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Pescadero Creek Road Hydraulic Study

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Pescadero Creek Road Hydraulic Study

Executive Summary

Pescadero Creek Road is maintained by San Mateo County and connects the town of Pescadero with State Highway 1 on the coast in central San Mateo County (**Figures 1 and 2**). It is an essential route for emergency vehicle access to Pescadero during natural disasters and medical emergencies. However, sections of Pescadero Creek Road lay within floodplain areas of Pescadero and Butano Creeks and are estimated to flood to depths of up to 5.0 feet during a 100-year flood. Butano Creek, a stream that drains a 20 square mile mountainous basin to the southeast, floods often (almost on an annual basis) and in larger floods such as the February 2-3, 1998 flood, closes emergency access on Pescadero Creek Road. This condition is deemed to be a serious public safety problem by the Pescadero community and San Mateo County.

Flood capacity at the bridge has diminished over the last 30 years due to filling of the channel bed on Butano Creek. Flows go overbank upstream of the bridge and cross lower portions of the road to the east. The lowest point of the road lies at 10.04 feet MSL, approximately 300 feet east of the bridge. The low point on the bridge soffit is at 11.9 feet and the bridge deck lies at 13.0 feet mean sea level (MSL).

A potential improvement to increase the flood capacity of the bridge and reduce the frequency of overtopping the road would be to raise Pescadero Creek Road east of the bridge to an elevation equal to the bridge deck or to raise the low point to some elevation between 10.0 and 13.0 feet MSL. This improvement alone would reduce nuisance flooding and perhaps the impacts of intermediate levels of flooding but not major flood events.

To determine the benefits of raising the road, a hydraulic model of Butano Creek and Pescadero Creek Road is needed to estimate the flow through the structure under existing and improved conditions. In addition, an understanding of flood frequency on Butano Creek is needed to estimate how often floods of a given volume could be expected to occur. Five scenarios were simulated using the U.S. Army Corps of Engineers River Analysis System (HEC-RAS) computer simulation model (see attached figure):

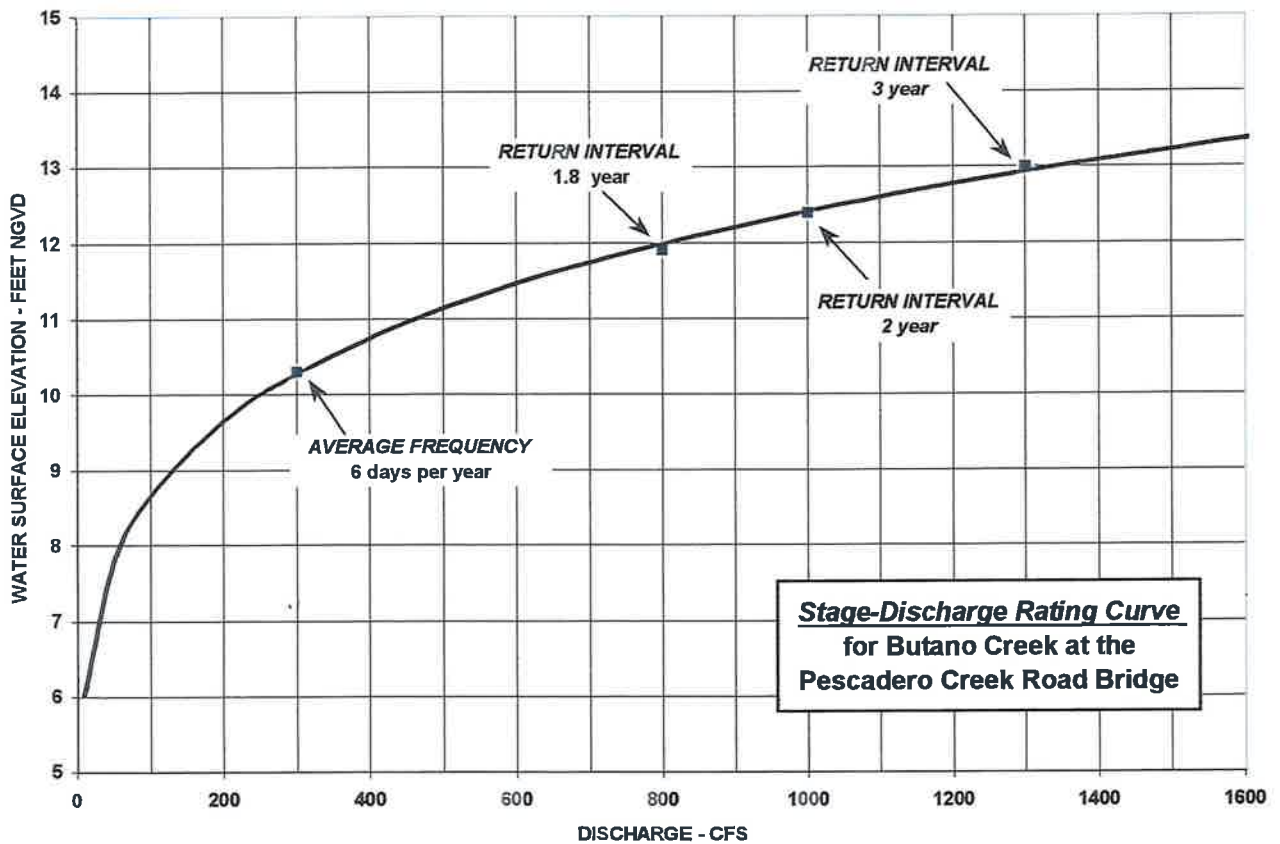
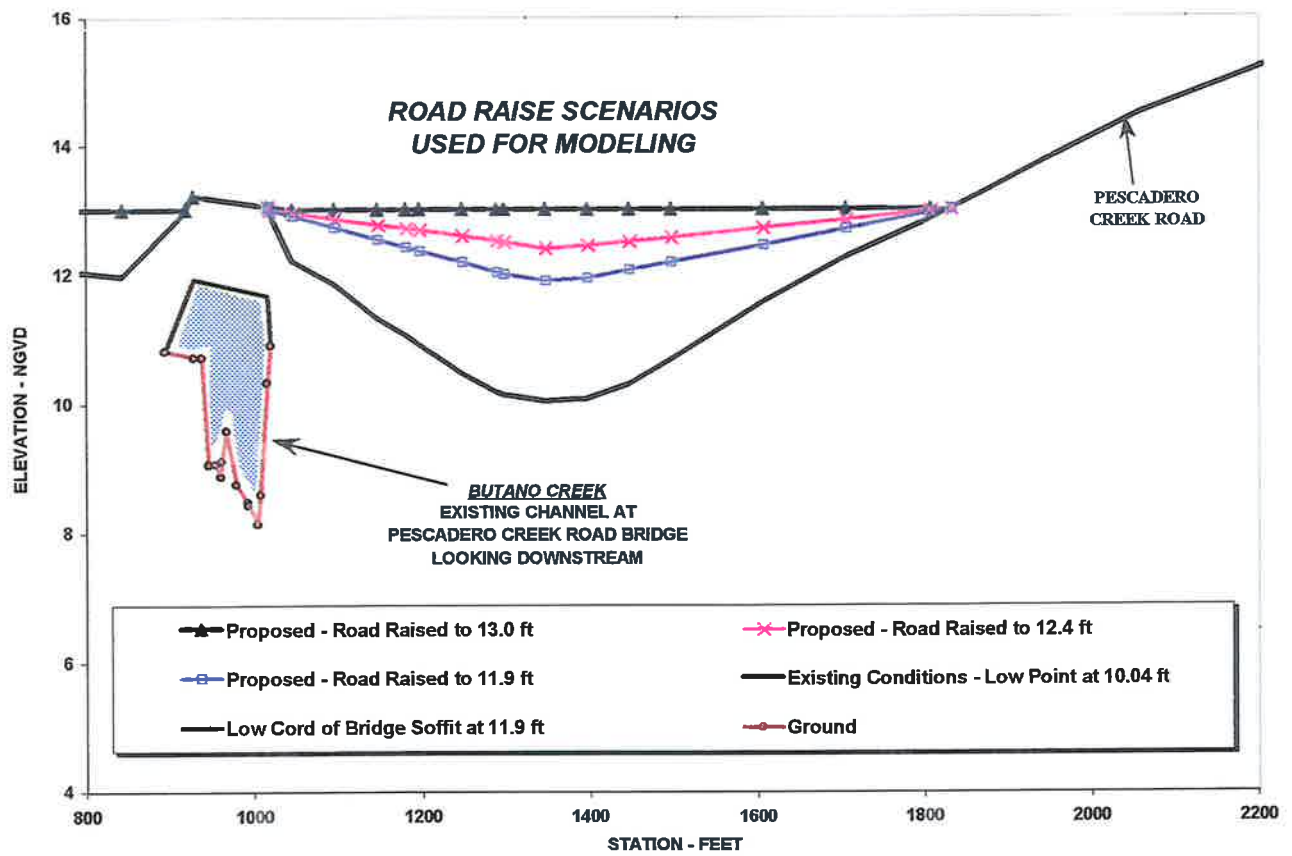
- 1) Existing conditions with the estimated February 1998 flood
- 2) With Pescadero Creek Road raised to a uniform 13.0 feet (MSL) with an estimated February 1998 flood.
- 3) With Pescadero Creek Road raised uniformly to 13.0 feet with a flow volume just prior to overtopping Pescadero Creek Road
- 4) With the low point raised to 11.9 feet (elevation of the bridge soffit)
- 5) With the low point raised to 12.4 feet (0.5 feet above the bridge soffit)

The potential improvement for bridge flood capacity with each road raise scenario is shown in the table below.

Road Elevation Low Point <i>mean sea level</i>	Bridge Flood Capacity <i>cubic feet per second</i>	Road Elevation Low Point <i>mean sea level</i>	Bridge Flood Capacity <i>cubic feet per second</i>
Existing – 10.0 feet	300 cfs	Raised – 11.9 feet	800 cfs
Raised – 13.0 feet	1300 cfs	Raised – 12.4 feet	1000 cfs

Potential impacts associated with a road raise are the most severe when raising the road to an even 13.0 feet to match the elevation of the bridge deck. Model results show that under these conditions, overtopping of the road occurs at approximately 1,300 cfs or a 3-year flood event. Water surface profiles show a significant drop from the crest of the road to the downstream side, creating a hydraulic jump and forces adequate to erode the downstream side of the road. Such conditions present the possibility for complete breaching of sections of the roadway. In the event of a breach at a particular location, flow would concentrate at the gap and accelerate, creating the potential for significant flood hazards and impacts downstream. With the road at an even elevation, flow would backwater upstream of the road and fill the floodplain eastward. The potential for a breach to occur further east toward the town of Pescadero is greater here than under other scenarios modeled.

Potential impacts associated with the intermediate road raise scenarios (low point at 11.9 and 12.4 feet MSL) are similar but less severe and may provide acceptable improvements to bridge capacity. By maintaining a low point in the road, overtopping would occur in a predictable location and the road would flood to lesser depths. The potential for a road breach and associated flood hazards and impacts still exists, but the force generated as the water falls from the road crest to the downstream side would be slightly less than with the road raised to 13.0 feet.



**CROSS SECTION AT UPSTREAM SIDE OF PESCADERO CREEK ROAD BRIDGE
SHOWING ROAD RAISE SCENARIOS USED TO MODEL POTENTIAL IMPROVEMENTS
TO BRIDGE CAPACITY. STAGE-DISCHARGE RATING CURVE SHOWS FLOOD
CAPACITY AT BRIDGE UNDER EACH SCENARIO.**

Introduction and Problem Statement

This report describes the results of a hydrologic and hydraulic investigation of Butano Creek at the Pescadero Creek Road crossing. The purpose is to estimate current hydraulic conditions and those expected with Pescadero Creek Road raised for improved flood capacity.

Pescadero Creek Road is maintained by San Mateo County and connects the town of Pescadero with State Highway 1 on the coast in central San Mateo County (**Figures 1 and 2**). It is an essential route for emergency vehicle access to Pescadero during natural disasters and medical emergencies. However, sections of Pescadero Creek Road lay within floodplain areas of Pescadero and Butano Creeks and are estimated to flood to depths of up to 5.0 feet during a 100-year flood. Butano Creek, a stream that drains a 20 square mile mountainous basin to the southeast, floods often (almost on an annual basis) and in larger floods such as the February 2-3, 1998 flood, closes emergency access on Pescadero Creek Road. This condition is deemed to be a serious public safety problem by the Pescadero community and San Mateo County.

The frequency of flooding over Pescadero Creek Road has apparently increased over the past 30+ years when the present bridge over Butano Creek replaced an older structure (**Figure 3**). The increased frequency of flooding is partly attributed to the loss of flood capacity due to filling or *aggradation* of the Butano Creek channel with over 6.0 feet sediment since the early 1960s. Aggradation has reduced the flow area under the bridge to a depth less than 3.0 feet. As a result, flows in Butano Creek leave the channel and go overbank upstream of Pescadero Creek Road, heading northward across open agricultural fields toward Pescadero Creek Road east of the bridge. The low point of the road (**Figure 4**) is 3.0 feet lower than the bridge deck (10.0 feet versus 13.0 feet at the bridge) and close to the grade of the surrounding floodplain. Essentially the road is an overflow weir that floods often. When flow depths over the road are 1.0 to 1.5 feet they are at a “nuisance” level but the road is generally passable; nuisance flooding may occur several days per year. During intermediate floods such as February 1998 the road appears to pass most of the flow and is dangerous if not impassible for large vehicles creating a major obstacle for emergency access. During flows between the nuisance and intermediate flood levels, crossing may be hazardous for conventional vehicles.

A potential improvement to increase the flood capacity of the bridge and reduce the frequency of overtopping the road would be to raise Pescadero Creek Road east of the bridge to an elevation equal to the bridge deck (13.0 feet above mean sea level-MSL) or to raise the low point to some other elevation. This improvement alone would reduce nuisance flooding and perhaps the impacts of intermediate levels of flooding but not major flood events.

To determine the benefits of raising the road, a hydraulic model of Butano Creek and Pescadero Creek Road is needed to estimate the flow through the structure under existing and improved conditions. In addition, an understanding of flood frequency on Butano

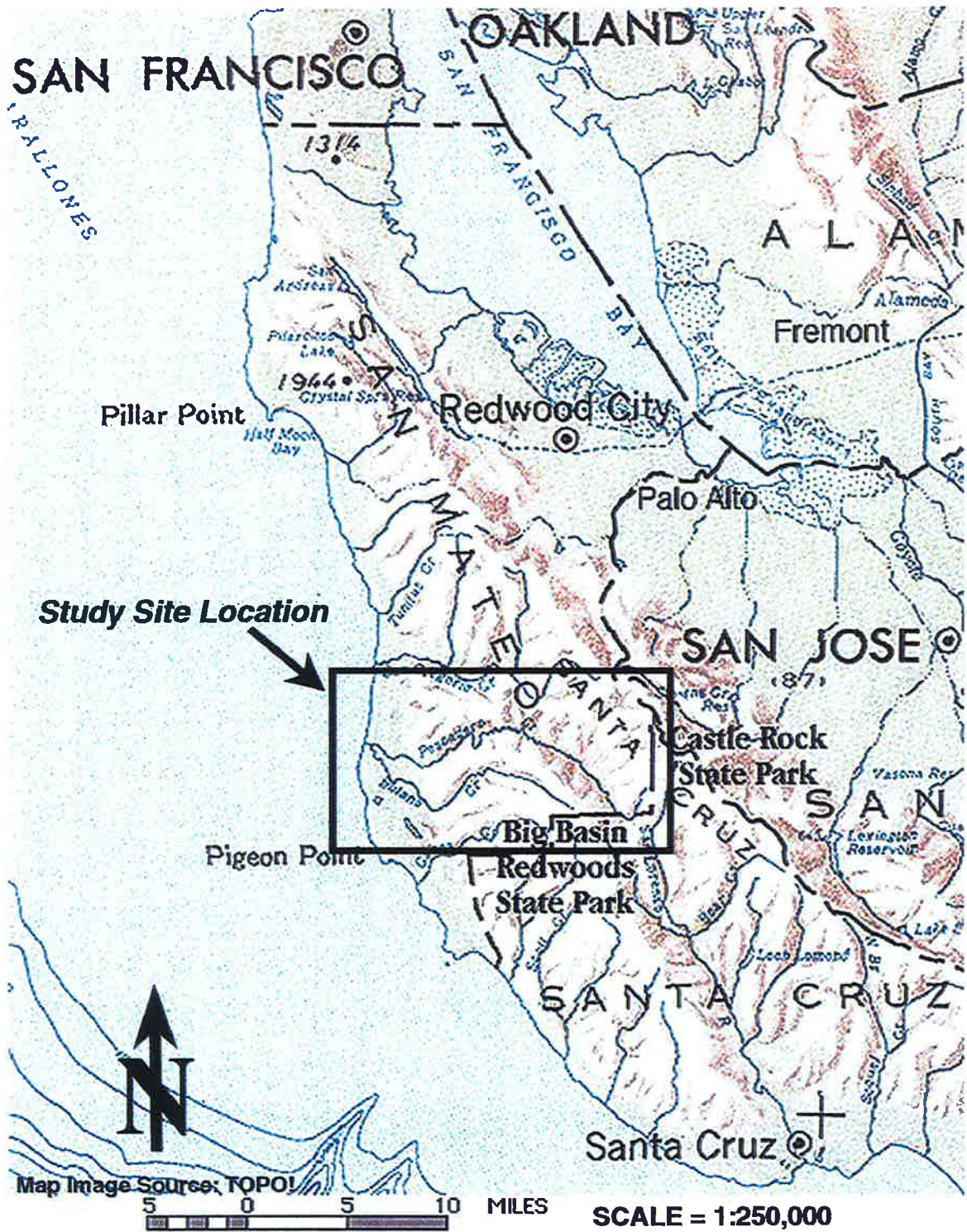


FIGURE 1: REGIONAL LOCATION MAP FOR BUTANO AND PESCADERO CREEK WATERSHEDS IN SAN MATEO COUNTY, CALIFORNIA

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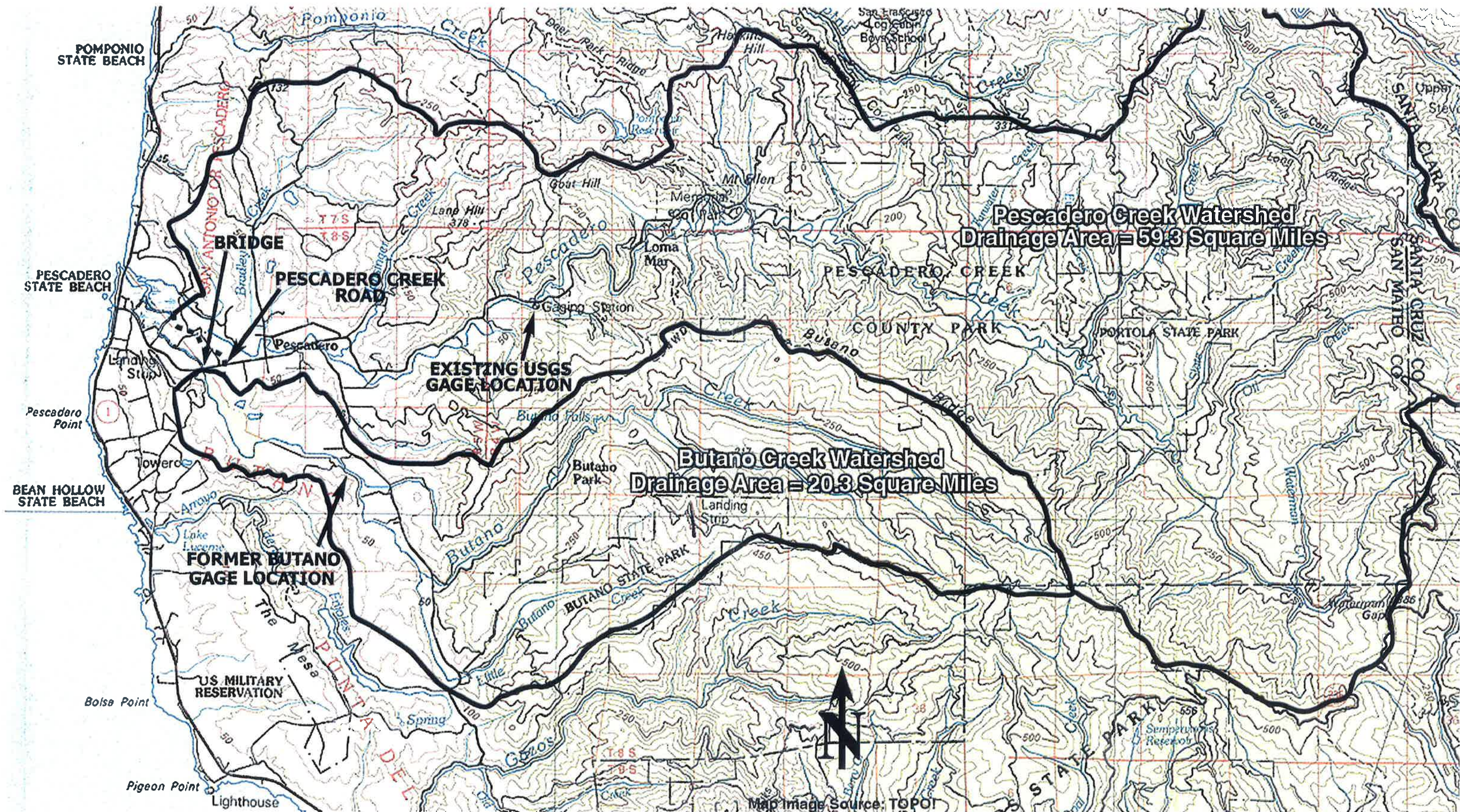


FIGURE 2: WATERSHED MAP FOR BUTANO AND PESCADERO CREEKS
San Mateo County, California

Photo Date: July 14, 1999

FIGURE 3: BUTANO CREEK AND THE PESCADERO CREEK ROAD BRIDGE LOOKING DOWNSTREAM.





FIGURE 4: PESCADERO CREEK ROAD AND BRIDGE AT BUTANO CREEK LOOKING EAST TOWARD LOW POINT.
Photo Date: July 14, 1999

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Creek is needed to estimate how often floods of a given volume could be expected to occur.

Objectives and Methods

The County of San Mateo Public Works Department contracted with Swanson Hydrology & Geomorphology and Murray, Burns and Kienlin to determine the hydraulic benefits of raising Pescadero Creek Road. To accomplish this, a hydraulic model was constructed using the U.S. Army Corps of Engineers River Analysis System (HEC-RAS) computer simulation model. HEC-RAS is essentially a one-dimensional model of conditions using the standard step backwater method for water surface computation and other options for modeling bridge hydraulics. Among hydraulic models available, it is simple to use and adequate for estimating the hydraulics of raising Pescadero Creek Road.

Development of HEC-RAS Model

The HEC-RAS model requires several types of input data. First, the topography of the stream and floodplain must be entered in the format of cross-sections aligned perpendicular to flow. For this study, a survey of the channel of Butano Creek was completed 1,200 feet upstream of the bridge and 900 feet downstream to obtain current data. The channel survey was conducted by level survey for vertical control, use of a tape for distance, and compass bearings for horizontal control. Additional points on the Pescadero Creek Road and floodplain areas were surveyed using an electronic total station. A total of 384 points were collected (a copy of this survey has been provided in digital format on CD-ROM). The density of vegetation growth in the channel and on the floodplain areas precluded an adequate line-of-sight unless large swaths of vegetation were removed. Instead, a 1-foot contour survey created in 1987 was used to extend the cross-sections away from the channel. The 1987 topographic survey was spot-checked with new points and found to be acceptably accurate for use in the HEC-RAS model.

The geometry of the bridge over Butano Creek was measured by tape and level survey. A topographic road profile was provided by San Mateo County and additional points were surveyed in the field. Mannings' hydraulic roughness factors for floodplain areas and the channel were determined by field inspection.

The final piece of information required is the downstream hydraulic control and starting water surface elevation for the model. The flow volumes that would be affected by raising the road are relatively small and intermediate sized-floods (i.e. less than a five-year return period for small, less than 20 -year for "intermediate"). In both cases the hydraulic control would be located downstream within Pescadero Marsh. In case of larger floods, (i.e. the 100-year flow), the control would be near the Highway 1 crossing at the constriction between roadfill and the bedrock bluff to the south. A lack of hydraulic data in the marsh, combined with the fact that intermediate-sized floods from Pescadero Creek commingle with Butano Creek flows upstream and downstream of the Pescadero Creek Road bridge, complicates hydraulic assumptions for modeling.

Estimating Flood Frequency

An estimate of peak flood volume frequency on Butano Creek and the discharge occurring at the Pescadero Creek Road crossing were developed as input for modeling. The USGS measured stream flow on Butano Creek near Cloverdale Road between 1961 to 1974 and the annual peaks from this record were used to develop a frequency curve by the Log Pearson III distribution method (**Figure 5**). An attempt was made to extend the Butano Creek record to account for large flow years of 1982, 1986, 1995, and 1998 by a regression analysis with the longer record of Pescadero Creek. However the correlation coefficient was deemed too low ($R^2 = 0.59$) for use. The U.S. Army Corps of Engineers (1989) conducted a feasibility study for a flood control project in early 1990s and estimated flood frequency for Butano Creek at Pescadero Creek Road. Although the details of the Corps analysis were not available, it is the most current and was deemed to be acceptable for modeling use (**Table 1**).

An assessment of the flood records and data found three types of floods of differing hydraulic and hydrologic character. The small floods are those of less than about 5-year recurrence and involve flow only from the Butano Creek watershed at the Pescadero Creek Road crossing. Intermediate-sized floods (about less than a 20-year event) involve overbank flow from Pescadero Creek flowing into Butano Creek above and below Pescadero Creek Road and adding to the flows from the Butano Creek watershed. Major floods are those greater than 20-year where the Pescadero Creek Valley behaves hydraulically as a lake with a hydraulic control at the mouth of Pescadero Creek at Highway One.

Accounts of the flood of February 2-3, 1998 (considered an intermediate event here) indicate that overbank flows from Pescadero Creek added significantly to Butano Creek flows upstream and downstream of the Pescadero Creek Road bridge. These accounts (Bill Cook, personal communication, 1998) indicate over two feet of flow near the Stage / Pescadero Creek Road intersection (**Figure 6**) heading westward toward the Butano Creek floodplain upstream of Pescadero Creek Road. In addition, a levee break on the south bank of Pescadero Creek sent flow overbank across Water Lane and into Butano Creek downstream of the bridge through the Neil Curry property. Conversations with long-time residents indicate that the commingling of flows is associated with the intermediate-sized floods of 1955, 1982 and 1998, but not during smaller floods. An estimate of additional flow from Pescadero Creek was added in the study reach for intermediate floods in addition to the Butano Creek gage records.

Due to the complexity and a lack of records, the estimated flows at Butano Creek should be deemed approximate, perhaps within 25 percent of actual flow.

Results*Investigation of February 2-3, 1998 Flood*

The flood of February 2-3, 1998 generated record peak flows on many San Mateo coastside streams including Pescadero Creek and presumably Butano Creek. The flood

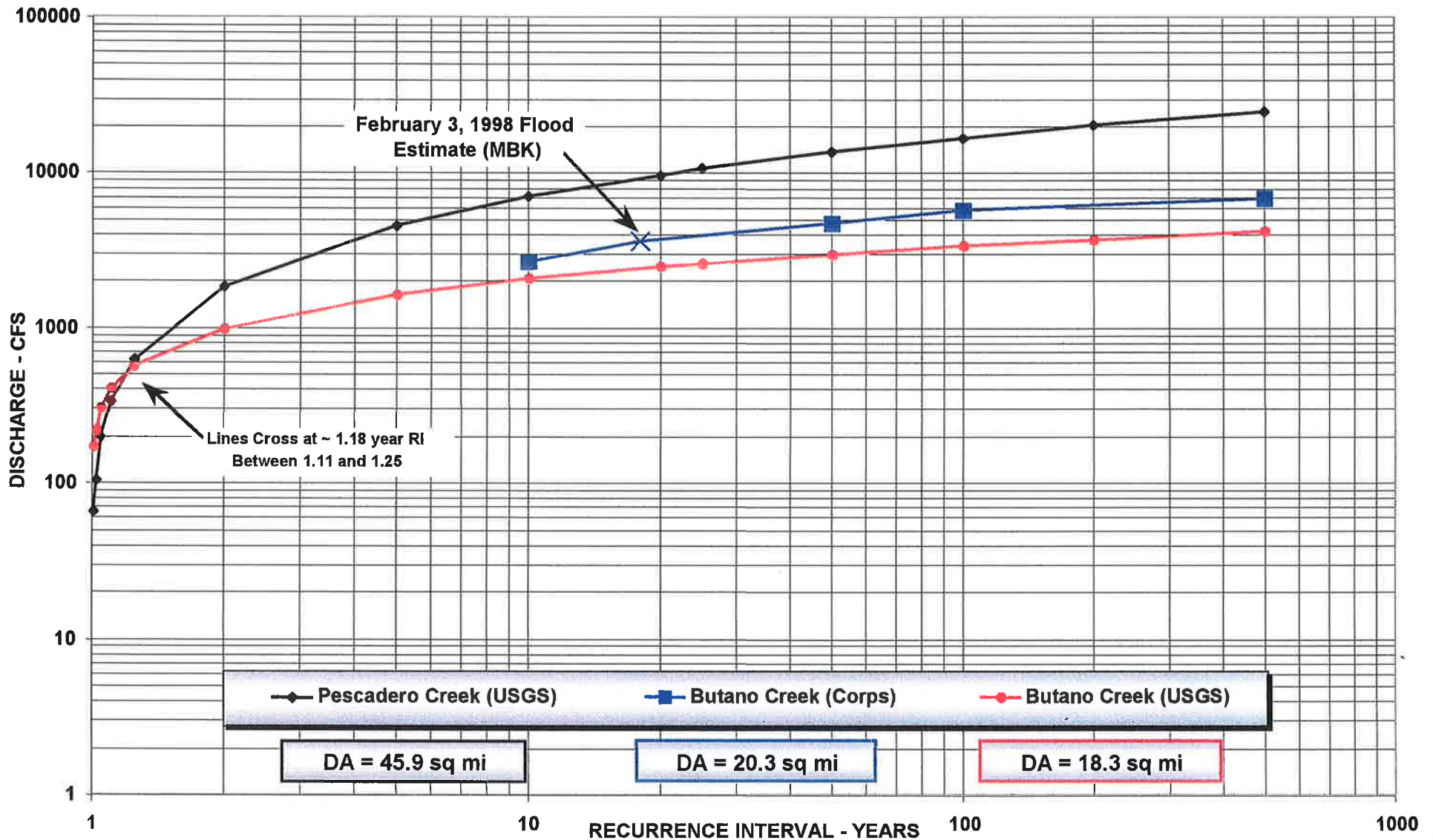


FIGURE 5: FLOOD FREQUENCY FROM ANNUAL PEAKS FOR PESCADERO (PC) AND BUTANO (BC) CREEKS.
 Data Sources: USGS Gages near Pescadero, San Mateo County, CA Records: 1952-1996 (PC) and 1961-1974 (BC), US Army Corps of Engineers, and Murray, Burns and Kienlen (MBK) Note: DA indicates drainage area upstream of gage site.

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TABLE 1: PESCADERO AND BUTANO CREEKS HYDROLOGY
Peak Discharge vs. Frequency Relationship

Location	Drainage Area (Square miles)	10 - Year	50 - Year	100 - Year	500 - Year	February – 98
Pescadero Creek at Pescadero Creek Road	53.5	7,700	13,900	16,700	20,000	10,600 [1]
Pescadero Creek at Pacific Ocean	81.3	11,000	20,000	24,000	29,000	15,250 [2]
Butano Creek at Pescadero Creek Road	21.3	2,600	5,700	5,700	6,800	3,600 [2]

Source: Corps, 1989.

[1] USGS [2] Estimated

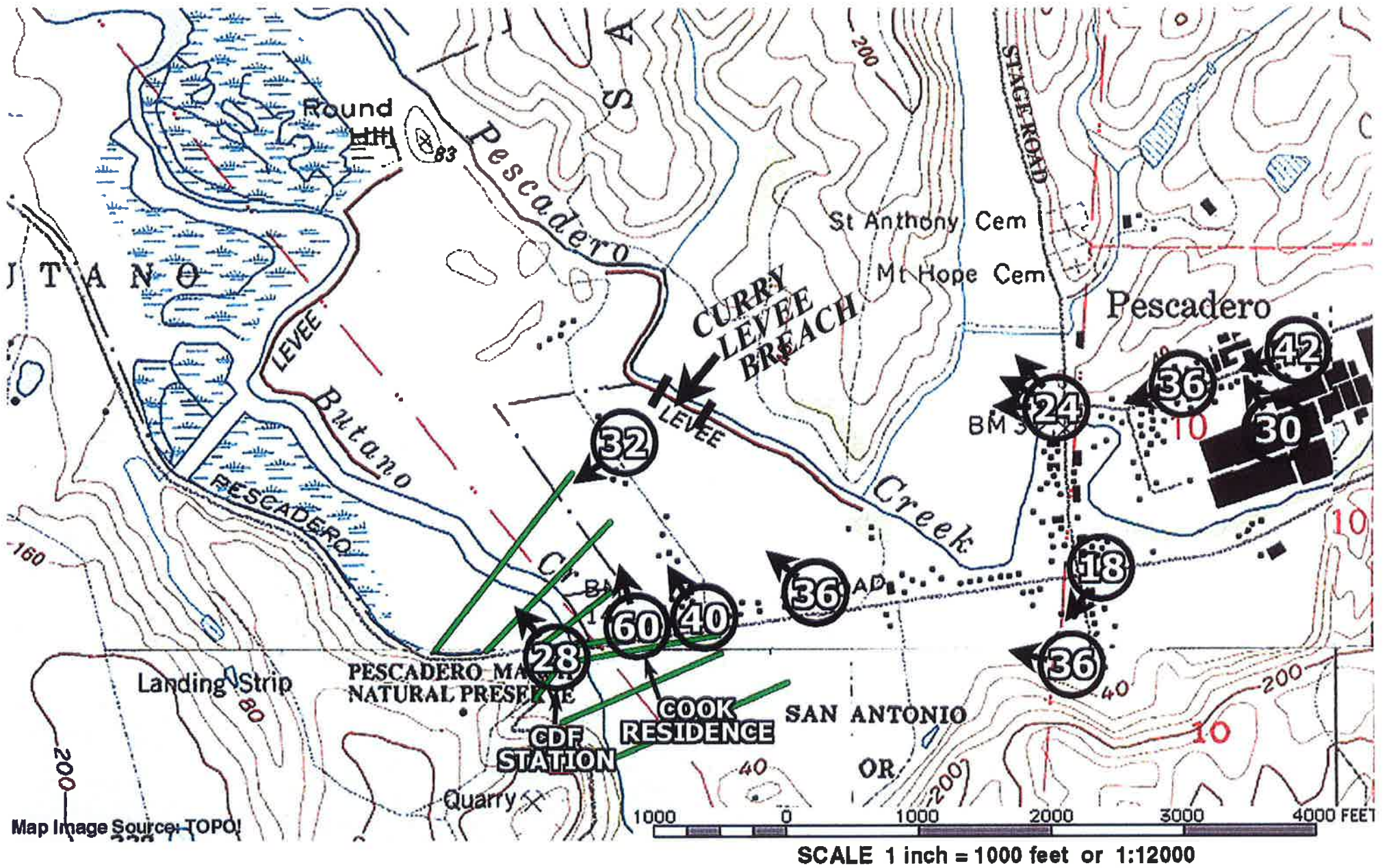


FIGURE 6: PROJECT LOCATION MAP FOR BUTANO CREEK MODELING SHOWING CROSS SECTION LOCATIONS. CIRCLES INDICATE DIRECTION OF FLOW AND DEPTH IN INCHES ESTIMATED BY EYE-WITNESSES DURING FLOOD OF FEBRUARY 3, 1998.

hydrograph recorded on Pescadero Creek shows a peak flow occurring near 2 a.m. on February 3rd (Figure 7). Accounts of flooding on Butano Creek indicate the same time of peak flow. Pescadero resident Bill Cook, who lives approximately 300 feet east of the bridge crossing, developed a peak flow depth and flow direction map (Figure 6) for the 1998 flood. In addition, flood high water marks on several of Mr. Cook's buildings indicate a flood elevation of 14.6 feet (MSL) just downstream of Pescadero Creek Road (this elevation was confirmed by Swanson Hydrology and by a survey of raised floor elevation next door to Mr. Cook). In addition, visible high water marks on the California Division of Forestry (CDF) building located just west of the bridge agree with the 14.6 foot high water mark.

Accounts of the flood by CDF staff and Mr. Cook indicated that flow depths over the bridge exceeded 1.5 feet and flow velocities were relatively high - perhaps in the 4-5 foot per second range over Pescadero Creek Road. A CDF water truck was nearly swept off the road when attempting to cross in flow depths at its headlights (approximately 3.5 feet). A second account described a car being swept southward two hundred feet from a parking lot at Stage and Pescadero Creek Roads to the Post Office in about 28 inches of fast-flowing water. At the peak, flow was at least 1.5 feet deep over the bridge deck and Pescadero Creek Road was flooded up to ¼ mile west of the bridge.

The February 1998 flood was used in hydraulic modeling as it provides the best high water mark data. For hydraulic modeling purposes, it was assumed that the February 1998 flood at the bridge was 3,600 cfs by drainage area reduction (Table 2) plus 1,400 cfs for estimated flow from Pescadero Creek overflow originating from the east for a total of 5,000 cfs. Flow was increased to 15,000 cfs approximately 1,000 feet downstream of the bridge to account for the overbank flow from the Curry levee break.

Investigation of Channel and Floodplain Condition

An inspection of channel and floodplain conditions was conducted in late July and early August 1999 to assess channel flood capacity and to estimate input variables for hydraulic modeling. The Butano Creek channel lying 1,200 feet above and 400 feet below the bridge at Pescadero Creek Road ranges between 1.5 to 3.5 feet in depth and 20 to 25 feet in width (Figure 8). The bed is generally flat and composed wholly of coarse decomposed granite sands. The sands were found to be somewhat compact and cohesive suggesting a clay fraction. Although the channel over this reach is fairly small in dimensions, it was generally free of obstructions.

From 400 feet below the bridge to a point approximately 900 feet downstream the channel is narrow and widths fluctuate between 10 and 25 feet with several log jam obstructions. In the narrow reaches, sand bars are covered with established willow and/or cattail vegetation. In some locations, trees have fallen completely across the channel. The channel bed elevation ranges between 6.0 and 8.0 feet (MSL), which is higher than the floodplain and marsh to the west. At least 4 major overflow points were identified on the western bank. Low flow in two of the breaches identified carried over 50% of the total flow in Butano Creek out of the channel into the floodplain and marsh areas to the east and west.

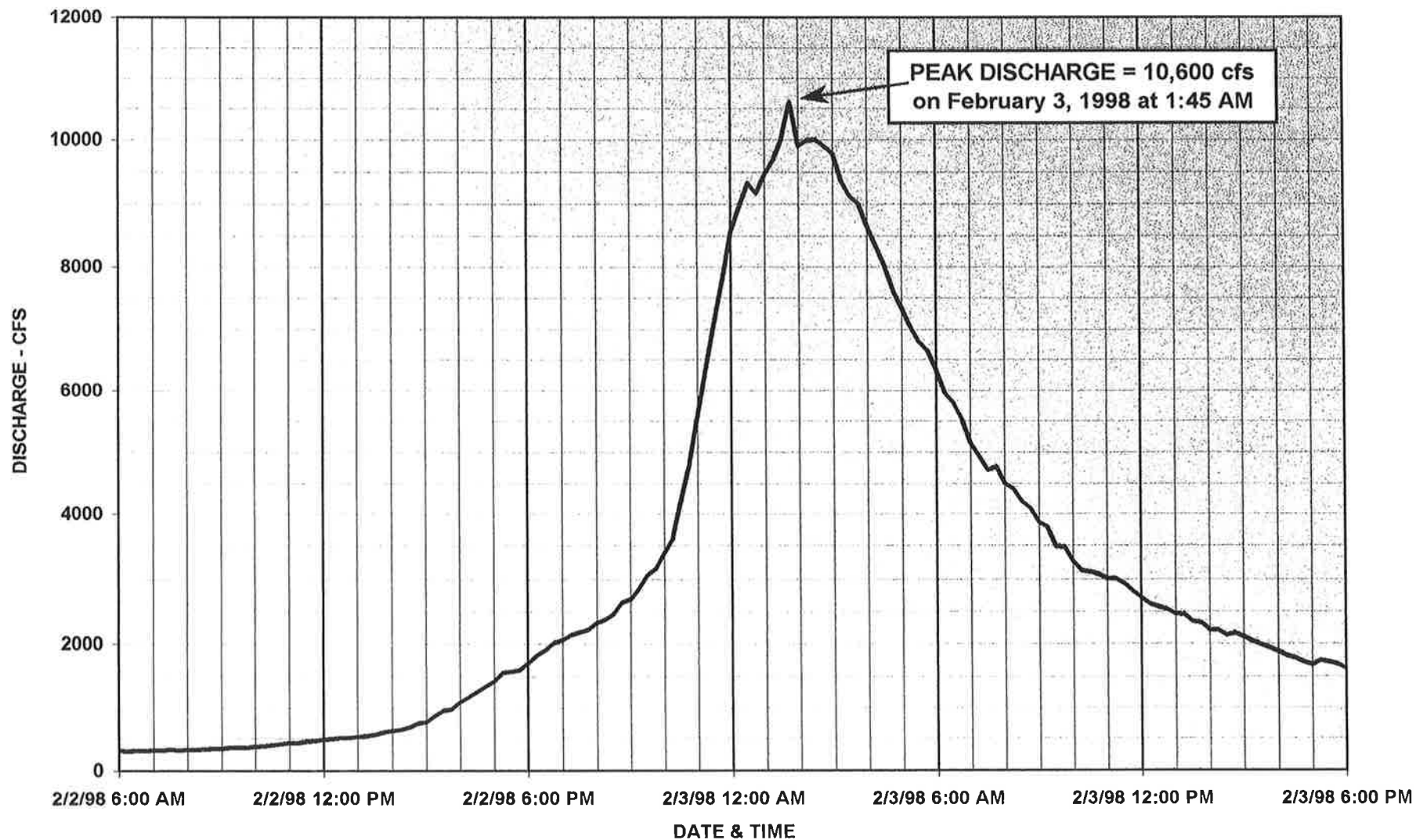


FIGURE 7: PESCADERO CREEK DISCHARGE HYDROGRAPH FROM FLOOD OF FEBRUARY 2-3, 1998
(Source: USGS)

TABLE 2: FLOWS USED FOR MODELING 1998 FLOOD EVENT

Butano Creek at Pescadero Creek Road	3,600 cfs
Butano Creek at Pescadero Creek Road with Added Flow from Pescadero Creek	5,000 cfs
Butano Creek 1,000 feet Downstream of Pescadero Creek Road With Curry Levee Break Flow Added	15,000 cfs



FIGURE 8: BUTANO CREEK AND PESCADERO CREEK ROAD BRIDGE LOOKING UPSTREAM.

Photo Date: July 14, 1999

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At a point 900 feet downstream, the channel becomes completely obstructed by vegetation growth (cattail and willow) and the channel bed is essentially level with the top of the channel banks. Spot inspection of the channel reaches below found similar obstructions occurring for a length of approximately 2,000 feet downstream.

The floodplain area east of Butano Creek and upstream of Pescadero Creek Road is an open agricultural field with low hydraulic roughness (**Figure 9**). The west bank above Pescadero Creek Road is densely vegetated, relatively narrow as it is bounded by the hill to the west (**Figure 10**).

The floodplain geometry changes abruptly at the Pescadero Creek Road crossing. The west overbank is obstructed by roadfill-raised Bean Hollow Road and its intersection with Pescadero Creek Road; the top of the road is near the same elevation as the bridge deck at about 13.0 feet MSL (**Figure 10**). Below Pescadero Creek Road the floodplain west of Butano Creek, also called the West Butano Marshes, is low and broad with elevations ranging between 5.0 and 8.0 feet. While the Butano Marshes are topographically low, they are covered with a dense growth of cattails that stand up to 8 feet high. Further downstream, the Butano Marshes are obstructed by cross levees exhibiting small breaches (30-50 feet wide).

On the floodplain to the east, Pescadero Creek Road forms a low weir, with a low point of 10.0 feet (MSL) located 300 feet east of the bridge (**Figure 4**). The low point is directly downstream of the open floodplain and agricultural field that extends above the west bank of Butano Creek. With this geometry, overbank flow from Butano Creek channel about 1,200 feet upstream of the bridge can move rapidly to the low point in Pescadero Creek Road. A small private levee has been graded above the east bank of Butano Creek in an attempt to control overbank flow.

The floodplain downstream of Pescadero Creek Road and east of Butano Creek is densely vegetated from the bank of the channel to a point about 400-500 feet away. From this point, the floodplain is fairly open with agricultural fields and rural residential properties extending to Water Lane.

The channel and floodplain inspection revealed that the Butano Creek channel has very low flood capacity relative to the flows imposed upon it by the Butano Creek Watershed and overflows from Pescadero Creek. The floodplain to the west of the Creek is narrow and densely vegetated upstream of Pescadero Creek Road and blocked at the bridge by the roadfill of Bean Hollow and Pescadero Creek Roads. Below Pescadero Creek Road, most of the flood conveyance occurs through agricultural fields east of the densely vegetated riparian corridor.

HEC-RAS Modeling Results

(The full results of the HEC-RAS modeling are presented in technical Appendix A. The key results are presented below).

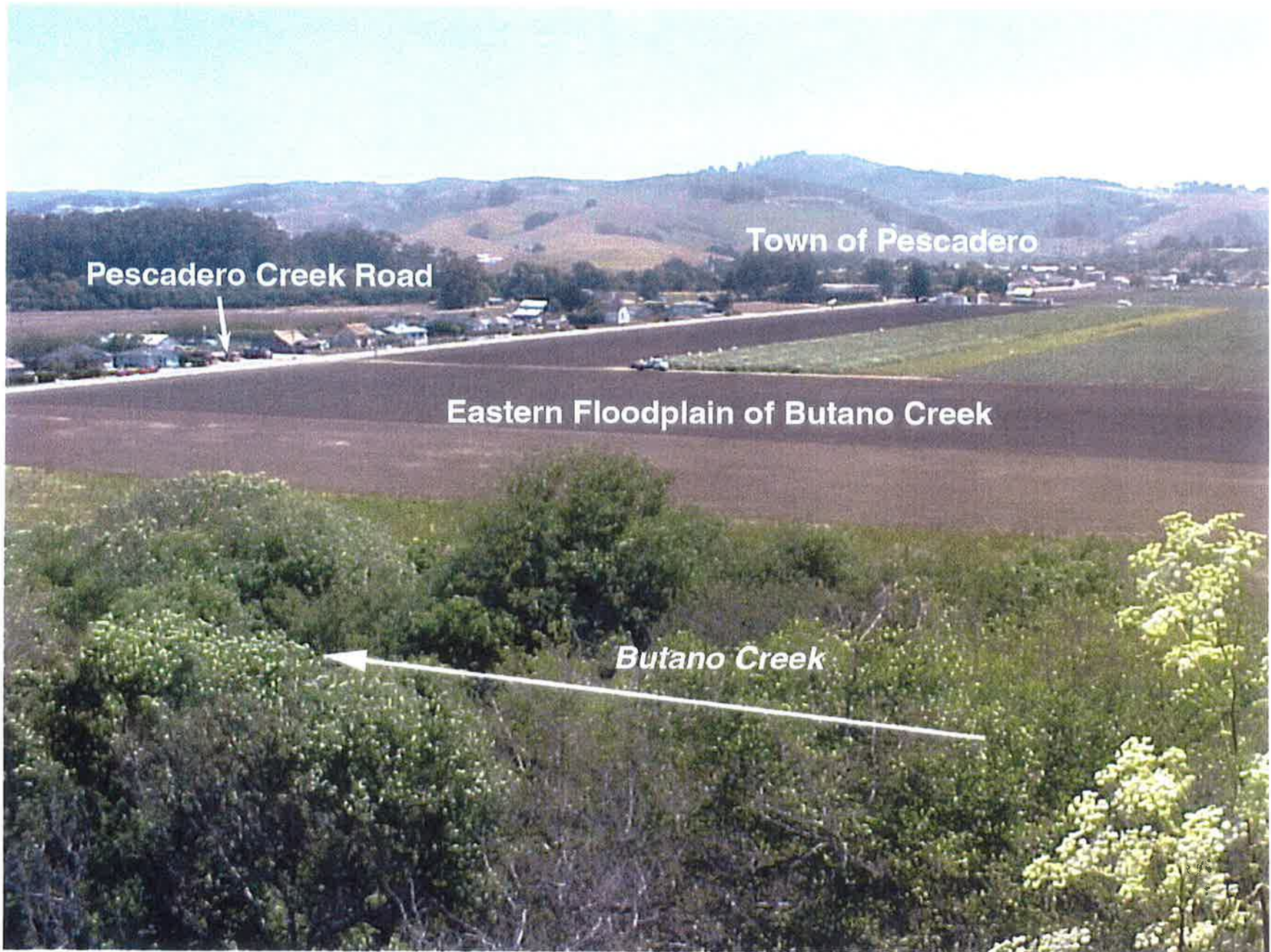


FIGURE 9: VIEW NORTHEAST ACROSS BUTANO CREEK SHOWING OPEN FLOODPLAIN UPSTREAM OF LOW POINT IN THE ROAD. Photo Date: June 22, 1999

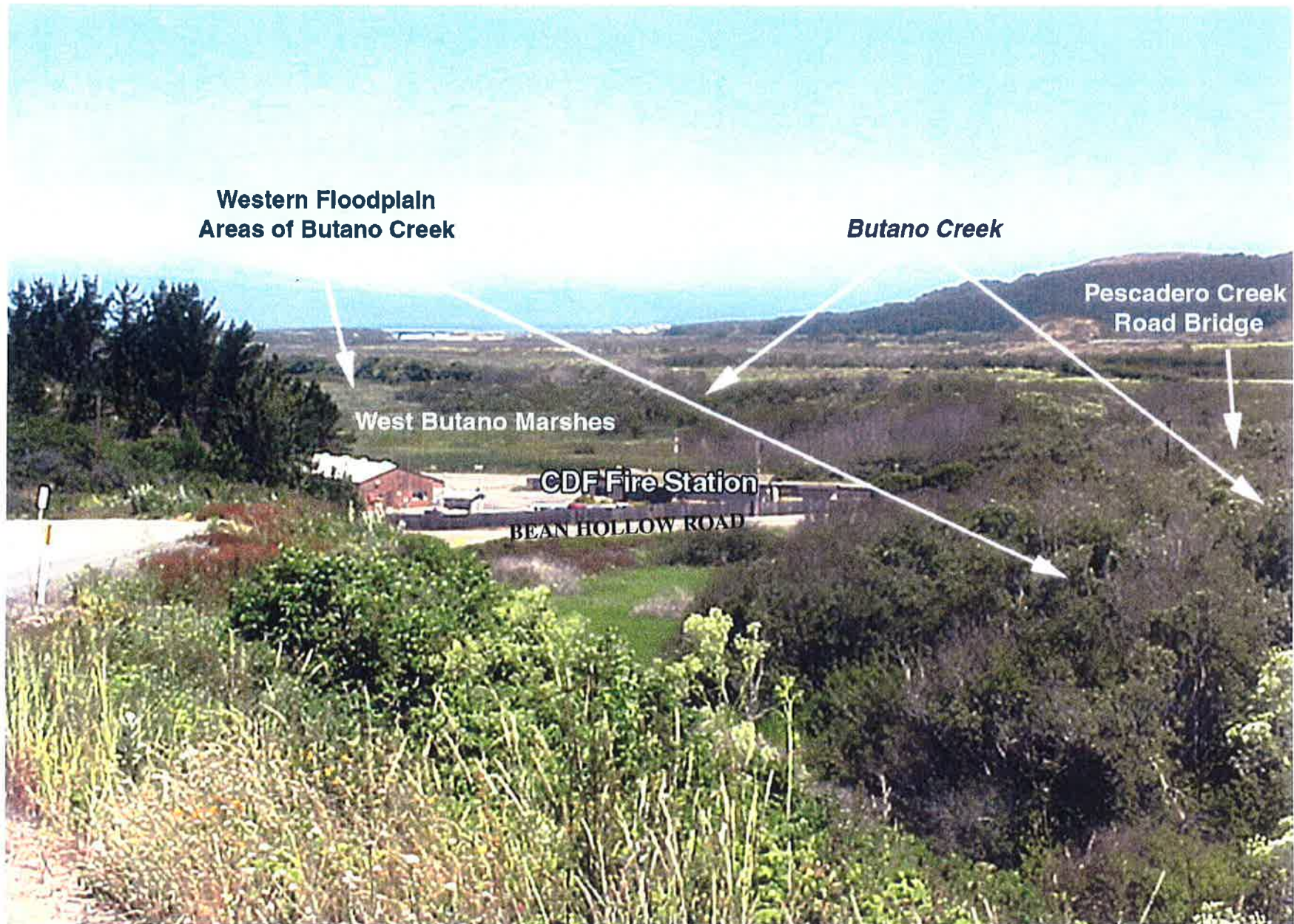


FIGURE 10: VIEW OF WEST OVBANK AREAS LOOKING DOWNSTREAM TOWARDS PESCADERO CREEK ROAD CROSSING AT BUTANO CREEK. Photo Date: June 22, 1999

HEC-RAS was used to model the following conditions:

- 1) Existing conditions with the estimated February 1998 flood. *Plan "14", Appendix A;*
- 2) With Pescadero Creek Road raised to a uniform 13.0 feet (MSL) with an estimated February 1998 flood. *Plan "15", Appendix A;*
- 3) With Pescadero Creek Road raised uniformly to 13.0 feet with a flow volume just prior to overtopping Pescadero Creek Road. *Plan "17", Appendix A.*
- 4) With the low point raised to 11.9 feet (elevation of the bridge soffit) *Plan "road_11-9 and set wse", Appendix A.*
- 5) With the low point raised to 12.4 feet (0.5 feet above the bridge soffit) *Plan "road_12-4 and set wse", Appendix A.*

As discussed above, two essential variables are difficult to estimate with presently available data: the downstream water surface elevation and the discharge in Butano Creek. In addition, the one-dimensional HEC-RAS model should be used with caution in areas of complex flow paths and unsteady flow conditions. However, hydraulic conditions at the bridge and roadway itself are within acceptable limits of HEC-RAS (i.e. flow perpendicular to cross-sections, peak flow conditions), but results away from the road should be viewed as approximate.

Estimating the discharge is secondary to producing a reasonable water surface elevation with the model at known high water mark locations. Modeling results can be back-checked by comparing modeled flow velocities with known data (e.g. force necessary to move cars and water tanker trucks), however such velocity data is highly approximate.

Large Flood (February 1998) with Existing Conditions and with Raised Road

To address the downstream starting water surface elevation, a series of runs (Plans 14 and 15, App. A) were made each with a 0.5 foot increase in an attempt to discover which starting elevation produces a 14.6 foot (MSL) water surface elevation at Pescadero Creek Road. The results shown in the profile of **Figure 11** demonstrate that the flood elevations at Pescadero Creek Road are highly dependent upon the water surface elevation in the marsh. The highest starting stage of 14.0 feet (MSL) produces the result closest to the measured high water mark of 14.6 feet at Pescadero Creek Road. This run was assumed to be the best for existing conditions (Profile #1). Similar results obtained for the other road raise alternatives (11.9 ft and 12.4 ft) during large flood conditions.

Impacts of Road Raises

With the road raised to a uniform 13.0 feet and with the estimated February 1998 peak flow, the water surface increases (0.3 feet) on the road and upstream, which should be expected (**Figure 12**). In profile (**Figure 13**) the model shows that the road becomes a control and a hydraulic jump occurs downstream suggesting that erosive force and possible road breaching on the downstream side of the raised road would be a concern. The model also shows that more flow is shifted over the road and into the eastern

Butano Creek Plan 14 9/9/99
Geom: Imported Geom 04 Flow: Imported Flow 04

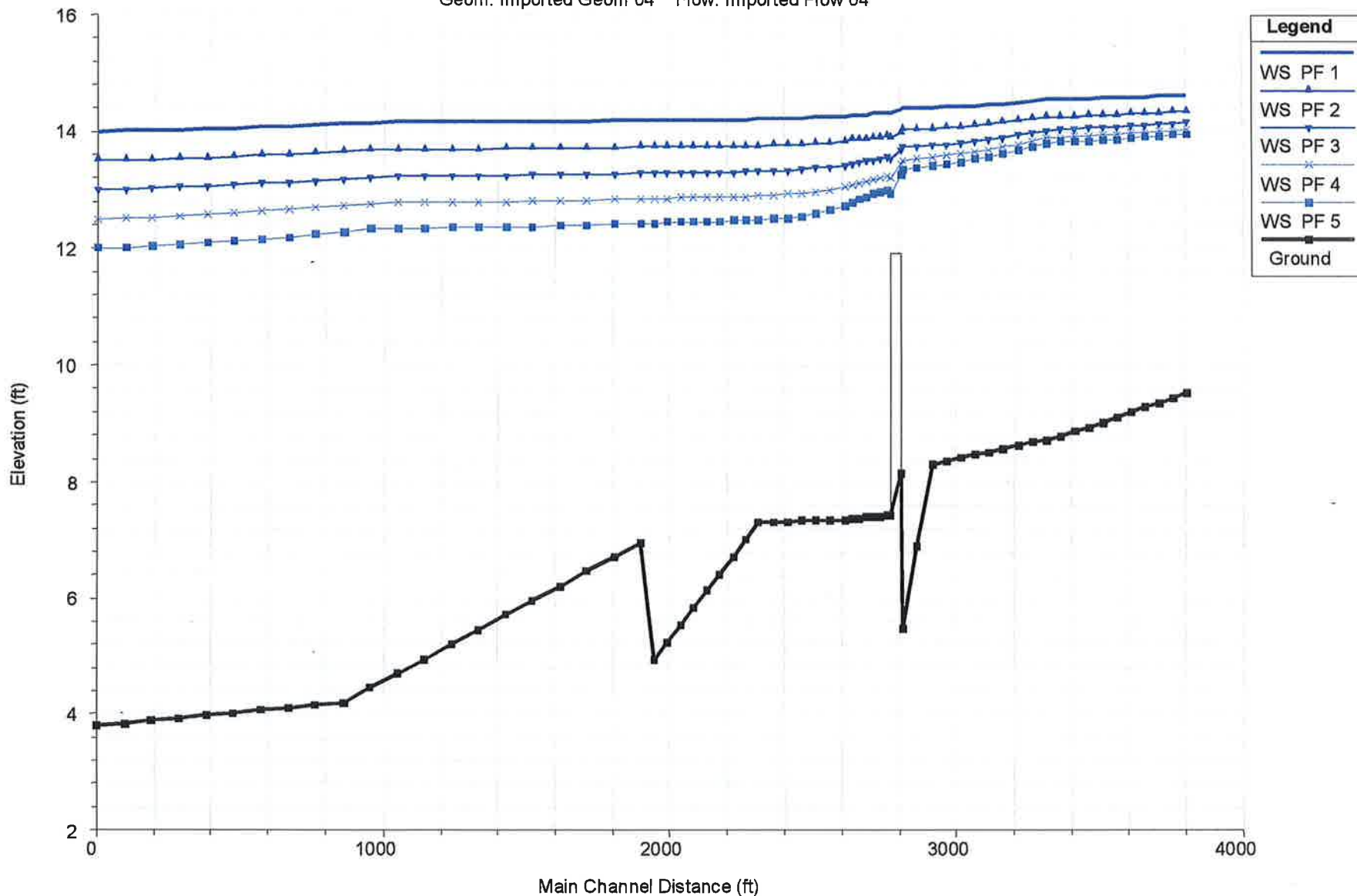


FIGURE 11: PROFILE RESULTS OF MODELING FEBRUARY 1998 FLOOD USING DIFFERENT STARTING WATER SURFACE ELEVATIONS SHOWING EFFECT ON WATER SURFACE AT PESCADERO CREEK ROAD BRIDGE.

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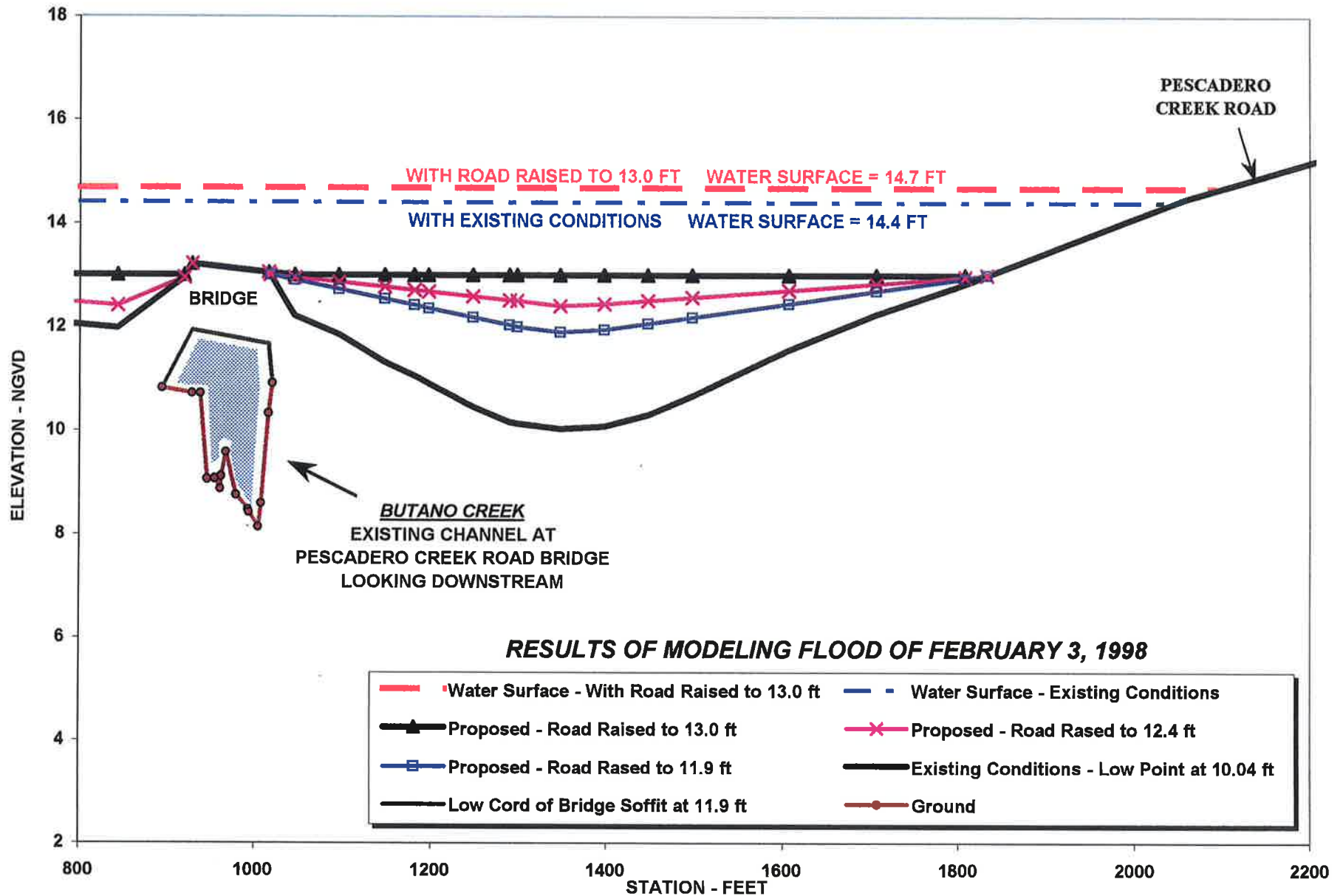


FIGURE 12: BUTANO CREEK FLOW MODELING RESULTS AT PESCADERO CREEK ROAD SHOWING EXISTING GROUND IN THE STREAM CHANNEL, EXISTING ROAD SURFACE, AND PROPOSED RAISED ROAD SURFACES. DIFFERENT SCENARIOS COMPUTED BY MODELS SHOW SIMILAR WATER SURFACE ELEVATIONS DURING A LARGE FLOOD.

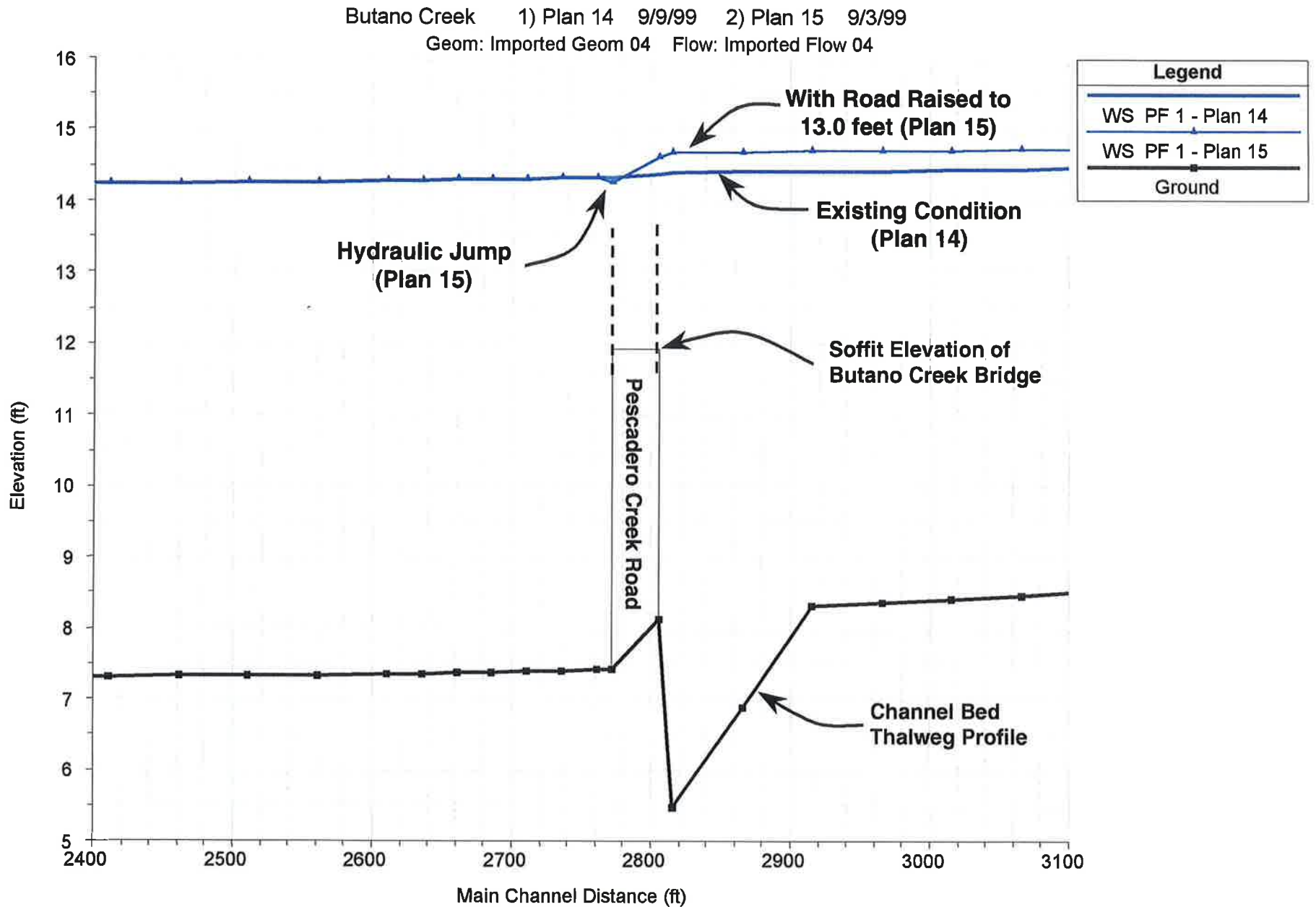


FIGURE 13: MODELING RESULTS SHOWING HYDRAULIC EFFECTS ON WATER SURFACE PROFILE OF BUTANO CREEK AT PESCADERO CREEK ROAD. NOTE HYDRAULIC CONTROL ON UPSTREAM SIDE AND HYDRAULIC JUMP AT THE DOWNSTREAM SIDE.

floodplain than under existing conditions. This would also be expected, as the higher road increases the water surface elevation and spreads flow further east to the open fields west of Water Lane.

Raising the low point in Pescadero Creek Road to 11.9 feet or 12.4 feet is aimed to concentrate overflow at its present location and reduce the impact of erosion by a hydraulic jump during a large flood. The model (due to a lack of precision) does not show a dramatic difference in this regard with the even road raise to 13.0 feet. However, engineering judgement of the situation leads to the conclusion that the force of flow would be concentrated at the low point and any scour of the roadway would be limited. Also, flow would not be shifted eastward, but rather would stay concentrated at the low point.

Benefits of Road Raise Alternatives

Model runs (Plans 17, road_11-9 and set wse, and road_12-4 and set wse App. A) were made with a raised Pescadero Creek Road to determine the maximum flood capacity attained under the Butano Creek bridge without overtopping the road. Model runs were conducted with a uniform road raise to 13.0 feet, as well as raising the low point to 11.9 and 12.4 feet (**Figures 12 and 14**).

Figure 14 shows the results of the model runs. Under existing conditions, Pescadero Creek Road begins to overtop at a flow of approximately 300 cfs, a flow which is exceeded six days per year on average based upon flow duration analysis of the 1961-74 Butano Creek streamflow records (**Figure 15**). Photographs taken by San Mateo County Public Works personnel show small flood condition similar to our modeling results where overbank flow at the low point in Pescadero Creek Road is occurring with 1.0-1.5 feet of clearance remaining under the bridge. This agrees with our modeling results (**Figure 15**).

With Pescadero Creek Road raised to 13.0 feet, the low stage model run results in a bridge flood capacity of 1,300 cfs or approximately a 3-year flood. A road raised to 12.4 feet allow the bridge to pass 1,000 cfs, or approximately a 2-year flood on Butano Creek. A road raise to 11.9 feet passes about 800 cfs, or a 1.8-year flood.

References

Cook, Bill, 1999, Personal Communication, Resident of Pescadero.

U.S. Army Corps of Engineers, 1989, *Section 205 Reconnaissance Report Flood Control Improvements, Pescadero and Butano Creeks, San Mateo County, California*.

Wildflower Productions, *TOPO!* Digital Map Images.

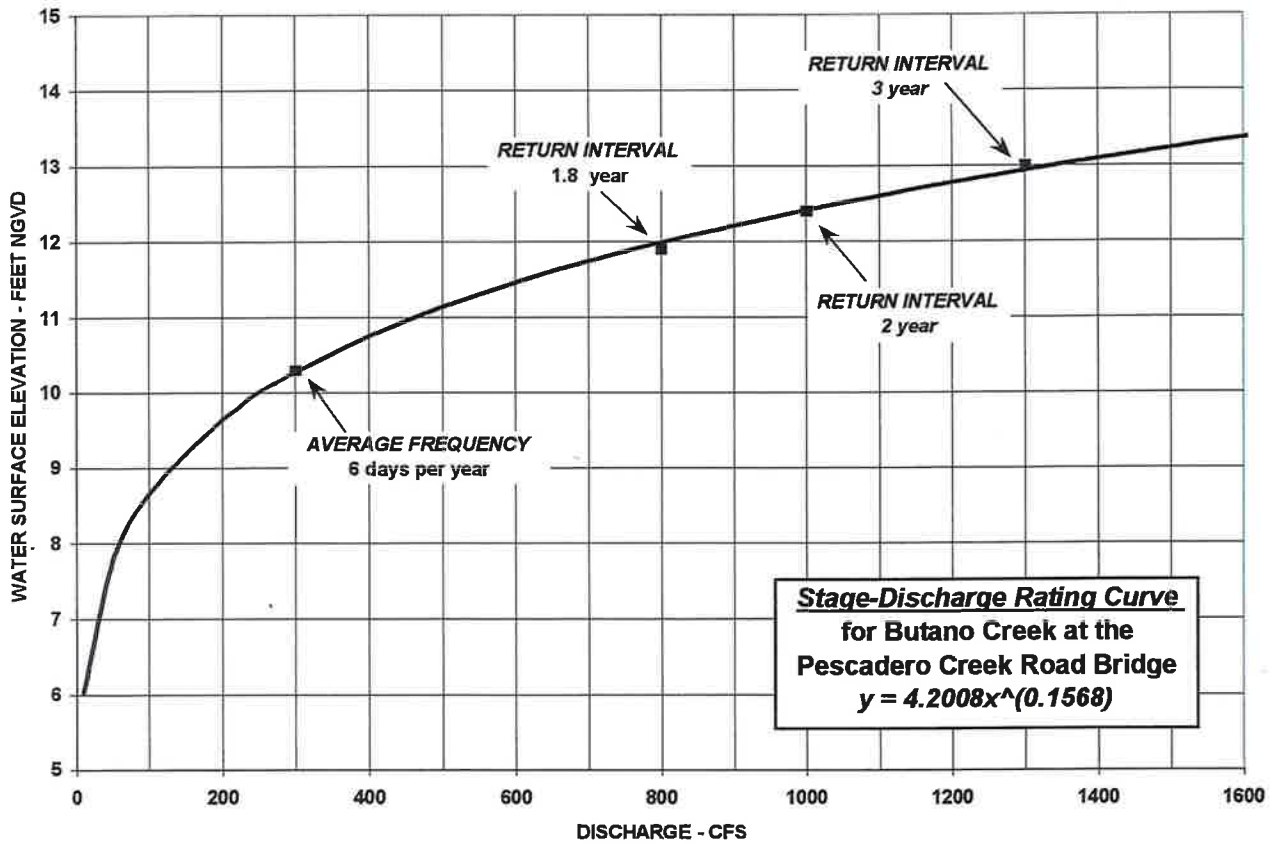
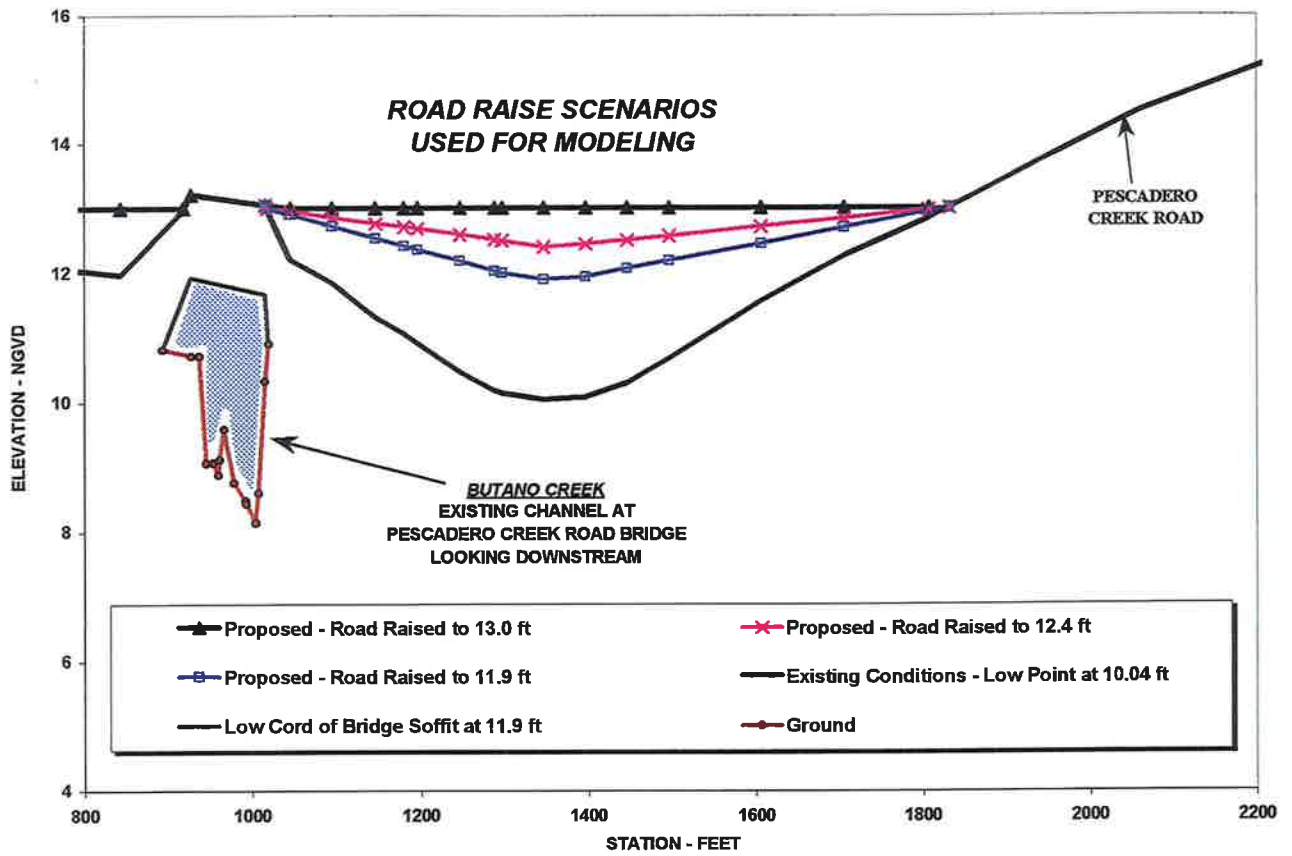


FIGURE 14: CROSS SECTION AT UPSTREAM SIDE OF PESCADERO CREEK ROAD BRIDGE SHOWING ROAD RAISE SCENARIOS USED TO MODEL POTENTIAL IMPROVEMENTS TO BRIDGE CAPACITY. STAGE-DISCHARGE RATING CURVE SHOWS FLOOD CAPACITY AT BRIDGE UNDER EACH SCENARIO.

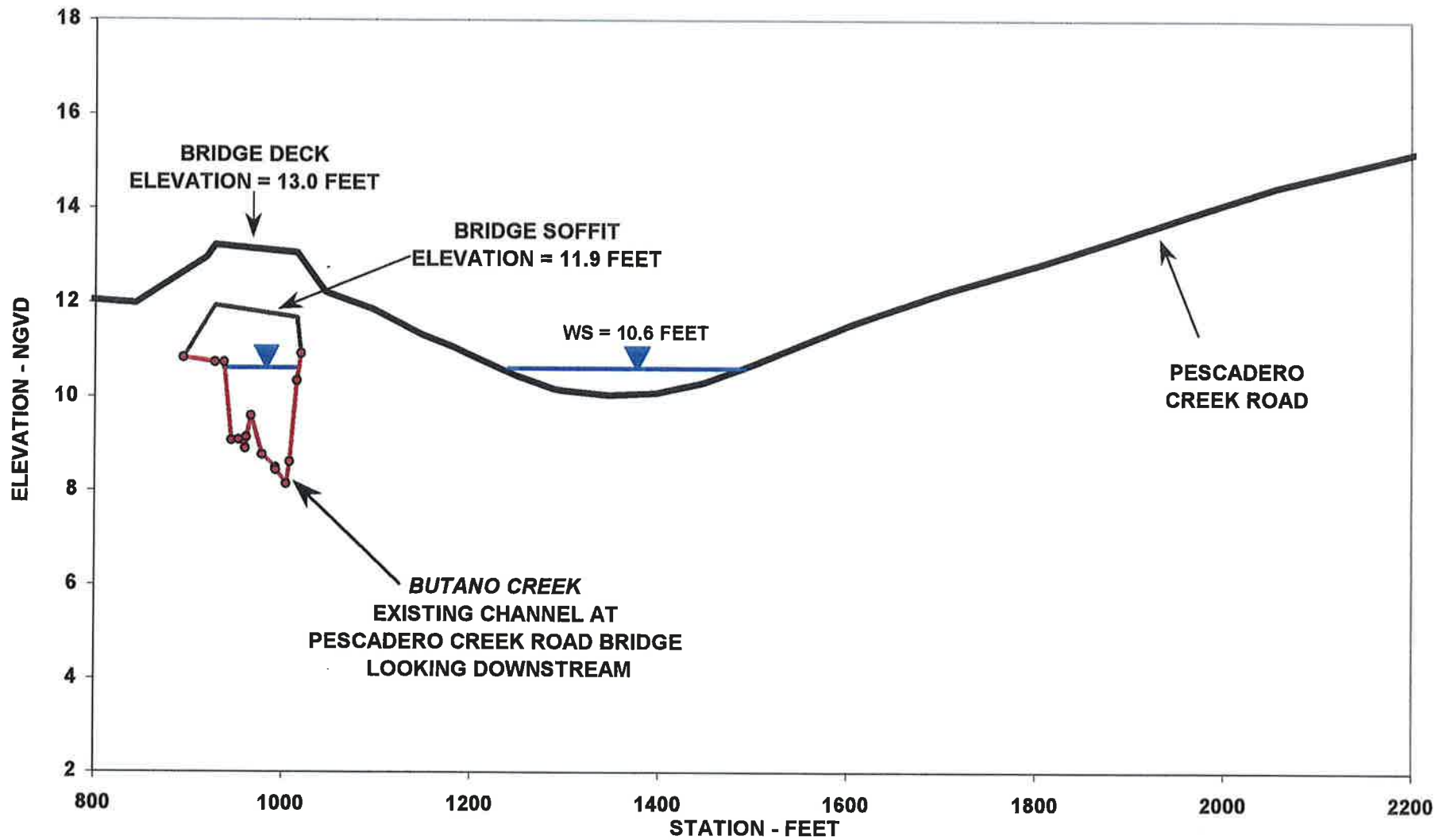


FIGURE 15: MODELING RESULTS SHOWING WATER SURFACE ELEVATION AT A DISCHARGE OF 300 CFS. CROSS SECTION IS LOCATED AT THE UPSTREAM SIDE OF THE BRIDGE. NOTE CAPACITY UNDER BRIDGE AND DEPTH OF WATER OVER LOW POINT ON PESCADERO CREEK ROAD.

Appendix A

Full Results of HEC-RAS Modeling

HEC-RAS Plan: Plan 14 River: RIVER-1 Reach: Reach-1

Reach	River Sta	Q Total (cfs)	Min Ch Elev (ft)	W.S. Elev (ft)	Cut W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10721	5000.00	9.51	14.62	12.19	14.64	0.000168	0.99	4090.11	1321.17	0.09
Reach-1	10721	5000.00	9.51	14.35	12.19	14.38	0.000229	1.11	3734.87	1320.58	0.10
Reach-1	10721	5000.00	9.51	14.16	12.19	14.19	0.000290	1.20	3481.35	1320.16	0.11
Reach-1	10721	5000.00	9.51	14.04	12.19	14.08	0.000339	1.27	3322.45	1319.89	0.12
Reach-1	10721	5000.00	9.51	13.97	12.19	14.01	0.000374	1.32	3228.61	1319.74	0.12
Reach-1	10671.6*	5000.00	9.43	14.61	12.14	14.64	0.000175	1.02	4139.91	1331.78	0.09
Reach-1	10671.6*	5000.00	9.43	14.34	12.14	14.37	0.000238	1.14	3778.33	1331.14	0.10
Reach-1	10671.6*	5000.00	9.43	14.15	12.14	14.18	0.000303	1.24	3519.20	1330.69	0.11
Reach-1	10671.6*	5000.00	9.43	14.02	12.14	14.06	0.000355	1.32	3356.10	1330.40	0.12
Reach-1	10671.6*	5000.00	9.43	13.95	12.14	13.99	0.000392	1.36	3259.46	1330.23	0.13
Reach-1	10622.3*	5000.00	9.35	14.61	12.09	14.63	0.000175	1.03	4191.55	1342.20	0.09
Reach-1	10622.3*	5000.00	9.35	14.33	12.09	14.36	0.000239	1.15	3823.38	1341.51	0.10
Reach-1	10622.3*	5000.00	9.35	14.13	12.09	14.17	0.000304	1.26	3558.35	1341.01	0.11
Reach-1	10622.3*	5000.00	9.35	14.01	12.09	14.04	0.000358	1.33	3390.77	1340.69	0.12
Reach-1	10622.3*	5000.00	9.35	13.93	12.09	13.97	0.000396	1.38	3291.10	1340.50	0.13
Reach-1	10572.9*	5000.00	9.27	14.60	12.05	14.62	0.000172	1.03	4244.52	1352.34	0.09
Reach-1	10572.9*	5000.00	9.27	14.32	12.05	14.35	0.000235	1.15	3869.82	1351.59	0.10
Reach-1	10572.9*	5000.00	9.27	14.12	12.05	14.15	0.000301	1.26	3598.89	1351.04	0.11
Reach-1	10572.9*	5000.00	9.27	13.99	12.05	14.03	0.000355	1.34	3426.79	1350.69	0.12
Reach-1	10572.9*	5000.00	9.27	13.92	12.05	13.95	0.000393	1.39	3324.05	1350.48	0.13
Reach-1	10523.6*	5000.00	9.19	14.59	12.00	14.61	0.000168	1.02	4299.48	1362.18	0.09
Reach-1	10523.6*	5000.00	9.19	14.31	12.00	14.34	0.000229	1.14	3918.38	1361.35	0.10
Reach-1	10523.6*	5000.00	9.19	14.11	12.00	14.14	0.000293	1.25	3641.64	1360.75	0.11
Reach-1	10523.6*	5000.00	9.19	13.98	12.00	14.01	0.000347	1.33	3465.08	1360.36	0.12
Reach-1	10523.6*	5000.00	9.19	13.90	12.00	13.94	0.000385	1.38	3359.30	1360.13	0.13
Reach-1	10474.3*	5000.00	9.10	14.58	11.95	14.61	0.000162	1.01	4354.25	1371.24	0.08
Reach-1	10474.3*	5000.00	9.10	14.30	11.95	14.33	0.000222	1.14	3967.33	1368.49	0.10
Reach-1	10474.3*	5000.00	9.10	14.10	11.95	14.13	0.000284	1.24	3685.54	1366.49	0.11
Reach-1	10474.3*	5000.00	9.10	13.96	11.95	14.00	0.000337	1.32	3505.15	1365.21	0.12
Reach-1	10474.3*	5000.00	9.10	13.88	11.95	13.92	0.000375	1.38	3396.76	1364.44	0.12
Reach-1	10424.9*	5000.00	9.02	14.58	11.90	14.60	0.000155	1.00	4419.24	1376.53	0.08
Reach-1	10424.9*	5000.00	9.02	14.29	11.90	14.32	0.000211	1.12	4027.37	1374.25	0.10
Reach-1	10424.9*	5000.00	9.02	14.08	11.90	14.11	0.000271	1.22	3740.77	1372.59	0.11
Reach-1	10424.9*	5000.00	9.02	13.95	11.90	13.98	0.000321	1.30	3556.53	1371.51	0.12
Reach-1	10424.9*	5000.00	9.02	13.87	11.90	13.90	0.000358	1.35	3445.43	1370.87	0.12
Reach-1	10375.6*	5000.00	8.94	14.57	11.91	14.59	0.000147	0.98	4485.68	1383.87	0.08
Reach-1	10375.6*	5000.00	8.94	14.28	11.91	14.31	0.000201	1.10	4088.43	1381.93	0.09
Reach-1	10375.6*	5000.00	8.94	14.07	11.91	14.10	0.000258	1.20	3796.76	1380.50	0.10
Reach-1	10375.6*	5000.00	8.94	13.94	11.91	13.97	0.000307	1.28	3608.52	1379.58	0.11
Reach-1	10375.6*	5000.00	8.94	13.85	11.91	13.89	0.000342	1.33	3494.64	1379.02	0.12
Reach-1	10326.3*	5000.00	8.86	14.57	11.82	14.59	0.000139	0.96	4556.62	1392.38	0.08
Reach-1	10326.3*	5000.00	8.86	14.28	11.82	14.30	0.000189	1.07	4153.82	1390.68	0.09
Reach-1	10326.3*	5000.00	8.86	14.06	11.82	14.09	0.000243	1.17	3857.03	1389.42	0.10
Reach-1	10326.3*	5000.00	8.86	13.92	11.82	13.96	0.000288	1.25	3684.77	1388.61	0.11
Reach-1	10326.3*	5000.00	8.86	13.84	11.82	13.87	0.000321	1.30	3548.10	1388.12	0.12
Reach-1	10277	5000.00	8.78	14.56	11.74	14.58	0.000131	0.94	4629.52	1401.71	0.08
Reach-1	10277	5000.00	8.78	14.27	11.74	14.29	0.000180	1.05	4221.09	1400.20	0.09
Reach-1	10277	5000.00	8.78	14.05	11.74	14.08	0.000231	1.15	3919.14	1399.07	0.10
Reach-1	10277	5000.00	8.78	13.91	11.74	13.94	0.000275	1.23	3722.87	1398.34	0.11
Reach-1	10277	5000.00	8.78	13.83	11.74	13.86	0.000307	1.28	3603.43	1397.90	0.11
Reach-1	10225.6*	5000.00	8.73	14.55	11.79	14.57	0.000555	1.95	4751.02	1444.81	0.16
Reach-1	10225.6*	5000.00	8.73	14.25	11.79	14.28	0.000757	2.19	4324.18	1442.86	0.18
Reach-1	10225.6*	5000.00	8.73	14.03	11.79	14.06	0.000972	2.40	4006.50	1441.40	0.20
Reach-1	10225.6*	5000.00	8.73	13.89	11.79	13.92	0.001157	2.55	3798.52	1440.44	0.22
Reach-1	10225.6*	5000.00	8.73	13.80	11.79	13.84	0.001293	2.66	3671.18	1439.86	0.23
Reach-1	10174.3*	5000.00	8.68	14.53	11.74	14.55	0.000512	1.90	4848.15	1487.68	0.15
Reach-1	10174.3*	5000.00	8.68	14.22	11.74	14.25	0.000708	2.14	4395.26	1485.16	0.18
Reach-1	10174.3*	5000.00	8.68	13.99	11.74	14.02	0.000926	2.36	4053.63	1483.26	0.20
Reach-1	10174.3*	5000.00	8.68	13.84	11.74	13.87	0.001120	2.53	3826.45	1481.99	0.22
Reach-1	10174.3*	5000.00	8.68	13.74	11.74	13.78	0.001268	2.65	3685.47	1481.20	0.23
Reach-1	10123.*	5000.00	8.62	14.50	11.69	14.52	0.000471	1.84	4946.37	1530.41	0.15
Reach-1	10123.*	5000.00	8.62	14.19	11.69	14.21	0.000662	2.09	4467.16	1527.21	0.17

HEC-RAS Plan: Plan 14 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ftft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10123.*	5000.00	8.62	13.95	11.69	13.98	0.000881	2.33	4100.63	1524.75	0.20
Reach-1	10123.*	5000.00	8.62	13.79	11.69	13.82	0.001084	2.52	3853.07	1523.09	0.22
Reach-1	10123.*	5000.00	8.62	13.69	11.69	13.72	0.001243	2.65	3697.24	1522.05	0.23
Reach-1	10071.6*	5000.00	8.57	14.48	11.59	14.50	0.000417	1.75	5047.97	1572.95	0.14
Reach-1	10071.6*	5000.00	8.57	14.16	11.59	14.19	0.000595	2.00	4542.46	1568.93	0.16
Reach-1	10071.6*	5000.00	8.57	13.91	11.59	13.94	0.000806	2.25	4150.57	1565.80	0.19
Reach-1	10071.6*	5000.00	8.57	13.74	11.59	13.77	0.001010	2.45	3881.71	1563.64	0.21
Reach-1	10071.6*	5000.00	8.57	13.63	11.59	13.67	0.001175	2.60	3709.72	1562.27	0.22
Reach-1	10020.3*	5000.00	8.52	14.47	11.49	14.48	0.000373	1.68	5148.27	1615.28	0.13
Reach-1	10020.3*	5000.00	8.52	14.14	11.49	14.16	0.000540	1.93	4616.72	1610.27	0.16
Reach-1	10020.3*	5000.00	8.52	13.88	11.49	13.90	0.000745	2.19	4199.29	1606.32	0.18
Reach-1	10020.3*	5000.00	8.52	13.70	11.49	13.73	0.000950	2.40	3908.37	1603.57	0.20
Reach-1	10020.3*	5000.00	8.52	13.58	11.49	13.61	0.001124	2.57	3719.15	1601.77	0.22
Reach-1	9969.*	5000.00	8.47	14.45	11.38	14.47	0.000319	1.57	5247.98	1657.41	0.12
Reach-1	9969.*	5000.00	8.47	14.12	11.38	14.14	0.000469	1.82	4690.97	1651.12	0.15
Reach-1	9969.*	5000.00	8.47	13.85	11.38	13.87	0.000659	2.08	4248.24	1646.11	0.17
Reach-1	9969.*	5000.00	8.47	13.66	11.38	13.69	0.000855	2.30	3935.13	1638.39	0.19
Reach-1	9969.*	5000.00	8.47	13.53	11.38	13.57	0.000996	2.44	3732.44	1597.38	0.21
Reach-1	9917.66*	5000.00	8.41	14.44	11.27	14.46	0.000275	1.48	5350.64	1699.03	0.11
Reach-1	9917.66*	5000.00	8.41	14.10	11.27	14.12	0.000410	1.73	4769.02	1691.16	0.14
Reach-1	9917.66*	5000.00	8.41	13.82	11.27	13.84	0.000586	1.99	4301.71	1684.80	0.16
Reach-1	9917.66*	5000.00	8.41	13.62	11.27	13.65	0.000745	2.18	3971.67	1631.39	0.18
Reach-1	9917.66*	5000.00	8.41	13.49	11.27	13.52	0.000873	2.31	3760.14	1588.07	0.20
Reach-1	9866.33*	5000.00	8.36	14.43	11.16	14.44	0.000224	1.35	5455.63	1740.16	0.10
Reach-1	9866.33*	5000.00	8.36	14.08	11.16	14.10	0.000339	1.59	4850.55	1730.31	0.12
Reach-1	9866.33*	5000.00	8.36	13.80	11.16	13.82	0.000482	1.83	4361.62	1693.77	0.15
Reach-1	9866.33*	5000.00	8.36	13.59	11.16	13.62	0.000611	2.00	4021.45	1625.86	0.16
Reach-1	9866.33*	5000.00	8.36	13.45	11.16	13.49	0.000720	2.12	3802.41	1578.73	0.18
Reach-1	9815	5000.00	8.31	14.42	11.04	14.43	0.000184	1.24	5562.10	1780.36	0.09
Reach-1	9815	5000.00	8.31	14.07	11.04	14.09	0.000282	1.47	4935.08	1767.80	0.11
Reach-1	9815	5000.00	8.31	13.78	11.04	13.80	0.000392	1.67	4432.00	1689.95	0.13
Reach-1	9815	5000.00	8.31	13.57	11.04	13.59	0.000497	1.83	4085.04	1613.50	0.15
Reach-1	9815	5000.00	8.31	13.43	11.04	13.46	0.000585	1.94	3861.08	1562.17	0.16
Reach-1	9783.*	5000.00	6.89	14.41	11.33	14.43	0.000273	1.52	6374.47	1982.13	0.11
Reach-1	9783.*	5000.00	6.89	14.06	11.33	14.07	0.000402	1.76	5667.89	1970.31	0.14
Reach-1	9783.*	5000.00	6.89	13.76	11.33	13.78	0.000549	1.97	5097.50	1900.99	0.16
Reach-1	9783.*	5000.00	6.89	13.55	11.33	13.57	0.000696	2.15	4695.26	1843.18	0.18
Reach-1	9783.*	5000.00	6.89	13.40	11.33	13.43	0.000816	2.28	4431.74	1792.64	0.19
Reach-1	9711	5000.00	5.47	14.40	11.10	14.41	0.000263	1.47	7230.42	2183.63	0.11
Reach-1	9711	5000.00	5.47	14.04	11.10	14.06	0.000377	1.68	6441.38	2168.61	0.13
Reach-1	9711	5000.00	5.47	13.74	11.10	13.76	0.000511	1.88	5800.52	2106.77	0.15
Reach-1	9711	5000.00	5.47	13.52	11.10	13.54	0.000647	2.05	5341.19	2061.31	0.17
Reach-1	9711	5000.00	5.47	13.37	11.10	13.40	0.000760	2.17	5036.59	2009.80	0.18
Reach-1	9700	Bridge									
Reach-1	9660	5000.00	7.42	14.33	10.26	14.34	0.000209	1.14	7793.52	2148.77	0.09
Reach-1	9660	5000.00	7.42	13.93	10.26	13.94	0.000282	1.26	6964.68	2000.46	0.10
Reach-1	9660	5000.00	7.42	13.56	10.26	13.57	0.000387	1.41	6241.33	1941.87	0.12
Reach-1	9660	5000.00	7.42	13.24	10.26	13.26	0.000519	1.56	5636.88	1891.53	0.13
Reach-1	9660	5000.00	7.42	12.99	10.26	13.01	0.000666	1.71	5166.50	1849.08	0.15
Reach-1	9637.5*	5000.00	7.41	14.32	10.57	14.33	0.000257	1.51	7470.96	2123.41	0.11
Reach-1	9637.5*	5000.00	7.41	13.91	10.57	13.93	0.000365	1.71	6617.82	2048.12	0.13
Reach-1	9637.5*	5000.00	7.41	13.54	10.57	13.56	0.000497	1.89	5884.81	1895.17	0.15
Reach-1	9637.5*	5000.00	7.41	13.22	10.57	13.24	0.000679	2.12	5284.86	1835.28	0.17
Reach-1	9637.5*	5000.00	7.41	12.96	10.57	12.99	0.000887	2.33	4818.31	1788.73	0.20
Reach-1	9615.*	5000.00	7.40	14.31	10.75	14.32	0.000283	1.56	7203.87	2089.07	0.12
Reach-1	9615.*	5000.00	7.40	13.90	10.75	13.92	0.000413	1.80	6348.77	2044.80	0.14
Reach-1	9615.*	5000.00	7.40	13.52	10.75	13.54	0.000587	2.04	5593.24	1954.97	0.16
Reach-1	9615.*	5000.00	7.40	13.19	10.75	13.22	0.000818	2.29	4963.15	1857.93	0.19
Reach-1	9615.*	5000.00	7.40	12.93	10.75	12.96	0.001060	2.51	4493.39	1738.05	0.22
Reach-1	9592.5*	5000.00	7.39	14.30	10.99	14.32	0.000295	1.59	6952.90	1972.98	0.12
Reach-1	9592.5*	5000.00	7.39	13.89	10.99	13.90	0.000440	1.84	6131.69	1967.40	0.14

HEC-RAS Plan: Plan 14 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntrl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9592.5	5000.00	7.39	13.50	10.99	13.52	0.000662	2.14	5378.20	1951.75	0.17
Reach-1	9582.5*	5000.00	7.39	13.17	10.99	13.19	0.000943	2.43	4725.86	1901.46	0.20
Reach-1	9592.5*	5000.00	7.39	12.89	10.99	12.93	0.001306	2.74	4213.36	1818.68	0.24
Reach-1	9570	5000.00	7.37	14.29	10.98	14.31	0.000307	1.60	6689.85	1850.02	0.12
Reach-1	9570*	5000.00	7.37	13.87	10.98	13.89	0.000457	1.85	5911.43	1845.76	0.15
Reach-1	9570*	5000.00	7.37	13.48	10.98	13.50	0.000692	2.16	5191.04	1841.81	0.18
Reach-1	9570*	5000.00	7.37	13.13	10.98	13.16	0.001047	2.52	4550.79	1837.76	0.21
Reach-1	9570*	5000.00	7.37	12.84	10.98	12.88	0.001497	2.87	4022.66	1813.38	0.25
Reach-1	9547.5*	5000.00	7.36	14.28	11.09	14.30	0.000321	1.61	6403.81	1723.36	0.12
Reach-1	9547.5*	5000.00	7.36	13.86	11.09	13.87	0.000476	1.86	5670.47	1720.02	0.15
Reach-1	9547.5*	5000.00	7.36	13.46	11.09	13.48	0.000719	2.16	4986.26	1716.89	0.18
Reach-1	9547.5*	5000.00	7.36	13.10	11.09	13.13	0.001096	2.52	4369.58	1714.06	0.22
Reach-1	9547.5*	5000.00	7.36	12.79	11.09	12.83	0.001639	2.94	3845.58	1711.66	0.26
Reach-1	9525	5000.00	7.35	14.27	11.14	14.29	0.000339	1.62	6092.74	1594.49	0.12
Reach-1	9525	5000.00	7.35	13.84	11.14	13.86	0.000500	1.86	5406.04	1591.82	0.15
Reach-1	9525	5000.00	7.35	13.44	11.14	13.46	0.000754	2.16	4759.94	1589.30	0.18
Reach-1	9525	5000.00	7.35	13.06	11.14	13.09	0.001155	2.52	4169.00	1586.99	0.22
Reach-1	9525	5000.00	7.35	12.74	11.14	12.78	0.001720	2.91	3657.73	1561.97	0.26
Reach-1	9473.33	5000.00	7.34	14.26	10.83	14.27	0.000289	1.51	6704.98	1647.28	0.11
Reach-1	9473.33*	5000.00	7.34	13.82	10.83	13.83	0.000418	1.72	5985.53	1640.38	0.14
Reach-1	9473.33*	5000.00	7.34	13.40	10.83	13.42	0.000621	1.98	5302.81	1636.52	0.16
Reach-1	9473.33*	5000.00	7.34	13.01	10.83	13.04	0.000944	2.30	4666.97	1633.67	0.20
Reach-1	9473.33*	5000.00	7.34	12.67	10.83	12.69	0.001445	2.68	4096.85	1631.05	0.24
Reach-1	9421.66*	5000.00	7.34	14.25	10.51	14.25	0.000238	1.39	7393.60	1700.76	0.10
Reach-1	9421.66*	5000.00	7.34	13.80	10.51	13.81	0.000338	1.57	6641.43	1696.03	0.12
Reach-1	9421.66*	5000.00	7.34	13.38	10.51	13.39	0.000493	1.79	5921.80	1691.30	0.15
Reach-1	9421.66*	5000.00	7.34	12.98	10.51	12.99	0.000735	2.06	5243.31	1687.02	0.18
Reach-1	9421.66*	5000.00	7.34	12.61	10.51	12.63	0.001110	2.38	4621.30	1681.30	0.21
Reach-1	9370*	5000.00	7.33	14.24	10.12	14.24	0.000191	1.27	8150.99	1749.70	0.09
Reach-1	9370*	5000.00	7.33	13.79	10.12	13.80	0.000265	1.42	7370.12	1746.06	0.11
Reach-1	9370*	5000.00	7.33	13.36	10.12	13.37	0.000377	1.60	6618.54	1742.55	0.13
Reach-1	9370*	5000.00	7.33	12.95	10.12	12.96	0.000549	1.81	5903.24	1739.00	0.15
Reach-1	9370*	5000.00	7.33	12.57	10.12	12.58	0.000810	2.07	5236.78	1735.08	0.18
Reach-1	9318.33	5000.00	7.32	14.23	9.95	14.23	0.000151	1.15	8974.09	1806.99	0.08
Reach-1	9318.33*	5000.00	7.32	13.78	9.95	13.79	0.000205	1.27	8163.95	1797.13	0.10
Reach-1	9318.33*	5000.00	7.32	13.35	9.95	13.35	0.000283	1.41	7383.89	1790.45	0.11
Reach-1	9318.33*	5000.00	7.32	12.93	9.95	12.94	0.000399	1.58	6637.55	1787.44	0.13
Reach-1	9318.33*	5000.00	7.32	12.53	9.95	12.55	0.000572	1.78	5935.27	1784.62	0.16
Reach-1	9266.66*	5000.00	7.32	14.22	9.79	14.23	0.000119	1.04	9871.87	1865.50	0.08
Reach-1	9266.66*	5000.00	7.32	13.77	9.79	13.78	0.000158	1.14	9031.36	1857.05	0.09
Reach-1	9266.66*	5000.00	7.32	13.33	9.79	13.34	0.000212	1.25	8220.39	1846.73	0.10
Reach-1	9266.66*	5000.00	7.32	12.91	9.79	12.92	0.000288	1.38	7444.38	1836.80	0.11
Reach-1	9266.66*	5000.00	7.32	12.51	9.79	12.52	0.000398	1.53	6712.37	1831.77	0.13
Reach-1	9215	5000.00	7.31	14.22	9.62	14.22	0.000092	0.93	10843.97	1922.07	0.07
Reach-1	9215	5000.00	7.31	13.77	9.62	13.77	0.000120	1.01	9974.86	1914.56	0.07
Reach-1	9215	5000.00	7.31	13.33	9.62	13.33	0.000158	1.10	9134.54	1906.20	0.08
Reach-1	9215	5000.00	7.31	12.90	9.62	12.91	0.000210	1.20	8327.96	1897.56	0.09
Reach-1	9215	5000.00	7.31	12.50	9.62	12.51	0.000280	1.32	7565.22	1887.49	0.11
Reach-1	9169.99	5000.00	7.01	14.22	9.50	14.22	0.000084	0.88	11179.91	1942.20	0.06
Reach-1	9169.99*	5000.00	7.01	13.76	9.50	13.77	0.000109	0.95	10299.65	1935.53	0.07
Reach-1	9169.99*	5000.00	7.01	13.32	9.50	13.33	0.000142	1.04	9447.50	1927.81	0.08
Reach-1	9169.99*	5000.00	7.01	12.90	9.50	12.90	0.000188	1.13	8628.15	1921.02	0.09
Reach-1	9169.99*	5000.00	7.01	12.49	9.50	12.50	0.000251	1.23	7850.61	1914.20	0.10
Reach-1	9124.99*	5000.00	6.72	14.21	9.37	14.22	0.000077	0.83	11518.41	1962.20	0.06
Reach-1	9124.99*	5000.00	6.72	13.76	9.37	13.76	0.000099	0.90	10627.29	1956.25	0.06
Reach-1	9124.99*	5000.00	6.72	13.32	9.37	13.32	0.000129	0.97	9763.67	1948.67	0.07
Reach-1	9124.99*	5000.00	6.72	12.89	9.37	12.89	0.000170	1.06	8932.32	1942.26	0.08
Reach-1	9124.99*	5000.00	6.72	12.48	9.37	12.49	0.000226	1.16	8141.75	1937.60	0.09
Reach-1	9079.99*	5000.00	6.42	14.21	9.25	14.21	0.000071	0.79	11860.00	1982.12	0.05
Reach-1	9079.99*	5000.00	6.42	13.75	9.25	13.76	0.000090	0.85	10958.23	1976.47	0.06
Reach-1	9079.99*	5000.00	6.42	13.31	9.25	13.32	0.000117	0.92	10083.42	1969.54	0.07
Reach-1	9079.99*	5000.00	6.42	12.88	9.25	12.89	0.000153	1.00	9240.41	1962.69	0.08

HEC-RAS Plan: Plan 14 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	G.Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Chl W/S (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8979.99*	5000.00	6.42	12.47	9.25	12.48	0.000203	1.10	8437.68	1958.62	0.09
Reach-1	9034.99*	5000.00	6.13	14.21	9.12	14.21	0.000065	0.75	12208.79	2001.92	0.05
Reach-1	9034.99*	5000.00	6.13	13.75	9.12	13.75	0.000083	0.81	11296.55	1996.48	0.06
Reach-1	9034.99*	5000.00	6.13	13.31	9.12	13.31	0.000106	0.88	10410.81	1990.34	0.06
Reach-1	9034.99*	5000.00	6.13	12.88	9.12	12.88	0.000138	0.96	9556.39	1983.49	0.07
Reach-1	9034.99*	5000.00	6.13	12.47	9.12	12.47	0.000182	1.04	8742.00	1979.15	0.08
Reach-1	8989.99*	5000.00	5.83	14.21	9.00	14.21	0.000059	0.72	12564.42	2021.77	0.05
Reach-1	8989.99*	5000.00	5.83	13.75	9.00	13.75	0.000075	0.78	11641.81	2016.53	0.05
Reach-1	8989.99*	5000.00	5.83	13.30	9.00	13.31	0.000097	0.84	10745.40	2010.89	0.06
Reach-1	8989.99*	5000.00	5.83	12.87	9.00	12.88	0.000125	0.92	9879.88	2004.31	0.07
Reach-1	8989.99*	5000.00	5.83	12.46	9.00	12.47	0.000163	1.00	9054.18	1999.19	0.08
Reach-1	8944.99*	5000.00	5.54	14.20	8.87	14.21	0.000054	0.70	12921.80	2041.42	0.05
Reach-1	8944.99*	5000.00	5.54	13.75	8.87	13.75	0.000069	0.75	11989.03	2036.35	0.05
Reach-1	8944.99*	5000.00	5.54	13.30	8.87	13.30	0.000088	0.81	11082.21	2031.26	0.06
Reach-1	8944.99*	5000.00	5.54	12.87	8.87	12.87	0.000113	0.88	10205.85	2024.95	0.06
Reach-1	8944.99*	5000.00	5.54	12.45	8.87	12.46	0.000147	0.96	9369.05	2018.94	0.07
Reach-1	8899.99*	5000.00	5.24	14.20	8.75	14.20	0.000050	0.67	13281.27	2061.02	0.04
Reach-1	8899.99*	5000.00	5.24	13.74	8.75	13.75	0.000063	0.72	12338.44	2056.10	0.05
Reach-1	8899.99*	5000.00	5.24	13.30	8.75	13.30	0.000080	0.78	11421.40	2051.33	0.05
Reach-1	8899.99*	5000.00	5.24	12.86	8.75	12.87	0.000103	0.85	10534.45	2045.51	0.06
Reach-1	8899.99*	5000.00	5.24	12.45	8.75	12.45	0.000132	0.92	9686.75	2039.72	0.07
Reach-1	8854.99*	5000.00	4.95	14.20	8.62	14.20	0.000046	0.65	13647.88	2080.61	0.04
Reach-1	8854.99*	5000.00	4.95	13.74	8.62	13.74	0.000058	0.70	12695.13	2075.77	0.05
Reach-1	8854.99*	5000.00	4.95	13.29	8.62	13.30	0.000073	0.75	11768.03	2071.15	0.05
Reach-1	8854.99*	5000.00	4.95	12.86	8.62	12.86	0.000093	0.82	10870.73	2065.85	0.06
Reach-1	8854.99*	5000.00	4.95	12.44	8.62	12.45	0.000120	0.89	10012.45	2060.26	0.06
Reach-1	8810	5000.00	6.96	14.20	9.01	14.20	0.000050	0.67	13659.38	2100.17	0.05
Reach-1	8810	5000.00	6.96	13.74	9.01	13.74	0.000063	0.71	12696.66	2095.38	0.05
Reach-1	8810	5000.00	6.96	13.29	9.01	13.29	0.000080	0.76	11759.46	2090.91	0.06
Reach-1	8810	5000.00	6.96	12.86	9.01	12.86	0.000103	0.81	10851.78	2086.13	0.07
Reach-1	8810	5000.00	6.96	12.44	9.01	12.44	0.000133	0.86	9982.81	2080.71	0.08
Reach-1	8809	5000.00	9.00	14.20		14.20	0.000053	0.25	13620.96	2100.17	0.02
Reach-1	8809	5000.00	9.00	13.74		13.74	0.000067	0.26	12658.21	2095.38	0.02
Reach-1	8809	5000.00	9.00	13.29		13.29	0.000085	0.27	11720.97	2090.91	0.02
Reach-1	8809	5000.00	9.00	12.86		12.86	0.000109	0.29	10813.23	2086.13	0.03
Reach-1	8809	5000.00	9.00	12.44		12.44	0.000140	0.30	9944.17	2080.71	0.03
Reach-1	8803.63*	5000.00	8.87	14.19	9.00	14.19	0.000049	0.24	13885.23	2085.32	0.02
Reach-1	8803.63*	5000.00	8.87	13.73	9.00	13.73	0.000062	0.25	12926.12	2081.34	0.02
Reach-1	8803.63*	5000.00	8.87	13.28	9.00	13.28	0.000078	0.27	11991.18	2077.45	0.02
Reach-1	8803.63*	5000.00	8.87	12.84	9.00	12.85	0.000100	0.28	11084.27	2072.90	0.03
Reach-1	8803.63*	5000.00	8.87	12.42	9.00	12.43	0.000128	0.29	10214.00	2068.45	0.03
Reach-1	8798.27*	5000.00	8.75	14.19	9.00	14.19	0.000046	0.24	14150.91	2071.56	0.02
Reach-1	8798.27*	5000.00	8.75	13.72	9.00	13.73	0.000057	0.25	13195.33	2068.05	0.02
Reach-1	8798.27*	5000.00	8.75	13.27	9.00	13.28	0.000072	0.26	12262.79	2064.35	0.02
Reach-1	8798.27*	5000.00	8.75	12.83	9.00	12.84	0.000091	0.27	11356.96	2060.43	0.02
Reach-1	8798.27*	5000.00	8.75	12.41	9.00	12.41	0.000117	0.29	10485.91	2056.65	0.03
Reach-1	8792.90*	5000.00	8.62	14.18	8.74	14.18	0.000043	0.23	14411.34	2058.42	0.02
Reach-1	8792.90*	5000.00	8.62	13.72	8.74	13.72	0.000053	0.24	13459.29	2055.28	0.02
Reach-1	8792.90*	5000.00	8.62	13.27	8.74	13.27	0.000066	0.25	12529.34	2051.79	0.02
Reach-1	8792.90*	5000.00	8.62	12.82	8.74	12.83	0.000084	0.27	11624.81	2048.40	0.02
Reach-1	8792.90*	5000.00	8.62	12.40	8.74	12.40	0.000107	0.28	10753.81	2042.02	0.03
Reach-1	8787.54*	5000.00	8.49	14.18	8.55	14.18	0.000040	0.23	14670.64	2045.66	0.02
Reach-1	8787.54*	5000.00	8.49	13.71	8.55	13.71	0.000049	0.24	13722.22	2042.66	0.02
Reach-1	8787.54*	5000.00	8.49	13.26	8.55	13.26	0.000061	0.25	12795.03	2039.61	0.02
Reach-1	8787.54*	5000.00	8.49	12.82	8.55	12.82	0.000077	0.26	11892.73	2033.13	0.02
Reach-1	8787.54*	5000.00	8.49	12.39	8.55	12.39	0.000097	0.27	11023.90	2026.14	0.02
Reach-1	8782.18*	5000.00	8.36	14.17	8.36	14.17	0.000037	0.22	14921.96	2033.25	0.02
Reach-1	8782.18*	5000.00	8.36	13.71	8.36	13.71	0.000046	0.23	13977.23	2030.30	0.02
Reach-1	8782.18*	5000.00	8.36	13.25	8.36	13.25	0.000056	0.24	13053.79	2024.11	0.02
Reach-1	8782.18*	5000.00	8.36	12.81	8.36	12.81	0.000071	0.26	12155.07	2018.07	0.02
Reach-1	8782.18*	5000.00	8.36	12.38	8.36	12.38	0.000089	0.27	11288.19	2012.22	0.02

HFC-RAS Plan: Plan 14 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Cr El (ft)	W.S. Elev (ft)	Cr W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vet Cntrl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #/Cfl
Reach-1	8776.81*	5000.00	8.24	14.17	8.19	14.17	0.000035	0.22	15175.56	2020.42	0.02
Reach-1	8776.81*	5000.00	8.24	13.70	8.19	13.70	0.000042	0.23	14235.58	2014.96	0.02
Reach-1	8776.81*	5000.00	8.24	13.25	8.19	13.25	0.000052	0.24	13316.59	2009.61	0.02
Reach-1	8776.81*	5000.00	8.24	12.80	8.19	12.80	0.000065	0.25	12421.14	2004.39	0.02
Reach-1	8776.81*	5000.00	8.24	12.37	8.19	12.37	0.000082	0.26	11556.12	1999.33	0.02
Reach-1	8771.45*	5000.00	8.11	14.16	8.00	14.17	0.000032	0.21	15425.59	2005.56	0.02
Reach-1	8771.45*	5000.00	8.11	13.70	8.00	13.70	0.000039	0.22	14490.70	2000.76	0.02
Reach-1	8771.45*	5000.00	8.11	13.24	8.00	13.24	0.000048	0.23	13575.93	1996.06	0.02
Reach-1	8771.45*	5000.00	8.11	12.79	8.00	12.79	0.000060	0.24	12683.67	1991.45	0.02
Reach-1	8771.45*	5000.00	8.11	12.36	8.00	12.36	0.000075	0.26	11820.65	1986.99	0.02
Reach-1	8766.09*	5000.00	7.98	14.16	7.82	14.16	0.000030	0.21	15674.19	1991.71	0.01
Reach-1	8766.09*	5000.00	7.98	13.69	7.82	13.70	0.000036	0.22	14744.13	1987.42	0.02
Reach-1	8766.09*	5000.00	7.98	13.23	7.82	13.24	0.000045	0.23	13833.42	1983.22	0.02
Reach-1	8766.09*	5000.00	7.98	12.79	7.82	12.79	0.000055	0.24	12944.35	1979.11	0.02
Reach-1	8766.09*	5000.00	7.98	12.35	7.82	12.35	0.000069	0.25	12083.45	1975.11	0.02
Reach-1	8760.72*	5000.00	7.81	14.16	7.62	14.16	0.000028	0.20	15921.37	1978.46	0.01
Reach-1	8760.72*	5000.00	7.81	13.69	7.62	13.69	0.000034	0.21	14996.01	1974.59	0.02
Reach-1	8760.72*	5000.00	7.81	13.23	7.62	13.23	0.000041	0.22	14089.35	1970.80	0.02
Reach-1	8760.72*	5000.00	7.81	12.78	7.62	12.78	0.000051	0.23	13203.54	1967.08	0.02
Reach-1	8760.72*	5000.00	7.81	12.34	7.62	12.35	0.000063	0.24	12344.99	1963.47	0.02
Reach-1	8755.36*	5000.00	7.73	14.15	7.43	14.16	0.000026	0.20	16166.50	1965.66	0.01
Reach-1	8755.36*	5000.00	7.73	13.69	7.43	13.69	0.000032	0.21	15245.79	1962.14	0.02
Reach-1	8755.36*	5000.00	7.73	13.23	7.43	13.23	0.000038	0.22	14343.17	1958.68	0.02
Reach-1	8755.36*	5000.00	7.73	12.77	7.43	12.78	0.000047	0.23	13460.74	1955.30	0.02
Reach-1	8755.36*	5000.00	7.73	12.34	7.43	12.34	0.000058	0.24	12604.71	1952.01	0.02
Reach-1	8750	15000.00	7.50	14.13	8.48	14.14	0.000222	0.59	16362.33	1963.07	0.04
Reach-1	8750	15000.00	7.50	13.66	8.48	13.67	0.000269	0.62	15439.47	1949.82	0.04
Reach-1	8750	15000.00	7.50	13.19	8.48	13.21	0.000327	0.64	14532.68	1946.62	0.05
Reach-1	8750	15000.00	7.50	12.73	8.48	12.75	0.000401	0.67	13643.56	1943.47	0.05
Reach-1	8750	15000.00	7.50	12.29	8.48	12.31	0.000495	0.70	12777.75	1940.41	0.06
Reach-1	8744.44*	15000.00	7.39	14.11	8.26	14.12	0.000205	0.57	16994.08	2013.25	0.04
Reach-1	8744.44*	15000.00	7.39	13.63	8.26	13.65	0.000247	0.60	16034.50	2009.90	0.04
Reach-1	8744.44*	15000.00	7.39	13.16	8.26	13.18	0.000301	0.62	15089.32	2006.60	0.05
Reach-1	8744.44*	15000.00	7.39	12.70	8.26	12.72	0.000370	0.65	14159.46	2003.34	0.05
Reach-1	8744.44*	15000.00	7.39	12.24	8.26	12.26	0.000459	0.68	13249.87	2000.15	0.06
Reach-1	8738.88*	15000.00	7.28	14.09	8.07	14.10	0.000188	0.55	17649.08	2073.47	0.04
Reach-1	8738.88*	15000.00	7.28	13.61	8.07	13.62	0.000227	0.58	16652.95	2070.02	0.04
Reach-1	8738.88*	15000.00	7.28	13.14	8.07	13.15	0.000277	0.60	15669.55	2066.61	0.04
Reach-1	8738.88*	15000.00	7.28	12.67	8.07	12.68	0.000341	0.63	14699.11	2063.23	0.05
Reach-1	8738.88*	15000.00	7.28	12.20	8.07	12.22	0.000424	0.66	13745.84	2059.92	0.05
Reach-1	8733.33*	15000.00	7.17	14.08	7.85	14.09	0.000173	0.53	18315.82	2133.70	0.04
Reach-1	8733.33*	15000.00	7.17	13.59	7.85	13.60	0.000209	0.56	17283.32	2130.15	0.04
Reach-1	8733.33*	15000.00	7.17	13.11	7.85	13.12	0.000255	0.59	16261.89	2126.63	0.04
Reach-1	8733.33*	15000.00	7.17	12.64	7.85	12.65	0.000315	0.61	15251.09	2123.14	0.05
Reach-1	8733.33*	15000.00	7.17	12.17	7.85	12.18	0.000392	0.64	14254.31	2119.69	0.05
Reach-1	8727.77*	15000.00	7.06	14.06	7.65	14.07	0.000160	0.52	19005.03	2194.02	0.03
Reach-1	8727.77*	15000.00	7.06	13.57	7.65	13.58	0.000193	0.54	17936.31	2190.36	0.04
Reach-1	8727.77*	15000.00	7.06	13.09	7.65	13.10	0.000235	0.57	16877.05	2186.73	0.04
Reach-1	8727.77*	15000.00	7.06	12.61	7.65	12.62	0.000290	0.59	15828.10	2183.12	0.05
Reach-1	8727.77*	15000.00	7.06	12.13	7.65	12.15	0.000361	0.62	14786.02	2179.54	0.05
Reach-1	8722.22*	15000.00	6.94	14.05	7.46	14.06	0.000147	0.50	19712.26	2253.46	0.03
Reach-1	8722.22*	15000.00	6.94	13.56	7.46	13.57	0.000177	0.52	18607.63	2250.58	0.04
Reach-1	8722.22*	15000.00	6.94	13.07	7.46	13.08	0.000216	0.55	17510.78	2246.84	0.04
Reach-1	8722.22*	15000.00	6.94	12.58	7.46	12.60	0.000266	0.58	16419.96	2243.11	0.04
Reach-1	8722.22*	15000.00	6.94	12.10	7.46	12.11	0.000319	0.59	15338.84	2227.23	0.05
Reach-1	8716.66*	15000.00	6.83	14.03	7.23	14.04	0.000135	0.48	20439.91	2311.75	0.03
Reach-1	8716.66*	15000.00	6.83	13.54	7.23	13.55	0.000163	0.51	19300.37	2309.52	0.04
Reach-1	8716.66*	15000.00	6.83	13.05	7.23	13.06	0.000199	0.53	18166.40	2307.02	0.04
Reach-1	8716.66*	15000.00	6.83	12.56	7.23	12.57	0.000245	0.56	17036.04	2303.16	0.04
Reach-1	8716.66*	15000.00	6.83	12.07	7.23	12.09	0.000292	0.57	15918.89	2273.00	0.05
Reach-1	8711.11*	15000.00	6.72	14.02	7.02	14.03	0.000124	0.47	21178.10	2370.05	0.03
Reach-1	8711.11*	15000.00	6.72	13.53	7.02	13.53	0.000150	0.49	20003.96	2367.71	0.03

HEC-RAS Plan: Plan 14 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vet Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8711.11*	15000.00	6.72	13.03	7.02	13.04	0.000183	0.51	18833.88	2365.37	0.04
Reach-1	8711.11*	15000.00	6.72	12.54	7.02	12.55	0.000218	0.53	17665.46	2362.71	0.04
Reach-1	8711.11*	15000.00	6.72	12.05	7.02	12.06	0.000267	0.55	16514.93	2318.93	0.04
Reach-1	8705.55*	15000.00	6.61	14.01	6.81	14.02	0.000114	0.45	21938.35	2428.43	0.03
Reach-1	8705.55*	15000.00	6.61	13.51	6.81	13.52	0.000138	0.48	20729.79	2425.97	0.03
Reach-1	8705.55*	15000.00	6.61	13.01	6.81	13.02	0.000168	0.50	19523.87	2423.51	0.04
Reach-1	8705.55*	15000.00	6.61	12.52	6.81	12.53	0.000199	0.51	18321.01	2404.23	0.04
Reach-1	8705.55*	15000.00	6.61	12.02	6.81	12.03	0.000244	0.53	17138.46	2363.97	0.04
Reach-1	8700	15000.00	6.50	14.00	6.58	14.01	0.000105	0.44	22712.74	2486.87	0.03
Reach-1	8700	15000.00	6.50	13.50	6.58	13.51	0.000127	0.46	21469.95	2484.29	0.03
Reach-1	8700	15000.00	6.50	13.00	6.58	13.01	0.000154	0.48	20228.45	2481.71	0.03
Reach-1	8700	15000.00	6.50	12.50	6.58	12.51	0.000182	0.50	18994.38	2448.46	0.04
Reach-1	8700	15000.00	6.50	12.00	6.58	12.01	0.000223	0.52	17780.38	2407.55	0.04

Reach	River Sta	Q Total (cfs)	Min Ch-El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (m/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch
Reach-1	10721	5000.00	9.51	14.85	12.19	14.87	0.000132	0.91	4393.29	1321.67	0.08
Reach-1	10721	5000.00	9.51	14.82	12.19	14.84	0.000137	0.92	4347.28	1321.60	0.08
Reach-1	10721	5000.00	9.51	14.82	12.19	14.84	0.000137	0.92	4347.28	1321.60	0.08
Reach-1	10721	5000.00	9.51	14.82	12.19	14.84	0.000137	0.92	4347.28	1321.60	0.08
Reach-1	10721	5000.00	9.51	14.82	12.19	14.84	0.000137	0.92	4347.28	1321.60	0.08
Reach-1	10671.6	5000.00	9.43	14.84	12.14	14.86	0.000137	0.94	4447.59	1332.32	0.08
Reach-1	10671.6	5000.00	9.43	14.81	12.14	14.83	0.000142	0.95	4400.94	1332.24	0.08
Reach-1	10671.6	5000.00	9.43	14.81	12.14	14.83	0.000142	0.95	4400.94	1332.24	0.08
Reach-1	10671.6	5000.00	9.43	14.81	12.14	14.83	0.000142	0.95	4400.94	1332.24	0.08
Reach-1	10671.6	5000.00	9.43	14.81	12.14	14.83	0.000142	0.95	4400.94	1332.24	0.08
Reach-1	10622.3	5000.00	9.35	14.84	12.09	14.86	0.000137	0.94	4503.86	1342.79	0.08
Reach-1	10622.3	5000.00	9.35	14.80	12.09	14.82	0.000142	0.96	4456.55	1342.70	0.08
Reach-1	10622.3	5000.00	9.35	14.80	12.09	14.82	0.000142	0.96	4456.55	1342.70	0.08
Reach-1	10622.3	5000.00	9.35	14.80	12.09	14.82	0.000142	0.96	4456.55	1342.70	0.08
Reach-1	10622.3	5000.00	9.35	14.80	12.09	14.82	0.000142	0.96	4456.55	1342.70	0.08
Reach-1	10572.9	5000.00	9.27	14.83	12.05	14.85	0.000135	0.94	4561.41	1352.98	0.08
Reach-1	10572.9	5000.00	9.27	14.80	12.05	14.82	0.000140	0.96	4513.45	1352.89	0.08
Reach-1	10572.9	5000.00	9.27	14.80	12.05	14.82	0.000140	0.96	4513.45	1352.89	0.08
Reach-1	10572.9	5000.00	9.27	14.80	12.05	14.82	0.000140	0.96	4513.45	1352.89	0.08
Reach-1	10572.9	5000.00	9.27	14.80	12.05	14.82	0.000140	0.96	4513.45	1352.89	0.08
Reach-1	10523.6	5000.00	9.19	14.83	12.00	14.85	0.000131	0.94	4620.83	1362.88	0.08
Reach-1	10523.6	5000.00	9.19	14.79	12.00	14.81	0.000136	0.95	4572.24	1362.78	0.08
Reach-1	10523.6	5000.00	9.19	14.79	12.00	14.81	0.000136	0.95	4572.24	1362.78	0.08
Reach-1	10523.6	5000.00	9.19	14.79	12.00	14.81	0.000136	0.95	4572.24	1362.78	0.08
Reach-1	10523.6	5000.00	9.19	14.79	12.00	14.81	0.000136	0.95	4572.24	1362.78	0.08
Reach-1	10474.3	5000.00	9.10	14.82	11.95	14.84	0.000127	0.93	4679.91	1372.37	0.08
Reach-1	10474.3	5000.00	9.10	14.79	11.95	14.81	0.000132	0.94	4630.70	1372.25	0.08
Reach-1	10474.3	5000.00	9.10	14.79	11.95	14.81	0.000132	0.94	4630.70	1372.25	0.08
Reach-1	10474.3	5000.00	9.10	14.79	11.95	14.81	0.000132	0.94	4630.70	1372.25	0.08
Reach-1	10474.3	5000.00	9.10	14.79	11.95	14.81	0.000132	0.94	4630.70	1372.25	0.08
Reach-1	10424.9	5000.00	9.02	14.82	11.90	14.84	0.000122	0.92	4748.18	1378.44	0.07
Reach-1	10424.9	5000.00	9.02	14.78	11.90	14.80	0.000126	0.93	4698.50	1378.15	0.08
Reach-1	10424.9	5000.00	9.02	14.78	11.90	14.80	0.000126	0.93	4698.50	1378.15	0.08
Reach-1	10424.9	5000.00	9.02	14.78	11.90	14.80	0.000126	0.93	4698.50	1378.15	0.08
Reach-1	10424.9	5000.00	9.02	14.78	11.90	14.80	0.000126	0.93	4698.50	1378.15	0.08
Reach-1	10375.6	5000.00	8.94	14.81	11.91	14.83	0.000116	0.90	4818.22	1385.49	0.07
Reach-1	10375.6	5000.00	8.94	14.78	11.91	14.79	0.000120	0.91	4768.03	1385.25	0.07
Reach-1	10375.6	5000.00	8.94	14.78	11.91	14.79	0.000120	0.91	4768.03	1385.25	0.07
Reach-1	10375.6	5000.00	8.94	14.78	11.91	14.79	0.000120	0.91	4768.03	1385.25	0.07
Reach-1	10375.6	5000.00	8.94	14.78	11.91	14.79	0.000120	0.91	4768.03	1385.25	0.07
Reach-1	10326.3	5000.00	8.86	14.81	11.82	14.83	0.000109	0.88	4892.95	1393.80	0.07
Reach-1	10326.3	5000.00	8.86	14.77	11.82	14.79	0.000113	0.89	4842.23	1393.59	0.07
Reach-1	10326.3	5000.00	8.86	14.77	11.82	14.79	0.000113	0.89	4842.23	1393.59	0.07
Reach-1	10326.3	5000.00	8.86	14.77	11.82	14.79	0.000113	0.89	4842.23	1393.59	0.07
Reach-1	10326.3	5000.00	8.86	14.77	11.82	14.79	0.000113	0.89	4842.23	1393.59	0.07
Reach-1	10277	5000.00	8.78	14.80	11.74	14.82	0.000103	0.86	4969.76	1402.97	0.07
Reach-1	10277	5000.00	8.78	14.77	11.74	14.78	0.000107	0.87	4918.49	1402.78	0.07
Reach-1	10277	5000.00	8.78	14.77	11.74	14.78	0.000107	0.87	4918.49	1402.78	0.07
Reach-1	10277	5000.00	8.78	14.77	11.74	14.78	0.000107	0.87	4918.49	1402.78	0.07
Reach-1	10277	5000.00	8.78	14.77	11.74	14.78	0.000107	0.87	4918.49	1402.78	0.07
Reach-1	10225.6	5000.00	8.73	14.79	11.79	14.81	0.000438	1.79	5105.16	1446.44	0.14
Reach-1	10225.6	5000.00	8.73	14.76	11.79	14.78	0.000454	1.82	5051.86	1446.19	0.14
Reach-1	10225.6	5000.00	8.73	14.76	11.79	14.78	0.000454	1.82	5051.86	1446.19	0.14
Reach-1	10225.6	5000.00	8.73	14.76	11.79	14.78	0.000454	1.82	5051.86	1446.19	0.14
Reach-1	10225.6	5000.00	8.73	14.76	11.79	14.78	0.000454	1.82	5051.86	1446.19	0.14
Reach-1	10174.3	5000.00	8.68	14.78	11.74	14.79	0.000400	1.73	5220.50	1489.75	0.14
Reach-1	10174.3	5000.00	8.68	14.74	11.74	14.76	0.000415	1.76	5164.60	1489.44	0.14
Reach-1	10174.3	5000.00	8.68	14.74	11.74	14.76	0.000415	1.76	5164.60	1489.44	0.14
Reach-1	10174.3	5000.00	8.68	14.74	11.74	14.76	0.000415	1.76	5164.60	1489.44	0.14
Reach-1	10174.3	5000.00	8.68	14.74	11.74	14.76	0.000415	1.76	5164.60	1489.44	0.14
Reach-1	10123	5000.00	8.62	14.76	11.69	14.78	0.000366	1.68	5336.98	1533.02	0.13
Reach-1	10123	5000.00	8.62	14.72	11.69	14.74	0.000379	1.70	5278.48	1532.63	0.13

HEC-RAS Plan: Plan 15 River RIVER-1 Reach: Reach_1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch E (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/m)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # (Ch)
Reach-1	10123.0	5000.00	8.62	14.72	11.69	14.74	0.000379	1.70	5278.48	1532.63	0.13
Reach-1	10123.0	5000.00	8.62	14.72	11.69	14.74	0.000379	1.70	5278.48	1532.63	0.13
Reach-1	10123.0	5000.00	8.62	14.72	11.69	14.74	0.000379	1.70	5278.48	1532.63	0.13
Reach-1	10071.6	5000.00	8.57	14.74	11.59	14.76	0.000321	1.59	5456.61	1576.20	0.12
Reach-1	10071.6	5000.00	8.57	14.71	11.59	14.72	0.000333	1.61	5395.55	1575.72	0.12
Reach-1	10071.6	5000.00	8.57	14.71	11.59	14.72	0.000333	1.61	5395.55	1575.72	0.12
Reach-1	10071.6	5000.00	8.57	14.71	11.59	14.72	0.000333	1.61	5395.55	1575.72	0.12
Reach-1	10071.6	5000.00	8.57	14.71	11.59	14.72	0.000333	1.61	5395.55	1575.72	0.12
Reach-1	10020.3	5000.00	8.52	14.73	11.49	14.75	0.000285	1.52	5574.68	1619.28	0.12
Reach-1	10020.3	5000.00	8.52	14.69	11.49	14.71	0.000296	1.54	5511.09	1618.69	0.12
Reach-1	10020.3	5000.00	8.52	14.69	11.49	14.71	0.000296	1.54	5511.09	1618.69	0.12
Reach-1	10020.3	5000.00	8.52	14.69	11.49	14.71	0.000296	1.54	5511.09	1618.69	0.12
Reach-1	10020.3	5000.00	8.52	14.69	11.49	14.71	0.000296	1.54	5511.09	1618.69	0.12
Reach-1	9969.0	5000.00	8.47	14.72	11.38	14.73	0.000242	1.42	5691.79	1662.41	0.11
Reach-1	9969.0	5000.00	8.47	14.68	11.38	14.69	0.000252	1.44	5625.72	1661.67	0.11
Reach-1	9969.0	5000.00	8.47	14.68	11.38	14.69	0.000252	1.44	5625.72	1661.67	0.11
Reach-1	9969.0	5000.00	8.47	14.68	11.38	14.69	0.000252	1.44	5625.72	1661.67	0.11
Reach-1	9969.0	5000.00	8.47	14.68	11.38	14.69	0.000252	1.44	5625.72	1661.67	0.11
Reach-1	9917.66	5000.00	8.41	14.71	11.27	14.72	0.000207	1.33	5811.27	1705.24	0.10
Reach-1	9917.66	5000.00	8.41	14.67	11.27	14.68	0.000216	1.35	5742.80	1704.32	0.10
Reach-1	9917.66	5000.00	8.41	14.67	11.27	14.68	0.000216	1.35	5742.80	1704.32	0.10
Reach-1	9917.66	5000.00	8.41	14.67	11.27	14.68	0.000216	1.35	5742.80	1704.32	0.10
Reach-1	9917.66	5000.00	8.41	14.67	11.27	14.68	0.000216	1.35	5742.80	1704.32	0.10
Reach-1	9866.33	5000.00	8.36	14.70	11.16	14.72	0.000168	1.21	5932.44	1747.89	0.09
Reach-1	9866.33	5000.00	8.36	14.66	11.16	14.67	0.000175	1.23	5861.65	1746.75	0.09
Reach-1	9866.33	5000.00	8.36	14.66	11.16	14.67	0.000175	1.23	5861.65	1746.75	0.09
Reach-1	9866.33	5000.00	8.36	14.66	11.16	14.67	0.000175	1.23	5861.65	1746.75	0.09
Reach-1	9866.33	5000.00	8.36	14.66	11.16	14.67	0.000175	1.23	5861.65	1746.75	0.09
Reach-1	9815.0	5000.00	8.31	14.69	11.04	14.71	0.000137	1.11	6054.33	1790.16	0.08
Reach-1	9815.0	5000.00	8.31	14.65	11.04	14.67	0.000143	1.13	5981.31	1788.71	0.08
Reach-1	9815.0	5000.00	8.31	14.65	11.04	14.67	0.000143	1.13	5981.31	1788.71	0.08
Reach-1	9815.0	5000.00	8.31	14.65	11.04	14.67	0.000143	1.13	5981.31	1788.71	0.08
Reach-1	9815.0	5000.00	8.31	14.65	11.04	14.67	0.000143	1.13	5981.31	1788.71	0.08
Reach-1	9763.0	5000.00	6.89	14.69	11.33	14.70	0.000208	1.37	6926.13	1991.32	0.10
Reach-1	9763.0	5000.00	6.89	14.65	11.33	14.66	0.000216	1.39	6844.42	1989.96	0.10
Reach-1	9763.0	5000.00	6.89	14.65	11.33	14.66	0.000216	1.39	6844.42	1989.96	0.10
Reach-1	9763.0	5000.00	6.89	14.65	11.33	14.66	0.000216	1.39	6844.42	1989.96	0.10
Reach-1	9763.0	5000.00	6.89	14.65	11.33	14.66	0.000216	1.39	6844.42	1989.96	0.10
Reach-1	9711.0	5000.00	5.47	14.68	11.10	14.69	0.000204	1.34	7843.35	2192.61	0.10
Reach-1	9711.0	5000.00	5.47	14.64	11.10	14.65	0.000212	1.36	7752.69	2191.29	0.10
Reach-1	9711.0	5000.00	5.47	14.64	11.10	14.65	0.000212	1.36	7752.69	2191.29	0.10
Reach-1	9711.0	5000.00	5.47	14.64	11.10	14.65	0.000212	1.36	7752.69	2191.29	0.10
Reach-1	9711.0	5000.00	5.47	14.64	11.10	14.65	0.000212	1.36	7752.69	2191.29	0.10
Reach-1	9700.0	Bridge									
Reach-1	9660.0	5000.00	7.42	14.33	10.60	14.34	0.000209	1.14	7793.52	2148.77	0.09
Reach-1	9660.0	5000.00	7.42	13.93	10.60	13.94	0.000282	1.26	6964.68	2000.46	0.10
Reach-1	9660.0	5000.00	7.42	13.56	10.60	13.57	0.000387	1.41	6241.33	1941.87	0.12
Reach-1	9660.0	5000.00	7.42	13.24	10.60	13.26	0.000519	1.56	5636.88	1891.53	0.13
Reach-1	9660.0	5000.00	7.42	12.99	10.60	13.01	0.000666	1.71	5168.50	1849.08	0.15
Reach-1	9637.5	5000.00	7.41	14.32	10.60	14.33	0.000257	1.51	7470.96	2123.41	0.11
Reach-1	9637.5	5000.00	7.41	13.91	10.60	13.93	0.000365	1.71	6617.82	2048.12	0.13
Reach-1	9637.5	5000.00	7.41	13.54	10.60	13.56	0.000497	1.89	5884.81	1895.17	0.15
Reach-1	9637.5	5000.00	7.41	13.22	10.60	13.24	0.000679	2.12	5284.86	1835.28	0.17
Reach-1	9637.5	5000.00	7.41	12.96	10.60	12.99	0.000887	2.33	4818.31	1768.73	0.20
Reach-1	9615.0	5000.00	7.40	14.31	10.75	14.32	0.000283	1.56	7203.87	2089.07	0.12
Reach-1	9615.0	5000.00	7.40	13.90	10.75	13.92	0.000413	1.80	6348.77	2044.80	0.14
Reach-1	9615.0	5000.00	7.40	13.52	10.75	13.54	0.000587	2.04	5593.24	1954.97	0.16
Reach-1	9615.0	5000.00	7.40	13.19	10.75	13.22	0.000818	2.29	4963.14	1857.93	0.19
Reach-1	9615.0	5000.00	7.40	12.93	10.75	12.96	0.001060	2.51	4493.39	1738.05	0.22
Reach-1	9592.5	5000.00	7.39	14.30	10.99	14.32	0.000295	1.59	6952.90	1972.98	0.12
Reach-1	9592.5	5000.00	7.39	13.89	10.99	13.90	0.000440	1.84	6131.69	1967.40	0.14

HEC-RAS Plan: Plan 15 River RIVER_1 Reach: Reach_1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Cor W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9592.5*	5000.00	7.39	13.50	10.99	13.52	0.000662	2.14	5378.20	1951.75	0.17
Reach-1	9592.5*	5000.00	7.39	13.17	10.99	13.19	0.000943	2.43	4725.85	1901.46	0.20
Reach-1	9592.5*	5000.00	7.39	12.89	10.99	12.93	0.001306	2.74	4213.36	1818.68	0.24
Reach-1	9570*	5000.00	7.37	14.29	10.98	14.31	0.000307	1.60	6689.85	1850.02	0.12
Reach-1	9570*	5000.00	7.37	13.87	10.98	13.89	0.000457	1.85	5911.43	1845.76	0.15
Reach-1	9570*	5000.00	7.37	13.48	10.98	13.50	0.000692	2.16	5191.04	1841.81	0.18
Reach-1	9570*	5000.00	7.37	13.13	10.98	13.16	0.001047	2.52	4550.79	1837.76	0.21
Reach-1	9570*	5000.00	7.37	12.84	10.98	12.88	0.001497	2.87	4022.66	1813.38	0.25
Reach-1	9547.5*	5000.00	7.36	14.28	11.09	14.30	0.000321	1.61	6403.81	1723.36	0.12
Reach-1	9547.5*	5000.00	7.36	13.86	11.09	13.87	0.000476	1.86	5670.47	1720.02	0.15
Reach-1	9547.5*	5000.00	7.36	13.46	11.09	13.48	0.000719	2.16	4986.26	1716.89	0.18
Reach-1	9547.5*	5000.00	7.36	13.10	11.09	13.13	0.001096	2.52	4369.58	1714.06	0.22
Reach-1	9547.5*	5000.00	7.36	12.79	11.09	12.83	0.001639	2.94	3845.58	1711.66	0.26
Reach-1	9525	5000.00	7.35	14.27	11.14	14.29	0.000339	1.62	6092.74	1594.49	0.12
Reach-1	9525	5000.00	7.35	13.84	11.14	13.86	0.000500	1.86	5406.04	1591.82	0.15
Reach-1	9525	5000.00	7.35	13.44	11.14	13.46	0.000754	2.16	4759.94	1589.30	0.18
Reach-1	9525	5000.00	7.35	13.06	11.14	13.09	0.001155	2.52	4169.00	1586.99	0.22
Reach-1	9525	5000.00	7.35	12.74	11.14	12.78	0.001720	2.91	3657.73	1561.97	0.26
Reach-1	9473.33*	5000.00	7.34	14.26	10.83	14.27	0.000289	1.51	6704.98	1647.28	0.11
Reach-1	9473.33*	5000.00	7.34	13.82	10.83	13.83	0.000418	1.72	5985.53	1640.38	0.14
Reach-1	9473.33*	5000.00	7.34	13.40	10.83	13.42	0.000621	1.98	5302.81	1636.52	0.16
Reach-1	9473.33*	5000.00	7.34	13.01	10.83	13.04	0.000944	2.30	4666.97	1633.67	0.20
Reach-1	9473.33*	5000.00	7.34	12.67	10.83	12.69	0.001445	2.68	4096.85	1631.05	0.24
Reach-1	9421.66*	5000.00	7.34	14.25	10.51	14.25	0.000238	1.39	7393.60	1700.76	0.10
Reach-1	9421.66*	5000.00	7.34	13.80	10.51	13.81	0.000338	1.57	6641.43	1696.03	0.12
Reach-1	9421.66*	5000.00	7.34	13.38	10.51	13.39	0.000493	1.79	5921.80	1691.30	0.15
Reach-1	9421.66*	5000.00	7.34	12.98	10.51	12.99	0.000735	2.06	5243.31	1687.02	0.18
Reach-1	9421.66*	5000.00	7.34	12.61	10.51	12.63	0.001110	2.38	4621.30	1681.30	0.21
Reach-1	9370*	5000.00	7.33	14.24	10.12	14.24	0.000191	1.27	8150.99	1749.70	0.09
Reach-1	9370*	5000.00	7.33	13.79	10.12	13.80	0.000265	1.42	7370.12	1746.06	0.11
Reach-1	9370*	5000.00	7.33	13.36	10.12	13.37	0.000377	1.60	6618.54	1742.55	0.13
Reach-1	9370*	5000.00	7.33	12.95	10.12	12.96	0.000549	1.81	5903.23	1739.00	0.15
Reach-1	9370*	5000.00	7.33	12.57	10.12	12.58	0.000810	2.07	5236.78	1735.08	0.18
Reach-1	9318.33*	5000.00	7.32	14.23	9.95	14.23	0.000151	1.15	8974.09	1806.99	0.08
Reach-1	9318.33*	5000.00	7.32	13.78	9.95	13.79	0.000205	1.27	8163.95	1797.13	0.10
Reach-1	9318.33*	5000.00	7.32	13.35	9.95	13.35	0.000283	1.41	7383.89	1790.45	0.11
Reach-1	9318.33*	5000.00	7.32	12.93	9.95	12.94	0.000399	1.58	6637.55	1787.44	0.13
Reach-1	9318.33*	5000.00	7.32	12.53	9.95	12.55	0.000572	1.78	5935.27	1784.62	0.16
Reach-1	9266.66*	5000.00	7.32	14.22	9.79	14.23	0.000119	1.04	9871.87	1865.50	0.08
Reach-1	9266.66*	5000.00	7.32	13.77	9.79	13.78	0.000158	1.14	9031.36	1857.05	0.09
Reach-1	9266.66*	5000.00	7.32	13.33	9.79	13.34	0.000212	1.25	8220.39	1846.73	0.10
Reach-1	9266.66*	5000.00	7.32	12.91	9.79	12.92	0.000288	1.38	7444.38	1836.80	0.11
Reach-1	9266.66*	5000.00	7.32	12.51	9.79	12.52	0.000398	1.53	6712.37	1831.77	0.13
Reach-1	9215	5000.00	7.31	14.22	9.62	14.22	0.000092	0.93	10843.97	1922.07	0.07
Reach-1	9215	5000.00	7.31	13.77	9.62	13.77	0.000120	1.01	9974.86	1914.56	0.07
Reach-1	9215	5000.00	7.31	13.33	9.62	13.33	0.000158	1.10	9134.54	1906.20	0.08
Reach-1	9215	5000.00	7.31	12.90	9.62	12.91	0.000210	1.20	8327.96	1897.56	0.09
Reach-1	9215	5000.00	7.31	12.50	9.62	12.51	0.000280	1.32	7565.22	1897.49	0.11
Reach-1	9169.99*	5000.00	7.01	14.22	9.50	14.22	0.000084	0.88	11179.91	1942.20	0.06
Reach-1	9169.99*	5000.00	7.01	13.76	9.50	13.77	0.000109	0.95	10299.65	1935.53	0.07
Reach-1	9169.99*	5000.00	7.01	13.32	9.50	13.33	0.000142	1.04	9447.50	1927.61	0.08
Reach-1	9169.99*	5000.00	7.01	12.90	9.50	12.90	0.000188	1.13	8628.15	1921.02	0.09
Reach-1	9169.99*	5000.00	7.01	12.49	9.50	12.50	0.000251	1.23	7850.61	1914.20	0.10
Reach-1	9124.99*	5000.00	6.72	14.21	9.37	14.22	0.000077	0.83	11518.41	1962.20	0.06
Reach-1	9124.99*	5000.00	6.72	13.76	9.37	13.76	0.000099	0.90	10627.29	1956.25	0.06
Reach-1	9124.99*	5000.00	6.72	13.32	9.37	13.32	0.000129	0.97	9763.67	1948.67	0.07
Reach-1	9124.99*	5000.00	6.72	12.89	9.37	12.89	0.000170	1.06	8932.31	1942.26	0.08
Reach-1	9124.99*	5000.00	6.72	12.48	9.37	12.49	0.000226	1.16	8141.75	1937.60	0.09
Reach-1	9079.99*	5000.00	6.42	14.21	9.25	14.21	0.000071	0.79	11860.00	1982.12	0.05
Reach-1	9079.99*	5000.00	6.42	13.75	9.25	13.76	0.000090	0.85	10958.23	1976.47	0.06
Reach-1	9079.99*	5000.00	6.42	13.31	9.25	13.32	0.000117	0.92	10083.42	1969.54	0.07
Reach-1	9079.99*	5000.00	6.42	12.88	9.25	12.89	0.000153	1.00	9240.41	1962.69	0.08

HEC-RAS Plan: Plan 15 River: RIVER_1 Reach: Reach_1 (Continued)

Reach	River Sta	Q.Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Cnt.W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntrl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9079.99*	5000.00	6.42	12.47	9.25	12.48	0.000203	1.10	8437.68	1958.62	0.09
Reach-1	9034.99*	5000.00	6.13	14.21	9.12	14.21	0.000065	0.75	12208.79	2001.92	0.05
Reach-1	9034.99*	5000.00	6.13	13.75	9.12	13.75	0.000083	0.81	11296.55	1996.48	0.06
Reach-1	9034.99*	5000.00	6.13	13.31	9.12	13.31	0.000106	0.88	10410.81	1990.34	0.06
Reach-1	9034.99*	5000.00	6.13	12.88	9.12	12.88	0.000138	0.96	9556.38	1983.49	0.07
Reach-1	9034.99*	5000.00	6.13	12.47	9.12	12.47	0.000182	1.04	8742.00	1979.15	0.08
Reach-1	8989.99*	5000.00	5.83	14.21	9.00	14.21	0.000059	0.72	12564.42	2021.77	0.05
Reach-1	8989.99*	5000.00	5.83	13.75	9.00	13.75	0.000075	0.78	11641.81	2016.53	0.05
Reach-1	8989.99*	5000.00	5.83	13.30	9.00	13.31	0.000097	0.84	10745.40	2010.89	0.06
Reach-1	8989.99*	5000.00	5.83	12.87	9.00	12.88	0.000125	0.92	9879.88	2004.31	0.07
Reach-1	8989.99*	5000.00	5.83	12.46	9.00	12.47	0.000163	1.00	9054.18	1999.19	0.08
Reach-1	8944.99*	5000.00	5.54	14.20	8.87	14.21	0.000054	0.70	12921.80	2041.42	0.05
Reach-1	8944.99*	5000.00	5.54	13.75	8.87	13.75	0.000069	0.75	11989.03	2036.35	0.05
Reach-1	8944.99*	5000.00	5.54	13.30	8.87	13.30	0.000088	0.81	11082.21	2031.26	0.06
Reach-1	8944.99*	5000.00	5.54	12.87	8.87	12.87	0.000113	0.88	10205.85	2024.95	0.06
Reach-1	8944.99*	5000.00	5.54	12.45	8.87	12.46	0.000147	0.96	9369.05	2018.94	0.07
Reach-1	8899.99*	5000.00	5.24	14.20	8.75	14.20	0.000050	0.67	13281.27	2061.02	0.04
Reach-1	8899.99*	5000.00	5.24	13.74	8.75	13.75	0.000063	0.72	12338.44	2056.10	0.05
Reach-1	8899.99*	5000.00	5.24	13.30	8.75	13.30	0.000080	0.78	11421.40	2051.33	0.05
Reach-1	8899.99*	5000.00	5.24	12.86	8.75	12.87	0.000103	0.85	10534.45	2045.51	0.06
Reach-1	8899.99*	5000.00	5.24	12.45	8.75	12.45	0.000132	0.92	9686.75	2039.72	0.07
Reach-1	8854.99*	5000.00	4.95	14.20	8.62	14.20	0.000046	0.65	13647.88	2080.61	0.04
Reach-1	8854.99*	5000.00	4.95	13.74	8.62	13.74	0.000058	0.70	12695.13	2075.77	0.05
Reach-1	8854.99*	5000.00	4.95	13.29	8.62	13.30	0.000073	0.75	11768.03	2071.15	0.05
Reach-1	8854.99*	5000.00	4.95	12.86	8.62	12.86	0.000093	0.82	10870.73	2065.85	0.06
Reach-1	8854.99*	5000.00	4.95	12.44	8.62	12.45	0.000120	0.89	10012.45	2060.26	0.06
Reach-1	8810	5000.00	6.96	14.20	9.01	14.20	0.000050	0.67	13659.38	2100.17	0.05
Reach-1	8810	5000.00	6.96	13.74	9.01	13.74	0.000063	0.71	12696.66	2095.38	0.05
Reach-1	8810	5000.00	6.96	13.29	9.01	13.29	0.000080	0.76	11759.46	2090.91	0.06
Reach-1	8810	5000.00	6.96	12.86	9.01	12.86	0.000103	0.81	10851.78	2086.13	0.07
Reach-1	8810	5000.00	6.96	12.44	9.01	12.44	0.000133	0.86	9982.81	2080.71	0.08
Reach-1	8809	5000.00	9.00	14.20		14.20	0.000053	0.25	13620.96	2100.17	0.02
Reach-1	8809	5000.00	9.00	13.74		13.74	0.000067	0.26	12658.21	2095.38	0.02
Reach-1	8809	5000.00	9.00	13.29		13.29	0.000085	0.27	11720.97	2090.91	0.02
Reach-1	8809	5000.00	9.00	12.86		12.86	0.000109	0.29	10813.23	2086.13	0.03
Reach-1	8809	5000.00	9.00	12.44		12.44	0.000140	0.30	9944.17	2080.71	0.03
Reach-1	8803.63*	5000.00	8.87	14.19	9.00	14.19	0.000049	0.24	13885.23	2085.32	0.02
Reach-1	8803.63*	5000.00	8.87	13.73	9.00	13.73	0.000062	0.25	12926.12	2081.34	0.02
Reach-1	8803.63*	5000.00	8.87	13.28	9.00	13.28	0.000078	0.27	11991.18	2077.45	0.02
Reach-1	8803.63*	5000.00	8.87	12.84	9.00	12.85	0.000100	0.28	11084.27	2072.90	0.03
Reach-1	8803.63*	5000.00	8.87	12.42	9.00	12.43	0.000128	0.29	10214.00	2068.45	0.03
Reach-1	8798.27*	5000.00	8.75	14.19	9.00	14.19	0.000046	0.24	14150.91	2071.56	0.02
Reach-1	8798.27*	5000.00	8.75	13.72	9.00	13.73	0.000057	0.25	13195.33	2068.05	0.02
Reach-1	8798.27*	5000.00	8.75	13.27	9.00	13.28	0.000072	0.26	12262.79	2064.35	0.02
Reach-1	8798.27*	5000.00	8.75	12.83	9.00	12.84	0.000091	0.27	11356.96	2060.43	0.02
Reach-1	8798.27*	5000.00	8.75	12.41	9.00	12.41	0.000117	0.29	10485.91	2056.65	0.03
Reach-1	8792.90*	5000.00	8.62	14.18	8.74	14.18	0.000043	0.23	14411.34	2058.42	0.02
Reach-1	8792.90*	5000.00	8.62	13.72	8.74	13.72	0.000053	0.24	13459.29	2055.28	0.02
Reach-1	8792.90*	5000.00	8.62	13.27	8.74	13.27	0.000066	0.25	12529.34	2051.79	0.02
Reach-1	8792.90*	5000.00	8.62	12.82	8.74	12.83	0.000084	0.27	11624.80	2048.40	0.02
Reach-1	8792.90*	5000.00	8.62	12.40	8.74	12.40	0.000107	0.28	10753.81	2042.02	0.03
Reach-1	8787.54*	5000.00	8.49	14.18	8.55	14.18	0.000040	0.23	14670.64	2045.66	0.02
Reach-1	8787.54*	5000.00	8.49	13.71	8.55	13.71	0.000049	0.24	13722.22	2042.66	0.02
Reach-1	8787.54*	5000.00	8.49	13.26	8.55	13.26	0.000061	0.25	12795.03	2039.61	0.02
Reach-1	8787.54*	5000.00	8.49	12.82	8.55	12.82	0.000077	0.26	11892.72	2033.13	0.02
Reach-1	8787.54*	5000.00	8.49	12.39	8.55	12.39	0.000097	0.27	11023.90	2026.14	0.02
Reach-1	8782.18*	5000.00	8.36	14.17	8.36	14.17	0.000037	0.22	14921.96	2033.25	0.02
Reach-1	8782.18*	5000.00	8.36	13.71	8.36	13.71	0.000046	0.23	13977.23	2030.30	0.02
Reach-1	8782.18*	5000.00	8.36	13.25	8.36	13.25	0.000056	0.24	13053.79	2024.11	0.02
Reach-1	8782.18*	5000.00	8.36	12.81	8.36	12.81	0.000071	0.26	12155.07	2018.07	0.02
Reach-1	8782.18*	5000.00	8.36	12.38	8.36	12.38	0.000089	0.27	11288.19	2012.22	0.02

HEC-RAS Plan: Plan 15 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W/S (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch1
Reach-1	8776.81*	5000.00	8.24	14.17	8.19	14.17	0.000035	0.22	15175.56	2020.42	0.02
Reach-1	8776.81*	5000.00	8.24	13.70	8.19	13.70	0.000042	0.23	14235.58	2014.96	0.02
Reach-1	8776.81*	5000.00	8.24	13.25	8.19	13.25	0.000052	0.24	13316.59	2009.61	0.02
Reach-1	8776.81*	5000.00	8.24	12.80	8.19	12.80	0.000065	0.25	12421.14	2004.39	0.02
Reach-1	8776.81*	5000.00	8.24	12.37	8.19	12.37	0.000082	0.26	11556.12	1999.33	0.02
Reach-1	8771.45*	5000.00	8.11	14.16	7.99	14.17	0.000032	0.21	15425.59	2005.56	0.02
Reach-1	8771.45*	5000.00	8.11	13.70	7.99	13.70	0.000039	0.22	14490.70	2000.76	0.02
Reach-1	8771.45*	5000.00	8.11	13.24	7.99	13.24	0.000048	0.23	13575.93	1998.06	0.02
Reach-1	8771.45*	5000.00	8.11	12.79	7.99	12.79	0.000060	0.24	12683.67	1991.45	0.02
Reach-1	8771.45*	5000.00	8.11	12.36	7.99	12.36	0.000075	0.26	11820.65	1986.99	0.02
Reach-1	8766.09*	5000.00	7.98	14.16	7.98	14.16	0.000030	0.21	15674.19	1991.71	0.01
Reach-1	8766.09*	5000.00	7.98	13.69	7.98	13.70	0.000036	0.22	14744.13	1987.42	0.02
Reach-1	8766.09*	5000.00	7.98	13.23	7.98	13.24	0.000045	0.23	13833.42	1983.22	0.02
Reach-1	8766.09*	5000.00	7.98	12.79	7.98	12.79	0.000055	0.24	12944.35	1979.11	0.02
Reach-1	8766.09*	5000.00	7.98	12.35	7.98	12.35	0.000069	0.25	12083.45	1975.11	0.02
Reach-1	8760.72*	5000.00	7.81	14.16	7.81	14.16	0.000028	0.20	15921.37	1978.46	0.01
Reach-1	8760.72*	5000.00	7.81	13.69	7.81	13.69	0.000034	0.21	14996.01	1974.59	0.02
Reach-1	8760.72*	5000.00	7.81	13.23	7.81	13.23	0.000041	0.22	14089.35	1970.80	0.02
Reach-1	8760.72*	5000.00	7.81	12.78	7.81	12.78	0.000051	0.23	13203.54	1967.08	0.02
Reach-1	8760.72*	5000.00	7.81	12.34	7.81	12.35	0.000063	0.24	12344.99	1963.47	0.02
Reach-1	8755.36*	5000.00	7.73	14.15	7.73	14.16	0.000026	0.20	16166.50	1965.66	0.01
Reach-1	8755.36*	5000.00	7.73	13.69	7.73	13.69	0.000032	0.21	15245.79	1962.14	0.02
Reach-1	8755.36*	5000.00	7.73	13.23	7.73	13.23	0.000038	0.22	14343.17	1958.68	0.02
Reach-1	8755.36*	5000.00	7.73	12.77	7.73	12.78	0.000047	0.23	13460.73	1955.30	0.02
Reach-1	8755.36*	5000.00	7.73	12.34	7.73	12.34	0.000058	0.24	12604.71	1952.01	0.02
Reach-1	8750	15000.00	7.50	14.13	7.50	14.14	0.000222	0.59	16362.33	1953.07	0.04
Reach-1	8750	15000.00	7.50	13.66	7.50	13.67	0.000269	0.62	15439.47	1949.82	0.04
Reach-1	8750	15000.00	7.50	13.19	7.50	13.21	0.000327	0.64	14532.68	1946.62	0.05
Reach-1	8750	15000.00	7.50	12.73	7.50	12.75	0.000401	0.67	13643.56	1943.47	0.05
Reach-1	8750	15000.00	7.50	12.29	7.50	12.31	0.000495	0.70	12777.75	1940.41	0.06
Reach-1	8744.44*	15000.00	7.39	14.11	7.39	14.12	0.000205	0.57	16994.08	2013.25	0.04
Reach-1	8744.44*	15000.00	7.39	13.63	7.39	13.65	0.000247	0.60	16034.50	2009.90	0.04
Reach-1	8744.44*	15000.00	7.39	13.16	7.39	13.18	0.000301	0.62	15089.32	2006.60	0.05
Reach-1	8744.44*	15000.00	7.39	12.70	7.39	12.72	0.000370	0.65	14159.46	2003.34	0.05
Reach-1	8744.44*	15000.00	7.39	12.24	7.39	12.26	0.000459	0.68	13249.87	2000.15	0.06
Reach-1	8738.88*	15000.00	7.28	14.09	7.28	14.10	0.000188	0.55	17649.08	2073.47	0.04
Reach-1	8738.88*	15000.00	7.28	13.61	7.28	13.62	0.000227	0.58	16652.95	2070.02	0.04
Reach-1	8738.88*	15000.00	7.28	13.14	7.28	13.15	0.000277	0.60	15669.55	2066.61	0.04
Reach-1	8738.88*	15000.00	7.28	12.67	7.28	12.68	0.000341	0.63	14699.11	2063.23	0.05
Reach-1	8738.88*	15000.00	7.28	12.20	7.28	12.22	0.000424	0.66	13745.84	2059.92	0.05
Reach-1	8733.33*	15000.00	7.17	14.08	7.17	14.09	0.000173	0.53	18315.82	2133.70	0.04
Reach-1	8733.33*	15000.00	7.17	13.59	7.17	13.60	0.000209	0.56	17283.32	2130.15	0.04
Reach-1	8733.33*	15000.00	7.17	13.11	7.17	13.12	0.000255	0.59	16261.89	2126.63	0.04
Reach-1	8733.33*	15000.00	7.17	12.64	7.17	12.65	0.000315	0.61	15251.09	2123.14	0.05
Reach-1	8733.33*	15000.00	7.17	12.17	7.17	12.18	0.000392	0.64	14254.31	2119.69	0.05
Reach-1	8727.77*	15000.00	7.06	14.06	7.06	14.07	0.000160	0.52	19005.03	2194.02	0.03
Reach-1	8727.77*	15000.00	7.06	13.57	7.06	13.58	0.000193	0.54	17936.31	2190.36	0.04
Reach-1	8727.77*	15000.00	7.06	13.09	7.06	13.10	0.000235	0.57	16877.05	2186.73	0.04
Reach-1	8727.77*	15000.00	7.06	12.61	7.06	12.62	0.000290	0.59	15826.10	2183.12	0.05
Reach-1	8727.77*	15000.00	7.06	12.13	7.06	12.15	0.000361	0.62	14786.02	2179.54	0.05
Reach-1	8722.22*	15000.00	6.94	14.05	6.94	14.06	0.000147	0.50	19712.26	2253.46	0.03
Reach-1	8722.22*	15000.00	6.94	13.56	6.94	13.57	0.000177	0.52	18607.63	2250.58	0.04
Reach-1	8722.22*	15000.00	6.94	13.07	6.94	13.08	0.000216	0.55	17510.78	2246.84	0.04
Reach-1	8722.22*	15000.00	6.94	12.58	6.94	12.60	0.000266	0.58	16419.96	2243.11	0.04
Reach-1	8722.22*	15000.00	6.94	12.10	6.94	12.11	0.000319	0.59	15338.84	2227.23	0.05
Reach-1	8716.66*	15000.00	6.83	14.03	6.83	14.04	0.000135	0.48	20439.91	2311.75	0.03
Reach-1	8716.66*	15000.00	6.83	13.54	6.83	13.55	0.000163	0.51	19300.37	2309.52	0.04
Reach-1	8716.66*	15000.00	6.83	13.05	6.83	13.06	0.000199	0.53	18166.40	2307.02	0.04
Reach-1	8716.66*	15000.00	6.83	12.56	6.83	12.57	0.000245	0.56	17036.04	2303.16	0.04
Reach-1	8716.66*	15000.00	6.83	12.07	6.83	12.09	0.000292	0.57	15918.89	2273.00	0.05
Reach-1	8711.11*	15000.00	6.72	14.02	6.72	14.03	0.000124	0.47	21178.10	2370.05	0.03
Reach-1	8711.11*	15000.00	6.72	13.53	6.72	13.53	0.000150	0.49	20003.96	2367.71	0.03

HEC-RAS Plan: Plan 15 River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Chl W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8711.11*	15000.00	6.72	13.03		13.04	0.000183	0.51	18833.88	2365.37	0.04
Reach-1	8711.11*	15000.00	6.72	12.54		12.55	0.000218	0.53	17665.46	2362.71	0.04
Reach-1	8711.11*	15000.00	6.72	12.05		12.06	0.000267	0.55	16514.93	2318.93	0.04
Reach-1	8705.55*	15000.00	6.61	14.01		14.02	0.000114	0.45	21938.35	2428.43	0.03
Reach-1	8705.55*	15000.00	6.61	13.51		13.52	0.000138	0.48	20729.79	2425.97	0.03
Reach-1	8705.55*	15000.00	6.61	13.01		13.02	0.000168	0.50	19523.87	2423.51	0.04
Reach-1	8705.55*	15000.00	6.61	12.52		12.53	0.000199	0.51	18321.01	2404.23	0.04
Reach-1	8705.55*	15000.00	6.61	12.02		12.03	0.000244	0.53	17138.46	2363.97	0.04
Reach-1	8700	15000.00	6.50	14.00	5.41	14.01	0.000105	0.44	22712.74	2486.87	0.03
Reach-1	8700	15000.00	6.50	13.50	5.41	13.51	0.000127	0.46	21469.95	2484.29	0.03
Reach-1	8700	15000.00	6.50	13.00	5.41	13.01	0.000154	0.48	20228.45	2481.71	0.03
Reach-1	8700	15000.00	6.50	12.50	5.41	12.51	0.000182	0.50	18994.38	2448.46	0.04
Reach-1	8700	15000.00	6.50	12.00	5.41	12.01	0.000223	0.52	17780.38	2407.55	0.04

HEC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10721	1600.00	9.51	13.05	12.07	13.06	0.000187	0.76	2021.42	1317.73	0.08
Reach-1	10721	1600.00	9.51	13.05	12.07	13.06	0.000187	0.76	2021.42	1317.73	0.08
Reach-1	10721	1600.00	9.51	13.05	12.07	13.06	0.000187	0.76	2021.42	1317.73	0.08
Reach-1	10721	1600.00	9.51	13.05	12.07	13.06	0.000187	0.76	2021.42	1317.73	0.08
Reach-1	10721	1600.00	9.51	13.05	12.07	13.06	0.000187	0.76	2021.42	1317.73	0.08
Reach-1	10671.6*	1600.00	9.43	13.05	11.99	13.05	0.000192	0.79	2053.62	1328.10	0.08
Reach-1	10671.6*	1600.00	9.43	13.05	11.99	13.05	0.000192	0.79	2053.62	1328.10	0.08
Reach-1	10671.6*	1600.00	9.43	13.05	11.99	13.05	0.000192	0.79	2053.62	1328.10	0.08
Reach-1	10671.6*	1600.00	9.43	13.05	11.99	13.05	0.000192	0.79	2053.62	1328.10	0.08
Reach-1	10671.6*	1600.00	9.43	13.05	11.99	13.05	0.000192	0.79	2053.62	1328.10	0.08
Reach-1	10622.3*	1600.00	9.35	13.04	11.91	13.05	0.000190	0.79	2088.28	1338.24	0.08
Reach-1	10622.3*	1600.00	9.35	13.04	11.91	13.05	0.000190	0.79	2088.28	1338.24	0.08
Reach-1	10622.3*	1600.00	9.35	13.04	11.91	13.05	0.000190	0.79	2088.28	1338.24	0.08
Reach-1	10622.3*	1600.00	9.35	13.04	11.91	13.05	0.000190	0.79	2088.28	1338.24	0.08
Reach-1	10622.3*	1600.00	9.35	13.04	11.91	13.05	0.000190	0.79	2088.28	1338.24	0.08
Reach-1	10572.9*	1600.00	9.27	13.03	11.83	13.04	0.000184	0.79	2124.87	1348.06	0.08
Reach-1	10572.9*	1600.00	9.27	13.03	11.83	13.04	0.000184	0.79	2124.87	1348.06	0.08
Reach-1	10572.9*	1600.00	9.27	13.03	11.83	13.04	0.000184	0.79	2124.87	1348.06	0.08
Reach-1	10572.9*	1600.00	9.27	13.03	11.83	13.04	0.000184	0.79	2124.87	1348.06	0.08
Reach-1	10572.9*	1600.00	9.27	13.03	11.83	13.04	0.000184	0.79	2124.87	1348.06	0.08
Reach-1	10523.6*	1600.00	9.19	13.02	11.75	13.03	0.000173	0.78	2167.11	1350.07	0.08
Reach-1	10523.6*	1600.00	9.19	13.02	11.75	13.03	0.000173	0.78	2167.11	1350.07	0.08
Reach-1	10523.6*	1600.00	9.19	13.02	11.75	13.03	0.000173	0.78	2167.11	1350.07	0.08
Reach-1	10523.6*	1600.00	9.19	13.02	11.75	13.03	0.000173	0.78	2167.11	1350.07	0.08
Reach-1	10523.6*	1600.00	9.19	13.02	11.75	13.03	0.000173	0.78	2167.11	1350.07	0.08
Reach-1	10474.3*	1600.00	9.10	13.01	11.66	13.02	0.000164	0.76	2212.85	1355.98	0.08
Reach-1	10474.3*	1600.00	9.10	13.01	11.66	13.02	0.000164	0.76	2212.85	1355.98	0.08
Reach-1	10474.3*	1600.00	9.10	13.01	11.66	13.02	0.000164	0.76	2212.85	1355.98	0.08
Reach-1	10474.3*	1600.00	9.10	13.01	11.66	13.02	0.000164	0.76	2212.85	1355.98	0.08
Reach-1	10474.3*	1600.00	9.10	13.01	11.66	13.02	0.000164	0.76	2212.85	1355.98	0.08
Reach-1	10424.9*	1600.00	9.02	13.01	11.58	13.02	0.000151	0.74	2267.31	1364.01	0.08
Reach-1	10424.9*	1600.00	9.02	13.01	11.58	13.02	0.000151	0.74	2267.31	1364.01	0.08
Reach-1	10424.9*	1600.00	9.02	13.01	11.58	13.02	0.000151	0.74	2267.31	1364.01	0.08
Reach-1	10424.9*	1600.00	9.02	13.01	11.58	13.02	0.000151	0.74	2267.31	1364.01	0.08
Reach-1	10424.9*	1600.00	9.02	13.01	11.58	13.02	0.000151	0.74	2267.31	1364.01	0.08
Reach-1	10375.6*	1600.00	8.94	13.00	11.50	13.01	0.000140	0.72	2320.86	1373.27	0.07
Reach-1	10375.6*	1600.00	8.94	13.00	11.50	13.01	0.000140	0.72	2320.86	1373.27	0.07
Reach-1	10375.6*	1600.00	8.94	13.00	11.50	13.01	0.000140	0.72	2320.86	1373.27	0.07
Reach-1	10375.6*	1600.00	8.94	13.00	11.50	13.01	0.000140	0.72	2320.86	1373.27	0.07
Reach-1	10375.6*	1600.00	8.94	13.00	11.50	13.01	0.000140	0.72	2320.86	1373.27	0.07
Reach-1	10326.3*	1600.00	8.86	13.00	11.42	13.00	0.000127	0.69	2377.74	1381.67	0.07
Reach-1	10326.3*	1600.00	8.86	13.00	11.42	13.00	0.000127	0.69	2377.74	1381.67	0.07
Reach-1	10326.3*	1600.00	8.86	13.00	11.42	13.00	0.000127	0.69	2377.74	1381.67	0.07
Reach-1	10326.3*	1600.00	8.86	13.00	11.42	13.00	0.000127	0.69	2377.74	1381.67	0.07
Reach-1	10326.3*	1600.00	8.86	13.00	11.42	13.00	0.000127	0.69	2377.74	1381.67	0.07
Reach-1	10277	1600.00	8.78	12.99	11.34	13.00	0.000119	0.68	2435.68	1390.36	0.07
Reach-1	10277	1600.00	8.78	12.99	11.34	13.00	0.000119	0.68	2435.68	1390.36	0.07
Reach-1	10277	1600.00	8.78	12.99	11.34	13.00	0.000119	0.68	2435.68	1390.36	0.07
Reach-1	10277	1600.00	8.78	12.99	11.34	13.00	0.000119	0.68	2435.68	1390.36	0.07
Reach-1	10277	1600.00	8.78	12.99	11.34	13.00	0.000119	0.68	2435.68	1390.36	0.07
Reach-1	10225.6*	1600.00	8.73	12.98	11.22	12.99	0.000446	1.34	2494.30	1391.88	0.13
Reach-1	10225.6*	1600.00	8.73	12.98	11.22	12.99	0.000446	1.34	2494.30	1391.88	0.13
Reach-1	10225.6*	1600.00	8.73	12.98	11.22	12.99	0.000446	1.34	2494.30	1391.88	0.13
Reach-1	10225.6*	1600.00	8.73	12.98	11.22	12.99	0.000446	1.34	2494.30	1391.88	0.13
Reach-1	10225.6*	1600.00	8.73	12.98	11.22	12.99	0.000446	1.34	2494.30	1391.88	0.13
Reach-1	10174.3*	1600.00	8.68	12.96	11.10	12.97	0.000411	1.31	2540.80	1390.54	0.13
Reach-1	10174.3*	1600.00	8.68	12.96	11.10	12.97	0.000411	1.31	2540.80	1390.54	0.13
Reach-1	10174.3*	1600.00	8.68	12.96	11.10	12.97	0.000411	1.31	2540.80	1390.54	0.13
Reach-1	10174.3*	1600.00	8.68	12.96	11.10	12.97	0.000411	1.31	2540.80	1390.54	0.13
Reach-1	10174.3*	1600.00	8.68	12.96	11.10	12.97	0.000411	1.31	2540.80	1390.54	0.13

HEC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10123.*	1600.00	8.62	12.94	11.02	12.95	0.000374	1.27	2594.03	1389.78	0.12
Reach-1	10123.*	1600.00	8.62	12.94	11.02	12.95	0.000374	1.27	2594.03	1389.78	0.12
Reach-1	10123.*	1600.00	8.62	12.94	11.02	12.95	0.000374	1.27	2594.03	1389.78	0.12
Reach-1	10123.*	1600.00	8.62	12.94	11.02	12.95	0.000374	1.27	2594.03	1389.78	0.12
Reach-1	10123.*	1600.00	8.62	12.94	11.02	12.95	0.000374	1.27	2594.03	1389.78	0.12
Reach-1	10071.6*	1600.00	8.57	12.93	10.95	12.94	0.000325	1.21	2655.63	1391.41	0.11
Reach-1	10071.6*	1600.00	8.57	12.93	10.95	12.94	0.000325	1.21	2655.63	1391.41	0.11
Reach-1	10071.6*	1600.00	8.57	12.93	10.95	12.94	0.000325	1.21	2655.63	1391.41	0.11
Reach-1	10071.6*	1600.00	8.57	12.93	10.95	12.94	0.000325	1.21	2655.63	1391.41	0.11
Reach-1	10071.6*	1600.00	8.57	12.93	10.95	12.94	0.000325	1.21	2655.63	1391.41	0.11
Reach-1	10020.3*	1600.00	8.52	12.91	10.87	12.92	0.000283	1.15	2722.82	1390.60	0.11
Reach-1	10020.3*	1600.00	8.52	12.91	10.87	12.92	0.000283	1.15	2722.82	1390.60	0.11
Reach-1	10020.3*	1600.00	8.52	12.91	10.87	12.92	0.000283	1.15	2722.82	1390.60	0.11
Reach-1	10020.3*	1600.00	8.52	12.91	10.87	12.92	0.000283	1.15	2722.82	1390.60	0.11
Reach-1	10020.3*	1600.00	8.52	12.91	10.87	12.92	0.000283	1.15	2722.82	1390.60	0.11
Reach-1	9969.*	1600.00	8.47	12.90	10.80	12.91	0.000235	1.07	2793.80	1390.14	0.10
Reach-1	9969.*	1600.00	8.47	12.90	10.80	12.91	0.000235	1.07	2793.80	1390.14	0.10
Reach-1	9969.*	1600.00	8.47	12.90	10.80	12.91	0.000235	1.07	2793.80	1390.14	0.10
Reach-1	9969.*	1600.00	8.47	12.90	10.80	12.91	0.000235	1.07	2793.80	1390.14	0.10
Reach-1	9969.*	1600.00	8.47	12.90	10.80	12.91	0.000235	1.07	2793.80	1390.14	0.10
Reach-1	9917.66*	1600.00	8.41	12.89	10.71	12.90	0.000194	0.99	2873.77	1387.48	0.09
Reach-1	9917.66*	1600.00	8.41	12.89	10.71	12.90	0.000194	0.99	2873.77	1387.48	0.09
Reach-1	9917.66*	1600.00	8.41	12.89	10.71	12.90	0.000194	0.99	2873.77	1387.48	0.09
Reach-1	9917.66*	1600.00	8.41	12.89	10.71	12.90	0.000194	0.99	2873.77	1387.48	0.09
Reach-1	9917.66*	1600.00	8.41	12.89	10.71	12.90	0.000194	0.99	2873.77	1387.48	0.09
Reach-1	9866.33*	1600.00	8.36	12.89	10.63	12.89	0.000152	0.89	2961.64	1383.44	0.08
Reach-1	9866.33*	1600.00	8.36	12.89	10.63	12.89	0.000152	0.89	2961.64	1383.44	0.08
Reach-1	9866.33*	1600.00	8.36	12.89	10.63	12.89	0.000152	0.89	2961.64	1383.44	0.08
Reach-1	9866.33*	1600.00	8.36	12.89	10.63	12.89	0.000152	0.89	2961.64	1383.44	0.08
Reach-1	9866.33*	1600.00	8.36	12.89	10.63	12.89	0.000152	0.89	2961.64	1383.44	0.08
Reach-1	9815	1600.00	8.31	12.88	10.55	12.89	0.000114	0.79	3068.39	1331.31	0.07
Reach-1	9815	1600.00	8.31	12.88	10.55	12.89	0.000114	0.79	3068.39	1331.31	0.07
Reach-1	9815	1600.00	8.31	12.88	10.55	12.89	0.000114	0.79	3068.39	1331.31	0.07
Reach-1	9815	1600.00	8.31	12.88	10.55	12.89	0.000114	0.79	3068.39	1331.31	0.07
Reach-1	9815	1600.00	8.31	12.88	10.55	12.89	0.000114	0.79	3068.39	1331.31	0.07
Reach-1	9763.*	1600.00	6.89	12.88	10.37	12.88	0.000153	0.91	3537.41	1607.51	0.08
Reach-1	9763.*	1600.00	6.89	12.88	10.37	12.88	0.000153	0.91	3537.41	1607.51	0.08
Reach-1	9763.*	1600.00	6.89	12.88	10.37	12.88	0.000153	0.91	3537.41	1607.51	0.08
Reach-1	9763.*	1600.00	6.89	12.88	10.37	12.88	0.000153	0.91	3537.41	1607.51	0.08
Reach-1	9763.*	1600.00	6.89	12.88	10.37	12.88	0.000153	0.91	3537.41	1607.51	0.08
Reach-1	9711	1600.00	5.47	12.87	10.11	12.87	0.000137	0.85	4074.68	1827.63	0.08
Reach-1	9711	1600.00	5.47	12.87	10.11	12.87	0.000137	0.85	4074.68	1827.63	0.08
Reach-1	9711	1600.00	5.47	12.87	10.11	12.87	0.000137	0.85	4074.68	1827.63	0.08
Reach-1	9711	1600.00	5.47	12.87	10.11	12.87	0.000137	0.85	4074.68	1827.63	0.08
Reach-1	9711	1600.00	5.47	12.87	10.11	12.87	0.000137	0.85	4074.68	1827.63	0.08
Reach-1	9700	Bridge									
Reach-1	9660	1600.00	7.42	11.41	9.20	11.42	0.000481	1.10	2538.32	1391.43	0.12
Reach-1	9660	1600.00	7.42	11.41	9.20	11.42	0.000481	1.10	2538.32	1391.43	0.12
Reach-1	9660	1600.00	7.42	11.41	9.20	11.42	0.000481	1.10	2538.32	1391.43	0.12
Reach-1	9660	1600.00	7.42	11.41	9.20	11.42	0.000481	1.10	2538.32	1391.43	0.12
Reach-1	9660	1600.00	7.42	11.41	9.20	11.42	0.000481	1.10	2538.32	1391.43	0.12
Reach-1	9637.5*	1600.00	7.41	11.39	9.46	11.40	0.000741	1.57	2261.97	1354.86	0.17
Reach-1	9637.5*	1600.00	7.41	11.39	9.46	11.40	0.000741	1.57	2261.97	1354.86	0.17
Reach-1	9637.5*	1600.00	7.41	11.39	9.46	11.40	0.000741	1.57	2261.97	1354.86	0.17
Reach-1	9637.5*	1600.00	7.41	11.39	9.46	11.40	0.000741	1.57	2261.97	1354.86	0.17
Reach-1	9637.5*	1600.00	7.41	11.39	9.46	11.40	0.000741	1.57	2261.97	1354.86	0.17
Reach-1	9615.*	1600.00	7.40	11.36	9.64	11.38	0.001012	1.79	2026.66	1391.12	0.19
Reach-1	9615.*	1600.00	7.40	11.36	9.64	11.38	0.001012	1.79	2026.66	1391.12	0.19
Reach-1	9615.*	1600.00	7.40	11.36	9.64	11.38	0.001012	1.79	2026.66	1391.12	0.19
Reach-1	9615.*	1600.00	7.40	11.36	9.64	11.38	0.001012	1.79	2026.66	1391.12	0.19

HEC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9615.*	1600.00	7.40	11.36	9.64	11.38	0.001012	1.79	2026.66	1391.12	0.19
Reach-1	9592.5*	1600.00	7.39	11.32	9.81	11.34	0.001363	2.03	1809.28	1337.07	0.22
Reach-1	9592.5*	1600.00	7.39	11.32	9.81	11.34	0.001363	2.03	1809.28	1337.07	0.22
Reach-1	9592.5*	1600.00	7.39	11.32	9.81	11.34	0.001363	2.03	1809.28	1337.07	0.22
Reach-1	9592.5*	1600.00	7.39	11.32	9.81	11.34	0.001363	2.03	1809.28	1337.07	0.22
Reach-1	9570.*	1600.00	7.37	11.26	10.03	11.29	0.001893	2.31	1602.66	1284.56	0.26
Reach-1	9570.*	1600.00	7.37	11.26	10.03	11.29	0.001893	2.31	1602.66	1284.56	0.26
Reach-1	9570.*	1600.00	7.37	11.26	10.03	11.29	0.001893	2.31	1602.66	1284.56	0.26
Reach-1	9570.*	1600.00	7.37	11.26	10.03	11.29	0.001893	2.31	1602.66	1284.56	0.26
Reach-1	9570.*	1600.00	7.37	11.26	10.03	11.29	0.001893	2.31	1602.66	1284.56	0.26
Reach-1	9547.5*	1600.00	7.36	11.18	10.23	11.22	0.002776	2.68	1401.83	1273.39	0.31
Reach-1	9547.5*	1600.00	7.36	11.18	10.23	11.22	0.002776	2.68	1401.83	1273.39	0.31
Reach-1	9547.5*	1600.00	7.36	11.18	10.23	11.22	0.002776	2.68	1401.83	1273.39	0.31
Reach-1	9547.5*	1600.00	7.36	11.18	10.23	11.22	0.002776	2.68	1401.83	1273.39	0.31
Reach-1	9547.5*	1600.00	7.36	11.18	10.23	11.22	0.002776	2.68	1401.83	1273.39	0.31
Reach-1	9525	1600.00	7.35	11.05	10.40	11.10	0.004966	3.33	1205.69	1376.28	0.41
Reach-1	9525	1600.00	7.35	11.05	10.40	11.10	0.004966	3.33	1205.69	1376.28	0.41
Reach-1	9525	1600.00	7.35	11.05	10.40	11.10	0.004966	3.33	1205.69	1376.28	0.41
Reach-1	9525	1600.00	7.35	11.05	10.40	11.10	0.004966	3.33	1205.69	1376.28	0.41
Reach-1	9525	1600.00	7.35	11.05	10.40	11.10	0.004966	3.33	1205.69	1376.28	0.41
Reach-1	9473.33*	1600.00	7.34	10.78	10.35	10.83	0.005742	3.39	1180.91	1246.67	0.43
Reach-1	9473.33*	1600.00	7.34	10.78	10.35	10.83	0.005742	3.39	1180.91	1246.67	0.43
Reach-1	9473.33*	1600.00	7.34	10.78	10.35	10.83	0.005742	3.39	1180.91	1246.67	0.43
Reach-1	9473.33*	1600.00	7.34	10.78	10.35	10.83	0.005742	3.39	1180.91	1246.67	0.43
Reach-1	9473.33*	1600.00	7.34	10.78	10.35	10.83	0.005742	3.39	1180.91	1246.67	0.43
Reach-1	9421.66*	1600.00	7.34	10.45	10.29	10.50	0.007550	3.59	1152.74	1332.38	0.49
Reach-1	9421.66*	1600.00	7.34	10.45	10.29	10.50	0.007550	3.59	1152.74	1332.38	0.49
Reach-1	9421.66*	1600.00	7.34	10.45	10.29	10.50	0.007550	3.59	1152.74	1332.38	0.49
Reach-1	9421.66*	1600.00	7.34	10.45	10.29	10.50	0.007550	3.59	1152.74	1332.38	0.49
Reach-1	9421.66*	1600.00	7.34	10.45	10.29	10.50	0.007550	3.59	1152.74	1332.38	0.49
Reach-1	9370.*	1600.00	7.33	10.13	10.12	10.16	0.006323	3.04	1246.90	1381.67	0.44
Reach-1	9370.*	1600.00	7.33	10.13	10.12	10.16	0.006323	3.04	1246.90	1381.67	0.44
Reach-1	9370.*	1600.00	7.33	10.13	10.12	10.16	0.006323	3.04	1246.90	1381.67	0.44
Reach-1	9370.*	1600.00	7.33	10.13	10.12	10.16	0.006323	3.04	1246.90	1381.67	0.44
Reach-1	9370.*	1600.00	7.33	10.13	10.12	10.16	0.006323	3.04	1246.90	1381.67	0.44
Reach-1	9318.33*	1600.00	7.32	9.95	9.95	9.97	0.002727	1.99	1597.96	1421.04	0.29
Reach-1	9318.33*	1600.00	7.32	9.95	9.95	9.97	0.002727	1.99	1597.96	1421.04	0.29
Reach-1	9318.33*	1600.00	7.32	9.95	9.95	9.97	0.002727	1.99	1597.96	1421.04	0.29
Reach-1	9318.33*	1600.00	7.32	9.95	9.95	9.97	0.002727	1.99	1597.96	1421.04	0.29
Reach-1	9318.33*	1600.00	7.32	9.95	9.95	9.97	0.002727	1.99	1597.96	1421.04	0.29
Reach-1	9266.66*	1600.00	7.32	9.79	9.79	9.80	0.001215	1.35	2018.20	1462.37	0.19
Reach-1	9266.66*	1600.00	7.32	9.79	9.79	9.80	0.001215	1.35	2018.20	1462.37	0.19
Reach-1	9266.66*	1600.00	7.32	9.79	9.79	9.80	0.001215	1.35	2018.20	1462.37	0.19
Reach-1	9266.66*	1600.00	7.32	9.79	9.79	9.80	0.001215	1.35	2018.20	1462.37	0.19
Reach-1	9266.66*	1600.00	7.32	9.79	9.79	9.80	0.001215	1.35	2018.20	1462.37	0.19
Reach-1	9215	1600.00	7.31	9.62	9.62	9.63	0.000588	0.98	2490.17	1502.67	0.13
Reach-1	9215	1600.00	7.31	9.62	9.62	9.63	0.000588	0.98	2490.17	1502.67	0.13
Reach-1	9215	1600.00	7.31	9.62	9.62	9.63	0.000588	0.98	2490.17	1502.67	0.13
Reach-1	9215	1600.00	7.31	9.62	9.62	9.63	0.000588	0.98	2490.17	1502.67	0.13
Reach-1	9215	1600.00	7.31	9.62	9.62	9.63	0.000588	0.98	2490.17	1502.67	0.13
Reach-1	9169.99*	1600.00	7.01	9.50	9.50	9.50	0.000547	0.93	2538.69	1502.53	0.13
Reach-1	9169.99*	1600.00	7.01	9.50	9.50	9.50	0.000547	0.93	2538.69	1502.53	0.13
Reach-1	9169.99*	1600.00	7.01	9.50	9.50	9.50	0.000547	0.93	2538.69	1502.53	0.13
Reach-1	9169.99*	1600.00	7.01	9.50	9.50	9.50	0.000547	0.93	2538.69	1502.53	0.13
Reach-1	9169.99*	1600.00	7.01	9.50	9.50	9.50	0.000547	0.93	2538.69	1502.53	0.13
Reach-1	9124.99*	1600.00	6.72	9.37	9.37	9.38	0.000523	0.90	2587.66	1501.39	0.12
Reach-1	9124.99*	1600.00	6.72	9.37	9.37	9.38	0.000523	0.90	2587.66	1501.39	0.12
Reach-1	9124.99*	1600.00	6.72	9.37	9.37	9.38	0.000523	0.90	2587.66	1501.39	0.12
Reach-1	9124.99*	1600.00	6.72	9.37	9.37	9.38	0.000523	0.90	2587.66	1501.39	0.12

HEC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9124.99*	1600.00	6.72	9.37	9.37	9.38	0.000523	0.90	2587.66	1501.39	0.12
Reach-1	9079.99*	1600.00	6.42	9.25	9.25	9.25	0.000499	0.87	2636.91	1497.52	0.12
Reach-1	9079.99*	1600.00	6.42	9.25	9.25	9.25	0.000499	0.87	2636.91	1497.52	0.12
Reach-1	9079.99*	1600.00	6.42	9.25	9.25	9.25	0.000499	0.87	2636.91	1497.52	0.12
Reach-1	9079.99*	1600.00	6.42	9.25	9.25	9.25	0.000499	0.87	2636.91	1497.52	0.12
Reach-1	9079.99*	1600.00	6.42	9.25	9.25	9.25	0.000499	0.87	2636.91	1497.52	0.12
Reach-1	9034.99*	1600.00	6.13	9.14	9.12	9.15	0.000459	0.85	2722.60	1495.57	0.11
Reach-1	9034.99*	1600.00	6.13	9.14	9.12	9.15	0.000459	0.85	2722.60	1495.57	0.11
Reach-1	9034.99*	1600.00	6.13	9.14	9.12	9.15	0.000459	0.85	2722.60	1495.57	0.11
Reach-1	9034.99*	1600.00	6.13	9.16	9.12	9.17	0.000448	0.85	2750.68	1499.04	0.11
Reach-1	9034.99*	1600.00	6.13	9.15	9.12	9.16	0.000454	0.85	2735.10	1497.12	0.11
Reach-1	8989.99*	1600.00	5.83	9.13	9.00	9.13	0.000372	0.81	2950.91	1508.31	0.10
Reach-1	8989.99*	1600.00	5.83	9.13	9.00	9.13	0.000372	0.81	2950.91	1508.31	0.10
Reach-1	8989.99*	1600.00	5.83	9.13	9.00	9.13	0.000372	0.81	2950.91	1508.31	0.10
Reach-1	8989.99*	1600.00	5.83	9.15	9.00	9.15	0.000363	0.80	2979.73	1512.14	0.10
Reach-1	8989.99*	1600.00	5.83	9.14	9.00	9.14	0.000368	0.80	2963.75	1510.01	0.10
Reach-1	8944.99*	1600.00	5.54	9.12	8.87	9.12	0.000304	0.77	3185.19	1523.98	0.09
Reach-1	8944.99*	1600.00	5.54	9.12	8.87	9.12	0.000304	0.77	3185.19	1523.98	0.09
Reach-1	8944.99*	1600.00	5.54	9.12	8.87	9.12	0.000304	0.77	3185.19	1523.98	0.09
Reach-1	8944.99*	1600.00	5.54	9.14	8.87	9.14	0.000296	0.76	3214.72	1528.16	0.09
Reach-1	8944.99*	1600.00	5.54	9.13	8.87	9.13	0.000300	0.76	3198.34	1525.84	0.09
Reach-1	8899.99*	1600.00	5.24	9.11	8.75	9.11	0.000249	0.73	3426.75	1540.12	0.08
Reach-1	8899.99*	1600.00	5.24	9.11	8.75	9.11	0.000249	0.73	3426.75	1540.12	0.08
Reach-1	8899.99*	1600.00	5.24	9.11	8.75	9.11	0.000249	0.73	3426.75	1540.12	0.08
Reach-1	8899.99*	1600.00	5.24	9.13	8.75	9.13	0.000243	0.72	3456.93	1544.61	0.08
Reach-1	8899.99*	1600.00	5.24	9.12	8.75	9.12	0.000246	0.73	3440.19	1542.12	0.08
Reach-1	8854.99*	1600.00	4.95	9.10	8.62	9.10	0.000204	0.69	3677.73	1554.80	0.08
Reach-1	8854.99*	1600.00	4.95	9.10	8.62	9.10	0.000204	0.69	3677.73	1554.80	0.08
Reach-1	8854.99*	1600.00	4.95	9.10	8.62	9.10	0.000204	0.69	3677.73	1554.80	0.08
Reach-1	8854.99*	1600.00	4.95	9.12	8.62	9.12	0.000199	0.68	3708.46	1559.73	0.08
Reach-1	8854.99*	1600.00	4.95	9.11	8.62	9.11	0.000201	0.69	3691.41	1557.00	0.08
Reach-1	8810	1600.00	6.96	9.09	9.00	9.10	0.000229	0.46	3588.91	1543.47	0.08
Reach-1	8810	1600.00	6.96	9.09	9.00	9.10	0.000229	0.46	3588.91	1543.47	0.08
Reach-1	8810	1600.00	6.96	9.09	9.00	9.10	0.000229	0.46	3588.91	1543.47	0.08
Reach-1	8810	1600.00	6.96	9.11	9.00	9.12	0.000224	0.45	3619.70	1550.62	0.08
Reach-1	8810	1600.00	6.96	9.10	9.00	9.10	0.000227	0.46	3602.62	1546.66	0.08
Reach-1	8809	1600.00	9.00	9.09		9.10	0.000235	0.03	3549.96	1543.36	0.02
Reach-1	8809	1600.00	9.00	9.09		9.10	0.000235	0.03	3549.96	1543.36	0.02
Reach-1	8809	1600.00	9.00	9.09		9.10	0.000235	0.03	3549.96	1543.36	0.02
Reach-1	8809	1600.00	9.00	9.11		9.12	0.000230	0.04	3580.76	1550.50	0.02
Reach-1	8809	1600.00	9.00	9.10		9.10	0.000232	0.04	3563.67	1546.54	0.02
Reach-1	8803.63*	1600.00	8.87	9.07	8.22	9.07	0.000205	0.05	3755.01	1596.74	0.02
Reach-1	8803.63*	1600.00	8.87	9.07	8.22	9.07	0.000205	0.05	3755.01	1596.74	0.02
Reach-1	8803.63*	1600.00	8.87	9.07	8.22	9.07	0.000205	0.05	3755.01	1596.74	0.02
Reach-1	8803.63*	1600.00	8.87	9.09	8.22	9.09	0.000200	0.06	3787.60	1602.28	0.02
Reach-1	8803.63*	1600.00	8.87	9.08	8.22	9.08	0.000203	0.05	3769.52	1599.21	0.02
Reach-1	8798.27*	1600.00	8.75	9.05	8.05	9.05	0.000178	0.07	3976.16	1638.97	0.02
Reach-1	8798.27*	1600.00	8.75	9.05	8.05	9.05	0.000178	0.07	3976.16	1638.97	0.02
Reach-1	8798.27*	1600.00	8.75	9.05	8.05	9.05	0.000178	0.07	3976.16	1638.97	0.02
Reach-1	8798.27*	1600.00	8.75	9.07	8.05	9.07	0.000174	0.07	4010.28	1644.43	0.02
Reach-1	8798.27*	1600.00	8.75	9.06	8.05	9.06	0.000176	0.07	3991.36	1641.40	0.02
Reach-1	8792.90*	1600.00	8.62	9.03	7.89	9.04	0.000154	0.08	4204.52	1679.30	0.02
Reach-1	8792.90*	1600.00	8.62	9.03	7.89	9.04	0.000154	0.08	4204.52	1679.30	0.02
Reach-1	8792.90*	1600.00	8.62	9.03	7.89	9.04	0.000154	0.08	4204.52	1679.30	0.02
Reach-1	8792.90*	1600.00	8.62	9.06	7.89	9.06	0.000151	0.08	4240.07	1684.74	0.02
Reach-1	8792.90*	1600.00	8.62	9.04	7.89	9.05	0.000153	0.08	4220.36	1681.73	0.02
Reach-1	8787.54*	1600.00	8.49	9.02	7.72	9.02	0.000133	0.08	4446.25	1714.88	0.02
Reach-1	8787.54*	1600.00	8.49	9.02	7.72	9.02	0.000133	0.08	4446.25	1714.88	0.02
Reach-1	8787.54*	1600.00	8.49	9.02	7.72	9.02	0.000133	0.08	4446.25	1714.88	0.02
Reach-1	8787.54*	1600.00	8.49	9.04	7.72	9.04	0.000130	0.09	4483.08	1720.24	0.02

HFC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8787.54*	1600.00	8.49	9.03	7.72	9.03	0.000132	0.09	4462.65	1717.27	0.02
Reach-1	8782.18*	1600.00	8.36	9.01	7.56	9.01	0.000112	0.09	4694.31	1743.16	0.02
Reach-1	8782.18*	1600.00	8.36	9.01	7.56	9.01	0.000112	0.09	4694.31	1743.16	0.02
Reach-1	8782.18*	1600.00	8.36	8.97	7.56	8.99	0.004127	0.52	1311.08	902.42	0.12
Reach-1	8782.18*	1600.00	8.36	8.96	7.56	8.98	0.004224	0.51	1299.41	897.72	0.12
Reach-1	8776.81*	1600.00	8.24	8.95	7.39	8.97	0.003022	0.49	1461.49	945.62	0.10
Reach-1	8776.81*	1600.00	8.24	8.95	7.39	8.97	0.003022	0.49	1461.49	945.62	0.10
Reach-1	8776.81*	1600.00	8.24	8.95	7.39	8.97	0.003022	0.49	1461.49	945.62	0.10
Reach-1	8776.81*	1600.00	8.24	8.91	7.39	8.93	0.003235	0.49	1425.73	936.61	0.11
Reach-1	8776.81*	1600.00	8.24	8.90	7.39	8.92	0.003316	0.49	1413.01	933.38	0.11
Reach-1	8771.45*	1600.00	8.11	7.22	7.22	7.56	0.163142		341.27	501.84	0.00
Reach-1	8771.45*	1600.00	8.11	7.22	7.22	7.56	0.163142		341.27	501.84	0.00
Reach-1	8771.45*	1600.00	8.11	7.22	7.22	7.56	0.163142		341.27	501.84	0.00
Reach-1	8771.45*	1600.00	8.11	7.46	7.21	7.64	0.066086		473.58	578.74	0.00
Reach-1	8771.45*	1600.00	8.11	7.82	7.21	7.90	0.022437		695.09	660.60	0.00
Reach-1	8766.09*	1600.00	7.98	6.40		6.41	0.001329		1771.23	1054.85	0.00
Reach-1	8766.09*	1600.00	7.98	7.11		7.11	0.000487		2610.30	1309.57	0.00
Reach-1	8766.09*	1600.00	7.98	7.24		7.25	0.000409		2792.83	1350.83	0.00
Reach-1	8766.09*	1600.00	7.98	7.45		7.45	0.000319		3072.88	1398.98	0.00
Reach-1	8766.09*	1600.00	7.98	7.79		7.79	0.000216		3563.48	1480.44	0.00
Reach-1	8760.72*	1600.00	7.81	6.28		6.29	0.001217		1829.67	1075.99	0.00
Reach-1	8760.72*	1600.00	7.81	7.06		7.07	0.000408		2789.61	1351.10	0.00
Reach-1	8760.72*	1600.00	7.81	7.21		7.21	0.000342		2986.41	1384.85	0.00
Reach-1	8760.72*	1600.00	7.81	7.42		7.42	0.000266		3284.69	1434.49	0.00
Reach-1	8760.72*	1600.00	7.81	7.77		7.77	0.000180		3800.79	1516.54	0.00
Reach-1	8755.36*	1600.00	7.73	6.17		6.18	0.001090		1904.59	1102.64	0.00
Reach-1	8755.36*	1600.00	7.73	7.03		7.03	0.000340		2986.22	1383.03	0.00
Reach-1	8755.36*	1600.00	7.73	7.18		7.18	0.000284		3195.77	1417.41	0.00
Reach-1	8755.36*	1600.00	7.73	7.39		7.40	0.000222		3510.50	1467.54	0.00
Reach-1	8755.36*	1600.00	7.73	7.75		7.75	0.000151	0.01	4050.79	1607.23	0.01
Reach-1	8750	1600.00	7.50	6.07		6.08	0.001003		1991.07	1135.73	0.00
Reach-1	8750	1600.00	7.50	7.00		7.00	0.000290		3193.10	1413.59	0.00
Reach-1	8750	1600.00	7.50	7.15		7.15	0.000243		3414.32	1448.60	0.00
Reach-1	8750	1600.00	7.50	7.37		7.38	0.000189		3744.13	1499.28	0.00
Reach-1	8750	1600.00	7.50	7.74		7.74	0.000130	0.03	4312.03	1652.52	0.02
Reach-1	8744.44*	1600.00	7.39	5.97		5.98	0.001068		1948.13	1154.87	0.00
Reach-1	8744.44*	1600.00	7.39	6.97		6.97	0.000274		3309.15	1504.40	0.00
Reach-1	8744.44*	1600.00	7.39	7.13		7.13	0.000227		3551.64	1544.58	0.00
Reach-1	8744.44*	1600.00	7.39	7.36		7.36	0.000176		3911.52	1602.35	0.00
Reach-1	8744.44*	1600.00	7.39	7.73		7.73	0.000121	0.05	4563.60	1868.94	0.02
Reach-1	8738.88*	1600.00	7.28	5.86		5.87	0.001146		1898.94	1162.29	0.00
Reach-1	8738.88*	1600.00	7.28	6.94		6.95	0.000256		3453.74	1614.83	0.00
Reach-1	8738.88*	1600.00	7.28	7.11		7.11	0.000213		3723.96	1710.25	0.00
Reach-1	8738.88*	1600.00	7.28	7.34		7.34	0.000164		4141.10	1841.01	0.00
Reach-1	8738.88*	1600.00	7.28	7.71		7.72	0.000107	0.06	4857.02	1923.93	0.02
Reach-1	8733.33*	1600.00	7.17	5.75		5.76	0.001256		1834.00	1159.74	0.00
Reach-1	8733.33*	1600.00	7.17	6.92		6.92	0.000240		3642.41	1857.93	0.00
Reach-1	8733.33*	1600.00	7.17	7.09		7.09	0.000194		3957.34	1882.98	0.00
Reach-1	8733.33*	1600.00	7.17	7.33		7.33	0.000145	0.02	4411.34	1971.59	0.02
Reach-1	8733.33*	1600.00	7.17	7.71		7.71	0.000094	0.06	5160.64	1979.35	0.02
Reach-1	8727.77*	1600.00	7.06	5.62		5.63	0.001397		1757.11	1153.21	0.00
Reach-1	8727.77*	1600.00	7.06	6.90		6.90	0.000214		3890.19	1925.94	0.00
Reach-1	8727.77*	1600.00	7.06	7.07		7.07	0.000171		4221.53	1930.98	0.00
Reach-1	8727.77*	1600.00	7.06	7.31		7.32	0.000127	0.04	4704.83	2029.98	0.02
Reach-1	8727.77*	1600.00	7.06	7.70		7.70	0.000083	0.07	5487.29	2047.67	0.02
Reach-1	8722.22*	1600.00	6.94	5.48		5.49	0.001580		1675.61	938.15	0.00
Reach-1	8722.22*	1600.00	6.94	6.88		6.88	0.000187		4158.57	1986.19	0.00
Reach-1	8722.22*	1600.00	6.94	7.06		7.06	0.000149	0.01	4508.99	2091.07	0.01
Reach-1	8722.22*	1600.00	6.94	7.30		7.30	0.000111	0.05	5025.27	2100.78	0.02

HEC-RAS Plan: Plan 17 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8722.22*	1600.00	6.94	7.69		7.69	0.000072	0.07	5843.62	2119.50	0.02
Reach-1	8716.66*	1600.00	6.83	5.31		5.33	0.001844		1603.61	829.27	0.00
Reach-1	8716.66*	1600.00	6.83	6.86		6.87	0.000162		4458.06	2052.44	0.00
Reach-1	8716.66*	1600.00	6.83	7.04		7.04	0.000129	0.03	4837.13	2162.23	0.02
Reach-1	8716.66*	1600.00	6.83	7.29		7.29	0.000096	0.06	5377.77	2168.02	0.02
Reach-1	8716.66*	1600.00	6.83	7.68		7.68	0.000062	0.07	6227.17	2177.07	0.02
Reach-1	8711.11*	1600.00	6.72	5.12		5.13	0.002325		1503.40	858.38	0.00
Reach-1	8711.11*	1600.00	6.72	6.85		6.85	0.000139	0.01	4782.15	2213.54	0.01
Reach-1	8711.11*	1600.00	6.72	7.03		7.03	0.000111	0.04	5184.93	2218.05	0.02
Reach-1	8711.11*	1600.00	6.72	7.28		7.29	0.000082	0.06	5746.00	2224.32	0.02
Reach-1	8711.11*	1600.00	6.72	7.68		7.68	0.000054	0.07	6623.96	2234.10	0.01
Reach-1	8705.55*	1600.00	6.61	4.84		4.87	0.003420		1347.72	852.22	0.00
Reach-1	8705.55*	1600.00	6.61	6.84		6.84	0.000118	0.03	5140.33	2268.56	0.02
Reach-1	8705.55*	1600.00	6.61	7.02		7.02	0.000094	0.05	5558.72	2273.64	0.02
Reach-1	8705.55*	1600.00	6.61	7.28		7.28	0.000070	0.06	6139.49	2280.57	0.02
Reach-1	8705.55*	1600.00	6.61	7.67		7.67	0.000046	0.07	7045.32	2291.15	0.01
Reach-1	8700	1600.00	6.50	3.60	3.60	3.88	0.141312		376.59	623.27	0.00
Reach-1	8700	1600.00	6.50	6.83	3.60	6.83	0.000100	0.04	5517.38	2323.62	0.02
Reach-1	8700	1600.00	6.50	7.01	3.60	7.02	0.000080	0.06	5950.68	2329.01	0.02
Reach-1	8700	1600.00	6.50	7.27	3.60	7.27	0.000060	0.07	6550.39	2336.46	0.01
Reach-1	8700	1600.00	6.50	7.67	3.60	7.67	0.000040	0.07	7483.33	2347.99	0.01

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10721	PF 1	300.00	9.51	12.20	11.50	12.21	0.000064	0.35	896.83	901.55	0.05
Reach-1	10721	PF 2	500.00	9.51	12.07	12.07	12.08	0.000266	0.69	779.13	855.38	0.09
Reach-1	10721	PF 3	600.00	9.51	12.07	12.07	12.08	0.000383	0.83	779.10	855.37	0.11
Reach-1	10721	PF 4	1000.00	9.51	12.69	12.07	12.70	0.000156	0.63	1562.81	1212.48	0.07
Reach-1	10721	PF 5	1400.00	9.51	13.01	12.07	13.02	0.000157	0.69	1965.83	1317.64	0.08
Reach-1	10721	PF#6	1600.00	9.51	13.13	12.07	13.14	0.000158	0.72	2121.95	1317.90	0.08
Reach-1	10721	PF#7	2000.00	9.51	13.37	12.07	13.38	0.000155	0.75	2434.12	1318.42	0.08
Reach-1	10721	PF#8	2500.00	9.51	13.75	12.07	13.76	0.000128	0.74	2939.38	1319.26	0.07
Reach-1	10671.6°	PF 1	300.00	9.43	11.60	11.44	12.14	0.024547	5.90	50.83	35.14	0.86
Reach-1	10671.6°	PF 2	500.00	9.43	11.99	11.99	12.00	0.000299	0.73	749.44	839.20	0.10
Reach-1	10671.6°	PF 3	600.00	9.43	11.99	11.99	12.00	0.000431	0.87	749.41	839.19	0.12
Reach-1	10671.6°	PF 4	1000.00	9.43	12.69	11.99	12.69	0.000159	0.65	1593.59	1221.13	0.08
Reach-1	10671.6°	PF 5	1400.00	9.43	13.00	11.99	13.01	0.000161	0.71	1999.29	1328.00	0.08
Reach-1	10671.6°	PF#6	1600.00	9.43	13.12	11.99	13.13	0.000163	0.74	2156.58	1328.28	0.08
Reach-1	10671.6°	PF#7	2000.00	9.43	13.36	11.99	13.37	0.000160	0.77	2471.40	1328.84	0.08
Reach-1	10671.6°	PF#8	2500.00	9.43	13.74	11.99	13.75	0.000132	0.76	2982.24	1329.74	0.07
Reach-1	10622.3°	PF 1	300.00	9.35	11.96	11.39	11.96	0.000102	0.43	764.37	841.79	0.06
Reach-1	10622.3°	PF 2	500.00	9.35	11.91	11.91	11.92	0.000336	0.76	722.16	827.73	0.10
Reach-1	10622.3°	PF 3	600.00	9.35	11.91	11.91	11.92	0.000483	0.92	722.13	827.72	0.12
Reach-1	10622.3°	PF 4	1000.00	9.35	12.66	11.91	12.69	0.000154	0.65	1627.37	1229.02	0.07
Reach-1	10622.3°	PF 5	1400.00	9.35	13.00	11.91	13.00	0.000159	0.72	2035.38	1337.19	0.08
Reach-1	10622.3°	PF#6	1600.00	9.35	13.12	11.91	13.12	0.000161	0.74	2193.76	1338.44	0.08
Reach-1	10622.3°	PF#7	2000.00	9.35	13.35	11.91	13.36	0.000159	0.78	2511.12	1339.03	0.08
Reach-1	10622.3°	PF#8	2500.00	9.35	13.74	11.91	13.75	0.000131	0.77	3027.50	1340.01	0.07
Reach-1	10572.9°	PF 1	300.00	9.27	11.95	11.34	11.96	0.000089	0.41	801.74	854.37	0.05
Reach-1	10572.9°	PF 2	500.00	9.27	11.83	11.83	11.83	0.000378	0.80	695.06	817.02	0.11
Reach-1	10572.9°	PF 3	600.00	9.27	11.83	11.83	11.84	0.000544	0.97	695.03	817.01	0.13
Reach-1	10572.9°	PF 4	1000.00	9.27	12.67	11.83	12.68	0.000146	0.64	1663.96	1232.47	0.07
Reach-1	10572.9°	PF 5	1400.00	9.27	12.99	11.83	13.00	0.000152	0.71	2073.43	1344.75	0.08
Reach-1	10572.9°	PF#6	1600.00	9.27	13.11	11.83	13.12	0.000155	0.74	2232.82	1348.28	0.08
Reach-1	10572.9°	PF#7	2000.00	9.27	13.35	11.83	13.36	0.000154	0.78	2552.61	1348.92	0.08
Reach-1	10572.9°	PF#8	2500.00	9.27	13.73	11.83	13.74	0.000128	0.77	3074.37	1349.98	0.07
Reach-1	10523.6°	PF 1	300.00	9.19	11.95	11.28	11.95	0.000077	0.38	840.29	864.59	0.05
Reach-1	10523.6°	PF 2	500.00	9.19	11.75	11.75	11.75	0.000419	0.84	669.16	802.59	0.12
Reach-1	10523.6°	PF 3	600.00	9.19	11.75	11.75	11.77	0.000585	1.00	675.94	805.21	0.14
Reach-1	10523.6°	PF 4	1000.00	9.19	12.67	11.75	12.67	0.000135	0.63	1708.39	1233.37	0.07
Reach-1	10523.6°	PF 5	1400.00	9.19	12.98	11.75	12.99	0.000143	0.70	2117.43	1344.29	0.07
Reach-1	10523.6°	PF#6	1600.00	9.19	13.10	11.75	13.11	0.000147	0.73	2276.86	1351.09	0.07
Reach-1	10523.6°	PF#7	2000.00	9.19	13.34	11.75	13.35	0.000147	0.77	2597.62	1354.06	0.08
Reach-1	10523.6°	PF#8	2500.00	9.19	13.73	11.75	13.74	0.000123	0.76	3123.53	1358.92	0.07
Reach-1	10474.3°	PF 1	300.00	9.10	11.24	11.22	11.88	0.032399	6.42	46.72	34.89	0.98
Reach-1	10474.3°	PF 2	500.00	9.10	11.66	11.66	11.67	0.000468	0.88	641.47	785.87	0.12
Reach-1	10474.3°	PF 3	600.00	9.10	11.73	11.66	11.74	0.000536	0.96	693.55	806.46	0.13
Reach-1	10474.3°	PF 4	1000.00	9.10	12.66	11.66	12.67	0.000125	0.61	1754.72	1238.55	0.07
Reach-1	10474.3°	PF 5	1400.00	9.10	12.98	11.66	12.99	0.000134	0.69	2164.73	1348.33	0.07
Reach-1	10474.3°	PF#6	1600.00	9.10	13.10	11.66	13.10	0.000138	0.72	2324.58	1356.78	0.07
Reach-1	10474.3°	PF#7	2000.00	9.10	13.33	11.66	13.34	0.000139	0.76	2646.60	1359.09	0.07
Reach-1	10474.3°	PF#8	2500.00	9.10	13.72	11.66	13.73	0.000118	0.75	3175.59	1362.86	0.07
Reach-1	10424.9°	PF 1	300.00	9.02	11.65	11.15	11.66	0.000142	0.49	672.24	790.68	0.07
Reach-1	10424.9°	PF 2	500.00	9.02	11.58	11.58	11.59	0.000505	0.91	618.26	768.16	0.13
Reach-1	10424.9°	PF 3	600.00	9.02	11.71	11.58	11.72	0.000471	0.91	716.84	808.82	0.12
Reach-1	10424.9°	PF 4	1000.00	9.02	12.66	11.58	12.66	0.000113	0.59	1808.83	1246.83	0.06
Reach-1	10424.9°	PF 5	1400.00	9.02	12.97	11.58	12.98	0.000123	0.66	2220.62	1354.71	0.07
Reach-1	10424.9°	PF#6	1600.00	9.02	13.09	11.58	13.10	0.000128	0.70	2381.10	1364.67	0.07
Reach-1	10424.9°	PF#7	2000.00	9.02	13.33	11.58	13.34	0.000130	0.74	2704.89	1366.55	0.07
Reach-1	10424.9°	PF#8	2500.00	9.02	13.72	11.58	13.73	0.000110	0.73	3237.87	1369.66	0.07
Reach-1	10375.6°	PF 1	300.00	8.94	11.65	11.10	11.65	0.000118	0.46	707.13	796.34	0.06
Reach-1	10375.6°	PF 2	500.00	8.94	11.50	11.50	11.51	0.000539	0.93	595.30	747.04	0.13
Reach-1	10375.6°	PF 3	600.00	8.94	11.69	11.50	11.70	0.000411	0.86	741.24	810.78	0.11
Reach-1	10375.6°	PF 4	1000.00	8.94	12.65	11.50	12.66	0.000102	0.57	1861.75	1255.11	0.06
Reach-1	10375.6°	PF 5	1400.00	8.94	12.97	11.50	12.97	0.000113	0.64	2275.49	1362.38	0.07
Reach-1	10375.6°	PF#6	1600.00	8.94	13.09	11.50	13.09	0.000118	0.68	2436.72	1373.84	0.07
Reach-1	10375.6°	PF#7	2000.00	8.94	13.32	11.50	13.33	0.000121	0.72	2762.55	1375.44	0.07
Reach-1	10375.6°	PF#8	2500.00	8.94	13.71	11.50	13.72	0.000104	0.72	3299.99	1378.07	0.07
Reach-1	10326.3°	PF 1	300.00	8.86	11.64	11.04	11.65	0.000095	0.41	744.79	803.37	0.06
Reach-1	10326.3°	PF 2	500.00	8.86	11.48	11.42	11.49	0.000447	0.85	619.46	746.45	0.12
Reach-1	10326.3°	PF 3	600.00	8.86	11.67	11.42	11.68	0.000347	0.80	769.76	814.23	0.11
Reach-1	10326.3°	PF 4	1000.00	8.86	12.65	11.42	12.65	0.000091	0.54	1917.68	1264.07	0.06

HFC-RAS Plan: roadsm_11-9 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10326.3*	PF 5	1400.00	8.86	12.96	11.42	12.97	0.000102	0.62	2333.57	1370.82	0.06
Reach-1	10326.3*	PF#6	1600.00	8.86	13.08	11.42	13.09	0.000108	0.65	2495.61	1383.66	0.06
Reach-1	10326.3*	PF#7	2000.00	8.86	13.32	11.42	13.33	0.000111	0.70	2823.59	1385.05	0.07
Reach-1	10326.3*	PF#8	2500.00	8.86	13.71	11.42	13.72	0.000096	0.70	3365.69	1387.35	0.06
Reach-1	10277	PF 1	300.00	8.78	11.64	10.98	11.64	0.000082	0.39	782.38	810.67	0.05
Reach-1	10277	PF 2	500.00	8.78	11.46	11.34	11.47	0.000394	0.81	645.56	745.31	0.11
Reach-1	10277	PF 3	600.00	8.78	11.66	11.34	11.67	0.000310	0.76	799.24	818.36	0.10
Reach-1	10277	PF 4	1000.00	8.78	12.64	11.34	12.65	0.000085	0.53	1974.41	1273.58	0.06
Reach-1	10277	PF 5	1400.00	8.78	12.96	11.34	12.97	0.000096	0.61	2392.60	1379.87	0.06
Reach-1	10277	PF#6	1600.00	8.78	13.08	11.34	13.08	0.000101	0.64	2555.50	1394.00	0.06
Reach-1	10277	PF#7	2000.00	8.78	13.31	11.34	13.32	0.000105	0.68	2885.74	1395.23	0.06
Reach-1	10277	PF#8	2500.00	8.78	13.70	11.34	13.71	0.000090	0.68	3432.66	1397.27	0.06
Reach-1	10225.6*	PF 1	300.00	8.73	11.63	10.92	11.64	0.000248	0.70	920.97	941.99	0.09
Reach-1	10225.6*	PF 2	500.00	8.73	11.43	11.22	11.44	0.001364	1.54	663.03	740.35	0.21
Reach-1	10225.6*	PF 3	600.00	8.73	11.64	11.22	11.65	0.000986	1.39	923.60	942.96	0.18
Reach-1	10225.6*	PF 4	1000.00	8.73	12.64	11.22	12.64	0.000306	1.03	2036.25	1277.06	0.11
Reach-1	10225.6*	PF 5	1400.00	8.73	12.95	11.22	12.96	0.000357	1.19	2453.95	1272.15	0.12
Reach-1	10225.6*	PF#6	1600.00	8.73	13.07	11.22	13.08	0.000390	1.28	2617.25	1421.12	0.12
Reach-1	10225.6*	PF#7	2000.00	8.73	13.30	11.24	13.31	0.000417	1.38	2956.63	1436.57	0.13
Reach-1	10225.6*	PF#8	2500.00	8.73	13.70	11.36	13.71	0.000370	1.40	3521.91	1439.17	0.12
Reach-1	10174.3*	PF 1	300.00	8.68	10.86	10.86	11.52	0.034055	6.54	45.85	34.40	1.00
Reach-1	10174.3*	PF 2	500.00	8.68	11.37	11.10	11.38	0.001389	1.57	659.03	725.15	0.21
Reach-1	10174.3*	PF 3	600.00	8.68	11.59	11.10	11.60	0.000941	1.39	942.10	947.93	0.18
Reach-1	10174.3*	PF 4	1000.00	8.68	12.62	11.10	12.63	0.000278	1.00	2090.93	1278.12	0.10
Reach-1	10174.3*	PF 5	1400.00	8.68	12.94	11.10	12.94	0.000327	1.16	2505.77	1382.11	0.11
Reach-1	10174.3*	PF#6	1600.00	8.68	13.05	11.10	13.06	0.000359	1.25	2667.10	1420.50	0.12
Reach-1	10174.3*	PF#7	2000.00	8.68	13.29	11.19	13.29	0.000394	1.37	3009.67	1477.42	0.13
Reach-1	10174.3*	PF#8	2500.00	8.68	13.68	11.31	13.69	0.000344	1.37	3594.41	1480.69	0.12
Reach-1	10123.*	PF 1	300.00	8.62	10.98	10.78	11.00	0.001470	1.46	443.98	610.51	0.21
Reach-1	10123.*	PF 2	500.00	8.62	11.30	10.98	11.32	0.001387	1.58	656.39	715.74	0.21
Reach-1	10123.*	PF 3	600.00	8.62	11.55	10.98	11.56	0.000877	1.37	964.10	958.12	0.17
Reach-1	10123.*	PF 4	1000.00	8.62	12.61	10.98	12.62	0.000248	0.97	2151.86	1279.43	0.10
Reach-1	10123.*	PF 5	1400.00	8.62	12.92	10.98	12.93	0.000296	1.13	2564.06	1382.59	0.11
Reach-1	10123.*	PF#6	1600.00	8.62	13.04	11.02	13.04	0.000326	1.21	2723.47	1420.44	0.11
Reach-1	10123.*	PF#7	2000.00	8.62	13.27	11.13	13.28	0.000385	1.34	3064.19	1498.14	0.12
Reach-1	10123.*	PF#8	2500.00	8.62	13.67	11.26	13.68	0.000319	1.34	3667.80	1521.85	0.12
Reach-1	10071.6*	PF 1	300.00	8.57	10.92	10.28	10.93	0.001423	1.46	444.90	601.21	0.21
Reach-1	10071.6*	PF 2	500.00	8.57	11.24	10.45	11.25	0.001321	1.56	657.64	706.00	0.21
Reach-1	10071.6*	PF 3	600.00	8.57	11.51	10.52	11.52	0.000753	1.29	994.89	948.34	0.16
Reach-1	10071.6*	PF 4	1000.00	8.57	12.60	10.72	12.61	0.000212	0.91	2219.64	1283.73	0.09
Reach-1	10071.6*	PF 5	1400.00	8.57	12.91	10.88	12.92	0.000256	1.07	2630.19	1385.38	0.10
Reach-1	10071.6*	PF#6	1600.00	8.57	13.02	10.85	13.03	0.000283	1.15	2788.07	1422.38	0.11
Reach-1	10071.6*	PF#7	2000.00	8.57	13.25	11.06	13.26	0.000319	1.27	3126.63	1498.64	0.12
Reach-1	10071.6*	PF#8	2500.00	8.57	13.65	11.19	13.66	0.000285	1.28	3744.15	1562.54	0.11
Reach-1	10020.3*	PF 1	300.00	8.52	10.85	10.19	10.86	0.001348	1.44	448.58	593.41	0.20
Reach-1	10020.3*	PF 2	500.00	8.52	11.19	10.38	11.20	0.001007	1.39	792.65	833.81	0.18
Reach-1	10020.3*	PF 3	600.00	8.52	11.48	10.45	11.49	0.000630	1.21	1049.84	918.65	0.15
Reach-1	10020.3*	PF 4	1000.00	8.52	12.59	10.65	12.60	0.000181	0.86	2293.09	1288.65	0.08
Reach-1	10020.3*	PF 5	1400.00	8.52	12.90	10.81	12.90	0.000221	1.01	2701.44	1385.53	0.09
Reach-1	10020.3*	PF#6	1600.00	8.52	13.01	10.87	13.02	0.000246	1.09	2857.68	1422.12	0.10
Reach-1	10020.3*	PF#7	2000.00	8.52	13.24	10.99	13.25	0.000280	1.21	3193.80	1497.37	0.11
Reach-1	10020.3*	PF#8	2500.00	8.52	13.64	11.12	13.65	0.000257	1.24	3818.77	1602.72	0.11
Reach-1	9969.*	PF 1	300.00	8.47	10.79	10.09	10.80	0.001233	1.40	452.80	584.29	0.20
Reach-1	9969.*	PF 2	500.00	8.47	11.15	10.29	11.16	0.000828	1.29	841.66	846.48	0.17
Reach-1	9969.*	PF 3	600.00	8.47	11.46	10.36	11.47	0.000503	1.12	1116.45	930.80	0.13
Reach-1	9969.*	PF 4	1000.00	8.47	12.59	10.56	12.59	0.000149	0.80	2368.95	1296.24	0.08
Reach-1	9969.*	PF 5	1400.00	8.47	12.89	10.73	12.90	0.000183	0.94	2775.89	1385.86	0.09
Reach-1	9969.*	PF#6	1600.00	8.47	13.00	10.80	13.01	0.000205	1.01	2930.73	1422.44	0.09
Reach-1	9969.*	PF#7	2000.00	8.47	13.23	10.91	13.24	0.000234	1.13	3264.92	1498.36	0.10
Reach-1	9969.*	PF#8	2500.00	8.47	13.63	11.07	13.64	0.000221	1.17	3892.75	1629.90	0.10
Reach-1	9917.66*	PF 1	300.00	8.41	10.74	9.99	10.75	0.001068	1.34	464.43	582.34	0.18
Reach-1	9917.66*	PF 2	500.00	8.41	11.12	10.21	11.12	0.000652	1.18	903.64	860.19	0.15
Reach-1	9917.66*	PF 3	600.00	8.41	11.44	10.28	11.44	0.000393	1.01	1194.41	945.25	0.12
Reach-1	9917.66*	PF 4	1000.00	8.41	12.58	10.49	12.58	0.000122	0.74	2452.83	1302.06	0.07
Reach-1	9917.66*	PF 5	1400.00	8.41	12.88	10.65	12.89	0.000151	0.87	2858.79	1383.83	0.08
Reach-1	9917.66*	PF#6	1600.00	8.41	12.99	10.71	13.00	0.000169	0.94	3012.16	1420.73	0.08
Reach-1	9917.66*	PF#7	2000.00	8.41	13.22	10.83	13.23	0.000196	1.05	3344.23	1497.51	0.09
Reach-1	9917.66*	PF#8	2500.00	8.41	13.62	10.96	13.63	0.000186	1.09	3973.16	1631.69	0.09

HEC-RAS Plan: roadsm 11-9 River: RIVER:1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9866.33*	PF 1	300.00	8.36	10.70	9.88	10.71	0.000898	1.26	478.97	582.73	0.17
Reach-1	9866.33*	PF 2	500.00	8.36	11.09	10.12	11.10	0.000495	1.06	975.53	878.41	0.13
Reach-1	9866.33*	PF 3	600.00	8.36	11.42	10.18	11.43	0.000297	0.91	1281.16	961.84	0.10
Reach-1	9866.33*	PF 4	1000.00	8.36	12.58	10.41	12.58	0.000091	0.65	2551.11	1249.34	0.06
Reach-1	9866.33*	PF 5	1400.00	8.36	12.88	10.57	12.88	0.000118	0.78	2949.03	1380.77	0.07
Reach-1	9866.33*	PF#6	1600.00	8.36	12.99	10.63	12.99	0.000133	0.85	3100.95	1417.32	0.08
Reach-1	9866.33*	PF#7	2000.00	8.36	13.21	10.75	13.22	0.000155	0.95	3430.82	1495.40	0.08
Reach-1	9866.33*	PF#8	2500.00	8.36	13.61	10.85	13.62	0.000149	0.99	4060.15	1633.98	0.08
Reach-1	9815	PF 1	300.00	8.31	10.66	9.81	10.67	0.000716	1.16	500.44	585.71	0.15
Reach-1	9815	PF 2	500.00	8.31	11.07	10.03	11.08	0.000365	0.94	1059.00	896.47	0.11
Reach-1	9815	PF 3	600.00	8.31	11.41	10.09	11.42	0.000220	0.81	1377.54	979.49	0.09
Reach-1	9815	PF 4	1000.00	8.31	12.57	10.32	12.57	0.000070	0.58	2672.71	1247.96	0.05
Reach-1	9815	PF 5	1400.00	8.31	12.87	10.48	12.88	0.000088	0.69	3057.92	1327.51	0.06
Reach-1	9815	PF#6	1600.00	8.31	12.98	10.55	12.99	0.000100	0.75	3204.22	1379.65	0.07
Reach-1	9815	PF#7	2000.00	8.31	13.21	10.66	13.21	0.000122	0.86	3527.85	1482.52	0.07
Reach-1	9815	PF#8	2500.00	8.31	13.61	10.74	13.62	0.000118	0.90	4153.83	1628.95	0.07
Reach-1	9763.*	PF 1	300.00	6.89	10.64	9.48	10.65	0.000489	0.95	562.84	641.97	0.13
Reach-1	9763.*	PF 2	500.00	6.89	11.05	9.71	11.06	0.000462	1.05	850.50	737.61	0.13
Reach-1	9763.*	PF 3	600.00	6.89	11.40	9.84	11.41	0.000214	0.79	1552.77	1159.15	0.09
Reach-1	9763.*	PF 4	1000.00	6.89	12.57	10.13	12.57	0.000086	0.65	3067.63	1459.03	0.06
Reach-1	9763.*	PF 5	1400.00	6.89	12.87	10.32	12.87	0.000118	0.80	3526.54	1604.57	0.07
Reach-1	9763.*	PF#6	1600.00	6.89	12.98	10.37	12.98	0.000137	0.85	3701.49	1647.00	0.08
Reach-1	9763.*	PF#7	2000.00	6.89	13.20	10.53	13.21	0.000164	0.99	4080.26	1723.38	0.08
Reach-1	9763.*	PF#8	2500.00	6.89	13.60	10.71	13.61	0.000163	1.05	4802.23	1861.06	0.09
Reach-1	9711	PF 1	300.00	5.47	10.63	8.71	10.63	0.000268	0.85	655.38	596.67	0.10
Reach-1	9711	PF 2	500.00	5.47	11.04	9.15	11.04	0.000374	0.93	928.04	731.45	0.11
Reach-1	9711	PF 3	600.00	5.47	11.39	9.34	11.40	0.000276	0.88	1205.13	828.76	0.10
Reach-1	9711	PF 4	1000.00	5.47	12.57	9.76	12.57	0.000074	0.59	3550.76	1636.00	0.05
Reach-1	9711	PF 5	1400.00	5.47	12.86	10.03	12.87	0.000106	0.74	4064.67	1825.30	0.07
Reach-1	9711	PF#6	1600.00	5.47	12.97	10.11	12.98	0.000122	0.82	4262.23	1870.67	0.07
Reach-1	9711	PF#7	2000.00	5.47	13.20	10.29	13.20	0.000147	0.93	4689.42	1947.59	0.08
Reach-1	9711	PF#8	2500.00	5.47	13.60	10.73	13.60	0.000149	0.99	5501.87	2077.33	0.08
Reach-1	9700		Bridge									
Reach-1	9660	PF 1	300.00	7.42	10.48	8.52	10.48	0.000117	0.51	992.26	612.22	0.06
Reach-1	9660	PF 2	500.00	7.42	10.75	8.68	10.76	0.000205	0.73	1163.69	643.34	0.09
Reach-1	9660	PF 3	600.00	7.42	11.14	8.74	11.15	0.000166	0.72	1423.14	690.50	0.08
Reach-1	9660	PF 4	1000.00	7.42	12.06	8.95	12.06	0.000078	0.60	3526.27	1653.64	0.06
Reach-1	9660	PF 5	1400.00	7.42	12.12	9.14	12.12	0.000143	0.81	3616.86	1668.07	0.08
Reach-1	9660	PF#6	1600.00	7.42	12.15	9.19	12.15	0.000179	0.92	3670.72	1677.32	0.09
Reach-1	9660	PF#7	2000.00	7.42	12.22	9.37	12.23	0.000256	1.11	3791.41	1697.86	0.10
Reach-1	9660	PF#8	2500.00	7.42	12.32	9.57	12.33	0.000354	1.33	3961.84	1726.44	0.12
Reach-1	9637.5*	PF 1	300.00	7.41	10.47	8.71	10.48	0.000193	0.63	876.20	577.47	0.08
Reach-1	9637.5*	PF 2	500.00	7.41	10.74	8.89	10.75	0.000332	0.90	1034.33	601.58	0.11
Reach-1	9637.5*	PF 3	600.00	7.41	11.13	8.96	11.14	0.000261	0.88	1283.26	679.51	0.10
Reach-1	9637.5*	PF 4	1000.00	7.41	12.06	9.20	12.06	0.000107	0.69	3278.91	1617.69	0.07
Reach-1	9637.5*	PF 5	1400.00	7.41	12.11	9.35	12.12	0.000195	0.94	3363.13	1629.35	0.09
Reach-1	9637.5*	PF#6	1600.00	7.41	12.14	9.46	12.15	0.000244	1.06	3413.22	1634.91	0.10
Reach-1	9637.5*	PF#7	2000.00	7.41	12.21	9.65	12.22	0.000348	1.28	3525.35	1647.28	0.12
Reach-1	9637.5*	PF#8	2500.00	7.41	12.30	9.83	12.32	0.000480	1.53	3683.45	1665.11	0.14
Reach-1	9615.*	PF 1	300.00	7.40	10.46	8.89	10.47	0.000269	0.72	765.61	541.69	0.09
Reach-1	9615.*	PF 2	500.00	7.40	10.73	9.06	10.73	0.000454	1.02	910.02	560.88	0.13
Reach-1	9615.*	PF 3	600.00	7.40	11.12	9.12	11.13	0.000344	0.99	1154.85	708.25	0.11
Reach-1	9615.*	PF 4	1000.00	7.40	12.05	9.36	12.06	0.000127	0.74	3054.87	1556.93	0.07
Reach-1	9615.*	PF 5	1400.00	7.40	12.10	9.54	12.11	0.000233	1.01	3130.98	1566.23	0.10
Reach-1	9615.*	PF#6	1600.00	7.40	12.13	9.64	12.14	0.000292	1.14	3176.40	1571.76	0.11
Reach-1	9615.*	PF#7	2000.00	7.40	12.20	9.81	12.21	0.000416	1.38	3278.37	1584.09	0.13
Reach-1	9615.*	PF#8	2500.00	7.40	12.29	10.02	12.30	0.000575	1.65	3422.91	1601.41	0.15
Reach-1	9592.5*	PF 1	300.00	7.39	10.45	9.05	10.46	0.000385	0.84	660.15	505.91	0.11
Reach-1	9592.5*	PF 2	500.00	7.39	10.71	9.23	10.72	0.000641	1.17	792.84	556.07	0.15
Reach-1	9592.5*	PF 3	600.00	7.39	11.11	9.30	11.12	0.000454	1.10	1064.83	781.62	0.13
Reach-1	9592.5*	PF 4	1000.00	7.39	12.05	9.53	12.05	0.000151	0.80	2849.32	1498.69	0.08
Reach-1	9592.5*	PF 5	1400.00	7.39	12.09	9.71	12.10	0.000277	1.09	2916.95	1507.38	0.11
Reach-1	9592.5*	PF#6	1600.00	7.39	12.12	9.81	12.13	0.000347	1.23	2957.47	1512.56	0.12
Reach-1	9592.5*	PF#7	2000.00	7.39	12.18	10.01	12.19	0.000496	1.49	3048.78	1524.17	0.14
Reach-1	9592.5*	PF#8	2500.00	7.39	12.27	10.22	12.28	0.000890	1.78	3178.96	1540.57	0.17
Reach-1	9570.*	PF 1	300.00	7.37	10.43	9.19	10.44	0.000590	0.99	558.46	490.02	0.14

HFC-RAS Plan: roadsm_11-9 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9570.*	PF 2	500.00	7.37	10.68	9.42	10.69	0.000944	1.37	694.99	653.51	0.18
Reach-1	9570.*	PF 3	600.00	7.37	11.09	9.47	11.10	0.000390	1.00	1388.77	1246.43	0.12
Reach-1	9570.*	PF 4	1000.00	7.37	12.04	9.69	12.05	0.000179	0.86	2677.02	1506.44	0.08
Reach-1	9570.*	PF 5	1400.00	7.37	12.08	9.91	12.09	0.000336	1.18	2738.45	1566.37	0.12
Reach-1	9570.*	PF#6	1600.00	7.37	12.11	10.03	12.12	0.000427	1.34	2776.80	1604.17	0.13
Reach-1	9570.*	PF#7	2000.00	7.37	12.16	10.20	12.18	0.000614	1.63	2865.06	1628.91	0.16
Reach-1	9570.*	PF#8	2500.00	7.37	12.24	10.39	12.26	0.000853	1.95	2993.10	1656.33	0.19
Reach-1	9547.5*	PF 1	300.00	7.36	10.41	9.35	10.42	0.000944	1.20	478.89	591.58	0.17
Reach-1	9547.5*	PF 2	500.00	7.36	10.63	9.64	10.65	0.001408	1.59	619.77	651.56	0.21
Reach-1	9547.5*	PF 3	600.00	7.36	11.08	9.72	11.09	0.000504	1.11	1272.02	1249.62	0.13
Reach-1	9547.5*	PF 4	1000.00	7.36	12.04	9.87	12.04	0.000196	0.88	2629.65	1544.96	0.09
Reach-1	9547.5*	PF 5	1400.00	7.36	12.07	10.12	12.08	0.000361	1.20	2684.37	1548.96	0.12
Reach-1	9547.5*	PF#6	1600.00	7.36	12.10	10.23	12.10	0.000454	1.35	2717.39	1551.37	0.13
Reach-1	9547.5*	PF#7	2000.00	7.36	12.14	10.43	12.16	0.000654	1.64	2792.86	1556.86	0.16
Reach-1	9547.5*	PF#8	2500.00	7.36	12.21	10.60	12.23	0.000911	1.97	2902.38	1564.80	0.19
Reach-1	9525	PF 1	300.00	7.35	10.36	9.54	10.37	0.001603	1.46	417.34	595.39	0.22
Reach-1	9525	PF 2	500.00	7.35	10.56	9.73	10.58	0.002281	1.89	545.32	651.36	0.26
Reach-1	9525	PF 3	600.00	7.35	11.06	9.94	11.07	0.000672	1.23	1222.07	1377.04	0.15
Reach-1	9525	PF 4	1000.00	7.35	12.03	10.16	12.04	0.000195	0.85	2592.08	1444.57	0.09
Reach-1	9525	PF 5	1400.00	7.35	12.06	10.33	12.07	0.000365	1.18	2635.62	1451.17	0.12
Reach-1	9525	PF#6	1600.00	7.35	12.08	10.40	12.09	0.000463	1.33	2662.12	1455.17	0.13
Reach-1	9525	PF#7	2000.00	7.35	12.12	10.53	12.13	0.000676	1.62	2723.33	1464.38	0.16
Reach-1	9525	PF#8	2500.00	7.35	12.18	10.66	12.20	0.000959	1.95	2813.60	1477.85	0.19
Reach-1	9473.33*	PF 1	300.00	7.34	10.27	9.57	10.28	0.001861	1.58	412.51	600.81	0.23
Reach-1	9473.33*	PF 2	500.00	7.34	10.42	9.73	10.45	0.003002	2.14	509.18	640.53	0.30
Reach-1	9473.33*	PF 3	600.00	7.34	11.03	9.81	11.04	0.000427	1.00	1519.79	1450.45	0.12
Reach-1	9473.33*	PF 4	1000.00	7.34	12.02	10.13	12.03	0.000149	0.76	3052.90	1622.15	0.08
Reach-1	9473.33*	PF 5	1400.00	7.34	12.05	10.28	12.05	0.000282	1.05	3090.22	1624.02	0.10
Reach-1	9473.33*	PF#6	1600.00	7.34	12.06	10.35	12.07	0.000360	1.19	3113.09	1625.16	0.12
Reach-1	9473.33*	PF#7	2000.00	7.34	12.09	10.45	12.10	0.000533	1.46	3166.58	1626.76	0.14
Reach-1	9473.33*	PF#8	2500.00	7.34	12.14	10.45	12.16	0.000768	1.77	3246.39	1627.13	0.17
Reach-1	9421.66*	PF 1	300.00	7.34	10.16	9.75	10.17	0.002308	1.76	397.86	605.27	0.26
Reach-1	9421.66*	PF 2	500.00	7.34	10.35	9.83	10.36	0.001013	1.26	1024.26	1284.71	0.18
Reach-1	9421.66*	PF 3	600.00	7.34	11.02	9.89	11.02	0.000237	0.77	1985.51	1629.83	0.09
Reach-1	9421.66*	PF 4	1000.00	7.34	12.02	10.08	12.02	0.000097	0.63	3633.72	1675.16	0.06
Reach-1	9421.66*	PF 5	1400.00	7.34	12.04	10.29	12.04	0.000186	0.87	3664.09	1675.31	0.09
Reach-1	9421.66*	PF#6	1600.00	7.34	12.05	10.29	12.05	0.000238	0.99	3682.81	1675.40	0.10
Reach-1	9421.66*	PF#7	2000.00	7.34	12.07	10.29	12.08	0.000358	1.22	3726.94	1675.62	0.12
Reach-1	9421.66*	PF#8	2500.00	7.34	12.11	10.29	12.12	0.000529	1.50	3793.76	1675.95	0.14
Reach-1	9370.*	PF 1	300.00	7.33	10.00	9.65	10.03	0.003375	2.11	360.53	604.75	0.32
Reach-1	9370.*	PF 2	500.00	7.33	10.01	9.79	10.08	0.009171	3.48	363.61	606.03	0.52
Reach-1	9370.*	PF 3	600.00	7.33	11.01	9.85	11.02	0.000109	0.54	2575.76	1678.57	0.06
Reach-1	9370.*	PF 4	1000.00	7.33	12.02	10.02	12.02	0.000062	0.52	4285.32	1729.83	0.05
Reach-1	9370.*	PF 5	1400.00	7.33	12.03	10.12	12.03	0.000119	0.72	4311.21	1729.97	0.07
Reach-1	9370.*	PF#6	1600.00	7.33	12.04	10.12	12.04	0.000154	0.82	4327.24	1730.06	0.08
Reach-1	9370.*	PF#7	2000.00	7.33	12.06	10.12	12.07	0.000234	1.01	4365.21	1730.26	0.10
Reach-1	9370.*	PF#8	2500.00	7.33	12.10	10.12	12.10	0.000350	1.25	4423.19	1730.57	0.12
Reach-1	9318.33*	PF 1	300.00	7.32	10.01	9.61	10.01	0.000084	0.36	1674.84	1430.36	0.05
Reach-1	9318.33*	PF 2	500.00	7.32	10.02	9.77	10.02	0.000227	0.59	1693.40	1432.60	0.08
Reach-1	9318.33*	PF 3	600.00	7.32	11.01	9.81	11.01	0.000053	0.40	3239.78	1732.43	0.04
Reach-1	9318.33*	PF 4	1000.00	7.32	12.01	9.95	12.01	0.000039	0.43	5006.32	1780.87	0.04
Reach-1	9318.33*	PF 5	1400.00	7.32	12.03	9.95	12.03	0.000076	0.59	5029.39	1780.99	0.06
Reach-1	9318.33*	PF#6	1600.00	7.32	12.03	9.95	12.04	0.000098	0.68	5043.71	1781.05	0.06
Reach-1	9318.33*	PF#7	2000.00	7.32	12.05	9.95	12.06	0.000150	0.84	5077.72	1781.19	0.08
Reach-1	9318.33*	PF#8	2500.00	7.32	12.08	9.95	12.09	0.000228	1.04	5129.92	1781.40	0.10
Reach-1	9266.66*	PF 1	300.00	7.32	10.01	9.56	10.01	0.000029	0.23	2341.78	1496.11	0.03
Reach-1	9266.66*	PF 2	500.00	7.32	10.02	9.69	10.02	0.000079	0.38	2356.27	1497.59	0.05
Reach-1	9266.66*	PF 3	600.00	7.32	11.01	9.79	11.01	0.000028	0.30	3975.93	1782.01	0.03
Reach-1	9266.66*	PF 4	1000.00	7.32	12.01	9.79	12.01	0.000025	0.35	5794.47	1828.51	0.03
Reach-1	9266.66*	PF 5	1400.00	7.32	12.02	9.79	12.02	0.000049	0.49	5815.83	1828.59	0.04
Reach-1	9266.66*	PF#6	1600.00	7.32	12.03	9.79	12.03	0.000063	0.56	5829.10	1828.64	0.05
Reach-1	9266.66*	PF#7	2000.00	7.32	12.05	9.79	12.05	0.000097	0.70	5860.68	1828.75	0.06
Reach-1	9266.66*	PF#8	2500.00	7.32	12.08	9.79	12.08	0.000148	0.87	5909.29	1828.92	0.08
Reach-1	9215	PF 1	300.00	7.31	10.00	9.48	10.00	0.000012	0.16	3078.83	1558.29	0.02
Reach-1	9215	PF 2	500.00	7.31	10.01	9.63	10.01	0.000033	0.27	3091.93	1560.57	0.03
Reach-1	9215	PF 3	600.00	7.31	11.01	9.62	11.01	0.000015	0.24	4779.05	1828.73	0.02
Reach-1	9215	PF 4	1000.00	7.31	12.01	9.62	12.01	0.000016	0.30	6847.06	1875.29	0.03
Reach-1	9215	PF 5	1400.00	7.31	12.02	9.62	12.02	0.000032	0.41	6867.43	1875.56	0.04

HEC-RAS Plan: roadsm_11-9 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9215	PF#6	1600.00	7.31	12.03	9.62	12.03	0.000041	0.47	6680.10	1875.73	0.04
Reach-1	9215	PF#7	2000.00	7.31	12.05	9.62	12.05	0.000064	0.59	6710.29	1876.13	0.05
Reach-1	9215	PF#8	2500.00	7.31	12.07	9.62	12.07	0.000098	0.73	6756.82	1876.75	0.06
Reach-1	9169.99*	PF 1	300.00	7.01	10.00	9.32	10.00	0.000010	0.15	3322.94	1585.02	0.02
Reach-1	9169.99*	PF 2	500.00	7.01	10.01	9.50	10.01	0.000027	0.25	3335.26	1587.13	0.03
Reach-1	9169.99*	PF 3	600.00	7.01	11.01	9.50	11.01	0.000013	0.22	5044.29	1849.42	0.02
Reach-1	9169.99*	PF 4	1000.00	7.01	12.01	9.50	12.01	0.000014	0.28	6936.59	1903.64	0.02
Reach-1	9169.99*	PF 5	1400.00	7.01	12.02	9.50	12.02	0.000028	0.39	6956.27	1903.83	0.03
Reach-1	9169.99*	PF#6	1600.00	7.01	12.03	9.50	12.03	0.000037	0.44	6968.51	1903.95	0.04
Reach-1	9169.99*	PF#7	2000.00	7.01	12.04	9.50	12.04	0.000057	0.55	6997.69	1904.25	0.05
Reach-1	9169.99*	PF#8	2500.00	7.01	12.07	9.50	12.07	0.000087	0.68	7042.71	1904.77	0.06
Reach-1	9124.99*	PF 1	300.00	6.72	10.00	9.15	10.00	0.000008	0.14	3570.38	1612.45	0.02
Reach-1	9124.99*	PF 2	500.00	6.72	10.01	9.29	10.01	0.000022	0.23	3582.07	1614.45	0.03
Reach-1	9124.99*	PF 3	600.00	6.72	11.01	9.38	11.01	0.000011	0.20	5312.96	1870.65	0.02
Reach-1	9124.99*	PF 4	1000.00	6.72	12.01	9.37	12.01	0.000013	0.26	7231.52	1930.04	0.02
Reach-1	9124.99*	PF 5	1400.00	6.72	12.02	9.37	12.02	0.000025	0.36	7250.57	1930.24	0.03
Reach-1	9124.99*	PF#6	1600.00	6.72	12.03	9.37	12.03	0.000033	0.41	7282.43	1930.36	0.03
Reach-1	9124.99*	PF#7	2000.00	6.72	12.04	9.37	12.04	0.000050	0.51	7290.69	1930.66	0.04
Reach-1	9124.99*	PF#8	2500.00	6.72	12.06	9.37	12.07	0.000077	0.64	7334.33	1931.12	0.05
Reach-1	9079.99*	PF 1	300.00	6.42	10.00	8.90	10.00	0.000007	0.13	3821.39	1642.44	0.01
Reach-1	9079.99*	PF 2	500.00	6.42	10.01	9.11	10.01	0.000018	0.21	3832.58	1644.30	0.02
Reach-1	9079.99*	PF 3	600.00	6.42	11.01	9.17	11.01	0.000010	0.19	5586.62	1896.39	0.02
Reach-1	9079.99*	PF 4	1000.00	6.42	12.01	9.25	12.01	0.000011	0.24	7531.57	1954.48	0.02
Reach-1	9079.99*	PF 5	1400.00	6.42	12.02	9.25	12.02	0.000022	0.34	7550.05	1954.57	0.03
Reach-1	9079.99*	PF#6	1600.00	6.42	12.03	9.25	12.03	0.000029	0.39	7561.55	1954.62	0.03
Reach-1	9079.99*	PF#7	2000.00	6.42	12.04	9.25	12.04	0.000045	0.49	7588.97	1954.75	0.04
Reach-1	9079.99*	PF#8	2500.00	6.42	12.06	9.25	12.06	0.000069	0.60	7631.33	1954.96	0.05
Reach-1	9034.99*	PF 1	300.00	6.13	10.00	8.57	10.00	0.000006	0.12	4081.32	1670.12	0.01
Reach-1	9034.99*	PF 2	500.00	6.13	10.01	8.86	10.01	0.000015	0.20	4092.09	1671.87	0.02
Reach-1	9034.99*	PF 3	600.00	6.13	11.01	8.95	11.01	0.000008	0.18	5889.85	1919.77	0.02
Reach-1	9034.99*	PF 4	1000.00	6.13	12.01	9.12	12.01	0.000010	0.23	7839.56	1975.48	0.02
Reach-1	9034.99*	PF 5	1400.00	6.13	12.02	9.12	12.02	0.000020	0.32	7857.50	1975.55	0.03
Reach-1	9034.99*	PF#6	1600.00	6.13	12.02	9.12	12.02	0.000026	0.37	7868.67	1975.59	0.03
Reach-1	9034.99*	PF#7	2000.00	6.13	12.04	9.12	12.04	0.000040	0.46	7895.31	1975.68	0.04
Reach-1	9034.99*	PF#8	2500.00	6.13	12.06	9.12	12.06	0.000061	0.57	7936.49	1975.84	0.05
Reach-1	8989.99*	PF 1	300.00	5.83	10.00	8.25	10.00	0.000005	0.11	4350.09	1702.39	0.01
Reach-1	8989.99*	PF 2	500.00	5.83	10.01	8.61	10.01	0.000013	0.19	4360.55	1704.08	0.02
Reach-1	8989.99*	PF 3	600.00	5.83	11.01	8.70	11.01	0.000007	0.17	6161.37	1944.00	0.02
Reach-1	8989.99*	PF 4	1000.00	5.83	12.01	9.00	12.01	0.000009	0.22	8154.53	1995.85	0.02
Reach-1	8989.99*	PF 5	1400.00	5.83	12.02	9.00	12.02	0.000017	0.31	8171.99	1995.91	0.02
Reach-1	8989.99*	PF#6	1600.00	5.83	12.02	9.00	12.02	0.000023	0.35	8182.86	1995.95	0.03
Reach-1	8989.99*	PF#7	2000.00	5.83	12.04	9.00	12.04	0.000035	0.44	8208.81	1996.05	0.03
Reach-1	8989.99*	PF#8	2500.00	5.83	12.06	9.00	12.06	0.000054	0.55	8248.95	1996.20	0.04
Reach-1	8944.99*	PF 1	300.00	5.54	10.00	7.94	10.00	0.000004	0.11	4623.47	1731.66	0.01
Reach-1	8944.99*	PF 2	500.00	5.54	10.01	8.30	10.01	0.000011	0.18	4633.65	1733.29	0.02
Reach-1	8944.99*	PF 3	600.00	5.54	11.01	8.44	11.01	0.000006	0.16	6456.54	1967.09	0.01
Reach-1	8944.99*	PF 4	1000.00	5.54	12.01	8.73	12.01	0.000008	0.21	8471.37	2015.99	0.02
Reach-1	8944.99*	PF 5	1400.00	5.54	12.02	8.87	12.02	0.000016	0.29	8488.42	2016.04	0.02
Reach-1	8944.99*	PF#6	1600.00	5.54	12.02	8.87	12.02	0.000020	0.34	8499.03	2016.08	0.03
Reach-1	8944.99*	PF#7	2000.00	5.54	12.04	8.87	12.04	0.000031	0.42	8524.38	2016.16	0.03
Reach-1	8944.99*	PF#8	2500.00	5.54	12.05	8.87	12.06	0.000048	0.52	8563.59	2016.29	0.04
Reach-1	8899.99*	PF 1	300.00	5.24	10.00	7.66	10.00	0.000003	0.10	4900.14	1762.05	0.01
Reach-1	8899.99*	PF 2	500.00	5.24	10.01	8.01	10.01	0.000009	0.17	4910.12	1763.67	0.02
Reach-1	8899.99*	PF 3	600.00	5.24	11.01	8.13	11.01	0.000005	0.16	6754.08	1987.57	0.01
Reach-1	8899.99*	PF 4	1000.00	5.24	12.01	8.48	12.01	0.000007	0.20	8790.17	2035.89	0.02
Reach-1	8899.99*	PF 5	1400.00	5.24	12.02	8.75	12.02	0.000014	0.28	8806.86	2035.94	0.02
Reach-1	8899.99*	PF#6	1600.00	5.24	12.02	8.75	12.02	0.000018	0.32	8817.25	2035.97	0.02
Reach-1	8899.99*	PF#7	2000.00	5.24	12.03	8.75	12.03	0.000028	0.40	8842.05	2036.04	0.03
Reach-1	8899.99*	PF#8	2500.00	5.24	12.05	8.75	12.05	0.000043	0.50	8880.45	2036.16	0.04
Reach-1	8854.99*	PF 1	300.00	4.95	10.00	7.39	10.00	0.000003	0.10	5185.81	1790.80	0.01
Reach-1	8854.99*	PF 2	500.00	4.95	10.01	7.73	10.01	0.000006	0.16	5195.61	1792.30	0.02
Reach-1	8854.99*	PF 3	600.00	4.95	11.01	7.85	11.01	0.000005	0.15	7059.17	2008.86	0.01
Reach-1	8854.99*	PF 4	1000.00	4.95	12.01	8.23	12.01	0.000006	0.19	9116.15	2055.55	0.01
Reach-1	8854.99*	PF 5	1400.00	4.95	12.02	8.45	12.02	0.000012	0.27	9132.51	2055.59	0.02
Reach-1	8854.99*	PF#6	1600.00	4.95	12.02	8.62	12.02	0.000016	0.31	9142.70	2055.62	0.02
Reach-1	8854.99*	PF#7	2000.00	4.95	12.03	8.62	12.03	0.000025	0.39	9167.04	2055.68	0.03
Reach-1	8854.99*	PF#8	2500.00	4.95	12.05	8.62	12.05	0.000038	0.48	9204.72	2055.78	0.04

HFC-RAS Plan: roadsm 11.9 River: RIVER_1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	8810	PF 1	300.00	4.65	10.00	7.13	10.00	0.000003	0.09	5475.34	1820.39	0.01
Reach-1	8810	PF 2	500.00	4.65	10.01	7.47	10.01	0.000007	0.16	5485.00	1821.08	0.01
Reach-1	8810	PF 3	600.00	4.65	11.01	7.59	11.01	0.000004	0.15	7368.50	2070.03	0.01
Reach-1	8810	PF 4	1000.00	4.65	12.01	8.03	12.01	0.000006	0.19	9444.21	2075.11	0.01
Reach-1	8810	PF 5	1400.00	4.65	12.02	8.27	12.02	0.000012	0.27	9460.26	2075.21	0.02
Reach-1	8810	PF#6	1600.00	4.65	12.02	8.39	12.02	0.000015	0.31	9470.26	2075.27	0.02
Reach-1	8810	PF#7	2000.00	4.65	12.03	8.50	12.03	0.000024	0.38	9494.14	2075.42	0.03
Reach-1	8810	PF#8	2500.00	4.65	12.05	8.50	12.05	0.000037	0.48	9531.14	2075.65	0.04
Reach-1	8809	PF 1	300.00	7.00	10.00	7.47	10.00	0.000003	0.04	5422.47	1820.39	0.00
Reach-1	8809	PF 2	500.00	7.00	10.01	7.63	10.01	0.000008	0.07	5432.12	1821.08	0.01
Reach-1	8809	PF 3	600.00	7.00	11.01	7.69	11.01	0.000005	0.06	7313.63	2070.03	0.01
Reach-1	8809	PF 4	1000.00	7.00	12.01	7.92	12.01	0.000007	0.09	9391.34	2075.11	0.01
Reach-1	8809	PF 5	1400.00	7.00	12.02	8.12	12.02	0.000013	0.12	9407.41	2075.21	0.01
Reach-1	8809	PF#6	1600.00	7.00	12.02	8.20	12.02	0.000017	0.14	9417.41	2075.27	0.01
Reach-1	8809	PF#7	2000.00	7.00	12.03	8.34	12.03	0.000026	0.17	9441.31	2075.42	0.01
Reach-1	8809	PF#8	2500.00	7.00	12.05	8.50	12.05	0.000041	0.21	9478.32	2075.65	0.02
Reach-1	8609.*	PF 1	300.00	6.85	10.00	7.31	10.00	0.000002	0.04	5696.05	1839.82	0.00
Reach-1	8609.*	PF 2	500.00	6.85	10.01	7.47	10.01	0.000006	0.06	5704.15	1840.39	0.01
Reach-1	8609.*	PF 3	600.00	6.85	11.00	7.54	11.00	0.000004	0.06	7622.32	2070.77	0.01
Reach-1	8609.*	PF 4	1000.00	6.85	12.01	7.76	12.01	0.000006	0.08	9700.22	2077.04	0.01
Reach-1	8609.*	PF 5	1400.00	6.85	12.01	7.95	12.01	0.000011	0.12	9713.89	2077.13	0.01
Reach-1	8609.*	PF#6	1600.00	6.85	12.02	8.02	12.02	0.000015	0.13	9722.40	2077.18	0.01
Reach-1	8609.*	PF#7	2000.00	6.85	12.03	8.17	12.03	0.000023	0.17	9742.76	2077.31	0.01
Reach-1	8609.*	PF#8	2500.00	6.85	12.04	8.35	12.04	0.000035	0.21	9774.34	2077.50	0.02
Reach-1	8409.*	PF 1	300.00	6.70	10.00	7.16	10.00	0.000002	0.04	5972.68	1859.27	0.00
Reach-1	8409.*	PF 2	500.00	6.70	10.01	7.32	10.01	0.000006	0.07	5979.43	1859.74	0.01
Reach-1	8409.*	PF 3	600.00	6.70	11.00	7.39	11.00	0.000004	0.06	7931.37	2071.52	0.01
Reach-1	8409.*	PF 4	1000.00	6.70	12.01	7.61	12.01	0.000005	0.09	10009.68	2078.98	0.01
Reach-1	8409.*	PF 5	1400.00	6.70	12.01	7.80	12.01	0.000010	0.12	10021.23	2079.05	0.01
Reach-1	8409.*	PF#6	1600.00	6.70	12.01	7.88	12.02	0.000013	0.14	10028.42	2079.09	0.01
Reach-1	8409.*	PF#7	2000.00	6.70	12.02	8.02	12.02	0.000020	0.17	10045.64	2079.20	0.01
Reach-1	8409.*	PF#8	2500.00	6.70	12.04	8.20	12.04	0.000032	0.21	10072.39	2079.37	0.02
Reach-1	8209.*	PF 1	300.00	6.55	10.00	7.01	10.00	0.000002	0.04	6252.32	1876.72	0.00
Reach-1	8209.*	PF 2	500.00	6.55	10.00	7.17	10.00	0.000005	0.07	6257.88	1879.10	0.01
Reach-1	8209.*	PF 3	600.00	6.55	11.00	7.24	11.00	0.000003	0.06	8240.71	2072.27	0.01
Reach-1	8209.*	PF 4	1000.00	6.55	12.00	7.47	12.00	0.000005	0.09	10319.63	2080.91	0.01
Reach-1	8209.*	PF 5	1400.00	6.55	12.01	7.65	12.01	0.000009	0.12	10329.25	2080.97	0.01
Reach-1	8209.*	PF#6	1600.00	6.55	12.01	7.74	12.01	0.000012	0.14	10335.24	2081.01	0.01
Reach-1	8209.*	PF#7	2000.00	6.55	12.02	7.87	12.02	0.000019	0.18	10349.60	2081.10	0.01
Reach-1	8209.*	PF#8	2500.00	6.55	12.03	8.05	12.03	0.000029	0.22	10371.92	2081.24	0.02
Reach-1	8009.*	PF 1	300.00	6.40	10.00	6.86	10.00	0.000002	0.04	6534.96	1898.17	0.00
Reach-1	8009.*	PF 2	500.00	6.40	10.00	7.02	10.00	0.000004	0.07	6539.45	1898.48	0.01
Reach-1	8009.*	PF 3	600.00	6.40	11.00	7.09	11.00	0.000003	0.07	8550.32	2073.01	0.01
Reach-1	8009.*	PF 4	1000.00	6.40	12.00	7.32	12.00	0.000004	0.09	10630.07	2082.85	0.01
Reach-1	8009.*	PF 5	1400.00	6.40	12.01	7.51	12.01	0.000008	0.13	10637.92	2082.90	0.01
Reach-1	8009.*	PF#6	1600.00	6.40	12.01	7.59	12.01	0.000011	0.14	10642.82	2082.93	0.01
Reach-1	8009.*	PF#7	2000.00	6.40	12.02	7.73	12.02	0.000017	0.18	10654.55	2083.00	0.01
Reach-1	8009.*	PF#8	2500.00	6.40	12.02	7.90	12.03	0.000026	0.23	10672.82	2083.12	0.02
Reach-1	7809.*	PF 1	300.00	6.25	10.00	6.72	10.00	0.000001	0.04	6820.58	1917.64	0.00
Reach-1	7809.*	PF 2	500.00	6.25	10.00	6.88	10.00	0.000004	0.07	6824.13	1917.88	0.01
Reach-1	7809.*	PF 3	600.00	6.25	11.00	6.94	11.00	0.000003	0.07	8860.18	2073.76	0.01
Reach-1	7809.*	PF 4	1000.00	6.25	12.00	7.17	12.00	0.000004	0.09	10940.95	2084.79	0.01
Reach-1	7809.*	PF 5	1400.00	6.25	12.01	7.37	12.01	0.000008	0.13	10947.19	2084.83	0.01
Reach-1	7809.*	PF#6	1600.00	6.25	12.01	7.45	12.01	0.000010	0.15	10951.09	2084.85	0.01
Reach-1	7809.*	PF#7	2000.00	6.25	12.01	7.59	12.01	0.000016	0.19	10960.43	2084.91	0.01
Reach-1	7809.*	PF#8	2500.00	6.25	12.02	7.75	12.02	0.000024	0.23	10974.99	2085.00	0.02
Reach-1	7609.*	PF 1	300.00	6.10	10.00	6.57	10.00	0.000001	0.04	7109.19	1937.10	0.00
Reach-1	7609.*	PF 2	500.00	6.10	10.00	6.73	10.00	0.000003	0.07	7111.88	1937.28	0.01
Reach-1	7609.*	PF 3	600.00	6.10	11.00	6.80	11.00	0.000002	0.07	9170.27	2074.51	0.01
Reach-1	7609.*	PF 4	1000.00	6.10	12.00	7.02	12.00	0.000004	0.10	11252.27	2086.73	0.01
Reach-1	7609.*	PF 5	1400.00	6.10	12.00	7.23	12.00	0.000007	0.14	11257.04	2086.76	0.01
Reach-1	7609.*	PF#6	1600.00	6.10	12.01	7.31	12.01	0.000009	0.16	11260.02	2086.78	0.01
Reach-1	7609.*	PF#7	2000.00	6.10	12.01	7.45	12.01	0.000014	0.20	11267.17	2086.82	0.01
Reach-1	7609.*	PF#8	2500.00	6.10	12.01	7.60	12.02	0.000022	0.24	11278.32	2086.89	0.02
Reach-1	7409.*	PF 1	300.00	5.95	10.00	6.42	10.00	0.000001	0.05	7406.67	2070.25	0.00
Reach-1	7409.*	PF 2	500.00	5.95	10.00	6.59	10.00	0.000003	0.08	7408.70	2070.26	0.01
Reach-1	7409.*	PF 3	600.00	5.95	11.00	6.66	11.00	0.000002	0.07	9480.58	2075.66	0.01
Reach-1	7409.*	PF 4	1000.00	5.95	12.00	6.89	12.00	0.000003	0.10	11564.01	2088.52	0.01

HEC-RAS Plan: roadsm 11-9 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chi
Reach-1	7409.*	PF 5	1400.00	5.95	12.00	7.09	12.00	0.000006	0.14	11567.44	2088.53	0.01
Reach-1	7409.*	PF#6	1600.00	5.95	12.00	7.17	12.00	0.000008	0.16	11569.58	2088.54	0.01
Reach-1	7409.*	PF#7	2000.00	5.95	12.01	7.31	12.01	0.000013	0.21	11574.72	2088.57	0.01
Reach-1	7409.*	PF#8	2500.00	5.95	12.01	7.45	12.01	0.000020	0.26	11582.74	2088.61	0.02
Reach-1	7209.*	PF 1	300.00	5.80	10.00	6.28	10.00	0.000001	0.05	7716.84	2071.00	0.00
Reach-1	7209.*	PF 2	500.00	5.80	10.00	6.45	10.00	0.000003	0.08	7718.12	2071.00	0.01
Reach-1	7209.*	PF 3	600.00	5.80	11.00	6.52	11.00	0.000002	0.08	9791.24	2077.61	0.01
Reach-1	7209.*	PF 4	1000.00	5.80	12.00	6.75	12.00	0.000003	0.11	11876.12	2090.01	0.01
Reach-1	7209.*	PF 5	1400.00	5.80	12.00	6.96	12.00	0.000006	0.15	11878.31	2090.02	0.01
Reach-1	7209.*	PF#6	1600.00	5.80	12.00	7.04	12.00	0.000008	0.18	11879.69	2090.03	0.01
Reach-1	7209.*	PF#7	2000.00	5.80	12.00	7.18	12.00	0.000012	0.22	11882.99	2090.04	0.02
Reach-1	7209.*	PF#8	2500.00	5.80	12.01	7.30	12.01	0.000016	0.27	11888.13	2090.07	0.02
Reach-1	7009.*	PF 1	300.00	5.65	10.00	6.14	10.00	0.000001	0.05	8027.17	2071.75	0.00
Reach-1	7009.*	PF 2	500.00	5.65	10.00	6.31	10.00	0.000002	0.09	8027.79	2071.75	0.01
Reach-1	7009.*	PF 3	600.00	5.65	11.00	6.38	11.00	0.000002	0.08	10102.28	2079.55	0.01
Reach-1	7009.*	PF 4	1000.00	5.65	12.00	6.63	12.00	0.000003	0.12	12188.55	2091.51	0.01
Reach-1	7009.*	PF 5	1400.00	5.65	12.00	6.84	12.00	0.000005	0.17	12189.63	2091.51	0.01
Reach-1	7009.*	PF#6	1600.00	5.65	12.00	6.92	12.00	0.000007	0.19	12190.30	2091.51	0.01
Reach-1	7009.*	PF#7	2000.00	5.65	12.00	7.06	12.00	0.000011	0.24	12191.91	2091.52	0.02
Reach-1	7009.*	PF#8	2500.00	5.65	12.00	7.15	12.00	0.000017	0.30	12194.42	2091.53	0.02
Reach-1	6809	PF 1	300.00	5.50	10.00	6.04	10.00	0.000001	0.06	8337.65	2072.50	0.00
Reach-1	6809	PF 2	500.00	5.50	10.00	6.23	10.00	0.000002	0.10	8337.65	2072.50	0.01
Reach-1	6809	PF 3	600.00	5.50	11.00	6.31	11.00	0.000002	0.09	10413.65	2081.50	0.01
Reach-1	6809	PF 4	1000.00	5.50	12.00	6.61	12.00	0.000003	0.13	12501.28	2093.00	0.01
Reach-1	6809	PF 5	1400.00	5.50	12.00	6.80	12.00	0.000005	0.19	12501.28	2093.00	0.01
Reach-1	6809	PF#6	1600.00	5.50	12.00	6.89	12.00	0.000007	0.21	12501.28	2093.00	0.01
Reach-1	6809	PF#7	2000.00	5.50	12.00	7.00	12.00	0.000010	0.27	12501.28	2093.00	0.02
Reach-1	6809	PF#8	2500.00	5.50	12.00	7.00	12.00	0.000016	0.33	12501.28	2093.00	0.02

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10721	300.00	9.51	12.20	11.50	12.21	0.000064	0.35	896.83	901.55	0.05
Reach-1	10721	500.00	9.51	12.07	12.07	12.08	0.000266	0.69	779.13	855.38	0.09
Reach-1	10721	600.00	9.51	12.07	12.07	12.08	0.000383	0.83	779.10	855.37	0.11
Reach-1	10721	1000.00	9.51	12.75	12.07	12.75	0.000139	0.61	1629.18	1231.07	0.07
Reach-1	10721	1400.00	9.51	13.24	12.07	13.24	0.000097	0.58	2266.36	1318.14	0.06
Reach-1	10721	1600.00	9.51	13.48	12.07	13.49	0.000081	0.56	2583.16	1318.66	0.06
Reach-1	10721	2000.00	9.51	13.52	12.07	13.52	0.000119	0.68	2630.73	1318.74	0.07
Reach-1	10721	2500.00	9.51	13.85	12.07	13.86	0.000111	0.70	3070.72	1319.48	0.07
Reach-1	10671.6*	300.00	9.43	11.60	11.44	12.14	0.024547	5.90	50.83	35.14	0.86
Reach-1	10671.6*	500.00	9.43	11.99	11.99	12.00	0.000299	0.73	749.44	839.20	0.10
Reach-1	10671.6*	600.00	9.43	11.99	11.99	12.00	0.000431	0.87	749.41	839.19	0.12
Reach-1	10671.6*	1000.00	9.43	12.74	11.99	12.75	0.000141	0.62	1661.40	1239.88	0.07
Reach-1	10671.6*	1400.00	9.43	13.23	11.99	13.24	0.000099	0.59	2305.65	1328.55	0.06
Reach-1	10671.6*	1600.00	9.43	13.48	11.99	13.48	0.000083	0.57	2625.85	1329.11	0.06
Reach-1	10671.6*	2000.00	9.43	13.51	11.99	13.52	0.000123	0.70	2671.63	1329.19	0.07
Reach-1	10671.6*	2500.00	9.43	13.84	11.99	13.85	0.000114	0.72	3115.63	1329.97	0.07
Reach-1	10622.3*	300.00	9.35	11.96	11.39	11.96	0.000102	0.43	764.37	841.79	0.06
Reach-1	10622.3*	500.00	9.35	11.91	11.91	11.92	0.000336	0.76	722.16	827.73	0.10
Reach-1	10622.3*	600.00	9.35	11.91	11.91	11.92	0.000483	0.92	722.13	827.72	0.12
Reach-1	10622.3*	1000.00	9.35	12.74	11.91	12.74	0.000137	0.62	1696.58	1248.03	0.07
Reach-1	10622.3*	1400.00	9.35	13.23	11.91	13.24	0.000098	0.59	2347.66	1336.73	0.06
Reach-1	10622.3*	1600.00	9.35	13.47	11.91	13.48	0.000082	0.58	2671.23	1339.34	0.06
Reach-1	10622.3*	2000.00	9.35	13.50	11.91	13.51	0.000122	0.70	2715.06	1339.42	0.07
Reach-1	10622.3*	2500.00	9.35	13.84	11.91	13.85	0.000113	0.73	3162.97	1340.26	0.07
Reach-1	10572.9*	300.00	9.27	11.95	11.34	11.96	0.000089	0.41	801.74	854.37	0.05
Reach-1	10572.9*	500.00	9.27	11.83	11.83	11.83	0.000378	0.80	695.06	817.02	0.11
Reach-1	10572.9*	600.00	9.27	11.83	11.83	11.84	0.000544	0.97	695.03	817.01	0.13
Reach-1	10572.9*	1000.00	9.27	12.73	11.83	12.73	0.000129	0.61	1734.29	1252.55	0.07
Reach-1	10572.9*	1400.00	9.27	13.23	11.83	13.23	0.000094	0.59	2391.48	1348.60	0.06
Reach-1	10572.9*	1600.00	9.27	13.47	11.83	13.47	0.000080	0.57	2718.32	1349.26	0.06
Reach-1	10572.9*	2000.00	9.27	13.50	11.83	13.51	0.000118	0.70	2760.19	1349.34	0.07
Reach-1	10572.9*	2500.00	9.27	13.83	11.83	13.84	0.000110	0.72	3211.90	1350.26	0.07
Reach-1	10523.6*	300.00	9.19	11.95	11.28	11.95	0.000077	0.38	840.29	864.59	0.05
Reach-1	10523.6*	500.00	9.19	11.75	11.75	11.75	0.000419	0.84	669.16	802.59	0.12
Reach-1	10523.6*	600.00	9.19	11.75	11.75	11.77	0.000585	1.00	675.94	805.21	0.14
Reach-1	10523.6*	1000.00	9.19	12.72	11.75	12.73	0.000120	0.60	1779.59	1253.38	0.07
Reach-1	10523.6*	1400.00	9.19	13.22	11.75	13.23	0.000089	0.58	2439.36	1352.60	0.06
Reach-1	10523.6*	1600.00	9.19	13.47	11.75	13.47	0.000076	0.56	2768.25	1355.64	0.05
Reach-1	10523.6*	2000.00	9.19	13.49	11.75	13.50	0.000113	0.69	2808.13	1356.01	0.07
Reach-1	10523.6*	2500.00	9.19	13.83	11.75	13.84	0.000106	0.72	3263.03	1359.92	0.07
Reach-1	10474.3*	300.00	9.10	11.24	11.22	11.88	0.032399	6.42	46.72	34.89	0.98
Reach-1	10474.3*	500.00	9.10	11.66	11.66	11.67	0.000468	0.88	641.47	785.87	0.12
Reach-1	10474.3*	600.00	9.10	11.73	11.66	11.74	0.000536	0.96	693.55	806.46	0.13
Reach-1	10474.3*	1000.00	9.10	12.72	11.66	12.72	0.000111	0.59	1826.98	1258.59	0.06
Reach-1	10474.3*	1400.00	9.10	13.22	11.66	13.22	0.000084	0.57	2491.01	1357.97	0.06
Reach-1	10474.3*	1600.00	9.10	13.46	11.66	13.47	0.000072	0.56	2821.86	1360.34	0.05
Reach-1	10474.3*	2000.00	9.10	13.49	11.66	13.50	0.000107	0.68	2859.79	1360.61	0.07
Reach-1	10474.3*	2500.00	9.10	13.83	11.66	13.84	0.000102	0.71	3316.43	1363.87	0.06
Reach-1	10424.9*	300.00	9.02	11.65	11.15	11.66	0.000142	0.49	672.24	790.68	0.07
Reach-1	10424.9*	500.00	9.02	11.58	11.58	11.59	0.000505	0.91	618.26	768.16	0.13
Reach-1	10424.9*	600.00	9.02	11.71	11.58	11.72	0.000471	0.91	716.84	808.82	0.12
Reach-1	10424.9*	1000.00	9.02	12.71	11.58	12.72	0.000101	0.57	1882.24	1266.74	0.06
Reach-1	10424.9*	1400.00	9.02	13.22	11.58	13.22	0.000077	0.56	2551.53	1365.66	0.06
Reach-1	10424.9*	1600.00	9.02	13.46	11.58	13.46	0.000067	0.54	2884.86	1367.60	0.05
Reach-1	10424.9*	2000.00	9.02	13.49	11.58	13.49	0.000100	0.67	2921.02	1367.81	0.06
Reach-1	10424.9*	2500.00	9.02	13.82	11.58	13.83	0.000095	0.69	3380.30	1370.49	0.06
Reach-1	10375.6*	300.00	8.94	11.65	11.10	11.65	0.000118	0.46	707.13	796.34	0.06
Reach-1	10375.6*	500.00	8.94	11.50	11.50	11.51	0.000539	0.93	595.30	747.04	0.13
Reach-1	10375.6*	600.00	8.94	11.69	11.50	11.70	0.000411	0.86	741.24	810.78	0.11
Reach-1	10375.6*	1000.00	8.94	12.71	11.50	12.72	0.000091	0.55	1936.27	1275.10	0.06
Reach-1	10375.6*	1400.00	8.94	13.21	11.50	13.22	0.000072	0.54	2611.10	1374.69	0.05
Reach-1	10375.6*	1600.00	8.94	13.46	11.50	13.46	0.000062	0.53	2947.20	1376.34	0.05
Reach-1	10375.6*	2000.00	8.94	13.48	11.50	13.49	0.000093	0.65	2981.74	1376.51	0.06
Reach-1	10375.6*	2500.00	8.94	13.82	11.50	13.83	0.000090	0.68	3444.13	1378.78	0.06
Reach-1	10326.3*	300.00	8.86	11.64	11.04	11.65	0.000095	0.41	744.79	803.37	0.06
Reach-1	10326.3*	500.00	8.86	11.48	11.42	11.49	0.000447	0.85	619.46	746.45	0.12

HFC-RAS Plan: roadsm_12.4 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	10326.3*	600.00	8.86	11.67	11.42	11.68	0.000347	0.80	769.76	814.23	0.11
Reach-1	10326.3*	1000.00	8.86	12.71	11.42	12.71	0.000082	0.52	1993.28	1284.14	0.06
Reach-1	10326.3*	1400.00	8.86	13.21	11.42	13.21	0.000065	0.52	2673.82	1384.42	0.05
Reach-1	10326.3*	1600.00	8.86	13.45	11.42	13.46	0.000057	0.51	3012.80	1385.85	0.05
Reach-1	10326.3*	2000.00	8.86	13.48	11.42	13.49	0.000086	0.63	3045.83	1385.99	0.06
Reach-1	10326.3*	2500.00	8.86	13.81	11.42	13.82	0.000083	0.66	3511.58	1387.96	0.06
Reach-1	10277	300.00	8.78	11.64	10.98	11.64	0.000082	0.39	782.38	810.67	0.05
Reach-1	10277	500.00	8.78	11.46	11.34	11.47	0.000394	0.81	645.56	745.31	0.11
Reach-1	10277	600.00	8.78	11.66	11.34	11.67	0.000310	0.76	799.24	818.36	0.10
Reach-1	10277	1000.00	8.78	12.70	11.34	12.71	0.000076	0.51	2051.06	1293.72	0.05
Reach-1	10277	1400.00	8.78	13.21	11.34	13.21	0.000061	0.51	2737.45	1394.68	0.05
Reach-1	10277	1600.00	8.78	13.45	11.34	13.46	0.000054	0.50	3079.39	1395.95	0.05
Reach-1	10277	2000.00	8.78	13.47	11.34	13.48	0.000081	0.62	3111.04	1396.07	0.06
Reach-1	10277	2500.00	8.78	13.81	11.34	13.82	0.000078	0.65	3580.32	1397.81	0.06
Reach-1	10225.6*	300.00	8.73	11.63	10.92	11.64	0.000248	0.70	920.97	941.99	0.09
Reach-1	10225.6*	500.00	8.73	11.43	11.22	11.44	0.001364	1.54	663.03	740.35	0.21
Reach-1	10225.6*	600.00	8.73	11.64	11.22	11.65	0.000986	1.39	923.60	942.98	0.18
Reach-1	10225.6*	1000.00	8.73	12.70	11.22	12.70	0.000276	0.99	2114.04	1297.27	0.10
Reach-1	10225.6*	1400.00	8.73	13.20	11.22	13.21	0.000241	1.03	2809.25	1435.89	0.10
Reach-1	10225.6*	1600.00	8.73	13.45	11.22	13.45	0.000215	1.02	3162.39	1437.51	0.09
Reach-1	10225.6*	2000.00	8.73	13.47	11.24	13.48	0.000326	1.26	3191.66	1437.65	0.12
Reach-1	10225.6*	2500.00	8.73	13.80	11.36	13.81	0.000322	1.33	3675.54	1439.88	0.12
Reach-1	10174.3*	300.00	8.68	10.86	10.86	11.52	0.034055	6.54	45.85	34.40	1.00
Reach-1	10174.3*	500.00	8.68	11.37	11.10	11.38	0.001389	1.57	659.03	725.15	0.21
Reach-1	10174.3*	600.00	8.68	11.59	11.10	11.60	0.000941	1.39	942.10	947.93	0.18
Reach-1	10174.3*	1000.00	8.68	12.69	11.10	12.69	0.000250	0.96	2170.47	1298.71	0.10
Reach-1	10174.3*	1400.00	8.68	13.19	11.10	13.20	0.000224	1.01	2869.66	1467.28	0.10
Reach-1	10174.3*	1600.00	8.68	13.44	11.10	13.44	0.000199	1.00	3234.44	1478.68	0.09
Reach-1	10174.3*	2000.00	8.68	13.45	11.19	13.46	0.000304	1.24	3257.39	1478.81	0.11
Reach-1	10174.3*	2500.00	8.68	13.79	11.31	13.80	0.000298	1.30	3755.64	1481.59	0.11
Reach-1	10123.*	300.00	8.62	10.98	10.78	11.00	0.001470	1.46	443.98	610.51	0.21
Reach-1	10123.*	500.00	8.62	11.30	10.98	11.32	0.001387	1.58	656.39	715.74	0.21
Reach-1	10123.*	600.00	8.62	11.55	10.98	11.56	0.000877	1.37	964.10	958.12	0.17
Reach-1	10123.*	1000.00	8.62	12.68	10.98	12.68	0.000223	0.93	2233.01	1300.42	0.09
Reach-1	10123.*	1400.00	8.62	13.18	10.98	13.19	0.000202	0.98	2934.56	1469.06	0.09
Reach-1	10123.*	1600.00	8.62	13.43	11.02	13.43	0.000184	0.98	3307.37	1519.43	0.09
Reach-1	10123.*	2000.00	8.62	13.44	11.13	13.45	0.000283	1.21	3323.99	1519.54	0.11
Reach-1	10123.*	2500.00	8.62	13.78	11.26	13.79	0.000275	1.26	3836.66	1522.98	0.11
Reach-1	10071.6*	300.00	8.57	10.92	10.28	10.93	0.001423	1.46	444.90	601.21	0.21
Reach-1	10071.6*	500.00	8.57	11.24	10.45	11.25	0.001321	1.56	657.64	706.00	0.21
Reach-1	10071.6*	600.00	8.57	11.51	10.52	11.52	0.000753	1.29	994.89	948.34	0.16
Reach-1	10071.6*	1000.00	8.57	12.67	10.72	12.67	0.000191	0.88	2302.39	1304.86	0.09
Reach-1	10071.6*	1400.00	8.57	13.17	10.88	13.18	0.000175	0.93	3007.03	1472.15	0.08
Reach-1	10071.6*	1600.00	8.57	13.42	10.95	13.43	0.000163	0.94	3383.07	1553.92	0.08
Reach-1	10071.6*	2000.00	8.57	13.43	11.06	13.44	0.000253	1.17	3393.54	1556.13	0.10
Reach-1	10071.6*	2500.00	8.57	13.77	11.19	13.77	0.000244	1.21	3920.53	1563.96	0.10
Reach-1	10020.3*	300.00	8.52	10.85	10.19	10.86	0.001348	1.44	448.58	593.41	0.20
Reach-1	10020.3*	500.00	8.52	11.19	10.38	11.20	0.001007	1.39	792.65	833.81	0.18
Reach-1	10020.3*	600.00	8.52	11.48	10.45	11.49	0.000630	1.21	1049.84	918.65	0.15
Reach-1	10020.3*	1000.00	8.52	12.66	10.65	12.66	0.000163	0.83	2377.16	1306.33	0.08
Reach-1	10020.3*	1400.00	8.52	13.17	10.81	13.17	0.000152	0.88	3083.24	1473.10	0.08
Reach-1	10020.3*	1600.00	8.52	13.42	10.87	13.42	0.000142	0.89	3460.15	1554.26	0.08
Reach-1	10020.3*	2000.00	8.52	13.42	10.99	13.42	0.000221	1.11	3464.77	1555.23	0.10
Reach-1	10020.3*	2500.00	8.52	13.76	11.12	13.76	0.000219	1.16	4002.55	1604.46	0.10
Reach-1	9969.*	300.00	8.47	10.79	10.09	10.80	0.001233	1.40	452.80	584.29	0.20
Reach-1	9969.*	500.00	8.47	11.15	10.29	11.16	0.000828	1.29	841.66	846.48	0.17
Reach-1	9969.*	600.00	8.47	11.46	10.36	11.47	0.000503	1.12	1116.45	930.80	0.13
Reach-1	9969.*	1000.00	8.47	12.65	10.56	12.65	0.000134	0.77	2454.45	1313.19	0.07
Reach-1	9969.*	1400.00	8.47	13.16	10.73	13.16	0.000126	0.82	3162.02	1475.40	0.07
Reach-1	9969.*	1600.00	8.47	13.41	10.80	13.41	0.000119	0.83	3540.20	1557.48	0.07
Reach-1	9969.*	2000.00	8.47	13.41	10.91	13.42	0.000186	1.03	3539.80	1557.40	0.09
Reach-1	9969.*	2500.00	8.47	13.75	11.07	13.75	0.000189	1.10	4083.37	1644.23	0.09
Reach-1	9917.66*	300.00	8.41	10.74	9.99	10.75	0.001068	1.34	464.43	582.34	0.18
Reach-1	9917.66*	500.00	8.41	11.12	10.21	11.12	0.000652	1.18	903.64	860.19	0.15
Reach-1	9917.66*	600.00	8.41	11.44	10.28	11.44	0.000393	1.01	1194.41	945.25	0.12
Reach-1	9917.66*	1000.00	8.41	12.65	10.49	12.65	0.000110	0.71	2539.50	1318.99	0.07

HFC-RAS Plan: roadsm_12.4 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9917.66*	1400.00	8.41	13.15	10.65	13.16	0.000104	0.76	3247.92	1475.65	0.07
Reach-1	9917.66*	1600.00	8.41	13.40	10.71	13.41	0.000099	0.77	3626.79	1559.86	0.07
Reach-1	9917.66*	2000.00	8.41	13.40	10.83	13.41	0.000156	0.96	3622.15	1558.86	0.08
Reach-1	9917.66*	2500.00	8.41	13.74	10.96	13.75	0.000162	1.03	4166.95	1670.39	0.08
Reach-1	9866.33*	300.00	8.36	10.70	9.88	10.71	0.000898	1.26	478.97	582.73	0.17
Reach-1	9866.33*	500.00	8.36	11.09	10.12	11.10	0.000495	1.06	975.53	878.41	0.13
Reach-1	9866.33*	600.00	8.36	11.42	10.18	11.43	0.000297	0.91	1281.16	961.84	0.10
Reach-1	9866.33*	1000.00	8.36	12.64	10.41	12.64	0.000082	0.63	2635.34	1281.65	0.06
Reach-1	9866.33*	1400.00	8.36	13.15	10.57	13.15	0.000082	0.69	3339.95	1474.31	0.06
Reach-1	9866.33*	1600.00	8.36	13.40	10.63	13.40	0.000079	0.70	3719.00	1560.42	0.06
Reach-1	9866.33*	2000.00	8.36	13.40	10.75	13.40	0.000124	0.87	3710.90	1558.63	0.07
Reach-1	9866.33*	2500.00	8.36	13.73	10.85	13.74	0.000130	0.94	4255.78	1673.02	0.08
Reach-1	9815	300.00	8.31	10.66	9.81	10.67	0.000716	1.16	500.44	585.71	0.15
Reach-1	9815	500.00	8.31	11.07	10.03	11.08	0.000365	0.94	1059.00	896.47	0.11
Reach-1	9815	600.00	8.31	11.41	10.09	11.42	0.000220	0.81	1377.54	979.49	0.09
Reach-1	9815	1000.00	8.31	12.64	10.32	12.64	0.000063	0.56	2756.69	1262.57	0.05
Reach-1	9815	1400.00	8.31	13.15	10.48	13.15	0.000064	0.62	3441.96	1461.28	0.05
Reach-1	9815	1600.00	8.31	13.40	10.55	13.40	0.000062	0.63	3818.51	1552.23	0.05
Reach-1	9815	2000.00	8.31	13.39	10.66	13.40	0.000097	0.79	3807.74	1549.70	0.07
Reach-1	9815	2500.00	8.31	13.73	10.74	13.73	0.000103	0.85	4350.32	1672.27	0.07
Reach-1	9763.*	300.00	6.89	10.64	9.48	10.65	0.000489	0.95	562.84	641.97	0.13
Reach-1	9763.*	500.00	6.89	11.05	9.71	11.06	0.000462	1.05	850.50	737.61	0.13
Reach-1	9763.*	600.00	6.89	11.40	9.84	11.41	0.000214	0.79	1552.77	1159.15	0.09
Reach-1	9763.*	1000.00	6.89	12.64	10.13	12.64	0.000079	0.63	3166.70	1491.65	0.06
Reach-1	9763.*	1400.00	6.89	13.15	10.32	13.15	0.000086	0.71	3984.22	1704.49	0.06
Reach-1	9763.*	1600.00	6.89	13.40	10.37	13.40	0.000084	0.73	4421.10	1790.57	0.06
Reach-1	9763.*	2000.00	6.89	13.39	10.53	13.39	0.000133	0.92	4406.13	1787.66	0.08
Reach-1	9763.*	2500.00	6.89	13.72	10.71	13.73	0.000143	1.00	5026.79	1891.51	0.08
Reach-1	9711	300.00	5.47	10.63	8.71	10.63	0.000268	0.85	655.38	596.67	0.10
Reach-1	9711	500.00	5.47	11.04	9.15	11.04	0.000374	0.93	928.04	731.45	0.11
Reach-1	9711	600.00	5.47	11.39	9.34	11.40	0.000276	0.88	1205.13	828.76	0.10
Reach-1	9711	1000.00	5.47	12.63	9.76	12.64	0.000068	0.57	3662.14	1670.42	0.05
Reach-1	9711	1400.00	5.47	13.14	10.03	13.14	0.000077	0.66	4586.33	1929.26	0.06
Reach-1	9711	1600.00	5.47	13.39	10.11	13.39	0.000076	0.69	5079.81	2017.41	0.06
Reach-1	9711	2000.00	5.47	13.38	10.29	13.39	0.000120	0.86	5059.38	2013.82	0.07
Reach-1	9711	2500.00	5.47	13.72	10.73	13.72	0.000131	0.95	5753.54	2102.17	0.08
Reach-1	9700	Bridge									
Reach-1	9660	300.00	7.42	10.48	8.52	10.48	0.000117	0.51	992.26	612.22	0.06
Reach-1	9660	500.00	7.42	10.75	8.68	10.76	0.000205	0.73	1163.69	643.34	0.09
Reach-1	9660	600.00	7.42	11.14	8.74	11.15	0.000166	0.72	1423.14	690.50	0.08
Reach-1	9660	1000.00	7.42	12.06	8.95	12.06	0.000078	0.60	3526.27	1653.64	0.06
Reach-1	9660	1400.00	7.42	12.12	9.14	12.12	0.000143	0.81	3616.86	1668.07	0.08
Reach-1	9660	1600.00	7.42	12.15	9.19	12.15	0.000179	0.92	3670.72	1677.32	0.09
Reach-1	9660	2000.00	7.42	12.22	9.37	12.23	0.000256	1.11	3791.41	1697.86	0.10
Reach-1	9660	2500.00	7.42	12.32	9.57	12.33	0.000354	1.33	3961.84	1726.44	0.12
Reach-1	9637.5*	300.00	7.41	10.47	8.71	10.48	0.000193	0.63	876.20	577.47	0.08
Reach-1	9637.5*	500.00	7.41	10.74	8.89	10.75	0.000332	0.90	1034.33	601.58	0.11
Reach-1	9637.5*	600.00	7.41	11.13	8.96	11.14	0.000261	0.88	1283.26	679.51	0.10
Reach-1	9637.5*	1000.00	7.41	12.06	9.20	12.06	0.000107	0.69	3278.91	1617.69	0.07
Reach-1	9637.5*	1400.00	7.41	12.11	9.35	12.12	0.000195	0.94	3363.13	1629.35	0.09
Reach-1	9637.5*	1600.00	7.41	12.14	9.46	12.15	0.000244	1.06	3413.22	1634.91	0.10
Reach-1	9637.5*	2000.00	7.41	12.21	9.65	12.22	0.000348	1.28	3525.35	1647.28	0.12
Reach-1	9637.5*	2500.00	7.41	12.30	9.83	12.32	0.000480	1.53	3683.45	1685.11	0.14
Reach-1	9615.*	300.00	7.40	10.46	8.89	10.47	0.000269	0.72	765.61	541.69	0.09
Reach-1	9615.*	500.00	7.40	10.73	9.06	10.73	0.000454	1.02	910.02	560.88	0.13
Reach-1	9615.*	600.00	7.40	11.12	9.12	11.13	0.000344	0.99	1154.85	708.25	0.11
Reach-1	9615.*	1000.00	7.40	12.05	9.36	12.06	0.000127	0.74	3054.87	1556.93	0.07
Reach-1	9615.*	1400.00	7.40	12.10	9.54	12.11	0.000233	1.01	3130.98	1566.23	0.10
Reach-1	9615.*	1600.00	7.40	12.13	9.64	12.14	0.000292	1.14	3176.40	1571.76	0.11
Reach-1	9615.*	2000.00	7.40	12.20	9.81	12.21	0.000416	1.38	3278.37	1584.09	0.13
Reach-1	9615.*	2500.00	7.40	12.29	10.02	12.30	0.000575	1.65	3422.91	1601.41	0.15
Reach-1	9592.5*	300.00	7.39	10.45	9.05	10.46	0.000388	0.84	660.15	505.91	0.11
Reach-1	9592.5*	500.00	7.39	10.71	9.23	10.72	0.000641	1.17	792.84	556.07	0.15
Reach-1	9592.5*	600.00	7.39	11.11	9.30	11.12	0.000454	1.10	1064.83	781.62	0.13
Reach-1	9592.5*	1000.00	7.39	12.05	9.53	12.05	0.000151	0.80	2849.32	1498.69	0.08

HEC-RAS Plan: roadsm_12-4 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9592.5*	1400.00	7.39	12.09	9.71	12.10	0.000277	1.09	2916.95	1507.38	0.11
Reach-1	9592.5*	1600.00	7.39	12.12	9.81	12.13	0.000347	1.23	2957.47	1512.56	0.12
Reach-1	9592.5*	2000.00	7.39	12.18	10.01	12.19	0.000498	1.49	3048.78	1524.17	0.14
Reach-1	9592.5*	2500.00	7.39	12.27	10.22	12.28	0.000690	1.78	3178.96	1540.57	0.17
Reach-1	9570.*	300.00	7.37	10.43	9.19	10.44	0.000590	0.99	558.46	490.02	0.14
Reach-1	9570.*	500.00	7.37	10.68	9.42	10.69	0.000944	1.37	694.99	653.51	0.18
Reach-1	9570.*	600.00	7.37	11.09	9.47	11.10	0.000390	1.00	1388.77	1246.43	0.12
Reach-1	9570.*	1000.00	7.37	12.04	9.69	12.05	0.000179	0.86	2677.02	1506.44	0.08
Reach-1	9570.*	1400.00	7.37	12.08	9.91	12.09	0.000336	1.18	2738.45	1566.37	0.12
Reach-1	9570.*	1600.00	7.37	12.11	10.03	12.12	0.000427	1.34	2776.80	1604.17	0.13
Reach-1	9570.*	2000.00	7.37	12.16	10.20	12.18	0.000614	1.63	2865.06	1628.91	0.16
Reach-1	9570.*	2500.00	7.37	12.24	10.39	12.26	0.000853	1.95	2993.10	1656.33	0.19
Reach-1	9547.5*	300.00	7.36	10.41	9.35	10.42	0.000944	1.20	478.99	591.58	0.17
Reach-1	9547.5*	500.00	7.36	10.63	9.64	10.65	0.001408	1.59	619.77	651.56	0.21
Reach-1	9547.5*	600.00	7.36	11.08	9.72	11.09	0.000504	1.11	1272.02	1249.62	0.13
Reach-1	9547.5*	1000.00	7.36	12.04	9.87	12.04	0.000196	0.88	2629.65	1544.96	0.09
Reach-1	9547.5*	1400.00	7.36	12.07	10.12	12.08	0.000361	1.20	2684.37	1548.96	0.12
Reach-1	9547.5*	1600.00	7.36	12.10	10.23	12.10	0.000454	1.35	2717.39	1551.37	0.13
Reach-1	9547.5*	2000.00	7.36	12.14	10.43	12.16	0.000654	1.64	2792.86	1556.86	0.16
Reach-1	9547.5*	2500.00	7.36	12.21	10.60	12.23	0.000911	1.97	2902.38	1564.80	0.19
Reach-1	9525	300.00	7.35	10.36	9.54	10.37	0.001603	1.46	417.34	595.39	0.22
Reach-1	9525	500.00	7.35	10.56	9.73	10.59	0.002261	1.89	545.32	651.36	0.26
Reach-1	9525	600.00	7.35	11.06	9.94	11.07	0.000672	1.23	1222.07	1377.04	0.15
Reach-1	9525	1000.00	7.35	12.03	10.16	12.04	0.000195	0.85	2592.08	1444.57	0.09
Reach-1	9525	1400.00	7.35	12.06	10.33	12.07	0.000365	1.18	2635.62	1451.17	0.12
Reach-1	9525	1600.00	7.35	12.08	10.40	12.09	0.000463	1.33	2662.12	1455.17	0.13
Reach-1	9525	2000.00	7.35	12.12	10.53	12.13	0.000676	1.62	2723.33	1464.38	0.16
Reach-1	9525	2500.00	7.35	12.18	10.66	12.20	0.000959	1.95	2813.60	1477.85	0.19
Reach-1	9473.33*	300.00	7.34	10.27	9.57	10.28	0.001861	1.58	412.51	600.81	0.23
Reach-1	9473.33*	500.00	7.34	10.42	9.73	10.45	0.003002	2.14	509.18	640.53	0.30
Reach-1	9473.33*	600.00	7.34	11.03	9.81	11.04	0.000427	1.00	1519.79	1450.45	0.12
Reach-1	9473.33*	1000.00	7.34	12.02	10.13	12.03	0.000149	0.76	3052.90	1622.15	0.08
Reach-1	9473.33*	1400.00	7.34	12.05	10.28	12.05	0.000282	1.05	3090.22	1624.02	0.10
Reach-1	9473.33*	1600.00	7.34	12.06	10.35	12.07	0.000360	1.19	3113.09	1625.16	0.12
Reach-1	9473.33*	2000.00	7.34	12.09	10.45	12.10	0.000533	1.46	3166.58	1626.76	0.14
Reach-1	9473.33*	2500.00	7.34	12.14	10.45	12.16	0.000768	1.77	3246.39	1627.13	0.17
Reach-1	9421.66*	300.00	7.34	10.16	9.75	10.17	0.002308	1.76	397.86	605.27	0.26
Reach-1	9421.66*	500.00	7.34	10.35	9.83	10.36	0.001013	1.26	1024.26	1284.71	0.18
Reach-1	9421.66*	600.00	7.34	11.02	9.89	11.02	0.000237	0.77	1985.51	1629.83	0.09
Reach-1	9421.66*	1000.00	7.34	12.02	10.08	12.02	0.000097	0.63	3633.72	1675.16	0.06
Reach-1	9421.66*	1400.00	7.34	12.04	10.29	12.04	0.000186	0.87	3664.09	1675.31	0.09
Reach-1	9421.66*	1600.00	7.34	12.05	10.29	12.05	0.000238	0.99	3682.81	1675.40	0.10
Reach-1	9421.66*	2000.00	7.34	12.07	10.29	12.08	0.000358	1.22	3726.94	1675.62	0.12
Reach-1	9421.66*	2500.00	7.34	12.11	10.29	12.12	0.000529	1.50	3793.76	1675.95	0.14
Reach-1	9370.*	300.00	7.33	10.00	9.65	10.03	0.003375	2.11	360.53	604.75	0.32
Reach-1	9370.*	500.00	7.33	10.01	9.79	10.08	0.009171	3.48	363.61	606.03	0.52
Reach-1	9370.*	600.00	7.33	11.01	9.85	11.02	0.000109	0.54	2575.76	1678.57	0.06
Reach-1	9370.*	1000.00	7.33	12.02	10.02	12.02	0.000062	0.52	4285.32	1729.83	0.05
Reach-1	9370.*	1400.00	7.33	12.03	10.12	12.03	0.000119	0.72	4311.21	1729.97	0.07
Reach-1	9370.*	1600.00	7.33	12.04	10.12	12.04	0.000154	0.82	4327.24	1730.06	0.08
Reach-1	9370.*	2000.00	7.33	12.06	10.12	12.07	0.000234	1.01	4365.21	1730.26	0.10
Reach-1	9370.*	2500.00	7.33	12.10	10.12	12.10	0.000350	1.25	4423.19	1730.57	0.12
Reach-1	9318.33*	300.00	7.32	10.01	9.61	10.01	0.000084	0.36	1674.84	1430.36	0.05
Reach-1	9318.33*	500.00	7.32	10.02	9.77	10.02	0.000227	0.59	1693.40	1432.60	0.08
Reach-1	9318.33*	600.00	7.32	11.01	9.81	11.01	0.000053	0.40	3239.78	1732.43	0.04
Reach-1	9318.33*	1000.00	7.32	12.01	9.95	12.01	0.000039	0.43	5006.32	1780.87	0.04
Reach-1	9318.33*	1400.00	7.32	12.03	9.95	12.03	0.000076	0.59	5029.39	1780.99	0.06
Reach-1	9318.33*	1600.00	7.32	12.03	9.95	12.04	0.000098	0.68	5043.71	1781.05	0.06
Reach-1	9318.33*	2000.00	7.32	12.05	9.95	12.06	0.000150	0.84	5077.72	1781.19	0.08
Reach-1	9318.33*	2500.00	7.32	12.08	9.95	12.09	0.000228	1.04	5129.92	1781.40	0.10
Reach-1	9266.66*	300.00	7.32	10.01	9.56	10.01	0.000029	0.23	2341.78	1496.11	0.03
Reach-1	9266.66*	500.00	7.32	10.02	9.69	10.02	0.000079	0.38	2356.27	1497.59	0.05
Reach-1	9266.66*	600.00	7.32	11.01	9.79	11.01	0.000028	0.30	3975.93	1782.01	0.03
Reach-1	9266.66*	1000.00	7.32	12.01	9.79	12.01	0.000025	0.35	5794.47	1828.51	0.03
Reach-1	9266.66*	1400.00	7.32	12.02	9.79	12.02	0.000049	0.49	5815.83	1828.59	0.04
Reach-1	9266.66*	1600.00	7.32	12.03	9.79	12.03	0.000063	0.56	5829.10	1828.64	0.05

HEC-RAS Plan: roadsm_12-4 River: RIVER-1 Reach: Reach-1 (Continued)

HEC-RAS Plan: roadsm_12-4 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
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HEC-RAS Plan: roadsm_12-4 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	9266.66*	2000.00	7.32	12.05	9.79	12.05	0.000097	0.70	5860.68	1828.75	0.06
Reach-1	9266.66*	2500.00	7.32	12.08	9.79	12.08	0.000148	0.87	5909.29	1828.92	0.08
Reach-1	9215	300.00	7.31	10.00	9.48	10.00	0.000012	0.16	3078.83	1558.29	0.02
Reach-1	9215	500.00	7.31	10.01	9.63	10.01	0.000033	0.27	3091.93	1560.57	0.03
Reach-1	9215	600.00	7.31	11.01	9.62	11.01	0.000015	0.24	4779.05	1828.73	0.02
Reach-1	9215	1000.00	7.31	12.01	9.62	12.01	0.000016	0.30	6647.06	1875.29	0.03
Reach-1	9215	1400.00	7.31	12.02	9.62	12.02	0.000032	0.41	6667.43	1875.56	0.04
Reach-1	9215	1600.00	7.31	12.03	9.62	12.03	0.000041	0.47	6680.10	1875.73	0.04
Reach-1	9215	2000.00	7.31	12.05	9.62	12.05	0.000064	0.59	6710.29	1876.13	0.05
Reach-1	9215	2500.00	7.31	12.07	9.62	12.07	0.000098	0.73	6756.82	1876.75	0.06
Reach-1	9169.99*	300.00	7.01	10.00	9.32	10.00	0.000010	0.15	3322.94	1585.02	0.02
Reach-1	9169.99*	500.00	7.01	10.01	9.50	10.01	0.000027	0.25	3335.26	1587.13	0.03
Reach-1	9169.99*	600.00	7.01	11.01	9.50	11.01	0.000013	0.22	5044.29	1849.42	0.02
Reach-1	9169.99*	1000.00	7.01	12.01	9.50	12.01	0.000014	0.28	6936.59	1903.64	0.02
Reach-1	9169.99*	1400.00	7.01	12.02	9.50	12.02	0.000028	0.39	6956.27	1903.83	0.03
Reach-1	9169.99*	1600.00	7.01	12.03	9.50	12.03	0.000037	0.44	6968.51	1903.95	0.04
Reach-1	9169.99*	2000.00	7.01	12.04	9.50	12.04	0.000057	0.55	6997.69	1904.25	0.05
Reach-1	9169.99*	2500.00	7.01	12.07	9.50	12.07	0.000087	0.68	7042.71	1904.77	0.06
Reach-1	9124.99*	300.00	6.72	10.00	9.15	10.00	0.000008	0.14	3570.38	1612.45	0.02
Reach-1	9124.99*	500.00	6.72	10.01	9.29	10.01	0.000022	0.23	3582.07	1614.45	0.03
Reach-1	9124.99*	600.00	6.72	11.01	9.38	11.01	0.000011	0.20	5312.96	1870.65	0.02
Reach-1	9124.99*	1000.00	6.72	12.01	9.37	12.01	0.000013	0.26	7231.52	1930.04	0.02
Reach-1	9124.99*	1400.00	6.72	12.02	9.37	12.02	0.000025	0.36	7250.57	1930.24	0.03
Reach-1	9124.99*	1600.00	6.72	12.03	9.37	12.03	0.000033	0.41	7262.43	1930.36	0.03
Reach-1	9124.99*	2000.00	6.72	12.04	9.37	12.04	0.000050	0.51	7290.69	1930.66	0.04
Reach-1	9124.99*	2500.00	6.72	12.06	9.37	12.07	0.000077	0.64	7334.33	1931.12	0.05
Reach-1	9079.99*	300.00	6.42	10.00	8.90	10.00	0.000007	0.13	3821.39	1642.44	0.01
Reach-1	9079.99*	500.00	6.42	10.01	9.11	10.01	0.000018	0.21	3832.58	1644.30	0.02
Reach-1	9079.99*	600.00	6.42	11.01	9.17	11.01	0.000010	0.19	5586.62	1896.39	0.02
Reach-1	9079.99*	1000.00	6.42	12.01	9.25	12.01	0.000011	0.24	7531.57	1954.48	0.02
Reach-1	9079.99*	1400.00	6.42	12.02	9.25	12.02	0.000022	0.34	7550.05	1954.57	0.03
Reach-1	9079.99*	1600.00	6.42	12.03	9.25	12.03	0.000029	0.39	7561.55	1954.62	0.03
Reach-1	9079.99*	2000.00	6.42	12.04	9.25	12.04	0.000045	0.49	7588.97	1954.75	0.04
Reach-1	9079.99*	2500.00	6.42	12.06	9.25	12.06	0.000069	0.60	7631.33	1954.96	0.05
Reach-1	9034.99*	300.00	6.13	10.00	8.57	10.00	0.000006	0.12	4081.32	1670.12	0.01
Reach-1	9034.99*	500.00	6.13	10.01	8.86	10.01	0.000015	0.20	4092.09	1671.87	0.02
Reach-1	9034.99*	600.00	6.13	11.01	8.95	11.01	0.000008	0.18	5869.85	1919.77	0.02
Reach-1	9034.99*	1000.00	6.13	12.01	9.12	12.01	0.000010	0.23	7839.56	1975.48	0.02
Reach-1	9034.99*	1400.00	6.13	12.02	9.12	12.02	0.000020	0.32	7857.50	1975.55	0.03
Reach-1	9034.99*	1600.00	6.13	12.02	9.12	12.02	0.000026	0.37	7868.67	1975.59	0.03
Reach-1	9034.99*	2000.00	6.13	12.04	9.12	12.04	0.000040	0.46	7895.31	1975.68	0.04
Reach-1	9034.99*	2500.00	6.13	12.06	9.12	12.06	0.000061	0.57	7936.49	1975.84	0.05
Reach-1	8989.99*	300.00	5.83	10.00	8.25	10.00	0.000005	0.11	4350.09	1702.39	0.01
Reach-1	8989.99*	500.00	5.83	10.01	8.61	10.01	0.000013	0.19	4360.55	1704.08	0.02
Reach-1	8989.99*	600.00	5.83	11.01	8.70	11.01	0.000007	0.17	6161.37	1944.00	0.02
Reach-1	8989.99*	1000.00	5.83	12.01	9.00	12.01	0.000009	0.22	8154.53	1995.85	0.02
Reach-1	8989.99*	1400.00	5.83	12.02	9.00	12.02	0.000017	0.31	8171.99	1995.91	0.02
Reach-1	8989.99*	1600.00	5.83	12.02	9.00	12.02	0.000023	0.35	8182.86	1995.95	0.03
Reach-1	8989.99*	2000.00	5.83	12.04	9.00	12.04	0.000035	0.44	8208.81	1996.05	0.03
Reach-1	8989.99*	2500.00	5.83	12.06	9.00	12.06	0.000054	0.55	8248.95	1996.20	0.04
Reach-1	8944.99*	300.00	5.54	10.00	7.94	10.00	0.000004	0.11	4623.47	1731.66	0.01
Reach-1	8944.99*	500.00	5.54	10.01	8.30	10.01	0.000011	0.18	4633.65	1733.29	0.02
Reach-1	8944.99*	600.00	5.54	11.01	8.44	11.01	0.000006	0.16	6456.54	1967.09	0.01
Reach-1	8944.99*	1000.00	5.54	12.01	8.73	12.01	0.000008	0.21	8471.37	2015.99	0.02
Reach-1	8944.99*	1400.00	5.54	12.02	8.87	12.02	0.000016	0.29	8488.42	2016.04	0.02
Reach-1	8944.99*	1600.00	5.54	12.02	8.87	12.02	0.000020	0.34	8499.03	2016.08	0.03
Reach-1	8944.99*	2000.00	5.54	12.04	8.87	12.04	0.000031	0.42	8524.38	2016.16	0.03
Reach-1	8944.99*	2500.00	5.54	12.05	8.87	12.06	0.000048	0.52	8563.59	2016.29	0.04
Reach-1	8899.99*	300.00	5.24	10.00	7.66	10.00	0.000003	0.10	4900.14	1762.05	0.01
Reach-1	8899.99*	500.00	5.24	10.01	8.01	10.01	0.000009	0.17	4910.12	1763.67	0.02
Reach-1	8899.99*	600.00	5.24	11.01	8.13	11.01	0.000005	0.16	6754.08	1987.57	0.01
Reach-1	8899.99*	1000.00	5.24	12.01	8.48	12.01	0.000007	0.20	8790.17	2035.89	0.02
Reach-1	8899.99*	1400.00	5.24	12.02	8.75	12.02	0.000014	0.28	8806.86	2035.94	0.02
Reach-1	8899.99*	1600.00	5.24	12.02	8.75	12.02	0.000018	0.32	8817.25	2035.97	0.02
Reach-1	8899.99*	2000.00	5.24	12.03	8.75	12.03	0.000028	0.40	8842.05	2036.04	0.03
Reach-1	8899.99*	2500.00	5.24	12.05	8.75	12.05	0.000043	0.50	8880.45	2036.16	0.04

