1074.00	10785.70	.0
	19.151	4400.00	1071.96	.21	-.85	1072.03	-1.49	.00	9910.00	1072.00	1074.00	10785.70	.0
*	19.235	12634.11	1074.03	.22	.00	1074.17	.00	.00	9900.00	1072.50	1076.00	10730.75	.0
*	19.235	8681.33	1073.34	.18	-.69	1073.43	-.74	.00	9900.00	1072.50	1076.00	10730.75	.0
*	19.235	4400.00	1072.30	.13	-1.05	1072.33	-1.84	.00	9900.00	1072.50	1076.00	10730.75	.0

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	SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
*	19.295	13200.00	1074.59	.49	.00	1074.96	.00	.00	9690.00	1076.00	1078.00	10700.00	.0
*	19.295	8800.00	1073.69	.53	-.90	1074.11	-.85	9690.00	9690.00	1126.00	100000.00	10700.00	10350.0
*	19.295	4400.00	1072.50	.54	-1.19	1072.78	-2.18	9690.00	9690.00	1126.00	100000.00	10700.00	10350.0
	19.355	13200.00	1076.73	.43	.00	1077.03	.00	9235.00	9235.00	1133.00	100000.00	10520.00	10320.0
	19.355	8800.00	1076.04	.40	-.69	1076.25	-.78	9235.00	9235.00	1133.00	100000.00	10520.00	10320.0
	19.355	4400.00	1075.03	.38	-1.01	1075.17	-1.87	9235.00	9235.00	1133.00	100000.00	10520.00	10320.0
*	19.412	13200.00	1079.16	.72	.00	1079.63	.00	.00	8863.08	1088.00	1090.00	10473.54	.0
*	19.412	8800.00	1078.60	.80	-.56	1079.03	-.60	.00	8863.08	1088.00	1090.00	10473.54	.0
*	19.412	4400.00	1077.94	.92	-.66	1078.32	-1.31	.00	8863.08	1088.00	1090.00	10473.54	.0
	19.498	13200.00	1085.08	.63	.00	1085.40	.00	.00	8382.49	1088.00	1092.00	10628.72	.0

*	19.498	8800.00	1084.79	.56	-.28	1085.01	-.40	.00	8382.49	1088.00	1092.00	10628.72	.0
*	19.498	4400.00	1084.36	.49	-.43	1084.48	-.93	.00	8382.49	1088.00	1092.00	10628.72	.0
	19.590	13200.00	1090.67	.63	.00	1090.98	.00	.00	8936.02	1094.00	1094.00	11072.81	.0
	19.590	8800.00	1089.82	.92	-.84	1090.31	-.67	.00	8936.02	1094.00	1094.00	11072.81	.0
	19.590	4400.00	1088.95	.78	-.87	1089.30	-1.67	8936.02	8936.02	1144.00	100000.00	11072.81	10550.0
	19.671	13200.00	1096.84	.91	.00	1097.43	.00	.00	9237.75	1100.00	1098.00	10848.11	.0
	19.671	8800.00	1096.48	.89	-.36	1096.92	-.51	.00	9237.75	1100.00	1098.00	10848.11	.0
	19.671	4400.00	1095.63	1.20	-.85	1096.12	-1.31	.00	9237.75	1100.00	1098.00	10848.11	.0
	19.753	13200.00	1103.19	.67	.00	1103.67	.00	.00	9493.51	1104.00	1104.00	10702.87	.0
	19.753	8800.00	1102.70	.64	-.49	1103.06	-.62	.00	9493.51	1104.00	1104.00	10702.87	.0
*	19.753	4400.00	1101.88	.72	-.83	1102.15	-1.52	.00	9493.51	1104.00	1104.00	10702.87	.0
*	19.844	13200.00	1110.81	1.02	.00	1111.94	.00	.00	9682.95	1120.00	1114.00	10654.93	.0
*	19.844	8800.00	1110.26	1.03	-.55	1111.15	-.79	.00	9682.95	1120.00	1114.00	10654.93	.0
*	19.844	4400.00	1109.42	1.02	-.84	1110.15	-1.79	9682.95	9682.95	1170.00	100000.00	10654.93	10270.0
*	19.898	13200.00	1114.16	.61	.00	1114.91	.00	.00	9752.00	1118.00	1118.00	10395.00	.0
*	19.898	8800.00	1113.41	.55	-.75	1113.91	-1.00	.00	9752.00	1118.00	1118.00	10395.00	.0
*	19.898	4400.00	1112.38	.47	-1.03	1112.64	-2.27	.00	9752.00	1118.00	1118.00	10395.00	.0
*	19.959	13200.00	1115.48	.49	.00	1116.09	.00	.00	9795.04	1118.00	1118.00	10233.44	.0
*	19.959	8800.00	1114.53	.45	-.96	1114.94	-1.15	.00	9795.04	1118.00	1118.00	10233.44	.0
*	19.959	4400.00	1113.27	.38	-1.26	1113.48	-2.61	.00	9795.04	1118.00	1118.00	10233.44	.0
	19.976	13200.00	1115.55	.63	.00	1116.46	.00	.00	9810.60	1124.00	1124.00	10230.52	.0
	19.976	8800.00	1114.62	.58	-.92	1115.25	-1.20	.00	9810.60	1124.00	1124.00	10230.52	.0
	19.976	4400.00	1113.39	.53	-1.24	1113.74	-2.72	.00	9810.60	1124.00	1124.00	10230.52	.0
*	19.995	13200.00	1117.55	1.01	.00	1119.33	.00	.00	9807.78	1132.00	1130.00	10192.84	.0
*	19.995	8800.00	1116.72	1.00	-.83	1118.07	-1.25	.00	9807.78	1132.00	1130.00	10192.84	.0
*	19.995	4400.00	1115.72	1.00	-1.01	1116.57	-2.75	.00	9807.78	1132.00	1130.00	10192.84	.0
*	20.005	13200.00	1118.77	.64	.00	1119.73	.00	.00	9806.96	1128.00	1124.00	10183.23	.0
*	20.005	8800.00	1117.78	.61	-.99	1118.46	-1.27	.00	9806.96	1128.00	1124.00	10183.23	.0
*	20.005	4400.00	1116.57	.54	-1.21	1116.94	-2.79	.00	9806.96	1128.00	1124.00	10183.23	.0

1 27JUL96 10:34:20

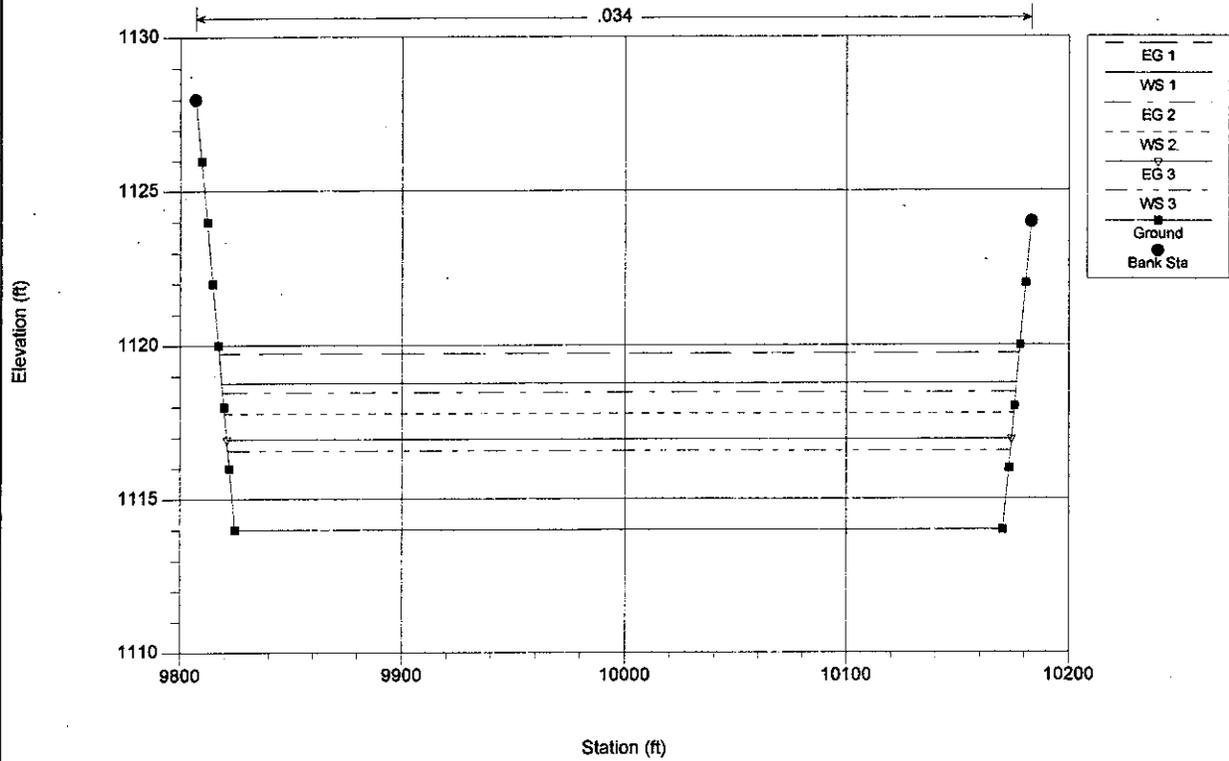
PAGE 17

SUMMARY OF ERRORS AND SPECIAL NOTES

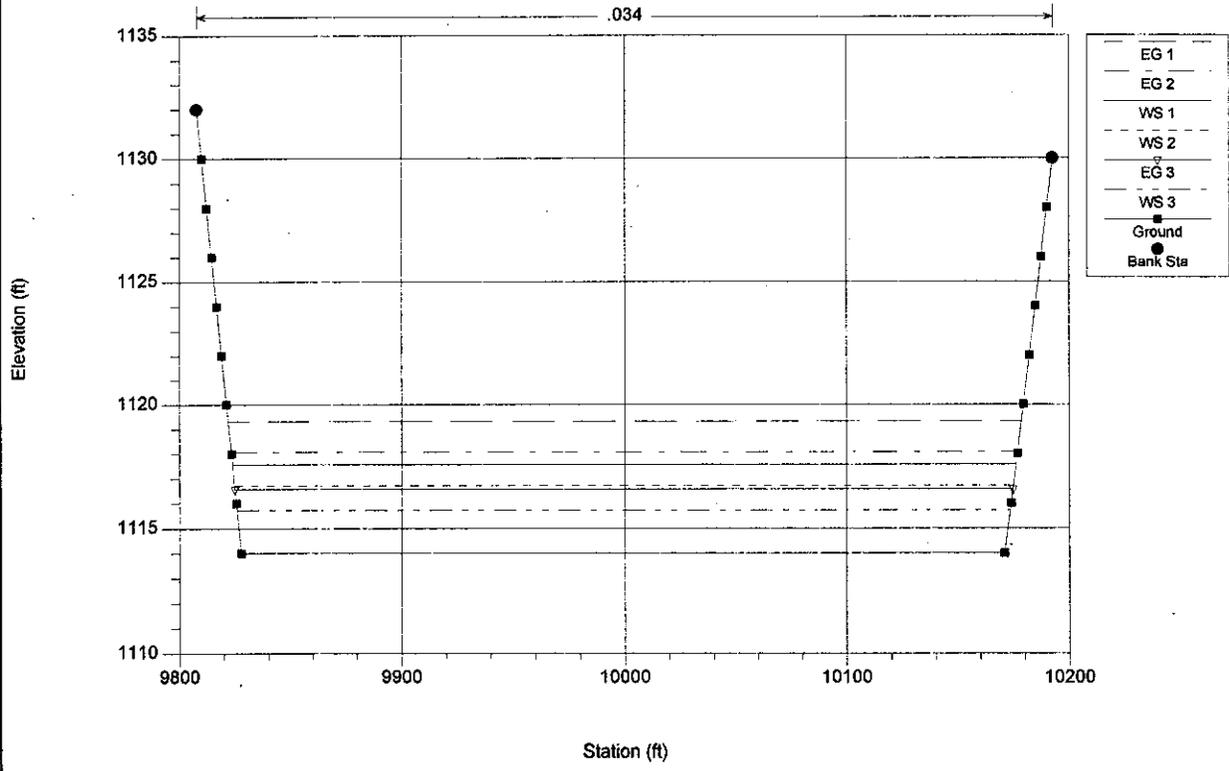
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WARNING SECNO=	19.753	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO=	19.995	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.995	PROFILE=	3	PROBABLE MINIMUM SPECIFIC ENERGY
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WARNING SECNO=	20.005	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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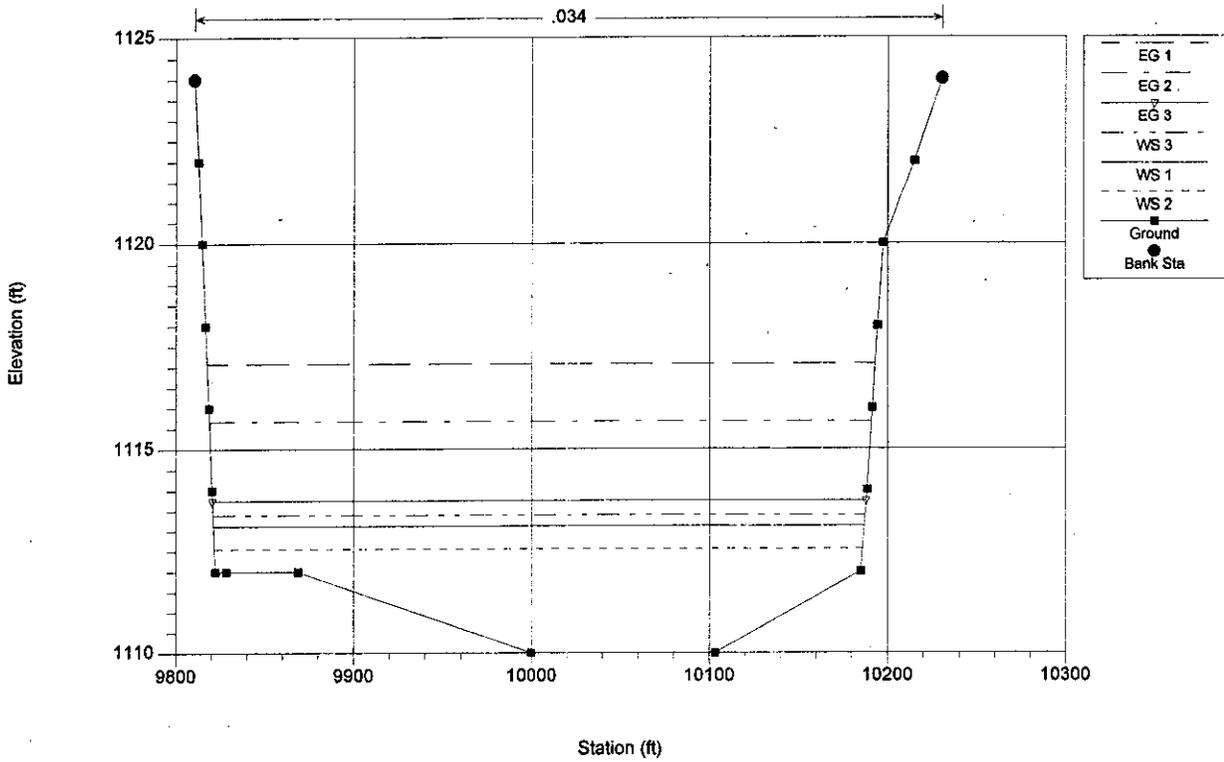
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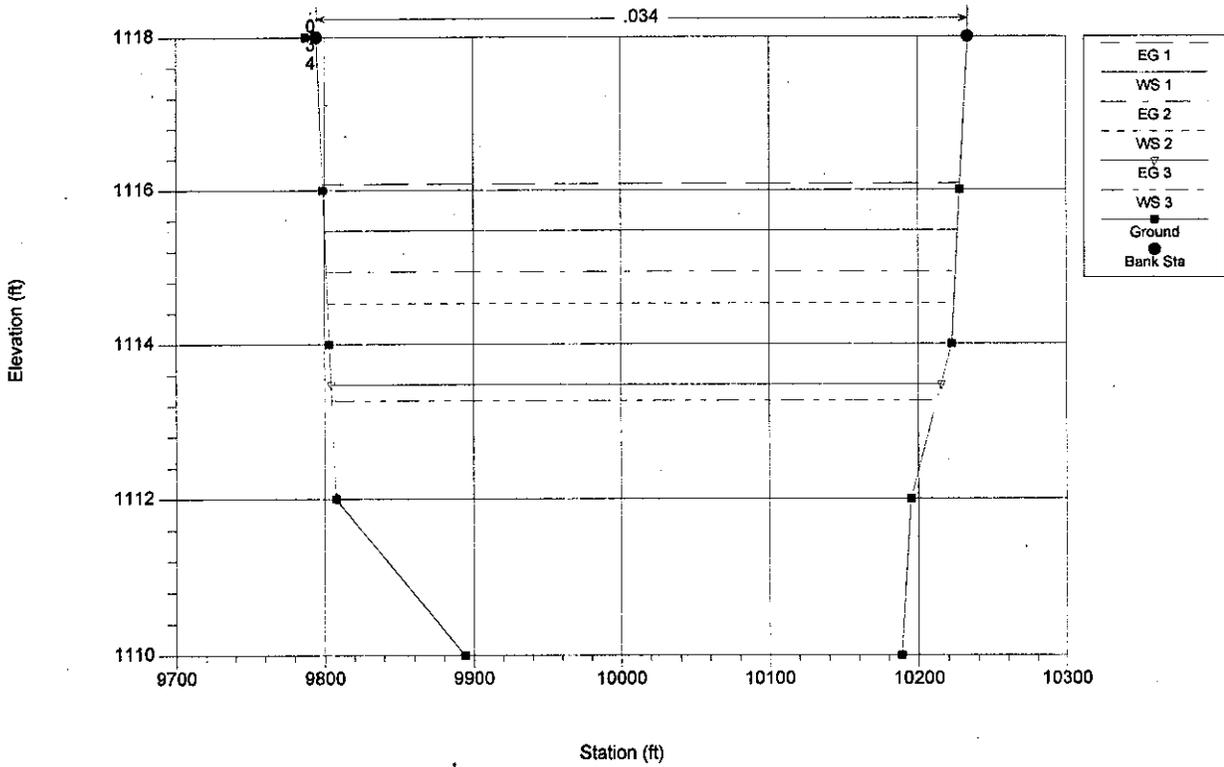
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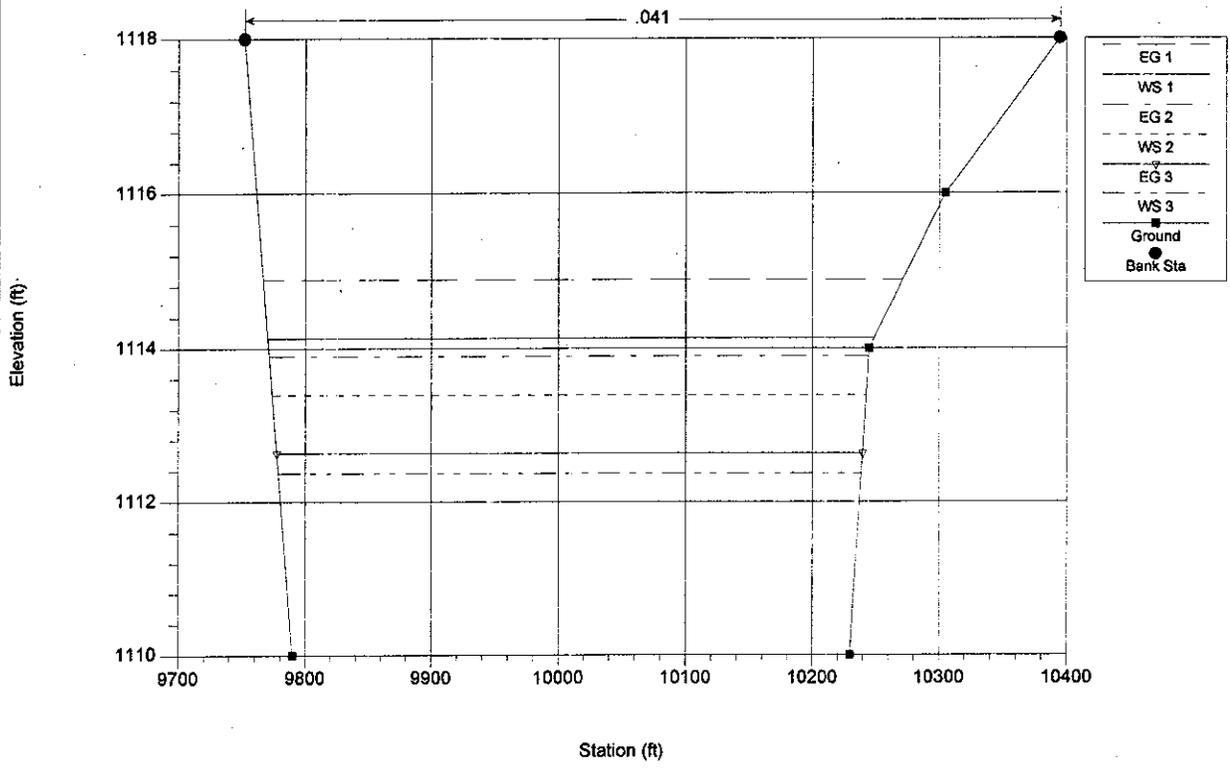
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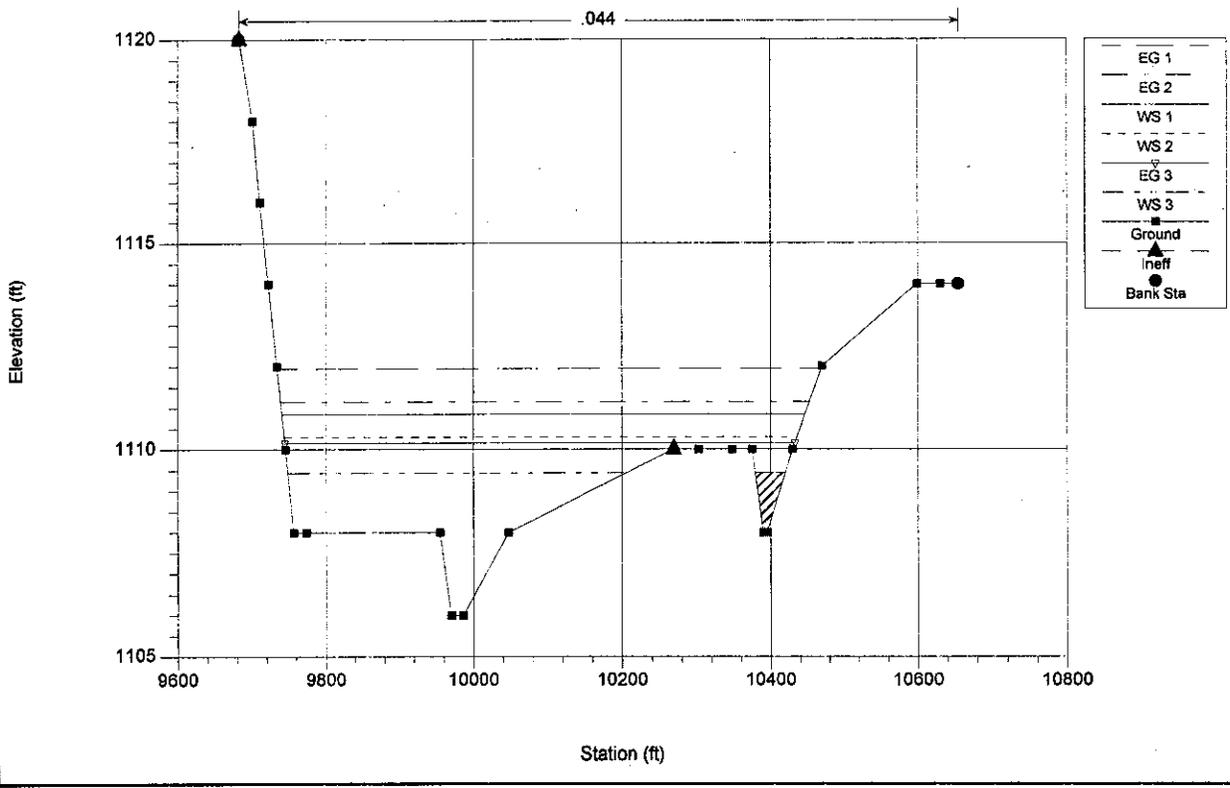
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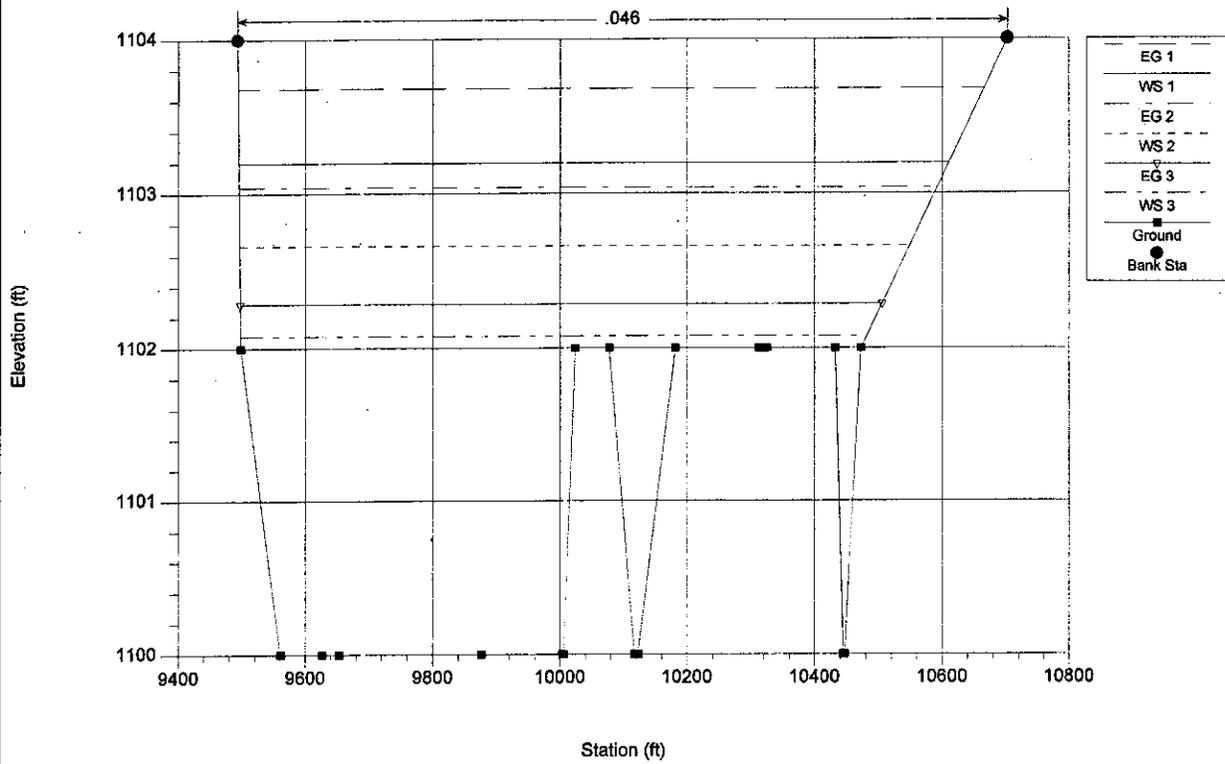
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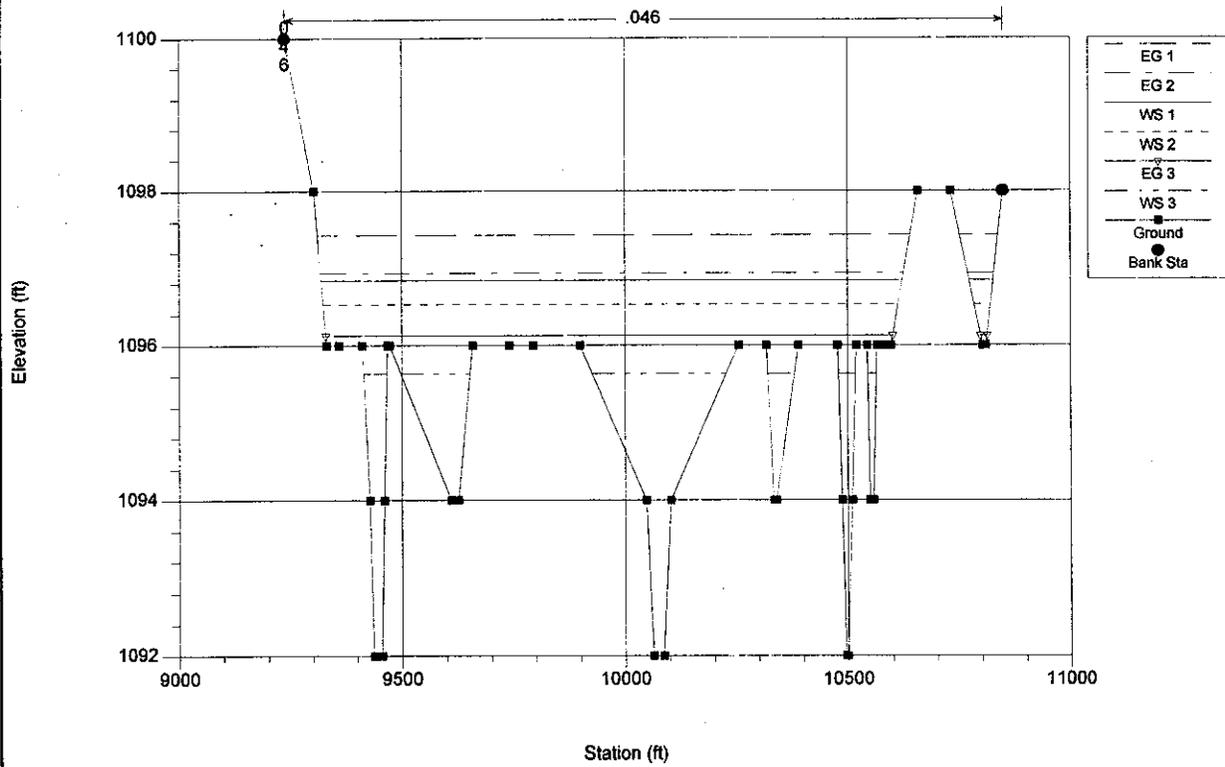
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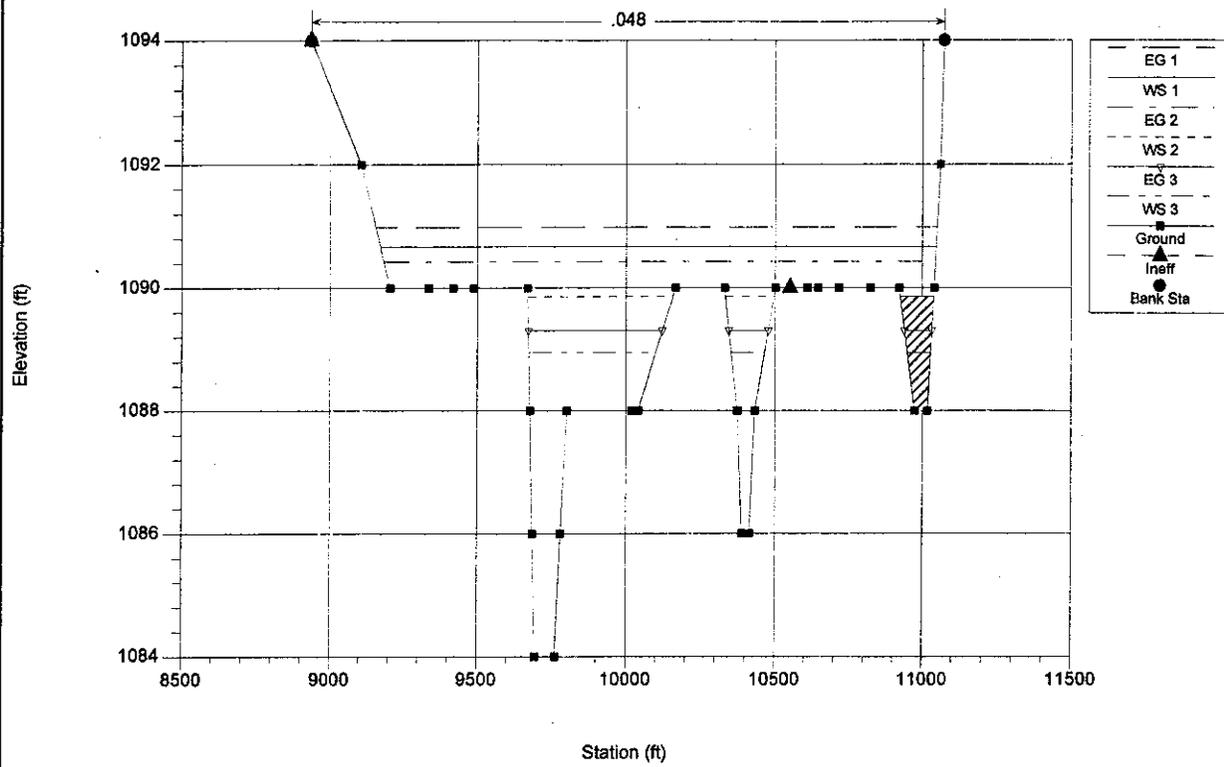
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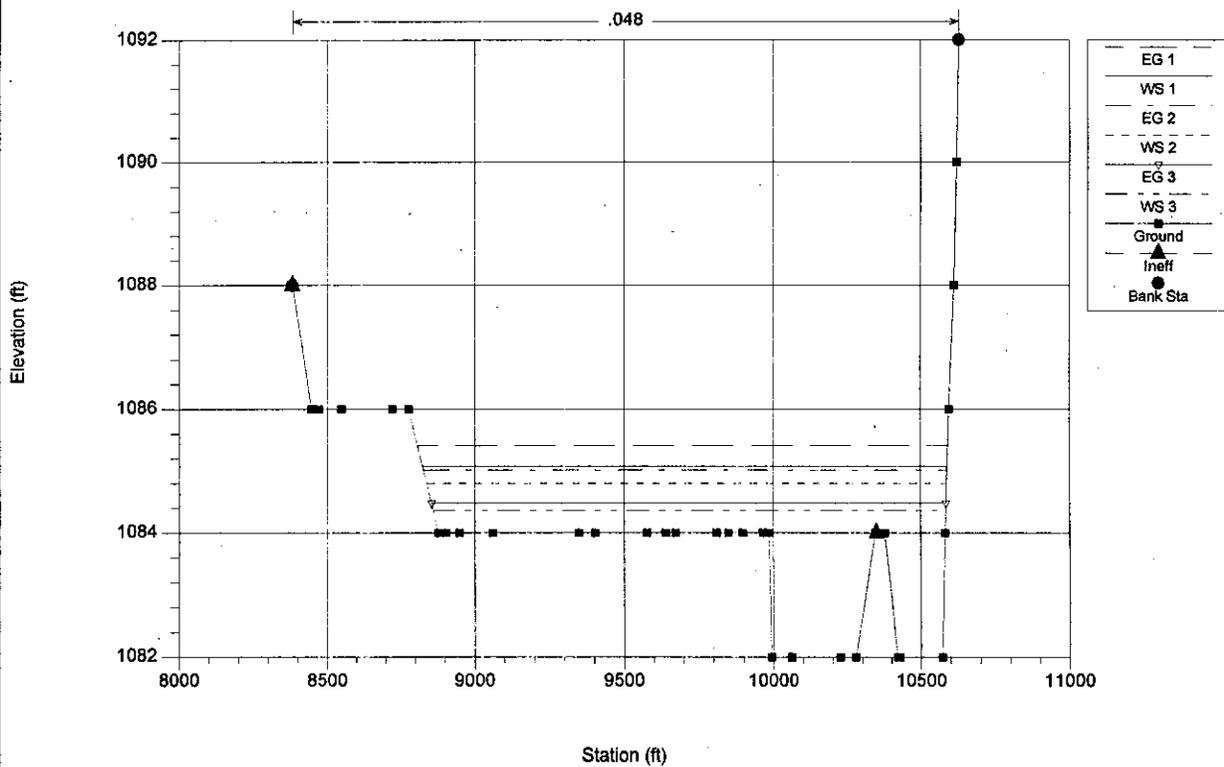
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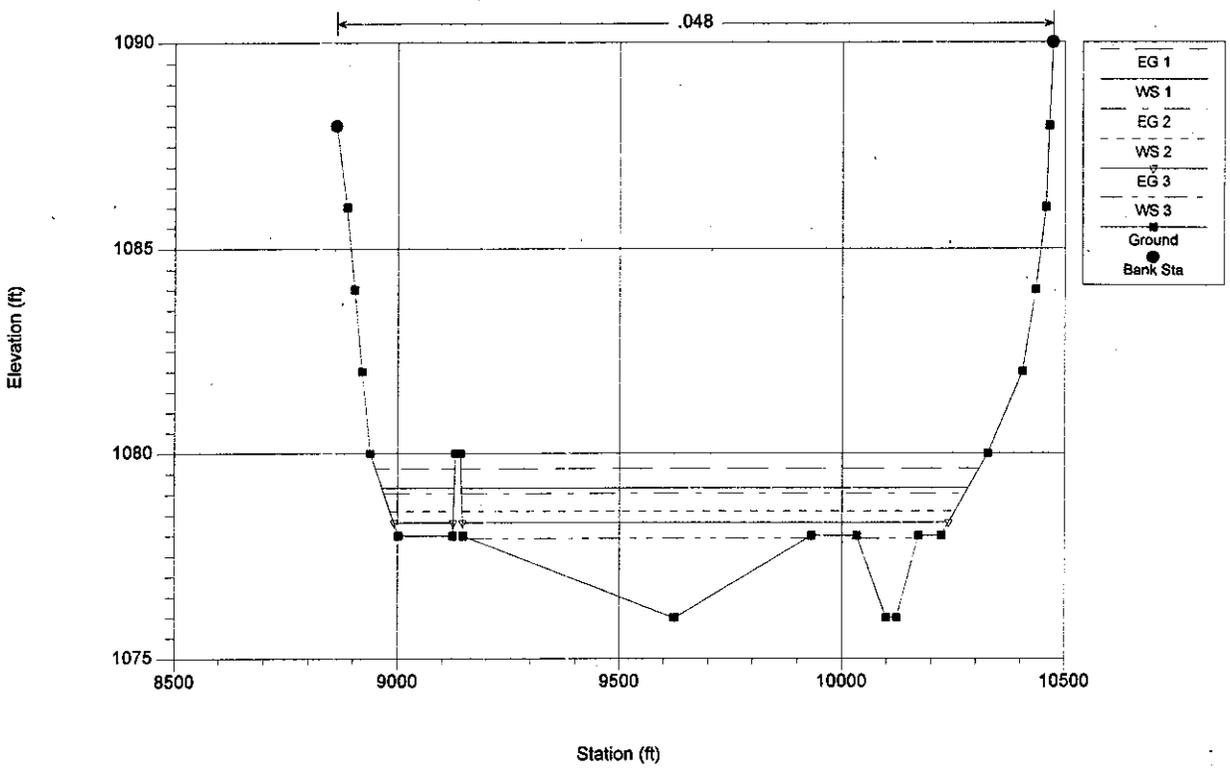
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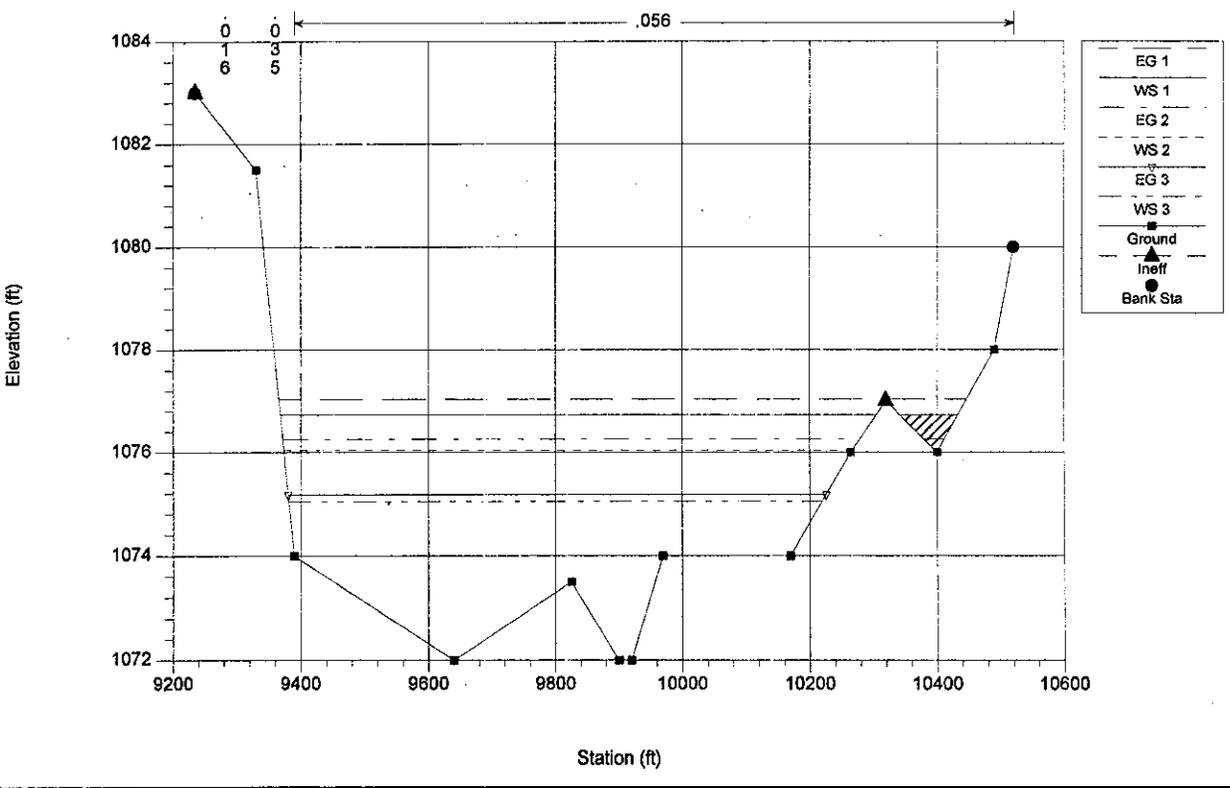
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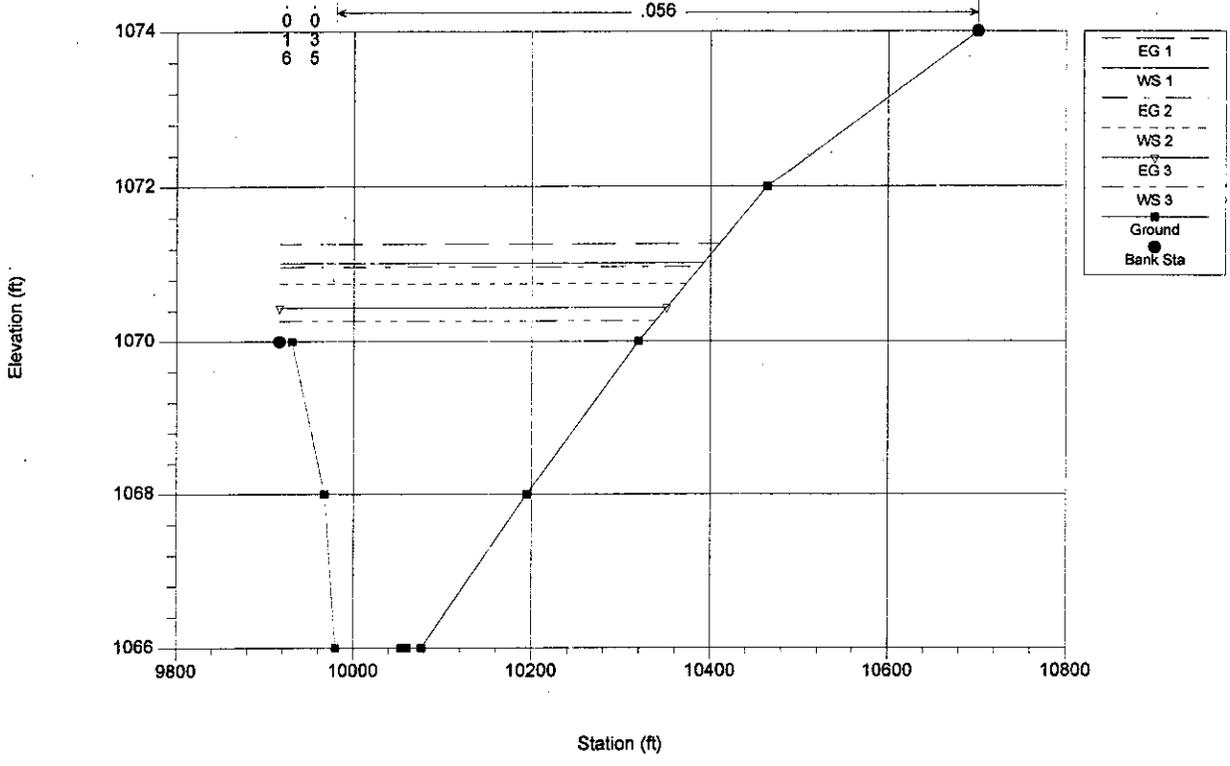
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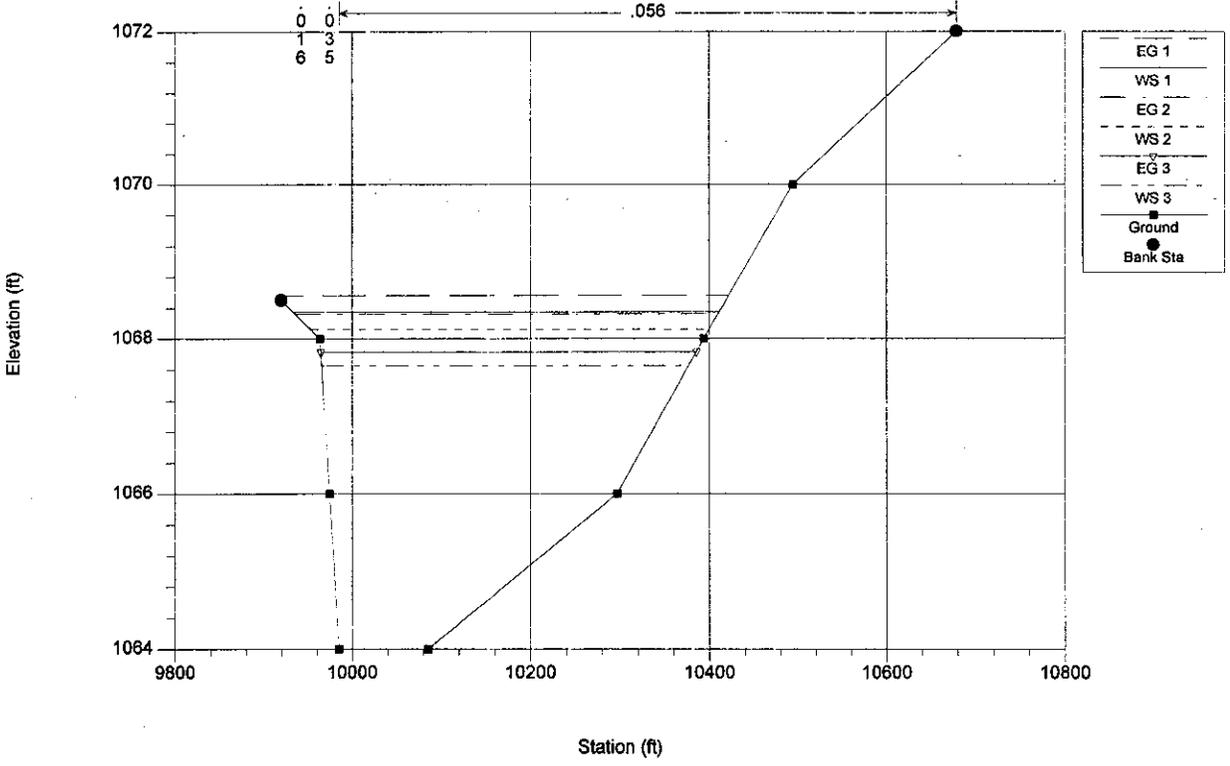




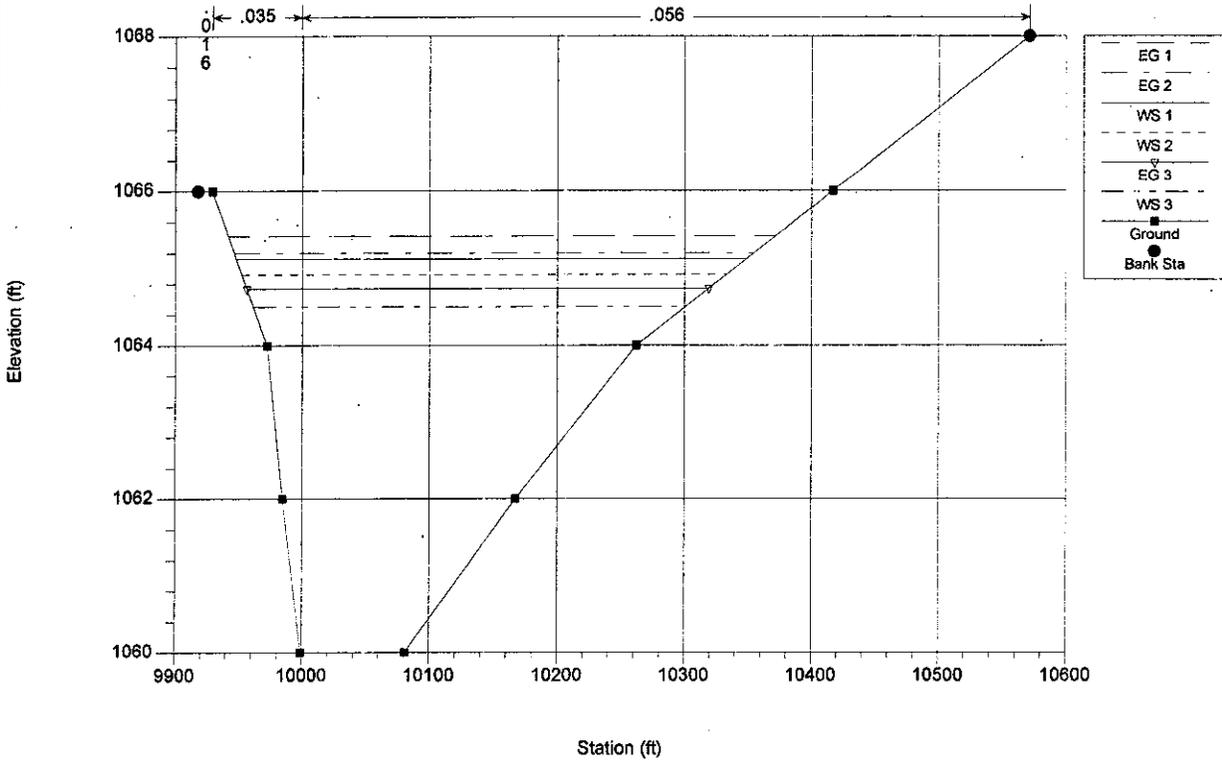
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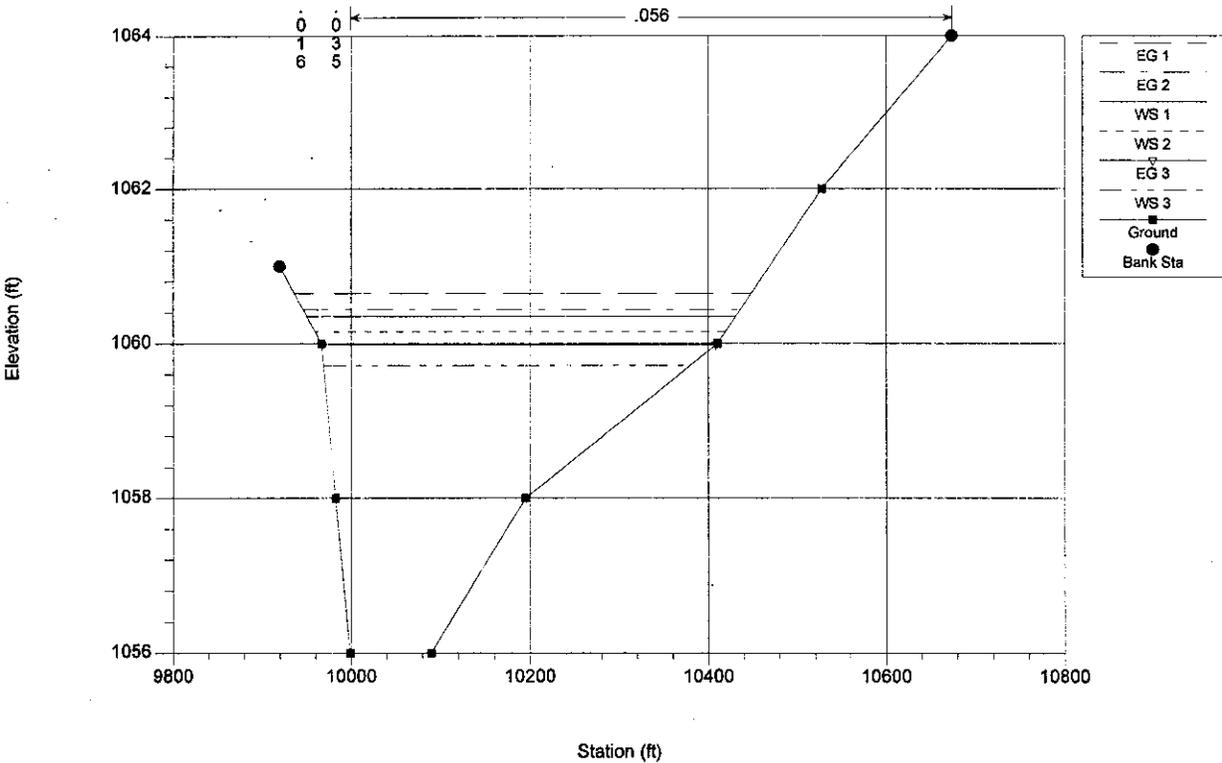
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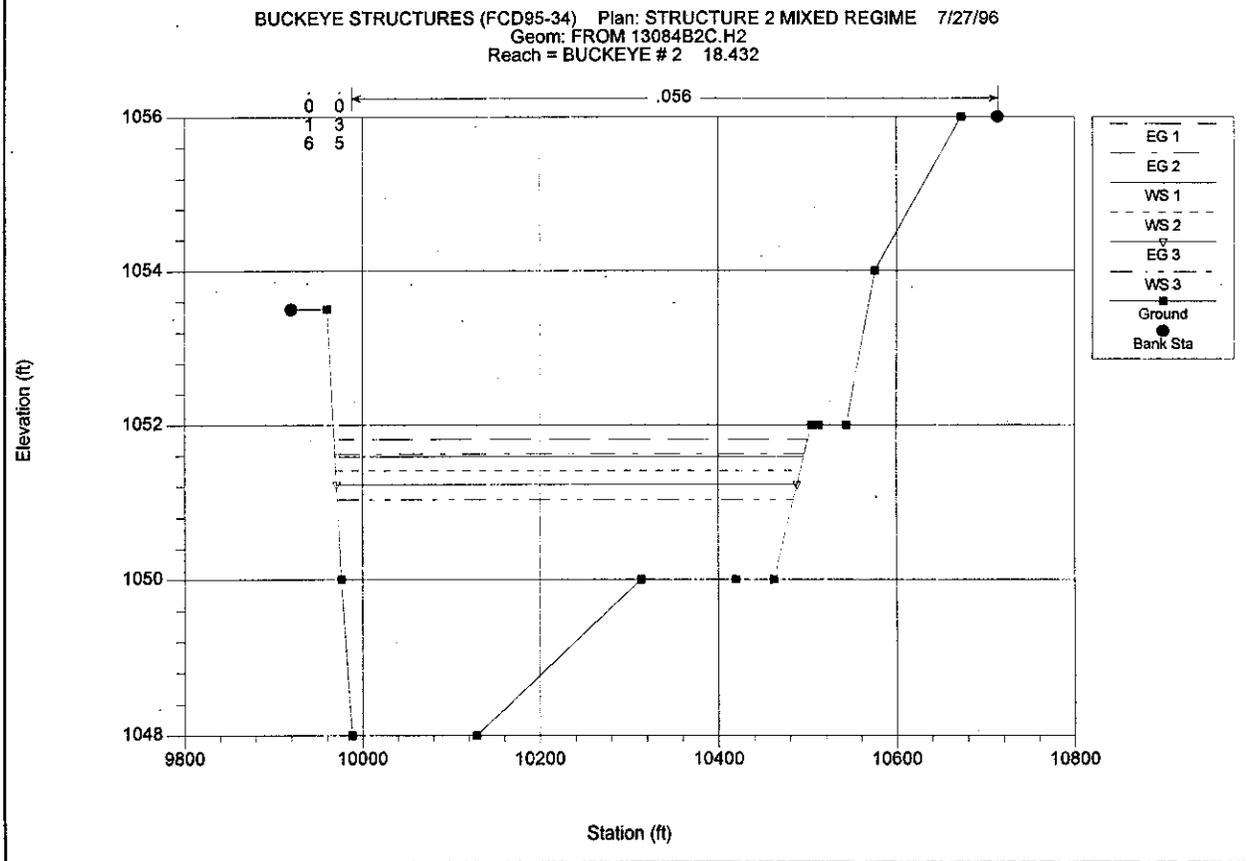
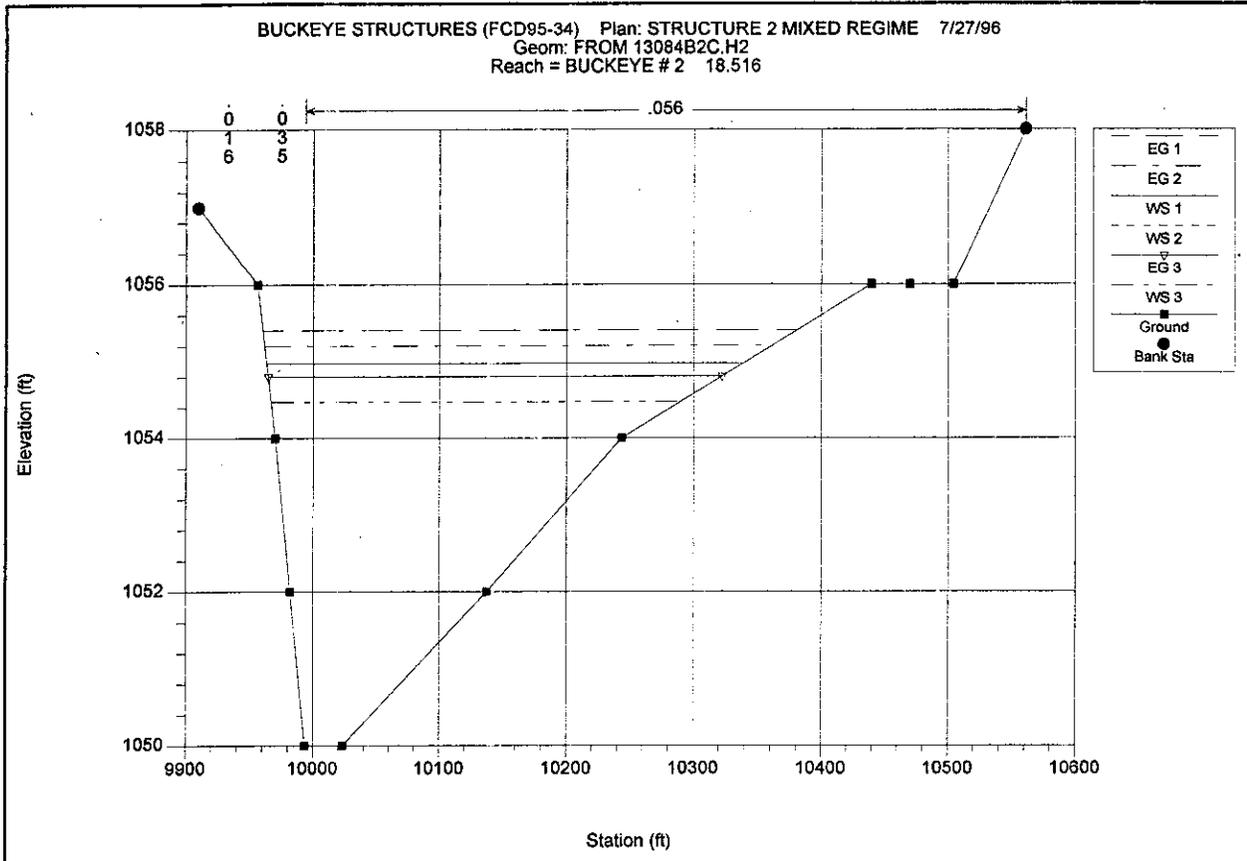


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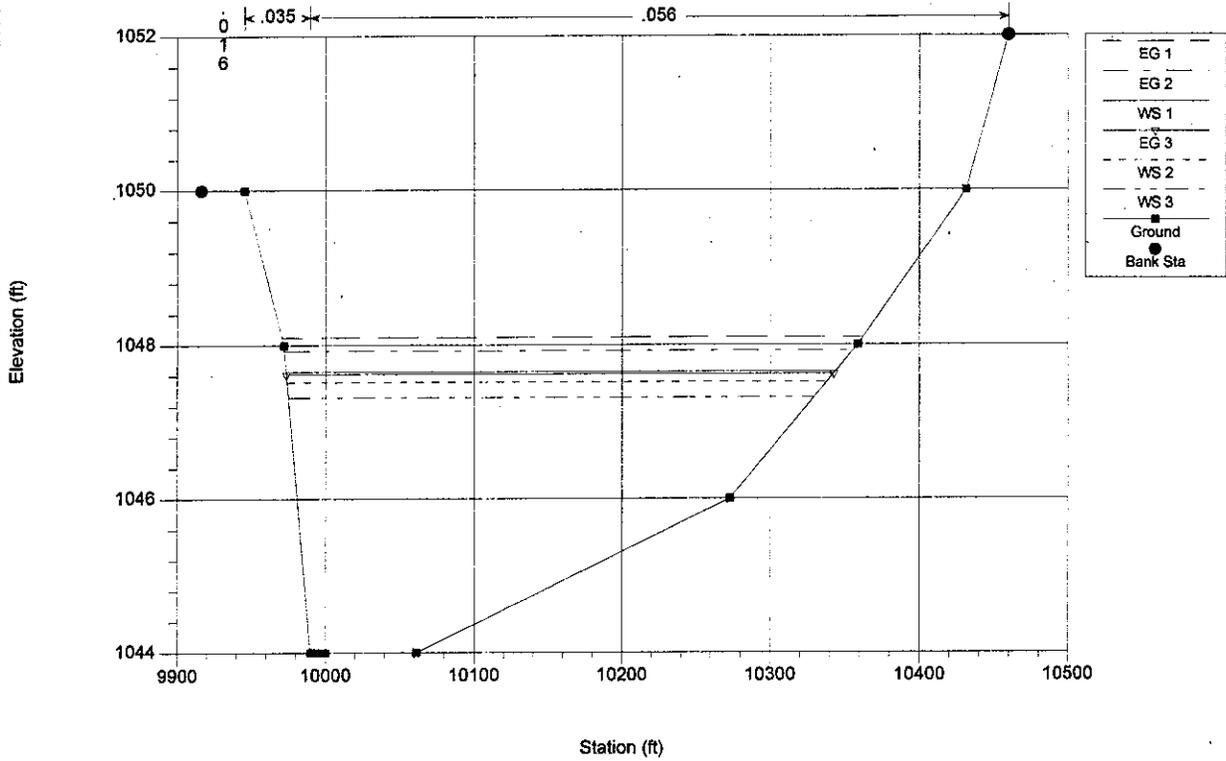


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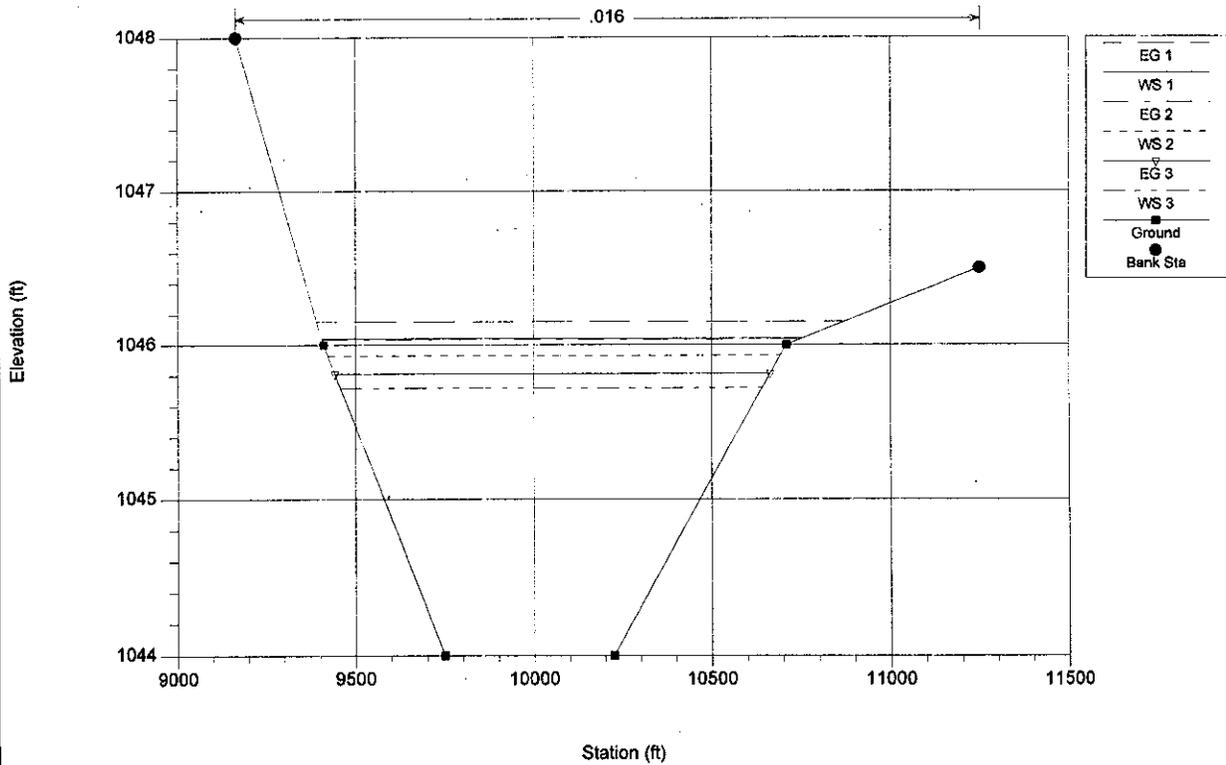




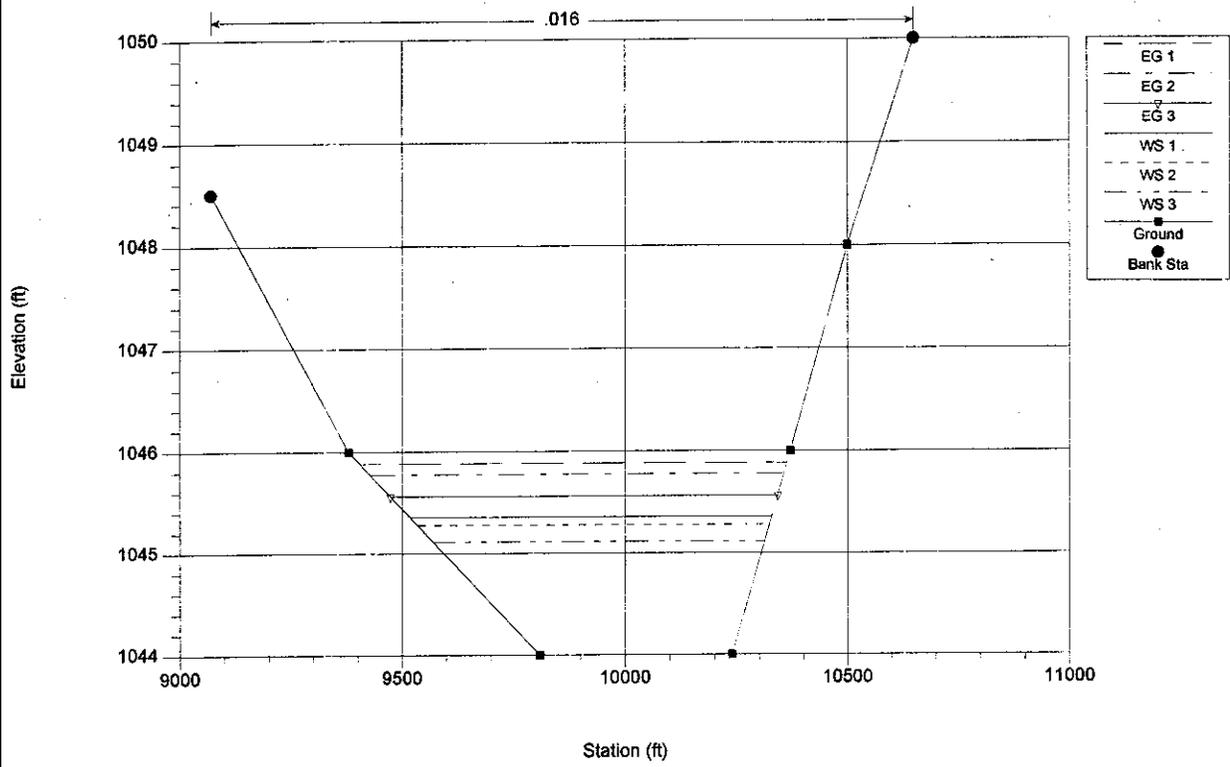
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 Geom: FROM 13084B2C.H2  
 Reach = BUCKEYE # 2 18.348



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 2 MIXED REGIME 7/27/96  
 Geom: FROM 13084B2C.H2  
 Reach = BUCKEYE # 2 18.115



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 2 MIXED REGIME 7/27/96  
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Reach = BUCKEYE # 2 18.091

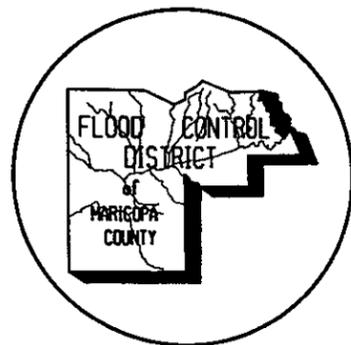


**DELINEATION OF SPILLWAY FLOWS  
FOR BUCKEYE STRUCTURES 1, 2 AND 3  
(FCD 95-34)**

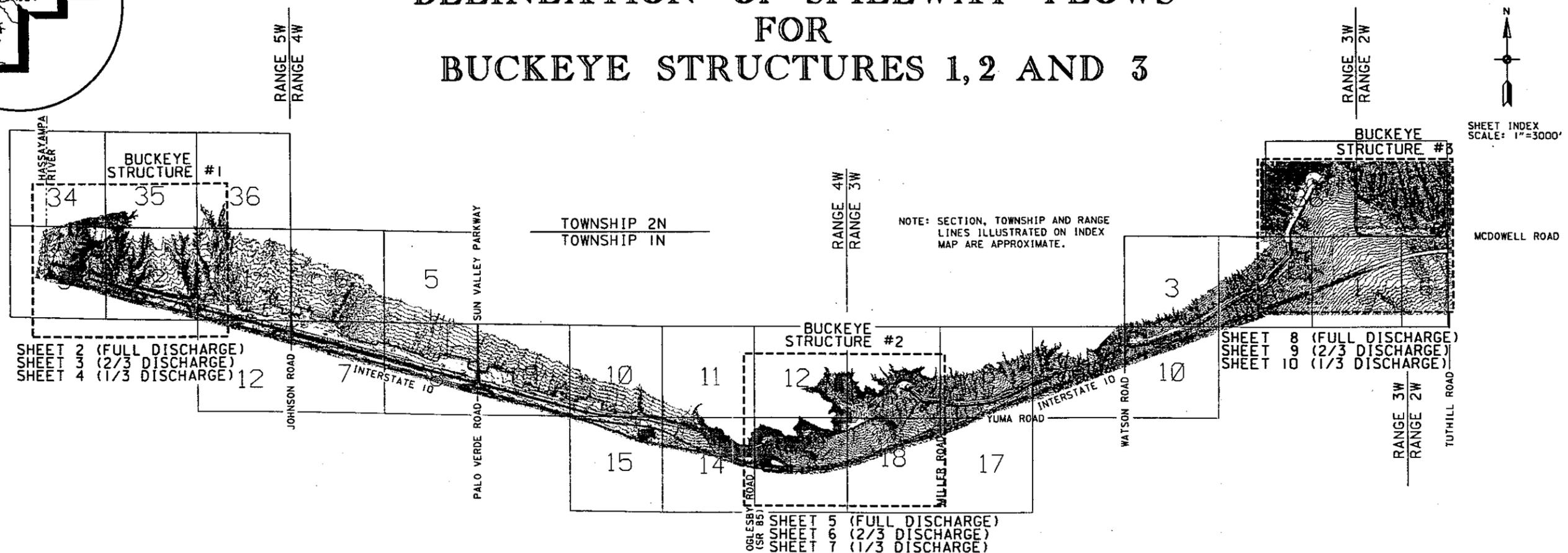
**APPENDIX E**

**BUCKEYE STRUCTURE 3**

1. Delineation Map Exhibits (11" x 17")
2. HEC-2 and HEC-RAS Printout
3. HEC-RAS Cross Section Plots



# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

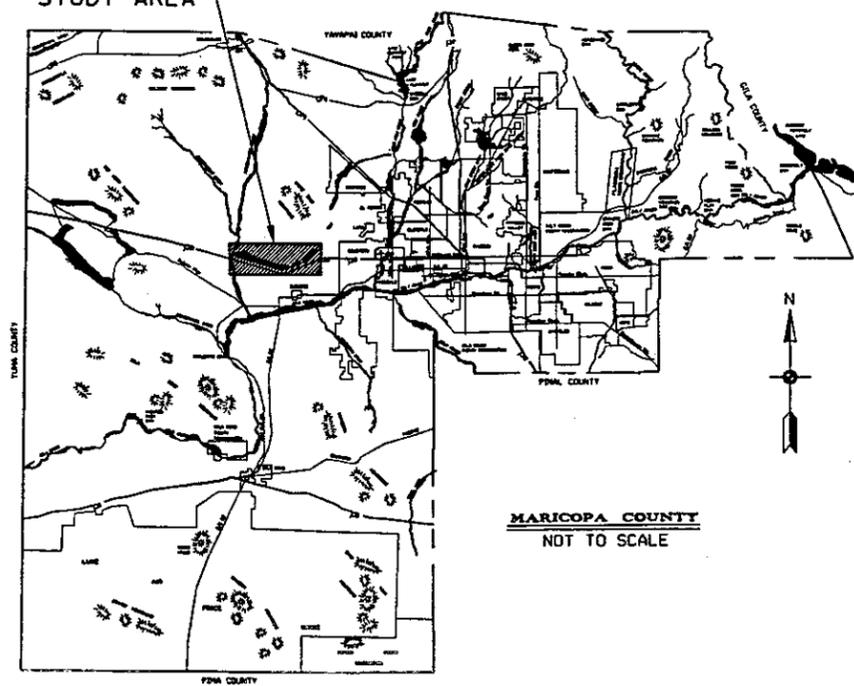


SHEET INDEX  
SCALE: 1"=3000'

MCDOWELL ROAD

TUTTILL ROAD

### STUDY AREA



### TOPOGRAPHY

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1 AND 2 WAS PREPARED BY MCLAIN HARBERS CO., INC. FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCD) UNDER FCD CONTRACT 93-51. GROUND CONTROL FOR THE MAPPING WAS PROVIDED BY COLLINS-PINA CONSULTING ENGINEERS - SURVEYING CO. PHOTO DATE WAS 7-12-94. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 200 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NAVD 88 (NORTH AMERICAN VERTICAL DATUM OF 1988). HORIZONTAL DATUM IS NAD 83 (NORTH AMERICAN DATUM OF 1983).

TOPOGRAPHY USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURE 3 WAS PREPARED BY COOPER AERIAL OF PHOENIX, INC. AND WESTERN AIR MAPS INC. OF LENEXA KANSAS FOR FCD. THIS MAPPING WAS PREPARED FOR THE WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY DONE BY THE WLB GROUP, INC. UNDER FCD CONTRACT 89-50. GROUND CONTROL FOR THE MAPPING WAS DONE UNDER THE SUPERVISION OF THE WLB GROUP. PHOTO DATE WAS 12-22-89. CONTOUR INTERVAL IS 2 FEET AND HORIZONTAL SCALE IS 1 INCH = 400 FEET NATIONAL MAP ACCURACY STANDARDS. VERTICAL DATUM IS NGVD 29 (NATIONAL GEODETIC VERTICAL DATUM OF 1929). ORIGINAL HORIZONTAL DATUM WAS NAD 27 (NORTH AMERICAN DATUM OF 1927). HOWEVER, THE WHITE TANKS/AGUA FRIA MAPPING HAS BEEN TRANSLATED FOR THIS STUDY TO NAD 83 DATUM TO BE CONSISTENT WITH THE MCLAIN HARBERS MAPPING.

### DISCHARGE RATES

DISCHARGES USED IN THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WERE OBTAINED FROM "PHASE I REPORT HYDROLOGIC ANALYSIS BUCKEYE FLOODWATER RETARDING STRUCTURES #1, #2, AND #3 FOR FLOOD CONTROL DISTRICT OF MARICOPA COUNTY," FCD PROJECT 88-63, PREPARED BY DAMES & MOORE, AND DATED JANUARY 23, 1990. THE FULL SPILLWAY DISCHARGES ESTIMATED IN THAT REPORT ALONG WITH THE 2/3 AND 1/3 SPILLWAY DISCHARGES ARE PRESENTED BELOW. DISCHARGES HAVE BEEN ROUNDED TO THE NEAREST 100 CFS.

	FULL DISCHARGE	2/3 DISCHARGE	1/3 DISCHARGE
BUCKEYE STRUCTURE #1	50,700 CFS	33,800 CFS	16,900 CFS
BUCKEYE STRUCTURE #2	13,200 CFS	8,800 CFS	4,400 CFS
BUCKEYE STRUCTURE #3	17,700 CFS	11,800 CFS	5,900 CFS

### LEGEND

- 2800 CFS WEIR OVERFLOW OF INTERSTATE-10
- APPROXIMATE INTERSTATE-10 MILE POST
- ELEVATION REFERENCE MARK
- EXISTING INTERSTATE-10 DRAINAGE CULVERT

### CERTIFICATION

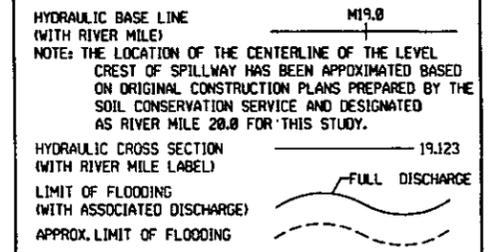
THIS IS TO CERTIFY THAT ALL WORK PERFORMED IN ASSOCIATION WITH THE DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3 WAS DONE IN ACCORDANCE WITH THE GENERAL PROVISIONS OF FCD CONTRACT 95-34 AND ALL AMENDMENTS THERETO, TOGETHER WITH ALL SUCH MODIFICATIONS, EITHER WRITTEN OR ORAL AS THE FCD CONTRACTING OFFICER OR THEIR REPRESENTATIVES HAVE DIRECTED, AS SUCH MODIFICATIONS AFFECT THIS CONTRACT, AND THAT ALL SUCH WORK HAS BEEN ACCOMPLISHED IN ACCORDANCE WITH SOUND AND ACCEPTED ENGINEERING PRACTICE WITHIN THE CONTRACT PROVISIONS FOR RESPECTIVE PHASES OF THE WORK.

<b>STANLEY CONSULTANTS</b> 2929 EAST CAMELBACK ROAD, SUITE 130 PHOENIX, ARIZONA 85016 (602) 912-6500			
<b>STANLEY CONSULTANTS PROJECT #13084</b>			
DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	
PLANS	-	-	RECOMMENDED BY: _____ DATE _____
PLANS CHK.	-	-	APPROVED BY: _____ DATE _____
SUBMITTED BY:	DATE:		CHEF ENGINEER AND GENERAL MANAGER
			SHEET 1 of 10

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

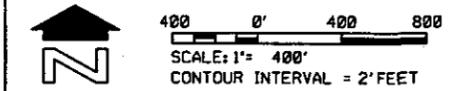
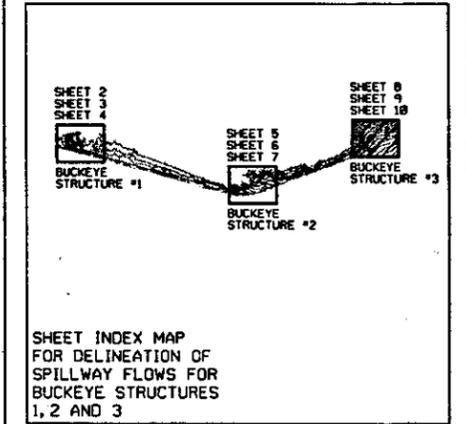
F.C.D. 95-34  
LEGEND



### ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
190	1138.12	3" OPEN PIPE, DEAN RD. AND MCDOWELL RD.
520	1184.64	3" ALUMINUM CAP AT WEST SIDE OF DIRT RD. ALONG WEST LINE OF SECTION 31, AT INTERSECTION WITH DIRT RD. TO NORTHEAST (+/-) 1200' SOUTH OF THE NORTHWEST CORNER OF SECTION 31
522	1114.76	STEEL PIN 0.8' BELOW SURFACE AT SOUTHWEST CORNER OF SECTION 31
523	1108.43	3" IRON PIPE AT CENTER OF PAVEMENT ON MCDOWELL RD. (+/-) 125' EAST OF BARRICADE AT FLOOD CONTROL CHANNEL

### INDEX MAP



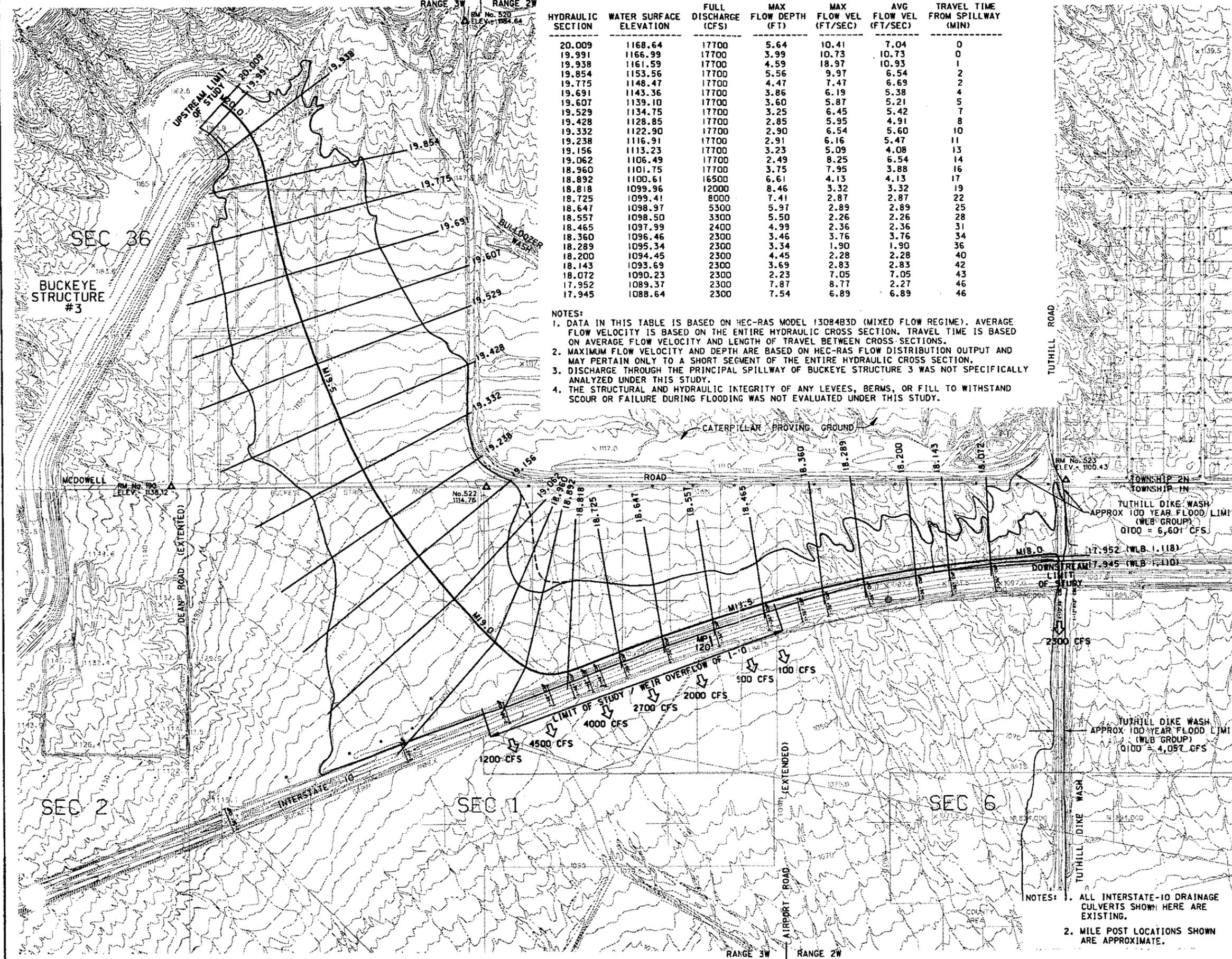
**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	DATE 10-15-96	RECOMMENDED BY
PLANS			APPROVED BY
PLANS CHK.			DATE
SUBMITTED BY:			DATE
			DATE

CHIEF ENGINEER AND GENERAL MANAGER  
SHEET 8 OF 10

HYDRAULIC SECTION	WATER SURFACE ELEVATION	FULL DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1168.64	17700	5.64	10.41	7.04	0
19.991	1166.99	17700	3.99	10.73	10.73	0
19.938	1161.59	17700	4.59	18.97	10.93	1
19.854	1153.56	17700	5.56	9.97	6.54	2
19.775	1148.47	17700	4.47	7.47	6.69	2
19.691	1143.36	17700	3.86	6.19	5.38	4
19.607	1139.10	17700	3.60	5.87	5.21	5
19.529	1134.75	17700	3.25	6.45	5.42	7
19.428	1128.85	17700	2.85	5.95	4.91	8
19.332	1122.90	17700	2.90	6.54	5.60	10
19.238	1116.91	17700	2.91	6.16	5.47	11
19.156	1113.23	17700	3.23	5.09	4.08	13
19.062	1106.49	17700	2.49	8.25	6.54	14
18.960	1101.75	17700	3.75	7.95	3.88	16
18.892	1100.61	16500	6.61	4.13	4.13	17
18.818	1099.96	12000	8.46	3.32	3.32	19
18.725	1099.41	8000	7.41	2.87	2.87	22
18.647	1098.97	5300	5.97	2.89	2.89	25
18.557	1098.50	3300	5.50	2.26	2.26	28
18.465	1097.99	2400	4.99	2.36	2.36	31
18.360	1096.46	2300	3.46	3.76	3.76	34
18.289	1095.34	2300	3.34	1.90	1.90	36
18.200	1094.45	2300	4.45	2.28	2.28	40
18.143	1093.69	2300	3.69	2.83	2.83	42
18.072	1090.23	2300	2.23	7.05	7.05	43
17.952	1089.37	2300	7.87	8.77	2.27	46
17.945	1088.64	2300	7.54	6.89	6.89	46

NOTES:  
1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 1308483D (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.  
2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.  
3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 3 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.  
4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.



NOTES:  
1. ALL INTERSTATE-10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.  
2. MILE POST LOCATIONS SHOWN ARE APPROXIMATE.

AERIAL TOPOGRAPHY: COOPER AERIAL AND WESTERN AIR MAPS  
PHOTO DATE: 12-22-83  
VERTICAL DATUM: MVD 29

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS  
1" = 400' HORIZONTAL SCALE AND 2" CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY  
DATA PROVIDED BY THE WLB GROUP

FLOOD CONTROL DISTRICT  
OF MARICOPA COUNTY  
DELINEATION OF SPILLWAY  
FLOWS FOR BUCKEYE STRUCTURES  
1, 2 AND 3  
F.C.D. 95-34  
LEGEND

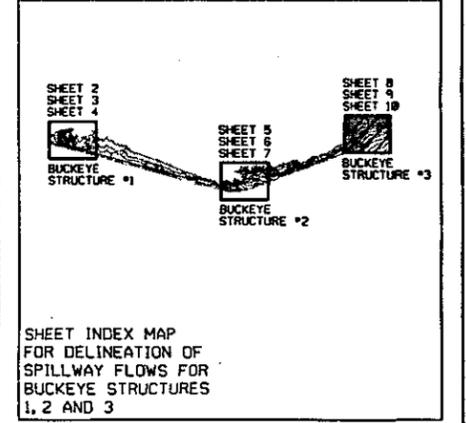
HYDRAULIC BASE LINE (WITH RIVER MILE) M19.0  
NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.

HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123  
LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) 2/3 DISCHARGE  
APPROX. LIMIT OF FLOODING

ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
198	1138.12	3/4" OPEN PIPE, DEAN RD. AND MCDOWELL RD.
528	1184.64	3" ALUMINUM CAP AT WEST SIDE OF DIRT RD. ALONG WEST LINE OF SECTION 31, AT INTERSECTION WITH DIRT RD. TO NORTHEAST (1/2-1/2) 1200' SOUTH OF THE NORTHWEST CORNER OF SECTION 31
522	1114.76	STEEL PIN 0.8" BELOW SURFACE AT SOUTHWEST CORNER OF SECTION 31
523	1108.43	3" IRON PIPE AT CENTER OF PAVEMENT ON MCDOWELL RD. (1/2-1/2) 25' EAST OF BARRICADE AT FLOOD CONTROL CHANNEL

INDEX MAP



SCALE: 1" = 400'  
CONTOUR INTERVAL = 2' FEET

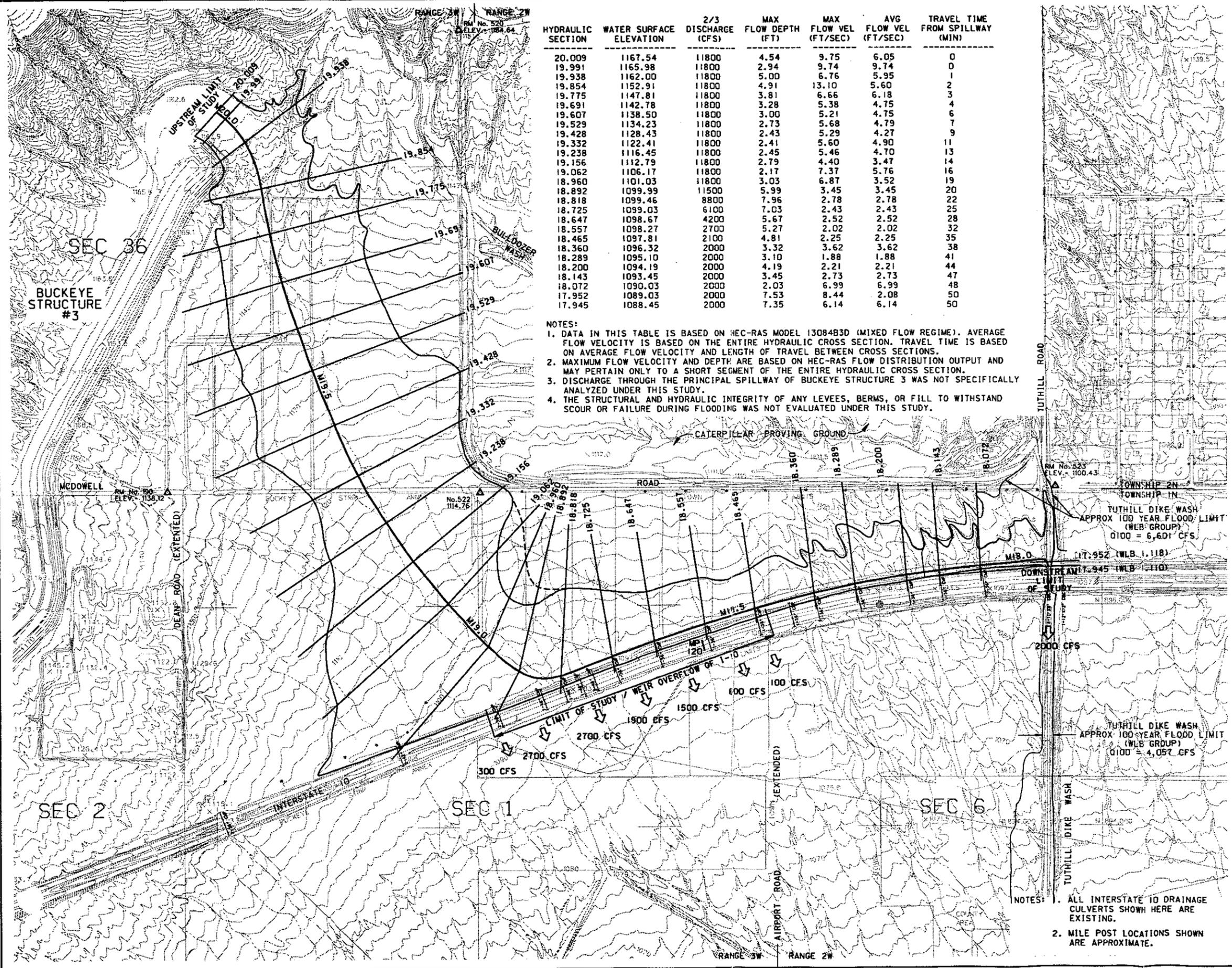
**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	RECOMMENDED BY:
PLANS			APPROVED BY: DATE
PLANS CHK.			DATE
SUBMITTED BY:			DATE
			DATE

CHIEF ENGINEER AND GENERAL MANAGER  
SHEET 9 OF 10

HYDRAULIC SECTION	WATER SURFACE ELEVATION	2/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1167.54	11800	4.54	9.75	6.05	0
19.991	1165.98	11800	2.94	9.74	9.74	0
19.938	1162.00	11800	5.00	6.76	5.95	1
19.854	1152.91	11800	4.91	13.10	5.60	2
19.775	1147.81	11800	3.81	6.66	6.18	3
19.691	1142.78	11800	3.28	5.38	4.75	4
19.607	1138.50	11800	3.00	5.21	4.75	6
19.529	1134.23	11800	2.73	5.68	4.79	7
19.428	1128.43	11800	2.43	5.29	4.27	9
19.332	1122.41	11800	2.41	5.60	4.90	11
19.238	1116.45	11800	2.45	5.46	4.70	13
19.156	1112.79	11800	2.79	4.40	3.47	14
19.062	1106.17	11800	2.17	7.37	5.76	16
18.960	1101.03	11800	3.03	6.87	3.52	19
18.892	1099.99	11500	5.99	3.45	3.45	20
18.818	1099.46	8800	7.96	2.78	2.78	22
18.725	1099.03	6100	7.03	2.43	2.43	25
18.647	1098.67	4200	5.67	2.52	2.52	28
18.557	1098.27	2700	5.27	2.02	2.02	32
18.465	1097.81	2100	4.81	2.25	2.25	35
18.360	1096.32	2000	3.32	3.62	3.62	38
18.289	1095.10	2000	3.10	1.88	1.88	41
18.200	1094.19	2000	4.19	2.21	2.21	44
18.143	1093.45	2000	3.45	2.73	2.73	47
18.072	1090.03	2000	2.03	6.99	6.99	48
17.952	1089.03	2000	7.53	8.44	2.08	50
17.945	1088.45	2000	7.35	6.14	6.14	50

NOTES:  
1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 1308483D (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.  
2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.  
3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 3 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.  
4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.



NOTES:  
1. ALL INTERSTATE 10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.  
2. MILE POST LOCATIONS SHOWN ARE APPROXIMATE.

BUCKEYE STRUCTURE #3  
2/3 SPILLWAY DISCHARGE

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

F.C.D. 95-34

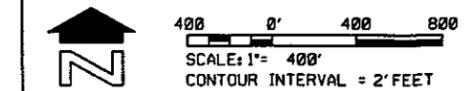
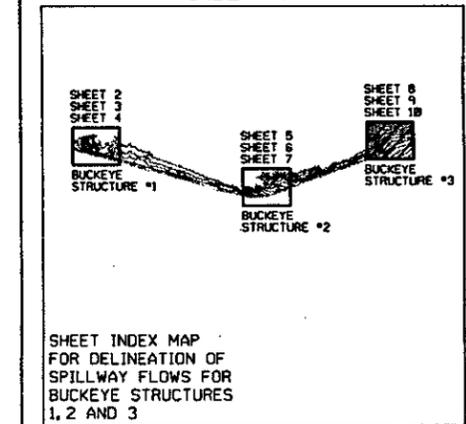
### LEGEND

- HYDRAULIC BASE LINE (WITH RIVER MILE) M19.0
- NOTE: THE LOCATION OF THE CENTERLINE OF THE LEVEL CREST OF SPILLWAY HAS BEEN APPROXIMATED BASED ON ORIGINAL CONSTRUCTION PLANS PREPARED BY THE SOIL CONSERVATION SERVICE AND DESIGNATED AS RIVER MILE 20.0 FOR THIS STUDY.
- HYDRAULIC CROSS SECTION (WITH RIVER MILE LABEL) 19.123
- LIMIT OF FLOODING (WITH ASSOCIATED DISCHARGE) 1/3 DISCHARGE
- APPROX. LIMIT OF FLOODING

### ELEVATION REFERENCE MARKS

NUMBER	ELEVATION	DESCRIPTION
198	1138.12	3/4" OPEN PIPE, DEAN RD. AND MCDOWELL RD.
520	1184.64	3" ALUMINUM CAP AT WEST SIDE OF DIRT RD. ALONG WEST LINE OF SECTION 31, AT INTERSECTION WITH DIRT RD. TO NORTHEAST (1/2-1/2) SOUTH OF THE NORTHWEST CORNER OF SECTION 31
522	1114.76	STEEL PIN 0.8' BELOW SURFACE AT SOUTHWEST CORNER OF SECTION 31
523	1100.43	3" IRON PIPE AT CENTER OF PAVEMENT ON MCDOWELL RD. (1/2-1/2) EAST OF BARRICADE AT FLOOD CONTROL CHANNEL

### INDEX MAP

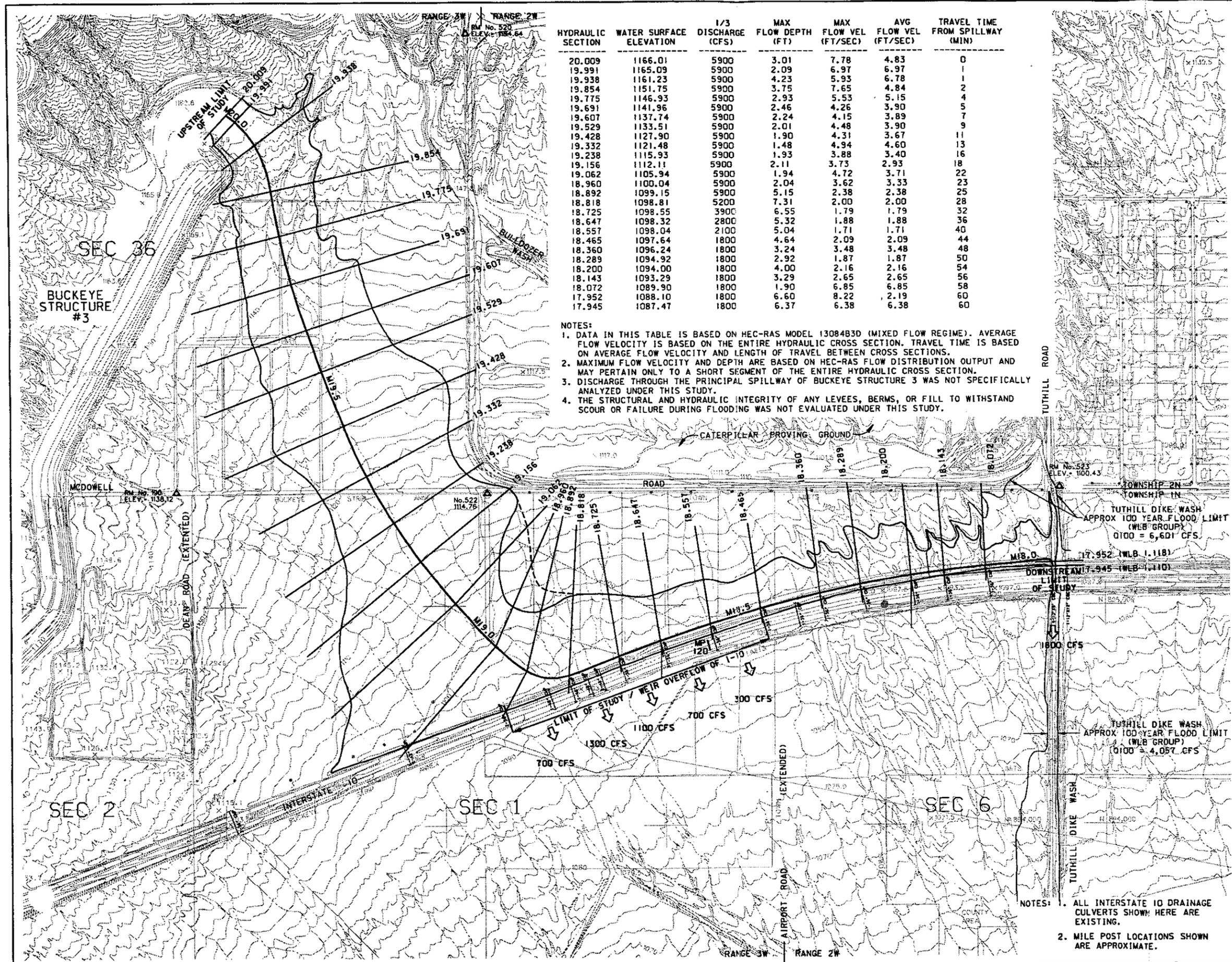


**STANLEY CONSULTANTS**  
2929 EAST CAMELBACK ROAD, SUITE 130  
PHOENIX, ARIZONA 85016 (602)912-6500

DESIGN	BY GSB	DATE 10-15-96	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	JRM	10-15-96	
PLANS	-	-	RECOMMENDED BY: _____ DATE: _____
PLANS CHK.	-	-	APPROVED BY: _____ DATE: _____
SUBMITTED BY:	DATE: _____		CHIEF ENGINEER AND GENERAL MANAGER
			SHEET 10 OF 10

HYDRAULIC SECTION	WATER SURFACE ELEVATION	1/3 DISCHARGE (CFS)	MAX FLOW DEPTH (FT)	MAX FLOW VEL (FT/SEC)	AVG FLOW VEL (FT/SEC)	TRAVEL TIME FROM SPILLWAY (MIN)
20.009	1166.01	5900	3.01	7.78	4.83	0
19.991	1165.09	5900	2.09	6.97	6.97	1
19.938	1161.23	5900	4.23	5.93	6.78	1
19.854	1151.75	5900	3.75	7.65	4.84	2
19.775	1146.93	5900	2.93	5.53	5.15	4
19.691	1141.96	5900	2.46	4.26	3.90	5
19.607	1137.74	5900	2.24	4.15	3.89	7
19.529	1133.51	5900	2.01	4.48	3.90	9
19.428	1127.90	5900	1.90	4.31	3.67	11
19.332	1121.48	5900	1.48	4.94	4.60	13
19.238	1115.93	5900	1.93	3.88	3.40	16
19.156	1112.11	5900	2.11	3.73	2.93	18
19.062	1105.94	5900	1.94	4.72	3.71	22
18.960	1100.04	5900	2.04	3.62	3.33	23
18.892	1099.15	5900	5.15	2.38	2.38	25
18.818	1098.81	5200	7.31	2.00	2.00	28
18.725	1098.55	3900	6.55	1.79	1.79	32
18.647	1098.32	2800	5.32	1.88	1.88	36
18.557	1098.04	2100	5.04	1.71	1.71	40
18.465	1097.64	1800	4.64	2.09	2.09	44
18.360	1096.24	1800	3.24	3.48	3.48	48
18.289	1094.92	1800	2.92	1.87	1.87	50
18.200	1094.00	1800	4.00	2.16	2.16	54
18.143	1093.29	1800	3.29	2.65	2.65	56
18.072	1089.90	1800	1.90	6.85	6.85	58
17.952	1088.10	1800	6.60	8.22	2.19	60
17.945	1087.47	1800	6.37	6.38	6.38	60

- NOTES:
1. DATA IN THIS TABLE IS BASED ON HEC-RAS MODEL 13084B3D (MIXED FLOW REGIME). AVERAGE FLOW VELOCITY IS BASED ON THE ENTIRE HYDRAULIC CROSS SECTION. TRAVEL TIME IS BASED ON AVERAGE FLOW VELOCITY AND LENGTH OF TRAVEL BETWEEN CROSS SECTIONS.
  2. MAXIMUM FLOW VELOCITY AND DEPTH ARE BASED ON HEC-RAS FLOW DISTRIBUTION OUTPUT AND MAY PERTAIN ONLY TO A SHORT SEGMENT OF THE ENTIRE HYDRAULIC CROSS SECTION.
  3. DISCHARGE THROUGH THE PRINCIPAL SPILLWAY OF BUCKEYE STRUCTURE 3 WAS NOT SPECIFICALLY ANALYZED UNDER THIS STUDY.
  4. THE STRUCTURAL AND HYDRAULIC INTEGRITY OF ANY LEVEES, BERMS, OR FILL TO WITHSTAND SCOUR OR FAILURE DURING FLOODING WAS NOT EVALUATED UNDER THIS STUDY.



- NOTES:
1. ALL INTERSTATE 10 DRAINAGE CULVERTS SHOWN HERE ARE EXISTING.
  2. MILE POST LOCATIONS SHOWN ARE APPROXIMATE.

15084 308410.dgn

HEC-RAS Reach: BUCKEYE # 3

1 of 5

River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. LR (ft)	Sta W.S. Rgt (ft)
20.009	SUBCRIT	1168.64		17700.00	5.64	4.92	2513.63	7.04	0.76	0.034	9788.72	10300.00
20.009	B3 MIXED	1168.64		17700.00	5.64	4.92	2513.63	7.04	0.76	0.034	9788.72	10300.00
20.009	SUBCRIT	1167.54		11800.00	4.54	3.83	1950.27	6.05	0.84	0.034	9790.93	10300.00
20.009	B3 MIXED	1167.54		11800.00	4.54	3.83	1950.27	6.05	0.84	0.034	9790.93	10300.00
20.009	SUBCRIT	1166.01		5900.00	3.01	2.96	1221.52	4.83	1.00	0.034	9793.98	10206.80
20.009	B3 MIXED	1166.01		5900.00	3.01	2.96	1221.52	4.83	1.00	0.034	9793.98	10206.80
19.991	SUBCRIT	1166.99	1166.99	17700.00	3.99	3.55	1650.24	10.73	0.76	0.034	9792.03	10257.24
19.991	B3 MIXED	1166.99	1166.99	17700.00	3.99	3.55	1650.24	10.73	0.76	0.034	9792.03	10257.24
19.991	SUBCRIT	1165.98	1165.98	11800.00	2.98	2.94	1211.56	9.74	0.84	0.034	9794.03	10205.97
19.991	B3 MIXED	1165.98	1165.98	11800.00	2.98	2.94	1211.56	9.74	0.84	0.034	9794.03	10205.97
19.991	SUBCRIT	1165.09		5900.00	2.09	2.07	846.17	6.97	0.99	0.034	9795.81	10204.19
19.991	B3 MIXED	1165.09		5900.00	2.09	2.07	846.17	6.97	0.99	0.034	9795.81	10204.19
19.938	SUBCRIT	1162.08	1162.08	17700.00	5.08	2.29	2055.80	8.61	0.75	0.041	9387.59	10284.16
19.938	B3 MIXED	1161.59	1162.08	17700.00	4.59	1.87	1619.57	10.93	0.75	0.041	9400.35	10283.17
19.938	SUBCRIT	1162.00	1162.00	11800.00	5.00	2.22	1984.11	5.95	0.83	0.041	9390.00	10284.00
19.938	B3 MIXED	1162.00	1162.00	11800.00	5.00	2.22	1984.11	5.95	0.83	0.041	9390.00	10284.00
19.938	SUBCRIT	1161.23	1161.23	5900.00	4.23	1.43	1312.79	6.78	0.98	0.041	9409.33	10282.45
19.938	B3 MIXED	1161.23	1161.23	5900.00	4.23	1.43	1312.79	6.78	0.98	0.041	9409.33	10282.45
19.854	SUBCRIT	1153.56	1152.85	17700.00	5.56	2.89	2741.38	6.54	0.73	0.046	9113.12	10485.63
19.854	B3 MIXED	1153.56	1152.85	17700.00	5.56	2.89	2741.38	6.54	0.73	0.046	9113.12	10485.63
19.854	SUBCRIT	1152.91	1152.10	11800.00	4.91	2.35	2106.50	5.60	0.81	0.046	9566.27	10479.13
19.854	B3 MIXED	1152.91	1152.10	11800.00	4.91	2.35	2106.50	5.60	0.81	0.046	9566.27	10479.13
19.854	SUBCRIT	1151.75	1151.15	5900.00	3.75	1.93	1219.53	4.84	0.96	0.046	9598.77	10467.50
19.854	B3 MIXED	1151.75	1151.15	5900.00	3.75	1.93	1219.53	4.84	0.96	0.046	9598.77	10467.50
19.775	SUBCRIT	1148.47	1148.07	17700.00	4.47	2.16	2704.78	6.69	0.72	0.046	9145.46	10563.45
19.775	B3 MIXED	1148.47	1148.07	17700.00	4.47	2.16	2704.78	6.69	0.72	0.046	9145.46	10563.45
19.775	SUBCRIT	1147.81	1147.44	11800.00	3.81	1.91	1916.65	6.18	0.79	0.046	9182.66	10473.82
19.775	B3 MIXED	1147.81	1147.44	11800.00	3.81	1.91	1916.65	6.18	0.79	0.046	9182.66	10473.82
19.775	SUBCRIT	1146.93	1146.56	5900.00	2.93	1.53	1145.28	5.15	0.94	0.046	9645.44	10399.12
19.775	B3 MIXED	1146.93	1146.56	5900.00	2.93	1.53	1145.28	5.15	0.94	0.046	9645.44	10399.12
19.691	SUBCRIT	1143.36		17700.00	3.86	2.24	3289.18	5.38	0.70	0.046	9129.58	10596.30
19.691	B3 MIXED	1143.36		17700.00	3.86	2.24	3289.18	5.38	0.70	0.046	9129.58	10596.30
19.691	SUBCRIT	1142.78		11800.00	3.28	1.90	2483.62	4.75	0.77	0.046	9219.66	10525.11
19.691	B3 MIXED	1142.78		11800.00	3.28	1.90	2483.62	4.75	0.77	0.046	9219.66	10525.11
19.691	SUBCRIT	1141.96		5900.00	2.46	1.40	1512.52	3.90	0.91	0.046	9341.33	10423.17
19.691	B3 MIXED	1141.96		5900.00	2.46	1.40	1512.52	3.90	0.91	0.046	9341.33	10423.17

HEC-RAS Reach: BUCKEYE # 3 (continued)

2 of 5

River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Tme Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
19.607	SUBCRIT	1139.10		17700.00	3.60	2.10	3398.62	5.21	0.67	0.046	9055.10	10674.69
19.607	B3 MIXED	1139.10		17700.00	3.60	2.10	3398.62	5.21	0.67	0.046	9055.10	10674.69
19.607	SUBCRIT	1138.50		11800.00	3.00	1.77	2484.74	4.75	0.74	0.046	9200.21	10603.65
19.607	B3 MIXED	1138.50		11800.00	3.00	1.77	2484.74	4.75	0.74	0.046	9200.21	10603.65
19.607	SUBCRIT	1137.74		5900.00	2.24	1.34	1517.07	3.89	0.88	0.046	9363.57	10499.45
19.607	B3 MIXED	1137.74		5900.00	2.24	1.34	1517.07	3.89	0.88	0.046	9363.57	10499.45
19.529	SUBCRIT	1134.75		17700.00	3.25	1.96	3264.12	5.42	0.65	0.046	9000.47	10667.31
19.529	B3 MIXED	1134.75		17700.00	3.25	1.96	3264.12	5.42	0.65	0.046	9000.47	10667.31
19.529	SUBCRIT	1134.23		11800.00	2.73	1.72	2461.67	4.79	0.72	0.046	9166.09	10600.02
19.529	B3 MIXED	1134.23		11800.00	2.73	1.72	2461.67	4.79	0.72	0.046	9166.09	10600.02
19.529	SUBCRIT	1133.51		5900.00	2.01	1.24	1514.69	3.90	0.85	0.046	9291.67	10513.41
19.529	B3 MIXED	1133.51		5900.00	2.01	1.24	1514.69	3.90	0.85	0.046	9291.67	10513.41
19.428	SUBCRIT	1128.85	1128.39	17700.00	2.85	1.77	3606.97	4.91	0.62	0.046	8764.35	10805.06
19.428	B3 MIXED	1128.85	1128.39	17700.00	2.85	1.77	3606.97	4.91	0.62	0.046	8764.35	10805.06
19.428	SUBCRIT	1128.43	1128.06	11800.00	2.43	1.40	2762.55	4.27	0.69	0.046	8769.60	10748.34
19.428	B3 MIXED	1128.43	1128.06	11800.00	2.43	1.40	2762.55	4.27	0.69	0.046	8769.60	10748.34
19.428	SUBCRIT	1127.90	1127.51	5900.00	1.90	1.20	1757.61	3.67	0.81	0.046	8980.20	10677.50
19.428	B3 MIXED	1127.90	1127.51	5900.00	1.90	1.20	1757.61	3.67	0.81	0.046	8980.20	10677.50
19.332	SUBCRIT	1122.90		17700.00	2.90	2.01	3158.55	5.60	0.60	0.047	8950.98	10521.15
19.332	B3 MIXED	1122.90		17700.00	2.90	2.01	3158.55	5.60	0.60	0.047	8950.98	10521.15
19.332	SUBCRIT	1122.41		11800.00	2.41	1.65	2408.84	4.90	0.65	0.047	8955.93	10413.44
19.332	B3 MIXED	1122.41		11800.00	2.41	1.65	2408.84	4.90	0.65	0.047	8955.93	10413.44
19.332	SUBCRIT	1121.48	1121.20	5900.00	1.48	1.27	1281.43	4.60	0.78	0.047	9298.64	10305.34
19.332	B3 MIXED	1121.48	1121.20	5900.00	1.48	1.27	1281.43	4.60	0.78	0.047	9298.64	10305.34
19.238	SUBCRIT	1116.91		17700.00	2.91	2.06	3237.36	5.47	0.57	0.048	9068.16	10640.19
19.238	B3 MIXED	1116.91		17700.00	2.91	2.06	3237.36	5.47	0.57	0.048	9068.16	10640.19
19.238	SUBCRIT	1116.45		11800.00	2.45	1.63	2510.91	4.70	0.63	0.048	9071.65	10614.54
19.238	B3 MIXED	1116.45		11800.00	2.45	1.63	2510.91	4.70	0.63	0.048	9071.65	10614.54
19.238	SUBCRIT	1115.93		5900.00	1.93	1.27	1733.99	3.40	0.74	0.048	9199.25	10566.72
19.238	B3 MIXED	1115.93		5900.00	1.93	1.27	1733.99	3.40	0.74	0.048	9199.25	10566.72
19.156	SUBCRIT	1113.23		17700.00	3.23	2.02	4335.91	4.08	0.55	0.048	8931.56	11075.23
19.156	B3 MIXED	1113.23		17700.00	3.23	2.02	4335.91	4.08	0.55	0.048	8931.56	11075.23
19.156	SUBCRIT	1112.79		11800.00	2.79	1.63	3402.87	3.47	0.60	0.048	8938.17	11026.73
19.156	B3 MIXED	1112.79		11800.00	2.79	1.63	3402.87	3.47	0.60	0.048	8938.17	11026.73
19.156	SUBCRIT	1112.11		5900.00	2.11	1.00	2012.18	2.93	0.70	0.048	8948.37	10951.96
19.156	B3 MIXED	1112.11		5900.00	2.11	1.00	2012.18	2.93	0.70	0.048	8948.37	10951.96

HEC-RAS Reach: BUCKEYE #3 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
19.062	SUBCRIT	1106.49	1106.49	17700.00	2.49	1.29	2704.50	6.54	0.52	0.048	9291.23	11386.77
19.062	B3 MIXED	1106.49	1106.49	17700.00	2.49	1.29	2704.50	6.54	0.52	0.048	9291.23	11386.77
19.062	SUBCRIT	1106.17	1106.17	11800.00	2.17	1.02	2049.55	5.76	0.57	0.048	9342.23	11356.49
19.062	B3 MIXED	1106.17	1106.17	11800.00	2.17	1.02	2049.55	5.76	0.57	0.048	9342.23	11356.49
19.062	SUBCRIT	1105.94		5900.00	1.94	0.84	1589.57	3.71	0.66	0.048	9392.45	11287.42
19.062	B3 MIXED	1105.94		5900.00	1.94	0.84	1589.57	3.71	0.66	0.048	9392.45	11287.42
18.96	SUBCRIT	1101.75		17700.00	3.75	2.65	4563.65	3.88	0.49	0.048	9444.99	11167.50
18.96	B3 MIXED	1101.75		17700.00	3.75	2.65	4563.65	3.88	0.49	0.048	9444.99	11167.50
18.96	SUBCRIT	1101.03		11800.00	3.03	2.04	3349.39	3.52	0.53	0.048	9517.14	11160.29
18.96	B3 MIXED	1101.03		11800.00	3.03	2.04	3349.39	3.52	0.53	0.048	9517.14	11160.29
18.96	SUBCRIT	1100.04		5900.00	2.04	1.16	1772.85	3.33	0.62	0.047	9616.39	11150.36
18.96	B3 MIXED	1100.04		5900.00	2.04	1.16	1772.85	3.33	0.62	0.047	9616.39	11150.36
18.892	SUBCRIT	1100.61		16500.00	6.61	3.62	3999.18	4.13	0.47	0.042	9309.20	10415.00
18.892	B3 MIXED	1100.61		16500.00	6.61	3.62	3999.18	4.13	0.47	0.042	9309.20	10415.00
18.892	SUBCRIT	1099.99		11500.00	5.99	3.21	3331.84	3.45	0.51	0.042	9375.64	10415.00
18.892	B3 MIXED	1099.99		11500.00	5.99	3.21	3331.84	3.45	0.51	0.042	9375.64	10415.00
18.892	SUBCRIT	1099.15		5900.00	5.15	2.51	2478.33	2.38	0.58	0.043	9428.30	10415.00
18.892	B3 MIXED	1099.15		5900.00	5.15	2.51	2478.33	2.38	0.58	0.043	9428.30	10415.00
18.818	SUBCRIT	1099.96		12000.00	8.46	3.86	3618.24	3.32	0.44	0.041	9163.41	10100.00
18.818	B3 MIXED	1099.96		12000.00	8.46	3.86	3618.24	3.32	0.44	0.041	9163.41	10100.00
18.818	SUBCRIT	1099.46		8800.00	7.96	3.55	3161.09	2.78	0.47	0.041	9208.42	10100.00
18.818	B3 MIXED	1099.46		8800.00	7.96	3.55	3161.09	2.78	0.47	0.041	9208.42	10100.00
18.818	SUBCRIT	1098.81		5200.00	7.31	3.12	2600.35	2.00	0.54	0.041	9266.94	10100.00
18.818	B3 MIXED	1098.81		5200.00	7.31	3.12	2600.35	2.00	0.54	0.041	9266.94	10100.00
18.725	SUBCRIT	1099.41		8000.00	7.41	3.78	2788.04	2.87	0.39	0.041	9358.33	10095.00
18.725	B3 MIXED	1099.41		8000.00	7.41	3.78	2788.04	2.87	0.39	0.041	9358.33	10095.00
18.725	SUBCRIT	1099.03		6100.00	7.03	3.56	2510.87	2.43	0.42	0.041	9390.05	10095.00
18.725	B3 MIXED	1099.03		6100.00	7.03	3.56	2510.87	2.43	0.42	0.041	9390.05	10095.00
18.725	SUBCRIT	1098.55		3900.00	6.55	3.28	2179.91	1.79	0.46	0.041	9429.91	10095.00
18.725	B3 MIXED	1098.55		3900.00	6.55	3.28	2179.91	1.79	0.46	0.041	9429.91	10095.00
18.647	SUBCRIT	1098.97		5300.00	5.97	3.21	1836.38	2.89	0.35	0.039	9522.72	10095.00
18.647	B3 MIXED	1098.97		5300.00	5.97	3.21	1836.38	2.89	0.35	0.039	9522.72	10095.00
18.647	SUBCRIT	1098.67		4200.00	5.67	3.06	1668.79	2.52	0.37	0.040	9549.72	10095.00
18.647	B3 MIXED	1098.67		4200.00	5.67	3.06	1668.79	2.52	0.37	0.040	9549.72	10095.00
18.647	SUBCRIT	1098.32		2800.00	5.32	2.89	1485.79	1.88	0.40	0.040	9580.81	10095.00
18.647	B3 MIXED	1098.32		2800.00	5.32	2.89	1485.79	1.88	0.40	0.040	9580.81	10095.00

HEC-RAS Reach: BUCKEYE #3 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (ft/s)	Trvl Time Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
18.557	SUBCRIT	1098.50		3300.00	5.50	2.74	1456.97	2.26	0.30	0.040	9557.84	10090.00
18.557	B3 MIXED	1098.50		3300.00	5.50	2.74	1456.97	2.26	0.30	0.040	9557.84	10090.00
18.557	SUBCRIT	1098.27		2700.00	5.27	2.60	1339.84	2.02	0.31	0.040	9574.61	10090.00
18.557	B3 MIXED	1098.27		2700.00	5.27	2.60	1339.84	2.02	0.31	0.040	9574.61	10090.00
18.557	SUBCRIT	1098.04		2100.00	5.04	2.46	1224.81	1.71	0.33	0.040	9591.63	10090.00
18.557	B3 MIXED	1098.04		2100.00	5.04	2.46	1224.81	1.71	0.33	0.040	9591.63	10090.00
18.465	SUBCRIT	1097.99		2400.00	4.99	2.13	1018.31	2.36	0.24	0.039	9616.36	10095.00
18.465	B3 MIXED	1097.99		2400.00	4.99	2.13	1018.31	2.36	0.24	0.039	9616.36	10095.00
18.465	SUBCRIT	1097.81		2100.00	4.81	2.04	932.68	2.25	0.25	0.039	9638.33	10095.00
18.465	B3 MIXED	1097.81		2100.00	4.81	2.04	932.68	2.25	0.25	0.039	9638.33	10095.00
18.465	SUBCRIT	1097.64		1800.00	4.64	1.97	860.39	2.09	0.26	0.039	9657.74	10095.00
18.465	B3 MIXED	1097.64		1800.00	4.64	1.97	860.39	2.09	0.26	0.039	9657.74	10095.00
18.36	SUBCRIT	1096.46		2300.00	3.46	1.36	611.96	3.76	0.19	0.046	9619.27	10068.66
18.36	B3 MIXED	1096.46		2300.00	3.46	1.36	611.96	3.76	0.19	0.046	9619.27	10068.66
18.36	SUBCRIT	1096.32		2000.00	3.32	1.27	552.81	3.62	0.20	0.046	9628.29	10064.65
18.36	B3 MIXED	1096.32		2000.00	3.32	1.27	552.81	3.62	0.20	0.046	9628.29	10064.65
18.36	SUBCRIT	1096.24		1800.00	3.24	1.21	516.88	3.48	0.20	0.045	9633.90	10062.16
18.36	B3 MIXED	1096.24		1800.00	3.24	1.21	516.88	3.48	0.20	0.045	9633.90	10062.16
18.289	SUBCRIT	1095.34		2300.00	3.34	1.99	1211.03	1.90	0.16	0.052	9447.87	10055.06
18.289	B3 MIXED	1095.34		2300.00	3.34	1.99	1211.03	1.90	0.16	0.052	9447.87	10055.06
18.289	SUBCRIT	1095.10		2000.00	3.10	1.80	1065.95	1.88	0.16	0.052	9461.79	10053.25
18.289	B3 MIXED	1095.10		2000.00	3.10	1.80	1065.95	1.88	0.16	0.052	9461.79	10053.25
18.289	SUBCRIT	1094.92		1800.00	2.92	1.66	961.15	1.87	0.16	0.052	9472.08	10051.90
18.289	B3 MIXED	1094.92		1800.00	2.92	1.66	961.15	1.87	0.16	0.052	9472.08	10051.90
18.2	SUBCRIT	1094.45		2300.00	4.45	2.38	1009.35	2.28	0.09	0.051	9628.98	10052.25
18.2	B3 MIXED	1094.45		2300.00	4.45	2.38	1009.35	2.28	0.09	0.051	9628.98	10052.25
18.2	SUBCRIT	1094.19		2000.00	4.19	2.37	904.55	2.21	0.10	0.051	9670.03	10050.95
18.2	B3 MIXED	1094.19		2000.00	4.19	2.37	904.55	2.21	0.10	0.051	9670.03	10050.95
18.2	SUBCRIT	1094.00		1800.00	4.00	2.38	833.63	2.16	0.10	0.051	9700.25	10049.98
18.2	B3 MIXED	1094.00		1800.00	4.00	2.38	833.63	2.16	0.10	0.051	9700.25	10049.98
18.143	SUBCRIT	1093.69		2300.00	3.69	2.31	812.93	2.83	0.06	0.051	9699.37	10050.54
18.143	B3 MIXED	1093.69		2300.00	3.69	2.31	812.93	2.83	0.06	0.051	9699.37	10050.54
18.143	SUBCRIT	1093.45		2000.00	3.45	2.21	733.94	2.73	0.06	0.051	9717.30	10049.09
18.143	B3 MIXED	1093.45		2000.00	3.45	2.21	733.94	2.73	0.06	0.051	9717.30	10049.09
18.143	SUBCRIT	1093.29		1800.00	3.29	2.14	679.59	2.65	0.06	0.051	9730.27	10048.04
18.143	B3 MIXED	1093.29		1800.00	3.29	2.14	679.59	2.65	0.06	0.051	9730.27	10048.04

HEC-RAS Reach: BUCKEYE # 3 (continued)

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River Sta.	Plan	W.S. Elev (ft)	Crit W.S. (ft)	Q Total (cfs)	Max Chl Dpth (ft)	Hydr Depth (ft)	Area (sq ft)	Vel Total (f/s)	Trvl Tme Avg (hrs)	Wtd. n Chnl	Sta W.S. Lft (ft)	Sta W.S. Rgt (ft)
18.072	SUBCRIT	1090.23	1090.23	2300.00	2.23	1.53	326.41	7.05	0.04	0.052	9824.02	10037.52
18.072	B3 MIXED	1090.23	1090.23	2300.00	2.23	1.53	326.41	7.05	0.04	0.052	9824.02	10037.52
18.072	SUBCRIT	1090.03	1090.03	2000.00	2.03	1.51	286.02	6.99	0.04	0.052	9847.08	10036.39
18.072	B3 MIXED	1090.03	1090.03	2000.00	2.03	1.51	286.02	6.99	0.04	0.052	9847.08	10036.39
18.072	SUBCRIT	1089.90	1089.90	1800.00	1.90	1.45	262.92	6.85	0.04	0.052	9853.98	10035.69
18.072	B3 MIXED	1089.90	1089.90	1800.00	1.90	1.45	262.92	6.85	0.04	0.052	9853.98	10035.69
17.952	SUBCRIT	1089.37	1084.27	2300.00	7.87	6.63	2598.89	2.27	0.00	0.035	9947.48	10731.70
17.952	B3 MIXED	1089.37	1084.27	2300.00	7.87	6.63	2598.89	2.27	0.00	0.035	9947.48	10731.70
17.952	SUBCRIT	1089.03	1084.08	2000.00	7.53	6.35	2340.06	2.08	0.00	0.035	9948.84	10673.82
17.952	B3 MIXED	1089.03	1084.08	2000.00	7.53	6.35	2340.06	2.08	0.00	0.035	9948.84	10673.82
17.952	SUBCRIT	1088.10	1083.95	1800.00	6.60	5.56	1738.15	2.19	0.00	0.035	9952.54	10516.17
17.952	B3 MIXED	1088.10	1083.95	1800.00	6.60	5.56	1738.15	2.19	0.00	0.035	9952.54	10516.17
17.945	SUBCRIT	1088.64	1085.48	2300.00	7.54	7.54	769.31	6.89	0.00	0.016	9958.59	10240.00
17.945	B3 MIXED	1088.64	1085.48	2300.00	7.54	7.54	769.31	6.89	0.00	0.016	9958.59	10240.00
17.945	SUBCRIT	1088.45	1085.09	2000.00	7.35	7.35	719.82	6.14	0.00	0.016	9959.07	10198.43
17.945	B3 MIXED	1088.45	1085.09	2000.00	7.35	7.35	719.82	6.14	0.00	0.016	9959.07	10198.43
17.945	SUBCRIT	1087.47	1084.82	1800.00	6.37	6.37	562.38	6.38	0.00	0.016	9961.58	10094.01
17.945	B3 MIXED	1087.47	1084.82	1800.00	6.37	6.37	562.38	6.38	0.00	0.016	9961.58	10094.01

## NOTE

The following HEC-RAS flow distribution printouts are based on mixed flow regime. Hydraulic data in these tables may not be consistent with the mixed flow regime water surface elevations from the HEC-RAS summary table at some cross sections due to possible HEC-RAS data errors.

FLOW DIST 1 of 5  
FULL FLOW 1 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 20.009 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10300.00	100.00	1700.08	509.80	165843.6	3.35	10.41

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.991 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10310.00	100.00	1650.24	466.87	167350.5	3.55	10.73

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.938 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9523.20	9716.40	4.08	57.59	46.29	2414.4	1.25	12.54
9716.40	9909.60	25.53	306.40	193.20	15101.7	1.59	14.75
9909.60	10102.80	25.53	306.40	193.20	15101.8	1.59	14.75
10102.80	10296.00	44.86	418.54	180.87	26538.0	2.32	18.97

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.854 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9298.00	9596.00	0.24	14.78	27.91	312.5	0.53	2.82
9596.00	9894.00	4.14	204.39	268.89	5499.0	0.76	3.58
9894.00	10192.00	59.16	1050.69	298.09	78606.9	3.53	9.97
10192.00	10490.00	36.46	773.60	286.56	48449.0	2.70	8.34

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.775 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9280.00	9660.00	4.24	254.49	322.18	7024.6	0.79	2.95
9660.00	10040.00	43.54	1100.36	380.10	72198.6	2.90	7.00
10040.00	10420.00	51.18	1212.36	380.02	84869.3	3.19	7.47
10420.00	10800.00	1.04	79.40	143.46	1728.9	0.55	2.32

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.691 Profile: 1 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
8700.00	9136.00	0.00	0.13	6.42	0.3	0.02	0.22
9136.00	9572.00	20.18	803.92	436.03	39046.4	1.84	4.44
9572.00	10008.00	46.16	1320.60	436.01	89302.2	3.03	6.19
10008.00	10444.00	32.50	1069.84	436.01	62869.0	2.45	5.38
10444.00	10880.00	1.15	94.68	152.30	2227.5	0.62	2.15

FLOW DIST 2 of 15  
FULL FLOW 2 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.607 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8958.00	9456.00	5.17	352.35	400.91	10443.3	0.88	2.60
9456.00	9954.00	49.24	1485.11	498.01	99390.6	2.98	5.87
9954.00	10452.00	42.62	1361.87	498.00	86028.6	2.73	5.54
10452.00	10950.00	2.96	199.30	222.70	5978.5	0.89	2.63

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.529 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8575.00	9085.00	0.05	11.16	84.53	93.5	0.13	0.83
9085.00	9595.00	21.31	844.21	510.01	38159.7	1.66	4.47
9595.00	10105.00	53.35	1464.19	510.00	95540.1	2.87	6.45
10105.00	10615.00	25.22	934.02	510.02	45162.1	1.83	4.78
10615.00	11125.00	0.07	10.52	52.31	116.7	0.20	1.10

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.428 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8740.00	9222.00	10.55	533.79	457.69	19104.9	1.17	3.50
9222.00	9704.00	24.21	897.28	482.01	43861.2	1.86	4.78
9704.00	10186.00	41.99	1248.56	482.00	76070.9	2.59	5.95
10186.00	10668.00	22.46	857.70	482.00	40684.2	1.78	4.63
10668.00	11150.00	0.79	69.64	137.06	1432.5	0.51	2.01

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.332 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8930.00	9344.00	7.40	401.63	393.07	12881.5	1.02	3.26
9344.00	9758.00	38.23	1098.11	414.00	66523.3	2.65	6.16
9758.00	10172.00	44.41	1201.37	414.00	77272.3	2.90	6.54
10172.00	10586.00	9.95	457.43	349.18	17314.6	1.31	3.85

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.238 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9040.00	9414.00	11.42	498.34	345.91	19678.0	1.44	4.06
9414.00	9788.00	37.05	1041.58	374.00	63825.2	2.78	6.30
9788.00	10162.00	35.13	1008.75	374.00	60507.8	2.70	6.16
10162.00	10536.00	15.28	612.23	374.00	26324.7	1.64	4.42
10536.00	10910.00	1.12	76.47	104.20	1926.1	0.73	2.59

Flow DIST 3 of 5

Full Flow 3 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.156 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8920.00	9368.00	9.24	573.79	436.48	21315.7	1.31	2.85
9368.00	9816.00	24.51	1041.12	448.00	56546.4	2.32	4.17
9816.00	10264.00	40.51	1407.53	448.00	93468.6	3.14	5.09
10264.00	10712.00	20.57	937.15	448.00	47451.6	2.09	3.88
10712.00	11160.00	5.17	376.28	363.24	11925.6	1.04	2.43

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.062 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8800.00	9346.00	0.08	9.37	54.77	89.4	0.17	1.55
9346.00	9892.00	20.04	636.34	546.00	21815.8	1.17	5.57
9892.00	10438.00	53.42	1146.03	546.00	58159.1	2.10	8.25
10438.00	10984.00	21.01	654.79	546.00	22880.2	1.20	5.68
10984.00	11530.00	5.45	257.98	402.77	5934.1	0.64	3.74

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.96 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9234.00	9738.00	1.16	68.74	166.35	1288.0	0.41	2.98
9738.00	10242.00	15.62	595.69	504.00	17363.0	1.18	4.64
10242.00	10746.00	44.08	981.98	504.00	49010.1	1.95	7.95
10746.00	11250.00	0.02	823.71	408.87	19.2	2.01	0.00

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.892 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9671.00	9.26	668.31	361.82	33976.3	1.85	2.29
9671.00	10043.00	28.97	1339.80	372.01	106309.8	3.60	3.57
10043.00	10415.00	3.87	1991.08	373.81	14190.8	5.35	0.32

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.818 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8956.00	9242.00	0.18	34.32	78.60	667.0	0.44	0.63
9242.00	9528.00	9.90	634.05	286.01	36405.4	2.22	1.87
9528.00	9814.00	30.00	1232.73	286.01	110256.0	4.31	2.92
9814.00	10100.00	5.20	1717.15	288.23	19130.1	6.00	0.36

Flow Dist 4 of 5  
Full Flow 4 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.725 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9187.00	9414.00	0.11	18.78	55.67	307.4	0.34	0.46
9414.00	9641.00	7.79	429.69	227.01	22203.9	1.89	1.45
9641.00	9868.00	32.75	1016.98	227.02	93330.4	4.48	2.58
9868.00	10095.00	5.63	1322.59	229.10	16052.7	5.83	0.34

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.647 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9471.00	9679.00	2.73	145.85	156.29	4703.7	0.93	0.99
9679.00	9887.00	34.87	754.19	208.02	60108.6	3.63	2.45
9887.00	10095.00	11.00	936.34	209.62	18952.4	4.50	0.62

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.557 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9538.00	9722.00	4.31	159.31	164.17	5273.5	0.97	0.89
9722.00	9906.00	31.51	550.47	184.02	38595.1	2.99	1.89
9906.00	10090.00	7.55	747.18	185.15	9243.0	4.06	0.33

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.465 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9491.00	9642.00	0.03	2.74	25.64	20.8	0.11	0.23
9642.00	9793.00	4.89	127.26	151.01	3834.4	0.84	0.92
9793.00	9944.00	29.96	377.40	151.03	23469.9	2.50	1.91
9944.00	10095.00	7.56	510.90	151.67	5925.4	3.38	0.36

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.36 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9540.00	9680.00	0.92	20.65	60.73	282.0	0.34	1.03
9680.00	9820.00	3.54	64.64	140.00	1082.5	0.46	1.26
9820.00	9960.00	36.64	262.82	140.02	11211.9	1.88	3.21
9960.00	10100.00	0.35	263.85	108.78	107.6	2.43	0.03

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.289 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9498.00	0.60	21.85	50.14	352.2	0.44	0.63
9498.00	9697.00	19.03	302.87	199.00	11234.9	1.52	1.45
9697.00	9896.00	33.22	423.13	199.00	19616.0	2.13	1.81
9896.00	10095.00	4.21	463.17	159.29	2488.1	2.91	0.21

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.2 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9572.00	9748.00	1.49	55.38	119.03	932.2	0.47	0.62
9748.00	9924.00	37.66	450.33	176.02	23616.8	2.56	1.92
9924.00	10100.00	10.70	503.64	128.60	6707.9	3.93	0.49

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.143 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9635.00	9790.00	2.22	52.99	90.64	1038.8	0.58	0.96
9790.00	9945.00	49.12	420.94	155.04	22968.1	2.72	2.68
9945.00	10100.00	9.12	339.01	105.77	4266.0	3.21	0.62

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.072 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9772.00	9936.00	24.36	114.37	112.01	3251.3	1.02	4.90
9936.00	10100.00	4.71	212.05	101.72	628.9	2.09	0.51

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.952 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10030.00	59.06	154.92	62.65	12027.6	2.49	8.77
10030.00	11850.00	40.94	129.99	70.00	8337.7	1.86	7.24

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.945 Profile: 1 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9977.70	10022.00	100.00	334.00	44.30	119260.0	7.54	6.89

FLOW DIST 6 of 15  
2/3 FLOW 1 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 20.009 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10300.00	100.00	1210.31	413.33	108261.7	2.94	9.75

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.991 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10310.00	100.00	1211.56	413.35	108446.8	2.94	9.74

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.938 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9330.00	9523.20	21.09	367.95	133.43	26223.4	2.76	6.76
9523.20	9716.40	15.15	349.89	193.37	18829.6	1.81	5.11
9716.40	9909.60	17.88	386.42	193.20	22231.9	2.00	5.46
9909.60	10102.80	17.88	386.42	193.20	22232.1	2.00	5.46
10102.80	10296.00	27.99	493.42	181.80	34795.3	2.72	6.69

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.854 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9596.00	9894.00	0.37	11.31	34.70	173.0	0.33	3.81
9894.00	10192.00	68.74	619.37	298.09	32577.6	2.08	13.10
10192.00	10490.00	30.89	369.51	272.01	14640.6	1.36	9.87

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.775 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9280.00	9660.00	1.56	85.79	185.54	1657.1	0.46	2.15
9660.00	10040.00	44.04	847.97	380.10	46766.9	2.23	6.13
10040.00	10420.00	54.16	959.97	380.02	57516.7	2.53	6.66
10420.00	10800.00	0.24	17.04	53.83	255.7	0.32	1.67

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.691 Profile: 2 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9136.00	9572.00	19.89	573.11	352.37	25603.8	1.63	4.10
9572.00	10008.00	48.65	1067.21	436.01	62612.1	2.45	5.38
10008.00	10444.00	31.13	816.45	436.01	40066.9	1.87	4.50
10444.00	10880.00	0.32	26.85	81.11	415.1	0.33	1.42

FLOW DIST 7 of 15  
2/3 FLOW 2 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.607 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8958.00	9456.00	2.72	153.83	255.80	3540.2	0.60	2.08
9456.00	9954.00	52.29	1184.01	498.01	68130.4	2.38	5.21
9954.00	10452.00	43.53	1060.77	498.00	56726.7	2.13	4.84
10452.00	10950.00	1.46	86.13	151.65	1908.1	0.57	2.01

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.529 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9085.00	9595.00	19.88	590.52	428.92	23607.6	1.38	3.97
9595.00	10105.00	57.77	1200.23	510.00	68595.4	2.35	5.68
10105.00	10615.00	22.35	670.92	495.04	26541.5	1.36	3.93

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.428 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8740.00	9222.00	7.61	342.61	452.42	9194.6	0.76	2.62
9222.00	9704.00	23.71	694.76	482.01	28636.9	1.44	4.03
9704.00	10186.00	46.89	1046.04	482.00	56639.1	2.17	5.29
10186.00	10668.00	21.50	655.18	482.00	25969.7	1.36	3.87
10668.00	11150.00	0.29	23.97	80.34	345.8	0.30	1.41

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.332 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8930.00	9344.00	3.63	208.22	388.09	4346.6	0.54	2.06
9344.00	9758.00	39.38	893.09	414.00	47139.2	2.16	5.20
9758.00	10172.00	47.26	996.34	414.00	56568.6	2.41	5.60
10172.00	10586.00	9.73	311.19	241.47	11651.3	1.29	3.69

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.238 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9040.00	9414.00	8.85	337.84	342.38	10365.6	0.99	3.09
9414.00	9788.00	40.15	867.14	374.00	47023.6	2.32	5.46
9788.00	10162.00	37.64	834.31	374.00	44094.1	2.23	5.32
10162.00	10536.00	12.85	437.79	374.00	15052.5	1.17	3.46
10536.00	10910.00	0.51	33.86	78.54	598.0	0.43	1.78

FLOW DIST 3 of 15  
2/3 FLOW 3 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.156 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8920.00	9368.00	6.81	382.82	429.85	10969.6	0.89	2.10
9368.00	9816.00	24.72	843.59	448.00	39821.9	1.88	3.46
9816.00	10264.00	45.10	1210.00	448.00	72646.0	2.70	4.40
10264.00	10712.00	19.86	739.62	448.00	31982.8	1.65	3.17
10712.00	11160.00	3.50	226.82	314.73	5644.0	0.72	1.82

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.062 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8800.00	9346.00	0.00	0.04	3.77	0.1	0.01	0.26
9346.00	9892.00	17.60	462.31	546.00	12809.1	0.85	4.49
9892.00	10438.00	60.72	972.01	546.00	44198.3	1.78	7.37
10438.00	10984.00	18.78	480.76	546.00	13672.4	0.88	4.61
10984.00	11530.00	2.90	134.43	372.49	2109.5	0.36	2.54

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.96 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9234.00	9738.00	0.12	12.78	128.38	92.7	0.10	1.15
9738.00	10242.00	12.75	404.29	504.00	9469.9	0.80	3.72
10242.00	10746.00	46.03	790.58	504.00	34200.3	1.57	6.87
10746.00	11250.00	0.00	669.17	405.05	0.3	1.65	0.00

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.892 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9671.00	7.50	463.97	295.38	21172.6	1.57	1.86
9671.00	10043.00	27.44	1108.30	372.01	77494.0	2.98	2.85
10043.00	10415.00	2.83	1759.58	373.19	8002.7	4.73	0.19

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.818 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8956.00	9242.00	0.02	6.27	33.59	69.1	0.19	0.32
9242.00	9528.00	7.83	491.02	286.01	23774.9	1.72	1.40
9528.00	9814.00	29.58	1089.69	286.01	89769.8	3.81	2.39
9814.00	10100.00	4.67	1574.11	287.73	14184.0	5.50	0.26

FLOW DIST 9 of 15  
2/3 FLOW 4 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.725 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9187.00	9414.00	0.01	3.48	23.95	32.4	0.15	0.23
9414.00	9641.00	6.18	342.40	227.01	15207.8	1.51	1.10
9641.00	9868.00	32.66	929.70	227.02	80365.4	4.10	2.14
9868.00	10095.00	5.07	1235.30	228.72	12466.8	5.44	0.25

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.647 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9471.00	9679.00	1.99	103.03	129.29	2990.5	0.80	0.81
9679.00	9887.00	34.61	691.81	208.02	52052.6	3.33	2.10
9887.00	10095.00	9.93	873.96	209.32	14932.5	4.20	0.48

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.557 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9538.00	9722.00	3.45	124.48	147.40	3755.8	0.84	0.75
9722.00	9906.00	31.11	509.32	184.02	33907.6	2.77	1.65
9906.00	10090.00	6.77	706.03	184.92	7381.7	3.84	0.26

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.465 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9491.00	9642.00	0.00	0.06	3.67	0.1	0.02	0.06
9642.00	9793.00	3.66	99.61	151.01	2549.1	0.66	0.77
9793.00	9944.00	29.67	349.75	151.03	20674.8	2.32	1.78
9944.00	10095.00	6.53	483.25	151.49	4550.9	3.20	0.28

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.36 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9540.00	9680.00	0.54	13.14	51.71	147.8	0.25	0.83
9680.00	9820.00	2.25	45.94	140.00	612.8	0.33	0.98
9820.00	9960.00	36.48	244.12	140.02	9914.4	1.74	2.99
9960.00	10100.00	0.16	249.61	104.77	42.6	2.39	0.01

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.289 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9498.00	0.30	11.40	36.22	148.0	0.31	0.53
9498.00	9697.00	17.24	254.70	199.00	8417.6	1.28	1.35
9697.00	9896.00	32.85	374.96	199.00	16037.2	1.88	1.75
9896.00	10095.00	4.17	424.89	157.46	2036.0	2.70	0.20

Flow DIST 10 of 15  
2/3 Flow 5 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.2 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9572.00	9748.00	0.81	29.71	77.98	437.7	0.38	0.54
9748.00	9924.00	36.31	404.46	176.02	19745.3	2.30	1.80
9924.00	10100.00	10.68	470.38	127.27	5807.4	3.71	0.45

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.143 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9635.00	9790.00	1.42	34.10	72.71	577.1	0.47	0.83
9790.00	9945.00	48.77	385.08	155.04	19800.9	2.48	2.53
9945.00	10100.00	8.93	314.76	104.30	3627.8	3.02	0.57

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.072 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9772.00	9936.00	24.24	94.22	88.95	2745.0	1.06	5.15
9936.00	10100.00	4.32	191.80	100.57	488.9	1.91	0.45

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.952 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10030.00	60.42	143.12	61.87	10628.4	2.33	8.44
10030.00	11850.00	39.58	116.66	70.00	6961.2	1.67	6.79

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.945 Profile: 2 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9977.70	10022.00	100.00	325.58	44.30	114291.4	7.35	6.14

FLOW DIST 11 of 15  
 1/3 FLOW 1 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 20.009 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10300.00	100.00	758.37	408.40	50072.4	1.86	7.78

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.991 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9786.00	10310.00	100.00	846.17	409.36	60007.4	2.07	6.97

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.938 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9523.20	9716.40	3.67	41.79	41.78	1515.0	1.00	5.17
9716.40	9909.60	23.82	237.02	193.20	9844.1	1.23	5.93
9909.60	10102.80	23.82	237.02	193.20	9844.2	1.23	5.93
10102.80	10296.00	48.69	353.90	180.07	20124.0	1.97	8.12

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.854 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9596.00	9894.00	0.17	4.93	19.31	64.2	0.26	2.05
9894.00	10192.00	71.17	548.91	298.09	26638.0	1.84	7.65
10192.00	10490.00	28.65	305.49	269.64	10724.6	1.13	5.53

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.775 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9280.00	9660.00	0.05	2.49	14.56	24.8	0.17	1.17
9660.00	10040.00	41.09	514.24	372.83	20582.6	1.38	4.71
10040.00	10420.00	58.86	628.55	359.14	29487.1	1.75	5.53

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.691 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
9136.00	9572.00	22.65	337.50	230.70	14049.5	1.46	3.96
9572.00	10008.00	51.44	712.16	436.01	31906.1	1.63	4.26
10008.00	10444.00	25.92	462.86	415.18	16075.5	1.11	3.30

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.607 Profile: 3 7/28/96

Left Sta	Right Sta	%Q	Area	W.P.	Conv.	Hydr D.	Velocity
(ft)	(ft)		(sq ft)	(ft)	(cfs)	(ft)	(ft/s)
8958.00	9456.00	0.57	25.89	92.44	358.0	0.28	1.29
9456.00	9954.00	56.52	803.95	498.01	35737.7	1.61	4.15
9954.00	10452.00	42.83	680.71	498.00	27082.3	1.37	3.71
10452.00	10950.00	0.09	6.53	47.45	56.2	0.14	0.80

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.529 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9085.00	9595.00	19.92	338.03	303.34	11736.5	1.11	3.48
9595.00	10105.00	63.16	831.49	510.00	37206.1	1.63	4.48
10105.00	10615.00	16.92	345.17	408.43	9966.6	0.85	2.89

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.428 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9222.00	9704.00	23.66	416.27	369.07	14570.1	1.13	3.35
9704.00	10186.00	57.77	791.39	482.00	35578.4	1.64	4.31
10186.00	10668.00	18.57	400.53	482.00	11435.5	0.83	2.74
10668.00	11150.00	0.00	0.35	9.50	1.2	0.04	0.34

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.332 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8930.00	9344.00	0.13	6.86	45.36	61.5	0.15	1.08
9344.00	9758.00	37.56	507.69	414.00	18389.0	1.23	4.37
9758.00	10172.00	51.14	610.94	414.00	25036.0	1.48	4.94
10172.00	10586.00	11.18	155.94	133.36	5471.8	1.17	4.23

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.238 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9040.00	9414.00	6.51	170.82	214.76	4539.5	0.80	2.25
9414.00	9788.00	44.40	674.66	374.00	30948.7	1.80	3.88
9788.00	10162.00	40.86	641.83	374.00	28479.7	1.72	3.76
10162.00	10536.00	8.22	245.31	374.00	5732.6	0.66	1.98
10536.00	10910.00	0.01	1.39	30.72	5.4	0.05	0.33

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.156 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
8920.00	9368.00	1.37	94.13	419.64	1075.8	0.22	0.86
9368.00	9816.00	24.10	539.09	448.00	18880.2	1.20	2.64
9816.00	10264.00	57.21	905.50	448.00	44811.0	2.02	3.73
10264.00	10712.00	16.87	435.12	448.00	13210.5	0.97	2.29
10712.00	11160.00	0.45	38.31	239.96	349.0	0.16	0.69

Flow Dist 13 of 15  
 1/3 Flow 3 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 19.062 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9346.00	9892.00	15.66	339.16	499.55	8110.4	0.68	2.72
9892.00	10438.00	67.56	844.97	546.00	34996.7	1.55	4.72
10438.00	10984.00	15.83	353.73	546.00	8198.6	0.65	2.64
10984.00	11530.00	0.95	51.72	303.42	492.3	0.17	1.08

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.96 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9234.00	9738.00	0.02	4.33	121.61	15.8	0.04	0.31
9738.00	10242.00	12.07	370.21	504.00	8269.3	0.73	1.92
10242.00	10746.00	46.39	756.50	504.00	31789.7	1.50	3.62
10746.00	11250.00	0.00	641.80	404.37	0.0	1.59	0.00

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.892 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9671.00	4.26	237.30	242.71	7894.4	0.98	1.06
9671.00	10043.00	24.06	794.88	372.01	44532.2	2.14	1.79
10043.00	10415.00	1.09	1446.16	372.34	2019.1	3.89	0.04

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.818 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9242.00	9528.00	5.05	308.50	261.07	11644.7	1.18	0.85
9528.00	9814.00	28.47	903.71	286.01	65716.8	3.16	1.64
9814.00	10100.00	3.73	1388.13	287.08	8610.2	4.85	0.14

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.725 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9414.00	9641.00	4.20	234.26	211.10	8479.6	1.11	0.70
9641.00	9868.00	32.26	820.02	227.02	65194.2	3.61	1.53
9868.00	10095.00	4.18	1125.63	228.24	8456.8	4.96	0.14

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.647 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9471.00	9679.00	1.27	63.74	98.20	1613.5	0.65	0.56
9679.00	9887.00	34.11	619.95	208.02	43357.4	2.98	1.54
9887.00	10095.00	8.47	802.10	208.97	10772.6	3.86	0.30

Flow DIST 14 of 15  
 1/3 FLOW 4 of 5

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.557 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9538.00	9722.00	2.60	92.96	130.38	2505.6	0.71	0.59
9722.00	9906.00	30.57	467.57	184.02	29402.4	2.54	1.37
9906.00	10090.00	5.88	664.28	184.70	5661.0	3.61	0.19

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.465 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9642.00	9793.00	2.80	76.22	135.26	1756.1	0.56	0.66
9793.00	9944.00	29.21	325.33	151.03	18325.0	2.15	1.62
9944.00	10095.00	5.51	458.83	151.32	3457.3	3.04	0.22

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.36 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9540.00	9680.00	0.34	9.08	46.10	86.1	0.20	0.68
9680.00	9820.00	1.49	34.30	140.00	376.6	0.25	0.78
9820.00	9960.00	36.26	232.48	140.02	9139.2	1.66	2.81
9960.00	10100.00	0.08	241.01	102.28	19.2	2.36	0.01

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.289 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9299.00	9498.00	0.14	5.84	25.93	60.7	0.23	0.45
9498.00	9697.00	15.64	219.09	199.00	6548.9	1.10	1.28
9697.00	9896.00	32.43	339.35	199.00	13579.9	1.71	1.72
9896.00	10095.00	4.15	396.87	156.10	1737.4	2.55	0.19

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.2 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9572.00	9748.00	0.52	17.53	47.75	252.1	0.37	0.53
9748.00	9924.00	35.02	370.28	176.02	17043.2	2.10	1.70
9924.00	10100.00	10.65	445.82	126.28	5181.6	3.54	0.43

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.143 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9635.00	9790.00	0.94	23.02	59.74	341.8	0.39	0.73
9790.00	9945.00	48.36	359.14	155.04	17628.1	2.32	2.42
9945.00	10100.00	8.78	297.43	103.25	3201.4	2.89	0.53

Flow Dist 15 of 15  
1/3 Flow 5 of 15

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 18.072 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9772.00	9936.00	23.60	83.63	82.04	2375.0	1.02	5.08
9936.00	10100.00	4.10	179.29	99.86	412.5	1.80	0.41

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.952 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9920.00	10030.00	61.56	134.81	61.31	9677.1	2.21	8.22
10030.00	11850.00	38.44	107.15	70.00	6042.1	1.53	6.46

Plan: B3 MIXED Reach: BUCKEYE # 3 Riv Sta: 17.945 Profile: 3 7/28/96

Left Sta (ft)	Right Sta (ft)	%Q	Area (sq ft)	W.P. (ft)	Conv. (cfs)	Hydr D. (ft)	Velocity (ft/s)
9977.70	10022.00	100.00	282.16	44.30	90038.1	6.37	6.38

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 \* HEC-2 WATER SURFACE PROFILES \*  
 \* \*  
 \* Version 4.6.2; May 1991 \*  
 \* \*  
 \* RUN DATE 28JUL96 TIME 09:30:41 \*  
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 \* U.S. ARMY CORPS OF ENGINEERS \*  
 \* HYDROLOGIC ENGINEERING CENTER \*  
 \* 609 SECOND STREET, SUITE D \*  
 \* DAVIS, CALIFORNIA 95616-4687 \*  
 \* (916) 756-1104 \*  
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PAGE 1

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 HEC-2 WATER SURFACE PROFILES  
 Version 4.6.2; May 1991  
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*BUCKEYE STRUCTURE 3*

T1 DELINEATION OF SPILLWAY FLOWS STANLEY CONSULTANTS # 13084  
 T2 FOR BUCKEYE STRUCTURES 1, 2 AND 3 CONTRACT FCD 95-34  
 T3 BUCKEYE STRUCTURE 3 INPUT FILENAME: 13084B3D.H2  
 T4

T4 PURPOSE OF MODEL IS TO PROVIDE BASIC MODEL GEOMETRY AND ASSOCIATED DATA  
 T4 FOR IMPORT INTO HEC-RAS. THIS MODEL IS IDENTICAL TO 13084B3C.H2 WITH THE  
 T4 EXCEPTION OF:  
 T4 1. THE I-10 WEIR/SPLITFLOW WHICH HAS BEEN REMOVED;  
 T4 2. CROSS SECTIONS DOWNSTREAM FROM 17.945 WHICH HAVE BEEN REMOVED;

T4 MODEL ASSUMPTIONS AND APPROACH AS FOLLOWS:  
 T4 1. EXIST CMP CULVERTS UNDER I-10 NOT REFLECTED IN SPLITFLOW.  
 T4 2. EXIST EARTH DIKES PROJECTING NORTH FROM I-10 ASSUMED WASHED OUT.  
 T4 3. CHANNEL BANK STATIONS CORRESPOND TO BEGINNING AND ENDING GR STATIONS.  
 T4 4. "n" VALUES ENTERED VIA BOTH NH AND NC RECORD.  
 T4 5. TYPE 1 ENCROACHMENT USED TO BLOCK OUT INEFFECTIVE FLOW AREA.  
 T4 6. KNOWN WATER SURFACE ELEV OPTION IS USED TO START EACH PROFILE WITH  
 T4 WATER SURFACE ELEVS TAKEN FROM MODEL 13084B3C.H2 OUTPUT.  
 T4 7. DISCHARGE RATES REFLECTING THE I-10 WEIR/SPLITFLOW HAVE BEEN TAKEN  
 T4 FROM 13084B3C.H2 OUTPUT. DISCHARGES HAVE BEEN ROUNDED TO THE NEAREST  
 T4 100 CFS.  
 T4 8. "n" VALUES AND EFFECTIVE FLOW AREA FROM THE ORIGINAL WLB WHITE TANKS/  
 T4 AGUA FRIA ADMS TUTHILL DIKE WASH MODEL 5.H21 HAVE BEEN MODIFIED  
 T4 SLIGHTLY AT CROSS SECTIONS 17.945 AND 17.952. THESE TWO CROSS SECTNS  
 T4 CORRESPOND TO WLB CROSS SECTIONS 1.110 AND 1.118 RESPECTIVELY.

T4 GENERAL MODEL NOTES:  
 T4 1. CROSS SECTION DATA DEVELOPED FROM COOPER AERIAL/WESTERN AIR MAPS  
 T4 2 FT CONTOUR MAPPING FOR WHITE TANKS/AGUA FRIA ADMS (FCD 89-50).  
 T4 VERT DATUM: NGVD 29. HORIZ DATUM: NAD 27.  
 T4 2. CROSS SECTIONS ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.  
 T4 3. CENTER LINE OF LEVEL BUCKEYE STRUCTURE SPILLWAY CREST (ACCORDING TO  
 T4 ORIGINAL SCS CONSTRUCTION PLANS) CORRESPONDS TO RIVER MILE 20.000.  
 T4 4. HYDRAULIC BASELINE CORRESPONDS TO CROSS SECTION GR STA 10,000.  
 T4 5. PROFILE 1: FULL SPILLWAY DISCHARGE  
 T4 PROFILE 2: 2/3 SPILLWAY DISCHARGE  
 T4 PROFILE 3: 1/3 SPILLWAY DISCHARGE  
 T4

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		4							1088.64	
J2	NPROF	IPLLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1		-1							

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PAGE 2

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	2	13	55	16	14	26	17
15	56	18		38	43	1	25	42	8
39	27	53	54	28	4	37		38	43
1	68	50	3	61	27	21	23	24	22
28									

J5 LPRNT NUMSEC \*\*\*\*\*REQUESTED SECTION NUMBERS\*\*\*\*\*  
 -10 -10  
 NC 0.035 0.035 0.016 .1 .3

QT	3			2300	2100	1800					
ET				9.1	9.1	9.1			9977.7	10022	
X1	17.945	8	9977.7	10022.0							
GR	1092	9950	1081.16	9977.7	1081.1	9978.6	1081.1	10000	1081.1	10021.	
GR	1081.1	10022	1088	10100	1096	11850					
NC	0.035	0.035	0.035								
ET				9.1	9.1	9.1			9920	10100	
X1	17.952	13	9920	10030	40	40	40				
GR	1096	9500	1094	9860	1091.5	9920	1090	9945	1081.52	9978.6	
GR	1081.5	10000	1081.5	10021.	1081.5	10021.4	1082	10030	1084	10200	
GR	1086	10260	1088	10500	1096	11850					
NH	3	.053	10025	.035	10070	.016	10100				
X1	18.072	9	9280	10100			635				
GR	1098.0	9280	1096.0	9420	1094.0	9550	1092.0	9620	1090.0	9850	
GR	1088.0	9930	1088.0	10025	1096.0	10070	1098.5	10100			
NH	3	.053	10020	.035	10065	.016	10100				
X1	18.143	10	9325	10100			375				
GR	1100.0	9325	1098.0	9435	1096.0	9595	1094.0	9675	1092.0	9830	
GR	1090.0	9890	1090.0	10020	1092.0	10040	1096.0	10065	1098.0	10100	
NH	3	.053	10020	.035	10060	.016	10100				
X1	18.200	9	9220	10100			300				
GR	1098.0	9220	1096.0	9385	1094.0	9700	1092.0	9830	1090.0	9955	
GR	1090.0	10020	1092.0	10040	1096.0	10060	1097.5	10100			

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NH	3	.053	10030	.035	10060	.016	10095				
X1	18.289	12	9100	10095			470				
GR	1102.0	9100	1100.0	9135	1100.0	9235	1098.0	9340	1096.0	9410	
GR	1094.0	9525	1093.0	9875	1092.0	9965	1092.0	10030	1094.0	10045	
GR	1096.0	10060	1097.5	10095							
NH	3	.053	10000	.035	10055	.016	10100				
X1	18.360	11	9400	10100			375				
GR	1100.0	9400	1098.0	9515	1096.0	9650	1096.0	9710	1096.0	9740	
GR	1096.0	9810	1094.0	9920	1093.0	10000	1094.0	10035	1096.0	10055	
GR	1097.5	10100									
NH	3	.044	10000	.035	10050	.016	10095				
QT	3			2400	2100	1800					
X1	18.465	9	9340	10095			555				
GR	1102.0	9340	1100.0	9485	1098.0	9615	1096.0	9855	1094.0	9940	
GR	1093.0	10000	1094.0	10035	1096.0	10050	1097.5	10095			
NH	3	.044	10000	.035	10050	.016	10090				
QT	3			3300	2700	2100					
X1	18.557	10	9170	10090			485				
GR	1104.0	9170	1102.0	9320	1100.0	9445	1098.0	9595	1096.0	9780	
GR	1094.0	9925	1093.0	10000	1094.0	10030	1096.0	10050	1097.5	10090	
NH	3	.044	10000	.035	10040	.016	10095				
QT	3			5300	4200	2800					
X1	18.647	10	9055	10095			475				
GR	1104.0	9055	1102.0	9255	1100.0	9430	1098.0	9610	1096.0	9740	
GR	1094.0	9870	1093.0	10000	1094.0	10020	1096.0	10040	1097.5	10095	
NH	3	.044	10000	.035	10060	.016	10095				
QT	3			8000	6100	3900					
X1	18.725	10	8960	10095			410				
GR	1104.0	8960	1102.0	9085	1100.0	9310	1098.0	9475	1096.0	9685	
GR	1094.0	9815	1092.0	10000	1094.0	10040	1096.0	10060	1097.5	10095	
NH	3	.044	10000	.035	10065	.016	10100				
QT	3			12000	8800	5200					
X1	18.818	11	8670	10100			490				
GR	1106.0	8670	1104.0	8840	1102.0	9020	1100.0	9160	1098.0	9340	
GR	1096.0	9620	1094.0	9910	1091.5	10000	1094.0	10045	1096.0	10065	
GR	1098.0	10100									
NH	3	.044	10325	.035	10370	.016	10415				
QT	3			16500	11500	5900					
X1	18.892	13	8555	10415			390				
GR	1108.0	8555	1106.0	8725	1104.0	8875	1102.0	9160	1100.0	9375	
GR	1098.0	9500	1098.0	9725	1096.0	10000	1094.0	10260	1094.0	10325	
GR	1096.0	10350	1098.0	10370	1099.0	10415					

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NH	5	.044	9780	.057	10250	.046	11150	.035	11170	.016	
NH	11250										
QT	3			17700	11800	5900					
X1	18.960	13	8730	11250			360				
GR	1108.0	8730	1106.0	9010	1104.0	9155	1102.0	9420	1100.0	9620	
GR	1100.0	9780	1099.0	10000	1099.0	10250	1098.0	10775	1098.0	10970	
GR	1100.0	11150	1102.0	11170	1103.5	11250					
NC			.048								
X1	19.062	10	8800	11530			540				
GR	1110.0	8800	1108.0	9050	1106.0	9370	1105.0	9750	1104.0	10020	
GR	1104.0	10065	1104.5	10250	1105.0	10450	1106.0	11340	1108.0	11530	
X1	19.156	11	8920	11160			495				

GR	1114.0	8920	1112.0	8950	1112.0	9175	1110.5	9750	1110.0	9875
GR	1110.0	10000	1110.0	10150	1110.5	10250	1112.0	10810	1112.0	10940
GR	1114.0	11160								
X1	19.238	13	9040	10910		435				
GR	1120.0	9040	1118.0	9060	1116.0	9075	1116.0	9190	1114.0	9460
GR	1114.0	9660	1114.5	9750	1114.0	9975	1114.0	10025	1115.0	10250
GR	1116.0	10590	1118.0	10700	1120.0	10910				
NC			.047							
X1	19.332	11	8930	11000		495				
GR	1126.0	8930	1124.0	8940	1122.0	8960	1122.0	9220	1120.0	9520
GR	1120.0	9750	1120.0	10000	1120.0	10250	1122.0	10325	1124.0	10760
GR	1126.0	11000								
NC			0.046							
ET						9.1			9325	11150
X1	19.428	15	8740	11150		505				
GR	1132.0	8740	1130.0	8750	1128.0	8775	1128.0	8960	1127.0	9170
GR	1128.0	9325	1126.5	9480	1126.5	9750	1126.0	9960	1126.0	10040
GR	1127.0	10250	1127.0	10560	1128.0	10690	1130.0	10960	1134.0	11150
X1	19.529	12	8575	11125		535				
GR	1138.0	8575	1136.0	8600	1134.0	9240	1132.0	9450	1132.0	9750
GR	1131.5	9920	1132.0	10040	1133.0	10250	1132.0	10340	1134.0	10570
GR	1136.0	10830	1138.0	11125						
X1	19.607	12	8460	10950		410				
GR	1142.0	8460	1141.5	8575	1140.0	8840	1138.0	9320	1136.0	9650
GR	1136.0	9750	1135.5	9850	1136.0	9965	1136.0	10200	1138.0	10545
GR	1140.0	10780	1142.0	10950						
X1	19.691	14	8700	10880		445				
GR	1146.0	8700	1144.0	9030	1142.0	9340	1140.0	9410	1141.0	9685
GR	1140.0	9840	1140.0	9945	1139.5	9975	1139.5	10015	1140.0	10040
GR	1141.0	10250	1142.0	10430	1144.0	10675	1146.0	10880		

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ET				7.1	9.1		9300	10800	9570	10800
X1	19.775	22	8900	10800		445				
GR	1150.0	8900	1149.0	8975	1150.0	9060	1147.5	9200	1149.0	9300
GR	1147.0	9430	1148.0	9530	1148.5	9570	1148.0	9600	1146.0	9685
GR	1147.0	9750	1146.0	9790	1144.0	9860	1146.0	9915	1145.5	9950
GR	1145.0	10000	1144.0	10090	1144.0	10130	1145.0	10200	1146.0	10320
GR	1148.0	10490	1150.0	10800						
ET				7.1	7.1	9.1	9525	10490	9820	10490
X1	19.854	26	9000	10490		415				
GR	1155.0	9000	1154.0	9100	1153.0	9130	1154.0	9150	1154.0	9250
GR	1153.0	9350	1154.0	9420	1154.5	9525	1152.0	9590	1151.0	9625
GR	1152.0	9640	1153.0	9680	1152.0	9725	1152.0	9770	1153.0	9820
GR	1152.0	9870	1150.0	9900	1148.0	9930	1148.0	9950	1149.0	10000
GR	1150.0	10120	1150.0	10250	1150.0	10385	1150.0	10450	1152.0	10470
GR	1154.0	10490								
NC			0.041							
ET					9.1	9.1			9665	10296
X1	19.938	16	9330	10296		445				
GR	1164.0	9330	1162.0	9390	1160.0	9440	1157.0	9470	1160.0	9550
GR	1159.0	9575	1160.0	9610	1162.0	9665	1160.0	9690	1160.0	9770
GR	1160.0	10000	1160.0	10180	1158.0	10215	1158.0	10250	1160.0	10280
GR	1168.0	10296								
NC			0.034							
X1	19.991	6	9786	10310		280				
GR	1170.0	9786	1163.0	9800	1163.0	10000	1163.0	10200	1166.0	10206
GR	1168.0	10310								
X1	20.009	6	9786	10300		100				
GR	1170.0	9786	1163.0	9800	1163.0	10000	1163.0	10200	1166.0	10206
GR	1167.0	10300								

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		5							1088.45	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
		2	-1							

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		6							1087.47	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE

\*\*\*\*\*  
 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

BUCKEYE STRUCTURE 3

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRISW	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN
	17.945	2300.00	1088.64	.00	.00	.00	.00	2300.00	6.89	16.00	.00	.00	.0
	17.945	2100.00	1088.45	.00	.00	.00	.00	2100.00	6.45	16.00	.00	.00	.0
	17.945	1800.00	1087.47	.00	.00	.00	.00	1800.00	6.38	16.00	.00	.00	.0
*	17.952	2300.00	1089.38	.00	.00	.00	.00	1187.17	2.26	35.00	1112.83	2.28	35.0
*	17.952	2100.00	1089.09	.00	.00	.00	.00	1084.26	2.16	35.00	1015.74	2.17	35.0
*	17.952	1800.00	1088.10	.00	.00	.00	.00	932.92	2.21	35.00	867.08	2.18	35.0
*	18.072	2300.00	1090.23	1090.23	.00	.00	.00	2300.00	7.03	51.94	.00	.00	.0
*	18.072	2100.00	1090.10	1090.10	.00	.00	.00	2100.00	7.00	51.95	.00	.00	.0
*	18.072	1800.00	1089.90	1089.90	.00	.00	.00	1800.00	6.84	51.99	.00	.00	.0
*	18.143	2300.00	1093.68	.00	.00	.00	.00	2300.00	2.83	51.10	.00	.00	.0
*	18.143	2100.00	1093.53	.00	.00	.00	.00	2100.00	2.76	51.13	.00	.00	.0
*	18.143	1800.00	1093.29	.00	.00	.00	.00	1800.00	2.65	51.17	.00	.00	.0
	18.200	2300.00	1094.45	.00	.00	.00	.00	2300.00	2.28	50.70	.00	.00	.0
	18.200	2100.00	1094.28	.00	.00	.00	.00	2100.00	2.23	50.75	.00	.00	.0
	18.200	1800.00	1094.00	.00	.00	.00	.00	1800.00	2.16	50.85	.00	.00	.0
	18.289	2300.00	1095.34	.00	.00	.00	.00	2300.00	1.91	52.14	.00	.00	.0
	18.289	2100.00	1095.19	.00	.00	.00	.00	2100.00	1.89	52.15	.00	.00	.0
	18.289	1800.00	1094.93	.00	.00	.00	.00	1800.00	1.87	52.17	.00	.00	.0
*	18.360	2300.00	1096.46	.00	.00	.00	.00	2300.00	3.74	43.45	.00	.00	.0
*	18.360	2100.00	1096.37	.00	.00	.00	.00	2100.00	3.67	43.22	.00	.00	.0
*	18.360	1800.00	1096.24	.00	.00	.00	.00	1800.00	3.48	42.84	.00	.00	.0
*	18.465	2400.00	1097.99	.00	.00	.00	.00	2400.00	2.36	36.68	.00	.00	.0
*	18.465	2100.00	1097.85	.00	.00	.00	.00	2100.00	2.20	36.72	.00	.00	.0
*	18.465	1800.00	1097.65	.00	.00	.00	.00	1800.00	2.09	36.76	.00	.00	.0

	SECNO	Q	CWSEL	CRISW	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN
*	18.557	3300.00	1098.50	.00	.00	.00	.00	3300.00	2.27	38.62	.00	.00	.0
*	18.557	2700.00	1098.30	.00	.00	.00	.00	2700.00	2.00	38.68	.00	.00	.0
*	18.557	2100.00	1098.05	.00	.00	.00	.00	2100.00	1.71	38.76	.00	.00	.0
	18.647	5300.00	1098.97	.00	.00	.00	.00	5300.00	2.89	38.67	.00	.00	.0
	18.647	4200.00	1098.69	.00	.00	.00	.00	4200.00	2.50	38.88	.00	.00	.0
	18.647	2800.00	1098.33	.00	.00	.00	.00	2800.00	1.88	39.15	.00	.00	.0
*	18.725	8000.00	1099.42	.00	.00	.00	.00	8000.00	2.87	39.93	.00	.00	.0
*	18.725	6100.00	1099.04	.00	.00	.00	.00	6100.00	2.42	40.00	.00	.00	.0
*	18.725	3900.00	1098.55	.00	.00	.00	.00	3900.00	1.79	40.12	.00	.00	.0
	18.818	12000.00	1099.96	.00	.00	.00	.00	12000.00	3.32	39.90	.00	.00	.0
	18.818	8800.00	1099.47	.00	.00	.00	.00	8800.00	2.78	39.87	.00	.00	.0
	18.818	5200.00	1098.81	.00	.00	.00	.00	5200.00	2.00	39.81	.00	.00	.0
	18.892	16500.00	1100.61	.00	.00	.00	.00	16500.00	4.13	41.85	.00	.00	.0
	18.892	11500.00	1100.00	.00	.00	.00	.00	11500.00	3.45	42.01	.00	.00	.0
	18.892	5900.00	1099.15	.00	.00	.00	.00	5900.00	2.38	42.13	.00	.00	.0
*	18.960	17700.00	1101.75	.00	.00	.00	.00	17700.00	3.88	45.85	.00	.00	.0
*	18.960	11800.00	1101.03	.00	.00	.00	.00	11800.00	3.51	45.40	.00	.00	.0
*	18.960	5900.00	1100.03	.00	.00	.00	.00	5900.00	3.31	42.40	.00	.00	.0
*	19.062	17700.00	1106.49	1106.49	.00	.00	.00	17700.00	6.56	48.00	.00	.00	.0
*	19.062	11800.00	1106.16	1106.16	.00	.00	.00	11800.00	5.83	48.00	.00	.00	.0
*	19.062	5900.00	1105.94	.00	.00	.00	.00	5900.00	3.73	48.00	.00	.00	.0
*	19.156	17700.00	1113.23	.00	.00	.00	.00	17700.00	4.08	48.00	.00	.00	.0
*	19.156	11800.00	1112.79	.00	.00	.00	.00	11800.00	3.45	48.00	.00	.00	.0
*	19.156	5900.00	1112.11	.00	.00	.00	.00	5900.00	2.92	48.00	.00	.00	.0
	19.238	17700.00	1116.92	.00	.00	.00	.00	17700.00	5.46	48.00	.00	.00	.0
	19.238	11800.00	1116.44	.00	.00	.00	.00	11800.00	4.72	48.00	.00	.00	.0
	19.238	5900.00	1115.92	1115.38	.00	.00	.00	5900.00	3.42	48.00	.00	.00	.0

19.332	17700.00	1122.91	.00	.00	.00	.00	17700.00	5.61	47.00	.00	.00	.0
19.332	11800.00	1122.42	.00	.00	.00	.00	11800.00	4.86	47.00	.00	.00	.0
19.332	5900.00	1121.48	.00	.00	.00	.00	5900.00	4.59	47.00	.00	.00	.0
19.428	17700.00	1128.85	1128.37	.00	.00	.00	17700.00	4.90	46.00	.00	.00	.0
19.428	11800.00	1128.42	.00	.00	.00	.00	11800.00	4.30	46.00	.00	.00	.0
19.428	5900.00	1127.89	.00	.00	.00	.00	5900.00	3.70	46.00	.00	.00	.0
19.529	17700.00	1134.75	1134.17	.00	.00	.00	17700.00	5.43	46.00	.00	.00	.0
19.529	11800.00	1134.24	1133.70	.00	.00	.00	11800.00	4.75	46.00	.00	.00	.0
19.529	5900.00	1133.52	.00	.00	.00	.00	5900.00	3.87	46.00	.00	.00	.0
19.607	17700.00	1139.10	1138.41	.00	.00	.00	17700.00	5.21	46.00	.00	.00	.0
19.607	11800.00	1138.49	1137.91	.00	.00	.00	11800.00	4.77	46.00	.00	.00	.0
19.607	5900.00	1137.73	.00	.00	.00	.00	5900.00	3.90	46.00	.00	.00	.0

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SECNO	Q	CWSEL	CRISW	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN
19.691	17700.00	1143.35	1142.62	.00	.00	.00	17700.00	5.40	46.00	.00	.00	.0
19.691	11800.00	1142.78	1142.11	.00	.00	.00	11800.00	4.73	46.00	.00	.00	.0
19.691	5900.00	1141.97	1141.47	.00	.00	.00	5900.00	3.87	46.00	.00	.00	.0
19.775	17700.00	1148.48	1148.06	.00	.00	.00	17700.00	6.68	46.00	.00	.00	.0
19.775	11800.00	1147.74	1147.39	.00	.00	.00	11800.00	6.58	46.00	.00	.00	.0
19.775	5900.00	1146.92	1146.56	.00	.00	.00	5900.00	5.19	46.00	.00	.00	.0
19.854	17700.00	1153.56	1152.83	.00	.00	.00	17700.00	6.53	46.00	.00	.00	.0
19.854	11800.00	1152.92	1152.10	.00	.00	.00	11800.00	5.58	46.00	.00	.00	.0
19.854	5900.00	1151.73	1151.13	.00	.00	.00	5900.00	4.95	46.00	.00	.00	.0
19.938	17700.00	1162.04	1162.04	.00	.00	.00	17700.00	8.76	41.00	.00	.00	.0
19.938	11800.00	1162.03	1162.03	.00	.00	.00	11800.00	8.67	41.00	.00	.00	.0
19.938	5900.00	1161.18	1161.18	.00	.00	.00	5900.00	7.02	41.00	.00	.00	.0
19.991	17700.00	1166.98	1166.98	.00	.00	.00	17700.00	10.73	34.00	.00	.00	.0
19.991	11800.00	1166.01	1165.97	.00	.00	.00	11800.00	9.65	34.00	.00	.00	.0
19.991	5900.00	1165.13	1164.88	.00	.00	.00	5900.00	6.84	34.00	.00	.00	.0
20.009	17700.00	1168.64	.00	.00	.00	.00	17700.00	7.05	34.00	.00	.00	.0
20.009	11800.00	1167.52	.00	.00	.00	.00	11800.00	6.07	34.00	.00	.00	.0
20.009	5900.00	1166.01	.00	.00	.00	.00	5900.00	4.83	34.00	.00	.00	.0

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BUCKEYE STRUCTURE 3  
SUMMARY PRINTOUT

SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
17.945	2300.00	1088.64	333.99	1081.10	7.54	.00	9977.70	9977.70	10022.00	10022.00	44.30	.0
17.945	2100.00	1088.45	325.57	1081.10	7.35	.00	9977.70	9977.70	10022.00	10022.00	44.30	.0
17.945	1800.00	1087.47	282.16	1081.10	6.37	.00	9977.70	9977.70	10022.00	10022.00	44.30	.0
17.952	2300.00	1089.38	1012.48	1081.50	7.88	40.00	9920.00	9947.47	10100.00	10100.00	152.53	.0
17.952	2100.00	1089.09	969.52	1081.50	7.59	40.00	9920.00	9948.59	10100.00	10100.00	151.41	.0
17.952	1800.00	1088.10	820.84	1081.50	6.60	40.00	9920.00	9952.53	10100.00	10100.00	147.47	.0
18.072	2300.00	1090.23	327.12	1088.00	2.23	635.00	.00	9823.64	10037.54	.00	213.90	2.2
18.072	2100.00	1090.10	299.87	1088.00	2.10	635.00	.00	9838.85	10036.79	.00	197.94	2.1
18.072	1800.00	1089.90	263.23	1088.00	1.90	635.00	.00	9853.92	10035.70	.00	181.78	1.9
18.143	2300.00	1093.68	812.55	1090.00	3.68	375.00	.00	9699.46	10050.53	.00	351.07	4.6
18.143	2100.00	1093.53	760.74	1090.00	3.53	375.00	.00	9711.10	10049.59	.00	338.49	4.4
18.143	1800.00	1093.29	679.67	1090.00	3.29	375.00	.00	9730.25	10048.04	.00	317.80	4.1
18.200	2300.00	1094.45	1009.04	1090.00	4.45	300.00	.00	9629.09	10052.25	.00	423.16	7.3
18.200	2100.00	1094.28	939.62	1090.00	4.28	300.00	.00	9655.80	10051.40	.00	395.60	6.9
18.200	1800.00	1094.00	834.40	1090.00	4.00	300.00	.00	9700.11	10049.99	.00	349.88	6.4
18.289	2300.00	1095.34	1207.10	1092.00	3.34	470.00	.00	9448.24	10055.01	.00	606.77	12.9
18.289	2100.00	1095.19	1113.16	1092.00	3.19	470.00	.00	9457.22	10053.84	.00	596.62	12.3
18.289	1800.00	1094.93	961.71	1092.00	2.93	470.00	.00	9472.02	10051.91	.00	579.89	11.4
18.360	2300.00	1096.46	614.81	1093.00	3.46	375.00	.00	9618.85	10068.85	.00	450.00	17.4
18.360	2100.00	1096.37	572.35	1093.00	3.37	375.00	.00	9625.28	10065.99	.00	440.71	16.7
18.360	1800.00	1096.24	517.77	1093.00	3.24	375.00	.00	9633.76	10062.22	.00	428.46	15.7
18.465	2400.00	1097.99	1018.72	1093.00	4.99	555.00	.00	9616.26	10095.00	.00	478.74	23.3
18.465	2100.00	1097.85	952.47	1093.00	4.85	555.00	.00	9633.16	10095.00	.00	461.84	22.5
18.465	1800.00	1097.65	862.04	1093.00	4.65	555.00	.00	9657.29	10095.00	.00	437.71	21.3
18.557	3300.00	1098.50	1456.71	1093.00	5.50	485.00	.00	9557.88	10090.00	.00	532.13	29.0
18.557	2700.00	1098.30	1351.43	1093.00	5.30	485.00	.00	9572.93	10090.00	.00	517.07	27.9
18.557	2100.00	1098.05	1224.87	1093.00	5.05	485.00	.00	9591.62	10090.00	.00	498.38	26.5
18.647	5300.00	1098.97	1836.10	1093.00	5.97	475.00	.00	9522.77	10095.00	.00	572.23	35.0
18.647	4200.00	1098.69	1677.59	1093.00	5.69	475.00	.00	9548.27	10095.00	.00	546.73	33.7
18.647	2800.00	1098.33	1487.04	1093.00	5.33	475.00	.00	9580.59	10095.00	.00	514.41	32.0
18.725	8000.00	1099.42	2787.50	1092.00	7.42	410.00	.00	9358.39	10095.00	.00	736.61	41.1
18.725	6100.00	1099.04	2517.68	1092.00	7.04	410.00	.00	9389.26	10095.00	.00	705.74	39.6
18.725	3900.00	1098.55	2180.96	1092.00	6.55	410.00	.00	9429.78	10095.00	.00	665.22	37.5

18.818	12000.00	1099.96	3617.10	1091.50	8.46	490.00	.00	9163.52	10100.00	.00	936.48	50.5
18.818	8800.00	1099.47	3167.84	1091.50	7.97	490.00	.00	9207.74	10100.00	.00	892.26	48.6
18.818	5200.00	1098.81	2600.96	1091.50	7.31	490.00	.00	9266.88	10100.00	.00	833.13	46.0

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SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
18.892	16500.00	1100.61	3998.37	1094.00	6.61	390.00	.00	9309.28	10415.00	.00	1105.72	59.7
18.892	11500.00	1100.00	3336.15	1094.00	6.00	390.00	.00	9375.38	10415.00	.00	1039.62	57.3
18.892	5900.00	1099.15	2478.93	1094.00	5.15	390.00	.00	9428.26	10415.00	.00	986.74	54.1
18.960	17700.00	1101.75	4564.70	1098.00	3.75	360.00	.00	9444.93	11167.51	.00	1722.58	71.4
* 18.960	11800.00	1101.03	3360.22	1098.00	3.03	360.00	.00	9516.48	11160.35	.00	1643.87	68.4
* 18.960	5900.00	1100.03	1783.16	1098.00	2.03	360.00	.00	9615.71	11150.43	.00	1534.71	64.5
* 19.062	17700.00	1106.49	2698.62	1104.00	2.49	540.00	.00	9291.68	11386.50	.00	2094.82	95.0
* 19.062	11800.00	1106.16	2024.74	1104.00	2.16	540.00	.00	9344.20	11355.32	.00	2011.12	91.0
* 19.062	5900.00	1105.94	1581.26	1104.00	1.94	540.00	.00	9394.12	11283.51	.00	1889.38	85.8
* 19.156	17700.00	1113.23	4340.09	1110.00	3.23	495.00	.00	8931.53	11075.45	.00	2143.92	119.1
* 19.156	11800.00	1112.79	3418.94	1110.00	2.79	495.00	.00	8938.06	11027.58	.00	2089.52	114.3
* 19.156	5900.00	1112.11	2021.97	1110.00	2.11	495.00	.00	8948.29	10952.50	.00	2004.21	107.9
19.238	17700.00	1116.92	3240.24	1114.00	2.92	435.00	.00	9068.14	10640.29	.00	1572.15	137.7
19.238	11800.00	1116.44	2499.80	1114.00	2.44	435.00	.00	9071.71	10614.14	.00	1542.43	132.4
19.238	5900.00	1115.92	1726.82	1114.00	1.92	435.00	.00	9199.95	10564.93	.00	1364.98	124.7
19.332	17700.00	1122.91	3155.29	1120.00	2.91	495.00	.00	8951.00	10520.70	.00	1569.70	155.5
19.332	11800.00	1122.42	2429.50	1120.00	2.42	495.00	.00	8955.79	10416.52	.00	1460.73	149.5
19.332	5900.00	1121.48	1286.10	1120.00	1.48	495.00	.00	9297.95	10305.51	.00	1007.56	138.2
19.428	17700.00	1128.85	3613.44	1126.00	2.85	505.00	.00	8764.31	10805.49	.00	2041.18	176.5
19.428	11800.00	1128.42	2741.78	1126.00	2.42	505.00	.00	8769.73	10746.92	.00	1977.19	169.4
19.428	5900.00	1127.89	1595.59	1126.00	1.89	505.00	9325.00	9335.94	10676.24	11150.00	1340.30	151.8
19.529	17700.00	1134.75	3261.27	1131.50	3.25	535.00	.00	9001.02	10667.09	.00	1666.07	199.2
19.529	11800.00	1134.24	2482.02	1131.50	2.74	535.00	.00	9161.56	10601.87	.00	1440.30	190.4
19.529	5900.00	1133.52	1525.14	1131.50	2.02	535.00	.00	9290.77	10514.40	.00	1223.63	167.5
* 19.607	17700.00	1139.10	3400.40	1135.50	3.60	410.00	.00	9054.83	10674.82	.00	1619.99	214.7
* 19.607	11800.00	1138.49	2472.08	1135.50	2.99	410.00	.00	9202.37	10602.59	.00	1400.21	203.8
* 19.607	5900.00	1137.73	1513.88	1135.50	2.23	410.00	.00	9364.03	10498.97	.00	1134.94	178.6
19.691	17700.00	1143.35	3280.23	1139.50	3.85	445.00	.00	9130.53	10595.55	.00	1465.03	230.4
19.691	11800.00	1142.78	2492.23	1139.50	3.28	445.00	.00	9218.64	10525.91	.00	1307.27	217.6
19.691	5900.00	1141.97	1522.84	1139.50	2.47	445.00	.00	9341.00	10424.88	.00	1083.89	190.0
* 19.775	17700.00	1148.48	2650.95	1144.00	4.48	445.00	9300.00	9333.97	10564.00	10800.00	1226.87	244.2
* 19.775	11800.00	1147.74	1792.99	1144.00	3.74	445.00	9570.00	9611.23	10467.54	10800.00	856.30	228.7
* 19.775	5900.00	1146.92	1137.28	1144.00	2.92	445.00	.00	9645.90	10398.20	.00	743.91	199.3
19.854	17700.00	1153.56	2709.87	1148.00	5.56	415.00	9525.00	9549.28	10485.66	10490.00	936.38	254.5
19.854	11800.00	1152.92	2114.39	1148.00	4.92	415.00	9525.00	9566.04	10479.22	10490.00	898.68	237.0
19.854	5900.00	1151.73	1192.81	1148.00	3.73	415.00	9820.00	9874.08	10467.28	10490.00	593.20	205.7
* 19.938	17700.00	1162.04	2020.69	1157.00	5.04	445.00	.00	9388.77	10284.08	.00	895.31	263.9
* 19.938	11800.00	1162.03	1360.40	1157.00	5.03	445.00	9665.00	9665.00	10284.05	10296.00	619.05	244.8
* 19.938	5900.00	1161.18	840.73	1157.00	4.18	445.00	9665.00	9675.26	10282.36	10296.00	607.10	211.8

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SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
* 19.991	17700.00	1166.98	1648.93	1163.00	3.98	280.00	.00	9792.03	10257.10	.00	465.06	268.2
* 19.991	11800.00	1166.01	1222.33	1163.00	3.01	280.00	.00	9793.98	10206.55	.00	412.57	248.1
* 19.991	5900.00	1165.13	862.92	1163.00	2.13	280.00	.00	9795.73	10204.27	.00	408.54	215.1
* 20.009	17700.00	1168.64	2510.13	1163.00	5.64	100.00	.00	9788.73	10300.00	.00	511.27	269.3
* 20.009	11800.00	1167.52	1943.00	1163.00	4.52	100.00	.00	9790.96	10300.00	.00	509.04	249.2
* 20.009	5900.00	1166.01	1220.32	1163.00	3.01	100.00	.00	9793.99	10206.53	.00	412.54	216.0

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BUCKEYE STRUCTURE 3  
SUMMARY PRINTOUT

SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
17.945	2300.00	1088.64	.44	.00	1089.38	.00	9977.70	9977.70	1081.16	100000.00	10022.00	10022.0
17.945	2100.00	1088.45	.42	-.19	1089.10	-.28	9977.70	9977.70	1081.16	100000.00	10022.00	10022.0
17.945	1800.00	1087.47	.45	-.98	1088.10	-1.27	9977.70	9977.70	1081.16	100000.00	10022.00	10022.0
* 17.952	2300.00	1089.38	.16	.00	1089.46	.00	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
* 17.952	2100.00	1089.09	.15	-.28	1089.17	-.29	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
* 17.952	1800.00	1088.10	.17	-.99	1088.17	-1.28	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
* 18.072	2300.00	1090.23	1.00	.00	1091.00	.00	.00	9280.00	1098.00	1098.50	10100.00	.0
* 18.072	2100.00	1090.10	1.00	-.13	1090.86	-.14	.00	9280.00	1098.00	1098.50	10100.00	.0
* 18.072	1800.00	1089.90	1.00	-.19	1090.63	-.37	.00	9280.00	1098.00	1098.50	10100.00	.0

*	18.143	2300.00	1093.68	.33	.00	1093.81	.00	.00	9325.00	1100.00	1098.00	10100.00	.0
*	18.143	2100.00	1093.53	.32	-.15	1093.65	-.16	.00	9325.00	1100.00	1098.00	10100.00	.0
*	18.143	1800.00	1093.29	.32	-.25	1093.40	-.41	.00	9325.00	1100.00	1098.00	10100.00	.0
	18.200	2300.00	1094.45	.26	.00	1094.53	.00	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.200	2100.00	1094.28	.26	-.17	1094.36	-.17	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.200	1800.00	1094.00	.25	-.28	1094.07	-.46	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.289	2300.00	1095.34	.24	.00	1095.40	.00	.00	9100.00	1102.00	1097.50	10095.00	.0
	18.289	2100.00	1095.19	.24	-.16	1095.24	-.16	.00	9100.00	1102.00	1097.50	10095.00	.0
	18.289	1800.00	1094.93	.26	-.26	1094.98	-.42	.00	9100.00	1102.00	1097.50	10095.00	.0
*	18.360	2300.00	1096.46	.56	.00	1096.68	.00	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.360	2100.00	1096.37	.57	-.09	1096.58	-.10	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.360	1800.00	1096.24	.56	-.13	1096.43	-.25	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.465	2400.00	1097.99	.28	.00	1098.08	.00	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.465	2100.00	1097.85	.27	-.14	1097.93	-.15	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.465	1800.00	1097.65	.26	-.20	1097.72	-.36	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.557	3300.00	1098.50	.24	.00	1098.58	.00	.00	9170.00	1104.00	1097.50	10090.00	.0
*	18.557	2700.00	1098.30	.22	-.20	1098.36	-.22	.00	9170.00	1104.00	1097.50	10090.00	.0
*	18.557	2100.00	1098.05	.19	-.25	1098.09	-.48	.00	9170.00	1104.00	1097.50	10090.00	.0
	18.647	5300.00	1098.97	.28	.00	1099.10	.00	.00	9055.00	1104.00	1097.50	10095.00	.0
	18.647	4200.00	1098.69	.25	-.28	1098.78	-.32	.00	9055.00	1104.00	1097.50	10095.00	.0
	18.647	2800.00	1098.33	.20	-.36	1098.38	-.72	.00	9055.00	1104.00	1097.50	10095.00	.0
*	18.725	8000.00	1099.42	.26	.00	1099.54	.00	.00	8960.00	1104.00	1097.50	10095.00	.0
*	18.725	6100.00	1099.04	.23	-.37	1099.13	-.41	.00	8960.00	1104.00	1097.50	10095.00	.0
*	18.725	3900.00	1098.55	.17	-.49	1098.60	-.95	.00	8960.00	1104.00	1097.50	10095.00	.0
	18.818	12000.00	1099.96	.30	.00	1100.13	.00	.00	8670.00	1106.00	1098.00	10100.00	.0
	18.818	8800.00	1099.47	.26	-.49	1099.59	-.54	.00	8670.00	1106.00	1098.00	10100.00	.0
	18.818	5200.00	1098.81	.20	-.66	1098.87	-1.26	.00	8670.00	1106.00	1098.00	10100.00	.0

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SECCO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC	
	18.892	16500.00	1100.61	.38	.00	1100.88	.00	.00	8555.00	1108.00	1099.00	10415.00	.0
	18.892	11500.00	1100.00	.34	-.62	1100.18	-.70	.00	8555.00	1108.00	1099.00	10415.00	.0
	18.892	5900.00	1099.15	.26	-.85	1099.24	-1.64	.00	8555.00	1108.00	1099.00	10415.00	.0
*	18.960	17700.00	1101.75	.42	.00	1101.98	.00	.00	8730.00	1108.00	1103.50	11250.00	.0
*	18.960	11800.00	1101.03	.43	-.72	1101.22	-.76	.00	8730.00	1108.00	1103.50	11250.00	.0
*	18.960	5900.00	1100.03	.54	-1.00	1100.20	-1.78	.00	8730.00	1108.00	1103.50	11250.00	.0
*	19.062	17700.00	1106.49	1.02	.00	1107.16	.00	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.062	11800.00	1106.16	1.02	-.33	1106.69	-.47	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.062	5900.00	1105.94	.72	-.22	1106.15	-1.00	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.156	17700.00	1113.23	.51	.00	1113.49	.00	.00	8920.00	1114.00	1114.00	11160.00	.0
*	19.156	11800.00	1112.79	.48	-.44	1112.98	-.51	.00	8920.00	1114.00	1114.00	11160.00	.0
*	19.156	5900.00	1112.11	.51	-.68	1112.25	-1.25	.00	8920.00	1114.00	1114.00	11160.00	.0
	19.238	17700.00	1116.92	.67	.00	1117.38	.00	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.238	11800.00	1116.44	.65	-.47	1116.79	-.59	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.238	5900.00	1115.92	.54	-.52	1116.11	-1.27	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.332	17700.00	1122.91	.70	.00	1123.39	.00	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.332	11800.00	1122.42	.66	-.49	1122.78	-.61	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.332	5900.00	1121.48	.72	-.93	1121.81	-1.59	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.428	17700.00	1128.85	.65	.00	1129.23	.00	.00	8740.00	1132.00	1134.00	11150.00	.0
	19.428	11800.00	1128.42	.64	-.43	1128.71	-.52	.00	8740.00	1132.00	1134.00	11150.00	.0
	19.428	5900.00	1127.89	.60	-.53	1128.11	-1.12	9325.00	8740.00	100000.00	100000.00	11150.00	11150.0
	19.529	17700.00	1134.75	.68	.00	1135.20	.00	.00	8575.00	1138.00	1138.00	11125.00	.0
	19.529	11800.00	1134.24	.64	-.50	1134.59	-.61	.00	8575.00	1138.00	1138.00	11125.00	.0
	19.529	5900.00	1133.52	.61	-.73	1133.75	-1.45	.00	8575.00	1138.00	1138.00	11125.00	.0
*	19.607	17700.00	1139.10	.63	.00	1139.52	.00	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.607	11800.00	1138.49	.63	-.62	1138.84	-.68	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.607	5900.00	1137.73	.59	-.75	1137.97	-1.55	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.691	17700.00	1143.35	.64	.00	1143.80	.00	.00	8700.00	1146.00	1146.00	10880.00	.0
	19.691	11800.00	1142.78	.60	-.57	1143.13	-.67	.00	8700.00	1146.00	1146.00	10880.00	.0
	19.691	5900.00	1141.97	.58	-.81	1142.20	-1.60	.00	8700.00	1146.00	1146.00	10880.00	.0
*	19.775	17700.00	1148.48	.80	.00	1149.17	.00	9300.00	8900.00	100000.00	100000.00	10800.00	10800.0
	19.775	11800.00	1147.74	.80	-.74	1148.41	-.76	9570.00	8900.00	100000.00	100000.00	10800.00	10800.0
	19.775	5900.00	1146.92	.74	-.82	1147.34	-1.83	.00	8900.00	1150.00	1150.00	10800.00	.0
	19.854	17700.00	1153.56	.68	.00	1154.23	.00	9525.00	9000.00	100000.00	100000.00	10490.00	10490.0
	19.854	11800.00	1152.92	.65	-.64	1153.41	-.82	9525.00	9000.00	100000.00	100000.00	10490.00	10490.0
	19.854	5900.00	1151.73	.61	-1.20	1152.11	-2.12	9820.00	9000.00	100000.00	100000.00	10490.00	10490.0
*	19.938	17700.00	1162.04	1.03	.00	1163.23	.00	.00	9330.00	1164.00	1168.00	10296.00	.0
*	19.938	11800.00	1162.03	1.03	-.01	1163.19	-.04	9665.00	9330.00	100000.00	100000.00	10296.00	10296.0
*	19.938	5900.00	1161.18	1.05	-.85	1161.94	-1.29	9665.00	9330.00	100000.00	100000.00	10296.00	10296.0

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SECCO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
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*	19.991	17700.00	1166.98	1.00	.00	1168.77	.00	.00	9786.00	1170.00	1168.00	10310.00	.0
	19.991	11800.00	1166.01	.99	-.97	1167.45	-1.32	.00	9786.00	1170.00	1168.00	10310.00	.0
*	19.991	5900.00	1165.13	.83	-.87	1165.86	-2.91	.00	9786.00	1170.00	1168.00	10310.00	.0
*	20.009	17700.00	1168.64	.56	.00	1169.41	.00	.00	9786.00	1170.00	1167.00	10300.00	.0
*	20.009	11800.00	1167.52	.55	-1.11	1168.10	-1.31	.00	9786.00	1170.00	1167.00	10300.00	.0
*	20.009	5900.00	1166.01	.50	-1.52	1166.37	-3.04	.00	9786.00	1170.00	1167.00	10300.00	.0

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 17.952 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 17.952 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 18.072 PROFILE= 1 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 18.072 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 18.072 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
CAUTION SECNO= 18.072 PROFILE= 2 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 18.072 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 18.072 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL  
CAUTION SECNO= 18.072 PROFILE= 3 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 18.072 PROFILE= 3 PROBABLE MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 18.072 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 18.143 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.143 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.143 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.360 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.360 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.360 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.465 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.465 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.465 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.557 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.557 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.557 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.725 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.725 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.725 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 18.960 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 18.960 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 19.062 PROFILE= 1 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 19.062 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 19.062 PROFILE= 2 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 19.062 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
WARNING SECNO= 19.062 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 19.156 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 19.156 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 19.156 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 19.607 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL  
CAUTION SECNO= 19.775 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL  
CAUTION SECNO= 19.938 PROFILE= 1 CRITICAL DEPTH ASSUMED

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CAUTION SECNO= 19.938 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 19.938 PROFILE= 2 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 19.938 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
CAUTION SECNO= 19.938 PROFILE= 3 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 19.938 PROFILE= 3 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 19.991 PROFILE= 1 CRITICAL DEPTH ASSUMED  
CAUTION SECNO= 19.991 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
WARNING SECNO= 19.991 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.009 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 20.009 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
WARNING SECNO= 20.009 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

\*\*\*\*\*  
 \* HEC-2 WATER SURFACE PROFILES \*  
 \* \*  
 \* Version 4.6.2; May 1991 \*  
 \* \*  
 \* RUN DATE 27JUL96 TIME 17:02:27 \*  
 \*\*\*\*\*

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

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

THIS RUN EXECUTED 27JUL96 17:02:27

\*\*\*\*\*  
 HEC-2 WATER SURFACE PROFILES  
 Version 4.6.2; May 1991  
 \*\*\*\*\*

SPLIT FLOW BEING PERFORMED

*BUCKEYE STRUCTURE 3*

SF WEIR FLOW OVER INTERSTATE-10 FROM RIVER MILE 18.072 TO RIVER MILE 18.960

TW TUTHILL DIKE WASH NORTH OF I-10 (BASED ON WHITE TANKS/AGUA FRIA ADMS DATA)

WS 2 17.952 18.072 -1 2.5  
 WC 0 1091.5 200 1091.5

TW I-10 WEIR XSECTN 18.072 TO XSECTN 18.143

WS 2 18.072 18.143 -1 3.0  
 WC 0 1099.0 375 1098.5

TW I-10 WEIR XSECTN 18.143 TO XSECTN 18.200

WS 2 18.143 18.200 -1 3.0  
 WC 0 1098.0 300 1097.5

TW I-10 WEIR XSECTN 18.200 TO XSECTN 18.289

WS 2 18.200 18.289 -1 3.0  
 WC 0 1097.5 470 1097.5

TW I-10 WEIR XSECTN 18.289 TO XSECTN 18.360

WS 2 18.289 18.360 -1 3.0  
 WC 0 1097.5 375 1097.5

TW I-10 WEIR XSECTN 18.360 TO XSECTN 18.465

WS 2 18.360 18.465 -1 3.0  
 WC 0 1097.5 555 1097.5

TW I-10 WEIR XSECTN 18.465 TO XSECTN 18.557

WS 2 18.465 18.557 -1 3.0  
 WC 0 1097.5 485 1097.5

TW I-10 WEIR XSECTN 18.557 TO XSECTN 18.647

WS 2 18.557 18.647 -1 3.0  
 WC 0 1097.5 475 1097.5

TW I-10 WEIR XSECTN 18.647 TO XSECTN 18.725

WS 2 18.647 18.725 -1 3.0  
 WC 0 1097.5 410 1097.5

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TW I-10 WEIR XSECTN 18.725 TO XSECTN 18.818

WS 2 18.725 18.818 -1 3.0  
 WC 0 1097.5 490 1098.0

TW I-10 WEIR XSECTN 18.818 TO XSECTN 18.892

WS 2 18.818 18.892 -1 3.0  
 WC 0 1098.0 633 1099.0

TW I-10 WEIR XSECTN 18.892 TO XSECTN 18.960

WS 2 18.892 18.960 -1 3.0  
 WC 0 1099.0 978 1103.5

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T1 DELINEATION OF SPILLWAY FLOWS  
 T2 FOR BUCKEYE STRUCTURES 1, 2 AND 3

STANLEY CONSULTANTS # 13084  
 CONTRACT FCD 95-34



ET			9.1						9911.75	10110
X1	0.540	11	9930	10040	660	650	660			
GR	1057.7	9910	1056	9930	1054	9960	1053	10000	1054	10030
GR	1056	10040	1056	10050	1055.3	10060	1056	10070	1056.9	10250
GR	1057.8	10335								
ET			9.1						9950.98	10105
X1	0.634	10	9970	10040	495	495	495			
GR	1062.4	9935	1062	9950	1058	9970	1056.8	10000	1058	10040
GR	1060	10055	1060.3	10105	1062	10170	1062	10240	1062.3	10290
ET			9.1						9953.52	10085
X1	0.729	16	9960	10085	500	500	500			
GR	1069.6	9920	1068	9940	1066	9950	1064	9960	1062	9970
GR	1060.7	10000	1062	10030	1061.7	10040	1062	10055	1064	10085
GR	1065.8	10275	1065.5	10385	1066	10460	1065.8	10485	1066	10505
GR	1068	10625								
ET			9.1						9952.71	10045.27
X1	0.823	11	9955	10030	495	495	495			
GR	1076	9925	1074	9940	1072	9950	1070	9955	1068	9960
GR	1066	9965	1064.5	10000	1066	10010	1068	10020	1070	10030
GR	1071.2	10050								
ET			9.1						9956.30	10050
X1	0.917	11	9965	10040	500	500	500			
GR	1079.6	9915	1078	9940	1076	9950	1074	9960	1072	9965
GR	1070	9970	1069.3	10000	1070	10030	1074	10040	1076	10130
GR	1076.2	10150								
ET			9.1						9936.36	10028.56
X1	1.012	11	9940	10020	500	500	500			
GR	1085.6	9920	1084	9925	1082	9930	1080	9940	1078	9945
GR	1076	9950	1075.7	10000	1076	10010	1078	10015	1080	10020
GR	1081.7	10040								
NC	.016	.016	.016	.3	.5					
ET			9.11						9977.7	10022
X1	1.067	7	9977.7	10022.0	293	293	293			
X3	10							1088	1088	
GR	1088	9915.0	1078.64	9977.7	1078.64	9978.64	1078.64	10000.0	1078.64	10021.4
GR	1078.9	10022.0	1086	10075						
SC	4.016	.5	2.6	0	8	10	227	8.1	1081.16	1078.64
ET			9.11						9950	10022
X1	17.945	8	9977.7	10022.0	227	227	227			
X2	0	0	2	1089.16	1091.5					
X3	10							1092	1099	
BT	5	9950	1092		9978.6	1099		10000	1099	
BT	10022	1099		10100	1099					
GR	1092	9950	1081.16	9977.7	1081.1	9978.6	1081.1	10000	1081.1	10021.
GR	1081.1	10022	1088	10100	1096	11850				

ET			9.1						9920	10100
X1	17.952	13	9920	10030			40			
X3				9920		10100				
GR	1096	9500	1094	9860	1091.5	9920	1090	9945	1081.52	9978.6
GR	1081.5	10000	1081.5	10021.	1081.5	10021.4	1082	10030	1084	10200
GR	1086	10260	1088	10500	1096	11850				
NC			0.1	0.3						
NH	3	.053	10025	.035	10070	.016	10100			
X1	18.072	9	9280	10100			635			
GR	1098.0	9280	1096.0	9420	1094.0	9550	1092.0	9620	1090.0	9850
GR	1088.0	9930	1088.0	10025	1096.0	10070	1098.5	10100		
NH	3	.053	10020	.035	10065	.016	10100			
X1	18.143	10	9325	10100			375			
GR	1100.0	9325	1098.0	9435	1096.0	9595	1094.0	9675	1092.0	9830
GR	1090.0	9890	1090.0	10020	1092.0	10040	1096.0	10065	1098.0	10100
NH	3	.053	10020	.035	10060	.016	10100			
X1	18.200	9	9220	10100			300			
GR	1098.0	9220	1096.0	9385	1094.0	9700	1092.0	9830	1090.0	9955
GR	1090.0	10020	1092.0	10040	1096.0	10060	1097.5	10100		
NH	3	.053	10030	.035	10060	.016	10095			
X1	18.289	12	9100	10095			470			
GR	1102.0	9100	1100.0	9135	1100.0	9235	1098.0	9340	1096.0	9410
GR	1094.0	9525	1093.0	9875	1092.0	9965	1092.0	10030	1094.0	10045
GR	1096.0	10060	1097.5	10095						
NH	3	.053	10000	.035	10055	.016	10100			
X1	18.360	11	9400	10100			375			
GR	1100.0	9400	1098.0	9515	1096.0	9650	1096.0	9710	1096.0	9740
GR	1096.0	9810	1094.0	9920	1093.0	10000	1094.0	10035	1096.0	10055
GR	1097.5	10100								
NH	3	.044	10000	.035	10050	.016	10095			



GR	1153.0	9350	1154.0	9420	1154.5	9525	1152.0	9590	1151.0	9625
GR	1152.0	9640	1153.0	9680	1152.0	9725	1152.0	9770	1153.0	9820
GR	1152.0	9870	1150.0	9900	1148.0	9930	1148.0	9950	1149.0	10000
GR	1150.0	10120	1150.0	10250	1150.0	10385	1150.0	10450	1152.0	10470
GR	1154.0	10490								
NC			0.041							
ET					9.1	9.1			9665	10296
X1	19.938	16	9330	10296			445			
GR	1164.0	9330	1162.0	9390	1160.0	9440	1157.0	9470	1160.0	9550
GR	1159.0	9575	1160.0	9610	1162.0	9665	1160.0	9690	1160.0	9770
GR	1160.0	10000	1160.0	10180	1158.0	10215	1158.0	10250	1160.0	10280
GR	1168.0	10296								
NC			0.034							
X1	19.991	6	9786	10310			280			
GR	1170.0	9786	1163.0	9800	1163.0	10000	1163.0	10200	1166.0	10206
GR	1168.0	10310								
X1	20.009	6	9786	10300			100			
GR	1170.0	9786	1163.0	9800	1163.0	10000	1163.0	10200	1166.0	10206
GR	1167.0	10300								

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		5							1087.90	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

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T1 DELINEATION OF SPILLWAY FLOWS FOR BUCKEYE STRUCTURES 1, 2 AND 3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		6							1087.24	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3		-1							

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THIS RUN EXECUTED 27JUL96 17:03:10

\*\*\*\*\*  
 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

BUCKEYE STRUCTURE 3  
 SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN	
.000	2309.92	1037.62	.00	.00	.00	.00	2309.92	7.02	30.00	.00	.00	.0	
.000	2064.09	1087.90	.00	358.42	.13	30.00	1412.79	.20	30.00	292.89	.11	40.0	
.000	1762.50	1087.24	.00	306.65	.11	30.00	1206.75	.17	30.00	249.10	.10	40.0	
.075	2309.92	1039.42	.00	306.92	4.20	30.00	2002.99	6.25	30.00	.00	.00	.0	
.075	2064.09	1087.90	.00	741.36	.15	30.00	1081.03	.19	30.00	241.71	.11	40.0	
.075	1762.50	1087.24	.00	633.53	.13	30.00	923.32	.17	30.00	205.65	.09	40.0	
*	.186	2309.92	1041.98	1041.98	44.22	4.52	30.00	2232.54	9.47	30.00	33.16	3.39	40.0
	.186	2064.09	1087.90	.00	1268.96	.12	30.00	539.42	.14	30.00	255.71	.08	40.0
	.186	1762.50	1087.24	.00	1083.53	.10	30.00	461.03	.12	30.00	217.94	.07	40.0
	.314	2309.92	1046.81	.00	.00	.00	30.00	2309.92	6.74	30.00	.00	.00	.0
*	.314	2064.09	1087.90	.00	1704.90	.05	30.00	325.02	.06	30.00	34.17	.03	40.0
*	.314	1762.50	1087.24	.00	1455.33	.05	30.00	278.02	.05	30.00	29.15	.03	40.0
*	.415	2309.92	1051.20	1051.20	140.12	2.76	30.00	1974.72	6.84	30.00	195.08	2.03	40.0
	.415	2064.09	1087.90	.00	1366.93	.05	30.00	278.85	.06	30.00	418.31	.04	40.0
	.415	1762.50	1087.24	.00	1166.88	.05	30.00	238.45	.05	30.00	357.17	.04	40.0
*	.540	2309.92	1056.62	1056.62	4.29	1.88	30.00	2178.16	7.68	30.00	127.47	1.97	40.0
*	.540	2064.09	1087.90	.00	63.79	.10	30.00	747.86	.20	30.00	1252.45	.14	40.0
*	.540	1762.50	1087.24	.00	54.84	.09	30.00	639.16	.18	30.00	1068.50	.12	40.0
*	.634	2309.92	1060.71	1060.71	88.40	4.83	30.00	2052.92	8.87	30.00	168.61	2.98	40.0
*	.634	2064.09	1087.90	.00	199.96	.21	30.00	612.83	.29	30.00	1251.30	.19	40.0

*	.634	1762.50	1087.24	.00	170.96	.19	30.00	524.75	.25	30.00	1066.79	.16	40.0
	.729	2309.92	1064.39	1064.18	.55	1.42	30.00	2300.57	7.62	30.00	8.80	1.08	40.0
*	.729	2064.09	1087.90	.00	103.27	.13	30.00	567.45	.18	30.00	1393.37	.12	40.0
*	.729	1762.50	1087.24	.00	88.02	.11	30.00	486.89	.15	30.00	1187.59	.10	40.0

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	SECNO	Q	CWSEL	CRISW	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN
*	.823	2309.92	1069.33	1069.33	.00	.00	.00	2309.92	10.26	30.00	.00	.00	.0
*	.823	2064.09	1087.89	.00	281.69	.66	30.00	1629.94	1.01	30.00	152.46	.44	40.0
*	.823	1762.50	1087.23	.00	236.45	.58	30.00	1395.62	.89	30.00	130.43	.39	40.0
	.917	2309.92	1073.51	.00	8.64	3.05	30.00	2301.27	8.88	30.00	.00	.00	.0
	.917	2064.09	1087.90	.00	300.97	.56	30.00	1099.24	.82	30.00	663.88	.48	40.0
	.917	1762.50	1087.24	.00	251.50	.50	30.00	950.55	.74	30.00	560.45	.42	40.0
*	1.012	2309.92	1079.28	1079.28	.00	.00	.00	2309.92	9.93	30.00	.00	.00	.0
*	1.012	2064.09	1087.88	.00	131.84	1.21	30.00	1806.11	1.96	30.00	126.15	.90	40.0
*	1.012	1762.50	1087.22	.00	103.26	1.08	30.00	1555.71	1.79	30.00	103.52	.81	40.0
*	1.067	2309.92	1083.01	1083.01	.00	.00	.00	2309.92	11.93	16.00	.00	.00	.0
*	1.067	2064.09	1087.73	.00	.00	.00	.00	2064.09	5.13	16.00	.00	.00	.0
*	1.067	1762.50	1087.10	.00	.00	.00	.00	1762.50	4.71	16.00	.00	.00	.0
*	17.945	2309.92	1088.64	.00	.00	.00	.00	2309.92	6.91	16.00	.00	.00	.0
*	17.945	2064.09	1088.45	.00	.00	.00	.00	2064.09	6.33	16.00	.00	.00	.0
*	17.945	1762.50	1087.47	.00	.00	.00	.00	1762.50	6.24	16.00	.00	.00	.0
*	17.952	2309.92	1089.50	.00	.00	.00	.00	1192.24	2.23	16.00	1117.68	2.25	16.0
*	17.952	2064.09	1089.17	.00	.00	.00	.00	1065.60	2.10	16.00	998.50	2.11	16.0
*	17.952	1762.50	1088.17	.00	.00	.00	.00	913.08	2.13	16.00	849.42	2.11	16.0
*	18.072	2309.92	1090.23	1090.23	.00	.00	.00	2309.92	7.04	51.93	.00	.00	.0
*	18.072	2064.09	1090.07	1090.07	.00	.00	.00	2064.09	7.00	51.95	.00	.00	.0
*	18.072	1762.51	1089.88	1089.88	.00	.00	.00	1762.50	6.82	52.00	.00	.00	.0
*	18.143	2309.92	1093.69	.00	.00	.00	.00	2309.92	2.83	51.10	.00	.00	.0
*	18.143	2064.09	1093.51	.00	.00	.00	.00	2064.09	2.75	51.13	.00	.00	.0
*	18.143	1762.51	1093.26	.00	.00	.00	.00	1762.50	2.63	51.18	.00	.00	.0
	18.200	2309.92	1094.46	.00	.00	.00	.00	2309.92	2.28	50.69	.00	.00	.0
	18.200	2064.09	1094.25	.00	.00	.00	.00	2064.09	2.22	50.76	.00	.00	.0
	18.200	1762.51	1093.97	.00	.00	.00	.00	1762.51	2.14	50.85	.00	.00	.0
	18.289	2309.92	1095.35	.00	.00	.00	.00	2309.92	1.90	52.14	.00	.00	.0
	18.289	2064.09	1095.15	.00	.00	.00	.00	2064.09	1.88	52.16	.00	.00	.0
	18.289	1762.51	1094.89	.00	.00	.00	.00	1762.51	1.86	52.17	.00	.00	.0
*	18.360	2309.92	1096.46	.00	.00	.00	.00	2309.92	3.77	43.45	.00	.00	.0
*	18.360	2064.09	1096.35	.00	.00	.00	.00	2064.09	3.66	43.17	.00	.00	.0
*	18.360	1762.51	1096.22	.00	.00	.00	.00	1762.51	3.47	42.76	.00	.00	.0
*	18.465	2379.81	1097.99	.00	.00	.00	.00	2379.81	2.34	36.69	.00	.00	.0
*	18.465	2094.61	1097.83	.00	.00	.00	.00	2094.61	2.22	36.73	.00	.00	.0
*	18.465	1765.38	1097.63	.00	.00	.00	.00	1765.38	2.08	36.77	.00	.00	.0
*	18.557	3331.40	1098.50	.00	.00	.00	.00	3331.40	2.29	38.62	.00	.00	.0
*	18.557	2728.84	1098.29	.00	.00	.00	.00	2728.84	2.03	38.69	.00	.00	.0
*	18.557	2050.53	1098.02	.00	.00	.00	.00	2050.53	1.69	38.77	.00	.00	.0

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	SECNO	Q	CWSEL	CRISW	QLOB	VLOB	K*XNL	QCH	VCH	K*XNCH	QROB	VROB	K*XN
*	18.647	5305.23	1098.98	.00	.00	.00	.00	5305.23	2.88	38.66	.00	.00	.0
	18.647	4151.94	1098.68	.00	.00	.00	.00	4151.94	2.48	38.88	.00	.00	.0
	18.647	2833.66	1098.31	.00	.00	.00	.00	2833.66	1.92	39.17	.00	.00	.0
*	18.725	8011.11	1099.42	.00	.00	.00	.00	8011.11	2.87	39.93	.00	.00	.0
*	18.725	6118.69	1099.04	.00	.00	.00	.00	6118.69	2.43	40.01	.00	.00	.0
*	18.725	3925.42	1098.53	.00	.00	.00	.00	3925.42	1.81	40.12	.00	.00	.0
	18.818	11974.81	1099.97	.00	.00	.00	.00	11974.81	3.31	39.90	.00	.00	.0
	18.818	8837.68	1099.47	.00	.00	.00	.00	8837.68	2.80	39.87	.00	.00	.0
	18.818	5231.17	1098.81	.00	.00	.00	.00	5231.17	2.02	39.81	.00	.00	.0
	18.892	16545.53	1100.61	.00	.00	.00	.00	16545.53	4.13	41.85	.00	.00	.0
	18.892	11460.85	1100.00	.00	.00	.00	.00	11460.85	3.43	42.01	.00	.00	.0
	18.892	5897.26	1099.15	.00	.00	.00	.00	5897.26	2.38	42.13	.00	.00	.0
	18.960	17700.00	1101.75	.00	.00	.00	.00	17700.00	3.87	45.85	.00	.00	.0
*	18.960	11800.00	1101.03	.00	.00	.00	.00	11800.00	3.52	45.39	.00	.00	.0
*	18.960	5900.00	1100.03	.00	.00	.00	.00	5900.00	3.33	42.36	.00	.00	.0
*	19.062	17700.00	1106.49	1106.49	.00	.00	.00	17700.00	6.56	48.00	.00	.00	.0
*	19.062	11800.00	1106.16	1106.16	.00	.00	.00	11800.00	5.83	48.00	.00	.00	.0
*	19.062	5900.00	1105.94	.00	.00	.00	.00	5900.00	3.70	48.00	.00	.00	.0
*	19.156	17700.00	1113.23	.00	.00	.00	.00	17700.00	4.08	48.00	.00	.00	.0
*	19.156	11800.00	1112.79	.00	.00	.00	.00	11800.00	3.45	48.00	.00	.00	.0
*	19.156	5900.00	1112.10	.00	.00	.00	.00	5900.00	2.93	48.00	.00	.00	.0
	19.238	17700.00	1116.91	.00	.00	.00	.00	17700.00	5.46	48.00	.00	.00	.0
	19.238	11800.00	1116.43	.00	.00	.00	.00	11800.00	4.72	48.00	.00	.00	.0

19.238	5900.00	1115.92	.00	.00	.00	.00	5900.00	3.40	48.00	.00	.00	.0
19.332	17700.00	1122.90	.00	.00	.00	.00	17700.00	5.61	47.00	.00	.00	.0
19.332	11800.00	1122.42	.00	.00	.00	.00	11800.00	4.87	47.00	.00	.00	.0
19.332	5900.00	1121.47	.00	.00	.00	.00	5900.00	4.61	47.00	.00	.00	.0
19.428	17700.00	1128.85	.00	.00	.00	.00	17700.00	4.90	46.00	.00	.00	.0
19.428	11800.00	1128.42	.00	.00	.00	.00	11800.00	4.29	46.00	.00	.00	.0
19.428	5900.00	1127.89	.00	.00	.00	.00	5900.00	3.68	46.00	.00	.00	.0
19.529	17700.00	1134.74	.00	.00	.00	.00	17700.00	5.43	46.00	.00	.00	.0
19.529	11800.00	1134.24	.00	.00	.00	.00	11800.00	4.77	46.00	.00	.00	.0
19.529	5900.00	1133.51	.00	.00	.00	.00	5900.00	3.89	46.00	.00	.00	.0
19.607	17700.00	1139.11	.00	.00	.00	.00	17700.00	5.21	46.00	.00	.00	.0
19.607	11800.00	1138.50	.00	.00	.00	.00	11800.00	4.77	46.00	.00	.00	.0
19.607	5900.00	1137.74	.00	.00	.00	.00	5900.00	3.88	46.00	.00	.00	.0
19.691	17700.00	1143.36	.00	.00	.00	.00	17700.00	5.39	46.00	.00	.00	.0
19.691	11800.00	1142.79	.00	.00	.00	.00	11800.00	4.74	46.00	.00	.00	.0
19.691	5900.00	1141.97	.00	.00	.00	.00	5900.00	3.88	46.00	.00	.00	.0

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SECNO	Q	CWSEL	CRWS	QLOB	VLOB	K*XLN	QCH	VCH	K*XLNCH	QROB	VROB	K*XLN
19.775	17700.00	1148.48	.00	.00	.00	.00	17700.00	6.68	46.00	.00	.00	.0
19.775	11800.00	1147.74	.00	.00	.00	.00	11800.00	6.56	46.00	.00	.00	.0
19.775	5900.00	1146.92	.00	.00	.00	.00	5900.00	5.18	46.00	.00	.00	.0
19.854	17700.00	1153.57	.00	.00	.00	.00	17700.00	6.53	46.00	.00	.00	.0
19.854	11800.00	1152.92	.00	.00	.00	.00	11800.00	5.59	46.00	.00	.00	.0
19.854	5900.00	1151.72	.00	.00	.00	.00	5900.00	4.95	46.00	.00	.00	.0
* 19.938	17700.00	1162.04	1162.04	.00	.00	.00	17700.00	8.76	41.00	.00	.00	.0
* 19.938	11800.00	1162.03	1162.03	.00	.00	.00	11800.00	8.67	41.00	.00	.00	.0
* 19.938	5900.00	1161.18	1161.18	.00	.00	.00	5900.00	7.02	41.00	.00	.00	.0
* 19.991	17700.00	1166.98	1166.98	.00	.00	.00	17700.00	10.73	34.00	.00	.00	.0
* 19.991	11800.00	1166.00	1165.98	.00	.00	.00	11800.00	9.65	34.00	.00	.00	.0
* 19.991	5900.00	1165.13	.00	.00	.00	.00	5900.00	6.83	34.00	.00	.00	.0
* 20.009	17700.00	1168.64	.00	.00	.00	.00	17700.00	7.04	34.00	.00	.00	.0
* 20.009	11800.00	1167.52	.00	.00	.00	.00	11800.00	6.08	34.00	.00	.00	.0
* 20.009	5900.00	1166.00	.00	.00	.00	.00	5900.00	4.84	34.00	.00	.00	.0

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BUCKEYE STRUCTURE 3  
SUMMARY PRINTOUT

SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
.000	2309.92	1037.62	329.28	1033.00	4.62	.00	.00	9953.87	10059.14	.00	105.27	.0
.000	2064.09	1087.90	12544.02	1033.00	54.90	.00	.00	9880.00	10140.00	.00	260.00	.0
.000	1762.50	1087.24	12372.41	1033.00	54.24	.00	.00	9880.00	10140.00	.00	260.00	.0
.075	2309.92	1039.42	393.56	1035.00	4.42	400.00	.00	9917.26	10063.46	.00	146.20	1.1
.075	2064.09	1087.90	12745.99	1035.00	52.90	400.00	.00	9860.00	10125.00	.00	265.00	2.4
.075	1762.50	1087.24	12571.11	1035.00	52.24	400.00	.00	9860.00	10125.00	.00	265.00	2.4
* .186	2309.92	1041.98	255.39	1038.50	3.48	580.00	.00	9960.11	10059.89	.00	99.79	2.7
* .186	2064.09	1087.90	17872.63	1038.50	49.40	580.00	.00	9730.00	10130.00	.00	400.00	6.8
* .186	1762.50	1087.24	17608.61	1038.50	48.74	580.00	.00	9730.00	10130.00	.00	400.00	6.8
* .314	2309.92	1046.81	342.88	1042.50	4.31	680.00	.00	9955.93	10074.07	.00	118.14	4.4
* .314	2064.09	1087.90	39198.02	1042.50	45.40	680.00	.00	9135.00	10110.00	.00	975.00	15.4
* .314	1762.50	1087.24	38554.36	1042.50	44.74	680.00	.00	9135.00	10110.00	.00	975.00	15.4
* .415	2309.92	1051.20	435.34	1047.20	4.00	530.00	.00	9819.73	10220.77	.00	400.81	7.8
* .415	2064.09	1087.90	39793.55	1047.20	40.70	530.00	.00	9250.00	10335.00	.00	1085.00	24.9
* .415	1762.50	1087.24	39077.28	1047.20	40.04	530.00	.00	9250.00	10335.00	.00	1085.00	24.9
* .540	2309.92	1056.62	350.49	1053.00	3.62	660.00	.00	9922.66	10194.73	.00	272.07	12.8
* .540	2064.09	1087.90	13566.82	1053.00	34.90	660.00	.00	9910.00	10335.00	.00	425.00	36.3
* .540	1762.50	1087.24	13286.36	1053.00	34.24	660.00	.00	9910.00	10335.00	.00	425.00	36.3
* .634	2309.92	1060.71	306.29	1056.80	3.91	495.00	.00	9956.47	10120.53	.00	164.06	15.3
* .634	2064.09	1087.90	9738.72	1056.80	31.10	495.00	.00	9935.00	10290.00	.00	355.00	40.7
* .634	1762.50	1087.24	9504.48	1056.80	30.44	495.00	.00	9935.00	10290.00	.00	355.00	40.7
* .729	2309.92	1064.39	310.53	1060.70	3.69	500.00	.00	9958.03	10126.55	.00	168.52	17.2
* .729	2064.09	1087.90	16037.53	1060.70	27.20	500.00	.00	9920.00	10625.00	.00	705.00	46.8
* .729	1762.50	1087.24	15571.95	1060.70	26.54	500.00	.00	9920.00	10625.00	.00	705.00	46.8
* .823	2309.92	1069.33	225.18	1064.50	4.83	495.00	.00	9956.67	10026.65	.00	69.97	18.6
* .823	2064.09	1087.89	2388.23	1064.50	23.39	495.00	.00	9925.00	10050.00	.00	125.00	51.5
* .823	1762.50	1087.23	2305.97	1064.50	22.73	495.00	.00	9925.00	10050.00	.00	125.00	51.5
.917	2309.92	1073.51	262.00	1069.30	4.21	500.00	.00	9961.24	10038.76	.00	77.52	19.4
.917	2064.09	1087.90	3276.02	1069.30	18.60	500.00	.00	9915.00	10150.00	.00	235.00	53.6
.917	1762.50	1087.24	3120.80	1069.30	17.94	500.00	.00	9915.00	10150.00	.00	235.00	53.6
* 1.012	2309.92	1079.28	232.74	1075.70	3.58	500.00	.00	9941.80	10018.20	.00	76.40	20.3

*	1.012	2064.09	1087.88	1169.12	1075.70	12.18	500.00	.00	9920.00	10040.00	.00	120.00	55.6
*	1.012	1762.50	1087.22	1090.28	1075.70	11.52	500.00	.00	9920.00	10040.00	.00	120.00	55.6
*	1.067	2309.92	1083.01	193.58	1078.64	4.37	293.00	.00	9977.70	10022.00	.00	44.30	20.7
*	1.067	2064.09	1087.73	402.45	1078.64	9.09	293.00	.00	9977.70	10022.00	.00	44.30	56.2
*	1.067	1762.50	1087.10	374.19	1078.64	8.46	293.00	.00	9977.70	10022.00	.00	44.30	56.2

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	SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
*	17.945	2309.92	1088.64	334.30	1081.10	7.54	227.00	.00	9977.70	10022.00	.00	44.30	20.9
*	17.945	2064.09	1088.45	325.86	1081.10	7.35	227.00	.00	9977.70	10022.00	.00	44.30	56.4
*	17.945	1762.50	1087.47	282.65	1081.10	6.37	227.00	.00	9977.70	10022.00	.00	44.30	56.4
*	17.952	2309.92	1089.50	1031.69	1081.50	8.00	40.00	9920.00	9946.97	10100.00	10100.00	153.03	21.0
*	17.952	2064.09	1089.17	981.49	1081.50	7.67	40.00	9920.00	9948.27	10100.00	10100.00	151.73	56.5
*	17.952	1762.50	1088.17	831.38	1081.50	6.67	40.00	9920.00	9952.25	10100.00	10100.00	147.75	56.4
*	18.072	2309.92	1090.23	328.03	1088.00	2.23	635.00	.00	9823.15	10037.56	.00	214.42	23.2
*	18.072	2064.09	1090.07	294.88	1088.00	2.07	635.00	.00	9841.77	10036.65	.00	194.88	58.5
*	18.072	1762.51	1089.88	258.46	1088.00	1.88	635.00	.00	9854.97	10035.55	.00	180.58	58.3
*	18.143	2309.92	1093.69	815.12	1090.00	3.69	375.00	.00	9698.89	10050.57	.00	351.69	25.6
*	18.143	2064.09	1093.51	750.90	1090.00	3.51	375.00	.00	9713.36	10049.41	.00	336.04	60.8
*	18.143	1762.51	1093.26	669.27	1090.00	3.26	375.00	.00	9732.79	10047.84	.00	315.04	60.5
	18.200	2309.92	1094.46	1012.97	1090.00	4.46	300.00	.00	9627.63	10052.30	.00	424.66	28.3
	18.200	2064.09	1094.25	928.01	1090.00	4.25	300.00	.00	9660.45	10051.26	.00	390.80	63.3
	18.200	1762.51	1093.97	823.29	1090.00	3.97	300.00	.00	9702.18	10049.83	.00	347.65	62.7
	18.289	2309.92	1095.35	1216.14	1092.00	3.35	470.00	.00	9447.38	10055.12	.00	607.74	33.8
	18.289	2064.09	1095.15	1099.99	1092.00	3.15	470.00	.00	9458.49	10053.68	.00	595.19	68.6
	18.289	1762.51	1094.89	947.72	1092.00	2.89	470.00	.00	9473.41	10051.73	.00	578.32	67.7
*	18.360	2309.92	1096.46	613.05	1093.00	3.46	375.00	.00	9619.11	10068.73	.00	449.62	38.4
*	18.360	2064.09	1096.35	563.60	1093.00	3.35	375.00	.00	9626.62	10065.39	.00	438.77	73.0
*	18.360	1762.51	1096.22	507.49	1093.00	3.22	375.00	.00	9635.38	10061.50	.00	426.11	72.1
*	18.465	2379.81	1097.99	1017.20	1093.00	4.99	555.00	.00	9616.64	10095.00	.00	478.36	44.3
*	18.465	2094.61	1097.83	943.42	1093.00	4.83	555.00	.00	9635.52	10095.00	.00	459.48	78.7
*	18.465	1765.38	1097.63	850.22	1093.00	4.63	555.00	.00	9660.54	10095.00	.00	434.46	77.5
*	18.557	3331.40	1098.50	1454.05	1093.00	5.50	485.00	.00	9558.25	10090.00	.00	531.75	49.9
*	18.557	2728.84	1098.29	1346.07	1093.00	5.29	485.00	.00	9573.71	10090.00	.00	516.29	84.2
*	18.557	2050.53	1098.02	1211.94	1093.00	5.02	485.00	.00	9593.57	10090.00	.00	496.43	82.7
*	18.647	5305.23	1098.98	1839.60	1093.00	5.98	475.00	.00	9522.22	10095.00	.00	572.78	56.0
*	18.647	4151.94	1098.68	1675.79	1093.00	5.68	475.00	.00	9548.56	10095.00	.00	546.44	90.0
*	18.647	2833.66	1098.31	1475.39	1093.00	5.31	475.00	.00	9582.63	10095.00	.00	512.37	88.2
*	18.725	8011.11	1099.42	2792.99	1092.00	7.42	410.00	.00	9357.78	10095.00	.00	737.22	62.1
*	18.725	6118.69	1099.04	2515.18	1092.00	7.04	410.00	.00	9389.55	10095.00	.00	705.45	95.9
*	18.725	3925.42	1098.53	2171.87	1092.00	6.53	410.00	.00	9430.91	10095.00	.00	664.09	93.8
	18.818	11974.81	1099.97	3622.25	1091.50	8.47	490.00	.00	9163.02	10100.00	.00	936.98	71.5
	18.818	8837.68	1099.47	3160.00	1091.50	7.97	490.00	.00	9208.53	10100.00	.00	891.47	104.8
	18.818	5231.17	1098.81	2591.00	1091.50	7.31	490.00	.00	9267.95	10100.00	.00	832.05	102.2
	18.892	16545.53	1100.61	4002.28	1094.00	6.61	390.00	.00	9308.90	10415.00	.00	1106.10	80.7
	18.892	11460.85	1100.00	3342.12	1094.00	6.00	390.00	.00	9375.02	10415.00	.00	1039.98	113.5
	18.892	5897.26	1099.15	2478.81	1094.00	5.15	390.00	.00	9428.27	10415.00	.00	986.73	110.3

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	SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA
*	18.960	17700.00	1101.75	4569.54	1098.00	3.75	360.00	.00	9444.65	11167.54	.00	1722.89	92.4
*	18.960	11800.00	1101.03	3347.79	1098.00	3.03	360.00	.00	9517.24	11160.28	.00	1643.03	124.6
*	18.960	5900.00	1100.03	1774.17	1098.00	2.03	360.00	.00	9616.30	11150.37	.00	1534.07	120.7
*	19.062	17700.00	1106.49	2698.88	1104.00	2.49	540.00	.00	9291.66	11386.51	.00	2094.85	116.0
*	19.062	11800.00	1106.16	2023.02	1104.00	2.16	540.00	.00	9344.34	11355.24	.00	2010.90	147.2
*	19.062	5900.00	1105.94	1595.83	1104.00	1.94	540.00	.00	9391.20	11290.35	.00	1899.15	142.0
*	19.156	17700.00	1113.23	4341.14	1110.00	3.23	495.00	.00	8931.52	11075.50	.00	2143.98	140.1
*	19.156	11800.00	1112.79	3420.47	1110.00	2.79	495.00	.00	8938.05	11027.66	.00	2089.61	170.5
*	19.156	5900.00	1112.10	2012.67	1110.00	2.10	495.00	.00	8948.37	10951.99	.00	2003.63	164.2
	19.238	17700.00	1116.91	3239.28	1114.00	2.91	435.00	.00	9068.15	10640.26	.00	1572.11	158.7
	19.238	11800.00	1116.43	2502.63	1114.00	2.43	435.00	.00	9071.69	10614.24	.00	1542.55	188.7
	19.238	5900.00	1115.92	1733.99	1114.00	1.92	435.00	.00	9199.25	10566.72	.00	1367.47	181.0
	19.332	17700.00	1122.90	3157.02	1120.00	2.90	495.00	.00	8950.99	10520.94	.00	1569.95	176.5
	19.332	11800.00	1122.42	2423.44	1120.00	2.42	495.00	.00	8955.83	10415.62	.00	1459.78	205.7
	19.332	5900.00	1121.47	1279.95	1120.00	1.47	495.00	.00	9298.86	10305.28	.00	1006.42	194.5
	19.428	17700.00	1128.85	3612.95	1126.00	2.85	505.00	.00	8764.31	10805.46	.00	2041.15	197.5
	19.428	11800.00	1128.42	2748.54	1126.00	2.42	505.00	.00	8769.69	10747.38	.00	1977.70	225.6
	19.428	5900.00	1127.89	1602.30	1126.00	1.89	505.00	9325.00	9335.42	10676.89	11150.00	1341.47	208.1
	19.529	17700.00	1134.74	3258.02	1131.50	3.24	535.00	.00	9001.64	10666.83	.00	1665.19	220.2
	19.529	11800.00	1134.24	2475.87	1131.50	2.74	535.00	.00	9162.93	10601.31	.00	1438.38	246.6
	19.529	5900.00	1133.51	1518.57	1131.50	2.01	535.00	.00	9291.33	10513.78	.00	1222.44	223.9
	19.607	17700.00	1139.11	3399.22	1135.50	3.61	410.00	.00	9055.01	10674.73	.00	1619.72	235.7

19.607	11800.00	1138.50	2472.76	1135.50	3.00	410.00	.00	9202.26	10602.65	.00	1400.39	260.0	
19.607	5900.00	1137.74	1519.15	1135.50	2.24	410.00	.00	9363.26	10499.77	.00	1136.51	235.0	
19.691	17700.00	1143.36	3283.09	1139.50	3.86	445.00	.00	9130.22	10595.79	.00	1465.57	251.4	
19.691	11800.00	1142.79	2491.27	1139.50	3.29	445.00	.00	9218.75	10525.82	.00	1307.07	273.8	
19.691	5900.00	1141.97	1519.26	1139.50	2.47	445.00	.00	9341.11	10424.29	.00	1083.18	246.3	
19.775	17700.00	1148.48	2650.20	1144.00	4.48	445.00	9300.00	9334.01	10563.91	10800.00	1226.65	265.2	
19.775	11800.00	1147.74	1797.49	1144.00	3.74	445.00	9570.00	9611.01	10467.98	10800.00	856.97	284.9	
19.775	5900.00	1146.92	1139.82	1144.00	2.92	445.00	.00	9645.75	10398.49	.00	744.71	255.6	
19.854	17700.00	1153.57	2709.42	1148.00	5.57	415.00	9525.00	9549.29	10485.66	10490.00	936.36	275.5	
19.854	11800.00	1152.92	2109.13	1148.00	4.92	415.00	9525.00	9566.19	10479.16	10490.00	897.39	293.2	
19.854	5900.00	1151.72	1191.15	1148.00	3.72	415.00	9820.00	9874.12	10467.25	10490.00	593.13	262.0	
*	19.938	17700.00	1162.04	2021.35	1157.00	5.04	445.00	.00	9388.75	10284.08	.00	895.34	284.8
*	19.938	11800.00	1162.03	1360.93	1157.00	5.03	445.00	9665.00	9665.00	10284.05	10296.00	619.05	301.0
*	19.938	5900.00	1161.18	840.29	1157.00	4.18	445.00	9665.00	9675.27	10282.36	10296.00	607.09	268.1
*	19.991	17700.00	1166.98	1648.87	1163.00	3.98	280.00	.00	9792.04	10257.09	.00	465.06	289.2
*	19.991	11800.00	1166.00	1222.88	1163.00	3.00	280.00	.00	9793.98	10206.62	.00	412.64	304.3
*	19.991	5900.00	1165.13	863.42	1163.00	2.13	280.00	.00	9795.73	10204.27	.00	408.54	271.4

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SECNO	Q	CWSEL	AREA	ELMIN	DEPTH	XLCH	STENCL	SSTA	ENDST	STENCR	TOPWID	TWA	
*	20.009	17700.00	1168.64	2513.69	1163.00	5.64	100.00	.00	9788.72	10300.00	.00	511.28	290.3
*	20.009	11800.00	1167.52	1941.63	1163.00	4.52	100.00	.00	9790.96	10300.00	.00	509.04	305.3
*	20.009	5900.00	1166.00	1220.01	1163.00	3.00	100.00	.00	9793.99	10206.46	.00	412.47	272.4

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BUCKEYE STRUCTURE 3  
SUMMARY PRINTOUT

SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC	
.000	2309.92	1037.62	.70	.00	1038.39	.00	.00	9940.00	1040.00	1040.00	10075.00	.0	
.000	2064.09	1087.90	.00	50.28	1087.90	49.51	.00	9940.00	1040.00	1040.00	10075.00	.0	
.000	1762.50	1087.24	.00	-.66	1087.24	48.85	.00	9940.00	1040.00	1040.00	10075.00	.0	
.075	2309.92	1039.42	.63	.00	1039.98	.00	.00	9960.00	1036.00	1040.00	10070.00	.0	
.075	2064.09	1087.90	.00	48.48	1087.90	47.92	.00	9960.00	1036.00	1040.00	10070.00	.0	
.075	1762.50	1087.24	.00	-.66	1087.24	47.26	.00	9960.00	1036.00	1040.00	10070.00	.0	
*	.186	2309.92	1041.98	.97	.00	1043.33	.00	.00	9970.00	1040.00	1040.00	10050.00	.0
.186	2064.09	1087.90	.00	45.92	1087.90	44.57	.00	9970.00	1040.00	1040.00	10050.00	.0	
.186	1762.50	1087.24	.00	-.66	1087.24	43.91	.00	9970.00	1040.00	1040.00	10050.00	.0	
.314	2309.92	1046.81	.70	.00	1047.52	.00	.00	9950.00	1048.00	1048.00	10080.00	.0	
*.314	2064.09	1087.90	.00	41.09	1087.90	40.38	.00	9950.00	1048.00	1048.00	10080.00	.0	
*.314	1762.50	1087.24	.00	-.66	1087.24	39.72	.00	9950.00	1048.00	1048.00	10080.00	.0	
.415	2309.92	1051.20	.78	.00	1051.83	.00	.00	9940.00	1050.00	1050.00	10060.00	.0	
*.415	2064.09	1087.90	.00	36.70	1087.90	36.07	.00	9940.00	1050.00	1050.00	10060.00	.0	
*.415	1762.50	1087.24	.00	-.66	1087.24	35.41	.00	9940.00	1050.00	1050.00	10060.00	.0	
.540	2309.92	1056.62	.84	.00	1057.49	.00	.00	9930.00	1056.00	1056.00	10040.00	.0	
*.540	2064.09	1087.90	.01	31.28	1087.90	30.41	.00	9930.00	1056.00	1056.00	10040.00	.0	
*.540	1762.50	1087.24	.01	-.66	1087.24	29.75	.00	9930.00	1056.00	1056.00	10040.00	.0	
.634	2309.92	1060.71	.86	.00	1061.82	.00	.00	9970.00	1058.00	1058.00	10040.00	.0	
*.634	2064.09	1087.90	.01	27.19	1087.90	26.08	.00	9970.00	1058.00	1058.00	10040.00	.0	
*.634	1762.50	1087.24	.01	-.66	1087.24	25.42	.00	9970.00	1058.00	1058.00	10040.00	.0	
.729	2309.92	1064.39	.86	.00	1065.29	.00	.00	9960.00	1064.00	1064.00	10085.00	.0	
*.729	2064.09	1087.90	.01	23.51	1087.90	22.61	.00	9960.00	1064.00	1064.00	10085.00	.0	
*.729	1762.50	1087.24	.01	-.66	1087.24	21.95	.00	9960.00	1064.00	1064.00	10085.00	.0	
.823	2309.92	1069.33	1.01	.00	1070.96	.00	.00	9955.00	1070.00	1070.00	10030.00	.0	
*.823	2064.09	1087.89	.04	18.56	1087.91	16.94	.00	9955.00	1070.00	1070.00	10030.00	.0	
*.823	1762.50	1087.23	.03	-.66	1087.24	16.28	.00	9955.00	1070.00	1070.00	10030.00	.0	
.917	2309.92	1073.51	.83	.00	1074.73	.00	.00	9965.00	1072.00	1074.00	10040.00	.0	
*.917	2064.09	1087.90	.03	14.40	1087.91	13.18	.00	9965.00	1072.00	1074.00	10040.00	.0	
*.917	1762.50	1087.24	.03	-.66	1087.25	12.52	.00	9965.00	1072.00	1074.00	10040.00	.0	
1.012	2309.92	1079.28	1.00	.00	1080.81	.00	.00	9940.00	1080.00	1080.00	10020.00	.0	
*1.012	2064.09	1087.88	.10	8.60	1087.93	7.12	.00	9940.00	1080.00	1080.00	10020.00	.0	
*1.012	1762.50	1087.22	.10	-.66	1087.27	6.46	.00	9940.00	1080.00	1080.00	10020.00	.0	
1.067	2309.92	1083.01	1.01	.00	1085.22	.00	.00	9977.70	1078.64	1078.90	10022.00	.0	
*1.067	2064.09	1087.73	.30	4.71	1088.13	2.91	.00	9977.70	1078.64	1078.90	10022.00	.0	
*1.067	1762.50	1087.10	.29	-.63	1087.44	2.22	.00	9977.70	1078.64	1078.90	10022.00	.0	

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SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
*17.945	2309.92	1088.64	.44	.00	1089.38	.00	.00	9977.70	1081.16	1081.10	10022.00	.0
17.945	2064.09	1088.45	.41	-.19	1089.07	-.31	.00	9977.70	1081.16	1081.10	10022.00	.0

*	17.945	1762.50	1087.47	.44	-.98	1088.08	-1.30	.00	9977.70	1081.16	1081.10	10022.00	.0
*	17.952	2309.92	1089.50	.15	.00	1089.58	.00	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
*	17.952	2064.09	1089.17	.15	-.33	1089.24	-.34	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
*	17.952	1762.50	1088.17	.16	-1.00	1088.24	-1.34	9920.00	9920.00	1091.50	1082.00	10030.00	10100.0
*	18.072	2309.92	1090.23	1.00	.00	1091.00	.00	.00	9280.00	1098.00	1098.50	10100.00	.0
*	18.072	2064.09	1090.07	1.00	-.16	1090.83	-.17	.00	9280.00	1098.00	1098.50	10100.00	.0
*	18.072	1762.51	1089.88	1.00	-.20	1090.60	-.41	.00	9280.00	1098.00	1098.50	10100.00	.0
*	18.143	2309.92	1093.69	.33	.00	1093.82	.00	.00	9325.00	1100.00	1098.00	10100.00	.0
*	18.143	2064.09	1093.51	.32	-.18	1093.63	-.19	.00	9325.00	1100.00	1098.00	10100.00	.0
*	18.143	1762.51	1093.26	.32	-.25	1093.37	-.45	.00	9325.00	1100.00	1098.00	10100.00	.0
	18.200	2309.92	1094.46	.26	.00	1094.54	.00	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.200	2064.09	1094.25	.25	-.21	1094.33	-.21	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.200	1762.51	1093.97	.25	-.28	1094.04	-.50	.00	9220.00	1098.00	1097.50	10100.00	.0
	18.289	2309.92	1095.35	.24	.00	1095.40	.00	.00	9100.00	1102.00	1097.50	10095.00	.0
	18.289	2064.09	1095.15	.24	-.19	1095.21	-.19	.00	9100.00	1102.00	1097.50	10095.00	.0
	18.289	1762.51	1094.89	.26	-.26	1094.95	-.46	.00	9100.00	1102.00	1097.50	10095.00	.0
*	18.360	2309.92	1096.46	.57	.00	1096.68	.00	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.360	2064.09	1096.35	.57	-.11	1096.55	-.12	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.360	1762.51	1096.22	.56	-.13	1096.40	-.27	.00	9400.00	1100.00	1097.50	10100.00	.0
*	18.465	2379.81	1097.99	.28	.00	1098.08	.00	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.465	2094.61	1097.83	.27	-.16	1097.91	-.17	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.465	1765.38	1097.63	.26	-.21	1097.69	-.38	.00	9340.00	1102.00	1097.50	10095.00	.0
*	18.557	3331.40	1098.50	.24	.00	1098.58	.00	.00	9170.00	1104.00	1097.50	10090.00	.0
*	18.557	2728.84	1098.29	.22	-.21	1098.36	-.23	.00	9170.00	1104.00	1097.50	10090.00	.0
*	18.557	2050.53	1098.02	.19	-.27	1098.07	-.51	.00	9170.00	1104.00	1097.50	10090.00	.0
*	18.647	5305.23	1098.98	.28	.00	1099.11	.00	.00	9055.00	1104.00	1097.50	10095.00	.0
	18.647	4151.94	1098.68	.25	-.29	1098.78	-.33	.00	9055.00	1104.00	1097.50	10095.00	.0
	18.647	2833.66	1098.31	.20	-.38	1098.36	-.75	.00	9055.00	1104.00	1097.50	10095.00	.0
*	18.725	8011.11	1099.42	.26	.00	1099.55	.00	.00	8960.00	1104.00	1097.50	10095.00	.0
*	18.725	6118.69	1099.04	.23	-.39	1099.13	-.42	.00	8960.00	1104.00	1097.50	10095.00	.0
*	18.725	3925.42	1098.53	.18	-.50	1098.59	-.96	.00	8960.00	1104.00	1097.50	10095.00	.0
	18.818	11974.81	1099.97	.30	.00	1100.14	.00	.00	8670.00	1106.00	1098.00	10100.00	.0
	18.818	8837.68	1099.47	.26	-.50	1099.59	-.54	.00	8670.00	1106.00	1098.00	10100.00	.0
	18.818	5231.17	1098.81	.20	-.66	1098.87	-1.27	.00	8670.00	1106.00	1098.00	10100.00	.0
	18.892	16545.53	1100.61	.38	.00	1100.88	.00	.00	8555.00	1108.00	1099.00	10415.00	.0
	18.892	11460.85	1100.00	.34	-.62	1100.18	-.70	.00	8555.00	1108.00	1099.00	10415.00	.0
	18.892	5897.26	1099.15	.26	-.85	1099.23	-1.65	.00	8555.00	1108.00	1099.00	10415.00	.0

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	SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
*	18.960	17700.00	1101.75	.42	.00	1101.99	.00	.00	8730.00	1108.00	1103.50	11250.00	.0
*	18.960	11800.00	1101.03	.44	-.73	1101.22	-.77	.00	8730.00	1108.00	1103.50	11250.00	.0
*	18.960	5900.00	1100.03	.54	-.99	1100.21	-1.78	.00	8730.00	1108.00	1103.50	11250.00	.0
*	19.062	17700.00	1106.49	1.02	.00	1107.16	.00	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.062	11800.00	1106.16	1.02	-.33	1106.69	-.47	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.062	5900.00	1105.94	.71	-.22	1106.15	-1.01	.00	8800.00	1110.00	1108.00	11530.00	.0
*	19.156	17700.00	1113.23	.50	.00	1113.49	.00	.00	8920.00	1114.00	1114.00	11160.00	.0
*	19.156	11800.00	1112.79	.48	-.44	1112.98	-.51	.00	8920.00	1114.00	1114.00	11160.00	.0
*	19.156	5900.00	1112.10	.52	-.69	1112.24	-1.25	.00	8920.00	1114.00	1114.00	11160.00	.0
	19.238	17700.00	1116.91	.67	.00	1117.38	.00	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.238	11800.00	1116.43	.65	-.48	1116.78	-.60	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.238	5900.00	1115.92	.53	-.51	1116.10	-1.27	.00	9040.00	1120.00	1120.00	10910.00	.0
	19.332	17700.00	1122.90	.70	.00	1123.39	.00	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.332	11800.00	1122.42	.67	-.49	1122.78	-.61	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.332	5900.00	1121.47	.72	-.94	1121.80	-1.58	.00	8930.00	1126.00	1126.00	11000.00	.0
	19.428	17700.00	1128.85	.65	.00	1129.22	.00	.00	8740.00	1132.00	1134.00	11150.00	.0
	19.428	11800.00	1128.42	.64	-.42	1128.71	-.51	.00	8740.00	1132.00	1134.00	11150.00	.0
	19.428	5900.00	1127.89	.59	-.53	1128.10	-1.12	9325.00	8740.00	100000.00	100000.00	11150.00	11150.0
	19.529	17700.00	1134.74	.68	.00	1135.20	.00	.00	8575.00	1138.00	1138.00	11125.00	.0
	19.529	11800.00	1134.24	.64	-.50	1134.59	-.61	.00	8575.00	1138.00	1138.00	11125.00	.0
	19.529	5900.00	1133.51	.61	-.73	1133.75	-1.46	.00	8575.00	1138.00	1138.00	11125.00	.0
	19.607	17700.00	1139.11	.63	.00	1139.53	.00	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.607	11800.00	1138.50	.63	-.61	1138.85	-.68	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.607	5900.00	1137.74	.59	-.76	1137.97	-1.56	.00	8460.00	1142.00	1142.00	10950.00	.0
	19.691	17700.00	1143.36	.63	.00	1143.81	.00	.00	8700.00	1146.00	1146.00	10880.00	.0
	19.691	11800.00	1142.79	.60	-.56	1143.14	-.67	.00	8700.00	1146.00	1146.00	10880.00	.0
	19.691	5900.00	1141.97	.58	-.83	1142.20	-1.61	.00	8700.00	1146.00	1146.00	10880.00	.0
	19.775	17700.00	1148.48	.80	.00	1149.17	.00	9300.00	8900.00	100000.00	100000.00	10800.00	10800.0
	19.775	11800.00	1147.74	.80	-.74	1148.41	-.76	9570.00	8900.00	100000.00	100000.00	10800.00	10800.0
	19.775	5900.00	1146.92	.74	-.82	1147.34	-1.83	.00	8900.00	1150.00	1150.00	10800.00	.0
	19.854	17700.00	1153.57	.68	.00	1154.23	.00	9525.00	9000.00	100000.00	100000.00	10490.00	10490.0
	19.854	11800.00	1152.92	.65	-.65	1153.40	-.82	9525.00	9000.00	100000.00	100000.00	10490.00	10490.0
	19.854	5900.00	1151.72	.62	-1.19	1152.11	-2.12	9820.00	9000.00	100000.00	100000.00	10490.00	10490.0

*	19.938	17700.00	1162.04	1.03	.00	1163.23	.00	.00	9330.00	1164.00	1168.00	10296.00	.0
*	19.938	11800.00	1162.03	1.03	-.01	1163.19	-.04	9665.00	9330.00	100000.00	100000.00	10296.00	10296.0
*	19.938	5900.00	1161.18	1.05	-.85	1161.94	-1.29	9665.00	9330.00	100000.00	100000.00	10296.00	10296.0
*	19.991	17700.00	1166.98	1.00	.00	1168.77	.00	.00	9786.00	1170.00	1168.00	10310.00	.0
*	19.991	11800.00	1166.00	.99	-.98	1167.45	-1.32	.00	9786.00	1170.00	1168.00	10310.00	.0
*	19.991	5900.00	1165.13	.83	-.87	1165.86	-2.91	.00	9786.00	1170.00	1168.00	10310.00	.0

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	SECNO	Q	CWSEL	FRCH	DIFWSP	EG	DIFEG	STENCL	STCHL	XLBEL	RBEL	STCHR	STENC
*	20.009	17700.00	1168.64	.56	.00	1169.41	.00	.00	9786.00	1170.00	1167.00	10300.00	.0
*	20.009	11800.00	1167.52	.55	-1.12	1168.09	-1.32	.00	9786.00	1170.00	1167.00	10300.00	.0
*	20.009	5900.00	1166.00	.50	-1.52	1166.37	-3.04	.00	9786.00	1170.00	1167.00	10300.00	.0

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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO=.186 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.186 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO=.314 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=.314 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=.415 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.415 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO=.540 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.540 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 WARNING SECNO=.540 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=.540 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=.634 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.634 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 WARNING SECNO=.634 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=.634 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=.729 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=.729 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=.823 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.823 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 WARNING SECNO=.823 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=.823 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=1.012 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=1.012 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 WARNING SECNO=1.012 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=1.012 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=1.067 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=1.067 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=1.067 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 WARNING SECNO=1.067 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=1.067 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=17.945 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=17.945 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=17.952 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=17.952 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=17.952 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=18.072 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=18.072 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=18.072 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO=18.072 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=18.072 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=18.072 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=18.072 PROFILE= 3 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=18.072 PROFILE= 3 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=18.072 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=18.143 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.143 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.143 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=18.360 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.360 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.360 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=18.465 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.465 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.465 PROFILE= 3 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=18.557 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO=18.557 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=	18.557	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.647	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.725	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.725	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.725	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.960	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	18.960	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=	19.062	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.062	PROFILE=	1	MINIMUM SPECIFIC ENERGY
CAUTION SECNO=	19.062	PROFILE=	2	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.062	PROFILE=	2	MINIMUM SPECIFIC ENERGY
WARNING SECNO=	19.062	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	19.156	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	19.156	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	19.156	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=	19.938	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.938	PROFILE=	1	MINIMUM SPECIFIC ENERGY
CAUTION SECNO=	19.938	PROFILE=	2	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.938	PROFILE=	2	MINIMUM SPECIFIC ENERGY
CAUTION SECNO=	19.938	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.938	PROFILE=	3	MINIMUM SPECIFIC ENERGY
CAUTION SECNO=	19.991	PROFILE=	1	CRITICAL DEPTH ASSUMED
CAUTION SECNO=	19.991	PROFILE=	1	MINIMUM SPECIFIC ENERGY
WARNING SECNO=	19.991	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	20.009	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	20.009	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=	20.009	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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ET			9.1						9925	10080
X1	0.314	14	9950	10080	500	720	680			
GR	1050	9135	1048	9350	1047	9680	1048	9760	1049	9870
GR	1048	9950	1044	9970	1042.5	10000	1044	10050	1046	10070
GR	1048	10080	1050	10090	1052	10100	1054	10110		
ET			9.1						9940	10175
X1	0.415	13	9940	10060	300	800	530			
GR	1052.3	9250	1051.8	9650	1051	9875	1050	9940	1049.5	9960
GR	1047.2	10000	1048	10010	1050	10060	1051.2	10100	1050	10140
GR	1052	10275	1052	10315	1052.3	10335				
ET			9.1						9911.75	10110
X1	0.540	11	9930	10040	660	650	660			
GR	1057.7	9910	1056	9930	1054	9960	1053	10000	1054	10030
GR	1056	10040	1056	10050	1055.3	10060	1056	10070	1056.9	10250
GR	1057.8	10335								
ET			9.1						9950.98	10105
X1	0.634	10	9970	10040	495	495	495			
GR	1062.4	9935	1062	9950	1058	9970	1056.8	10000	1058	10040
GR	1060	10055	1060.3	10105	1062	10170	1062	10240	1062.3	10290
ET			9.1						9953.52	10085
X1	0.729	16	9960	10085	500	500	500			
GR	1069.6	9920	1068	9940	1066	9950	1064	9960	1062	9970
GR	1060.7	10000	1062	10030	1061.7	10040	1062	10055	1064	10085
GR	1065.8	10275	1065.5	10385	1066	10460	1065.8	10485	1066	10505
GR	1068	10625								

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ET			9.1						9952.71	10045.27
X1	0.823	11	9955	10030	495	495	495			
GR	1076	9925	1074	9940	1072	9950	1070	9955	1068	9960
GR	1066	9965	1064.5	10000	1066	10010	1068	10020	1070	10030
GR	1071.2	10050								
ET			9.1						9956.30	10050
X1	0.917	11	9965	10040	500	500	500			
GR	1079.6	9915	1078	9940	1076	9950	1074	9960	1072	9965
GR	1070	9970	1069.3	10000	1070	10030	1074	10040	1076	10130
GR	1076.2	10150								
ET			9.1						9936.36	10028.56
X1	1.012	11	9940	10020	500	500	500			
GR	1085.6	9920	1084	9925	1082	9930	1080	9940	1078	9945
GR	1076	9950	1075.7	10000	1076	10010	1078	10015	1080	10020
GR	1081.7	10040								
NC	.016	.016	.016	.3	.5					
QT	2	4061	4061							
ET			9.11						9977.7	10022

Q @ X1 = 1.067 TO X1 = 1.110 EQUALS Q AT CP43 (AFTER DIVERT)  
 Q = 4061 CFS  
 FLOW LEFT OVER AFTER WEIR FLOW OVER DIKE UPSTREAM OF CULVERT

4 - 10ft x 8ft x 227ft BC AT INTERSTATE 10

X1	1.067	7	9977.7	10022.0	293	293	293			
X3	10							1088	1088	
GR	1088	9915.0	1078.64	9977.7	1078.64	9978.64	1078.64	10000.0	1078.64	10021.4
GR	1078.9	10022.0	1086	10075						
SC	4.016	.5	2.6	0	8	10	227	8.1	1081.16	1078.64
ET			9.11						9950	10022

PORTION OF FLOW FOR THE NEXT FOUR CROSS SECTIONS UPSTREAM  
 IS LOST AS WEIR FLOW OVER THE DIKE TO THE EAST  
 APPROXIMATELY 1440 CFS FLOWS EAST OVER DIKE

EFFECTIVE FLOW OPTION IS INCORPORATED FOR THE NEXT 5 UPSTREAM CROSS  
 SECTIONS AS A RESULT OF PONDING AND UPSTREAM AND DOWNSTREAM EXPANSION  
 AND CONTRATION FLOW SITUATIONS.

ACTUAL MAPPED LIMITS CORRESPOND TO WATER SURFACE ELEVATIONS AND ARE  
 SHOWN CORRECTLY ON THE FLOODPLAIN WORK MAP.

X1	1.110	8	9977.7	10022.0	227	227	227			
X2	0	0	2	1089.16	1091.5					
X3	10							1092	1099	
BT	5	9950	1092		9978.6	1099		10000	1099	
BT	10022	1099		10100	1099					
GR	1092	9950	1081.16	9977.7	1081.1	9978.6	1081.1	10000	1081.1	10021.

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PAGE 4

GR	1081.1	10022	1088	10100	1096	11850				
QT	2	5503	5503							
ET			9.1						9920	10100

Q @ X1 = 1.118 TO X1 = 1.198 EQUALS STORAGE ROUTED Q AT CP43  
 Q = 5503 CFS

X1	1.118	13	9920	10030	40	40	40			
----	-------	----	------	-------	----	----	----	--	--	--

X3				9920		10100						
GR	1096	9500	1094	9860	1091.5	9920	1090	9945	1081.52	9978.6		
GR	1081.5	10000	1081.5	10021.	1081.5	10021.4	1082	10030	1084	10200		
GR	1086	10260	1088	10500	1096	11850						

T1 WHITE TANKS/AGUA FRIA AREA DRAINAGE MASTER STUDY  
T2 100-YEAR STORM EVENT FLOODWAY RUN  
T3 TUTHILL DIKE WASH - WASH "5"

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3							1039.06	
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15		-1							

THIS RUN EXECUTED 30APR96 10:13:17

\*\*\*\*\*  
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

TUTHILL DIKE WASH - WASH  
SUMMARY PRINTOUT

SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
.000	4057.00	1039.06	9945.48	9940.00	10075.00	10068.73	.00	123.25	6.06	1033.00	43.68	8.2
.000	4057.00	1039.06	9945.48	9940.00	10075.00	10068.73	.00	123.25	6.06	1033.00	43.67	8.2
.075	4057.00	1040.84	9888.88	9960.00	10070.00	10073.38	1.79	184.50	5.84	1035.00	27.90	6.9
.075	4057.00	1040.84	9910.00	9960.00	10070.00	10073.36	1.78	163.36	5.84	1035.00	28.33	6.9
*	.186	4057.00	1043.71	9751.25	9970.00	10050.00	2.87	294.60	5.21	1038.50	45.59	9.3
*	.186	4057.00	1043.25	9953.74	9970.00	10050.00	2.41	112.53	4.75	1038.50	75.16	11.2
*	.314	4057.00	1047.99	9353.42	9950.00	10080.00	4.28	535.64	5.49	1042.50	39.51	7.5
*	.314	4057.00	1048.06	9945.41	9950.00	10080.00	4.80	134.59	5.56	1042.50	45.66	8.1
*	.415	4057.00	1051.93	9545.90	9940.00	10060.00	3.94	724.39	4.73	1047.20	47.17	7.2
*	.415	4057.00	1051.88	9940.00	9940.00	10060.00	3.83	235.00	4.68	1047.20	77.95	9.1
*	.540	4057.00	1057.55	9911.75	9930.00	10040.00	5.62	399.72	4.55	1053.00	53.00	8.3
*	.540	4057.00	1057.46	9912.87	9930.00	10040.00	5.57	197.13	4.46	1053.00	72.54	9.5
*	.634	4057.00	1061.80	9950.98	9970.00	10040.00	4.25	211.54	5.00	1056.80	59.83	10.2
*	.634	4057.00	1061.79	9951.07	9970.00	10040.00	4.33	153.93	4.99	1056.80	64.21	10.6
*	.729	4057.00	1065.30	9953.52	9960.00	10085.00	3.49	268.28	4.60	1060.70	70.72	9.2
*	.729	4057.00	1065.34	9953.52	9960.00	10085.00	3.55	131.48	4.64	1060.70	75.84	9.6
*	.823	4057.00	1070.92	9952.71	9955.00	10030.00	5.62	92.56	6.42	1064.50	76.65	11.8
*	.823	4057.00	1070.94	9952.71	9955.00	10030.00	5.60	92.56	6.44	1064.50	75.23	11.7
	.917	4057.00	1074.73	9956.30	9965.00	10040.00	3.82	116.97	5.43	1069.30	68.23	11.3
	.917	4057.00	1074.71	9956.49	9965.00	10040.00	3.77	93.51	5.41	1069.30	70.36	11.4
*	1.012	4057.00	1080.73	9936.36	9940.00	10020.00	5.99	92.19	5.03	1075.70	80.31	11.6
*	1.012	4057.00	1080.75	9936.36	9940.00	10020.00	6.04	92.20	5.05	1075.70	79.12	11.6

SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
*	1.067	4061.00	1085.01	9977.70	9977.70	10022.00	4.28	44.30	6.37	1078.64	20.40	14.4
*	1.067	4061.00	1085.01	9977.70	9977.70	10022.00	4.26	44.30	6.37	1078.64	24.23	14.4
*	1.110	4061.00	1093.14	9950.00	9977.70	10022.00	8.13	72.00	12.04	1081.10	1.66	6.2
*	1.110	4061.00	1093.16	9950.00	9977.70	10022.00	8.15	72.00	12.06	1081.10	2.14	6.0
*	1.118	5503.00	1093.65	9920.00	9920.00	10030.00	.51	180.00	12.15	1081.50	.61	3.0
*	1.118	5503.00	1093.64	9920.00	9920.00	10030.00	.48	180.00	12.14	1081.50	.61	3.0

TUTHILL DIKE WASH - WASH

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENC
.000	1039.06	-.94	1040.11	123.25	.00	4057.00	.00	.00	.00	9940.00	10075.00	.0
.000	1039.06	.00	1040.11	123.25	.00	4057.00	.00	123.25	9945.48	9940.00	10075.00	10068.7
.075	1040.84	.00	1041.52	184.50	758.82	3296.64	1.55	.00	.00	9960.00	10070.00	.0
.075	1040.84	-.01	1041.53	163.36	740.68	3314.79	1.53	163.38	9910.00	9960.00	10070.00	10073.3
* .186	1043.71	.00	1044.90	294.60	428.50	3499.86	128.64	.00	.00	9970.00	10050.00	.0
* .186	1043.25	-.46	1045.10	112.53	155.07	3785.63	116.30	118.55	9950.00	9970.00	10050.00	10068.5
* .314	1047.99	.00	1048.79	535.64	391.03	3665.97	.00	.00	.00	9950.00	10080.00	.0
* .314	1048.06	.07	1049.09	134.59	.04	4056.96	.00	155.00	9925.00	9950.00	10080.00	10080.0
* .415	1051.93	.00	1052.53	724.39	670.95	2744.45	641.59	.00	.00	9940.00	10060.00	.0
* .415	1051.88	-.05	1053.02	235.00	.00	3407.42	649.58	235.00	9940.00	9940.00	10060.00	10175.0
* .540	1057.55	.00	1058.43	399.72	42.96	3203.28	810.75	.00	.00	9930.00	10040.00	.0
* .540	1057.46	-.09	1058.73	197.13	42.49	3580.08	434.43	198.25	9911.75	9930.00	10040.00	10110.0
* .634	1061.80	.00	1063.16	211.54	210.06	3172.71	674.23	.00	.00	9970.00	10040.00	.0
* .634	1061.79	-.02	1063.28	153.93	214.97	3265.15	576.88	154.02	9950.98	9970.00	10040.00	10105.0
* .729	1065.30	.00	1066.56	268.28	12.93	3836.70	207.37	.00	.00	9960.00	10085.00	.0
* .729	1065.34	.04	1066.77	131.48	15.03	4041.97	.00	131.48	9953.52	9960.00	10085.00	10085.0
* .823	1070.92	.00	1073.07	92.56	2.57	4040.92	13.51	.00	.00	9955.00	10030.00	.0
* .823	1070.94	.02	1073.07	92.56	2.77	4039.64	14.59	92.56	9952.71	9955.00	10030.00	10045.2
.917	1074.73	.00	1076.70	116.97	51.83	3985.72	19.45	.00	.00	9965.00	10040.00	.0
* .917	1074.71	-.03	1076.72	93.51	50.50	3993.93	12.57	93.70	9956.30	9965.00	10040.00	10050.0
* 1.012	1080.73	.00	1082.83	92.19	2.95	4048.78	5.27	.00	.00	9940.00	10020.00	.0
* 1.012	1080.75	.02	1082.83	92.20	3.18	4048.14	5.68	92.20	9936.36	9940.00	10020.00	10028.5
* 1.067	1085.01	.00	1088.23	44.30	.00	4061.00	.00	.00	.00	9977.70	10022.00	.0
* 1.067	1085.01	.00	1088.23	44.30	.00	4061.00	.00	44.30	9977.70	9977.70	10022.00	10022.0
* 1.110	1093.14	.00	1093.68	72.00	708.59	3352.41	.00	.00	.00	9977.70	10022.00	.0
* 1.110	1093.16	.03	1093.68	72.00	809.08	3251.92	.00	72.00	9950.00	9977.70	10022.00	10022.0
* 1.118	1093.65	.00	1093.81	180.00	.00	2898.01	2604.99	180.00	9920.00	9920.00	10030.00	10100.0
* 1.118	1093.64	-.01	1093.80	180.00	.00	2897.52	2605.48	180.00	9920.00	9920.00	10030.00	10100.0

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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO=.186 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.186 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.186 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.186 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.314 PROFILE= 1 CRITICAL DEPTH ASSUMED  
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 CAUTION SECNO=.415 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
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 CAUTION SECNO=.415 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
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 CAUTION SECNO=.540 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.540 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.634 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.634 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.634 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO=.634 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.634 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.729 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.729 PROFILE= 1 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.823 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.823 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=.823 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO=.823 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=.823 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=1.012 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=1.012 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=1.012 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO=1.012 PROFILE= 2 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=1.012 PROFILE= 2 MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=1.067 PROFILE= 1 CRITICAL DEPTH ASSUMED  
 CAUTION SECNO=1.067 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO=1.067 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL  
 CAUTION SECNO=1.067 PROFILE= 2 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1.067 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY  
 CAUTION SECNO= 1.067 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 1.110 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 1.110 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1.118 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE  
 WARNING SECNO= 1.118 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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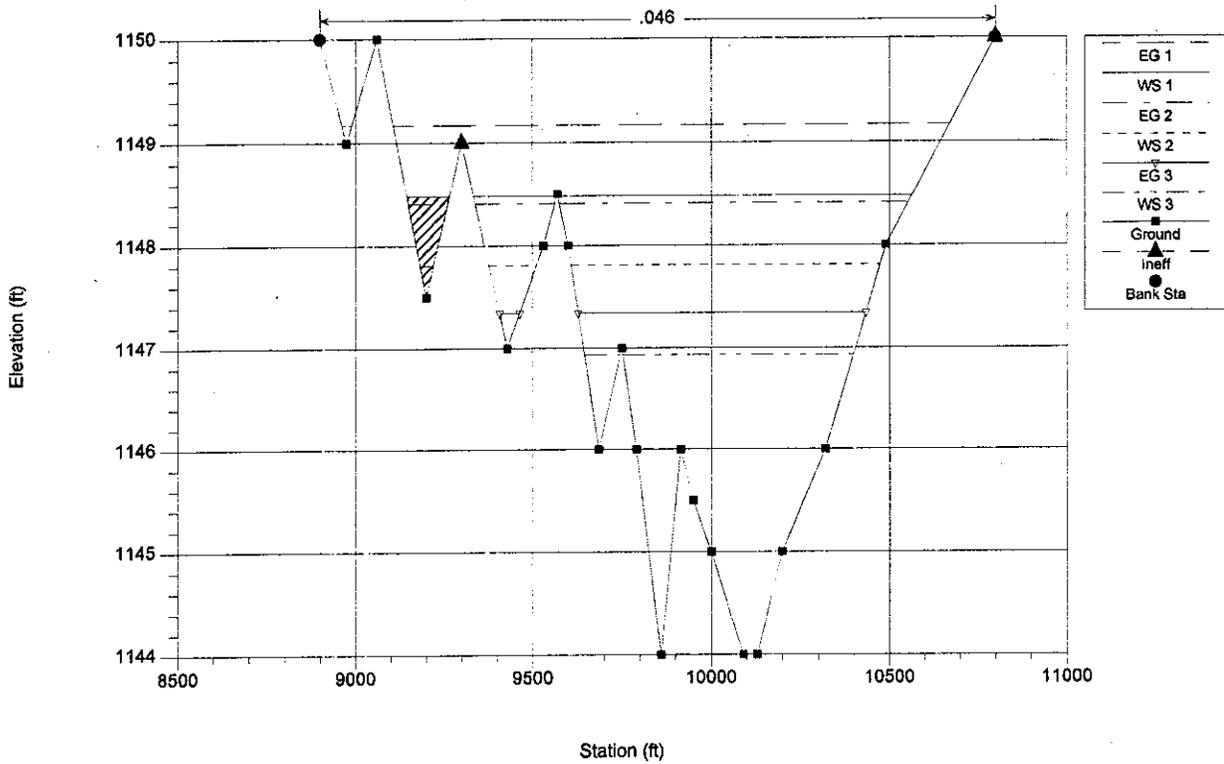
FLOODWAY DATA, TUTHILL DIKE WASH - WASH  
 PROFILE NO. 2

STATION	FLOODWAY			WATER SURFACE ELEVATION		
	WIDTH	SECTION AREA	MEAN VELOCITY	WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
.000	123.	494.	8.2	1039.1	1039.1	.0
.075	163.	618.	6.6	1040.8	1040.8	.0
.186	113.	391.	10.4	1043.2	1043.7	-.5
.314	135.	498.	8.2	1048.1	1048.0	.1
.415	235.	531.	7.6	1051.9	1051.9	.0
.540	197.	493.	8.2	1057.5	1057.6	-.1
.634	154.	467.	8.7	1061.8	1061.8	.0
.729	131.	425.	9.5	1065.3	1065.3	.0
.823	93.	353.	11.5	1070.9	1070.9	.0
.917	94.	364.	11.1	1074.7	1074.7	.0
1.012	92.	353.	11.5	1080.7	1080.7	.0
1.067	44.	282.	14.4	1085.0	1085.0	.0
1.110	72.	717.	5.7	1093.1	1093.1	.0
1.118	180.	1745.	3.2	1093.7	1093.7	.0

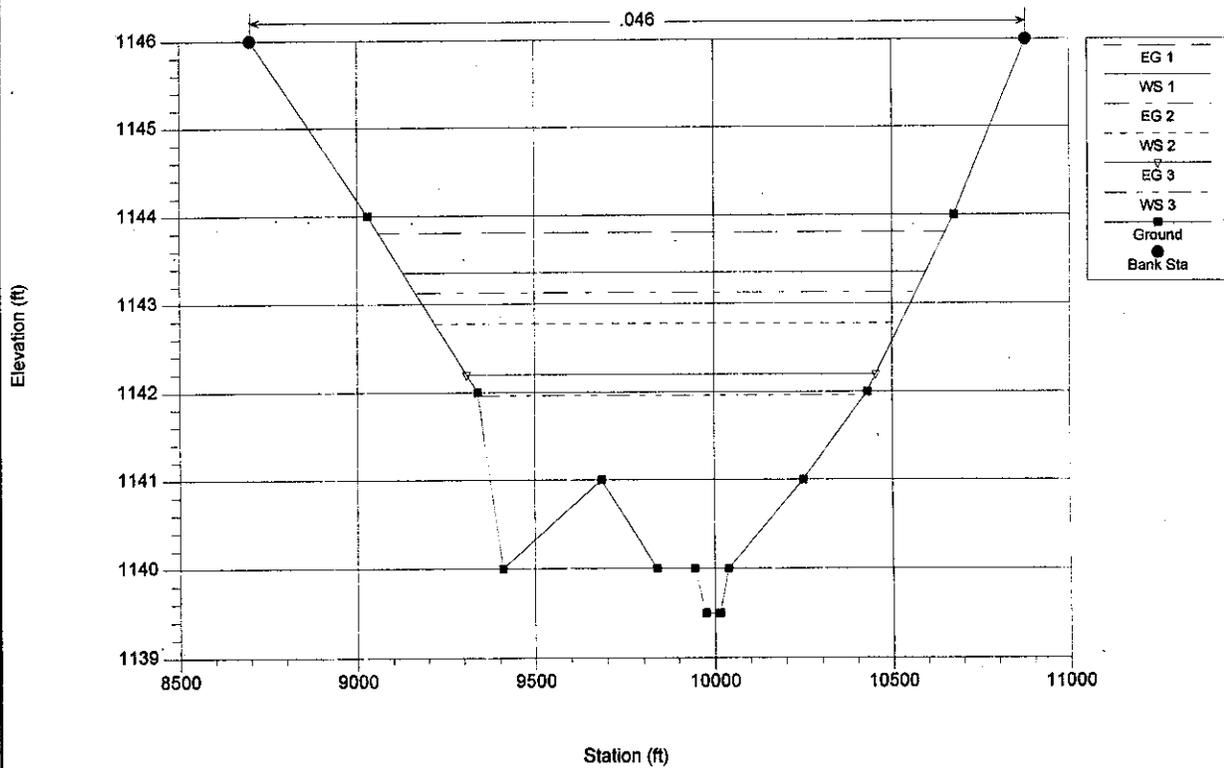




BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 3 MIXED REGIME 7/28/96  
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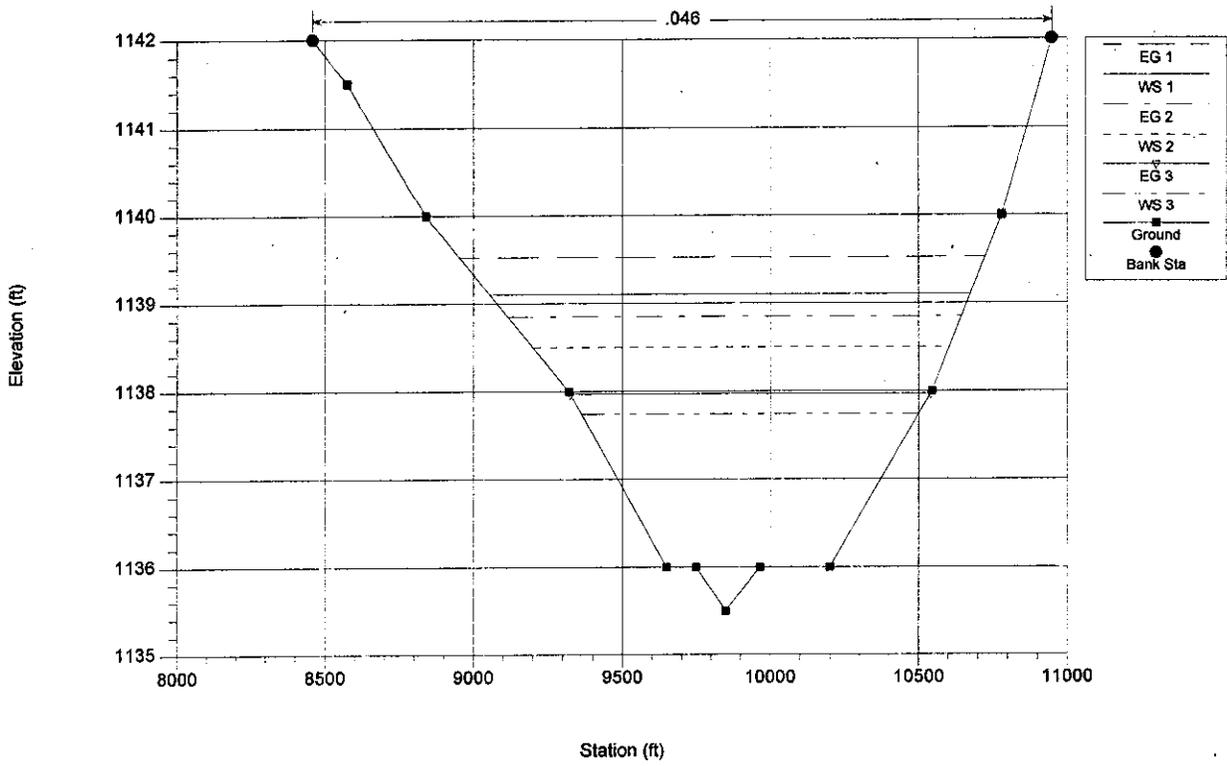


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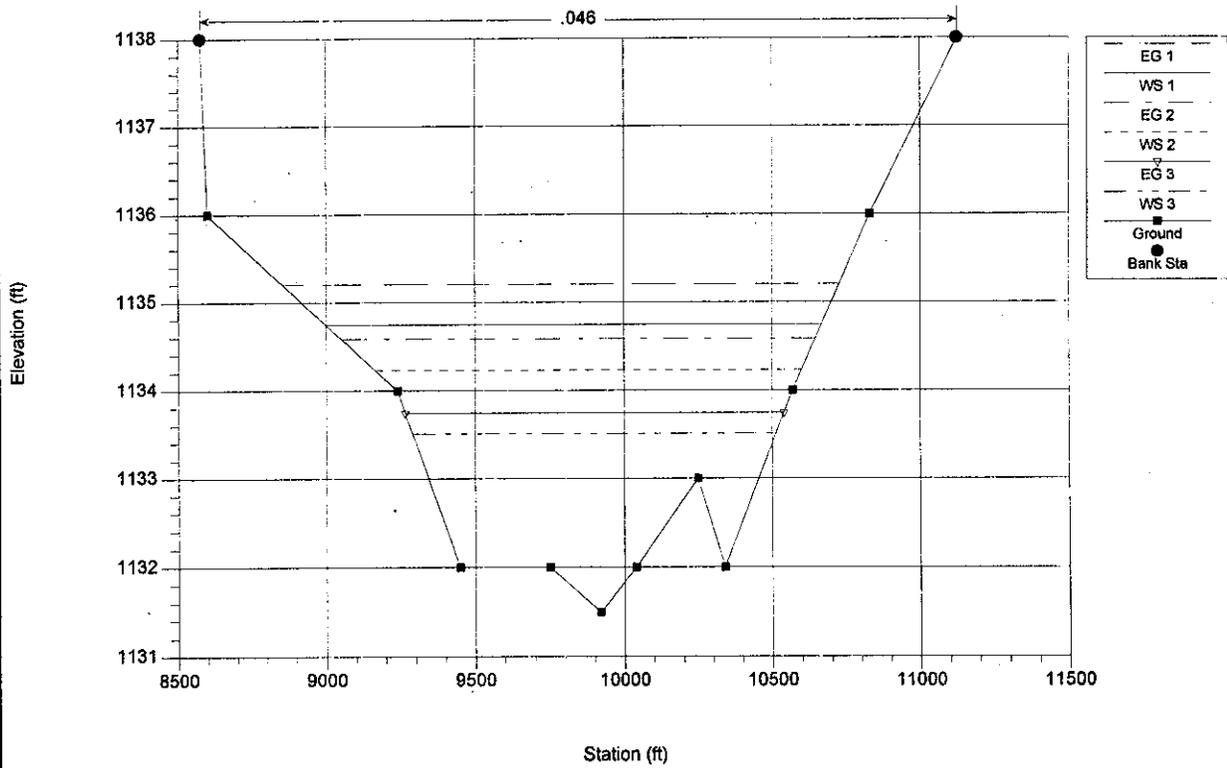


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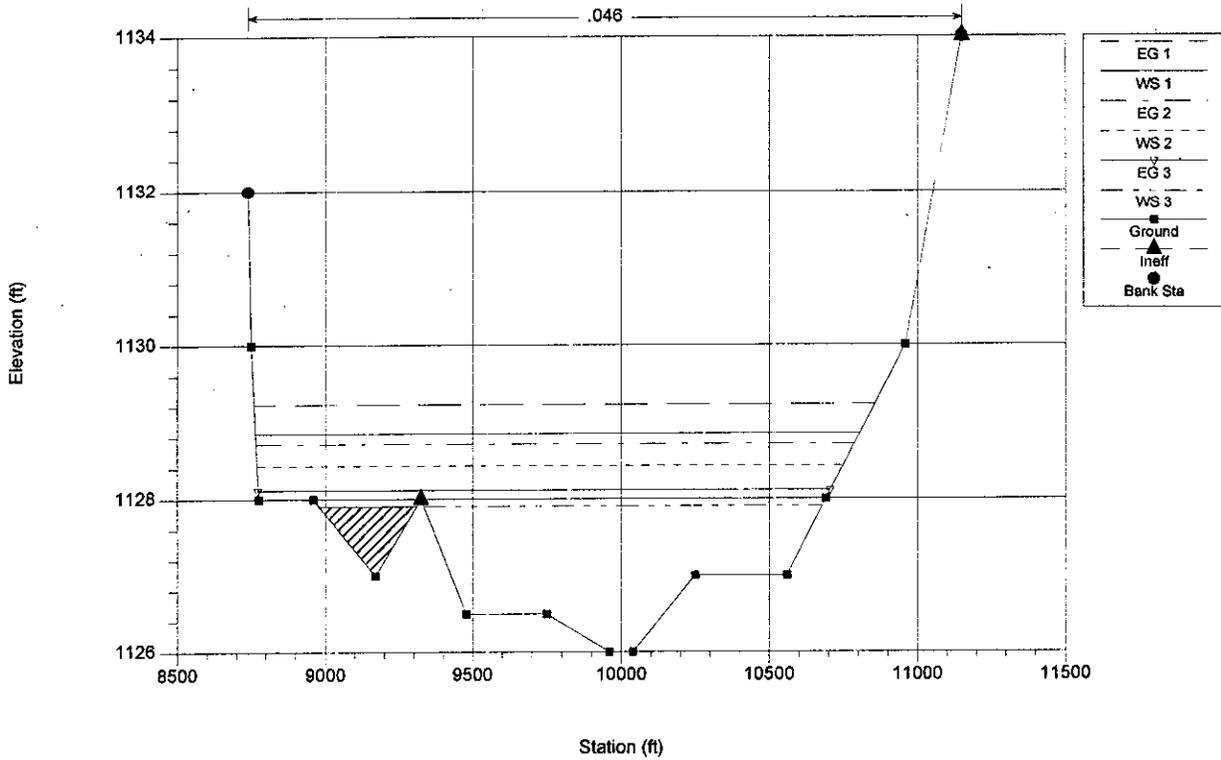
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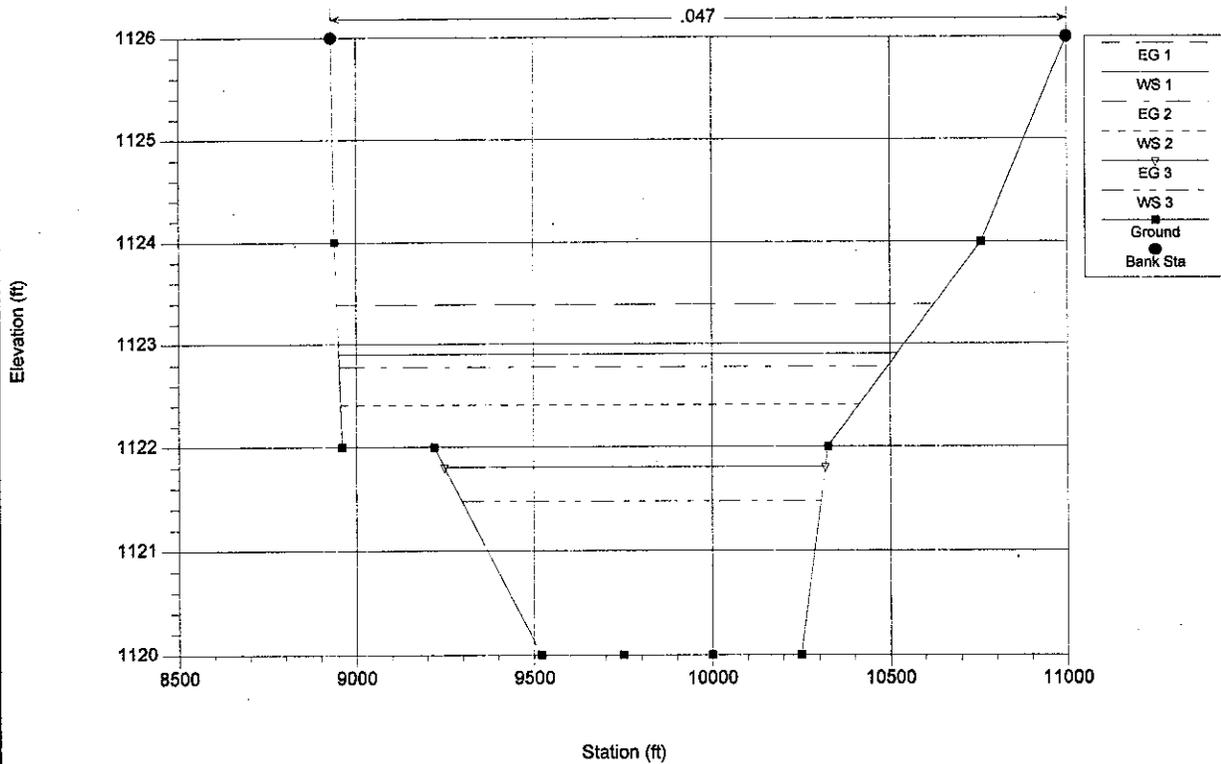
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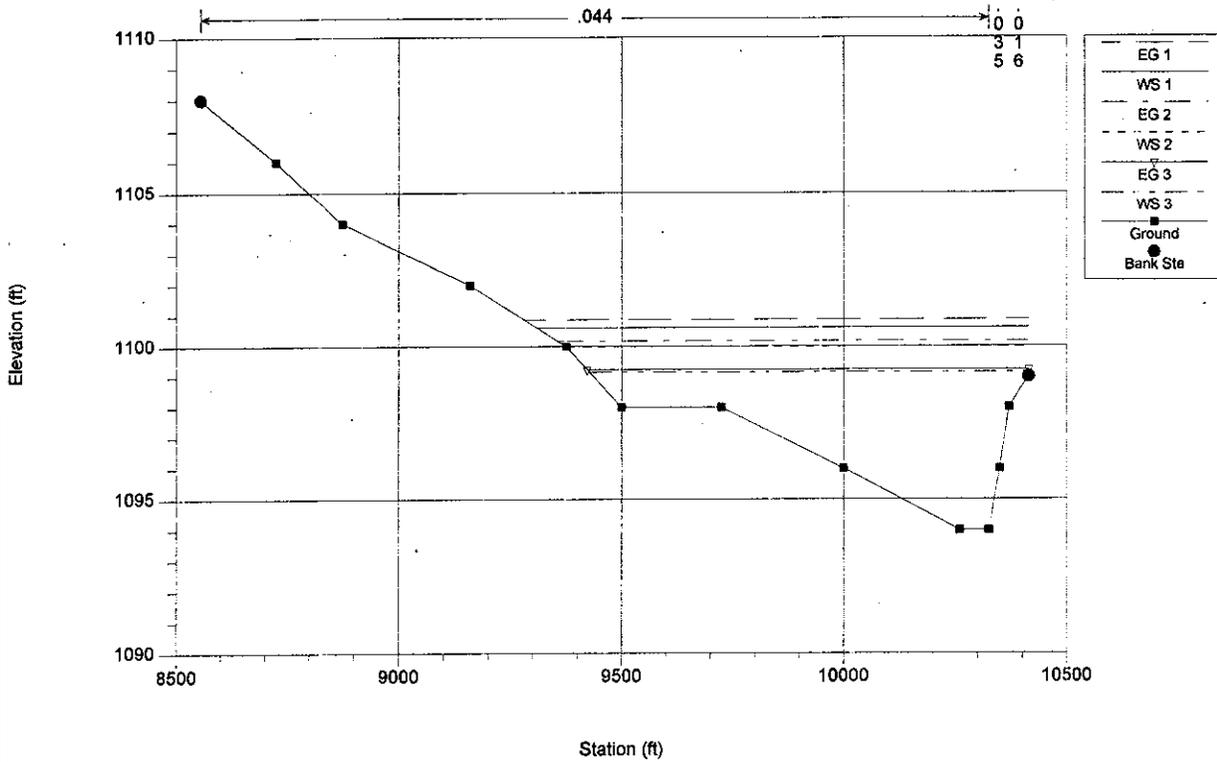
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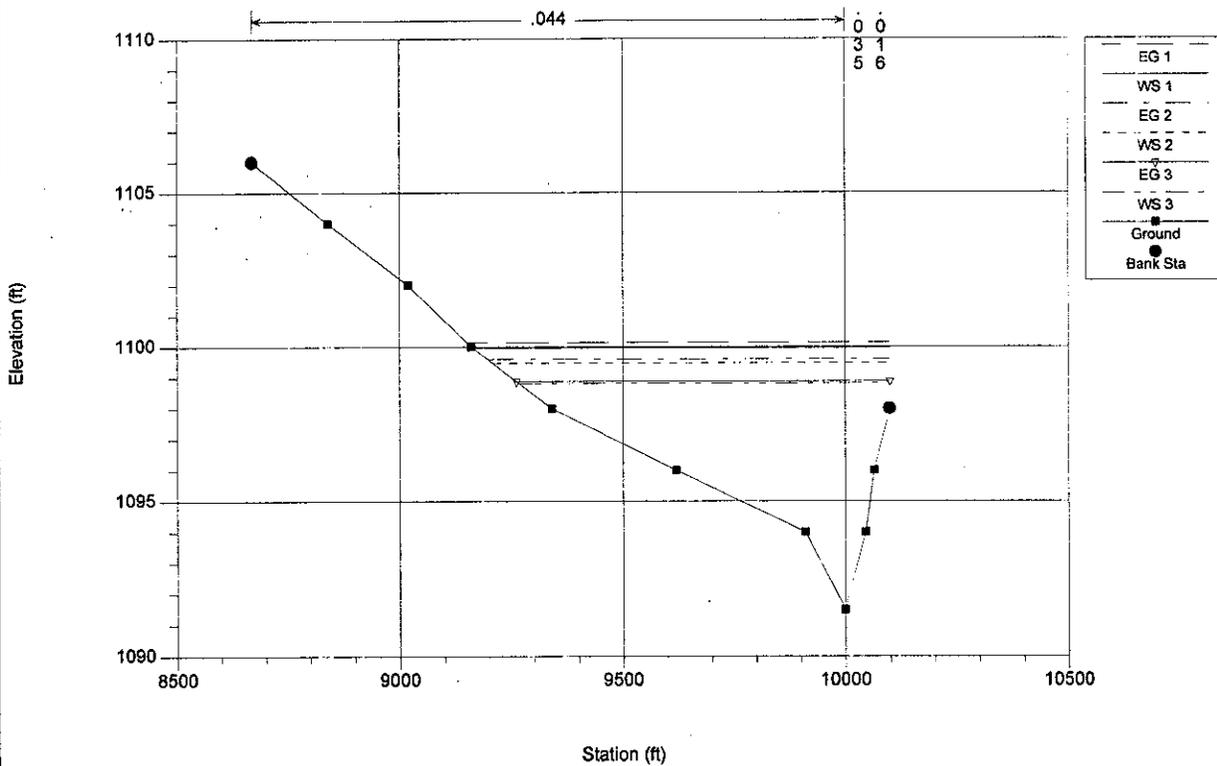




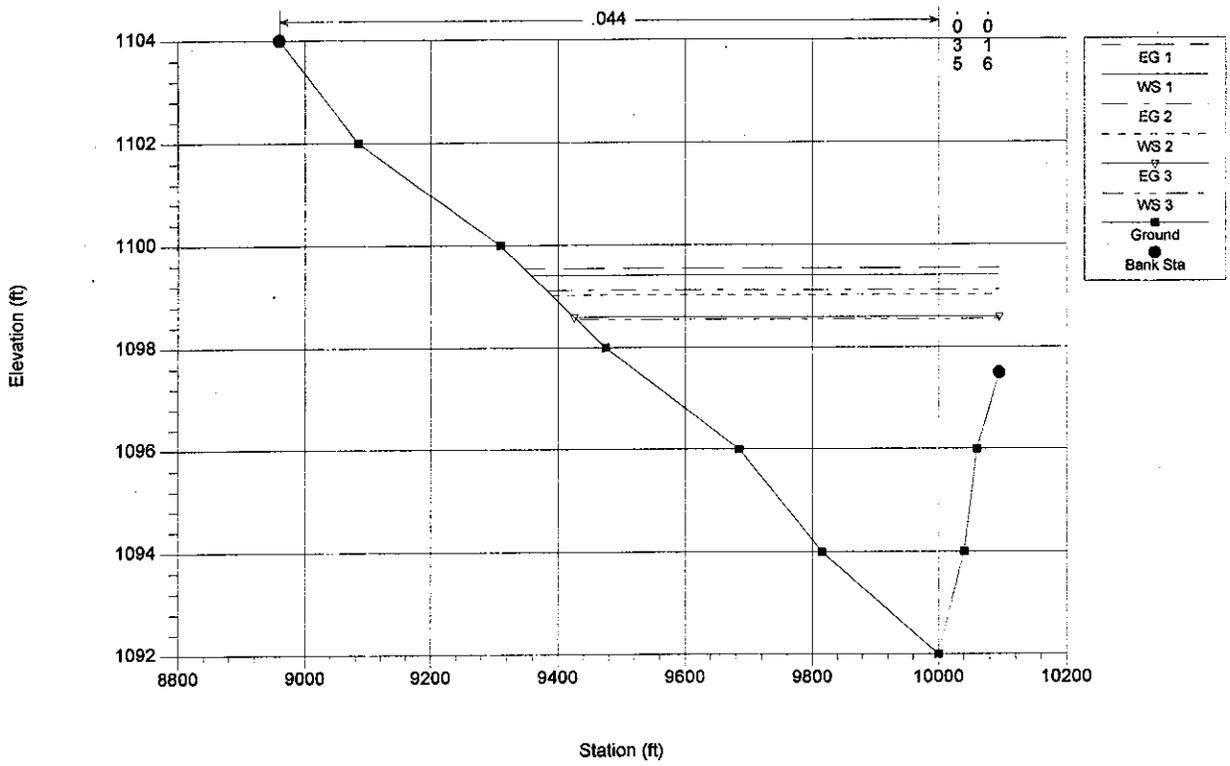
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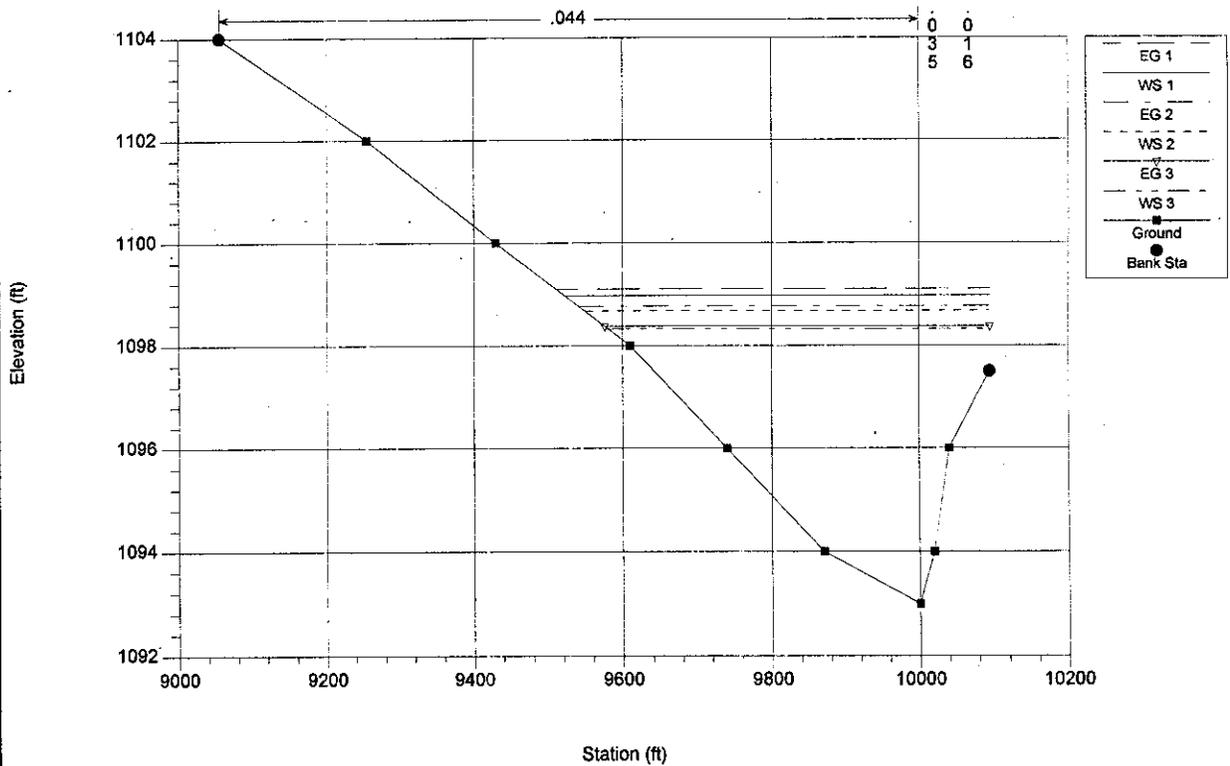
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 Reach = BUCKEYE # 3 18.818



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 3 MIXED REGIME 7/28/96  
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Reach = BUCKEYE # 3 18.725

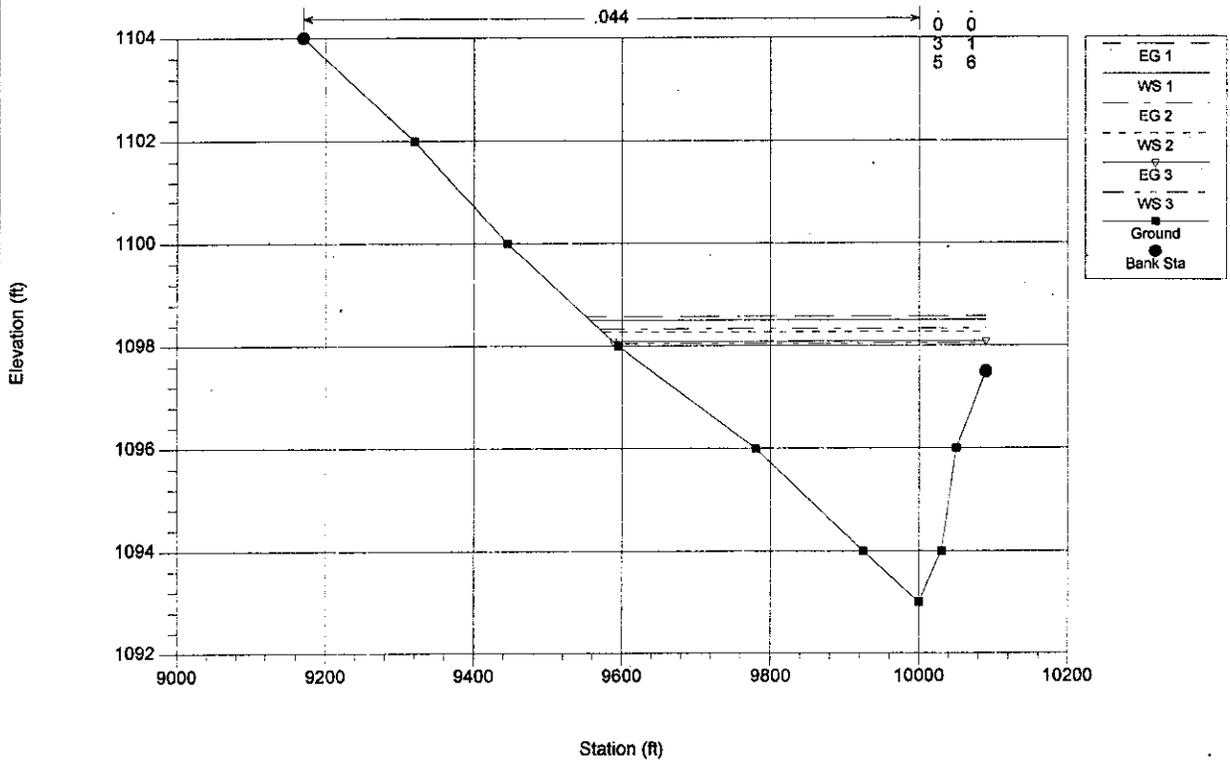


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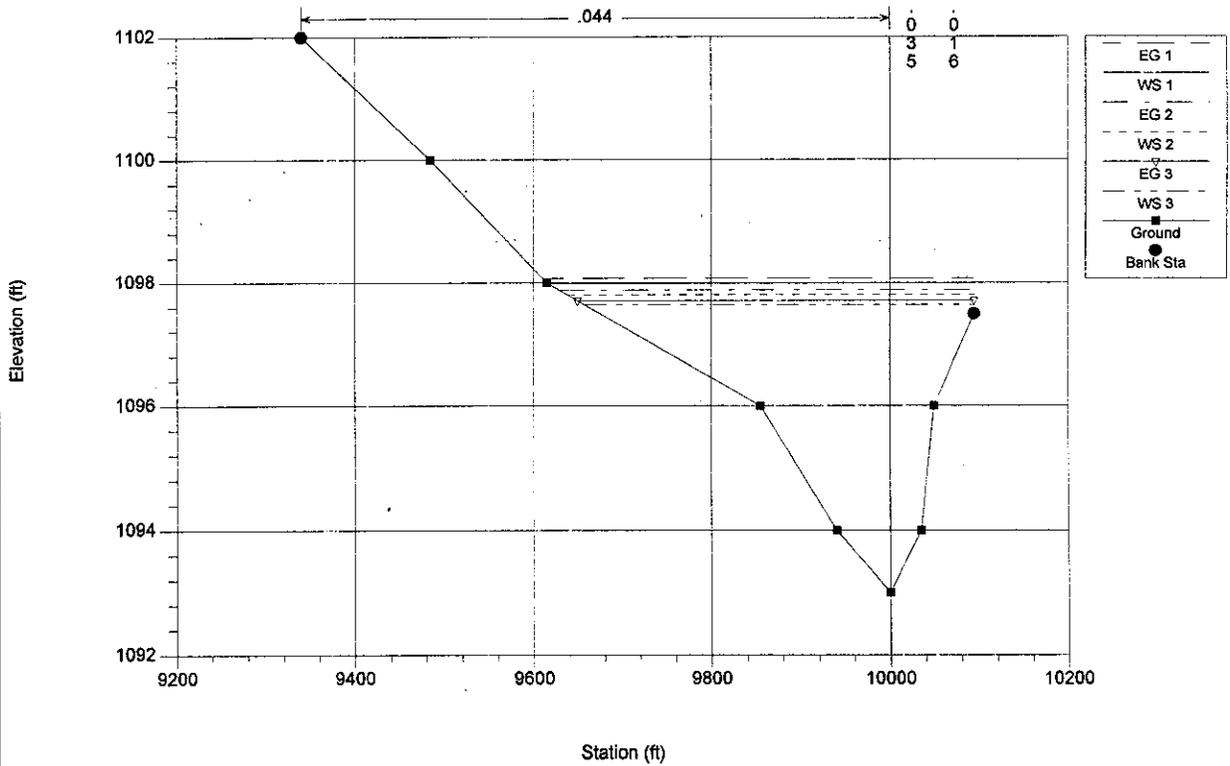


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Reach = BUCKEYE # 3 18.557



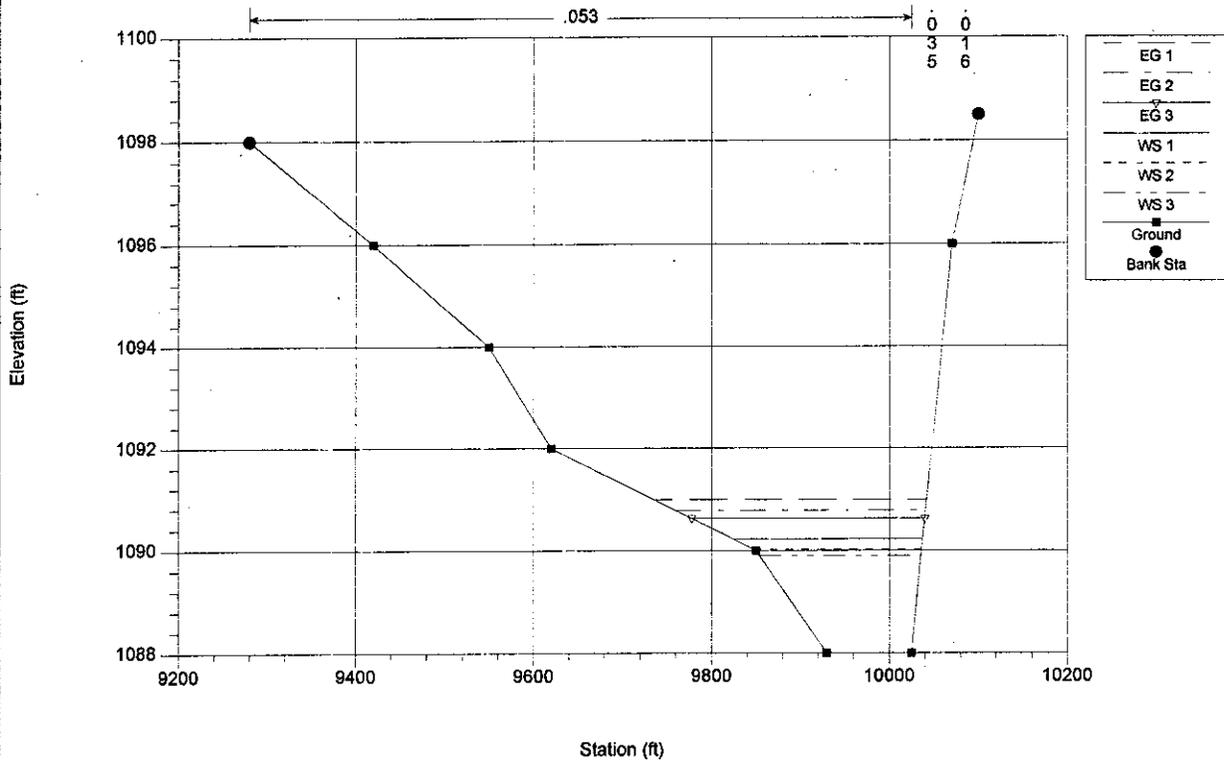
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Geom: FROM 13084B3D.H2  
Reach = BUCKEYE # 3 18.465



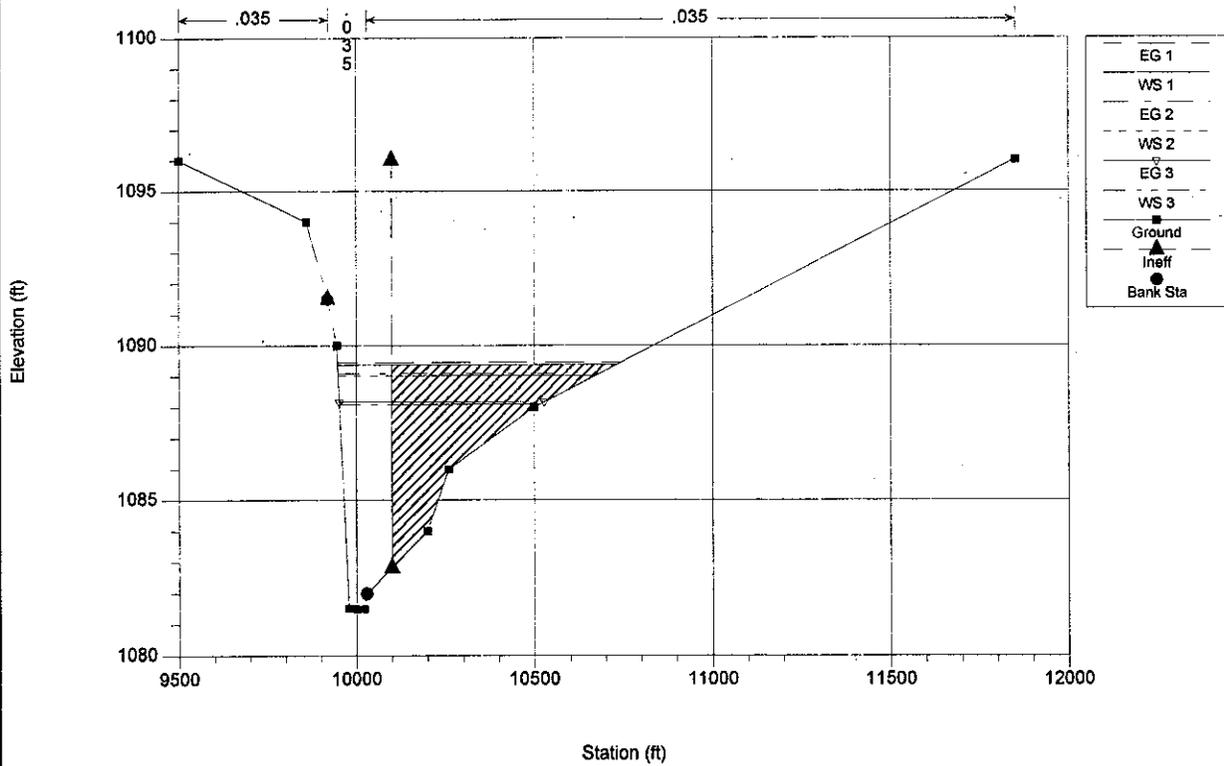




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Geom: FROM 13084B3D.H2  
Reach = BUCKEYE # 3 18.072



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 3 MIXED REGIME 7/28/96  
Geom: FROM 13084B3D.H2  
Reach = BUCKEYE # 3 SAME AS WLB 1.118



BUCKEYE STRUCTURES (FCD95-34) Plan: STRUCTURE 3 MIXED REGIME 7/28/96  
Geom: FROM 13084B3D.H2  
Reach = BUCKEYE #3 SAME AS WLB 1.110

