Appendix G

Technical Memorandum: Underwood Creek Effluent Return Evaluation, July 23, 2009

SEH TECHNICAL MEMORANDUM

TO: Daniel Duchniak, Waukesha Water Utility

FROM: Tom Sear, SEH
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COPY: Tom Chapman, MMSD

DATE: July 23, 2009

RE: Underwood Creek Effluent Return Evaluation

SEH No.: 108425

Executive Summary

Waukesha Water Utility (WWU) is interested in determining the impact of a proposed effluent discharge on a 6,600-foot long segment of rehabilitated Underwood Creek watercourse, given that the rehabilitated channel has been designed for a base flow equal to 3 cubic feet per second (cfs). WWU has contracted with SEH to perform an evaluation of the impact of adding an approximate 20 cfs effluent return to the existing Underwood Creek base flow. The results of this evaluation are summarized herein, and address: (1) the rehabilitated main and low flow channel designs; (2) the hydraulic response of these rehabilitated channels to a range of discharges; and (3) the hydraulic, geomorphic and fisheries impacts of adding the effluent return to the Underwood Creek base flow.

Hydraulic conditions associated with a range of discharges were determined using a HEC-RAS hydraulic model of the rehabilitated main and low flow channels, extending from the confluence with the Menomonee River to Mayfair Road. HEC-RAS cross-sections were developed at riffle sections. This hydraulic evaluation demonstrated that the Phase 1 main and low flow channel designs, associated with the upstream 2,400 feet of rehabilitated watercourse, are appropriately designed for the desired capacities (200 cfs and 3 cfs, respectively). Preliminary Phase 2 channel dimensions are also provided that will require some adjustment during final design.

The proposed effluent return to Underwood Creek will have a negligible effect on the hydraulic and geomorphic conditions during average and peak discharge events. The addition of an effluent return to the Underwood Creek base flow (3 cfs) was evaluated over a range of modified low flow conditions, including 10 and 23 cfs, which resulted in water depths increasing between 0.15 and 0.80 feet (1.8 and 9.6 inches). Velocity increased from a negligible amount to a maximum of 1 foot per second (fps).

As a result of this evaluation, the following was concluded:

1. Current and Low Flow Channel Design: The current main and low flow channel design properly convey the design discharges (200 cfs and 3 cfs, respectively). Although,

supplemental channel dimension definition will be needed during the completion of the Phase 2 final design, particularly within the steeper portions of the Phase 2 channel segment.

2. Sediment Transport Considerations: The majority of sediment transport tends to occur when the main channel is running full, a condition known as bankfull. For the current Underwood Creek channel design, this occurs when the discharge rate is approximately 200 cfs and shear stresses are approximately 1.0 pounds per square foot (lbs/sq.ft.). Sheer stresses that occur at discharges less than 50 cfs are relatively minor (less than 0.50 lbs/sq.ft.), and will not affect sediment transport. Therefore, the addition of an effluent return to Underwood Creek will not affect sediment transport.
3. Fisheries Considerations: The most significant impact resulting from the effluent return is the water depth in the main channel outside the low flow channel. These variable water depths, however, are not expected to impact fish passage, since fish will move to the portion of the channel with a suitable water depth. A key parameter to fish passage is the minimum water depth, which is accommodated by the original low flow channel design. Should the low flow discharge increase, the resulting water depth outside the low flow channel will only enhance fish passage by creating additional flow within the channel cross-section.
4. Alternative Low Flow Channel Design Not Recommended: An alternative low flow channel design was developed for comparative purposes, assuming a base flow equal to 23 cfs. However, the resulting change in channel hydraulics, compared to those provided by the current low flow channel design, does not justify developing the alternative low flow channel for the purpose of enhancing fish passage. In addition, given the anticipated fluctuations of the effluent return, a greater concern is that a modified low flow channel could be too large when the base flow is diminished, resulting in unacceptably low water depths.

Introduction

The Waukesha Water Utility (WWU) is proposing to use Great Lakes (Lake Michigan) water as their public water supply. Since the City of Waukesha is located west of the sub-continental divide, the Great Lakes Compact requires that this water be returned to Lake Michigan, minus an allowance for consumptive use. As a result, the WWU is investigating the discharge of treated wastewater effluent into Underwood Creek, in the vicinity of 124th Street and Bluemound Road, which would return water to the Great Lakes Basin that was previously pumped from Lake Michigan to the City of Waukesha. It is anticipated that the desired effluent diversion to Underwood Creek will have an Average Daily Flow (ADF) ranging from 17 to 20 cubic feet per second (cfs), which can also be interpreted as 7,600 to 9,000 gallons per minute (gpm), or 11 to 13 million gallons per day (mgd).

The Milwaukee Metropolitan Sewerage District (MMSD) has an ongoing *Underwood Creek Rehabilitation and Flood Management (R&FM) Project* that extends approximately 6,600 feet from the confluence with the Menomonee River to Mayfair Road (Highway 100). The Underwood Creek R&FM - Phase 1 Project is currently under construction, and extends approximately 2,400 feet downstream of Mayfair Road. The final design and construction of the Phase 2 Project, to occur in the future, will rehabilitate the remaining 4,400 feet of watercourse down to the Menomonee River confluence.

Given the above, the WWU is interested in determining the impact of the proposed effluent discharge on the rehabilitated Underwood Creek watercourse, given that the Phase 1

rehabilitated channel has been designed for a base flow equal to 3 cfs. Accordingly, WWU has contracted with SEH to perform an associated watercourse evaluation, with the objective of evaluating the impact of adding approximately 20 cfs to the existing Underwood Creek base flow. The results of this evaluation are summarized herein, and address: (1) the rehabilitated main and low flow channel designs for the Underwood Creek R&FM – Phase 1 and 2 Projects; (2) the hydraulic response of these rehabilitated channels to a range of discharges, extending from base flow to the main channel design capacity; and (3) the hydraulic, geomorphic and fisheries impacts of adding the desired effluent return to the Underwood Creek base flow.

Underwood Creek R&FM – Phase 1 and 2 Project Descriptions

Construction of watercourse improvements associated with the MMSD Underwood Creek R&FM – Phase 1 Project will result in the development of approximately 2,400 feet of rehabilitated stone-lined channel between Mayfair Road (Highway 100) and the Canadian Pacific Railway (CPR) Bridge, located just upstream of the Interstate 45 Bridge. These Phase 1 watercourse improvements, initiated in December 2008, are planned to be complete in June 2010, and include a single rehabilitated channel with an inner low flow channel that have design conveyance capacities equal to approximately 200 and 3 cfs, respectively. Rehabilitated main and low flow channel dimensions and bed slopes for Phase 1 were obtained from the project construction drawings provided in Attachment 1. In particular, Drawing GV-7 (Sheet 41) provides a typical cross-section at a riffle section, which illustrates the rehabilitated main channel with the inner low flow channel.

The MMSD Underwood Creek R&FM – Phase 2 Final Design and Construction Project will be completed in the future, which will rehabilitate approximately 4,200 feet of watercourse downstream of the Phase 1 Project. Preliminary Phase 2 channel bed slopes are defined in the MMSD *Underwood Creek R&FM Preliminary Engineering (PE) Design Report*, dated August 2006. Although the final design is not yet developed, it is likely that the Phase 2 rehabilitated main channel and interior low flow channel will have discharge capacities similar to those adopted for the Phase 1 Project. Phase 2 bed slopes were obtained from the preliminary drawings provided in Attachment 2. For analysis presented herein, the Phase 2 main and low flow channel dimensions were estimated using Manning's Equation, assuming uniform flow conditions.

Representative main and low flow channel dimensions and slopes, for the Phase 1 and 2 Projects, are presented in Table 1. Average bed slope was a key parameter value in the determination of the channel dimensions, which consist of a trapezoidal channel with bottom width, top width, depth and side slope. As presented on Table 1, the bed slope is generally flatter in Phase 1 Project segment (typically 0.194%). Near the upstream limit of the Phase 2 Project, over a length of 180 feet, the bed slope is much steeper (0.83%), gradually declining to 0.10% at the downstream limit of the project. As such, the main and low flow channel dimensions were adjusted to reflect the changing bed slope.

Basis for HEC-RAS Hydraulic Simulation

Hydraulic conditions associated with a range of discharges were determined using a HEC-RAS hydraulic model of the rehabilitated (Phase 1 and 2) main and low flow channels, extending from the confluence with the Menomonee River to Mayfair Road. HEC-RAS cross-sections were developed at riffle sections (pools sections were not considered). Information pertaining to this hydraulic evaluation is provided below.

1. Simulated Discharges: Seven sets of discharges were input to the HEC-RAS model in order to evaluate the hydraulic response for a range of flow conditions for the main and low flow channel. These discharges include 3 cfs (base flow) and 23 cfs (base flow discharge with an assumed 20 cfs ADF effluent diversion). Also, given previously developed design peak discharge events, it was determined that discharges resulting from land surface runoff events (50 cfs and greater) increase approximately 35 percent downstream of Station 147+50, which is located approximately 300 feet downstream of the CPR Railroad Bridge. It was assumed that smaller discharge events (less than 50 cfs) resulted primarily from interflow and groundwater inputs, and a 35 percent increase in discharge at Station 147+50 was not warranted for these events. Accordingly, the discharges used in the HEC-RAS hydraulic simulations are:

   a. *Station 147+50 to 176+20*: 3, 5, 10, 23, 50, 100 and 200 cfs

   b. *Station 110+50 to 147+50*: 3, 5, 10, 23, 70, 136 and 270 cfs.

2. HEC-RAS Cross-Sections: Representative HEC-RAS cross-sections, illustrating the main and low flow channels for the stations listed on Table 1, are provided on the exhibits described below. Each of these exhibits also presents seven water surface elevations (WSE) associated with the range of discharges presented above.

   a. *Phase 1 Channel Cross-Sections* - Exhibits A-1 through A-5 present main and low flow channel cross-sections at Stations 172+00, 163+50, 157+00, 153+50 and 152+50, respectively, which can be located on the drawings included in Attachment 1.

   b. *Phase 2 Channel Cross-Sections* - Exhibits B-1 through B-6 present main and low flow channel cross-sections at Stations 149+50, 147+50, 146+00, 133+40, 118+40 and 110+50, respectively, which can be located on the drawings included in Attachment 2.

3. HEC-RAS Channel Bed and WSE Profiles: Channel bed and WSE profiles for the discharges identified above are illustrated on Exhibit C, which also identifies the location of main channel stations referenced elsewhere. Evident from this exhibit are the variable channel bed slopes summarized on Table 1.

4. HEC-RAS Summary Output Table: Attachment 3 includes a tabular summary of HEC-RAS hydraulic output, which includes for each station and discharge (Q Total) the following hydraulic data: minimum channel elevation (Min Ch El), water surface elevation (W.S. Elev), average channel shear stress (Shear Chan), energy grade elevation (E.G. Elev), energy grade slope (E.G. Slope), channel velocity (Vel. Chnl), flow area, top width, and channel Froude number (Froude # Chl).

5. Station and River Mile References: Rehabilitated main and low flow channel information presented in Attachments 1 and 2 are referenced to the Rehabilitated Main Channel Baseline (RMCB) Stations, which are measured in feet from the confluence with the Menomonee River (Note: The RMCB Station at the Menomonee River confluence is equal to 7+00 feet). The HEC-RAS output provided in Attachment 3 is referenced to River Mile (RM), which is measured in miles from the Menomonee River confluence. Both sets of cross-section markers are provided in Table 1 for comparison purposes.

HEC-RAS Model Simulation Results Relative to the Current Main and Low Flow Channel Design

In regard to the HEC-RAS hydraulic simulation output referenced above, the following observations are noted, as related to the currently designed rehabilitated main channel and interior low flow channel.

1. Main Channel WSEs: As presented on Exhibits A-1 through B-6, the main channel dimensions summarized on Table 1 provide reasonable WSEs for the desired main channel discharge capacity (200 cfs upstream of Station 147+50 and 270 cfs downstream of Station 147+50). In particular:

   a. *Phase 1 Dimensions* - Main channel dimensions provided for Phase 1 (currently under construction) provide a WSE near the top of bank (typically within one foot), as illustrated on Exhibits A-1 through A-5.

   b. *Phase 2 Dimensions* – In general, preliminary main channel dimensions provided for Phase 2 also provide a WSE near the top of bank, as illustrated on Exhibits B-1 through B-6. However, additional analysis is recommended during the completion of the future final main channel design in order to provide a conveyance capacity closer to the desired main channel discharges, particularly along the steeper portions of the channel (Station 133+40 to 149+50).

2. Low Flow Channel WSEs: As presented on Exhibits A-1 though B-6, the low flow channel dimensions summarized on Table 1 also provide reasonable WSEs for the desired low flow discharge capacity (3 cfs). In particular:

   a. *Phase 1 Dimensions* – Low flow channel dimensions provided for Phase 1 (currently under construction) provide a WSE near the top of the low flow channel bank (typically within 0.2 feet), as illustrated on Exhibits A-1 through A-5.

   b. *Phase 2 Dimensions* – In general, preliminary low flow channel dimensions provided for Phase 2 also provide a WSE near the top of bank, as illustrated on Exhibits B-1 through B-6. However, additional analysis is again recommended during the completion of the future final low flow channel design in order to provide a conveyance capacity closer to the desired low flow channel discharge (3 cfs). Of particular importance is the segment of low flow channel (Station 146+00 to 149+50) where the WSE resulting from 3 cfs exceeds the top of the low flow channel by approximately 0.05 feet.

3. Channel Shear Stresses: The majority of sediment transport will tend to occur when the main channel is running full, a condition known as bankfull. The shear stress on the channel bed at bankfull appears adequate (typically around 1 lbs/sq. ft., as shown in Attachment 3). Sheer stresses that occur at discharges less than 50 cfs (70 cfs downstream of Station 147+50), as presented in Attachment 3, are relatively minor (less than 0.50 lbs/sq.ft.), which will not affect sediment transport.

Anticipated Impact Resulting from the Proposed Effluent Return

In regard to the anticipated impact of the proposed effluent return on the rehabilitated Underwood Creek channel, the following observations are noted:

1. Impact on Underwood Creek Discharges: The following is noted regarding the impact of the proposed effluent return on Underwood Creek discharges.

   a. *Average and Peak Discharge Events* - There is general agreement that a proposed effluent return to Underwood Creek equal to 20 cfs or less (ADF) will have a negligible effect on the hydraulic and geomorphic conditions during average and peak discharge events. This lack of effect is due to the short durations of average and peak discharge events, and the relatively minor percent increase in overall flow resulting from the effluent return.

   b. *Base Flow Events* - The addition of an effluent return to the Underwood Creek base flow (3 cfs) could have a relatively significant impact on the resulting main channel discharge rate, recognizing that the actual effluent return value is dependent on weather and operational conditions. For instance, it is noted that a 20 cfs effluent return could experience an operational diurnal fluctuation that would cause the instantaneous flow rate to range from approximately 6 cfs to 28 cfs during a typical 24 hour period. Weather conditions that could affect the effluent return rate include wet weather patterns that induce infiltration and inflow (I&I) to the sanitary collection system; and warm and dry weather conditions that reduce I&I, while increasing outdoor watering. As a result, it is best to evaluate the impact of an effluent return on Underwood Creek over a range of potential discharge conditions, as presented in Attachment 3, which includes results from discharges equal to 3, 5, 10 and 23 cfs.

2. Impact on Main Channel Hydraulics (Existing Design): The following is noted regarding the impact on main channel hydraulics due to the addition of the effluent return, assuming a range of discharge conditions and the existing design of the main and low flow channel.

   a. *Water Depth and Velocity Impacts* – Using the data provided in Attachment 3, Table 2 summarizes the WSEs, water depths and average velocities resulting from a range of base flow discharges, including 3, 10 and 23 cfs. Table 2 also presents the change in water depth and average velocity, assuming an increase in the base flow discharge from 3 cfs to 10 and 23 cfs. As presented on Table 2, the increase in water depth varies from 0.15 feet (1.8 inches) to 0.80 feet (9.6 inches). The average velocity varies from a slight reduction (-0.07 fps) to and increase equal to 1.04 fps.

   b. *Water Depth Outside the Low Flow Channel* - As illustrated on Exhibits A-1 through B-6, the WSEs resulting from the 23 cfs discharge event (3 cfs base flow plus an assumed 20 cfs ADF effluent return) results in water depths in the main channel (outside the low flow channel) ranging from 0.33 to 0.78 feet (4.0 to 9.4 inches). Given the results summarized in Table 2, a channel discharge equal to 10 cfs would result in water depths (outside the low flow channel) ranging from 0.13 to 0.39 feet (1.6 to 4.7 inches).

   c. *Geomorphic Impacts* – As provided in Attachment 3 and stated previously, average channel shear stresses associated with discharges less than 50 cfs (70 cfs downstream of Station 147+50) will not significantly contribute to sediment transport. Therefore, the

addition of the effluent return, given the above stated discharge range, will not impact sediment transport conditions in the rehabilitated Underwood Creek channel.

3. Impact on Fisheries: The following is noted regarding the anticipated impact on fisheries due to the effluent return.

   a. *Indicator Species* - The indicator fish species for the rehabilitated Underwood Creek channel has been identified as Northern pike, a relatively weak swimming fish. For the purposes of evaluating water velocity in the low flow channel relative to the swimming capabilities of this fish species, an average maximum velocity ranging from 1.5 to 1.7 feet per second (fps) was used.

   b. *Average Channel Velocities* - Average channel velocities reported in Attachment 3, for discharges equal to or less than 23 cfs, are generally less than the targeted velocity range for Northern Pike, indicating that the effluent return discharge will have minimal impact on upstream fish passage during base flow conditions.

   c. *Need for Additional Channel Design* - It is noted, however, that certain portions of the rehabilitated channel, primarily located where the bed gradient is steeper downstream of the CPR Railroad Bridge, do exceed this desirable velocity range. In these cases, the dimensions and slope of the low flow channel will need further refinement in order to lower velocities and better accommodate fish passage. Also, appropriate placement of boulders in riffle sections and pools can also help mitigate the impact of these higher velocities on fish passage.

   d. *Water Depths Outside the Low Flow Channel* – Perhaps the most significant impact of the effluent return is the water depth in the main channel outside the low flow channel, as described previously. These variable water depths, however, are not expected to impact fish passage, since fish will move to the portion of the channel with a suitable water depth. A key parameter to fish passage is the minimum water depth, which is accommodated by the original low flow channel design. Should the low flow discharge increase, the resulting water depth outside the low flow channel will only enhance fish passage by creating additional flow area within the channel cross-section.

4. Alternative Low Flow Channel Design: For comparative purposes, an alternative low flow channel design was developed to convey a 23 cfs base flow along the Phase 1 and 2 Project segments. The modified low flow channel dimensions were created using Manning's Equation and are also presented in Table 1. The following is noted regarding these modified low flow channel designs, which are not recommended because they would provide no additional benefit in comparison to the current low flow channel design.

   a. *Depths of Flow and Velocities* - As presented on Table 1, the depths associated with these modified low flow channels are 1.50 feet in the Phase 1 channel segment, and 0.56 to 1.20 feet in the Phase 2 channel segment. Corresponding average channel velocities were 1.5 fps in the Phase 1 channel segment, and 1.0 to 2.1 fps in the Phase 2 channel segment.

   b. *Channel Bottom and Top Widths* – The additional base flow was generally accommodated by developing a wider channel bottom, then by increasing channel depth as needed. In this manner, base flow velocities are kept at an acceptable range of values, given the associated increase in channel roughness and wetted perimeter.

c. *Impact on Existing Main Channel Design* – The modified low flow channel designs provided in Table 1 will fit within the bottom of the existing main channel. An example (Phase 1) modified low flow channel is presented in Exhibit D. Similar modified channel cross-sections would be developed for the Phase 2 watercourse segment. In most instances, the top of the low flow channel would essentially merge directly into the bottom of the main channel.

d. *Necessity of Modified Low Flow Channel* – Given the above results, the velocities and shear stresses of the modified low flow channels, assuming a base flow equal to 23 cfs, will be similar to those provided using the existing low flow channel design. The principal difference will be the depth of flow, which will be slightly greater for the modified low flow channel during low flow events. However, this slight difference does not warrant redesigning the low flow channel for the purpose of enhancing fish passage. In addition, given the anticipated fluctuations of the effluent return, a greater concern is that the modified low flow channel could be too large when the base flow is diminished, resulting in unacceptably low water depths.

5. Effluent Return Benefits: The following is noted regarding the potential benefits associated with the development of an effluent return to the rehabilitated Underwood Creek watercourse, as currently designed.

a. *Fisheries Benefit* – As stated previously, an increased water depth outside the low flow channel will enhance fish passage by creating additional flow area within the channel cross-section. It is acknowledged that fish will move to the portion of the main channel that has a suitable flow depth, and the key is to provide a minimum depth, which is accommodated by the previously designed low flow channel.

b. *Floodplain Hydration* – Having a higher low flow depth in the main channel will also slightly increase groundwater elevations in the floodplain in the vicinity of channel, which will improve hydration for the wetland plantings. The extent of this enhancement can not be determined without additional study.

c. *Other Biological Benefits* – It is generally acknowledged that a greater base flow discharge will provide enhanced aquatic habitat by virtue of there being more water in the main channel. The extent of this improvement, however, is beyond the scope of this evaluation, and is dependent on the water quality characteristics of the effluent return and the identified desirable aquatic species.

List of Attachments

- **Tables**
  - Table 1: Underwood Creek – Phase 1 and 2 Projects, Rehabilitated Main and Low Flow Channel Dimensions
  - Table 2: Underwood Creek – Phase 1 and 2 Projects, Depth and Velocity Changes due to Increased Baseflow
- **Exhibits**
  - Exhibits A: Phase 1 Project – Main and Low Flow Channels
    - A-1: River Station (RS) 1.180, Station (STA) 172+00
    - A-2: RS 1.032, STA 163+50
    - A-3: RS 0.919, STA 157+00
    - A-4: RS 0.858, STA 153+50
    - A-5: RS 0.841, STA 152+50
  - Exhibits B: Phase 2 Project – Main and Low Flow Channels
    - B-1: RS 0.792, STA 149+50
    - B-2: RS 0.754, STA 147+50
    - B-3: RS 0.726, STA 146+00
    - B-4: RS 0.491, STA 133+40
    - B-5: RS 0.207, STA 118+40
    - B-6: RS 0.058, STA 110+50
  - Exhibit C: Underwood Creek – Channel Bottom and Water Surface Profiles
  - Exhibit D: Underwood Creek – Phase 1 Rehabilitated Main Channel With Modified Low Flow Channel
- **Attachments**
  - Attachment 1: Underwood Creek Rehabilitation and Flood Management - Phase 1 Bid and Construction Drawings, April 2008
  - Attachment 2: Underwood Creek Rehabilitation and Flood Management - Phase 2 Preliminary Engineering Drawings, January 2006
  - Attachment 3: Underwood Creek Main and Low Flow Channels, HEC-RAS Summary Output

Table 1

Underwood Creek - Phase 1 and 2 Projects
Rehabilitated Main and Low Flow Channel Dimensions

Phase	River Mile (RM)	Main Channel Station (feet)	Location Description	Trapezoidal Channel Dimensions												
				Average Bottom Slope (percent)	Main Channel				Low Flow Channel (Q = 3 cfs)				Low Flow Channel (Q = 23 cfs)			
					Bottom Width (feet)	Top Width (feet)	Depth (feet)	Side Slopes (ft/ft)	Bottom Width (feet)	Top Width (feet)	Depth (feet)	Side Slopes (ft/ft)	Bottom Width (feet)	Top Width (feet)	Depth (feet)	Side Slopes (ft/ft)
1	1.26	176+20	Upstream limit of Phase 1 Project	Existing Concrete Lined Channel												
				0.194%												
	1.18	172+00			18.3	22.3	3.17	2:1	3.5	8.0	0.75	3:1	6.0	15.0	1.50	3:1
				0.194%												
	1.032	163+50			26.1	30.0	3.37	2:1	3.5	8.0	0.75	3:1	6.0	15.0	1.50	3:1
				0.194%												
	0.919	157+00			22.1	26.2	3.50	2:1	3.5	8.0	0.75	3:1	6.0	15.0	1.50	3:1
				0.194%												
	0.858	153+50			26.0	30.1	2.93	2:1	3.5	8.0	0.75	3:1	6.0	15.0	1.50	3:1
				0.834%												
	0.841	152+50	Phase 1 and 2 Project Transition		22.1	26.2	3.02	2:1	3.5	8.0	0.75	3:1	16.0	19.8	0.63	3:1
	0.82	150+70	CPR Railroad Bridge	Channel slope and dimensions beneath bridge to be determined in Phase 2 Project												
2	0.792	149+50			20.0	27.9	3.00	2:1	3.5	6.2	0.45	3:1	16.0	19.8	0.63	3:1
				0.830%												
	0.754	147+50	Main Channel flow increases by 35%		24.0	32.6	3.13	2:1	3.5	6.2	0.45	3:1	16.0	19.8	0.63	3:1
				0.830%												
	0.726	146+00			26.2	35.0	3.20	2:1	3.5	6.2	0.45	3:1	16.0	19.8	0.63	3:1
				0.650%												
	0.491	133+40			21.0	33.4	4.10	2:1	3.5	7.1	0.60	3:1	22.0	25.4	0.56	3:1
				0.290%												
	0.207	118+40			22.0	38.3	4.10	2:1	5.5	9.4	0.65	3:1	15.9	21.0	0.85	3:1
				0.100%												
	0.058	110+50	Downstream limit of Phase 2 Project		22.0	38.3	4.10	2:1	5.5	9.4	0.65	3:1	14.8	22.0	1.20	3:1

Note: Manning n (roughness) = 0.045 throughout.

Table 2

Underwood Creek - Phase 1 and 2 Projects
Depth and Velocity Changes due to Increased Baseflow

Phase	River Mile (RM)	Main Channel Station (feet)	Location Description	Base Flow Depths and Velocities										Change from 3 cfs Base Flow			
					Base Flow = 3 cfs			Base Flow = 10 cfs			Base Flow = 23 cfs			Base Flow = 10 cfs		Base Flow = 23 cfs	
				Min Ch El (ft)	W.S. Elev (ft)	Water Depth (ft)	Vel Chnl (fps)	W.S. Elev (ft)	Water Depth (ft)	Vel Chnl (fps)	W.S. Elev (ft)	Water Depth (ft)	Vel Chnl (fps)	Water Depth (ft)	Vel Chnl (fps)	Water Depth (ft)	Vel Chnl (fps)
1	1.26	176+20	Upstream limit of Phase 1 Project	Existing Concrete Lined Channel													
	1.18	172+00		688.18	688.82	0.64	0.87	689.24	1.06	1.01	689.58	1.40	1.40	0.42	0.14	0.76	0.53
	1.032	163+50		686.53	687.17	0.64	0.87	687.59	1.06	0.80	687.94	1.41	1.06	0.42	-0.07	0.77	0.19
	0.919	157+00		685.27	685.91	0.64	0.87	686.34	1.07	0.88	686.68	1.41	1.20	0.43	0.01	0.77	0.33
	0.858	153+50		684.56	685.00	0.44	1.43	685.44	0.88	1.30	685.64	1.08	1.77	0.44	-0.13	0.64	0.34
	0.841	152+50	Phase 1 and 2 Project Transition	683.73	684.20	0.47	1.28	684.65	0.92	1.24	684.84	1.11	1.87	0.45	-0.04	0.64	0.59
	0.82	150+70	CPR Railroad Bridge	Channel hydraulic characeristics beneath bridge to be determined in Phase 2 Project													
2	0.792	149+50		681.98	682.49	0.51	0.90	682.67	0.69	1.41	682.89	0.91	1.94	0.18	0.51	0.40	1.04
	0.754	147+50	Main Channel flow increases by 35%	680.33	680.84	0.51	0.85	680.99	0.66	1.35	681.19	0.86	1.84	0.15	0.50	0.35	0.99
	0.726	146+00		679.11	679.63	0.52	0.77	679.79	0.68	1.23	679.99	0.88	1.68	0.16	0.46	0.36	0.91
	0.491	133+40		670.87	671.44	0.57	1.01	671.77	0.90	1.03	672.07	1.20	1.40	0.33	0.02	0.63	0.39
	0.207	118+40		666.49	667.12	0.63	0.65	667.53	1.04	0.72	667.92	1.43	0.97	0.41	0.07	0.80	0.32
	0.058	110+50	Downstream limit of Phase 2 Project	665.70	666.30	0.60	0.69	666.71	1.01	0.76	667.09	1.39	1.02	0.41	0.07	0.79	0.33

Exhibits

Exhibits A: Phase 1 Project – Main and Low Flow Channels

A-1: River Station (RS) 1.180, Station (STA) 172+00

A-2: RS 1.032, STA 163+50

A-3: RS 0.919, STA 157+00

A-4: RS 0.858, STA 153+50

A-5: RS 0.841, STA 152+50

Exhibits B: Phase 2 Project – Main and Low Flow Channels

B-1: RS 0.792, STA 149+50

B-2: RS 0.754, STA 147+50

B-3: RS 0.726, STA 146+00

B-4: RS 0.491, STA 133+40

B-5: RS 0.207, STA 118+40

B-6: RS 0.058, STA 110+50

Exhibit C

Underwood Creek – Channel Bottom and Water Surface Profiles

Exhibit D

Underwood Creek – Phase 1 Rehabilitated Main Channel With Modified Low Flow Channel

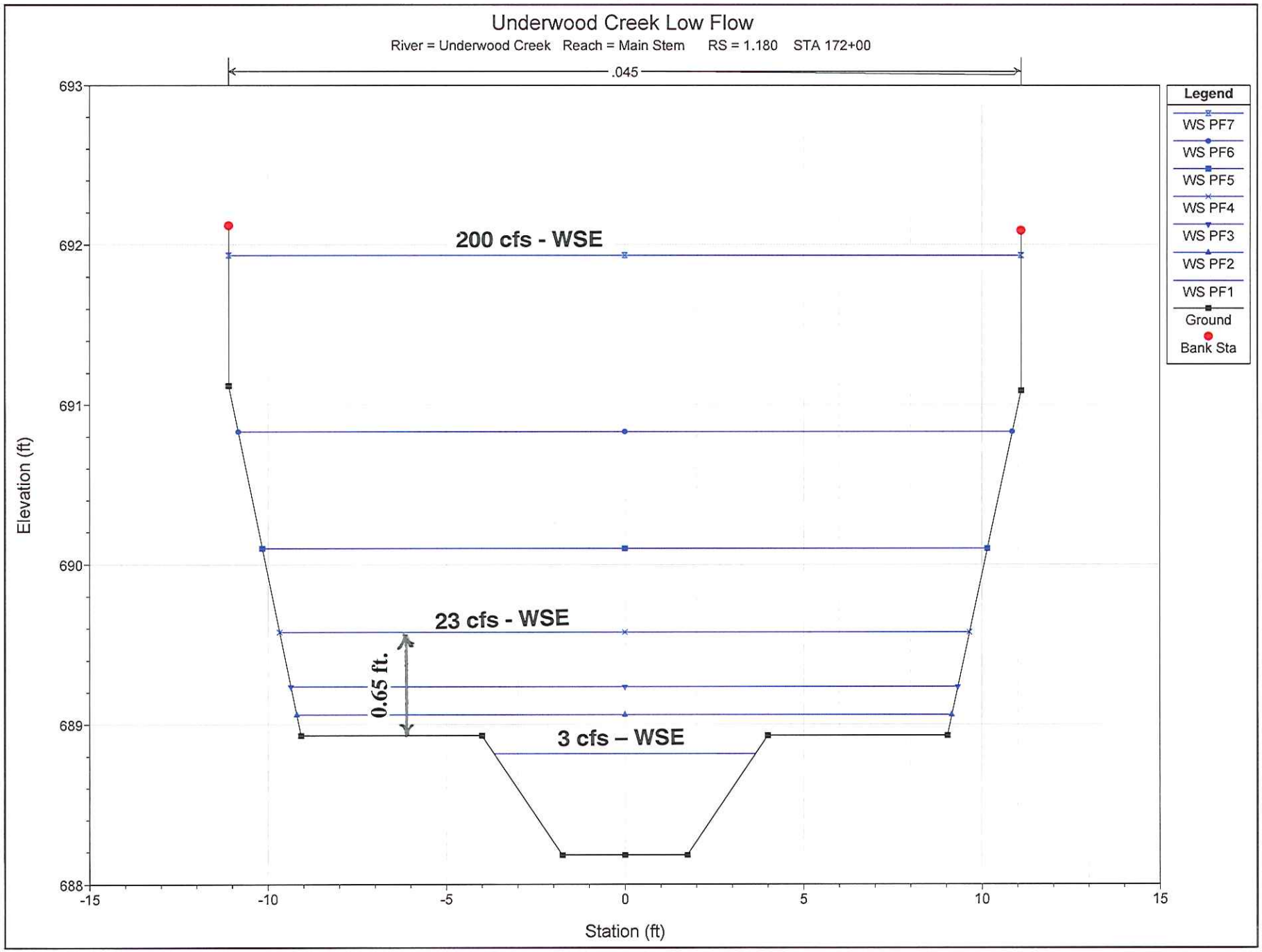


Exhibit A-1
Phase 1 Project - Main and Low Flow Channels

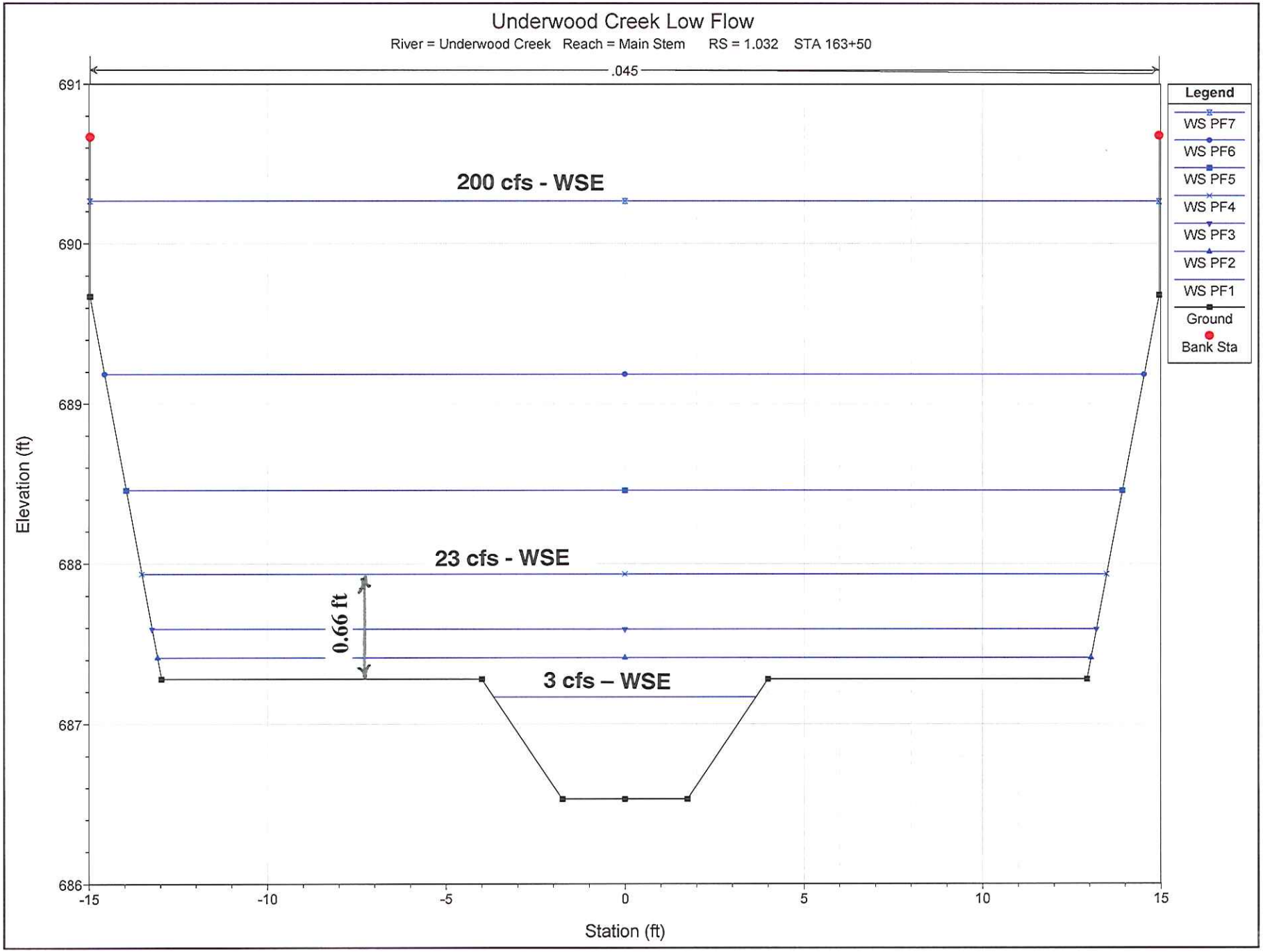


Exhibit A-2
Phase 1 Project - Main and Low Flow Channels

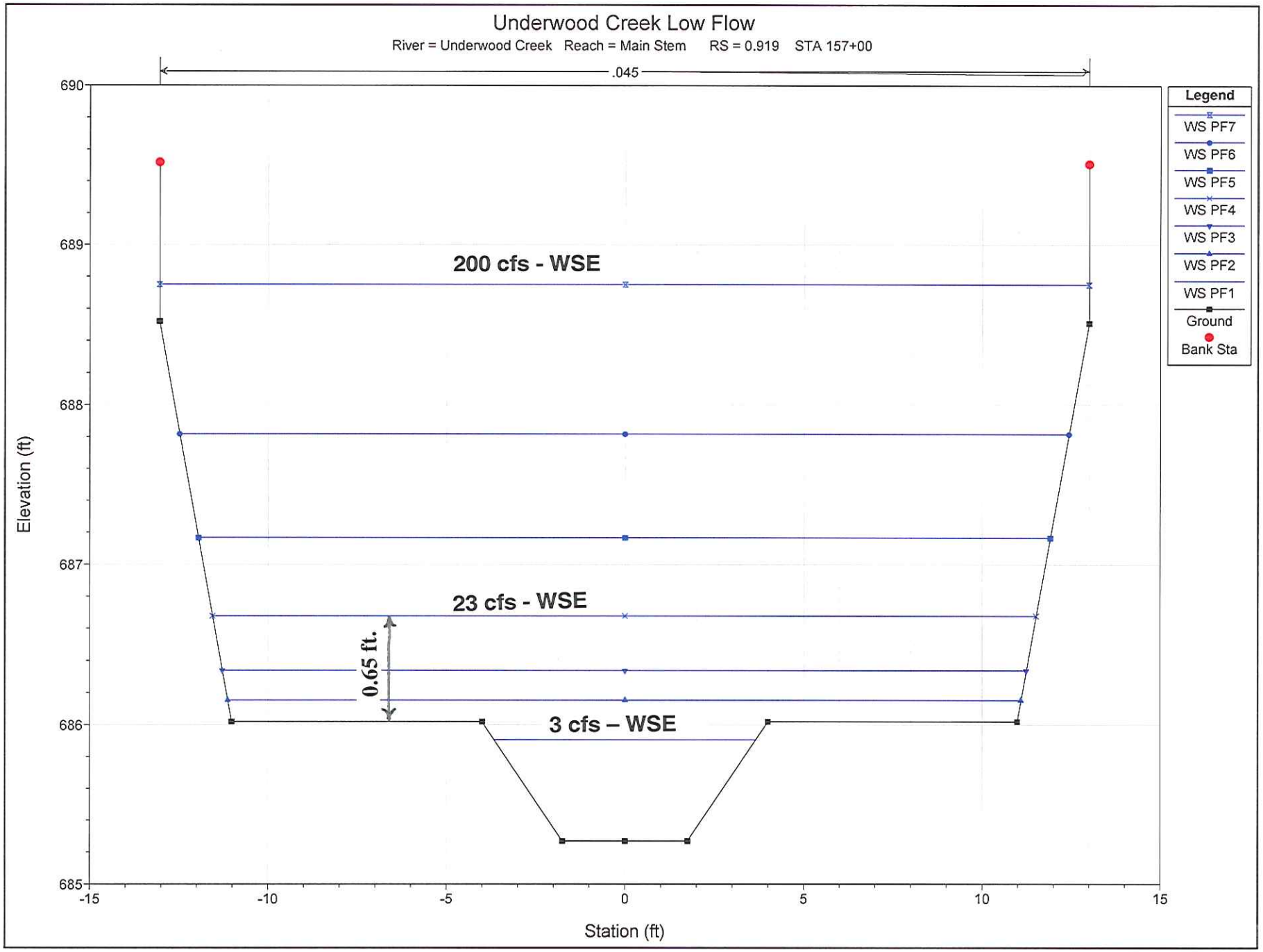


Exhibit A-3
Phase 1 Project - Main and Low Flow Channels

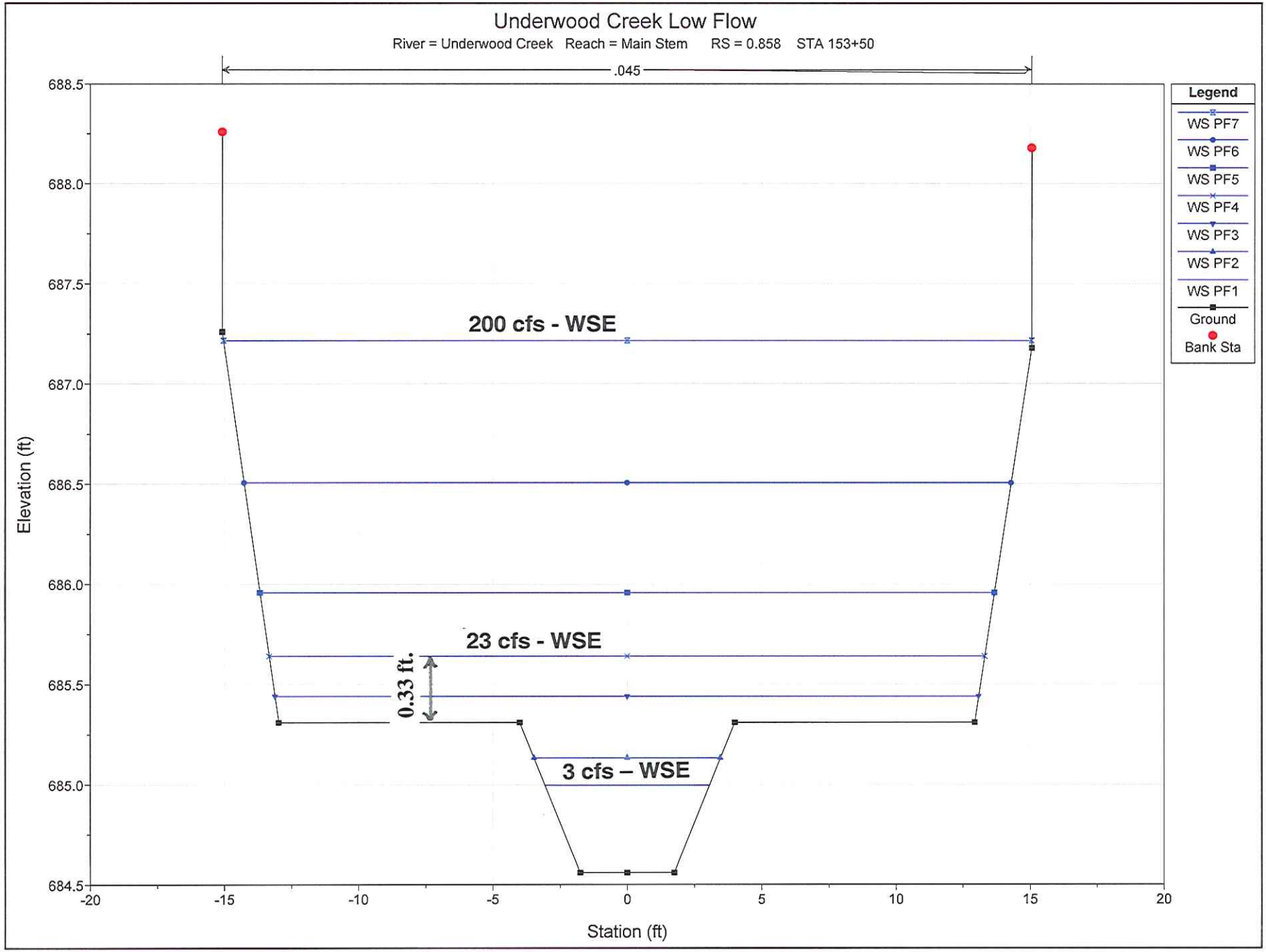


Exhibit A-4
Phase 1 Project - Main and Low Flow Channels

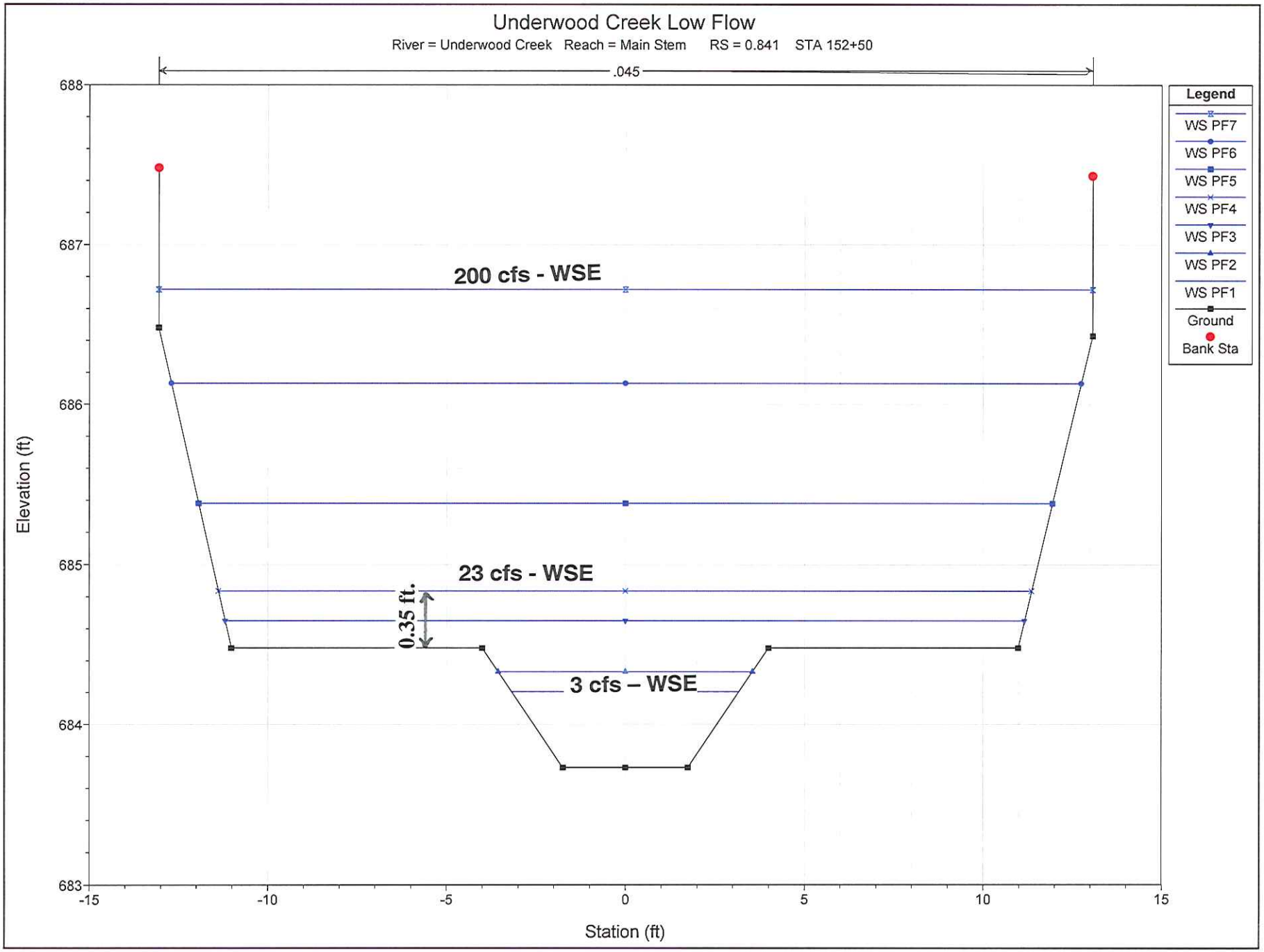


Exhibit A-5
Phase 1 Project - Main and Low Flow Channels

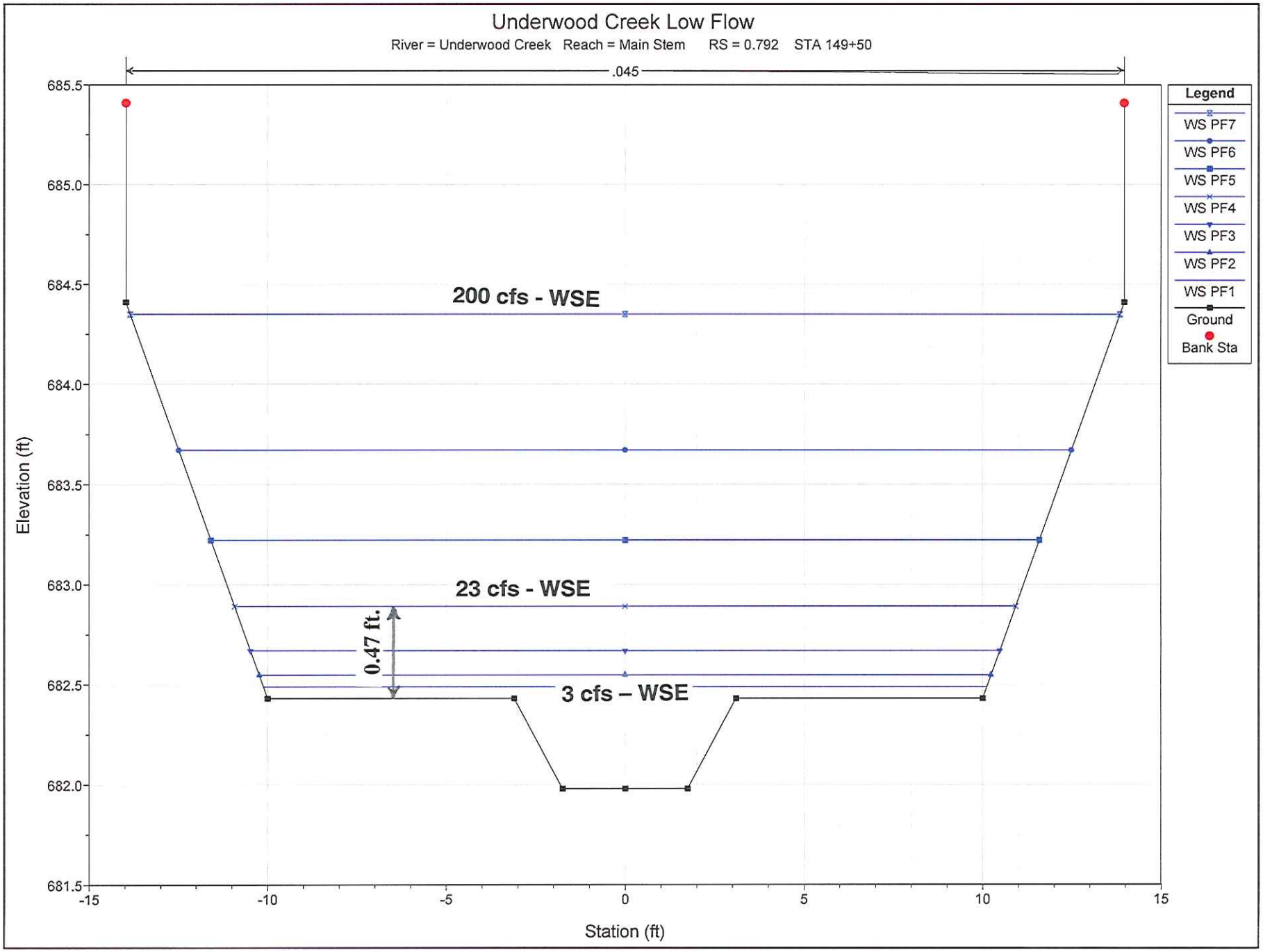


Exhibit B-1
Phase 2 Project - Main and Low Flow Channels

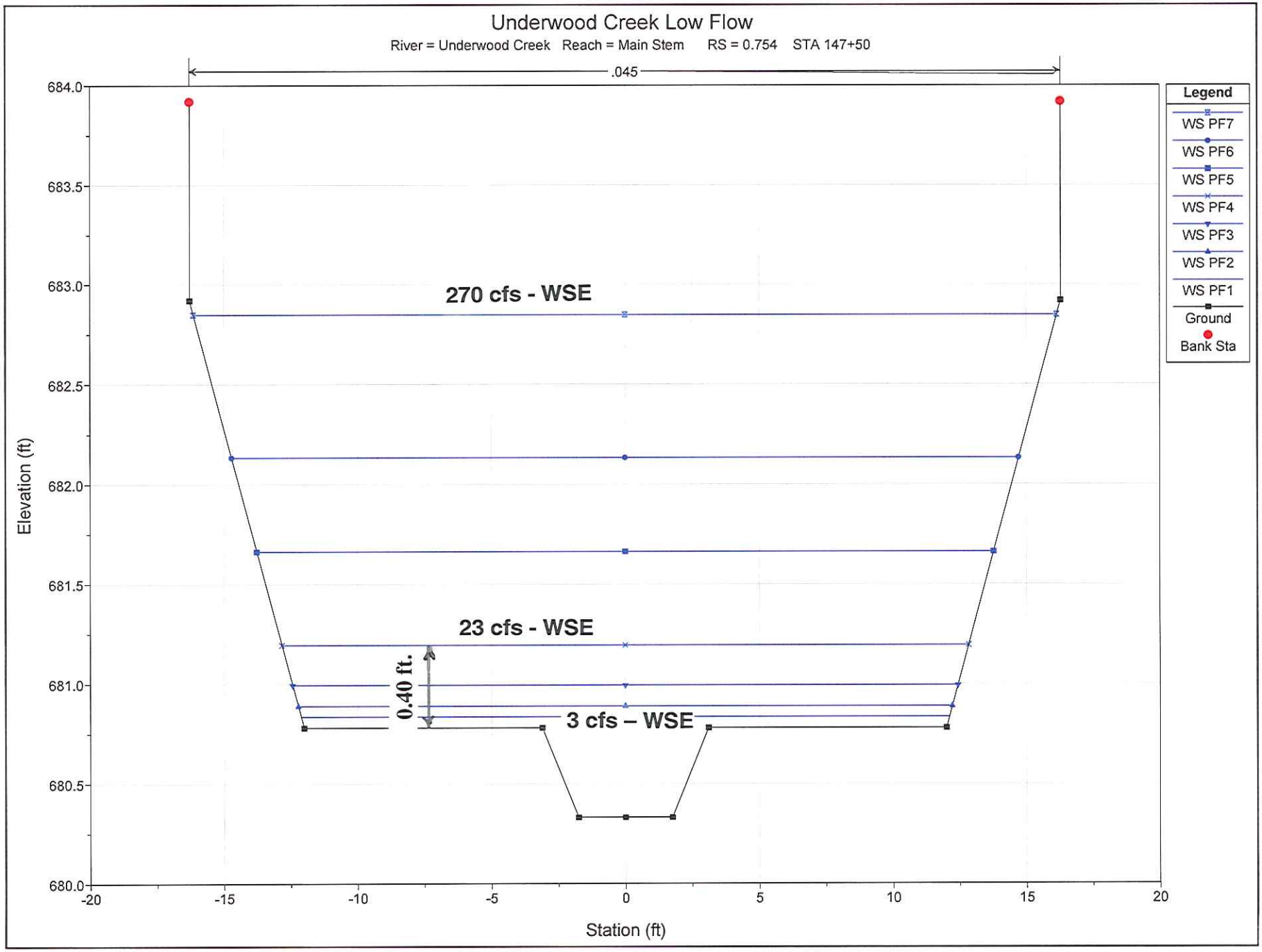


Exhibit B-2
Phase 2 Project - Main and Low Flow Channels

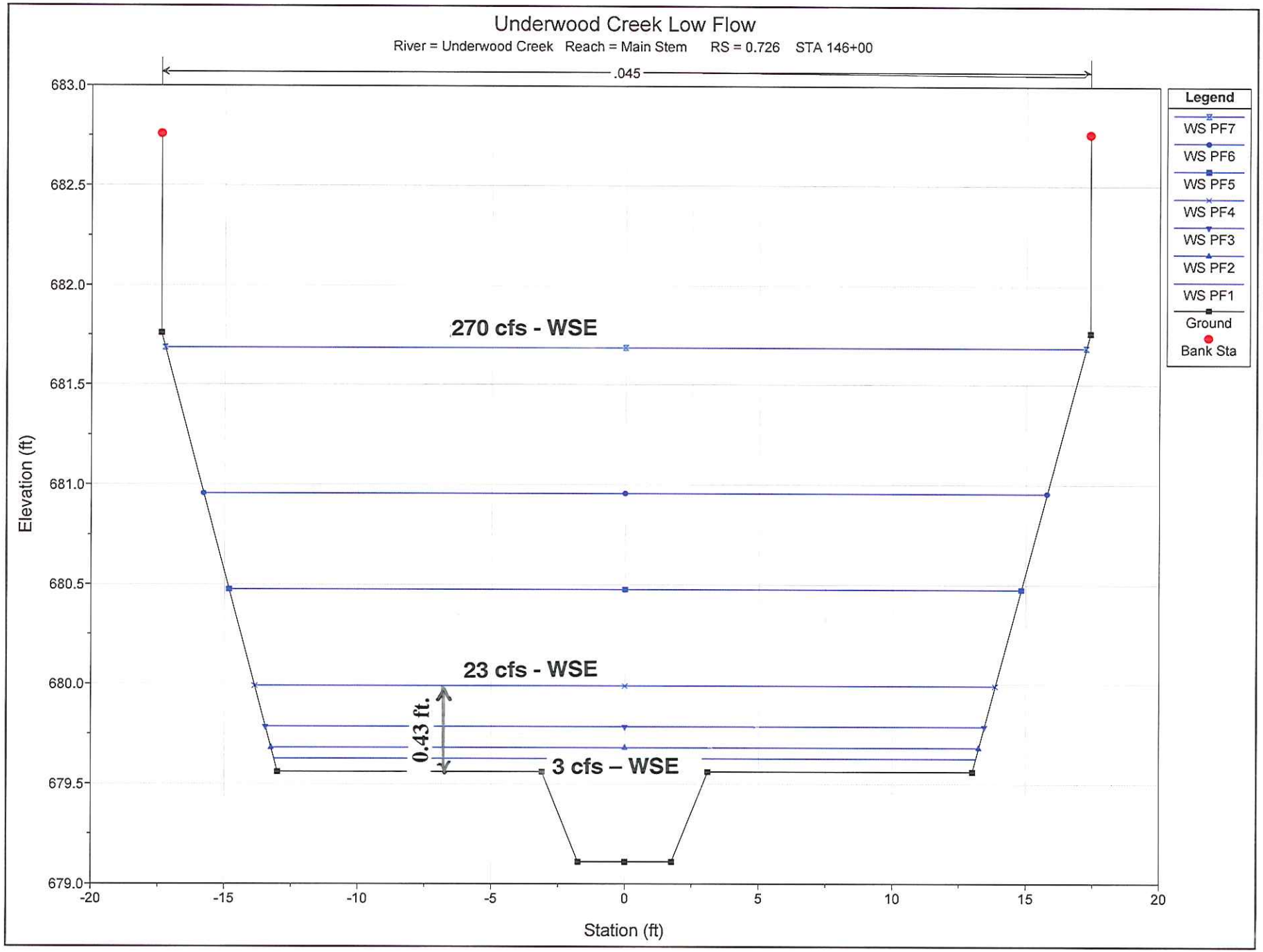


Exhibit B-3
Phase 2 Project - Main and Low Flow Channels

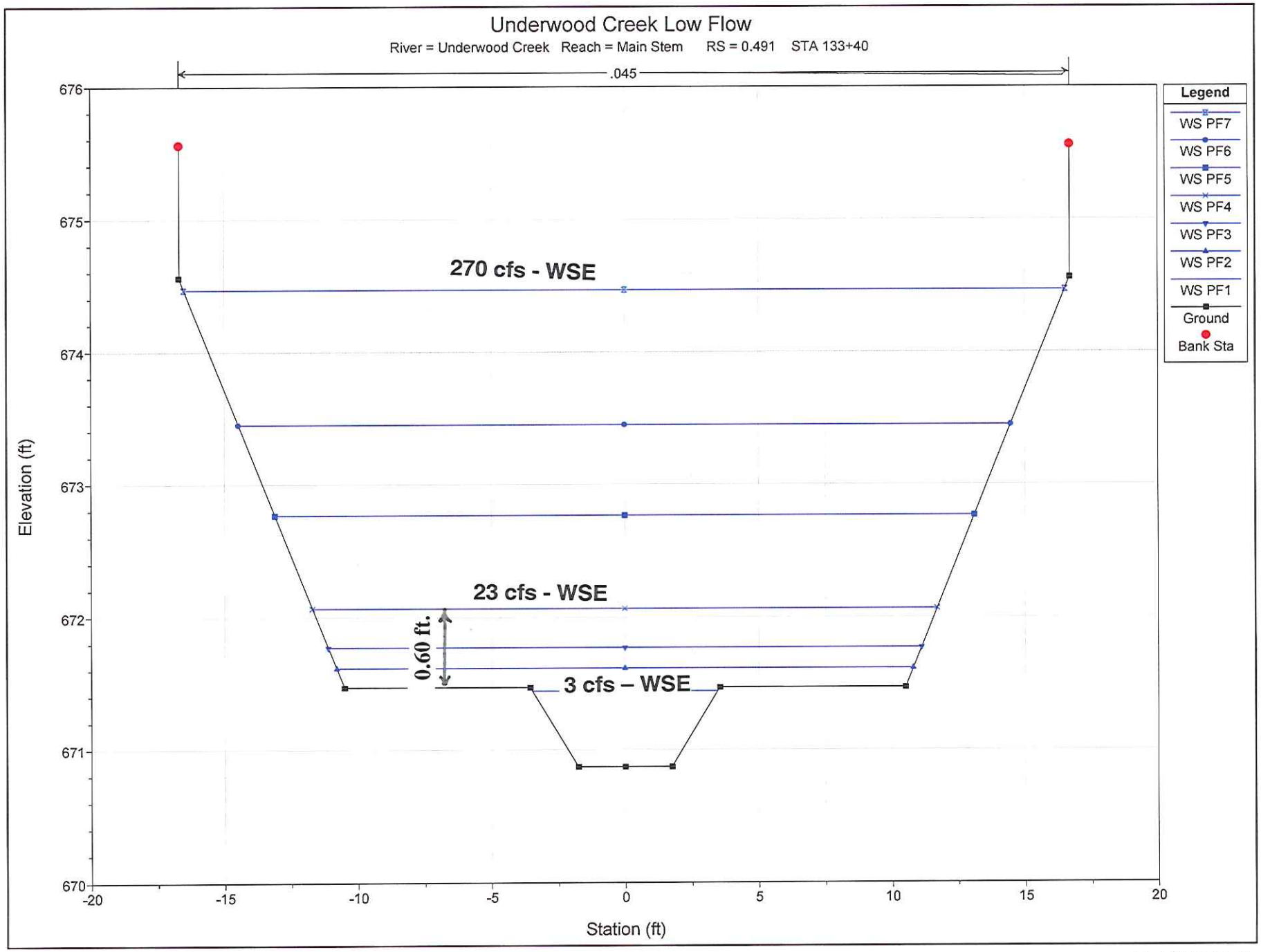


Exhibit B-4
Phase 2 Project - Main and Low Flow Channels

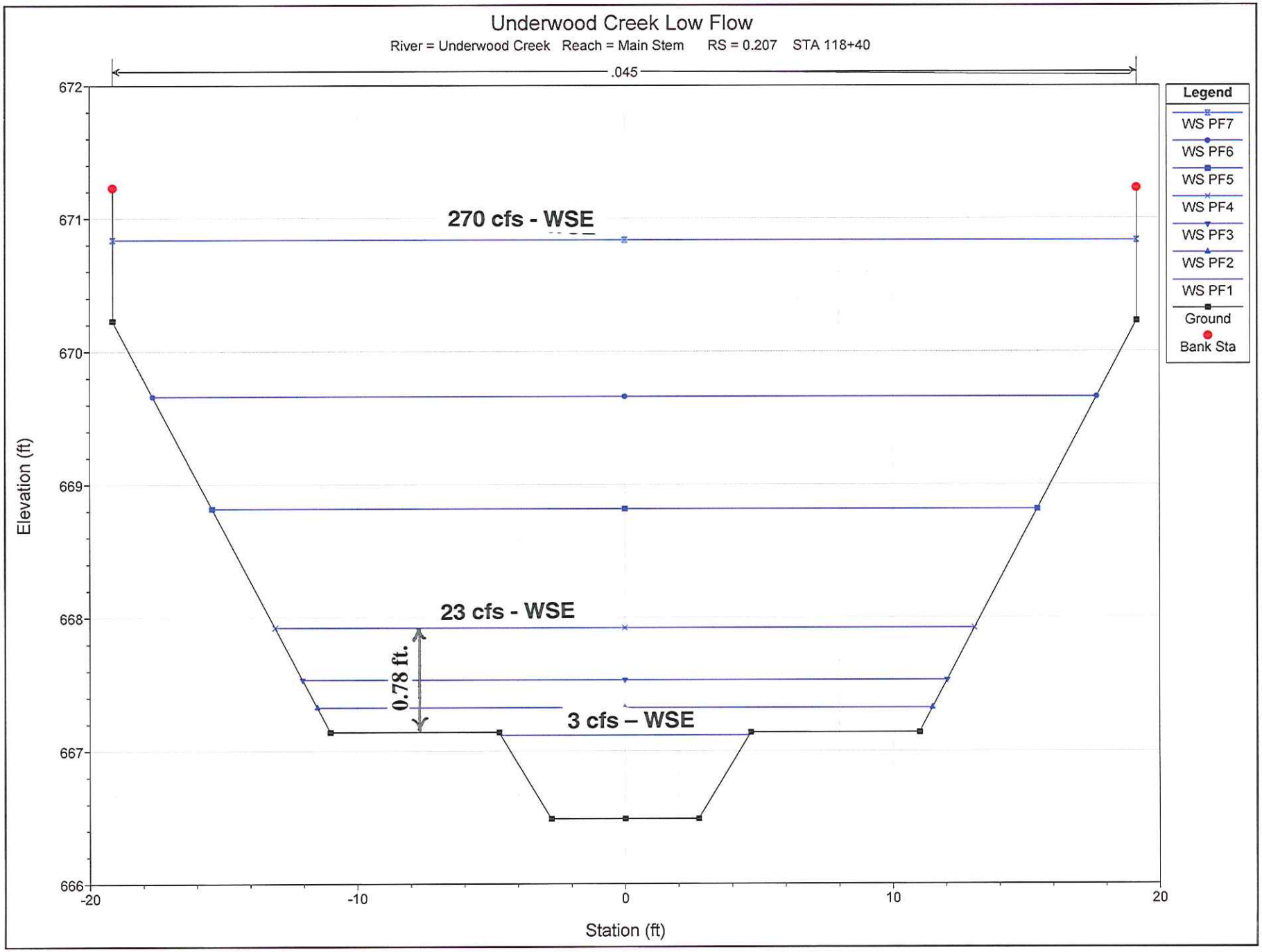


Exhibit B-5
Phase 2 Project - Main and Low Flow Channels

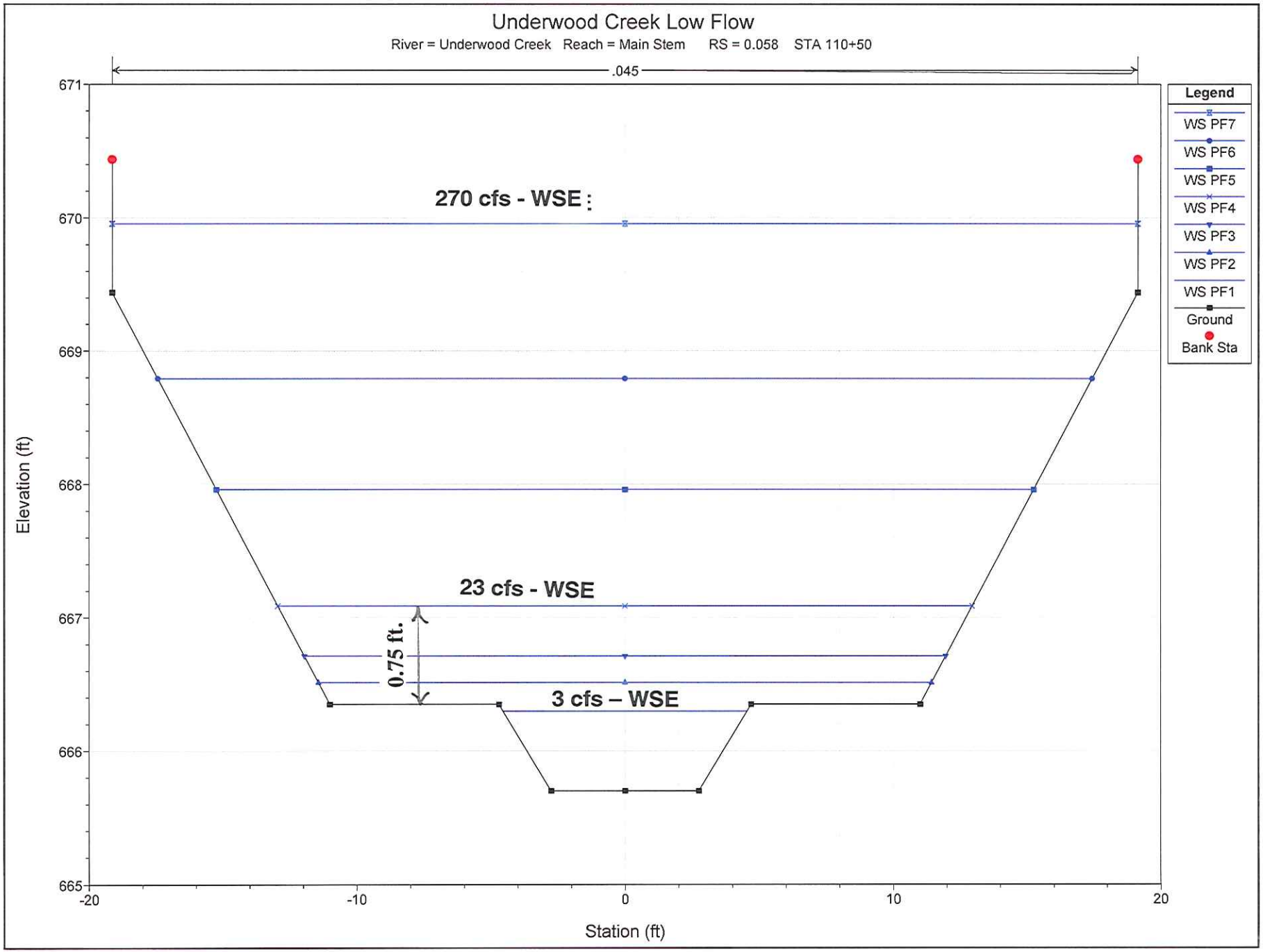


Exhibit B-6
Phase 2 Project - Main and Low Flow Channels

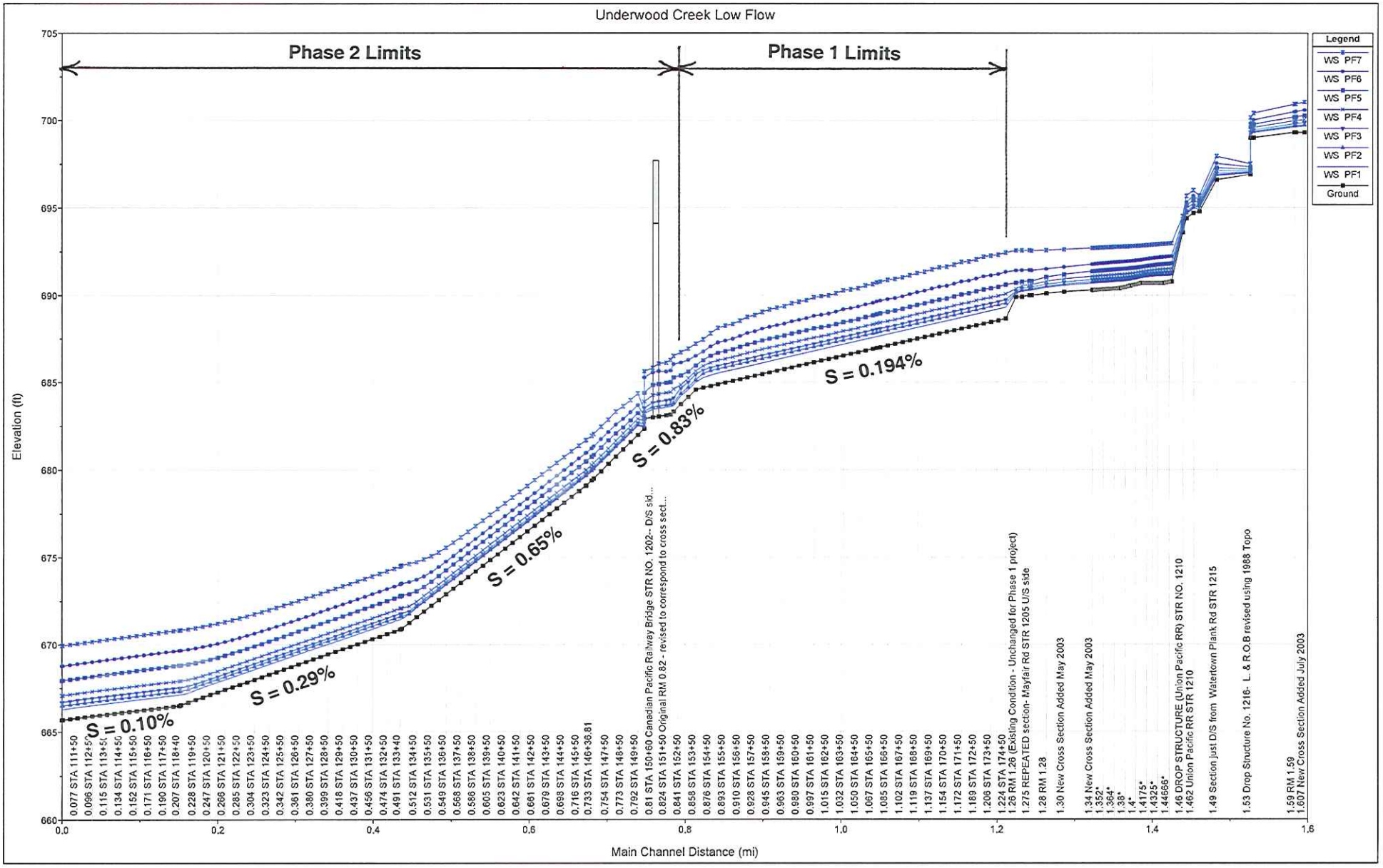
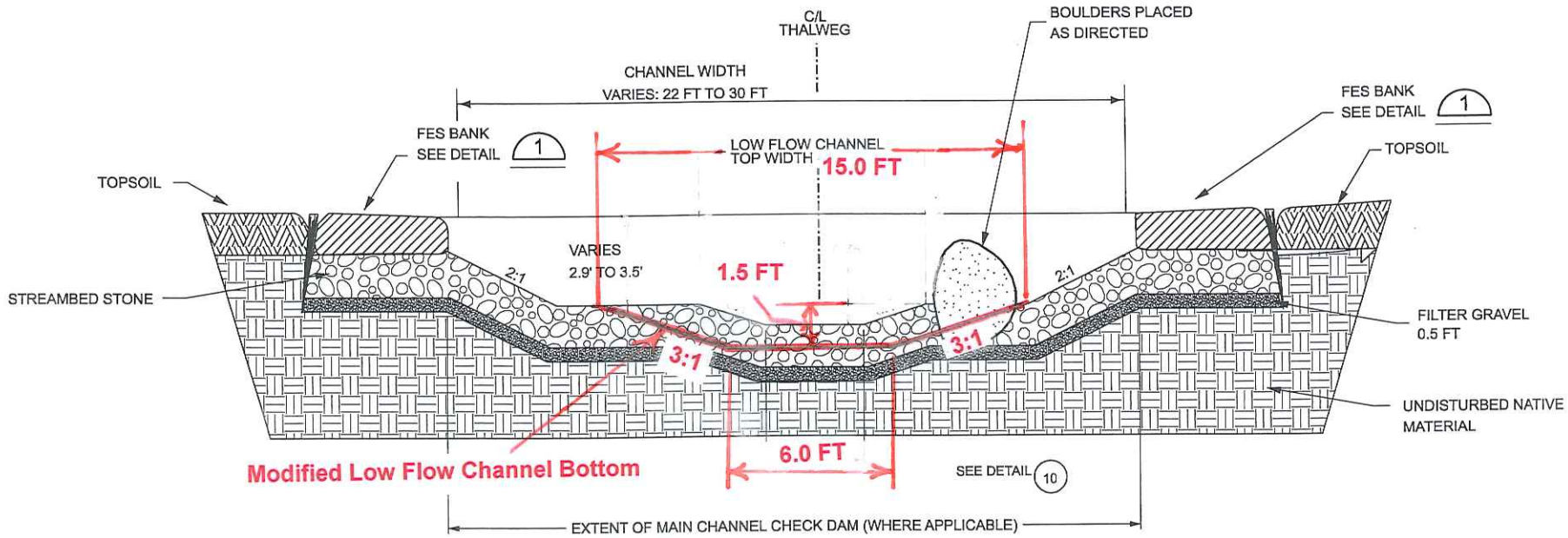


Exhibit C

Underwood Creek – Channel Bottom and Water Surface Profiles



MAIN CHANNEL CROSS-SECTION AT RIFFLE
TYPICAL SECTION

Exhibit D
Underwood Creek – Phase 1 Rehabilitated Main Channel
With Modified Low Flow Channel

Attachment 1

Underwood Creek Rehabilitation and Flood Management - Phase 1
Bid and Construction Drawings
April 2008

Contract Documents

Milwaukee Metropolitan
Sewerage District

Watercourse

Underwood Creek Rehabilitation and Flood Management - Phase 1

Contract W21005C01

Plans

For information regarding this project call: David C. Fowler, Senior Project Manager: (414) 277-6368

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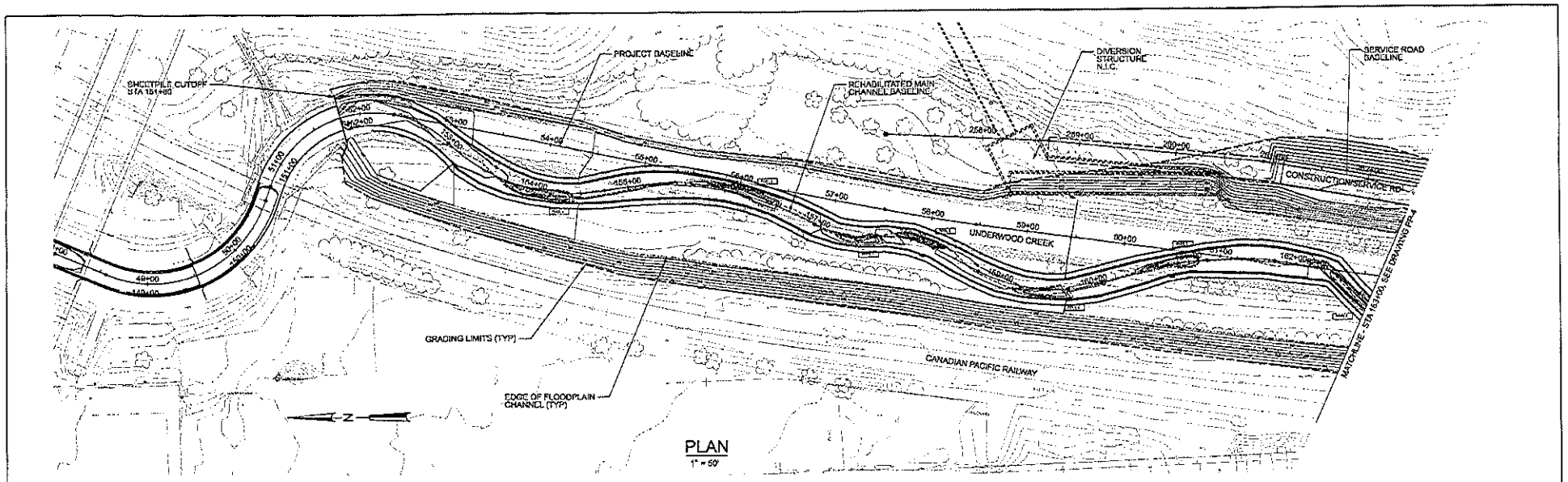
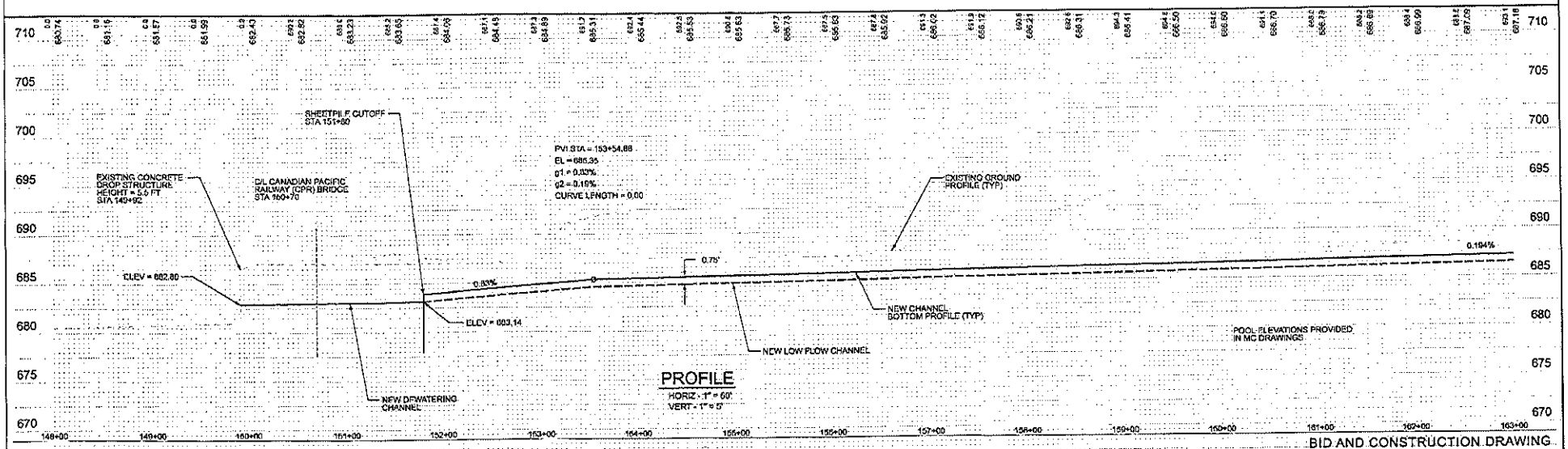
Bid - April 2008

BID AND CONSTRUCTION DRAWING SET

MMSD FILE NO. 151-572.DGN



PLAN
1" = 50'



PROFILE
HORIZ - 1" = 60'
VERT - 1" = 5'

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DR	M. WEBER
CK	T. SEAR
APVD	T. SEAR

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SHORT ELLIOTT HENDRICKSON INC.

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MILWAUKEE METROPOLITAN SEWERAGE DISTRICT
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
REHABILITATED MAIN CHANNEL
PLAN AND PROFILE

DRAWING NO.:	PP-3
SHEET:	14
DATE:	APRIL, 2009
CONTRACT:	W21005C01
MMSD FILE:	151-505.DGN

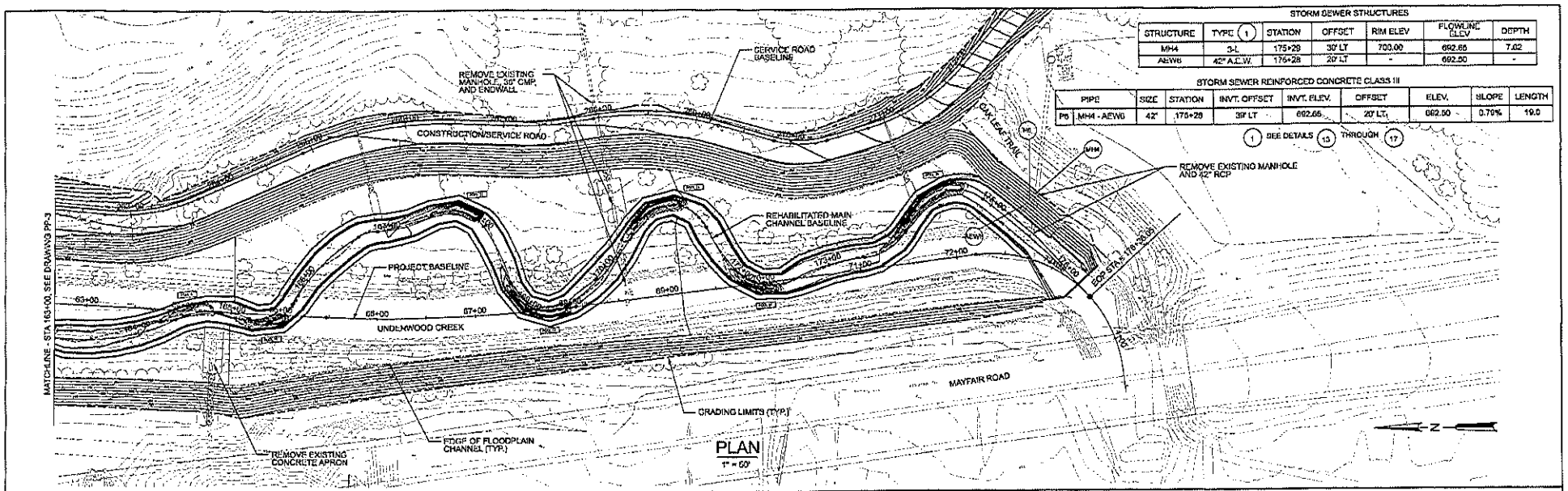
STORM SEWER STRUCTURES

STRUCTURE	TYPE (1)	STATION	OFFSET	RIM ELEV	FLOWLINE ELEV	DEPTH
MH4	3-L	175+29	39' LT	700.00	692.65	7.02
AEW6	42" A.E.W.	176+28	20' LT	-	692.50	-

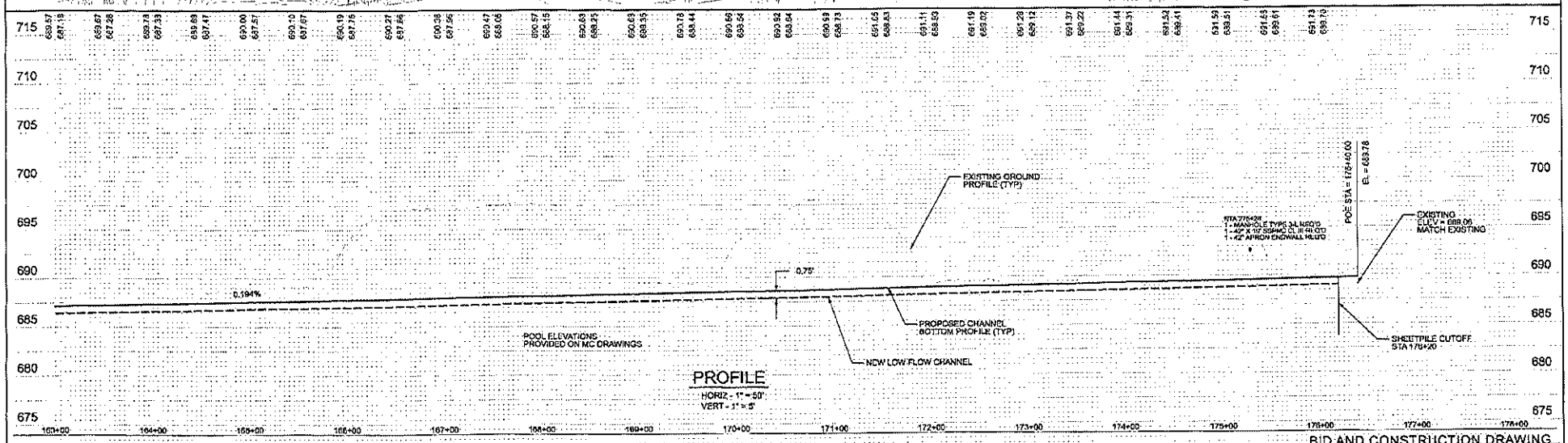
STORM SEWER REINFORCED CONCRETE CLASS III

	PIPE	SIZE	STATION	INVT. OFFSET	INVT. ELEV.	OFFSET	ELEV.	SLOPE	LENGTH
P6	MH4 - AEW6	42"	175+29	39' LT	692.65	20' LT	692.50	0.79%	19.0

(1) SEE DETAILS (13) THROUGH (17)



PLAN
1" = 50'



PROFILE
HORIZ - 1" = 50'
VERT - 1" = 5'

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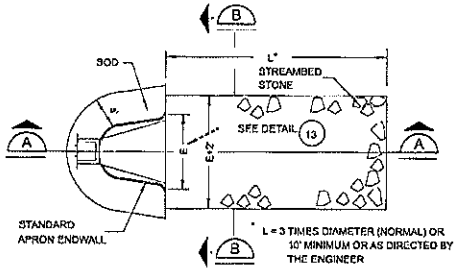
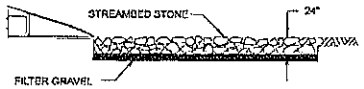
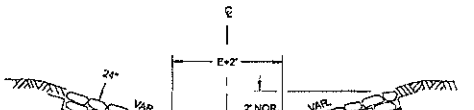
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
REHABILITATED MAIN CHANNEL
PLAN AND PROFILE

DRAWING NO.:	PP-4
SHEET:	15
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	151-589.DGN





SECTION A



SECTION B

STORM WATER CONVEYANCE DETAILS

NTS

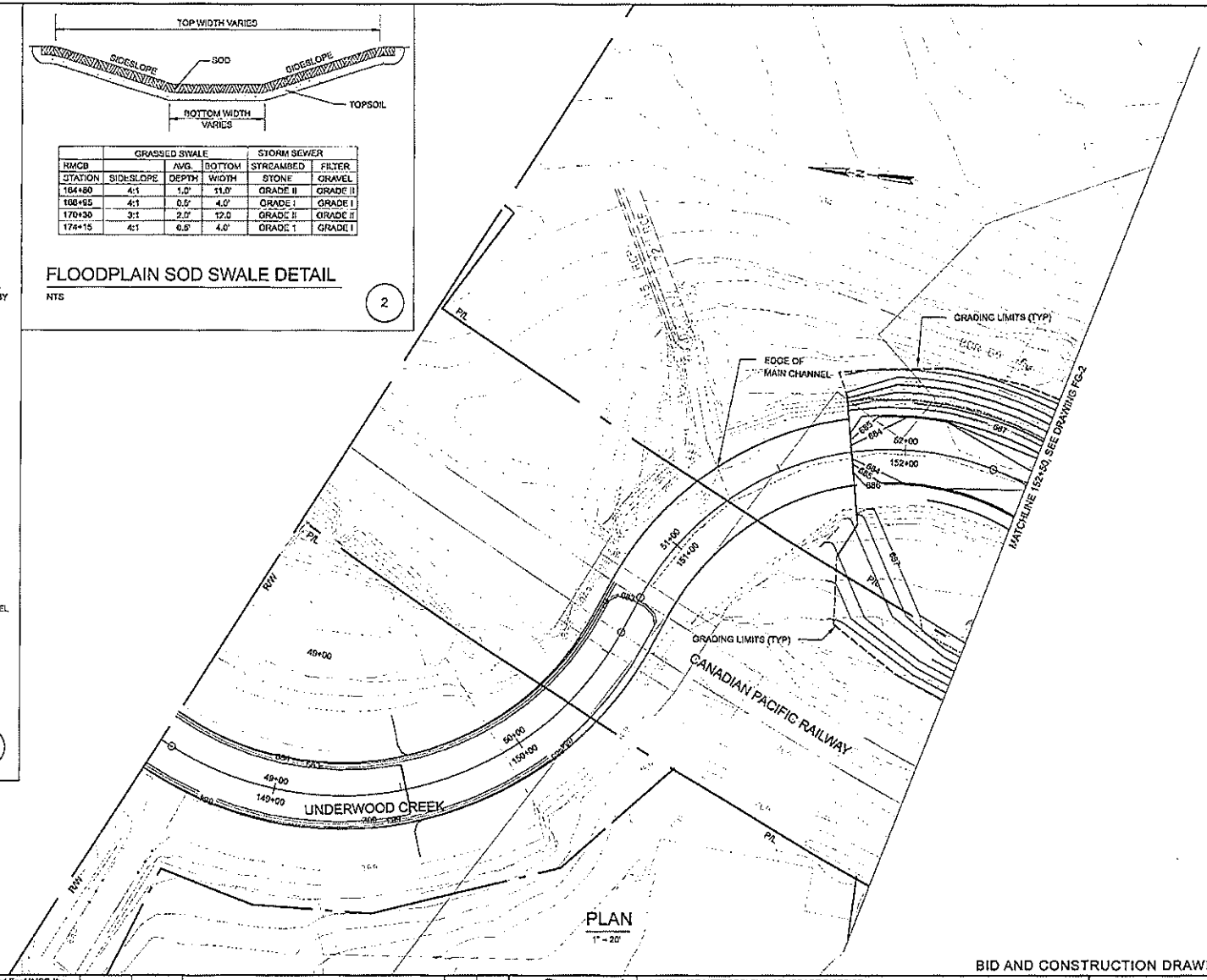
1

	GRASSED SWALE			STORM SEWER	
RMCB		AVG.	BOTTOM	STREAMBED	FILTER
STATION	SIDESLOPE	DEPTH	WIDTH	STONE	GRAVEL
164+80	4:1	1.0'	11.0'	GRADE II	GRADE II
168+95	4:1	0.5'	4.0'	GRADE I	GRADE I
170+30	3:1	2.0'	12.0	GRADE II	GRADE II
174+15	4:1	0.5'	4.0'	GRADE 1	GRADE I

FLOODPLAIN SOD SWALE DETAIL

NTS

2



PLAN

1" = 20'

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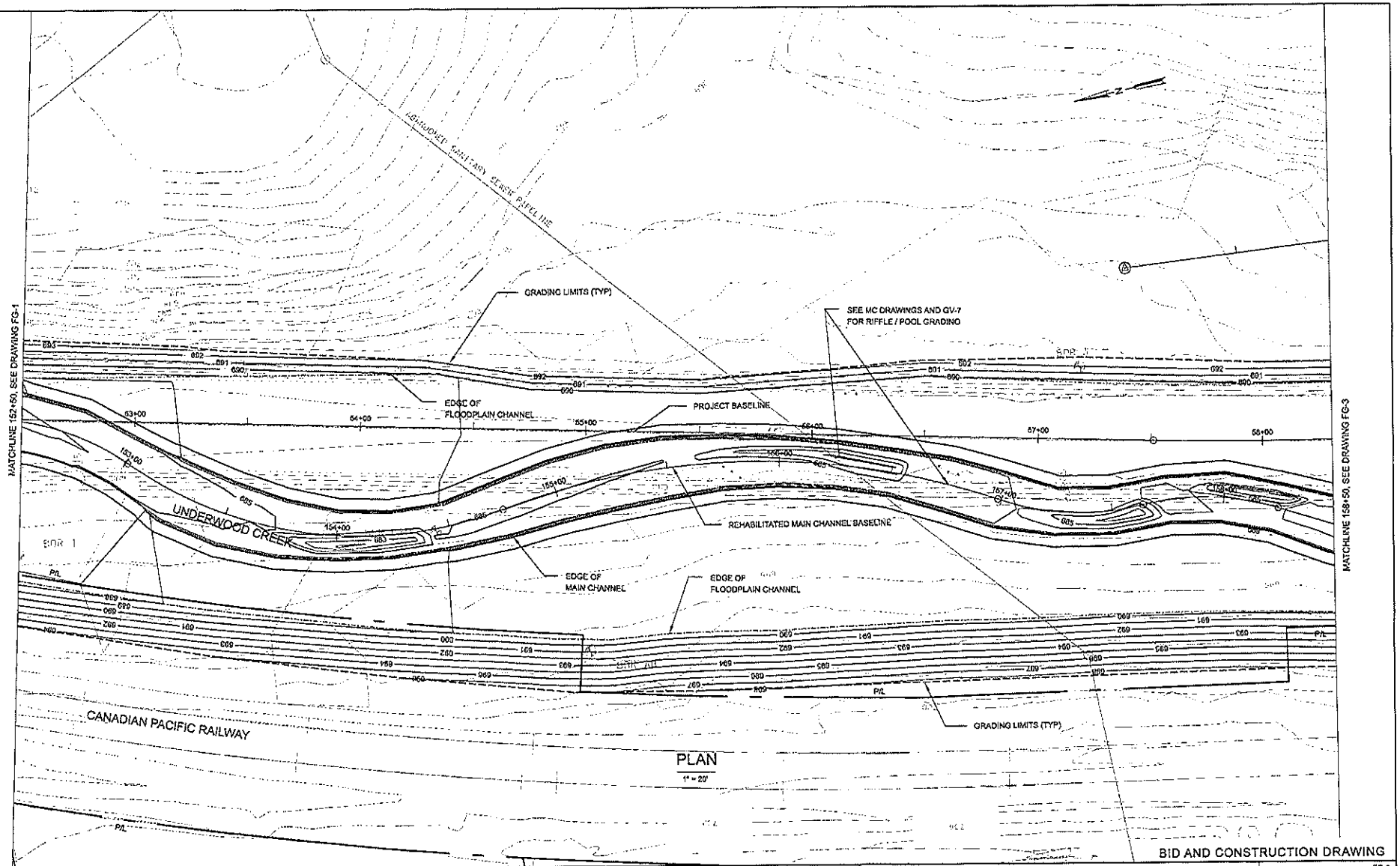
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
FLOODPLAIN GRADING
PLAN AND SECTIONS

DRAWING NO.:	FG-1
SHEET:	22
DATE:	APRIL, 2006
CONTRACT:	W21005C01
MMSD FILE:	161-593.DGN



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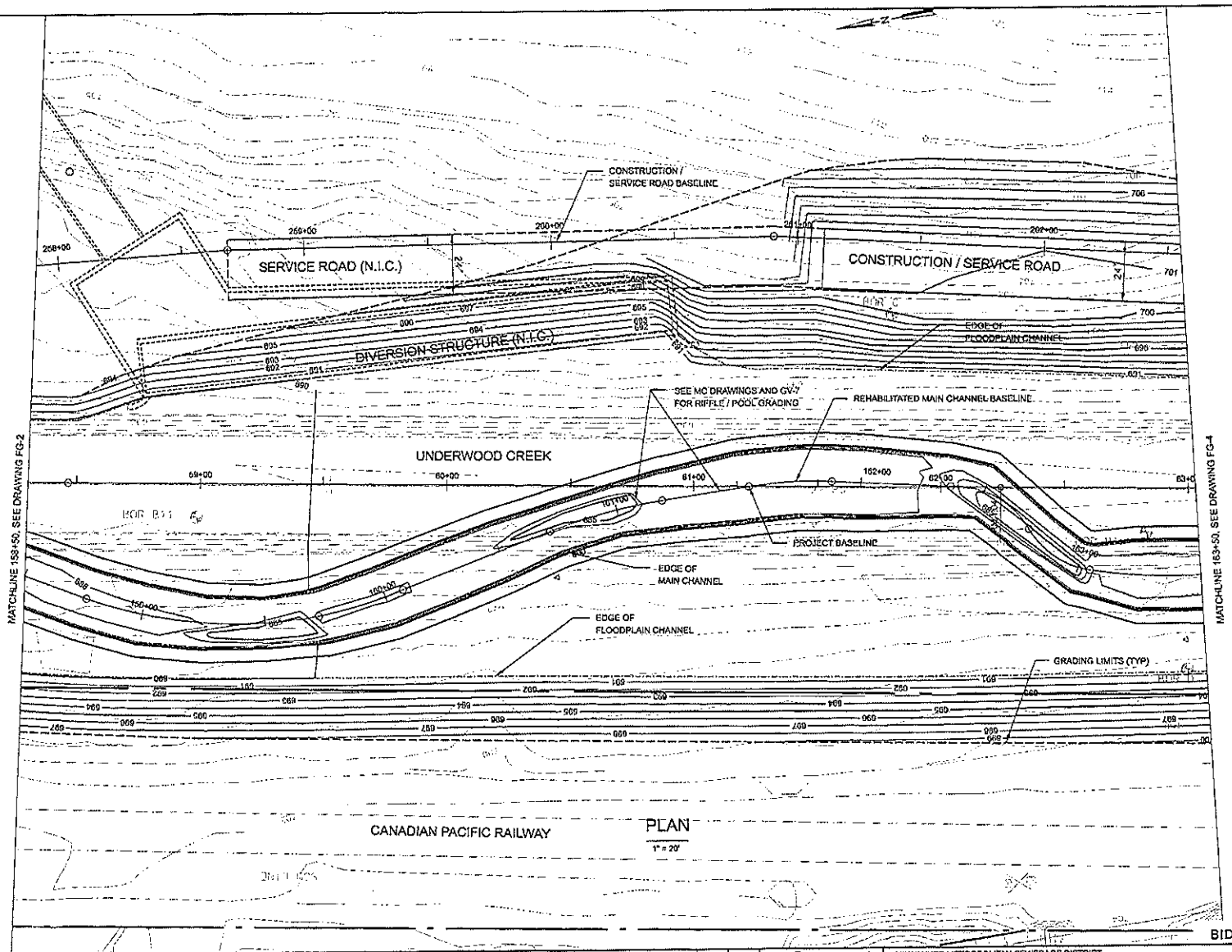
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
FLOODPLAIN GRADING
PLAN

DRAWING NO.:	FG-2
SHEET:	23
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	151-504.DGN



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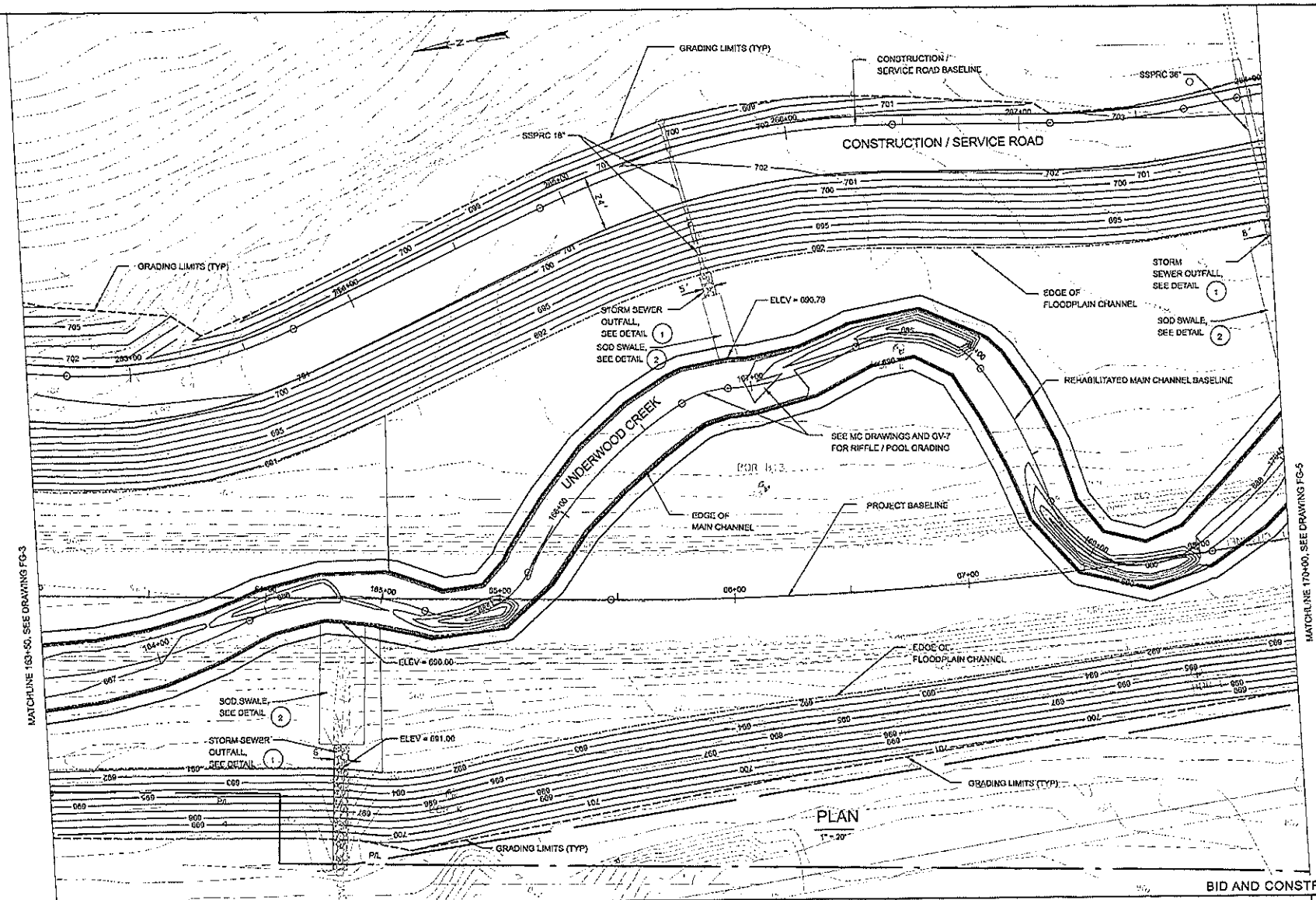
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
FLOODPLAIN GRADING
PLAN

DRAWING NO.:	FG-3
SHEET:	24
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	161-595.DGN



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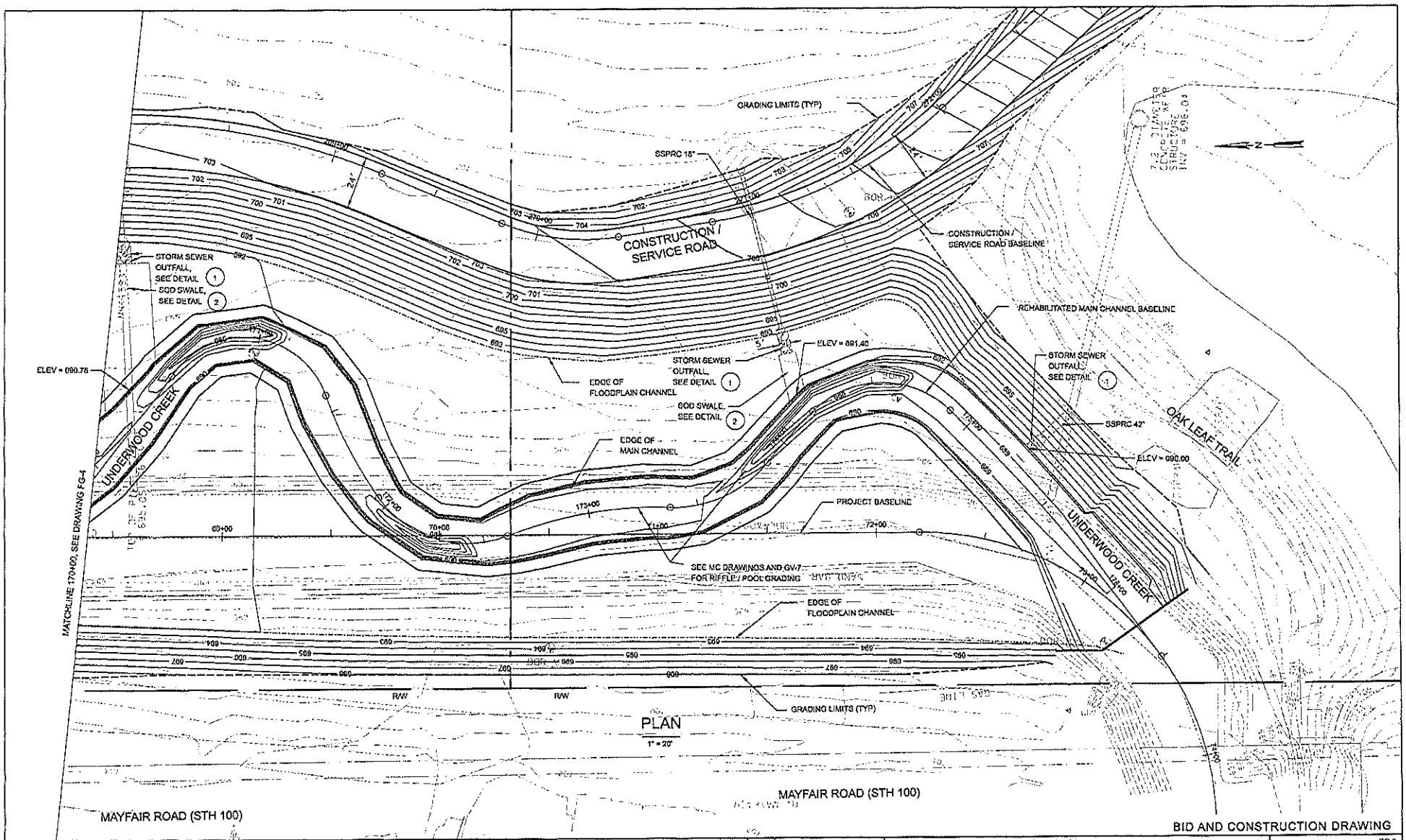
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
FLOODPLAIN GRADING
PLAN

DRAWING NO.:	FG-4
SHEET:	25
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	151-596.DGN



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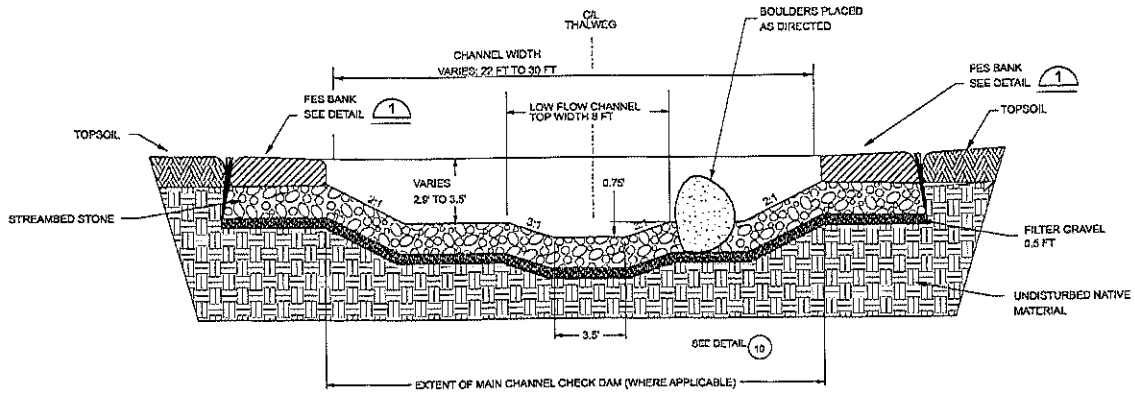
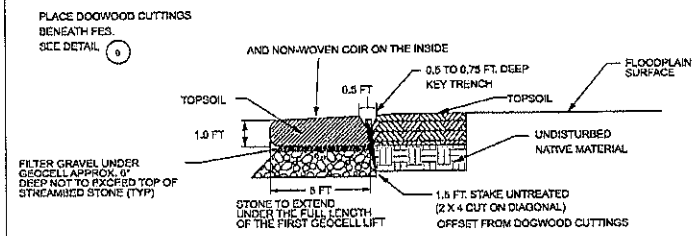
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
FLOODPLAIN GRADING
PLAN

DRAWING NO.:	FG-5
SHEET:	28
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	151-597.DGN



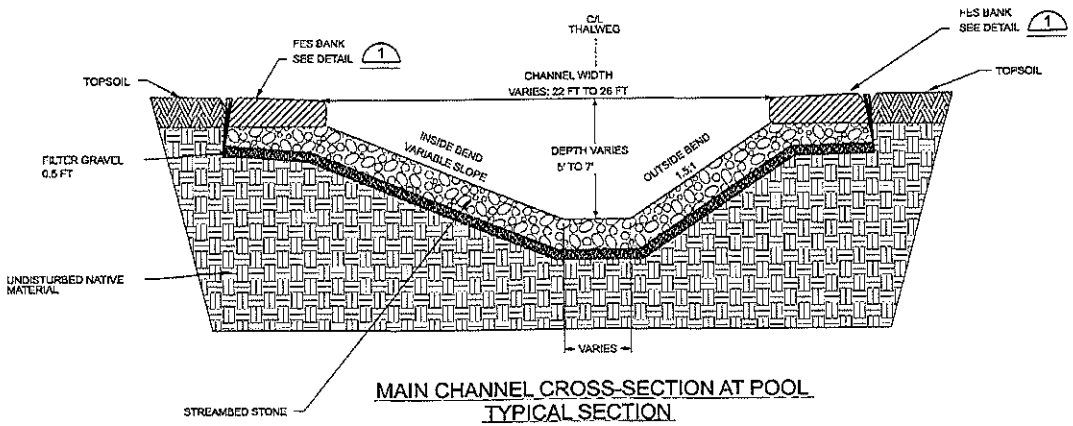
MAIN CHANNEL CROSS-SECTION AT RIFFLE TYPICAL SECTION



FABRIC ENCAPSULATED SOIL (FES) BANK

DETAIL 1

NTS



MAIN CHANNEL CROSS-SECTION AT POOL TYPICAL SECTION

REHABILITATED MAIN CHANNEL STREAMBED STONE AND RIP RAP PLACEMENT (1)				
RMCD STATION		STREAMBED STONE		RIP RAP
BEGIN	END	GRADE I	GRADE II	
151+80	152+05			YES
152+05	152+50		YES	
152+50	158+60	YES		
158+60	165+70		YES	
165+70	167+40	YES		
167+40	168+10		YES	
168+10	168+60	YES		
168+60	169+80		YES	
169+80	170+50	YES		
170+50	171+30		YES	
171+30	171+80	YES		
171+80	172+60		YES	
172+00	173+70	YES		
173+70	175+70		YES	
175+70	176+20			YES

BOULDER PLACEMENT		
RMCD STATION		NUMBER OF BOULDERS TO BE PLACED
BEGIN	END	AS DIRECTED
152+30	153+80	18
154+50	155+60	13
156+80	157+10	6
157+76	157+80	1
158+25	159+05	10
159+65	160+45	10
161+10	162+35	15
163+05	164+10	13
164+80	164+95	2
165+60	166+90	16
167+95	168+45	6
169+40	170+25	10
171+15	171+80	8
172+50	173+55	13
174+60	176+50	23
TOTAL		184

1) MINIMUM DEPTH OF STREAMBED STONE AND RIP RAP LAYER

STREAMBED STONE		
GRADE I	GRADE II	RIP RAP
1.5'	2.0'	3'

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APVD T. SCAR

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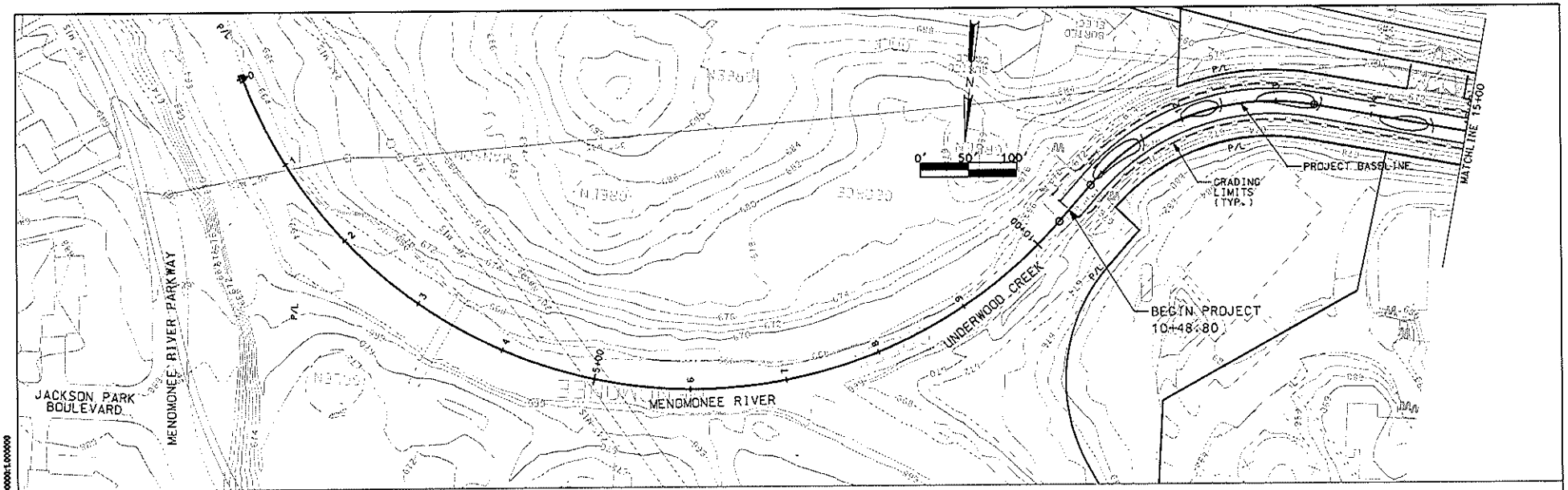
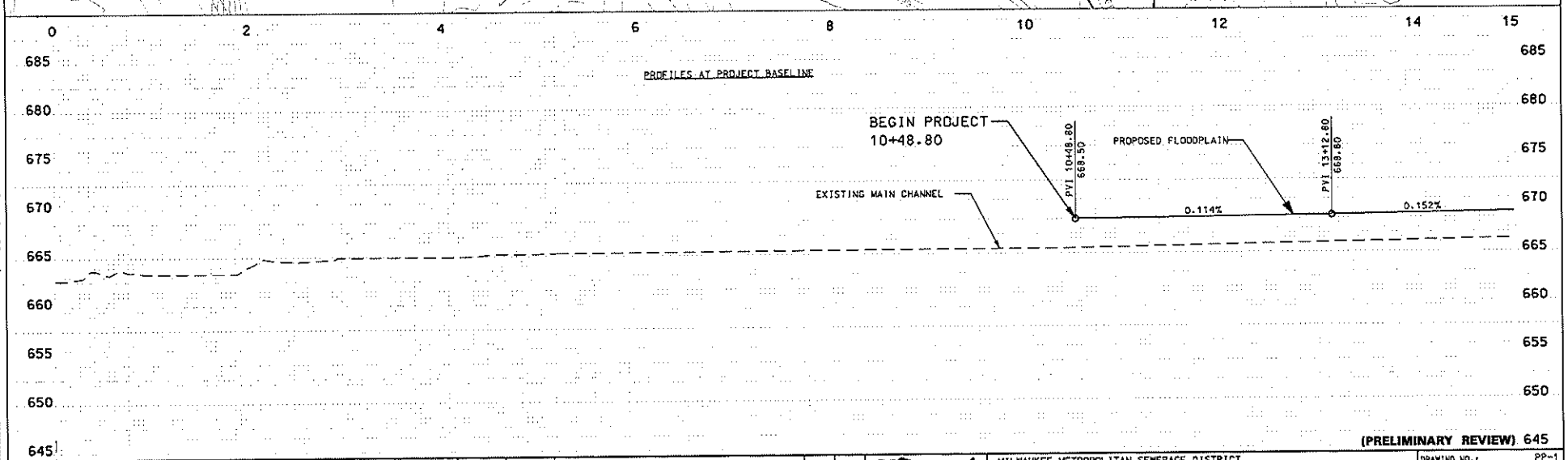
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
WATERCOURSE IMPROVEMENTS - PHASE 1
GEOMORPHIC AND VEGETATION
TYPICAL CHANNEL SECTIONS

DRAWING NO.:	GV-7
SHEET:	41
DATE:	APRIL, 2008
CONTRACT:	W21005C01
MMSD FILE:	151-612.DGN

Attachment 2

Underwood Creek Rehabilitation and Flood Management - Phase 2
Preliminary Engineering Drawings
January 2006





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TETRA TECH
In Association With:
HNTB

REV. NO.	DATE	REVISION DESCRIPTION	BY	APVD

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MILWAUKEE METROPOLITAN SEWERAGE DISTRICT
WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
PLAN
PLAN AND PROFILE UNDERWOOD CREEK

DRAWING NO.:	PP-1
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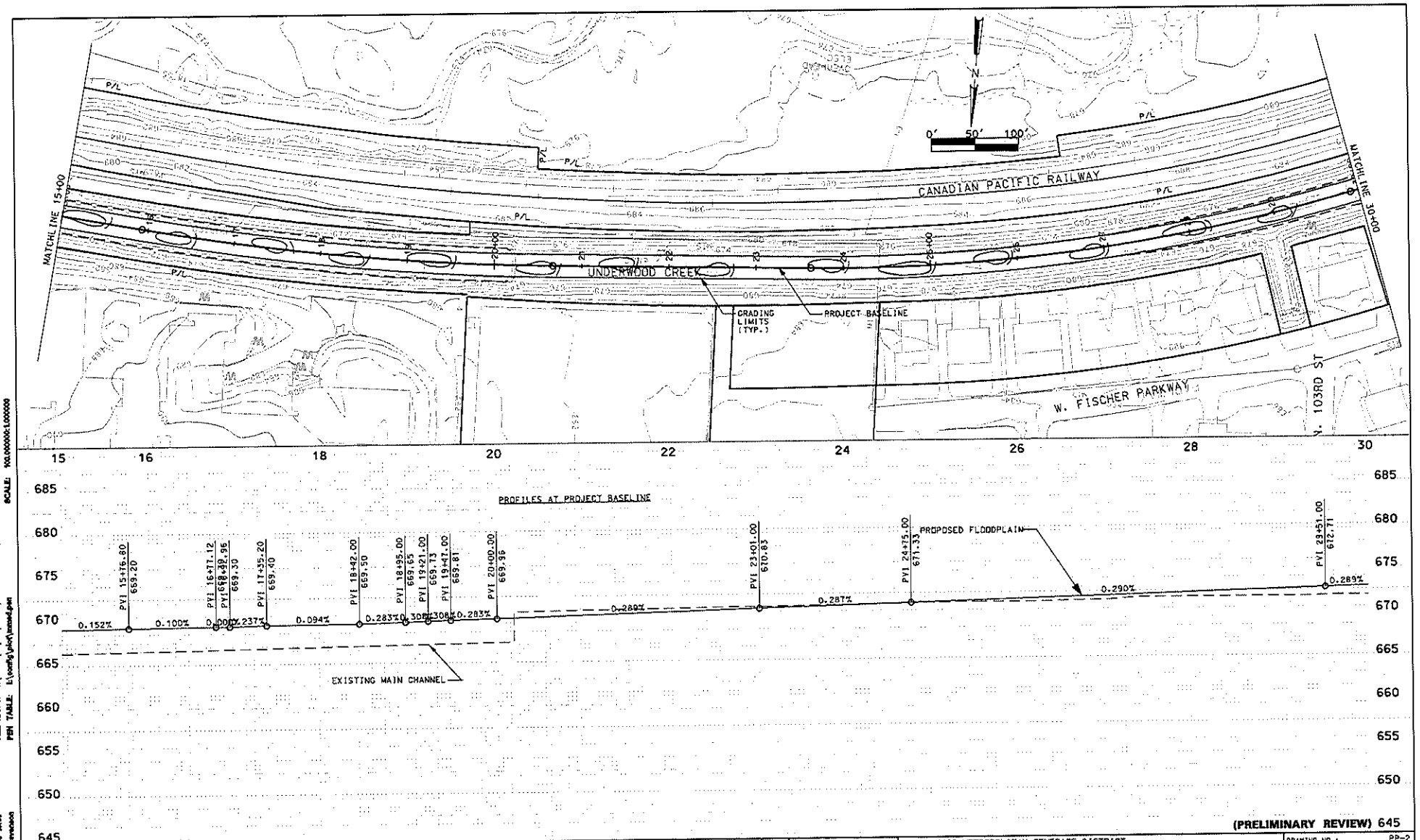

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UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
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PLAN AND PROFILE UNDERWOOD CREEK

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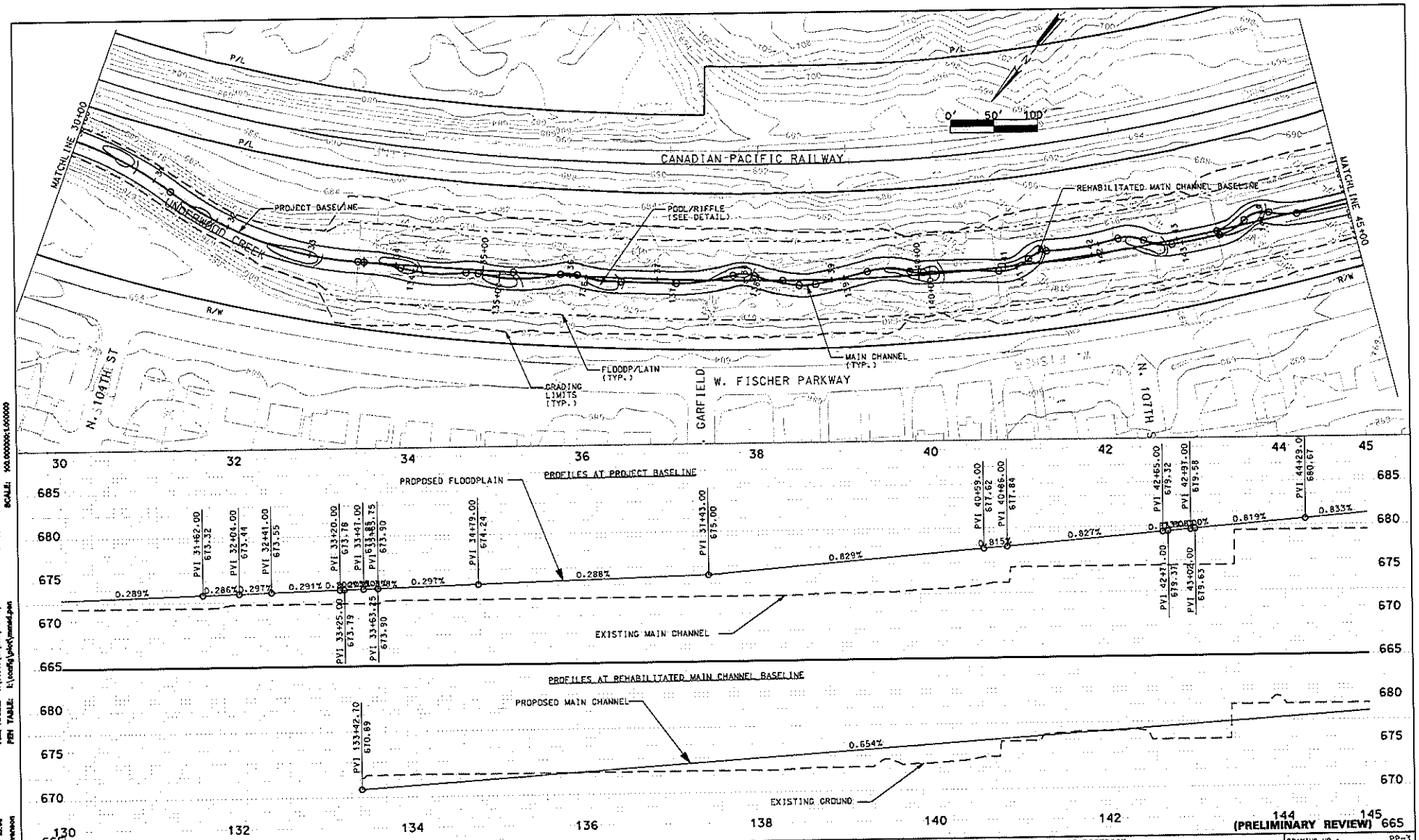

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UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
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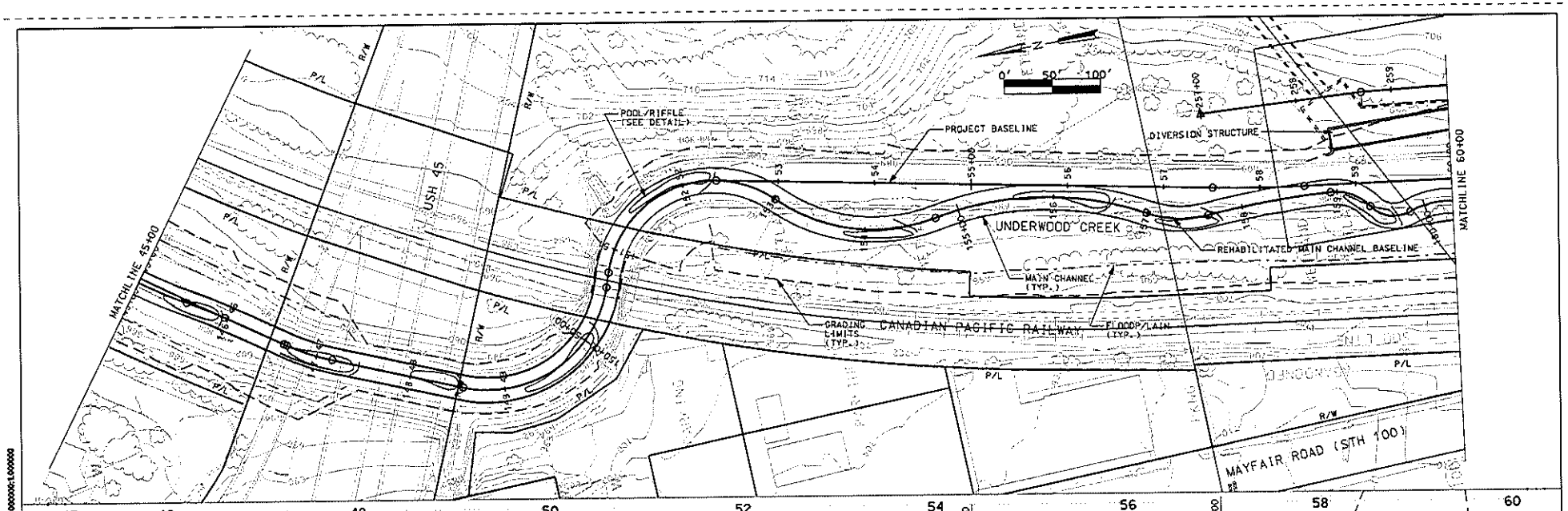

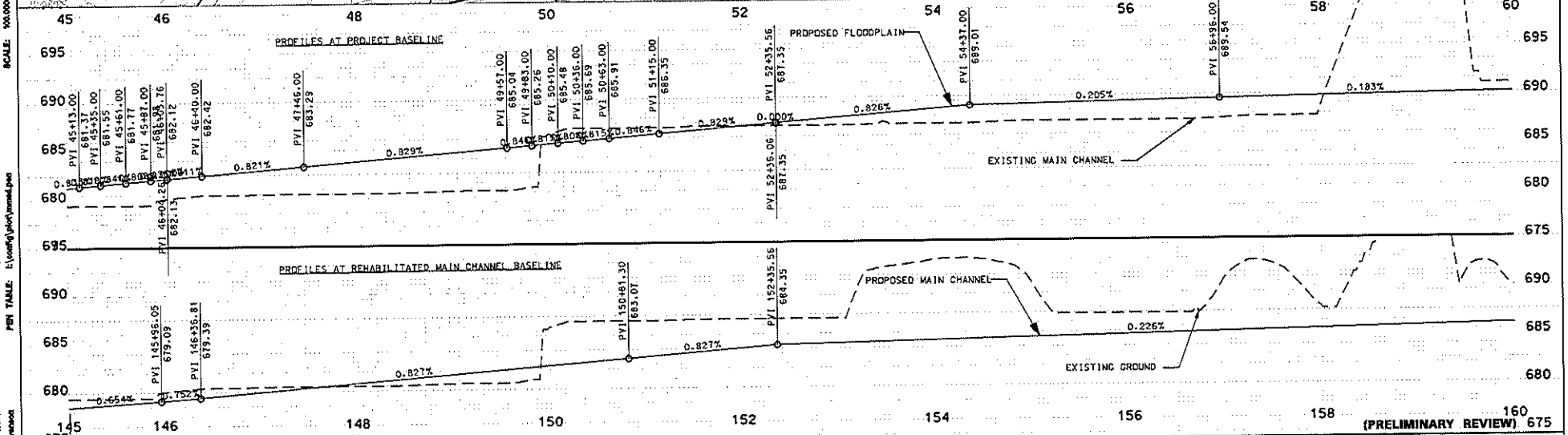

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UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
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DRAWING NO.:	PP-4
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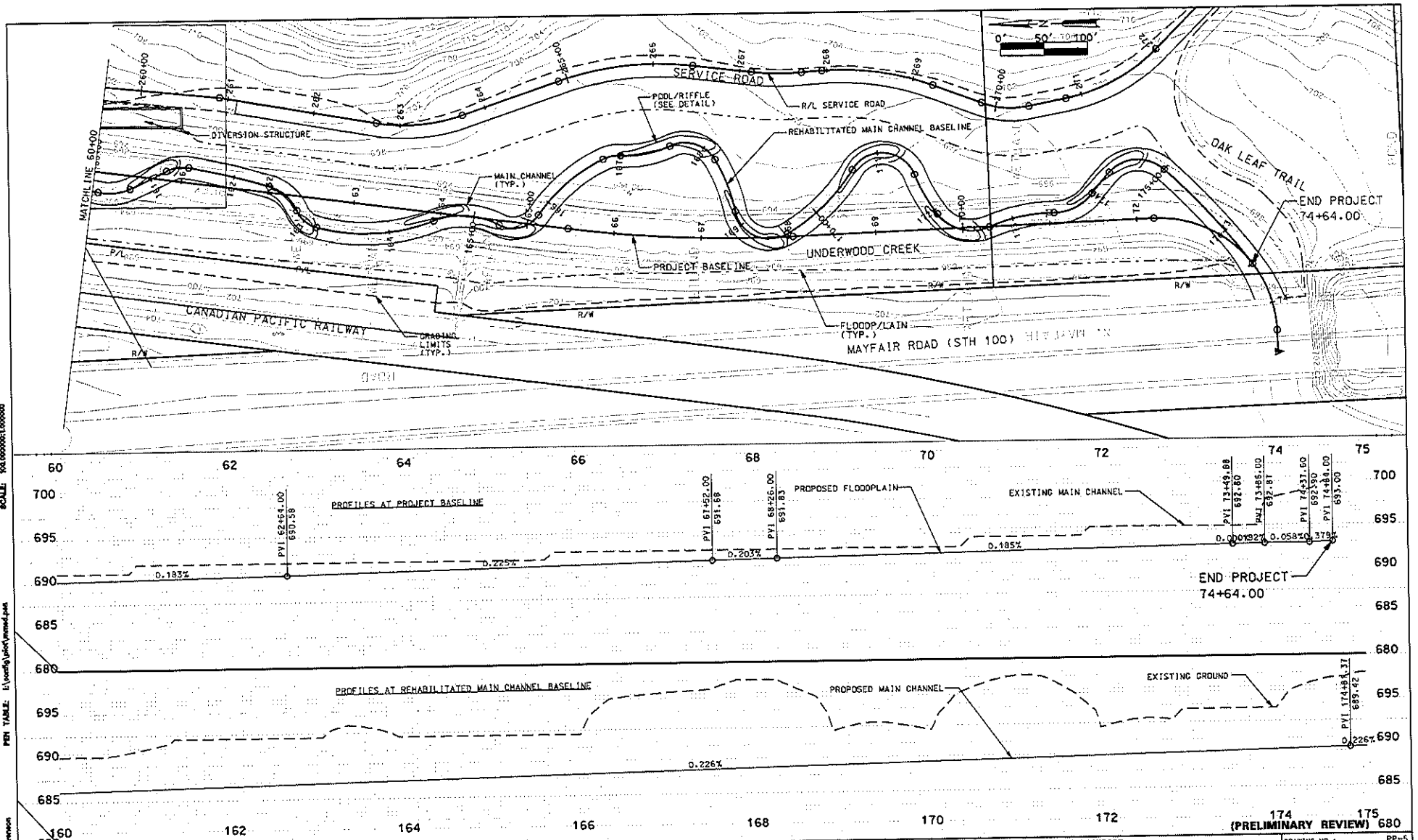

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WATERCOURSE
UNDERWOOD CREEK REHABILITATION AND FLOOD MANAGEMENT
PLAN
PLAN AND PROFILE UNDERWOOD CREEK

DRAWING NO.:	PP-5
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Attachment 3

Underwood Creek Main and Low Flow Channels
HEC-RAS Summary Output

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	1.26	PF1	3.00	689.90	690.10	0.06	690.15	0.009029	1.81	1.66	16.28	1.00
Underwood Creek	Main Stem	1.26	PF2	5.00	689.90	690.15	0.07	690.21	0.008370	2.00	2.50	20.00	1.00
Underwood Creek	Main Stem	1.26	PF3	10.00	689.90	690.23	0.08	690.31	0.007608	2.29	4.36	26.41	0.99
Underwood Creek	Main Stem	1.26	PF4	23.00	689.90	690.36	0.10	690.47	0.006855	2.72	8.47	36.81	1.00
Underwood Creek	Main Stem	1.26	PF5	50.00	689.90	690.71	0.05	690.78	0.001464	2.22	22.52	41.52	0.53
Underwood Creek	Main Stem	1.26	PF6	100.00	689.90	691.41	0.03	691.47	0.000377	1.88	53.09	45.02	0.31
Underwood Creek	Main Stem	1.26	PF7	200.00	689.90	692.55	0.02	692.61	0.000169	1.86	107.68	50.67	0.22
Underwood Creek	Main Stem	1.224	PF1	3.00	688.66	689.30	0.06	689.31	0.001957	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.224	PF2	5.00	688.66	689.54	0.04	689.55	0.001987	0.74	6.72	18.35	0.22
Underwood Creek	Main Stem	1.224	PF3	10.00	688.66	689.73	0.07	689.74	0.002060	0.98	10.19	18.71	0.23
Underwood Creek	Main Stem	1.224	PF4	23.00	688.66	690.07	0.11	690.10	0.002210	1.37	16.77	19.37	0.26
Underwood Creek	Main Stem	1.224	PF5	50.00	688.66	690.60	0.18	690.65	0.002301	1.84	27.13	20.36	0.28
Underwood Creek	Main Stem	1.224	PF6	100.00	688.66	691.33	0.26	691.41	0.002324	2.35	42.49	21.75	0.30
Underwood Creek	Main Stem	1.224	PF7	200.00	688.66	692.43	0.37	692.57	0.002323	2.99	66.91	22.12	0.30
Underwood Creek	Main Stem	1.215	PF1	3.00	688.56	689.20	0.05	689.21	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	1.215	PF2	5.00	688.56	689.45	0.04	689.46	0.001905	0.73	6.81	18.36	0.21
Underwood Creek	Main Stem	1.215	PF3	10.00	688.56	689.62	0.07	689.64	0.002145	0.99	10.06	18.70	0.24
Underwood Creek	Main Stem	1.215	PF4	23.00	688.56	689.96	0.12	689.99	0.002338	1.40	16.47	19.35	0.27
Underwood Creek	Main Stem	1.215	PF5	50.00	688.56	690.48	0.19	690.53	0.002409	1.87	26.74	20.34	0.29
Underwood Creek	Main Stem	1.215	PF6	100.00	688.56	691.21	0.27	691.29	0.002394	2.38	42.09	21.74	0.30
Underwood Creek	Main Stem	1.215	PF7	200.00	688.56	692.31	0.38	692.45	0.002359	3.00	66.61	22.20	0.31
Underwood Creek	Main Stem	1.206	PF1	3.00	688.47	689.11	0.06	689.12	0.001982	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.206	PF2	5.00	688.47	689.35	0.04	689.36	0.002027	0.68	7.33	23.22	0.21
Underwood Creek	Main Stem	1.206	PF3	10.00	688.47	689.52	0.06	689.53	0.001937	0.88	11.35	23.55	0.22
Underwood Creek	Main Stem	1.206	PF4	23.00	688.47	689.86	0.09	689.88	0.001782	1.18	19.48	24.18	0.23
Underwood Creek	Main Stem	1.206	PF5	50.00	688.47	690.39	0.13	690.43	0.001649	1.54	32.49	25.17	0.24
Underwood Creek	Main Stem	1.206	PF6	100.00	688.47	691.13	0.18	691.19	0.001552	1.94	51.66	26.55	0.24
Underwood Creek	Main Stem	1.206	PF7	200.00	688.47	692.25	0.25	692.35	0.001489	2.44	81.91	27.01	0.25
Underwood Creek	Main Stem	1.198	PF1	3.00	688.37	689.01	0.06	689.02	0.001957	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.198	PF2	5.00	688.37	689.25	0.04	689.26	0.001936	0.64	7.79	26.15	0.21
Underwood Creek	Main Stem	1.198	PF3	10.00	688.37	689.44	0.05	689.45	0.001586	0.79	12.63	26.49	0.20
Underwood Creek	Main Stem	1.198	PF4	23.00	688.37	689.79	0.07	689.81	0.001366	1.04	22.07	27.15	0.20
Underwood Creek	Main Stem	1.198	PF5	50.00	688.37	690.33	0.10	690.35	0.001248	1.36	36.89	28.15	0.21
Underwood Creek	Main Stem	1.198	PF6	100.00	688.37	691.07	0.14	691.12	0.001176	1.71	58.46	29.54	0.21
Underwood Creek	Main Stem	1.198	PF7	200.00	688.37	692.20	0.19	692.28	0.001136	2.17	92.22	29.92	0.22
Underwood Creek	Main Stem	1.189	PF1	3.00	688.27	688.91	0.05	688.92	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	1.189	PF2	5.00	688.27	689.16	0.04	689.17	0.001894	0.73	6.82	18.35	0.21
Underwood Creek	Main Stem	1.189	PF3	10.00	688.27	689.34	0.07	689.36	0.002011	0.97	10.26	18.70	0.23
Underwood Creek	Main Stem	1.189	PF4	23.00	688.27	689.69	0.11	689.72	0.002152	1.36	16.90	19.35	0.26
Underwood Creek	Main Stem	1.189	PF5	50.00	688.27	690.22	0.18	690.27	0.002244	1.83	27.33	20.32	0.28
Underwood Creek	Main Stem	1.189	PF6	100.00	688.27	690.95	0.26	691.04	0.002284	2.34	42.69	21.67	0.29
Underwood Creek	Main Stem	1.189	PF7	200.00	688.27	692.05	0.37	692.19	0.002308	2.98	67.03	22.12	0.30
Underwood Creek	Main Stem	1.180	PF1	3.00	688.18	688.82	0.06	688.83	0.001982	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.180	PF2	5.00	688.18	689.06	0.05	689.07	0.002035	0.75	6.67	18.34	0.22
Underwood Creek	Main Stem	1.180	PF3	10.00	688.18	689.24	0.07	689.25	0.002231	1.01	9.94	18.68	0.24
Underwood Creek	Main Stem	1.180	PF4	23.00	688.18	689.58	0.12	689.61	0.002361	1.40	16.42	19.32	0.27
Underwood Creek	Main Stem	1.180	PF5	50.00	688.18	690.10	0.19	690.15	0.002397	1.87	26.77	20.30	0.29
Underwood Creek	Main Stem	1.180	PF6	100.00	688.18	690.83	0.27	690.92	0.002384	2.37	42.12	21.68	0.30
Underwood Creek	Main Stem	1.180	PF7	200.00	688.18	691.93	0.38	692.07	0.002364	3.01	66.54	22.20	0.31
Underwood Creek	Main Stem	1.172	PF1	3.00	688.08	688.72	0.06	688.73	0.001958	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.172	PF2	5.00	688.08	688.96	0.04	688.97	0.001937	0.64	7.79	26.15	0.21
Underwood Creek	Main Stem	1.172	PF3	10.00	688.08	689.15	0.05	689.16	0.001589	0.79	12.62	26.49	0.20
Underwood Creek	Main Stem	1.172	PF4	23.00	688.08	689.50	0.07	689.52	0.001371	1.04	22.05	27.15	0.20
Underwood Creek	Main Stem	1.172	PF5	50.00	688.08	690.03	0.10	690.06	0.001254	1.36	36.82	28.14	0.21
Underwood Creek	Main Stem	1.172	PF6	100.00	688.08	690.78	0.14	690.82	0.001185	1.71	58.31	29.53	0.22
Underwood Creek	Main Stem	1.172	PF7	200.00	688.08	691.90	0.19	691.97	0.001147	2.17	91.99	30.06	0.22
Underwood Creek	Main Stem	1.163	PF1	3.00	687.98	688.62	0.05	688.63	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	1.163	PF2	5.00	687.98	688.87	0.04	688.88	0.001895	0.73	6.82	18.35	0.21
Underwood Creek	Main Stem	1.163	PF3	10.00	687.98	689.05	0.07	689.07	0.002018	0.98	10.25	18.68	0.23
Underwood Creek	Main Stem	1.163	PF4	23.00	687.98	689.40	0.11	689.43	0.002164	1.36	16.86	19.30	0.26
Underwood Creek	Main Stem	1.163	PF5	50.00	687.98	689.93	0.18	689.98	0.002266	1.84	27.22	20.24	0.28
Underwood Creek	Main Stem	1.163	PF6	100.00	687.98	690.65	0.26	690.74	0.002319	2.36	42.42	21.54	0.30
Underwood Creek	Main Stem	1.163	PF7	200.00	687.98	691.75	0.38	691.89	0.002353	3.00	66.59	22.16	0.31
Underwood Creek	Main Stem	1.154	PF1	3.00	687.89	688.53	0.06	688.54	0.001984	0.87	3.44	7.31	0.22
Underwood Creek	Main Stem	1.154	PF2	5.00	687.89	688.77	0.05	688.78	0.002035	0.75	6.67	18.33	0.22
Underwood Creek	Main Stem	1.154	PF3	10.00	687.89	688.94	0.07	688.96	0.002248	1.01	9.91	18.65	0.24
Underwood Creek	Main Stem	1.154	PF4	23.00	687.89	689.28	0.12	689.32	0.002384	1.41	16.36	19.26	0.27
Underwood Creek	Main Stem	1.154	PF5	50.00	687.89	689.80	0.19	689.86	0.002432	1.88	26.62	20.20	0.29
Underwood Creek	Main Stem	1.154	PF6	100.00	687.89	690.53	0.27	690.62	0.002433	2.39	41.77	21.51	0.30
Underwood Creek	Main Stem	1.154	PF7	200.00	687.89	691.63	0.39	691.77	0.002426	3.03	65.94	22.21	0.31
Underwood Creek	Main Stem	1.145	PF1	3.00	687.79	688.43	0.06	688.44	0.001960	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.145	PF2	5.00	687.79	688.67	0.04	688.68	0.001946	0.64	7.77	26.14	0.21
Underwood Creek	Main Stem	1.145	PF3	10.00	687.79	688.85	0.05	688.86	0.001616	0.80	12.55	26.46	0.20
Underwood Creek	Main Stem	1.145	PF4	23.00	687.79	689.21	0.07	689.22	0.001391	1.05	21.94	27.08	0.21
Underwood Creek	Main Stem	1.145	PF5	50.00	687.79	689.74	0.10	689.77	0.001276	1.37	36.59	28.03	0.21
Underwood Creek	Main Stem	1.145	PF6	100.00	687.79	690.48	0.14	690.52	0.001211	1.73	57.83	29.34	0.22
Underwood Creek	Main Stem	1.145	PF7	200.00	687.79	691.59	0.20	691.67	0.001177	2.19	91.14	30.02	0.22

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	1.137	PF1	3.00	687.69	688.33	0.05	688.34	0.001907	0.86	3.49	7.35	0.22
Underwood Creek	Main Stem	1.137	PF2	5.00	687.69	688.58	0.04	688.59	0.001887	0.70	7.10	20.29	0.21
Underwood Creek	Main Stem	1.137	PF3	10.00	687.69	688.77	0.06	688.78	0.001855	0.92	10.92	20.62	0.22
Underwood Creek	Main Stem	1.137	PF4	23.00	687.69	689.12	0.10	689.14	0.001863	1.26	18.30	21.23	0.24
Underwood Creek	Main Stem	1.137	PF5	50.00	687.69	689.64	0.15	689.69	0.001898	1.68	29.71	22.14	0.26
Underwood Creek	Main Stem	1.137	PF6	100.00	687.69	690.37	0.22	690.45	0.001917	2.16	46.35	23.41	0.27
Underwood Creek	Main Stem	1.137	PF7	200.00	687.69	691.47	0.32	691.59	0.001939	2.75	72.63	24.12	0.28
Underwood Creek	Main Stem	1.128	PF1	3.00	687.60	688.24	0.06	688.25	0.001993	0.87	3.43	7.31	0.22
Underwood Creek	Main Stem	1.128	PF2	5.00	687.60	688.48	0.04	688.49	0.002004	0.75	6.70	18.33	0.22
Underwood Creek	Main Stem	1.128	PF3	10.00	687.60	688.66	0.07	688.68	0.002149	1.00	10.05	18.65	0.24
Underwood Creek	Main Stem	1.128	PF4	23.00	687.60	689.01	0.12	689.04	0.002272	1.39	16.60	19.26	0.26
Underwood Creek	Main Stem	1.128	PF5	50.00	687.60	689.53	0.18	689.58	0.002365	1.86	26.84	20.17	0.28
Underwood Creek	Main Stem	1.128	PF6	100.00	687.60	690.25	0.27	690.34	0.002412	2.39	41.85	21.43	0.30
Underwood Creek	Main Stem	1.128	PF7	200.00	687.60	691.33	0.39	691.48	0.002445	3.04	65.75	22.20	0.31
Underwood Creek	Main Stem	1.119	PF1	3.00	687.50	688.14	0.06	688.15	0.001982	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.119	PF2	5.00	687.50	688.38	0.04	688.39	0.001986	0.70	7.19	21.80	0.21
Underwood Creek	Main Stem	1.119	PF3	10.00	687.50	688.56	0.06	688.58	0.001878	0.89	11.18	22.12	0.22
Underwood Creek	Main Stem	1.119	PF4	23.00	687.50	688.91	0.09	688.94	0.001794	1.21	18.99	22.73	0.23
Underwood Creek	Main Stem	1.119	PF5	50.00	687.50	689.44	0.14	689.48	0.001765	1.61	31.12	23.64	0.25
Underwood Creek	Main Stem	1.119	PF6	100.00	687.50	690.16	0.20	690.23	0.001742	2.05	48.79	24.92	0.26
Underwood Creek	Main Stem	1.119	PF7	200.00	687.50	691.26	0.28	691.36	0.001732	2.61	76.76	25.75	0.27
Underwood Creek	Main Stem	1.111	PF1	3.00	687.40	688.04	0.06	688.05	0.001957	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.111	PF2	5.00	687.40	688.28	0.04	688.29	0.001985	0.72	6.90	19.63	0.22
Underwood Creek	Main Stem	1.111	PF3	10.00	687.40	688.47	0.06	688.48	0.001985	0.95	10.57	19.94	0.23
Underwood Creek	Main Stem	1.111	PF4	23.00	687.40	688.81	0.11	688.84	0.002051	1.31	17.55	20.53	0.25
Underwood Creek	Main Stem	1.111	PF5	50.00	687.40	689.33	0.16	689.38	0.002112	1.76	28.41	21.41	0.27
Underwood Creek	Main Stem	1.111	PF6	100.00	687.40	690.05	0.24	690.13	0.002140	2.26	44.29	22.63	0.28
Underwood Creek	Main Stem	1.111	PF7	200.00	687.40	691.14	0.35	691.26	0.002161	2.88	69.56	23.54	0.29
Underwood Creek	Main Stem	1.102	PF1	3.00	687.30	687.94	0.05	687.95	0.001899	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	1.102	PF2	5.00	687.30	688.19	0.04	688.20	0.001904	0.73	6.81	18.39	0.21
Underwood Creek	Main Stem	1.102	PF3	10.00	687.30	688.36	0.07	688.38	0.002123	0.99	10.10	18.76	0.24
Underwood Creek	Main Stem	1.102	PF4	23.00	687.30	688.70	0.12	688.73	0.002337	1.39	16.50	19.46	0.27
Underwood Creek	Main Stem	1.102	PF5	50.00	687.30	689.21	0.19	689.27	0.002433	1.87	26.73	20.53	0.29
Underwood Creek	Main Stem	1.102	PF6	100.00	687.30	689.93	0.27	690.02	0.002440	2.38	42.00	22.03	0.30
Underwood Creek	Main Stem	1.102	PF7	200.00	687.30	691.01	0.38	691.15	0.002397	3.00	66.77	23.18	0.31
Underwood Creek	Main Stem	1.093	PF1	3.00	687.21	687.85	0.06	687.86	0.001980	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.093	PF2	5.00	687.21	688.09	0.04	688.10	0.002034	0.70	7.11	21.57	0.22
Underwood Creek	Main Stem	1.093	PF3	10.00	687.21	688.26	0.06	688.27	0.002081	0.93	10.79	21.85	0.23
Underwood Creek	Main Stem	1.093	PF4	23.00	687.21	688.59	0.10	688.62	0.002042	1.27	18.17	22.41	0.25
Underwood Creek	Main Stem	1.093	PF5	50.00	687.21	689.11	0.15	689.15	0.001964	1.67	29.96	23.28	0.26
Underwood Creek	Main Stem	1.093	PF6	100.00	687.21	689.83	0.21	689.90	0.001897	2.12	47.26	24.49	0.27
Underwood Creek	Main Stem	1.093	PF7	200.00	687.21	690.92	0.30	691.04	0.001860	2.68	74.70	25.37	0.27
Underwood Creek	Main Stem	1.085	PF1	3.00	687.11	687.75	0.06	687.76	0.001951	0.87	3.46	7.33	0.22
Underwood Creek	Main Stem	1.085	PF2	5.00	687.11	687.99	0.04	688.00	0.001960	0.64	7.76	26.13	0.21
Underwood Creek	Main Stem	1.085	PF3	10.00	687.11	688.17	0.05	688.18	0.001671	0.81	12.42	26.44	0.21
Underwood Creek	Main Stem	1.085	PF4	23.00	687.11	688.51	0.07	688.53	0.001462	1.07	21.60	27.03	0.21
Underwood Creek	Main Stem	1.085	PF5	50.00	687.11	689.04	0.10	689.07	0.001337	1.39	36.04	27.94	0.22
Underwood Creek	Main Stem	1.085	PF6	100.00	687.11	689.77	0.14	689.82	0.001263	1.75	57.01	29.21	0.22
Underwood Creek	Main Stem	1.085	PF7	200.00	687.11	690.87	0.20	690.95	0.001228	2.22	89.89	30.03	0.23
Underwood Creek	Main Stem	1.076	PF1	3.00	687.01	687.65	0.05	687.67	0.001886	0.86	3.50	7.37	0.22
Underwood Creek	Main Stem	1.076	PF2	5.00	687.01	687.90	0.04	687.91	0.001838	0.67	7.42	22.24	0.21
Underwood Creek	Main Stem	1.076	PF3	10.00	687.01	688.08	0.05	688.09	0.001755	0.87	11.50	22.55	0.21
Underwood Creek	Main Stem	1.076	PF4	23.00	687.01	688.43	0.09	688.45	0.001700	1.18	19.45	23.15	0.23
Underwood Creek	Main Stem	1.076	PF5	50.00	687.01	688.96	0.13	688.99	0.001674	1.57	31.83	24.05	0.24
Underwood Creek	Main Stem	1.076	PF6	100.00	687.01	689.68	0.19	689.75	0.001658	2.01	49.83	25.31	0.25
Underwood Creek	Main Stem	1.076	PF7	200.00	687.01	690.78	0.27	690.88	0.001661	2.56	78.16	26.15	0.26
Underwood Creek	Main Stem	1.071	PF1	3.00	686.97	687.61	0.06	687.62	0.001987	0.87	3.44	7.31	0.22
Underwood Creek	Main Stem	1.071	PF2	5.00	686.97	687.85	0.04	687.86	0.001995	0.70	7.11	21.25	0.21
Underwood Creek	Main Stem	1.071	PF3	10.00	686.97	688.04	0.06	688.05	0.001890	0.90	11.05	21.56	0.22
Underwood Creek	Main Stem	1.071	PF4	23.00	686.97	688.38	0.09	688.41	0.001846	1.23	18.65	22.16	0.24
Underwood Creek	Main Stem	1.071	PF5	50.00	686.97	688.91	0.14	688.95	0.001833	1.64	30.48	23.06	0.25
Underwood Creek	Main Stem	1.071	PF6	100.00	686.97	689.63	0.21	689.70	0.001823	2.10	47.70	24.30	0.26
Underwood Creek	Main Stem	1.071	PF7	200.00	686.97	690.72	0.30	690.83	0.001832	2.67	74.86	25.18	0.27
Underwood Creek	Main Stem	1.067	PF1	3.00	686.92	687.56	0.06	687.57	0.001982	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.067	PF2	5.00	686.92	687.80	0.04	687.81	0.002003	0.75	6.70	18.32	0.22
Underwood Creek	Main Stem	1.067	PF3	10.00	686.92	687.98	0.07	688.00	0.002137	0.99	10.06	18.62	0.24
Underwood Creek	Main Stem	1.067	PF4	23.00	686.92	688.33	0.12	688.36	0.002295	1.39	16.54	19.20	0.26
Underwood Creek	Main Stem	1.067	PF5	50.00	686.92	688.84	0.19	688.90	0.002406	1.88	26.66	20.06	0.29
Underwood Creek	Main Stem	1.067	PF6	100.00	686.92	689.56	0.27	689.65	0.002469	2.41	41.46	21.26	0.30
Underwood Creek	Main Stem	1.067	PF7	200.00	686.92	690.63	0.40	690.78	0.002530	3.08	64.97	22.18	0.32
Underwood Creek	Main Stem	1.058	PF1	3.00	686.82	687.46	0.06	687.47	0.001958	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.058	PF2	5.00	686.82	687.70	0.04	687.71	0.001978	0.70	7.17	21.57	0.21
Underwood Creek	Main Stem	1.058	PF3	10.00	686.82	687.89	0.06	687.90	0.001879	0.90	11.14	21.87	0.22
Underwood Creek	Main Stem	1.058	PF4	23.00	686.82	688.23	0.09	688.25	0.001852	1.23	18.73	22.44	0.24
Underwood Creek	Main Stem	1.058	PF5	50.00	686.82	688.75	0.14	688.79	0.001843	1.64	30.56	23.30	0.25
Underwood Creek	Main Stem	1.058	PF6	100.00	686.82	689.47	0.21	689.54	0.001828	2.09	47.82	24.50	0.26
Underwood Creek	Main Stem	1.058	PF7	200.00	686.82	690.55	0.30	690.66	0.001839	2.67	74.98	25.38	0.27

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	1.050	PF1	3.00	686.72	687.36	0.05	687.37	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	1.050	PF2	5.00	686.72	687.61	0.04	687.62	0.001904	0.73	6.81	18.33	0.21
Underwood Creek	Main Stem	1.050	PF3	10.00	686.72	687.78	0.07	687.80	0.002149	1.00	10.05	18.63	0.24
Underwood Creek	Main Stem	1.050	PF4	23.00	686.72	688.11	0.12	688.14	0.002393	1.41	16.32	19.18	0.27
Underwood Creek	Main Stem	1.050	PF5	50.00	686.72	688.62	0.19	688.68	0.002516	1.90	26.29	20.04	0.29
Underwood Creek	Main Stem	1.050	PF6	100.00	686.72	689.33	0.28	689.43	0.002565	2.44	40.95	21.23	0.31
Underwood Creek	Main Stem	1.050	PF7	200.00	686.72	690.39	0.41	690.54	0.002621	3.11	64.21	22.17	0.32
Underwood Creek	Main Stem	1.041	PF1	3.00	686.63	687.27	0.06	687.28	0.001984	0.87	3.44	7.31	0.22
Underwood Creek	Main Stem	1.041	PF2	5.00	686.63	687.51	0.04	687.52	0.002028	0.69	7.29	22.87	0.21
Underwood Creek	Main Stem	1.041	PF3	10.00	686.63	687.68	0.06	687.69	0.001984	0.89	11.20	23.16	0.23
Underwood Creek	Main Stem	1.041	PF4	23.00	686.63	688.01	0.09	688.04	0.001892	1.21	19.00	23.72	0.24
Underwood Creek	Main Stem	1.041	PF5	50.00	686.63	688.53	0.14	688.57	0.001791	1.59	31.44	24.59	0.25
Underwood Creek	Main Stem	1.041	PF6	100.00	686.63	689.25	0.19	689.31	0.001720	2.02	49.62	25.81	0.26
Underwood Creek	Main Stem	1.041	PF7	200.00	686.63	690.32	0.27	690.43	0.001702	2.56	78.06	26.71	0.26
Underwood Creek	Main Stem	1.032	PF1	3.00	686.53	687.17	0.06	687.18	0.001961	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	1.032	PF2	5.00	686.53	687.41	0.04	687.42	0.001938	0.64	7.78	26.12	0.21
Underwood Creek	Main Stem	1.032	PF3	10.00	686.53	687.59	0.05	687.60	0.001635	0.80	12.50	26.43	0.20
Underwood Creek	Main Stem	1.032	PF4	23.00	686.53	687.94	0.07	687.95	0.001450	1.06	21.64	27.00	0.21
Underwood Creek	Main Stem	1.032	PF5	50.00	686.53	688.46	0.10	688.49	0.001340	1.39	36.00	27.88	0.22
Underwood Creek	Main Stem	1.032	PF6	100.00	686.53	689.19	0.15	689.23	0.001280	1.76	56.73	29.10	0.22
Underwood Creek	Main Stem	1.032	PF7	200.00	686.53	690.27	0.21	690.35	0.001269	2.25	88.86	29.92	0.23
Underwood Creek	Main Stem	1.024	PF1	3.00	686.43	687.07	0.05	687.08	0.001907	0.86	3.49	7.35	0.22
Underwood Creek	Main Stem	1.024	PF2	5.00	686.43	687.32	0.04	687.33	0.001908	0.73	6.80	18.33	0.21
Underwood Creek	Main Stem	1.024	PF3	10.00	686.43	687.50	0.07	687.51	0.002112	0.99	10.10	18.63	0.24
Underwood Creek	Main Stem	1.024	PF4	23.00	686.43	687.83	0.12	687.86	0.002334	1.40	16.45	19.20	0.27
Underwood Creek	Main Stem	1.024	PF5	50.00	686.43	688.34	0.19	688.40	0.002458	1.89	26.49	20.07	0.29
Underwood Creek	Main Stem	1.024	PF6	100.00	686.43	689.05	0.28	689.14	0.002532	2.43	41.14	21.27	0.31
Underwood Creek	Main Stem	1.024	PF7	200.00	686.43	690.10	0.41	690.25	0.002633	3.12	64.11	22.14	0.32
Underwood Creek	Main Stem	1.015	PF1	3.00	686.34	686.98	0.06	686.99	0.001993	0.87	3.43	7.31	0.22
Underwood Creek	Main Stem	1.015	PF2	5.00	686.34	687.22	0.04	687.23	0.002037	0.73	6.89	19.88	0.22
Underwood Creek	Main Stem	1.015	PF3	10.00	686.34	687.39	0.07	687.40	0.002262	0.98	10.20	20.16	0.24
Underwood Creek	Main Stem	1.015	PF4	23.00	686.34	687.71	0.11	687.74	0.002340	1.36	16.91	20.71	0.27
Underwood Creek	Main Stem	1.015	PF5	50.00	686.34	688.23	0.17	688.28	0.002308	1.80	27.72	21.57	0.28
Underwood Creek	Main Stem	1.015	PF6	100.00	686.34	688.94	0.25	689.02	0.002283	2.30	43.50	22.76	0.29
Underwood Creek	Main Stem	1.015	PF7	200.00	686.34	689.99	0.36	690.12	0.002321	2.94	68.12	23.70	0.31
Underwood Creek	Main Stem	1.006	PF1	3.00	686.24	686.88	0.06	686.89	0.001982	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	1.006	PF2	5.00	686.24	687.12	0.04	687.13	0.002005	0.65	7.70	26.12	0.21
Underwood Creek	Main Stem	1.006	PF3	10.00	686.24	687.29	0.05	687.30	0.001804	0.82	12.13	26.40	0.21
Underwood Creek	Main Stem	1.006	PF4	23.00	686.24	687.63	0.07	687.65	0.001559	1.09	21.16	26.96	0.22
Underwood Creek	Main Stem	1.006	PF5	50.00	686.24	688.15	0.11	688.18	0.001398	1.41	35.52	27.84	0.22
Underwood Creek	Main Stem	1.006	PF6	100.00	686.24	688.87	0.15	688.92	0.001325	1.78	56.09	29.04	0.23
Underwood Creek	Main Stem	1.006	PF7	200.00	686.24	689.94	0.22	690.02	0.001323	2.28	87.69	29.92	0.23
Underwood Creek	Main Stem	0.997	PF1	3.00	686.14	686.78	0.06	686.79	0.001958	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	0.997	PF2	5.00	686.14	687.02	0.04	687.03	0.001937	0.64	7.78	26.12	0.21
Underwood Creek	Main Stem	0.997	PF3	10.00	686.14	687.20	0.05	687.21	0.001615	0.80	12.55	26.42	0.20
Underwood Creek	Main Stem	0.997	PF4	23.00	686.14	687.56	0.07	687.57	0.001392	1.05	21.92	27.01	0.21
Underwood Creek	Main Stem	0.997	PF5	50.00	686.14	688.09	0.10	688.12	0.001284	1.37	36.48	27.89	0.21
Underwood Creek	Main Stem	0.997	PF6	100.00	686.14	688.81	0.14	688.86	0.001250	1.75	57.15	29.09	0.22
Underwood Creek	Main Stem	0.997	PF7	200.00	686.14	689.87	0.21	689.95	0.001273	2.25	88.76	29.93	0.23
Underwood Creek	Main Stem	0.989	PF1	3.00	686.04	686.68	0.05	686.69	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	0.989	PF2	5.00	686.04	686.93	0.04	686.94	0.001897	0.73	6.81	18.33	0.21
Underwood Creek	Main Stem	0.989	PF3	10.00	686.04	687.11	0.07	687.13	0.002050	0.98	10.19	18.63	0.23
Underwood Creek	Main Stem	0.989	PF4	23.00	686.04	687.46	0.11	687.49	0.002209	1.37	16.73	19.20	0.26
Underwood Creek	Main Stem	0.989	PF5	50.00	686.04	687.97	0.18	688.03	0.002339	1.86	26.90	20.06	0.28
Underwood Creek	Main Stem	0.989	PF6	100.00	686.04	688.68	0.27	688.77	0.002467	2.41	41.46	21.23	0.30
Underwood Creek	Main Stem	0.989	PF7	200.00	686.04	689.71	0.41	689.86	0.002653	3.13	63.93	22.13	0.32
Underwood Creek	Main Stem	0.980	PF1	3.00	685.95	686.59	0.06	686.60	0.001983	0.87	3.44	7.31	0.22
Underwood Creek	Main Stem	0.980	PF2	5.00	685.95	686.83	0.04	686.84	0.002004	0.70	7.13	21.44	0.21
Underwood Creek	Main Stem	0.980	PF3	10.00	685.95	687.01	0.06	687.02	0.001963	0.91	10.96	21.73	0.23
Underwood Creek	Main Stem	0.980	PF4	23.00	685.95	687.36	0.09	687.38	0.001875	1.24	18.61	22.31	0.24
Underwood Creek	Main Stem	0.980	PF5	50.00	685.95	687.88	0.14	687.92	0.001851	1.64	30.46	23.18	0.25
Underwood Creek	Main Stem	0.980	PF6	100.00	685.95	688.59	0.21	688.66	0.001881	2.11	47.30	24.35	0.27
Underwood Creek	Main Stem	0.980	PF7	200.00	685.95	689.62	0.31	689.73	0.001982	2.74	73.07	25.27	0.28
Underwood Creek	Main Stem	0.971	PF1	3.00	685.85	686.49	0.06	686.50	0.001957	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	0.971	PF2	5.00	685.85	686.73	0.04	686.74	0.001971	0.69	7.27	22.22	0.21
Underwood Creek	Main Stem	0.971	PF3	10.00	685.85	686.92	0.06	686.93	0.001803	0.88	11.41	22.53	0.22
Underwood Creek	Main Stem	0.971	PF4	23.00	685.85	687.27	0.09	687.29	0.001707	1.18	19.41	23.11	0.23
Underwood Creek	Main Stem	0.971	PF5	50.00	685.85	687.79	0.13	687.83	0.001689	1.58	31.72	23.98	0.24
Underwood Creek	Main Stem	0.971	PF6	100.00	685.85	688.50	0.19	688.56	0.001728	2.04	49.11	25.15	0.26
Underwood Creek	Main Stem	0.971	PF7	200.00	685.85	689.53	0.29	689.64	0.001835	2.65	75.60	26.06	0.27
Underwood Creek	Main Stem	0.963	PF1	3.00	685.75	686.39	0.05	686.40	0.001901	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	0.963	PF2	5.00	685.75	686.64	0.04	686.65	0.001901	0.74	6.80	18.22	0.21
Underwood Creek	Main Stem	0.963	PF3	10.00	685.75	686.82	0.07	686.83	0.002081	0.99	10.12	18.52	0.24
Underwood Creek	Main Stem	0.963	PF4	23.00	685.75	687.16	0.12	687.19	0.002259	1.39	16.58	19.08	0.26
Underwood Creek	Main Stem	0.963	PF5	50.00	685.75	687.67	0.19	687.73	0.002418	1.88	26.56	19.91	0.29
Underwood Creek	Main Stem	0.963	PF6	100.00	685.75	688.36	0.29	688.46	0.002603	2.46	40.66	21.03	0.31
Underwood Creek	Main Stem	0.963	PF7	200.00	685.75	689.36	0.44	689.52	0.002865	3.21	62.23	22.00	0.34

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.954	PF1	3.00	685.66	686.30	0.06	686.31	0.001983	0.87	3.44	7.31	0.22
Underwood Creek	Main Stem	0.954	PF2	5.00	685.66	686.54	0.04	686.55	0.001999	0.69	7.23	22.22	0.21
Underwood Creek	Main Stem	0.954	PF3	10.00	685.66	686.72	0.06	686.73	0.001925	0.89	11.18	22.51	0.22
Underwood Creek	Main Stem	0.954	PF4	23.00	685.66	687.07	0.09	687.09	0.001801	1.20	19.09	23.07	0.23
Underwood Creek	Main Stem	0.954	PF5	50.00	685.66	687.58	0.14	687.62	0.001779	1.60	31.20	23.92	0.25
Underwood Creek	Main Stem	0.954	PF6	100.00	685.66	688.27	0.20	688.34	0.001836	2.08	48.14	25.05	0.26
Underwood Creek	Main Stem	0.954	PF7	200.00	685.66	689.27	0.31	689.38	0.001973	2.71	73.83	26.04	0.28
Underwood Creek	Main Stem	0.945	PF1	3.00	685.56	686.20	0.06	686.21	0.001959	0.87	3.45	7.33	0.22
Underwood Creek	Main Stem	0.945	PF2	5.00	685.56	686.44	0.04	686.45	0.001977	0.69	7.26	22.22	0.21
Underwood Creek	Main Stem	0.945	PF3	10.00	685.56	686.63	0.06	686.64	0.001811	0.88	11.39	22.52	0.22
Underwood Creek	Main Stem	0.945	PF4	23.00	685.56	686.98	0.09	687.00	0.001712	1.19	19.39	23.09	0.23
Underwood Creek	Main Stem	0.945	PF5	50.00	685.56	687.49	0.13	687.53	0.001723	1.59	31.51	23.94	0.24
Underwood Creek	Main Stem	0.945	PF6	100.00	685.56	688.18	0.20	688.25	0.001809	2.07	48.37	25.06	0.26
Underwood Creek	Main Stem	0.945	PF7	200.00	685.56	689.17	0.31	689.29	0.001970	2.71	73.86	26.05	0.28
Underwood Creek	Main Stem	0.936	PF1	3.00	685.46	686.10	0.05	686.11	0.001906	0.86	3.49	7.36	0.22
Underwood Creek	Main Stem	0.936	PF2	5.00	685.46	686.35	0.04	686.36	0.001888	0.71	7.04	19.83	0.21
Underwood Creek	Main Stem	0.936	PF3	10.00	685.46	686.54	0.06	686.55	0.001871	0.93	10.80	20.15	0.22
Underwood Creek	Main Stem	0.936	PF4	23.00	685.46	686.88	0.10	686.91	0.001947	1.29	17.90	20.73	0.24
Underwood Creek	Main Stem	0.936	PF5	50.00	685.46	687.39	0.16	687.44	0.002081	1.75	28.63	21.58	0.27
Underwood Creek	Main Stem	0.936	PF6	100.00	685.46	688.06	0.25	688.15	0.002270	2.30	43.54	22.71	0.29
Underwood Creek	Main Stem	0.936	PF7	200.00	685.46	689.03	0.39	689.17	0.002540	3.03	66.08	23.61	0.32
Underwood Creek	Main Stem	0.928	PF1	3.00	685.37	686.01	0.06	686.02	0.001990	0.87	3.43	7.31	0.22
Underwood Creek	Main Stem	0.928	PF2	5.00	685.37	686.25	0.04	686.26	0.002006	0.75	6.70	18.32	0.22
Underwood Creek	Main Stem	0.928	PF3	10.00	685.37	686.43	0.07	686.45	0.002141	0.99	10.06	18.62	0.24
Underwood Creek	Main Stem	0.928	PF4	23.00	685.37	686.77	0.12	686.80	0.002325	1.40	16.46	19.17	0.27
Underwood Creek	Main Stem	0.928	PF5	50.00	685.37	687.27	0.20	687.32	0.002563	1.91	26.12	19.99	0.30
Underwood Creek	Main Stem	0.928	PF6	100.00	685.37	687.92	0.31	688.02	0.002854	2.53	39.52	21.06	0.33
Underwood Creek	Main Stem	0.928	PF7	200.00	685.37	688.85	0.48	689.03	0.003241	3.34	59.85	22.12	0.36
Underwood Creek	Main Stem	0.919	PF1	3.00	685.27	685.91	0.06	685.92	0.001977	0.87	3.44	7.32	0.22
Underwood Creek	Main Stem	0.919	PF2	5.00	685.27	686.15	0.04	686.16	0.001975	0.69	7.26	22.22	0.21
Underwood Creek	Main Stem	0.919	PF3	10.00	685.27	686.34	0.06	686.35	0.001806	0.88	11.40	22.52	0.22
Underwood Creek	Main Stem	0.919	PF4	23.00	685.27	686.68	0.09	686.70	0.001793	1.20	19.11	23.07	0.23
Underwood Creek	Main Stem	0.919	PF5	50.00	685.27	687.17	0.14	687.21	0.001889	1.63	30.61	23.86	0.25
Underwood Creek	Main Stem	0.919	PF6	100.00	685.27	687.82	0.22	687.89	0.002045	2.15	46.48	24.92	0.28
Underwood Creek	Main Stem	0.919	PF7	200.00	685.27	688.75	0.34	688.88	0.002283	2.84	70.40	26.05	0.30
Underwood Creek	Main Stem	0.910	PF1	3.00	685.17	685.81	0.06	685.82	0.001945	0.87	3.46	7.33	0.22
Underwood Creek	Main Stem	0.910	PF2	5.00	685.17	686.06	0.04	686.06	0.001917	0.74	6.78	18.22	0.21
Underwood Creek	Main Stem	0.910	PF3	10.00	685.17	686.24	0.07	686.25	0.002080	0.99	10.12	18.50	0.24
Underwood Creek	Main Stem	0.910	PF4	23.00	685.17	686.56	0.12	686.60	0.002411	1.42	16.24	19.02	0.27
Underwood Creek	Main Stem	0.910	PF5	50.00	685.17	687.03	0.21	687.09	0.002802	1.97	25.32	19.76	0.31
Underwood Creek	Main Stem	0.910	PF6	100.00	685.17	687.65	0.34	687.76	0.003236	2.64	37.83	20.74	0.34
Underwood Creek	Main Stem	0.910	PF7	200.00	685.17	688.53	0.54	688.72	0.003799	3.53	56.72	22.03	0.39
Underwood Creek	Main Stem	0.902	PF1	3.00	685.08	685.71	0.06	685.72	0.002058	0.88	3.39	7.28	0.23
Underwood Creek	Main Stem	0.902	PF2	5.00	685.08	685.96	0.04	685.97	0.002045	0.74	6.80	19.30	0.22
Underwood Creek	Main Stem	0.902	PF3	10.00	685.08	686.13	0.07	686.14	0.002273	0.99	10.07	19.57	0.24
Underwood Creek	Main Stem	0.902	PF4	23.00	685.08	686.44	0.12	686.47	0.002574	1.42	16.24	20.08	0.28
Underwood Creek	Main Stem	0.902	PF5	50.00	685.08	686.89	0.21	686.95	0.002929	1.97	25.44	20.81	0.31
Underwood Creek	Main Stem	0.902	PF6	100.00	685.08	687.49	0.33	687.59	0.003313	2.62	38.18	21.78	0.35
Underwood Creek	Main Stem	0.902	PF7	200.00	685.08	688.34	0.53	688.53	0.003821	3.48	57.45	23.12	0.39
Underwood Creek	Main Stem	0.893	PF1	3.00	684.98	685.61	0.06	685.62	0.002098	0.89	3.37	7.26	0.23
Underwood Creek	Main Stem	0.893	PF2	5.00	684.98	685.86	0.04	685.87	0.002064	0.67	7.48	24.81	0.21
Underwood Creek	Main Stem	0.893	PF3	10.00	684.98	686.03	0.05	686.04	0.001932	0.86	11.65	25.08	0.22
Underwood Creek	Main Stem	0.893	PF4	23.00	684.98	686.33	0.09	686.36	0.001915	1.18	19.49	25.58	0.24
Underwood Creek	Main Stem	0.893	PF5	50.00	684.98	686.78	0.14	686.82	0.002020	1.61	31.09	26.31	0.26
Underwood Creek	Main Stem	0.893	PF6	100.00	684.98	687.38	0.22	687.45	0.002172	2.12	47.12	27.28	0.28
Underwood Creek	Main Stem	0.893	PF7	200.00	684.98	688.24	0.34	688.36	0.002421	2.81	71.17	28.63	0.31
Underwood Creek	Main Stem	0.884	PF1	3.00	684.88	685.50	0.06	685.51	0.002161	0.90	3.33	7.23	0.23
Underwood Creek	Main Stem	0.884	PF2	5.00	684.88	685.76	0.04	685.77	0.002027	0.66	7.56	25.13	0.21
Underwood Creek	Main Stem	0.884	PF3	10.00	684.88	685.93	0.05	685.94	0.001820	0.84	11.92	25.42	0.22
Underwood Creek	Main Stem	0.884	PF4	23.00	684.88	686.24	0.08	686.26	0.001820	1.16	19.89	25.92	0.23
Underwood Creek	Main Stem	0.884	PF5	50.00	684.88	686.68	0.14	686.72	0.001969	1.59	31.48	26.64	0.26
Underwood Creek	Main Stem	0.884	PF6	100.00	684.88	687.27	0.22	687.34	0.002150	2.11	47.47	27.61	0.28
Underwood Creek	Main Stem	0.884	PF7	200.00	684.88	688.12	0.34	688.24	0.002423	2.80	71.43	28.98	0.31
Underwood Creek	Main Stem	0.876	PF1	3.00	684.78	685.39	0.06	685.40	0.002324	0.92	3.25	7.16	0.24
Underwood Creek	Main Stem	0.876	PF2	5.00	684.78	685.65	0.05	685.66	0.002213	0.77	6.50	18.30	0.23
Underwood Creek	Main Stem	0.876	PF3	10.00	684.78	685.82	0.08	685.84	0.002422	1.03	9.68	18.60	0.25
Underwood Creek	Main Stem	0.876	PF4	23.00	684.78	686.11	0.14	686.15	0.003038	1.52	15.15	19.09	0.30
Underwood Creek	Main Stem	0.876	PF5	50.00	684.78	686.51	0.27	686.59	0.003885	2.18	22.88	19.77	0.36
Underwood Creek	Main Stem	0.876	PF6	100.00	684.78	687.05	0.44	687.18	0.004660	2.97	33.71	20.68	0.41
Underwood Creek	Main Stem	0.876	PF7	200.00	684.78	687.80	0.73	688.05	0.005684	4.02	49.80	21.97	0.47
Underwood Creek	Main Stem	0.867	PF1	3.00	684.69	685.25	0.08	685.27	0.003196	1.03	2.90	6.86	0.28
Underwood Creek	Main Stem	0.867	PF2	5.00	684.69	685.48	0.08	685.50	0.005216	0.97	5.14	19.48	0.33
Underwood Creek	Main Stem	0.867	PF3	10.00	684.69	685.69	0.09	685.70	0.003180	1.09	9.14	19.85	0.28
Underwood Creek	Main Stem	0.867	PF4	23.00	684.69	685.93	0.18	685.97	0.004262	1.65	13.98	20.30	0.35
Underwood Creek	Main Stem	0.867	PF5	50.00	684.69	686.26	0.33	686.35	0.005551	2.39	20.93	20.92	0.42
Underwood Creek	Main Stem	0.867	PF6	100.00	684.69	686.76	0.52	686.91	0.006199	3.18	31.43	21.82	0.47
Underwood Creek	Main Stem	0.867	PF7	200.00	684.69	687.45	0.84	687.73	0.007215	4.26	46.96	23.09	0.53

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.858	PF1	3.00	684.56	685.00	0.17	685.03	0.008116	1.43	2.09	6.11	0.43
Underwood Creek	Main Stem	0.858	PF2	5.00	684.56	685.13	0.21	685.18	0.008167	1.67	2.99	6.94	0.45
Underwood Creek	Main Stem	0.858	PF3	10.00	684.56	685.44	0.14	685.47	0.007980	1.30	7.72	26.19	0.42
Underwood Creek	Main Stem	0.858	PF4	23.00	684.56	685.64	0.23	685.69	0.007700	1.77	12.98	26.63	0.45
Underwood Creek	Main Stem	0.858	PF5	50.00	684.56	685.96	0.34	686.04	0.007013	2.32	21.56	27.34	0.46
Underwood Creek	Main Stem	0.858	PF6	100.00	684.56	686.51	0.39	686.62	0.005053	2.71	36.89	28.56	0.42
Underwood Creek	Main Stem	0.858	PF7	200.00	684.56	687.22	0.56	687.40	0.004969	3.46	57.75	30.09	0.44
Underwood Creek	Main Stem	0.849	PF1	3.00	684.14	684.56	0.19	684.59	0.009298	1.50	2.00	6.02	0.46
Underwood Creek	Main Stem	0.849	PF2	5.00	684.14	684.71	0.22	684.75	0.008533	1.70	2.94	6.90	0.46
Underwood Creek	Main Stem	0.849	PF3	10.00	684.14	685.00	0.18	685.04	0.009673	1.46	6.83	22.25	0.47
Underwood Creek	Main Stem	0.849	PF4	23.00	684.14	685.23	0.27	685.29	0.008329	1.93	11.92	22.76	0.47
Underwood Creek	Main Stem	0.849	PF5	50.00	684.14	685.60	0.36	685.70	0.006792	2.43	20.57	23.59	0.46
Underwood Creek	Main Stem	0.849	PF6	100.00	684.14	686.27	0.38	686.39	0.004318	2.71	36.87	25.08	0.39
Underwood Creek	Main Stem	0.849	PF7	200.00	684.14	686.93	0.64	687.14	0.005395	3.72	53.74	26.38	0.46
Underwood Creek	Main Stem	0.841	PF1	3.00	683.73	684.20	0.13	684.23	0.005917	1.28	2.34	6.35	0.37
Underwood Creek	Main Stem	0.841	PF2	5.00	683.73	684.33	0.19	684.37	0.006829	1.57	3.19	7.10	0.41
Underwood Creek	Main Stem	0.841	PF3	10.00	683.73	684.65	0.12	684.67	0.005615	1.24	8.06	22.35	0.36
Underwood Creek	Main Stem	0.841	PF4	23.00	683.73	684.84	0.25	684.89	0.007571	1.87	12.27	22.74	0.45
Underwood Creek	Main Stem	0.841	PF5	50.00	683.73	685.38	0.23	685.44	0.003647	2.00	24.98	23.88	0.34
Underwood Creek	Main Stem	0.841	PF6	100.00	683.73	686.13	0.26	686.21	0.002568	2.30	43.51	25.46	0.31
Underwood Creek	Main Stem	0.841	PF7	200.00	683.73	686.72	0.52	686.90	0.004052	3.41	58.74	26.13	0.40
Underwood Creek	Main Stem	0.832	PF1	3.00	683.31	683.64	0.38	683.70	0.023128	2.06	1.46	5.45	0.70
Underwood Creek	Main Stem	0.832	PF2	5.00	683.31	683.78	0.37	683.85	0.016672	2.15	2.32	6.34	0.63
Underwood Creek	Main Stem	0.832	PF3	10.00	683.31	684.09	0.38	684.16	0.023323	2.04	4.89	18.70	0.70
Underwood Creek	Main Stem	0.832	PF4	23.00	683.31	684.60	0.15	684.64	0.003466	1.54	14.95	20.74	0.32
Underwood Creek	Main Stem	0.832	PF5	50.00	683.31	685.26	0.15	685.31	0.001979	1.70	29.45	22.58	0.26
Underwood Creek	Main Stem	0.832	PF6	100.00	683.31	686.03	0.21	686.10	0.001833	2.13	46.84	22.58	0.26
Underwood Creek	Main Stem	0.832	PF7	200.00	683.31	686.51	0.53	686.69	0.004216	3.42	58.44	26.15	0.40
Underwood Creek	Main Stem	0.829	PF1	3.00	683.14	683.58	0.03	683.63	0.001320	1.76	1.70	4.75	0.52
Underwood Creek	Main Stem	0.829	PF2	5.00	683.14	683.72	0.04	683.79	0.001334	2.07	2.42	5.32	0.54
Underwood Creek	Main Stem	0.829	PF3	10.00	683.14	683.98	0.05	684.08	0.001356	2.54	3.93	6.36	0.57
Underwood Creek	Main Stem	0.829	PF4	23.00	683.14	684.42	0.07	684.58	0.001388	3.23	7.13	8.12	0.61
Underwood Creek	Main Stem	0.829	PF5	50.00	683.14	685.01	0.10	685.25	0.001409	3.98	12.56	10.45	0.64
Underwood Creek	Main Stem	0.829	PF6	100.00	683.14	685.66	0.17	686.03	0.002801	4.85	20.63	20.45	0.85
Underwood Creek	Main Stem	0.829	PF7	200.00	683.14	686.28	0.16	686.61	0.002560	4.63	43.19	41.33	0.80
Underwood Creek	Main Stem	0.824	PF1	3.00	683.10	683.54	0.03	683.59	0.001313	1.76	1.70	4.76	0.52
Underwood Creek	Main Stem	0.824	PF2	5.00	683.10	683.68	0.04	683.75	0.001332	2.07	2.42	5.32	0.54
Underwood Creek	Main Stem	0.824	PF3	10.00	683.10	683.94	0.05	684.04	0.001360	2.55	3.93	6.36	0.57
Underwood Creek	Main Stem	0.824	PF4	23.00	683.10	684.38	0.07	684.54	0.001396	3.23	7.12	8.12	0.61
Underwood Creek	Main Stem	0.824	PF5	50.00	683.10	684.96	0.10	685.21	0.001417	3.99	12.53	10.45	0.64
Underwood Creek	Main Stem	0.824	PF6	100.00	683.10	685.60	0.09	685.98	0.001530	4.90	20.42	20.08	0.86
Underwood Creek	Main Stem	0.824	PF7	200.00	683.10	686.12	0.10	686.54	0.001858	5.23	38.25	41.24	0.96
Underwood Creek	Main Stem	0.815	PF1	3.00	683.03	683.48	0.03	683.52	0.001223	1.72	1.75	4.79	0.50
Underwood Creek	Main Stem	0.815	PF2	5.00	683.03	683.62	0.03	683.68	0.001285	2.04	2.45	5.35	0.53
Underwood Creek	Main Stem	0.815	PF3	10.00	683.03	683.87	0.05	683.97	0.001342	2.53	3.95	6.37	0.57
Underwood Creek	Main Stem	0.815	PF4	23.00	683.03	684.31	0.07	684.47	0.001394	3.23	7.12	8.12	0.61
Underwood Creek	Main Stem	0.815	PF5	50.00	683.03	684.89	0.10	685.14	0.001420	3.99	12.53	10.45	0.64
Underwood Creek	Main Stem	0.815	PF6	100.00	683.03	685.63	0.08	685.80	0.001356	3.31	30.20	29.00	0.57
Underwood Creek	Main Stem	0.815	PF7	200.00	683.03	686.07	0.15	686.41	0.001737	4.65	43.01	29.00	0.67
Underwood Creek	Main Stem	0.8125		Bridge									
Underwood Creek	Main Stem	0.81	PF1	3.00	682.98	683.43	0.03	683.47	0.001235	1.72	1.74	4.79	0.50
Underwood Creek	Main Stem	0.81	PF2	5.00	682.98	683.56	0.04	683.63	0.001332	2.07	2.42	5.33	0.54
Underwood Creek	Main Stem	0.81	PF3	10.00	682.98	683.81	0.05	683.92	0.001402	2.57	3.89	6.34	0.58
Underwood Creek	Main Stem	0.81	PF4	23.00	682.98	684.25	0.07	684.41	0.001451	3.28	7.02	8.08	0.62
Underwood Creek	Main Stem	0.81	PF5	50.00	682.98	684.83	0.10	685.08	0.001465	4.04	12.39	10.41	0.65
Underwood Creek	Main Stem	0.81	PF6	100.00	682.98	685.56	0.09	685.75	0.001595	3.48	28.70	29.00	0.62
Underwood Creek	Main Stem	0.81	PF7	200.00	682.98	685.82	0.22	686.29	0.003019	5.53	36.18	29.00	0.87
Underwood Creek	Main Stem	0.805	PF1	3.00	682.90	683.19	0.08	683.32	0.005478	2.86	1.05	4.17	1.00
Underwood Creek	Main Stem	0.805	PF2	5.00	682.90	683.31	0.10	683.47	0.004823	3.23	1.55	4.62	0.98
Underwood Creek	Main Stem	0.805	PF3	10.00	682.90	683.51	0.13	683.74	0.004478	3.89	2.57	5.44	1.00
Underwood Creek	Main Stem	0.805	PF4	23.00	682.90	683.87	0.17	684.23	0.004080	4.77	4.82	6.90	1.01
Underwood Creek	Main Stem	0.805	PF5	50.00	682.90	684.38	0.21	684.88	0.003656	5.66	8.84	8.93	1.00
Underwood Creek	Main Stem	0.805	PF6	100.00	682.90	685.27	0.18	685.57	0.004934	4.38	22.83	38.96	1.01
Underwood Creek	Main Stem	0.805	PF7	200.00	682.90	685.62	0.23	686.08	0.004198	5.42	36.91	40.36	1.00
Underwood Creek	Main Stem	0.800	PF1	3.00	682.33	682.44	6.24	683.23	0.995002	7.12	0.42	4.16	3.94
Underwood Creek	Main Stem	0.800	PF2	5.00	682.33	682.50	6.13	683.37	0.670929	7.51	0.67	4.50	3.44
Underwood Creek	Main Stem	0.800	PF3	10.00	682.33	682.61	6.22	683.65	0.430160	8.17	1.22	5.19	2.97
Underwood Creek	Main Stem	0.800	PF4	23.00	682.33	682.80	9.78	684.12	1.269508	9.22	2.49	20.06	4.61
Underwood Creek	Main Stem	0.800	PF5	50.00	682.33	682.90	11.09	684.72	0.796909	10.84	4.61	20.48	4.03
Underwood Creek	Main Stem	0.800	PF6	100.00	682.33	683.08	11.55	685.35	0.480990	12.11	8.26	21.18	3.42
Underwood Creek	Main Stem	0.800	PF7	200.00	682.33	683.43	10.18	685.87	0.235757	12.54	15.94	22.59	2.63
Underwood Creek	Main Stem	0.792	PF1	3.00	681.98	682.49	0.08	682.50	0.008210	0.90	3.35	20.23	0.39
Underwood Creek	Main Stem	0.792	PF2	5.00	681.98	682.55	0.11	682.57	0.008288	1.10	4.56	20.47	0.41
Underwood Creek	Main Stem	0.792	PF3	10.00	681.98	682.67	0.16	682.70	0.007883	1.41	7.09	20.96	0.43
Underwood Creek	Main Stem	0.792	PF4	23.00	681.98	682.89	0.27	682.95	0.008022	1.94	11.83	21.85	0.47
Underwood Creek	Main Stem	0.792	PF5	50.00	681.98	683.22	0.41	683.33	0.008111	2.59	19.29	23.18	0.50
Underwood Creek	Main Stem	0.792	PF6	100.00	681.98	683.67	0.60	683.84	0.008199	3.32	30.10	24.98	0.53

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.792	PF7	200.00	681.98	684.35	0.84	684.62	0.008047	4.17	47.99	27.70	0.56
Underwood Creek	Main Stem	0.783	PF1	3.00	681.57	682.08	0.09	682.09	0.008454	0.90	3.32	20.23	0.39
Underwood Creek	Main Stem	0.783	PF2	5.00	681.57	682.14	0.11	682.16	0.008236	1.09	4.57	20.47	0.41
Underwood Creek	Main Stem	0.783	PF3	10.00	681.57	682.25	0.17	682.28	0.008548	1.45	6.91	20.93	0.44
Underwood Creek	Main Stem	0.783	PF4	23.00	681.57	682.47	0.28	682.53	0.008476	1.98	11.63	21.81	0.48
Underwood Creek	Main Stem	0.783	PF5	50.00	681.57	682.80	0.42	682.91	0.008361	2.62	19.10	23.14	0.51
Underwood Creek	Main Stem	0.783	PF6	100.00	681.57	683.26	0.60	683.43	0.008201	3.32	30.10	24.98	0.53
Underwood Creek	Main Stem	0.783	PF7	200.00	681.57	683.96	0.82	684.22	0.007798	4.12	48.50	27.78	0.55
Underwood Creek	Main Stem	0.773	PF1	3.00	681.15	681.66	0.08	681.67	0.008233	0.90	3.34	20.23	0.39
Underwood Creek	Main Stem	0.773	PF2	5.00	681.15	681.72	0.12	681.73	0.008478	1.10	4.53	20.46	0.41
Underwood Creek	Main Stem	0.773	PF3	10.00	681.15	681.84	0.17	681.87	0.008057	1.42	7.04	20.95	0.43
Underwood Creek	Main Stem	0.773	PF4	23.00	681.15	682.06	0.27	682.12	0.008107	1.95	11.79	21.83	0.47
Underwood Creek	Main Stem	0.773	PF5	50.00	681.15	682.40	0.41	682.50	0.007961	2.58	19.40	23.18	0.50
Underwood Creek	Main Stem	0.773	PF6	100.00	681.15	682.88	0.56	683.04	0.007484	3.22	31.01	25.10	0.51
Underwood Creek	Main Stem	0.773	PF7	200.00	681.15	683.60	0.76	683.85	0.007017	3.98	50.21	27.94	0.52
Underwood Creek	Main Stem	0.764	PF1	3.00	680.74	681.25	0.08	681.26	0.008112	0.89	3.36	20.23	0.39
Underwood Creek	Main Stem	0.764	PF2	5.00	680.74	681.31	0.11	681.33	0.007927	1.08	4.62	20.48	0.40
Underwood Creek	Main Stem	0.764	PF3	10.00	680.74	681.42	0.18	681.45	0.008646	1.45	6.89	20.92	0.45
Underwood Creek	Main Stem	0.764	PF4	23.00	680.74	681.63	0.30	681.69	0.009343	2.04	11.28	21.75	0.50
Underwood Creek	Main Stem	0.764	PF5	50.00	680.74	682.07	0.33	682.15	0.005987	2.35	21.26	23.52	0.44
Underwood Creek	Main Stem	0.764	PF6	100.00	680.74	682.56	0.48	682.70	0.006026	3.00	33.31	25.49	0.46
Underwood Creek	Main Stem	0.764	PF7	200.00	680.74	683.30	0.66	683.52	0.005782	3.75	53.38	27.94	0.48
Underwood Creek	Main Stem	0.754	PF1	3.00	680.33	680.84	0.08	680.85	0.008800	0.85	3.52	24.22	0.39
Underwood Creek	Main Stem	0.754	PF2	5.00	680.33	680.89	0.11	680.91	0.008690	1.04	4.82	24.44	0.41
Underwood Creek	Main Stem	0.754	PF3	10.00	680.33	680.99	0.16	681.02	0.008556	1.35	7.39	24.85	0.44
Underwood Creek	Main Stem	0.754	PF4	23.00	680.33	681.19	0.25	681.25	0.008309	1.84	12.47	25.66	0.47
Underwood Creek	Main Stem	0.754	PF5	70.00	680.33	681.66	0.47	681.79	0.008488	2.81	24.92	27.53	0.52
Underwood Creek	Main Stem	0.754	PF6	136.00	680.33	682.13	0.67	682.33	0.008396	3.55	38.34	29.42	0.55
Underwood Creek	Main Stem	0.754	PF7	270.00	680.33	682.85	0.94	683.16	0.008322	4.47	60.39	32.27	0.58
Underwood Creek	Main Stem	0.745	PF1	3.00	679.91	680.42	0.07	680.43	0.008052	0.83	3.62	24.24	0.38
Underwood Creek	Main Stem	0.745	PF2	5.00	679.91	680.47	0.10	680.49	0.008035	1.01	4.94	24.45	0.40
Underwood Creek	Main Stem	0.745	PF3	10.00	679.91	680.58	0.15	680.60	0.008281	1.34	7.47	24.87	0.43
Underwood Creek	Main Stem	0.745	PF4	23.00	679.91	680.78	0.24	680.83	0.008084	1.83	12.58	25.67	0.46
Underwood Creek	Main Stem	0.745	PF5	70.00	679.91	681.25	0.46	681.37	0.008203	2.78	25.19	27.57	0.51
Underwood Creek	Main Stem	0.745	PF6	136.00	679.91	681.72	0.65	681.92	0.008206	3.52	38.63	29.45	0.54
Underwood Creek	Main Stem	0.745	PF7	270.00	679.91	682.44	0.93	682.75	0.008197	4.45	60.70	32.31	0.57
Underwood Creek	Main Stem	0.735	PF1	3.00	679.50	680.01	0.08	680.02	0.008631	0.85	3.54	24.23	0.39
Underwood Creek	Main Stem	0.735	PF2	5.00	679.50	680.06	0.10	680.08	0.008490	1.03	4.85	24.44	0.41
Underwood Creek	Main Stem	0.735	PF3	10.00	679.50	680.17	0.15	680.19	0.008370	1.34	7.44	24.86	0.43
Underwood Creek	Main Stem	0.735	PF4	23.00	679.50	680.36	0.25	680.42	0.008278	1.84	12.48	25.66	0.47
Underwood Creek	Main Stem	0.735	PF5	70.00	679.50	680.84	0.46	680.96	0.008279	2.79	25.12	27.56	0.51
Underwood Creek	Main Stem	0.735	PF6	136.00	679.50	681.31	0.66	681.50	0.008247	3.53	38.56	29.45	0.54
Underwood Creek	Main Stem	0.735	PF7	270.00	679.50	682.03	0.93	682.34	0.008192	4.45	60.71	32.31	0.57
Underwood Creek	Main Stem	0.733	PF1	3.00	679.39	679.90	0.08	679.91	0.008139	0.83	3.60	24.24	0.38
Underwood Creek	Main Stem	0.733	PF2	5.00	679.39	679.95	0.10	679.97	0.008148	1.02	4.92	24.45	0.40
Underwood Creek	Main Stem	0.733	PF3	10.00	679.39	680.06	0.15	680.09	0.008178	1.33	7.50	24.87	0.43
Underwood Creek	Main Stem	0.733	PF4	23.00	679.39	680.26	0.25	680.31	0.008133	1.83	12.55	25.67	0.46
Underwood Creek	Main Stem	0.733	PF5	70.00	679.39	680.73	0.46	680.85	0.008243	2.78	25.16	27.56	0.51
Underwood Creek	Main Stem	0.733	PF6	136.00	679.39	681.20	0.65	681.40	0.008216	3.52	38.61	29.45	0.54
Underwood Creek	Main Stem	0.733	PF7	270.00	679.39	681.92	0.93	682.23	0.008162	4.44	60.78	32.32	0.57
Underwood Creek	Main Stem	0.726	PF1	3.00	679.11	679.63	0.06	679.63	0.006980	0.77	3.90	26.26	0.35
Underwood Creek	Main Stem	0.726	PF2	5.00	679.11	679.68	0.09	679.69	0.006893	0.94	5.33	26.48	0.37
Underwood Creek	Main Stem	0.726	PF3	10.00	679.11	679.79	0.13	679.81	0.006841	1.23	8.16	26.90	0.39
Underwood Creek	Main Stem	0.726	PF4	23.00	679.11	679.99	0.20	680.03	0.006688	1.68	13.72	27.71	0.42
Underwood Creek	Main Stem	0.726	PF5	70.00	679.11	680.48	0.38	680.58	0.006612	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.726	PF6	136.00	679.11	680.96	0.54	681.12	0.006594	3.21	42.39	31.57	0.49
Underwood Creek	Main Stem	0.726	PF7	270.00	679.11	681.69	0.77	681.94	0.006573	4.06	66.53	34.49	0.51
Underwood Creek	Main Stem	0.725	PF1	3.00	679.08	679.60	0.06	679.61	0.006183	0.74	4.04	26.28	0.33
Underwood Creek	Main Stem	0.725	PF2	5.00	679.08	679.65	0.08	679.67	0.006383	0.92	5.46	26.50	0.36
Underwood Creek	Main Stem	0.725	PF3	10.00	679.08	679.76	0.12	679.78	0.006544	1.21	8.27	26.92	0.38
Underwood Creek	Main Stem	0.725	PF4	23.00	679.08	679.96	0.20	680.01	0.006505	1.66	13.84	27.73	0.41
Underwood Creek	Main Stem	0.725	PF5	70.00	679.08	680.45	0.37	680.55	0.006519	2.52	27.79	29.67	0.46
Underwood Creek	Main Stem	0.725	PF6	136.00	679.08	680.93	0.54	681.09	0.006531	3.20	42.52	31.59	0.49
Underwood Creek	Main Stem	0.725	PF7	270.00	679.08	681.66	0.76	681.92	0.006530	4.05	66.67	34.51	0.51
Underwood Creek	Main Stem	0.716	PF1	3.00	678.78	679.30	0.06	679.31	0.006842	0.77	3.92	26.27	0.35
Underwood Creek	Main Stem	0.716	PF2	5.00	678.78	679.35	0.09	679.36	0.006846	0.94	5.35	26.48	0.37
Underwood Creek	Main Stem	0.716	PF3	10.00	678.78	679.46	0.13	679.48	0.006709	1.22	8.21	26.91	0.39
Underwood Creek	Main Stem	0.716	PF4	23.00	678.78	679.66	0.20	679.71	0.006526	1.66	13.83	27.73	0.42
Underwood Creek	Main Stem	0.716	PF5	70.00	678.78	680.15	0.38	680.25	0.006615	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.716	PF6	136.00	678.78	680.63	0.54	680.79	0.006566	3.20	42.44	31.58	0.49
Underwood Creek	Main Stem	0.716	PF7	270.00	678.78	681.36	0.76	681.62	0.006544	4.05	66.63	34.50	0.51
Underwood Creek	Main Stem	0.707	PF1	3.00	678.45	678.97	0.06	678.98	0.006314	0.75	4.02	26.28	0.34
Underwood Creek	Main Stem	0.707	PF2	5.00	678.45	679.02	0.08	679.04	0.006547	0.92	5.42	26.49	0.36
Underwood Creek	Main Stem	0.707	PF3	10.00	678.45	679.13	0.12	679.16	0.006291	1.19	8.37	26.93	0.38
Underwood Creek	Main Stem	0.707	PF4	23.00	678.45	679.34	0.20	679.38	0.006308	1.65	13.97	27.75	0.41
Underwood Creek	Main Stem	0.707	PF5	70.00	678.45	679.82	0.37	679.92	0.006455	2.51	27.87	29.68	0.46
Underwood Creek	Main Stem	0.707	PF6	136.00	678.45	680.31	0.53	680.46	0.006467	3.19	42.65	31.61	0.48

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.707	PF7	270.00	678.45	681.04	0.76	681.29	0.006486	4.04	66.82	34.52	0.51
Underwood Creek	Main Stem	0.698	PF1	3.00	678.13	678.65	0.06	678.66	0.006686	0.76	3.95	26.27	0.35
Underwood Creek	Main Stem	0.698	PF2	5.00	678.13	678.71	0.08	678.72	0.006254	0.91	5.49	26.51	0.35
Underwood Creek	Main Stem	0.698	PF3	10.00	678.13	678.81	0.13	678.83	0.006743	1.22	8.20	26.91	0.39
Underwood Creek	Main Stem	0.698	PF4	23.00	678.13	679.02	0.20	679.06	0.006438	1.66	13.89	27.75	0.41
Underwood Creek	Main Stem	0.698	PF5	70.00	678.13	679.50	0.38	679.60	0.006596	2.53	27.69	29.67	0.46
Underwood Creek	Main Stem	0.698	PF6	136.00	678.13	679.98	0.54	680.14	0.006588	3.21	42.41	31.60	0.49
Underwood Creek	Main Stem	0.698	PF7	270.00	678.13	680.71	0.76	680.96	0.006565	4.06	66.58	34.53	0.51
Underwood Creek	Main Stem	0.689	PF1	3.00	677.80	678.32	0.06	678.33	0.006407	0.75	4.00	26.28	0.34
Underwood Creek	Main Stem	0.689	PF2	5.00	677.80	678.37	0.09	678.38	0.006811	0.93	5.35	26.48	0.37
Underwood Creek	Main Stem	0.689	PF3	10.00	677.80	678.48	0.12	678.50	0.006544	1.21	8.27	26.92	0.38
Underwood Creek	Main Stem	0.689	PF4	23.00	677.80	678.68	0.21	678.72	0.006755	1.68	13.68	27.71	0.42
Underwood Creek	Main Stem	0.689	PF5	70.00	677.80	679.17	0.38	679.27	0.006614	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.689	PF6	136.00	677.80	679.65	0.54	679.81	0.006566	3.20	42.44	31.58	0.49
Underwood Creek	Main Stem	0.689	PF7	270.00	677.80	680.38	0.76	680.64	0.006544	4.05	66.63	34.50	0.51
Underwood Creek	Main Stem	0.679	PF1	3.00	677.47	677.99	0.06	678.00	0.006676	0.76	3.95	26.27	0.35
Underwood Creek	Main Stem	0.679	PF2	5.00	677.47	678.04	0.08	678.06	0.006477	0.92	5.44	26.49	0.36
Underwood Creek	Main Stem	0.679	PF3	10.00	677.47	678.15	0.12	678.17	0.006435	1.20	8.32	26.92	0.38
Underwood Creek	Main Stem	0.679	PF4	23.00	677.47	678.35	0.20	678.40	0.006466	1.66	13.87	27.74	0.41
Underwood Creek	Main Stem	0.679	PF5	70.00	677.47	678.84	0.37	678.94	0.006455	2.51	27.87	29.68	0.46
Underwood Creek	Main Stem	0.679	PF6	136.00	677.47	679.33	0.53	679.48	0.006467	3.19	42.65	31.61	0.48
Underwood Creek	Main Stem	0.679	PF7	270.00	677.47	680.06	0.76	680.31	0.006486	4.04	66.82	34.52	0.51
Underwood Creek	Main Stem	0.670	PF1	3.00	677.15	677.67	0.06	677.68	0.006209	0.74	4.04	26.28	0.33
Underwood Creek	Main Stem	0.670	PF2	5.00	677.15	677.72	0.08	677.74	0.006397	0.92	5.46	26.50	0.36
Underwood Creek	Main Stem	0.670	PF3	10.00	677.15	677.83	0.12	677.86	0.006337	1.20	8.35	26.93	0.38
Underwood Creek	Main Stem	0.670	PF4	23.00	677.15	678.03	0.20	678.07	0.006680	1.68	13.73	27.72	0.42
Underwood Creek	Main Stem	0.670	PF5	70.00	677.15	678.52	0.38	678.62	0.006595	2.53	27.69	29.67	0.46
Underwood Creek	Main Stem	0.670	PF6	136.00	677.15	679.00	0.54	679.16	0.006587	3.21	42.41	31.60	0.49
Underwood Creek	Main Stem	0.670	PF7	270.00	677.15	679.73	0.76	679.98	0.006567	4.06	66.57	34.53	0.51
Underwood Creek	Main Stem	0.661	PF1	3.00	676.82	677.34	0.06	677.35	0.006758	0.76	3.94	26.27	0.35
Underwood Creek	Main Stem	0.661	PF2	5.00	676.82	677.39	0.08	677.41	0.006724	0.93	5.37	26.49	0.36
Underwood Creek	Main Stem	0.661	PF3	10.00	676.82	677.50	0.13	677.52	0.006708	1.22	8.21	26.91	0.39
Underwood Creek	Main Stem	0.661	PF4	23.00	676.82	677.70	0.20	677.75	0.006530	1.66	13.82	27.73	0.42
Underwood Creek	Main Stem	0.661	PF5	70.00	676.82	678.19	0.38	678.29	0.006614	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.661	PF6	136.00	676.82	678.67	0.54	678.83	0.006567	3.20	42.44	31.58	0.49
Underwood Creek	Main Stem	0.661	PF7	270.00	676.82	679.40	0.76	679.66	0.006548	4.05	66.61	34.50	0.51
Underwood Creek	Main Stem	0.651	PF1	3.00	676.49	677.01	0.06	677.02	0.006381	0.75	4.00	26.28	0.34
Underwood Creek	Main Stem	0.651	PF2	5.00	676.49	677.06	0.08	677.08	0.006395	0.92	5.46	26.50	0.36
Underwood Creek	Main Stem	0.651	PF3	10.00	676.49	677.17	0.12	677.20	0.006296	1.19	8.37	26.93	0.38
Underwood Creek	Main Stem	0.651	PF4	23.00	676.49	677.38	0.20	677.42	0.006318	1.65	13.97	27.75	0.41
Underwood Creek	Main Stem	0.651	PF5	70.00	676.49	677.86	0.37	677.96	0.006452	2.51	27.88	29.68	0.46
Underwood Creek	Main Stem	0.651	PF6	136.00	676.49	678.34	0.53	678.50	0.006470	3.19	42.65	31.61	0.48
Underwood Creek	Main Stem	0.651	PF7	270.00	676.49	679.08	0.76	679.33	0.006494	4.04	66.80	34.52	0.51
Underwood Creek	Main Stem	0.642	PF1	3.00	676.17	676.69	0.06	676.70	0.006740	0.76	3.94	26.27	0.35
Underwood Creek	Main Stem	0.642	PF2	5.00	676.17	676.74	0.08	676.75	0.006744	0.93	5.37	26.49	0.36
Underwood Creek	Main Stem	0.642	PF3	10.00	676.17	676.85	0.13	676.87	0.006690	1.22	8.22	26.91	0.39
Underwood Creek	Main Stem	0.642	PF4	23.00	676.17	677.05	0.20	677.10	0.006515	1.66	13.84	27.74	0.41
Underwood Creek	Main Stem	0.642	PF5	70.00	676.17	677.54	0.38	677.64	0.006603	2.53	27.68	29.67	0.46
Underwood Creek	Main Stem	0.642	PF6	136.00	676.17	678.02	0.54	678.18	0.006597	3.21	42.39	31.60	0.49
Underwood Creek	Main Stem	0.642	PF7	270.00	676.17	678.75	0.77	679.00	0.006582	4.06	66.52	34.52	0.52
Underwood Creek	Main Stem	0.633	PF1	3.00	675.84	676.36	0.06	676.37	0.006634	0.76	3.96	26.27	0.34
Underwood Creek	Main Stem	0.633	PF2	5.00	675.84	676.42	0.08	676.43	0.006347	0.91	5.47	26.50	0.35
Underwood Creek	Main Stem	0.633	PF3	10.00	675.84	676.52	0.12	676.55	0.006337	1.20	8.35	26.93	0.38
Underwood Creek	Main Stem	0.633	PF4	23.00	675.84	676.72	0.20	676.76	0.006682	1.68	13.73	27.72	0.42
Underwood Creek	Main Stem	0.633	PF5	70.00	675.84	677.21	0.38	677.31	0.006595	2.53	27.69	29.67	0.46
Underwood Creek	Main Stem	0.633	PF6	136.00	675.84	677.69	0.54	677.85	0.006587	3.21	42.41	31.60	0.49
Underwood Creek	Main Stem	0.633	PF7	270.00	675.84	678.42	0.76	678.67	0.006563	4.05	66.59	34.53	0.51
Underwood Creek	Main Stem	0.623	PF1	3.00	675.51	676.03	0.06	676.04	0.006794	0.76	3.93	26.27	0.35
Underwood Creek	Main Stem	0.623	PF2	5.00	675.51	676.08	0.08	676.09	0.006750	0.93	5.37	26.48	0.36
Underwood Creek	Main Stem	0.623	PF3	10.00	675.51	676.19	0.13	676.21	0.006708	1.22	8.21	26.91	0.39
Underwood Creek	Main Stem	0.623	PF4	23.00	675.51	676.39	0.20	676.44	0.006528	1.66	13.83	27.73	0.42
Underwood Creek	Main Stem	0.623	PF5	70.00	675.51	676.88	0.38	676.98	0.006614	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.623	PF6	136.00	675.51	677.36	0.54	677.52	0.006566	3.20	42.44	31.58	0.49
Underwood Creek	Main Stem	0.623	PF7	270.00	675.51	678.09	0.76	678.35	0.006540	4.05	66.64	34.50	0.51
Underwood Creek	Main Stem	0.614	PF1	3.00	675.18	675.70	0.06	675.71	0.006527	0.75	3.98	26.27	0.34
Underwood Creek	Main Stem	0.614	PF2	5.00	675.18	675.75	0.08	675.77	0.006509	0.92	5.43	26.49	0.36
Underwood Creek	Main Stem	0.614	PF3	10.00	675.18	675.86	0.12	675.89	0.006287	1.19	8.37	26.93	0.38
Underwood Creek	Main Stem	0.614	PF4	23.00	675.18	676.07	0.20	676.11	0.006308	1.65	13.97	27.75	0.41
Underwood Creek	Main Stem	0.614	PF5	70.00	675.18	676.55	0.37	676.65	0.006455	2.51	27.87	29.68	0.46
Underwood Creek	Main Stem	0.614	PF6	136.00	675.18	677.04	0.53	677.19	0.006467	3.19	42.65	31.61	0.48
Underwood Creek	Main Stem	0.614	PF7	270.00	675.18	677.77	0.76	678.02	0.006479	4.04	66.85	34.53	0.51
Underwood Creek	Main Stem	0.605	PF1	3.00	674.86	675.38	0.06	675.39	0.006650	0.76	3.95	26.27	0.34
Underwood Creek	Main Stem	0.605	PF2	5.00	674.86	675.43	0.08	675.45	0.006496	0.92	5.43	26.50	0.36
Underwood Creek	Main Stem	0.605	PF3	10.00	674.86	675.54	0.13	675.56	0.006756	1.22	8.19	26.91	0.39
Underwood Creek	Main Stem	0.605	PF4	23.00	674.86	675.75	0.20	675.79	0.006453	1.66	13.88	27.74	0.41
Underwood Creek	Main Stem	0.605	PF5	70.00	674.86	676.23	0.38	676.33	0.006596	2.53	27.69	29.67	0.46
Underwood Creek	Main Stem	0.605	PF6	136.00	674.86	676.71	0.54	676.87	0.006587	3.21	42.41	31.60	0.49

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.605	PF7	270.00	674.86	677.44	0.76	677.69	0.006550	4.05	66.63	34.54	0.51
Underwood Creek	Main Stem	0.596	PF1	3.00	674.53	675.05	0.06	675.06	0.006805	0.76	3.93	26.27	0.35
Underwood Creek	Main Stem	0.596	PF2	5.00	674.53	675.10	0.09	675.11	0.006819	0.93	5.35	26.48	0.37
Underwood Creek	Main Stem	0.596	PF3	10.00	674.53	675.21	0.12	675.23	0.006536	1.21	8.28	26.92	0.38
Underwood Creek	Main Stem	0.596	PF4	23.00	674.53	675.41	0.21	675.45	0.006742	1.68	13.69	27.71	0.42
Underwood Creek	Main Stem	0.596	PF5	70.00	674.53	675.90	0.38	676.00	0.006613	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.596	PF6	136.00	674.53	676.38	0.54	676.54	0.006565	3.20	42.45	31.58	0.49
Underwood Creek	Main Stem	0.596	PF7	270.00	674.53	677.11	0.76	677.37	0.006513	4.05	66.73	34.51	0.51
Underwood Creek	Main Stem	0.586	PF1	3.00	674.20	674.72	0.06	674.73	0.006527	0.75	3.98	26.27	0.34
Underwood Creek	Main Stem	0.586	PF2	5.00	674.20	674.78	0.08	674.79	0.006242	0.91	5.50	26.50	0.35
Underwood Creek	Main Stem	0.586	PF3	10.00	674.20	674.88	0.12	674.90	0.006426	1.20	8.32	26.93	0.38
Underwood Creek	Main Stem	0.586	PF4	23.00	674.20	675.08	0.20	675.13	0.006477	1.66	13.86	27.73	0.41
Underwood Creek	Main Stem	0.586	PF5	70.00	674.20	675.57	0.37	675.67	0.006456	2.51	27.87	29.68	0.46
Underwood Creek	Main Stem	0.586	PF6	136.00	674.20	676.06	0.53	676.21	0.006465	3.19	42.66	31.61	0.48
Underwood Creek	Main Stem	0.586	PF7	270.00	674.20	676.79	0.75	677.04	0.006426	4.03	67.03	34.55	0.51
Underwood Creek	Main Stem	0.577	PF1	3.00	673.88	674.40	0.06	674.41	0.006458	0.75	3.99	26.28	0.34
Underwood Creek	Main Stem	0.577	PF2	5.00	673.88	674.45	0.09	674.46	0.006831	0.93	5.35	26.48	0.37
Underwood Creek	Main Stem	0.577	PF3	10.00	673.88	674.56	0.12	674.59	0.006356	1.20	8.35	26.93	0.38
Underwood Creek	Main Stem	0.577	PF4	23.00	673.88	674.76	0.20	674.80	0.006671	1.67	13.73	27.72	0.42
Underwood Creek	Main Stem	0.577	PF5	70.00	673.88	675.25	0.38	675.35	0.006596	2.53	27.69	29.67	0.46
Underwood Creek	Main Stem	0.577	PF6	136.00	673.88	675.73	0.54	675.89	0.006584	3.21	42.42	31.60	0.49
Underwood Creek	Main Stem	0.577	PF7	270.00	673.88	676.47	0.75	676.72	0.006441	4.03	67.00	34.58	0.51
Underwood Creek	Main Stem	0.568	PF1	3.00	673.55	674.07	0.06	674.08	0.006785	0.76	3.93	26.27	0.35
Underwood Creek	Main Stem	0.568	PF2	5.00	673.55	674.12	0.08	674.14	0.006464	0.92	5.44	26.50	0.36
Underwood Creek	Main Stem	0.568	PF3	10.00	673.55	674.23	0.13	674.25	0.006699	1.22	8.21	26.91	0.39
Underwood Creek	Main Stem	0.568	PF4	23.00	673.55	674.43	0.20	674.48	0.006538	1.66	13.82	27.73	0.42
Underwood Creek	Main Stem	0.568	PF5	70.00	673.55	674.92	0.38	675.02	0.006616	2.53	27.66	29.65	0.46
Underwood Creek	Main Stem	0.568	PF6	136.00	673.55	675.40	0.54	675.56	0.006552	3.20	42.47	31.58	0.49
Underwood Creek	Main Stem	0.568	PF7	270.00	673.55	676.15	0.74	676.40	0.006310	4.00	67.44	34.60	0.51
Underwood Creek	Main Stem	0.558	PF1	3.00	673.22	673.74	0.06	673.75	0.006348	0.75	4.01	26.28	0.34
Underwood Creek	Main Stem	0.558	PF2	5.00	673.22	673.79	0.08	673.81	0.006631	0.93	5.40	26.49	0.36
Underwood Creek	Main Stem	0.558	PF3	10.00	673.22	673.90	0.12	673.93	0.006312	1.20	8.36	26.93	0.38
Underwood Creek	Main Stem	0.558	PF4	23.00	673.22	674.11	0.20	674.15	0.006353	1.65	13.94	27.75	0.41
Underwood Creek	Main Stem	0.558	PF5	70.00	673.22	674.59	0.37	674.69	0.006445	2.51	27.89	29.68	0.46
Underwood Creek	Main Stem	0.558	PF6	136.00	673.22	675.08	0.53	675.24	0.006413	3.18	42.77	31.62	0.48
Underwood Creek	Main Stem	0.558	PF7	270.00	673.22	675.85	0.72	676.09	0.006067	3.95	68.32	34.70	0.50
Underwood Creek	Main Stem	0.549	PF1	3.00	672.90	673.42	0.06	673.43	0.006434	0.75	3.99	26.28	0.34
Underwood Creek	Main Stem	0.549	PF2	5.00	672.90	673.47	0.08	673.49	0.006440	0.92	5.45	26.50	0.36
Underwood Creek	Main Stem	0.549	PF3	10.00	672.90	673.58	0.13	673.60	0.006687	1.22	8.22	26.91	0.39
Underwood Creek	Main Stem	0.549	PF4	23.00	672.90	673.78	0.21	673.82	0.006798	1.68	13.65	27.71	0.42
Underwood Creek	Main Stem	0.549	PF5	70.00	672.90	674.27	0.38	674.37	0.006605	2.53	27.68	29.67	0.46
Underwood Creek	Main Stem	0.549	PF6	136.00	672.90	674.76	0.53	674.91	0.006437	3.18	42.73	31.64	0.48
Underwood Creek	Main Stem	0.549	PF7	270.00	672.90	675.56	0.70	675.79	0.005789	3.89	69.38	34.78	0.49
Underwood Creek	Main Stem	0.540	PF1	3.00	672.57	673.09	0.06	673.09	0.007018	0.77	3.89	26.26	0.35
Underwood Creek	Main Stem	0.540	PF2	5.00	672.57	673.14	0.09	673.15	0.007004	0.94	5.31	26.48	0.37
Underwood Creek	Main Stem	0.540	PF3	10.00	672.57	673.25	0.12	673.27	0.006569	1.21	8.26	26.92	0.38
Underwood Creek	Main Stem	0.540	PF4	23.00	672.57	673.46	0.20	673.50	0.006428	1.66	13.89	27.75	0.41
Underwood Creek	Main Stem	0.540	PF5	70.00	672.57	673.94	0.38	674.04	0.006556	2.52	27.74	29.68	0.46
Underwood Creek	Main Stem	0.540	PF6	136.00	672.57	674.45	0.51	674.60	0.006172	3.14	43.32	31.71	0.47
Underwood Creek	Main Stem	0.540	PF7	270.00	672.57	675.29	0.65	675.51	0.005224	3.77	71.66	34.78	0.46
Underwood Creek	Main Stem	0.531	PF1	3.00	672.24	672.76	0.06	672.77	0.006240	0.74	4.03	26.28	0.33
Underwood Creek	Main Stem	0.531	PF2	5.00	672.24	672.82	0.08	672.83	0.006146	0.91	5.52	26.51	0.35
Underwood Creek	Main Stem	0.531	PF3	10.00	672.24	672.92	0.13	672.94	0.006634	1.21	8.24	26.91	0.39
Underwood Creek	Main Stem	0.531	PF4	23.00	672.24	673.12	0.21	673.16	0.006763	1.68	13.68	27.71	0.42
Underwood Creek	Main Stem	0.531	PF5	70.00	672.24	673.62	0.37	673.71	0.006397	2.50	27.95	29.69	0.45
Underwood Creek	Main Stem	0.531	PF6	136.00	672.24	674.16	0.48	674.30	0.005591	3.04	44.72	31.87	0.45
Underwood Creek	Main Stem	0.531	PF7	270.00	672.24	675.07	0.58	675.27	0.004484	3.59	75.18	34.78	0.43
Underwood Creek	Main Stem	0.521	PF1	3.00	671.91	672.42	0.07	672.43	0.007570	0.79	3.80	26.25	0.37
Underwood Creek	Main Stem	0.521	PF2	5.00	671.91	672.47	0.09	672.49	0.007858	0.98	5.13	26.45	0.39
Underwood Creek	Main Stem	0.521	PF3	10.00	671.91	672.59	0.12	672.61	0.006587	1.21	8.26	26.92	0.39
Underwood Creek	Main Stem	0.521	PF4	23.00	671.91	672.80	0.20	672.84	0.006459	1.66	13.87	27.74	0.41
Underwood Creek	Main Stem	0.521	PF5	70.00	671.91	673.32	0.34	673.41	0.005753	2.42	28.91	29.82	0.43
Underwood Creek	Main Stem	0.521	PF6	136.00	671.91	673.92	0.42	674.04	0.004638	2.86	47.52	32.22	0.42
Underwood Creek	Main Stem	0.521	PF7	270.00	671.91	674.88	0.50	675.06	0.003648	3.36	80.24	34.78	0.39
Underwood Creek	Main Stem	0.512	PF1	3.00	671.59	672.12	0.05	672.13	0.005085	0.70	4.29	26.32	0.31
Underwood Creek	Main Stem	0.512	PF2	5.00	671.59	672.19	0.06	672.20	0.004424	0.82	6.11	26.60	0.30
Underwood Creek	Main Stem	0.512	PF3	10.00	671.59	672.27	0.12	672.30	0.006312	1.20	8.36	26.94	0.38
Underwood Creek	Main Stem	0.512	PF4	23.00	671.59	672.47	0.20	672.51	0.006706	1.68	13.71	27.72	0.42
Underwood Creek	Main Stem	0.512	PF5	70.00	671.59	673.07	0.29	673.15	0.004574	2.25	31.11	30.13	0.39
Underwood Creek	Main Stem	0.512	PF6	136.00	671.59	673.73	0.34	673.84	0.003559	2.62	51.83	32.77	0.37
Underwood Creek	Main Stem	0.512	PF7	270.00	671.59	674.74	0.42	674.89	0.002892	3.13	86.37	34.78	0.35
Underwood Creek	Main Stem	0.503	PF1	3.00	671.26	671.76	0.09	671.77	0.010776	0.88	3.42	26.19	0.43
Underwood Creek	Main Stem	0.503	PF2	5.00	671.26	671.78	0.17	671.80	0.017702	1.25	4.01	26.28	0.56
Underwood Creek	Main Stem	0.503	PF3	10.00	671.26	671.92	0.14	671.95	0.007850	1.28	7.82	26.85	0.42
Underwood Creek	Main Stem	0.503	PF4	23.00	671.26	672.21	0.15	672.24	0.004428	1.47	15.60	27.98	0.35
Underwood Creek	Main Stem	0.503	PF5	70.00	671.26	672.91	0.21	672.96	0.002860	1.94	36.15	30.78	0.31
Underwood Creek	Main Stem	0.503	PF6	136.00	671.26	673.60	0.26	673.68	0.002474	2.33	58.39	33.54	0.31

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.503	PF7	270.00	671.26	674.63	0.35	674.76	0.002215	2.87	93.99	34.78	0.31
Underwood Creek	Main Stem	0.493	PF1	3.00	670.93	671.48	0.04	671.49	0.003477	0.62	4.81	26.40	0.26
Underwood Creek	Main Stem	0.493	PF2	5.00	670.93	671.63	0.03	671.64	0.001286	0.56	8.91	27.01	0.17
Underwood Creek	Main Stem	0.493	PF3	10.00	670.93	671.80	0.04	671.80	0.001389	0.75	13.33	27.66	0.19
Underwood Creek	Main Stem	0.493	PF4	23.00	670.93	672.10	0.07	672.12	0.001494	1.05	21.90	28.87	0.21
Underwood Creek	Main Stem	0.493	PF5	70.00	670.93	672.81	0.13	672.85	0.001603	1.61	43.58	31.72	0.24
Underwood Creek	Main Stem	0.493	PF6	136.00	670.93	673.51	0.19	673.58	0.001657	2.04	66.67	34.51	0.26
Underwood Creek	Main Stem	0.493	PF7	270.00	670.93	674.55	0.28	674.65	0.001681	2.63	102.64	34.78	0.27
Underwood Creek	Main Stem	0.492	PF1	3.00	670.89	671.46	0.03	671.47	0.002459	0.56	5.35	26.48	0.22
Underwood Creek	Main Stem	0.492	PF2	5.00	670.89	671.63	0.02	671.63	0.000945	0.51	9.79	27.15	0.15
Underwood Creek	Main Stem	0.492	PF3	10.00	670.89	671.79	0.04	671.79	0.001131	0.70	14.21	27.79	0.17
Underwood Creek	Main Stem	0.492	PF4	23.00	670.89	672.09	0.06	672.11	0.001318	1.01	22.79	29.00	0.20
Underwood Creek	Main Stem	0.492	PF5	70.00	670.89	672.80	0.13	672.84	0.001500	1.57	44.54	31.87	0.23
Underwood Creek	Main Stem	0.492	PF6	136.00	670.89	673.50	0.19	673.56	0.001582	2.01	67.73	34.66	0.25
Underwood Creek	Main Stem	0.492	PF7	270.00	670.89	674.54	0.28	674.64	0.001629	2.60	103.69	34.78	0.27
Underwood Creek	Main Stem	0.491	PF1	3.00	670.87	671.44	0.08	671.46	0.002966	1.01	2.98	6.93	0.27
Underwood Creek	Main Stem	0.491	PF2	5.00	670.87	671.62	0.05	671.63	0.003059	0.80	6.28	21.58	0.26
Underwood Creek	Main Stem	0.491	PF3	10.00	670.87	671.77	0.08	671.79	0.002978	1.03	9.72	22.21	0.27
Underwood Creek	Main Stem	0.491	PF4	23.00	670.87	672.07	0.13	672.10	0.002937	1.40	16.46	23.40	0.29
Underwood Creek	Main Stem	0.491	PF5	70.00	670.87	672.77	0.23	672.83	0.002914	2.07	33.81	26.20	0.32
Underwood Creek	Main Stem	0.491	PF6	136.00	670.87	673.45	0.32	673.55	0.002905	2.58	52.62	28.93	0.34
Underwood Creek	Main Stem	0.491	PF7	270.00	670.87	674.47	0.44	674.63	0.002885	3.21	84.19	33.02	0.35
Underwood Creek	Main Stem	0.484	PF1	3.00	670.75	671.33	0.08	671.34	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.484	PF2	5.00	670.75	671.50	0.05	671.51	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.484	PF3	10.00	670.75	671.66	0.08	671.67	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.484	PF4	23.00	670.75	671.95	0.12	671.98	0.002871	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.484	PF5	70.00	670.75	672.65	0.23	672.72	0.002883	2.06	33.92	26.20	0.32
Underwood Creek	Main Stem	0.484	PF6	136.00	670.75	673.33	0.32	673.44	0.002885	2.58	52.72	28.93	0.34
Underwood Creek	Main Stem	0.484	PF7	270.00	670.75	674.35	0.44	674.51	0.002872	3.20	84.29	33.00	0.35
Underwood Creek	Main Stem	0.474	PF1	3.00	670.61	671.18	0.08	671.20	0.002994	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.474	PF2	5.00	670.61	671.36	0.05	671.37	0.002955	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.474	PF3	10.00	670.61	671.51	0.08	671.53	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.474	PF4	23.00	670.61	671.81	0.13	671.84	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.474	PF5	70.00	670.61	672.51	0.23	672.57	0.002922	2.07	33.78	26.19	0.32
Underwood Creek	Main Stem	0.474	PF6	136.00	670.61	673.19	0.32	673.29	0.002909	2.59	52.59	28.93	0.34
Underwood Creek	Main Stem	0.474	PF7	270.00	670.61	674.21	0.44	674.37	0.002883	3.21	84.21	33.02	0.35
Underwood Creek	Main Stem	0.465	PF1	3.00	670.46	671.04	0.08	671.05	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.465	PF2	5.00	670.46	671.21	0.05	671.22	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.465	PF3	10.00	670.46	671.37	0.08	671.38	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.465	PF4	23.00	670.46	671.66	0.12	671.69	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.465	PF5	70.00	670.46	672.36	0.23	672.43	0.002884	2.06	33.92	26.20	0.32
Underwood Creek	Main Stem	0.465	PF6	136.00	670.46	673.04	0.32	673.15	0.002884	2.58	52.73	28.93	0.34
Underwood Creek	Main Stem	0.465	PF7	270.00	670.46	674.07	0.44	674.23	0.002864	3.20	84.37	33.01	0.35
Underwood Creek	Main Stem	0.456	PF1	3.00	670.32	670.89	0.08	670.91	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.456	PF2	5.00	670.32	671.07	0.05	671.08	0.002953	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.456	PF3	10.00	670.32	671.22	0.08	671.24	0.003010	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.456	PF4	23.00	670.32	671.52	0.13	671.55	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.456	PF5	70.00	670.32	672.22	0.23	672.28	0.002922	2.07	33.78	26.19	0.32
Underwood Creek	Main Stem	0.456	PF6	136.00	670.32	672.90	0.32	673.00	0.002907	2.59	52.60	28.93	0.34
Underwood Creek	Main Stem	0.456	PF7	270.00	670.32	673.92	0.44	674.08	0.002873	3.20	84.31	33.03	0.35
Underwood Creek	Main Stem	0.446	PF1	3.00	670.17	670.75	0.08	670.76	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.446	PF2	5.00	670.17	670.92	0.05	670.93	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.446	PF3	10.00	670.17	671.08	0.08	671.09	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.446	PF4	23.00	670.17	671.37	0.12	671.40	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.446	PF5	70.00	670.17	672.07	0.23	672.14	0.002884	2.06	33.92	26.20	0.32
Underwood Creek	Main Stem	0.446	PF6	136.00	670.17	672.76	0.32	672.86	0.002881	2.58	52.75	28.93	0.34
Underwood Creek	Main Stem	0.446	PF7	270.00	670.17	673.78	0.43	673.94	0.002852	3.20	84.49	33.02	0.35
Underwood Creek	Main Stem	0.437	PF1	3.00	670.03	670.60	0.08	670.62	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.437	PF2	5.00	670.03	670.78	0.05	670.79	0.002953	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.437	PF3	10.00	670.03	670.93	0.08	670.95	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.437	PF4	23.00	670.03	671.23	0.13	671.26	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.437	PF5	70.00	670.03	671.93	0.23	671.99	0.002922	2.07	33.78	26.20	0.32
Underwood Creek	Main Stem	0.437	PF6	136.00	670.03	672.61	0.32	672.71	0.002904	2.58	52.62	28.93	0.34
Underwood Creek	Main Stem	0.437	PF7	270.00	670.03	673.64	0.43	673.80	0.002859	3.20	84.46	33.05	0.35
Underwood Creek	Main Stem	0.427	PF1	3.00	669.88	670.46	0.08	670.47	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.427	PF2	5.00	669.88	670.63	0.05	670.64	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.427	PF3	10.00	669.88	670.79	0.08	670.80	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.427	PF4	23.00	669.88	671.08	0.12	671.11	0.002871	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.427	PF5	70.00	669.88	671.78	0.23	671.85	0.002883	2.06	33.92	26.20	0.32
Underwood Creek	Main Stem	0.427	PF6	136.00	669.88	672.47	0.32	672.57	0.002876	2.58	52.78	28.93	0.34
Underwood Creek	Main Stem	0.427	PF7	270.00	669.88	673.50	0.43	673.65	0.002836	3.19	84.66	33.04	0.35
Underwood Creek	Main Stem	0.418	PF1	3.00	669.74	670.31	0.08	670.33	0.002994	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.418	PF2	5.00	669.74	670.49	0.05	670.50	0.002955	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.418	PF3	10.00	669.74	670.64	0.08	670.66	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.418	PF4	23.00	669.74	670.94	0.13	670.97	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.418	PF5	70.00	669.74	671.64	0.23	671.70	0.002921	2.07	33.78	26.20	0.32
Underwood Creek	Main Stem	0.418	PF6	136.00	669.74	672.32	0.32	672.43	0.002898	2.58	52.66	28.94	0.34

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.418	PF7	270.00	669.74	673.35	0.43	673.51	0.002839	3.19	84.66	33.07	0.35
Underwood Creek	Main Stem	0.408	PF1	3.00	669.59	670.17	0.08	670.18	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.408	PF2	5.00	669.59	670.34	0.05	670.35	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.408	PF3	10.00	669.59	670.50	0.08	670.51	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.408	PF4	23.00	669.59	670.79	0.12	670.82	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.408	PF5	70.00	669.59	671.49	0.23	671.56	0.002882	2.06	33.92	26.20	0.32
Underwood Creek	Main Stem	0.408	PF6	136.00	669.59	672.18	0.31	672.28	0.002869	2.57	52.82	28.94	0.34
Underwood Creek	Main Stem	0.408	PF7	270.00	669.59	673.21	0.43	673.37	0.002812	3.18	84.91	33.07	0.35
Underwood Creek	Main Stem	0.399	PF1	3.00	669.45	670.02	0.08	670.04	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.399	PF2	5.00	669.45	670.20	0.05	670.21	0.002953	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.399	PF3	10.00	669.45	670.35	0.08	670.37	0.003010	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.399	PF4	23.00	669.45	670.65	0.13	670.68	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.399	PF5	70.00	669.45	671.35	0.23	671.41	0.002920	2.07	33.79	26.20	0.32
Underwood Creek	Main Stem	0.399	PF6	136.00	669.45	672.03	0.32	672.14	0.002887	2.58	52.73	28.95	0.34
Underwood Creek	Main Stem	0.399	PF7	270.00	669.45	673.07	0.43	673.23	0.002811	3.18	84.95	33.11	0.35
Underwood Creek	Main Stem	0.389	PF1	3.00	669.30	669.88	0.08	669.89	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.389	PF2	5.00	669.30	670.05	0.05	670.06	0.002797	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.389	PF3	10.00	669.30	670.21	0.08	670.22	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.389	PF4	23.00	669.30	670.50	0.12	670.53	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.389	PF5	70.00	669.30	671.20	0.23	671.27	0.002881	2.06	33.93	26.20	0.32
Underwood Creek	Main Stem	0.389	PF6	136.00	669.30	671.89	0.31	671.99	0.002855	2.57	52.91	28.95	0.34
Underwood Creek	Main Stem	0.389	PF7	270.00	669.30	672.93	0.43	673.09	0.002779	3.17	85.26	33.11	0.35
Underwood Creek	Main Stem	0.380	PF1	3.00	669.16	669.73	0.08	669.75	0.002994	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.380	PF2	5.00	669.16	669.91	0.05	669.92	0.002955	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.380	PF3	10.00	669.16	670.06	0.08	670.08	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.380	PF4	23.00	669.16	670.36	0.13	670.39	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.380	PF5	70.00	669.16	671.06	0.23	671.12	0.002918	2.07	33.80	26.20	0.32
Underwood Creek	Main Stem	0.380	PF6	136.00	669.16	671.75	0.31	671.85	0.002869	2.57	52.83	28.96	0.34
Underwood Creek	Main Stem	0.380	PF7	270.00	669.16	672.80	0.42	672.95	0.002772	3.16	85.37	33.16	0.35
Underwood Creek	Main Stem	0.370	PF1	3.00	669.01	669.59	0.08	669.60	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.370	PF2	5.00	669.01	669.76	0.05	669.77	0.002795	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.370	PF3	10.00	669.01	669.92	0.08	669.93	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.370	PF4	23.00	669.01	670.21	0.12	670.24	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.370	PF5	70.00	669.01	670.91	0.23	670.98	0.002877	2.06	33.95	26.21	0.32
Underwood Creek	Main Stem	0.370	PF6	136.00	669.01	671.61	0.31	671.71	0.002833	2.56	53.05	28.97	0.33
Underwood Creek	Main Stem	0.370	PF7	270.00	669.01	672.66	0.42	672.81	0.002733	3.15	85.75	33.17	0.35
Underwood Creek	Main Stem	0.361	PF1	3.00	668.87	669.44	0.08	669.46	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.361	PF2	5.00	668.87	669.62	0.05	669.63	0.002953	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.361	PF3	10.00	668.87	669.77	0.08	669.79	0.003010	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.361	PF4	23.00	668.87	670.07	0.13	670.10	0.002955	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.361	PF5	70.00	668.87	670.77	0.23	670.83	0.002911	2.07	33.82	26.20	0.32
Underwood Creek	Main Stem	0.361	PF6	136.00	668.87	671.46	0.31	671.57	0.002840	2.57	53.02	28.99	0.33
Underwood Creek	Main Stem	0.361	PF7	270.00	668.87	672.52	0.42	672.68	0.002718	3.14	85.95	33.23	0.34
Underwood Creek	Main Stem	0.351	PF1	3.00	668.72	669.30	0.08	669.31	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.351	PF2	5.00	668.72	669.47	0.05	669.48	0.002795	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.351	PF3	10.00	668.72	669.63	0.08	669.64	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.351	PF4	23.00	668.72	669.92	0.12	669.95	0.002872	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.351	PF5	70.00	668.72	670.62	0.23	670.69	0.002868	2.06	33.98	26.21	0.32
Underwood Creek	Main Stem	0.351	PF6	136.00	668.72	671.32	0.31	671.43	0.002796	2.55	53.28	29.00	0.33
Underwood Creek	Main Stem	0.351	PF7	270.00	668.72	672.39	0.41	672.54	0.002671	3.12	86.44	33.26	0.34
Underwood Creek	Main Stem	0.342	PF1	3.00	668.58	669.15	0.08	669.17	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.342	PF2	5.00	668.58	669.33	0.05	669.34	0.002953	0.79	6.35	21.60	0.26
Underwood Creek	Main Stem	0.342	PF3	10.00	668.58	669.48	0.08	669.50	0.003010	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.342	PF4	23.00	668.58	669.78	0.13	669.81	0.002954	1.40	16.43	23.39	0.29
Underwood Creek	Main Stem	0.342	PF5	70.00	668.58	670.48	0.23	670.55	0.002899	2.07	33.87	26.21	0.32
Underwood Creek	Main Stem	0.342	PF6	136.00	668.58	671.18	0.31	671.29	0.002793	2.55	53.32	29.03	0.33
Underwood Creek	Main Stem	0.342	PF7	270.00	668.58	672.26	0.41	672.41	0.002645	3.11	86.76	33.33	0.34
Underwood Creek	Main Stem	0.332	PF1	3.00	668.43	669.01	0.08	669.02	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.332	PF2	5.00	668.43	669.18	0.05	669.19	0.002795	0.77	6.46	21.61	0.25
Underwood Creek	Main Stem	0.332	PF3	10.00	668.43	669.34	0.08	669.35	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.332	PF4	23.00	668.43	669.63	0.12	669.66	0.002871	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.332	PF5	70.00	668.43	670.34	0.22	670.40	0.002849	2.06	34.05	26.22	0.32
Underwood Creek	Main Stem	0.332	PF6	136.00	668.43	671.05	0.30	671.15	0.002737	2.53	53.66	29.06	0.33
Underwood Creek	Main Stem	0.332	PF7	270.00	668.43	672.13	0.40	672.28	0.002588	3.09	87.39	33.37	0.34
Underwood Creek	Main Stem	0.323	PF1	3.00	668.29	668.86	0.08	668.88	0.002994	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.323	PF2	5.00	668.29	669.03	0.06	669.04	0.003124	0.80	6.24	21.58	0.26
Underwood Creek	Main Stem	0.323	PF3	10.00	668.29	669.19	0.08	669.21	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.323	PF4	23.00	668.29	669.49	0.13	669.52	0.002954	1.40	16.44	23.39	0.29
Underwood Creek	Main Stem	0.323	PF5	70.00	668.29	670.19	0.23	670.26	0.002871	2.06	33.97	26.22	0.32
Underwood Creek	Main Stem	0.323	PF6	136.00	668.29	670.91	0.30	671.01	0.002718	2.53	53.81	29.10	0.33
Underwood Creek	Main Stem	0.323	PF7	270.00	668.29	672.00	0.40	672.15	0.002544	3.07	87.88	33.38	0.33
Underwood Creek	Main Stem	0.313	PF1	3.00	668.14	668.72	0.08	668.73	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.313	PF2	5.00	668.14	668.89	0.05	668.90	0.002803	0.77	6.45	21.61	0.25
Underwood Creek	Main Stem	0.313	PF3	10.00	668.14	669.05	0.08	669.06	0.002849	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.313	PF4	23.00	668.14	669.34	0.12	669.37	0.002870	1.39	16.58	23.41	0.29
Underwood Creek	Main Stem	0.313	PF5	70.00	668.14	670.05	0.22	670.12	0.002809	2.05	34.21	26.25	0.32
Underwood Creek	Main Stem	0.313	PF6	136.00	668.14	670.78	0.30	670.88	0.002645	2.51	54.29	29.14	0.32

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.313	PF7	270.00	668.14	671.88	0.39	672.02	0.002470	3.04	88.70	33.38	0.33
Underwood Creek	Main Stem	0.304	PF1	3.00	668.00	668.57	0.08	668.59	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.304	PF2	5.00	668.00	668.74	0.06	668.75	0.003121	0.80	6.25	21.58	0.26
Underwood Creek	Main Stem	0.304	PF3	10.00	668.00	668.90	0.08	668.92	0.003010	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.304	PF4	23.00	668.00	669.20	0.13	669.23	0.002952	1.40	16.44	23.39	0.29
Underwood Creek	Main Stem	0.304	PF5	70.00	668.00	669.91	0.22	669.98	0.002812	2.05	34.21	26.26	0.32
Underwood Creek	Main Stem	0.304	PF6	136.00	668.00	670.65	0.29	670.74	0.002602	2.49	54.61	29.21	0.32
Underwood Creek	Main Stem	0.304	PF7	270.00	668.00	671.76	0.38	671.90	0.002409	3.02	89.42	33.38	0.33
Underwood Creek	Main Stem	0.295	PF1	3.00	667.85	668.43	0.08	668.44	0.002857	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.295	PF2	5.00	667.85	668.60	0.05	668.61	0.002814	0.78	6.45	21.61	0.25
Underwood Creek	Main Stem	0.295	PF3	10.00	667.85	668.76	0.08	668.78	0.002848	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.295	PF4	23.00	667.85	669.05	0.12	669.08	0.002864	1.39	16.60	23.41	0.29
Underwood Creek	Main Stem	0.295	PF5	70.00	667.85	669.78	0.22	669.84	0.002732	2.03	34.53	26.29	0.31
Underwood Creek	Main Stem	0.295	PF6	136.00	667.85	670.52	0.28	670.62	0.002506	2.46	55.29	29.28	0.32
Underwood Creek	Main Stem	0.295	PF7	270.00	667.85	671.64	0.37	671.78	0.002320	2.98	90.49	33.38	0.32
Underwood Creek	Main Stem	0.285	PF1	3.00	667.71	668.28	0.08	668.30	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.285	PF2	5.00	667.71	668.45	0.06	668.46	0.003108	0.80	6.25	21.58	0.26
Underwood Creek	Main Stem	0.285	PF3	10.00	667.71	668.61	0.08	668.63	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.285	PF4	23.00	667.71	668.91	0.13	668.94	0.002942	1.40	16.46	23.40	0.29
Underwood Creek	Main Stem	0.285	PF5	70.00	667.71	669.64	0.22	669.70	0.002699	2.02	34.67	26.33	0.31
Underwood Creek	Main Stem	0.285	PF6	136.00	667.71	670.40	0.28	670.49	0.002435	2.44	55.84	29.38	0.31
Underwood Creek	Main Stem	0.285	PF7	270.00	667.71	671.53	0.36	671.66	0.002243	2.95	91.49	33.38	0.31
Underwood Creek	Main Stem	0.276	PF1	3.00	667.56	668.14	0.08	668.15	0.002860	0.99	3.02	6.96	0.27
Underwood Creek	Main Stem	0.276	PF2	5.00	667.56	668.31	0.05	668.32	0.002833	0.78	6.43	21.61	0.25
Underwood Creek	Main Stem	0.276	PF3	10.00	667.56	668.47	0.08	668.49	0.002843	1.01	9.86	22.23	0.27
Underwood Creek	Main Stem	0.276	PF4	23.00	667.56	668.77	0.12	668.80	0.002837	1.38	16.65	23.42	0.29
Underwood Creek	Main Stem	0.276	PF5	70.00	667.56	669.51	0.21	669.57	0.002580	1.99	35.18	26.39	0.30
Underwood Creek	Main Stem	0.276	PF6	136.00	667.56	670.28	0.27	670.37	0.002313	2.39	56.81	29.48	0.30
Underwood Creek	Main Stem	0.276	PF7	270.00	667.56	671.42	0.35	671.55	0.002139	2.91	92.87	33.38	0.31
Underwood Creek	Main Stem	0.266	PF1	3.00	667.42	667.99	0.08	668.01	0.002995	1.01	2.97	6.92	0.27
Underwood Creek	Main Stem	0.266	PF2	5.00	667.42	668.16	0.06	668.17	0.003088	0.80	6.27	21.58	0.26
Underwood Creek	Main Stem	0.266	PF3	10.00	667.42	668.32	0.08	668.34	0.003011	1.03	9.69	22.21	0.28
Underwood Creek	Main Stem	0.266	PF4	23.00	667.42	668.62	0.12	668.65	0.002890	1.39	16.55	23.41	0.29
Underwood Creek	Main Stem	0.266	PF5	70.00	667.42	669.38	0.20	669.44	0.002496	1.97	35.57	26.47	0.30
Underwood Creek	Main Stem	0.266	PF6	136.00	667.42	670.17	0.26	670.26	0.002211	2.36	57.69	29.63	0.30
Underwood Creek	Main Stem	0.266	PF7	270.00	667.42	671.32	0.34	671.45	0.002047	2.87	94.20	33.38	0.30
Underwood Creek	Main Stem	0.257	PF1	3.00	667.27	667.85	0.08	667.86	0.002876	1.00	3.01	6.96	0.27
Underwood Creek	Main Stem	0.257	PF2	5.00	667.27	668.02	0.05	668.03	0.002863	0.78	6.41	21.61	0.25
Underwood Creek	Main Stem	0.257	PF3	10.00	667.27	668.18	0.08	668.20	0.002825	1.01	9.88	22.24	0.27
Underwood Creek	Main Stem	0.257	PF4	23.00	667.27	668.48	0.12	668.51	0.002772	1.37	16.77	23.44	0.29
Underwood Creek	Main Stem	0.257	PF5	70.00	667.27	669.27	0.19	669.32	0.002324	1.92	36.41	26.58	0.29
Underwood Creek	Main Stem	0.257	PF6	136.00	667.27	670.07	0.25	670.15	0.002065	2.30	59.03	29.78	0.29
Underwood Creek	Main Stem	0.257	PF7	270.00	667.27	671.22	0.33	671.35	0.001933	2.81	95.94	33.38	0.29
Underwood Creek	Main Stem	0.247	PF1	3.00	667.13	667.70	0.08	667.71	0.003023	1.01	2.96	6.91	0.27
Underwood Creek	Main Stem	0.247	PF2	5.00	667.13	667.88	0.05	667.89	0.003059	0.80	6.28	21.58	0.26
Underwood Creek	Main Stem	0.247	PF3	10.00	667.13	668.03	0.08	668.05	0.002941	1.02	9.76	22.22	0.27
Underwood Creek	Main Stem	0.247	PF4	23.00	667.13	668.34	0.12	668.37	0.002730	1.36	16.85	23.46	0.28
Underwood Creek	Main Stem	0.247	PF5	70.00	667.13	669.16	0.18	669.21	0.002176	1.88	37.22	26.72	0.28
Underwood Creek	Main Stem	0.247	PF6	136.00	667.13	669.97	0.23	670.05	0.001938	2.25	60.33	29.98	0.28
Underwood Creek	Main Stem	0.247	PF7	270.00	667.13	671.13	0.31	671.25	0.001831	2.77	97.63	33.38	0.28
Underwood Creek	Main Stem	0.238	PF1	3.00	666.98	667.55	0.08	667.57	0.002923	1.00	3.00	6.94	0.27
Underwood Creek	Main Stem	0.238	PF2	5.00	666.98	667.73	0.05	667.74	0.002911	0.78	6.38	21.60	0.25
Underwood Creek	Main Stem	0.238	PF3	10.00	666.98	667.89	0.08	667.91	0.002800	1.01	9.91	22.24	0.27
Underwood Creek	Main Stem	0.238	PF4	23.00	666.98	668.22	0.11	668.24	0.002484	1.32	17.36	23.54	0.27
Underwood Creek	Main Stem	0.238	PF5	70.00	666.98	669.06	0.17	669.11	0.001958	1.82	38.53	26.90	0.27
Underwood Creek	Main Stem	0.238	PF6	136.00	666.98	669.88	0.22	669.96	0.001777	2.19	62.11	30.19	0.27
Underwood Creek	Main Stem	0.238	PF7	270.00	666.98	671.05	0.30	671.16	0.001713	2.71	99.73	33.38	0.28
Underwood Creek	Main Stem	0.228	PF1	3.00	666.84	667.40	0.08	667.42	0.003209	1.04	2.90	6.86	0.28
Underwood Creek	Main Stem	0.228	PF2	5.00	666.84	667.59	0.05	667.60	0.003004	0.79	6.32	21.59	0.26
Underwood Creek	Main Stem	0.228	PF3	10.00	666.84	667.75	0.08	667.77	0.002772	1.01	9.94	22.25	0.27
Underwood Creek	Main Stem	0.228	PF4	23.00	666.84	668.10	0.10	668.13	0.002243	1.28	17.93	23.65	0.26
Underwood Creek	Main Stem	0.228	PF5	70.00	666.84	668.97	0.16	669.01	0.001765	1.76	39.88	27.11	0.26
Underwood Creek	Main Stem	0.228	PF6	136.00	666.84	669.80	0.21	669.87	0.001636	2.13	63.89	30.45	0.26
Underwood Creek	Main Stem	0.228	PF7	270.00	666.84	670.97	0.28	671.08	0.001607	2.65	101.81	33.38	0.27
Underwood Creek	Main Stem	0.219	PF1	3.00	666.69	667.22	0.09	667.24	0.003817	1.10	2.73	6.71	0.30
Underwood Creek	Main Stem	0.219	PF2	5.00	666.69	667.44	0.05	667.45	0.002995	0.79	6.32	21.59	0.26
Underwood Creek	Main Stem	0.219	PF3	10.00	666.69	667.63	0.07	667.64	0.002329	0.95	10.50	22.35	0.25
Underwood Creek	Main Stem	0.219	PF4	23.00	666.69	668.00	0.09	668.02	0.001825	1.20	19.15	23.84	0.24
Underwood Creek	Main Stem	0.219	PF5	70.00	666.69	668.89	0.14	668.93	0.001531	1.67	41.80	27.38	0.24
Underwood Creek	Main Stem	0.219	PF6	136.00	666.69	669.73	0.19	669.79	0.001475	2.06	66.17	30.73	0.25
Underwood Creek	Main Stem	0.219	PF7	270.00	666.69	670.89	0.27	671.00	0.001491	2.59	104.29	33.38	0.26
Underwood Creek	Main Stem	0.209	PF1	3.00	666.55	667.13	0.04	667.14	0.001348	0.72	4.18	8.96	0.19
Underwood Creek	Main Stem	0.209	PF2	5.00	666.55	667.34	0.03	667.34	0.001529	0.63	7.89	22.72	0.19
Underwood Creek	Main Stem	0.209	PF3	10.00	666.55	667.54	0.04	667.55	0.001328	0.79	12.73	23.81	0.19
Underwood Creek	Main Stem	0.209	PF4	23.00	666.55	667.93	0.06	667.95	0.001202	1.03	22.39	25.86	0.19
Underwood Creek	Main Stem	0.209	PF5	70.00	666.55	668.83	0.11	668.86	0.001135	1.47	47.64	30.58	0.21
Underwood Creek	Main Stem	0.209	PF6	136.00	666.55	669.67	0.15	669.72	0.001123	1.81	75.33	35.02	0.22

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.209	PF7	270.00	666.55	670.85	0.21	670.93	0.001122	2.26	119.29	38.28	0.23
Underwood Creek	Main Stem	0.207	PF1	3.00	666.49	667.12	0.03	667.12	0.001002	0.65	4.63	9.26	0.16
Underwood Creek	Main Stem	0.207	PF2	5.00	666.49	667.33	0.02	667.33	0.001001	0.56	9.01	22.98	0.16
Underwood Creek	Main Stem	0.207	PF3	10.00	666.49	667.53	0.04	667.54	0.001002	0.72	13.92	24.08	0.17
Underwood Creek	Main Stem	0.207	PF4	23.00	666.49	667.92	0.06	667.94	0.001010	0.97	23.69	26.13	0.18
Underwood Creek	Main Stem	0.207	PF5	70.00	666.49	668.82	0.10	668.85	0.001032	1.42	49.20	30.84	0.20
Underwood Creek	Main Stem	0.207	PF6	136.00	666.49	669.66	0.14	669.71	0.001050	1.76	77.11	35.29	0.21
Underwood Creek	Main Stem	0.207	PF7	270.00	666.49	670.84	0.20	670.91	0.001066	2.23	121.23	38.28	0.22
Underwood Creek	Main Stem	0.200	PF1	3.00	666.45	667.08	0.03	667.08	0.001002	0.65	4.63	9.26	0.16
Underwood Creek	Main Stem	0.200	PF2	5.00	666.45	667.29	0.02	667.29	0.001000	0.55	9.01	22.98	0.16
Underwood Creek	Main Stem	0.200	PF3	10.00	666.45	667.49	0.04	667.50	0.001002	0.72	13.92	24.08	0.17
Underwood Creek	Main Stem	0.200	PF4	23.00	666.45	667.88	0.06	667.90	0.001011	0.97	23.68	26.13	0.18
Underwood Creek	Main Stem	0.200	PF5	70.00	666.45	668.78	0.10	668.81	0.001035	1.42	49.16	30.84	0.20
Underwood Creek	Main Stem	0.200	PF6	136.00	666.45	669.62	0.14	669.67	0.001053	1.77	77.04	35.28	0.21
Underwood Creek	Main Stem	0.200	PF7	270.00	666.45	670.79	0.20	670.87	0.001069	2.23	121.12	38.28	0.22
Underwood Creek	Main Stem	0.190	PF1	3.00	666.40	667.03	0.03	667.03	0.001003	0.65	4.62	9.26	0.16
Underwood Creek	Main Stem	0.190	PF2	5.00	666.40	667.24	0.02	667.24	0.001001	0.56	9.01	22.98	0.16
Underwood Creek	Main Stem	0.190	PF3	10.00	666.40	667.44	0.04	667.45	0.001003	0.72	13.91	24.07	0.17
Underwood Creek	Main Stem	0.190	PF4	23.00	666.40	667.83	0.06	667.85	0.001013	0.97	23.67	26.12	0.18
Underwood Creek	Main Stem	0.190	PF5	70.00	666.40	668.73	0.10	668.76	0.001038	1.43	49.10	30.83	0.20
Underwood Creek	Main Stem	0.190	PF6	136.00	666.40	669.57	0.14	669.62	0.001057	1.77	76.93	35.27	0.21
Underwood Creek	Main Stem	0.190	PF7	270.00	666.40	670.74	0.20	670.82	0.001073	2.23	120.98	38.28	0.22
Underwood Creek	Main Stem	0.181	PF1	3.00	666.35	666.98	0.03	666.98	0.001003	0.65	4.62	9.26	0.16
Underwood Creek	Main Stem	0.181	PF2	5.00	666.35	667.19	0.02	667.19	0.001001	0.56	9.01	22.98	0.16
Underwood Creek	Main Stem	0.181	PF3	10.00	666.35	667.39	0.04	667.40	0.001004	0.72	13.91	24.07	0.17
Underwood Creek	Main Stem	0.181	PF4	23.00	666.35	667.78	0.06	667.80	0.001016	0.97	23.65	26.12	0.18
Underwood Creek	Main Stem	0.181	PF5	70.00	666.35	668.67	0.10	668.71	0.001042	1.43	49.03	30.82	0.20
Underwood Creek	Main Stem	0.181	PF6	136.00	666.35	669.51	0.14	669.56	0.001061	1.77	76.82	35.25	0.21
Underwood Creek	Main Stem	0.181	PF7	270.00	666.35	670.69	0.20	670.76	0.001078	2.23	120.83	38.28	0.22
Underwood Creek	Main Stem	0.171	PF1	3.00	666.30	666.93	0.03	666.93	0.001005	0.65	4.62	9.26	0.16
Underwood Creek	Main Stem	0.171	PF2	5.00	666.30	667.14	0.02	667.14	0.001002	0.56	9.01	22.98	0.16
Underwood Creek	Main Stem	0.171	PF3	10.00	666.30	667.34	0.04	667.35	0.001006	0.72	13.90	24.07	0.17
Underwood Creek	Main Stem	0.171	PF4	23.00	666.30	667.73	0.06	667.75	0.001018	0.97	23.63	26.11	0.18
Underwood Creek	Main Stem	0.171	PF5	70.00	666.30	668.62	0.10	668.65	0.001047	1.43	48.96	30.80	0.20
Underwood Creek	Main Stem	0.171	PF6	136.00	666.30	669.46	0.14	669.51	0.001066	1.77	76.71	35.23	0.21
Underwood Creek	Main Stem	0.171	PF7	270.00	666.30	670.63	0.20	670.71	0.001082	2.24	120.67	38.28	0.22
Underwood Creek	Main Stem	0.162	PF1	3.00	666.25	666.88	0.03	666.88	0.001007	0.65	4.62	9.26	0.16
Underwood Creek	Main Stem	0.162	PF2	5.00	666.25	667.09	0.02	667.09	0.001003	0.56	9.00	22.97	0.16
Underwood Creek	Main Stem	0.162	PF3	10.00	666.25	667.29	0.04	667.30	0.001008	0.72	13.90	24.07	0.17
Underwood Creek	Main Stem	0.162	PF4	23.00	666.25	667.68	0.06	667.69	0.001022	0.97	23.60	26.11	0.18
Underwood Creek	Main Stem	0.162	PF5	70.00	666.25	668.57	0.10	668.60	0.001052	1.43	48.88	30.79	0.20
Underwood Creek	Main Stem	0.162	PF6	136.00	666.25	669.41	0.14	669.46	0.001071	1.78	76.58	35.21	0.21
Underwood Creek	Main Stem	0.162	PF7	270.00	666.25	670.58	0.20	670.66	0.001087	2.24	120.50	38.28	0.22
Underwood Creek	Main Stem	0.152	PF1	3.00	666.20	666.83	0.03	666.83	0.001009	0.65	4.62	9.25	0.16
Underwood Creek	Main Stem	0.152	PF2	5.00	666.20	667.03	0.02	667.04	0.001003	0.56	9.00	22.97	0.16
Underwood Creek	Main Stem	0.152	PF3	10.00	666.20	667.24	0.04	667.25	0.001010	0.72	13.89	24.07	0.17
Underwood Creek	Main Stem	0.152	PF4	23.00	666.20	667.63	0.06	667.64	0.001026	0.98	23.57	26.10	0.18
Underwood Creek	Main Stem	0.152	PF5	70.00	666.20	668.52	0.10	668.55	0.001058	1.43	48.79	30.78	0.20
Underwood Creek	Main Stem	0.152	PF6	136.00	666.20	669.35	0.14	669.40	0.001076	1.78	76.44	35.19	0.21
Underwood Creek	Main Stem	0.152	PF7	270.00	666.20	670.52	0.20	670.60	0.001092	2.24	120.31	38.28	0.22
Underwood Creek	Main Stem	0.143	PF1	3.00	666.15	666.78	0.03	666.78	0.001012	0.65	4.61	9.25	0.16
Underwood Creek	Main Stem	0.143	PF2	5.00	666.15	666.98	0.02	666.99	0.001005	0.56	9.00	22.97	0.16
Underwood Creek	Main Stem	0.143	PF3	10.00	666.15	667.19	0.04	667.20	0.001013	0.72	13.87	24.07	0.17
Underwood Creek	Main Stem	0.143	PF4	23.00	666.15	667.58	0.06	667.59	0.001032	0.98	23.53	26.09	0.18
Underwood Creek	Main Stem	0.143	PF5	70.00	666.15	668.46	0.10	668.49	0.001064	1.44	48.70	30.76	0.20
Underwood Creek	Main Stem	0.143	PF6	136.00	666.15	669.30	0.14	669.35	0.001082	1.78	76.30	35.17	0.21
Underwood Creek	Main Stem	0.143	PF7	270.00	666.15	670.47	0.20	670.55	0.001097	2.25	120.12	38.28	0.22
Underwood Creek	Main Stem	0.134	PF1	3.00	666.10	666.72	0.03	666.73	0.001015	0.65	4.60	9.25	0.16
Underwood Creek	Main Stem	0.134	PF2	5.00	666.10	666.93	0.02	666.94	0.001007	0.56	8.99	22.97	0.16
Underwood Creek	Main Stem	0.134	PF3	10.00	666.10	667.14	0.04	667.15	0.001017	0.72	13.85	24.06	0.17
Underwood Creek	Main Stem	0.134	PF4	23.00	666.10	667.53	0.06	667.54	0.001038	0.98	23.48	26.08	0.18
Underwood Creek	Main Stem	0.134	PF5	70.00	666.10	668.41	0.10	668.44	0.001071	1.44	48.59	30.74	0.20
Underwood Creek	Main Stem	0.134	PF6	136.00	666.10	669.25	0.14	669.29	0.001089	1.79	76.14	35.15	0.21
Underwood Creek	Main Stem	0.134	PF7	270.00	666.10	670.41	0.20	670.49	0.001103	2.25	119.92	38.28	0.22
Underwood Creek	Main Stem	0.124	PF1	3.00	666.05	666.67	0.03	666.68	0.001021	0.65	4.60	9.24	0.16
Underwood Creek	Main Stem	0.124	PF2	5.00	666.05	666.88	0.02	666.89	0.001011	0.56	8.98	22.97	0.16
Underwood Creek	Main Stem	0.124	PF3	10.00	666.05	667.09	0.04	667.10	0.001023	0.72	13.83	24.06	0.17
Underwood Creek	Main Stem	0.124	PF4	23.00	666.05	667.47	0.06	667.49	0.001045	0.98	23.43	26.07	0.18
Underwood Creek	Main Stem	0.124	PF5	70.00	666.05	668.36	0.10	668.39	0.001079	1.44	48.47	30.72	0.20
Underwood Creek	Main Stem	0.124	PF6	136.00	666.05	669.19	0.14	669.24	0.001096	1.79	75.97	35.12	0.21
Underwood Creek	Main Stem	0.124	PF7	270.00	666.05	670.36	0.20	670.44	0.001109	2.26	119.71	38.28	0.22
Underwood Creek	Main Stem	0.115	PF1	3.00	666.00	666.62	0.03	666.63	0.001028	0.65	4.58	9.23	0.16
Underwood Creek	Main Stem	0.115	PF2	5.00	666.00	666.83	0.02	666.84	0.001016	0.56	8.96	22.97	0.16
Underwood Creek	Main Stem	0.115	PF3	10.00	666.00	667.04	0.04	667.05	0.001030	0.72	13.80	24.05	0.17
Underwood Creek	Main Stem	0.115	PF4	23.00	666.00	667.42	0.06	667.44	0.001055	0.98	23.36	26.06	0.18
Underwood Creek	Main Stem	0.115	PF5	70.00	666.00	668.30	0.10	668.33	0.001088	1.45	48.33	30.70	0.20
Underwood Creek	Main Stem	0.115	PF6	136.00	666.00	669.14	0.14	669.19	0.001104	1.79	75.78	35.09	0.22

HEC-RAS Plan: Low Flow Rev Ph2 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Shear Chan	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(lb/sq ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Underwood Creek	Main Stem	0.115	PF7	270.00	666.00	670.30	0.20	670.38	0.001116	2.26	119.48	38.28	0.23
Underwood Creek	Main Stem	0.105	PF1	3.00	665.95	666.57	0.03	666.58	0.001038	0.66	4.57	9.22	0.16
Underwood Creek	Main Stem	0.105	PF2	5.00	665.95	666.78	0.02	666.79	0.001024	0.56	8.94	22.96	0.16
Underwood Creek	Main Stem	0.105	PF3	10.00	665.95	666.99	0.04	667.00	0.001040	0.73	13.76	24.04	0.17
Underwood Creek	Main Stem	0.105	PF4	23.00	665.95	667.37	0.06	667.38	0.001066	0.99	23.28	26.04	0.18
Underwood Creek	Main Stem	0.105	PF5	70.00	665.95	668.25	0.10	668.28	0.001098	1.45	48.18	30.67	0.20
Underwood Creek	Main Stem	0.105	PF6	136.00	665.95	669.08	0.15	669.13	0.001112	1.80	75.58	35.06	0.22
Underwood Creek	Main Stem	0.105	PF7	270.00	665.95	670.25	0.21	670.33	0.001123	2.26	119.23	38.28	0.23
Underwood Creek	Main Stem	0.096	PF1	3.00	665.90	666.52	0.03	666.53	0.001051	0.66	4.55	9.21	0.17
Underwood Creek	Main Stem	0.096	PF2	5.00	665.90	666.73	0.02	666.74	0.001035	0.56	8.91	22.95	0.16
Underwood Creek	Main Stem	0.096	PF3	10.00	665.90	666.93	0.04	666.94	0.001054	0.73	13.70	24.03	0.17
Underwood Creek	Main Stem	0.096	PF4	23.00	665.90	667.31	0.06	667.33	0.001080	0.99	23.18	26.02	0.19
Underwood Creek	Main Stem	0.096	PF5	70.00	665.90	668.19	0.11	668.22	0.001109	1.46	48.02	30.64	0.21
Underwood Creek	Main Stem	0.096	PF6	136.00	665.90	669.02	0.15	669.07	0.001121	1.80	75.37	35.03	0.22
Underwood Creek	Main Stem	0.096	PF7	270.00	665.90	670.19	0.21	670.27	0.001131	2.27	118.98	38.28	0.23
Underwood Creek	Main Stem	0.086	PF1	3.00	665.85	666.47	0.03	666.47	0.001070	0.66	4.52	9.19	0.17
Underwood Creek	Main Stem	0.086	PF2	5.00	665.85	666.68	0.03	666.68	0.001053	0.56	8.87	22.94	0.16
Underwood Creek	Main Stem	0.086	PF3	10.00	665.85	666.88	0.04	666.89	0.001072	0.73	13.62	24.01	0.17
Underwood Creek	Main Stem	0.086	PF4	23.00	665.85	667.26	0.06	667.27	0.001097	1.00	23.07	26.00	0.19
Underwood Creek	Main Stem	0.086	PF5	70.00	665.85	668.13	0.11	668.17	0.001122	1.46	47.83	30.61	0.21
Underwood Creek	Main Stem	0.086	PF6	136.00	665.85	668.97	0.15	669.02	0.001131	1.81	75.14	35.00	0.22
Underwood Creek	Main Stem	0.086	PF7	270.00	665.85	670.13	0.21	670.21	0.001139	2.27	118.70	38.28	0.23
Underwood Creek	Main Stem	0.077	PF1	3.00	665.80	666.41	0.03	666.42	0.001095	0.67	4.49	9.17	0.17
Underwood Creek	Main Stem	0.077	PF2	5.00	665.80	666.63	0.03	666.63	0.001080	0.57	8.80	22.93	0.16
Underwood Creek	Main Stem	0.077	PF3	10.00	665.80	666.83	0.04	666.84	0.001098	0.74	13.52	23.99	0.17
Underwood Creek	Main Stem	0.077	PF4	23.00	665.80	667.20	0.06	667.22	0.001118	1.00	22.92	25.97	0.19
Underwood Creek	Main Stem	0.077	PF5	70.00	665.80	668.08	0.11	668.11	0.001136	1.47	47.63	30.57	0.21
Underwood Creek	Main Stem	0.077	PF6	136.00	665.80	668.91	0.15	668.96	0.001142	1.82	74.88	34.96	0.22
Underwood Creek	Main Stem	0.077	PF7	270.00	665.80	670.07	0.21	670.15	0.001148	2.28	118.41	38.28	0.23
Underwood Creek	Main Stem	0.067	PF1	3.00	665.75	666.36	0.03	666.36	0.001132	0.68	4.43	9.14	0.17
Underwood Creek	Main Stem	0.067	PF2	5.00	665.75	666.57	0.03	666.58	0.001120	0.57	8.70	22.90	0.16
Underwood Creek	Main Stem	0.067	PF3	10.00	665.75	666.77	0.04	666.78	0.001134	0.75	13.39	23.96	0.18
Underwood Creek	Main Stem	0.067	PF4	23.00	665.75	667.15	0.06	667.16	0.001144	1.01	22.75	25.94	0.19
Underwood Creek	Main Stem	0.067	PF5	70.00	665.75	668.02	0.11	668.05	0.001153	1.48	47.39	30.53	0.21
Underwood Creek	Main Stem	0.067	PF6	136.00	665.75	668.85	0.15	668.90	0.001154	1.82	74.61	34.92	0.22
Underwood Creek	Main Stem	0.067	PF7	270.00	665.75	670.02	0.21	670.10	0.001157	2.29	118.10	38.28	0.23
Underwood Creek	Main Stem	0.058	PF1	3.00	665.70	666.30	0.03	666.31	0.001189	0.69	4.36	9.09	0.18
Underwood Creek	Main Stem	0.058	PF2	5.00	665.70	666.51	0.03	666.52	0.001199	0.59	8.51	22.86	0.17
Underwood Creek	Main Stem	0.058	PF3	10.00	665.70	666.71	0.04	666.72	0.001188	0.76	13.19	23.92	0.18
Underwood Creek	Main Stem	0.058	PF4	23.00	665.70	667.09	0.06	667.10	0.001179	1.02	22.53	25.89	0.19
Underwood Creek	Main Stem	0.058	PF5	70.00	665.70	667.96	0.11	668.00	0.001171	1.49	47.13	30.49	0.21
Underwood Creek	Main Stem	0.058	PF6	136.00	665.70	668.79	0.15	668.85	0.001168	1.83	74.32	34.87	0.22
Underwood Creek	Main Stem	0.058	PF7	270.00	665.70	669.96	0.21	670.04	0.001167	2.29	117.77	38.28	0.23
Underwood Creek	Main Stem	0.057	PF1	3.00	665.69	666.29	0.03	666.30	0.001163	0.68	4.39	9.11	0.17
Underwood Creek	Main Stem	0.057	PF2	5.00	665.69	666.51	0.03	666.51	0.001163	0.58	8.60	22.88	0.17
Underwood Creek	Main Stem	0.057	PF3	10.00	665.69	666.71	0.04	666.72	0.001164	0.75	13.27	23.93	0.18
Underwood Creek	Main Stem	0.057	PF4	23.00	665.69	667.08	0.06	667.10	0.001164	1.02	22.62	25.90	0.19
Underwood Creek	Main Stem	0.057	PF5	70.00	665.69	667.96	0.11	667.99	0.001164	1.48	47.22	30.48	0.21
Underwood Creek	Main Stem	0.057	PF6	136.00	665.69	668.79	0.15	668.84	0.001163	1.83	74.39	34.85	0.22
Underwood Creek	Main Stem	0.057	PF7	270.00	665.69	669.95	0.21	670.03	0.001165	2.29	117.83	38.28	0.23