

**Schubert Ranch Sand Resource
Floodplain Modeling
Technical Memorandum
For
Black Squirrel Creek**

El Paso County, Colorado

Prepared For:
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February 25, 2020

ZERO RISE CERTIFICATION FOR SCHUBERT RANCH SAND RESOURCE PROJECT

I certify that I am a duly qualified registered Professional Engineer licensed in the state of Colorado.

I certify that the proposed project Schubert Ranch Sand Resource Project as detailed on the construction drawings in Appendix E of this report will result in zero rise in the FEMA designated 100-year flood heights, and no increase in the 100-year discharge at published and unpublished cross sections of the current FEMA floodplain of Black Squirrel Creek as shown on FEMA maps 08041C0830G and 08041C0840G.

This certification is intended as proof of meeting the requirements set forth in the Pikes Peak Regional Building Code RBC313.20.1.

Please note that no “encroachment” into the floodplain or floodway is planned. The project involves only excavation of pits for the commercial extraction of sand within the floodplain and/or floodway. The 100-year floodplain extent will be changed in some locations. The floodplain will extend to the pit wall. This change will occur only on property leased by the permittee. This change will not impact any neighboring property owners.

I offer the following documentation in accordance with standard Engineering practice to support my findings:

Schubert Ranch Sand Resource Floodplain Modeling Technical Memorandum for Black Squirrel Creek. El Paso County, Colorado. EME Solutions, Inc. February 25, 2020.



John L. Jankousky, P.E.
Registered Professional Engineer
State of Colorado No. 30941

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1 OBJECTIVES

To support a floodplain permit application for Ellicott Sand and Gravel (the Client) at the Schubert Ranch Sand Resource (the Site), EME Solutions, Inc. (EME) performed floodplain modeling of Black Squirrel Creek in El Paso County, Colorado. The purpose of the floodplain modeling is to support a zero-rise certification for the floodway and floodplains. A US Army Corps of Engineers (USACE) Hydrologic Engineering Center River Analysis System (HEC-RAS) modeling analysis for the 100-year flood was performed for Black Squirrel Creek. This modeling analysis was based on the current model approved by Federal Emergency Management Agency (FEMA). The modeling effort required altering certain river cross sections to include the proposed sand quarry pits.

2 HEC-RAS MODEL SETUP

This section describes the HEC-RAS model setup, including the source of the model, the cross sections relating to the Site, the topographic mapping used, and roughness coefficients.

2.1 Source of HEC-RAS Model

EME used the HEC-RAS model, which included hydrology, provided by the FEMA Engineering Library (FEMA 2020). The provided model was created as part of the FEMA RiskMap project for El Paso County, Colorado. Anderson Consulting Engineers, Inc. (ACE), under contract with the Colorado Water Conservation Board (CWCB), performed detailed (Zone AE) hydraulic analyses and floodplain mapping for portions of the following streams in El Paso County: Black Squirrel Creek, Book Ranch, Ellicott Consolidated, Ellicott Consolidated, and Telephone Exchange (Anderson Consulting Engineers, 2013). The results of this modeling were incorporated into the Flood Insurance Rate Maps (FIRMs) for the area including the Site (FIRM Map Numbers 08041C0830G, Revised December 7, 2018 and 08041C0840G, Revised December 7, 2018) (FEMA 2018a, FEMA 2018b). The results are also presented in the Flood Insurance Study for El Paso County (FEMA 2018c).

This modeling effort focused on the area that includes the Schubert Ranch Sand Resource Site: Black Squirrel Creek, Reach US to LBS, River Station 34955 to River Station 27503 (this includes three cross sections above the Site) and Black Squirrel Creek, Reach LBS to ROB Split, River Station 26962 to River Station 20250 (this includes three cross sections below the Site). The river station numbering indicates the river length from the extent of the detailed study, just downstream from the confluence of Black Squirrel Creek and Telephone Exchange. These cross section numbers are presented in Table A-1 in Appendix A.

2.2 Topographic Modeling

Anderson Engineering used the digital topographic mapping from Kucera International, Inc. that was previously used by the US Army Corps of Engineers (USACE) to model the streams in the study. Effective flood hazard information throughout El Paso County and its incorporated communities is based on the North American Vertical Datum (NAVD) of 1988. The detailed mapping at the Site matches this datum and the detailed mapping matched well with the model topographic contours.

2.3 Roughness Coefficients

The Manning's n values for all stream reaches were set at 0.03 for the main channels and 0.04 for the flood overbank areas.

3 DISCHARGE PROFILES

Hydrologic modeling of the Black Squirrel Creek Watershed was previously completed by the USACE using the USACE Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS). The results of this HEC-HMS modeling were used by Anderson Consulting Engineers in the HEC-RAS model for Black Squirrel Creek.

100-year discharge profiles (1% annual chance event) used in the hydraulic analyses are provided in Table 3.1.

Table 3.1 Summary of 100-Year Peak Discharges.

Location	Peak Discharge (cfs)
	1% Annual Chance Event
Black Squirrel Creek	
Book Ranch Confluence	46,640
Telephone Exchange Confluence	40,000
Ellicott Consolidated Confluence	37,400
Upstream of Ellicott Consolidated Confluence	29,850
Lower Big Springs Confluence	29,100
Upstream of Lower Big Springs Confluence	25,150

4 HYDRAULIC MODELING

Hydraulic modeling for the entire extent of the Anderson Engineering study was conducted using HEC-RAS Version 5.0.7 (USACE Hydrologic Engineering Center 2019). Hydraulic modeling included analysis of the 1% annual chance flood event. Discharges for each reach of Black Squirrel Creek were defined using the flow values provided in Table 3.1 above.

4.1 Boundary Conditions

Hydraulic analyses were conducted assuming subcritical, steady state flow conditions. Consequently, boundary conditions were required only at the downstream end of the mainstem reach of Black Squirrel Creek, the Ellicott Consolidated Highway Split Flow Path, and the Ellicott Consolidated East Tributary. For the Black Squirrel Creek main reach, normal depth was computed at the downstream end of the study reach utilizing a bed slope of 0.0048 ft/ft (Anderson Consulting Engineers, 2013).

4.2 Modeling of Project Topography

This modeling analysis required altering certain river cross sections to include the proposed sand quarry pits. The HEC-RAS model was run using both the existing topography used in the Anderson Consulting study and the proposed topography based on the final reclamation contours for the Schubert Ranch Sand Resource Site. Because of the depth of the pits, the pits were modeled as ineffective flow areas except for the top two feet. This is thought to be representative of the actual flow conditions in the pits. The pits are about 50 feet deep. The horizontal flow in these pits will be concentrated in the upper few feet.

4.3 HEC-RAS Model Results

The HEC-RAS model was run for the 100-year flows for both the existing topography and the proposed topography. The 100-year water surface elevations for the existing and developed conditions were evaluated in the modeled cross sections.

The model results show that no rise in water surface elevation is expected as a result of the construction of the Schubert Ranch Sand Resource project.

The results are presented in detail in the appendices. See Table A-1 in Appendix A for a comparison of water surface elevations for the existing and developed conditions. Appendix B presents water surface profile information. Appendix C presents detailed cross section information. Appendix D presents Standard Table 1 and Standard Table 2 from the HEC-RAS outputs. Within the HEC-RAS outputs, the existing topography without the pits is designated as

Plan 03 or “Plan-without-pits” (depending on the output file) and the developed conditions with the pits is designated as Plan 02. All of the data presented show the water surface elevations with the pits as equal or slightly lower than the existing condition water surface elevations without the pits.

The horizontal extents of the floodplains will change in some of the cross sections. In these cases, the floodplain will extend to the pit wall. This change will occur only on property leased by the permittee. This change will not impact any neighboring property owners. See Figure 1 for the existing conditions and Figure 2 for the post-project, developed conditions. Revised floodplain lines are shown in green on Figure 2.

4.4 Construction Plans and Bank and Pit Armoring

The construction of the mine will proceed in accordance with the Mine Plan submitted to and approved by the Division of Mining Reclamation and Safety (DRMS). In accordance with the Mine Plan and with discussions between EME and Keith Curtis, Floodplain Administrator, Pikes Peak Regional Building Department, the following requirements will be met: (1) no material stockpiles or fill of any kind that exceed the pre-mining elevations will be placed in the floodway. (2) Material stockpiles will be placed away from Black Squirrel Creek to the extent practicable. See Map Exhibit C-1, Mining Plan Map in Appendix E for some of the proposed stockpile locations. (3) Any temporary stockpiles within the floodplain will be placed with the longitudinal axis parallel to the creek, to encourage flow around the temporary stockpiles. (4) Bank and pit armoring will occur as mining progresses (see the discussion in the paragraph below).

The banks of Black Squirrel Creek and the adjacent pit edge of each sand pit are armored to a depth below the stream thalweg. This armoring is not required for the small pit in the northwest corner of the Site (Stage V), because this entire pit is outside of the limits of the 100-year floodplain. See the attached drawings in Appendix E for the locations and details of the bank and pit armoring. These armoring plans are in accordance with Urban Drainage and Flood Control District guidelines (Urban Drainage and Flood Control District 2013) and discussions with US Army Corps of Engineers personnel.

5 REFERENCES

Anderson Consulting Engineers, 2013. *Detailed Hydraulic Evaluation and Floodplain Mapping for Black Squirrel Creek and Tributaries, as part of the El Paso County FEMA RiskMap Study El Paso County, Colorado*. (ACE Project No. COCWCB12). Anderson Consulting Engineers, Inc., August 2013.

FEMA 2018a. Federal Emergency Management Agency. FIRM Map Number 08041C0830G, Revised December 7, 2018.

FEMA 2018b. Federal Emergency Management Agency. FIRM Map Number 08041C0840G, Revised December 7, 2018.

FEMA 2018c. *Flood Insurance Study, El Paso County, Colorado, and Incorporated Areas*. Flood Insurance Study Number 08041CV001A. Federal Emergency Management Agency. Revised December 7, 2018.

FEMA 2020. FEMA Engineering Library Data Request Case No. B2008025, provided January 30, 2020 by Michael Baker International.

Urban Drainage and Flood Control District 2013. *Technical Review Guidelines For Gravel Mining & Water Storage Activities Within or Adjacent to 100-Year Floodplains*. Prepared for Urban Drainage and Flood Control District by Wright Water Engineers, Inc. January 2013.

USACE Hydrologic Engineering Center 2019. HEC-RAS Version 5.0.7 Software. US Army Corps of Engineers, Hydrologic Engineering Center. March 2019.

LEGEND

- PERMIT BOUNDARY/ AFFECTED LANDS
- 200 FOOT LIMIT
- STAGE LINE
- ROADS (HAUL, ACCESS) (TYP.)
- FENCE
- BURIED TELEPHONE/COMMUNICATION LINES
- OVERHEAD ELECTRIC LINES
- BUILDING
- WATER WELL
- 2 FOOT CONTOURS
- TOPO CONTOUR
- EPHEMERAL DRAINAGE
- FLOOD PLAIN (100 YR)
- FLOOD PLAIN (100 YR) REVISED
- ORDINARY HIGH-WATER LINE 2019
- REVEGETATED AREA
- BANK ARMORING
- HEC-RAS CROSS SECTION

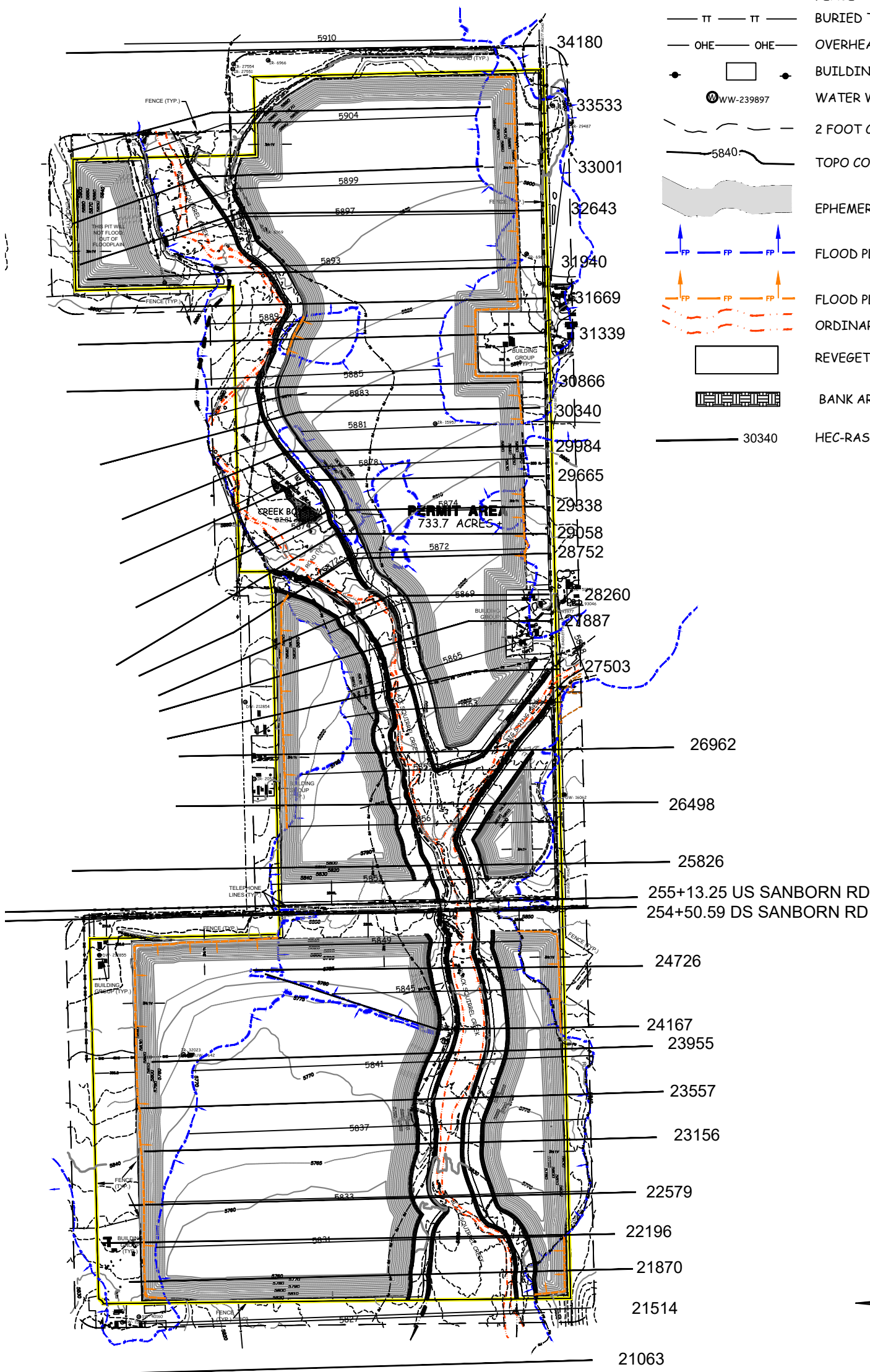


FIGURE 2 - Reclamation Plan Map with HEC-RAS Cross Sections

REVISIONS:	DATE:	PREPARED FOR: ELLICOTT SAND AND GRAVEL LLC	PREPARED BY: ENVIRONMENT, INC. STEVE O'BRIAN ENVIRONMENT-INC@OUTDRS.NET AND EME SOLUTIONS, INC. JOHN JANKOUSKY JOHN.JANKOUSKY@EME-SOLUTIONS.COM
		PROJECT: SCHUBERT RANCH SAND RESOURCE	
SCALE 1" = 1000' ORIG. DATE 2/18/2020			

Appendix A. Table A-1. Comparison of Water Surface Elevations
Without Pits and With Pits

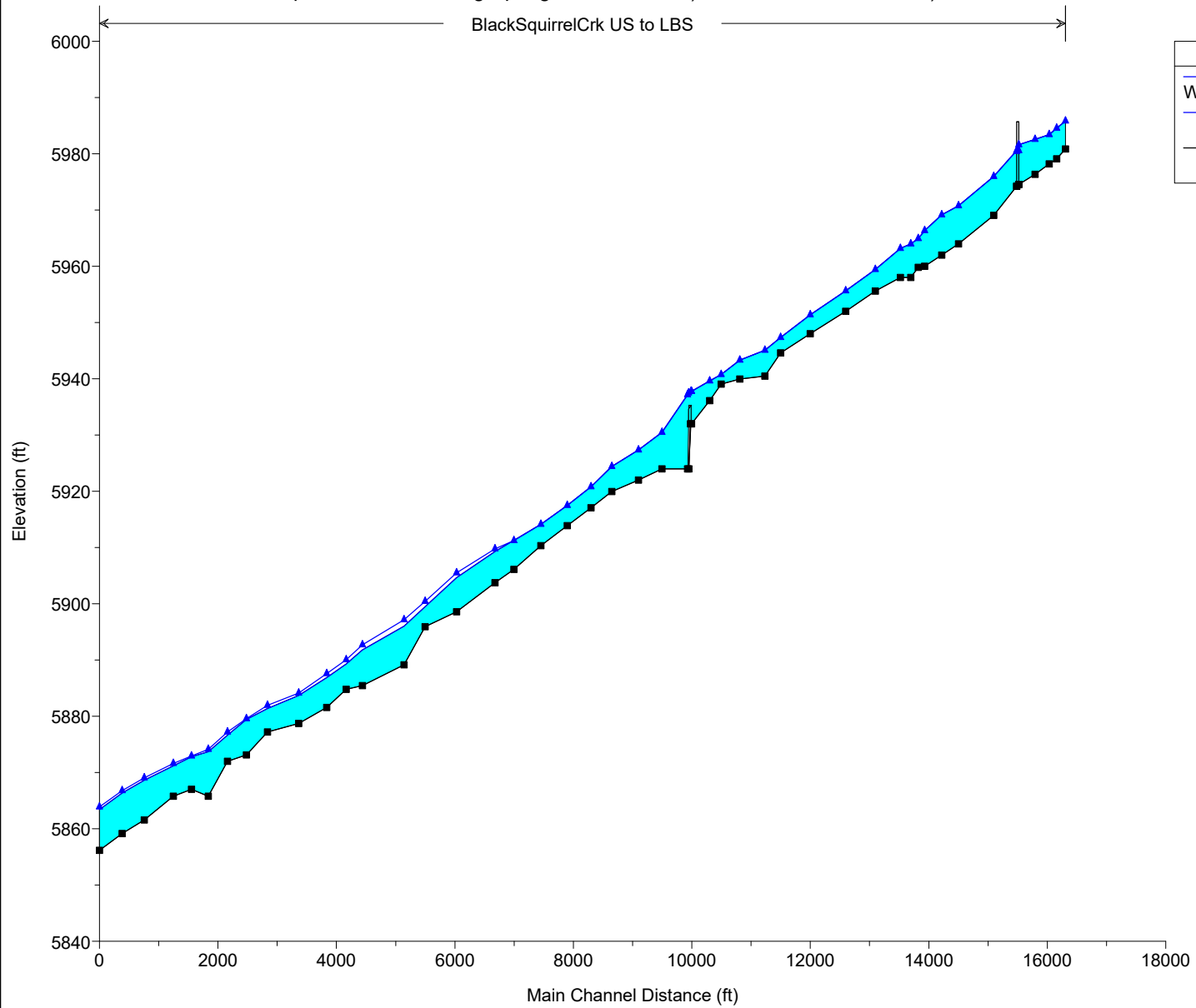
Table A-1. Comparison of Water Surface Elevations Without Pits and With Pits

Reach	Cross Section	Regulatory Water Surface Elevation (100-year WSEL) (Feet NAVD)	Water Surface Elevation with Pits (100-year WSEL) (Feet NAVD)	Comment
US to LBS	34955	5914.13	5914.13	Upstream from pits
	34498	5911.23	5911.23	Upstream from pits
	34180	5909.75	5909.75	Upstream from pits
	33533	5905.48	5905.48	First cross section with pits
	33001	5900.43	5899.55	
	32643	5897.15	5896.00	
	31940	5892.70	5891.96	
	31669	5890.07	5889.29	
	31339	5887.59	5886.85	
	30866	5884.12	5883.69	
	30340	5881.94	5881.35	
	29984	5879.58	5879.45	
	29665	5877.18	5876.64	
	29338	5874.14	5873.52	
	29058	5872.96	5872.79	
	28752	5871.62	5871.19	
	28260	5869.06	5868.61	
	27887	5866.77	5866.36	
	27503	5863.88	5863.40	
LBS to ROB Split	26962	5859.86	5859.43	
	26498	5856.65	5856.28	
	26826	5853.37	5853.25	
	25513	5851.31	5851.31	Upstream side of Sanborn Road
	25451	5850.49	5850.47	Downstream side of Sanborn Road
	24726	5845.84	5845.23	
	24167	5842.46	5841.92	
	23955	5840.90	5840.35	
	23557	5838.39	5837.79	
	23156	5835.26	5834.70	
	22579	5832.48	5832.06	
	22196	5830.70	5829.91	
	21870	5828.53	5828.36	Last cross section with pits
	21514	5826.60	5826.60	Downstream of pits
	21063	5823.24	5823.24	Downstream of pits
	20250	5818.56	5818.56	Downstream of pits

Appendix B. Water Surface Profiles

Black Squirrel with Lower Big Springs Plan: 1) Plan 02 2/12/2020 2) Plan-Without-Pits 2/12/2020

BlackSquirrelCrk US to LBS

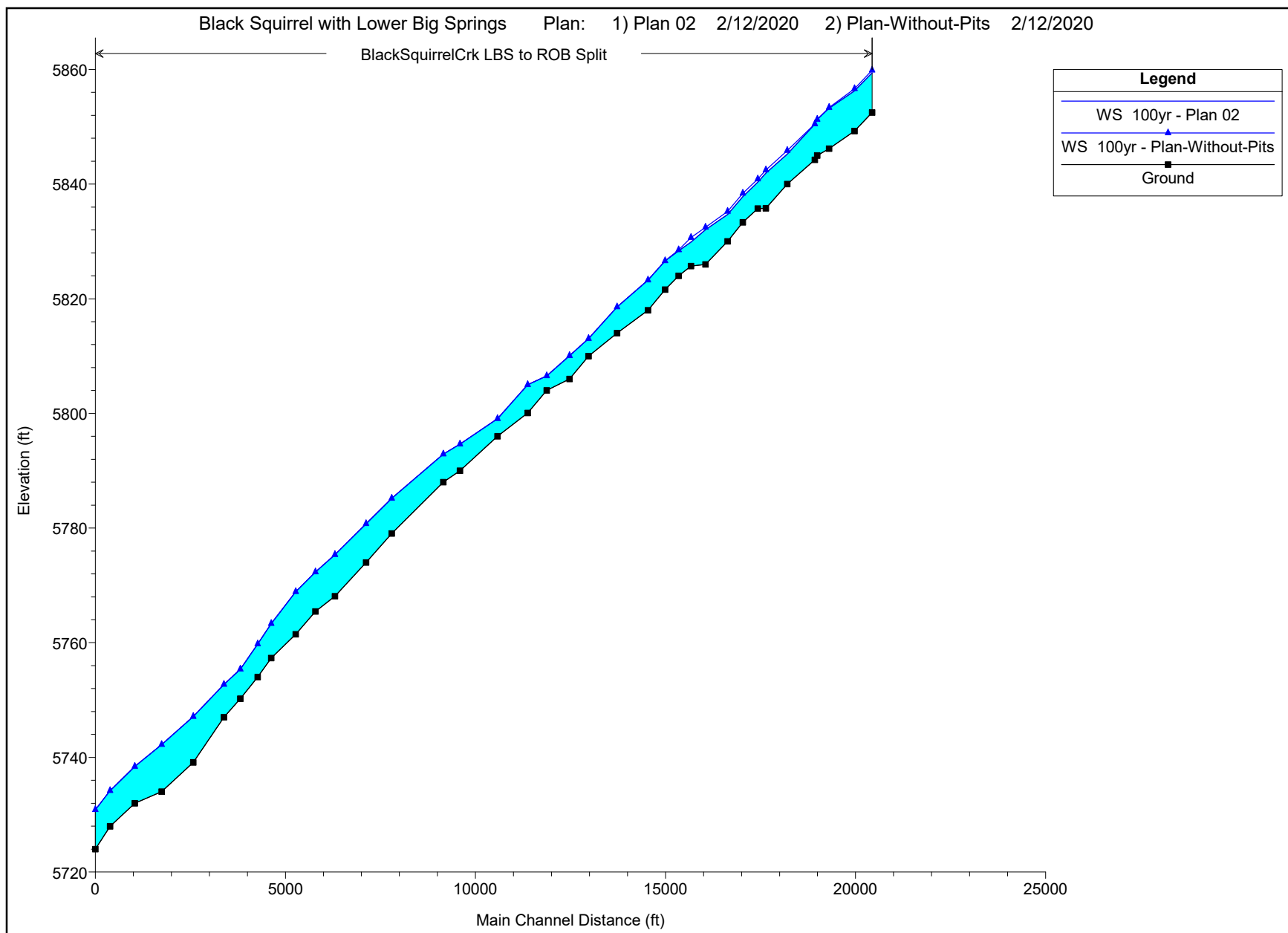


Legend

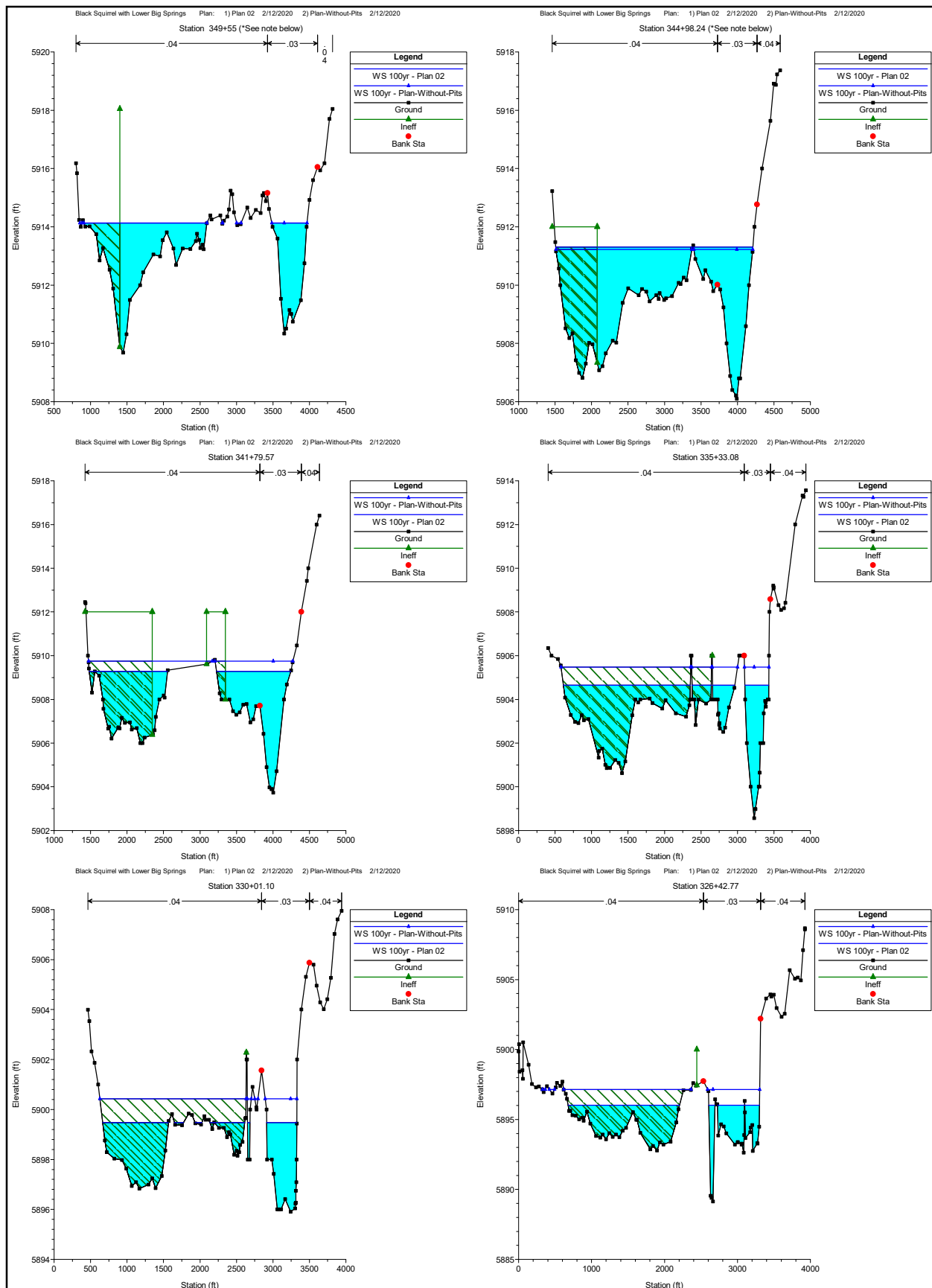
WS 100yr - Plan-Without-Pits

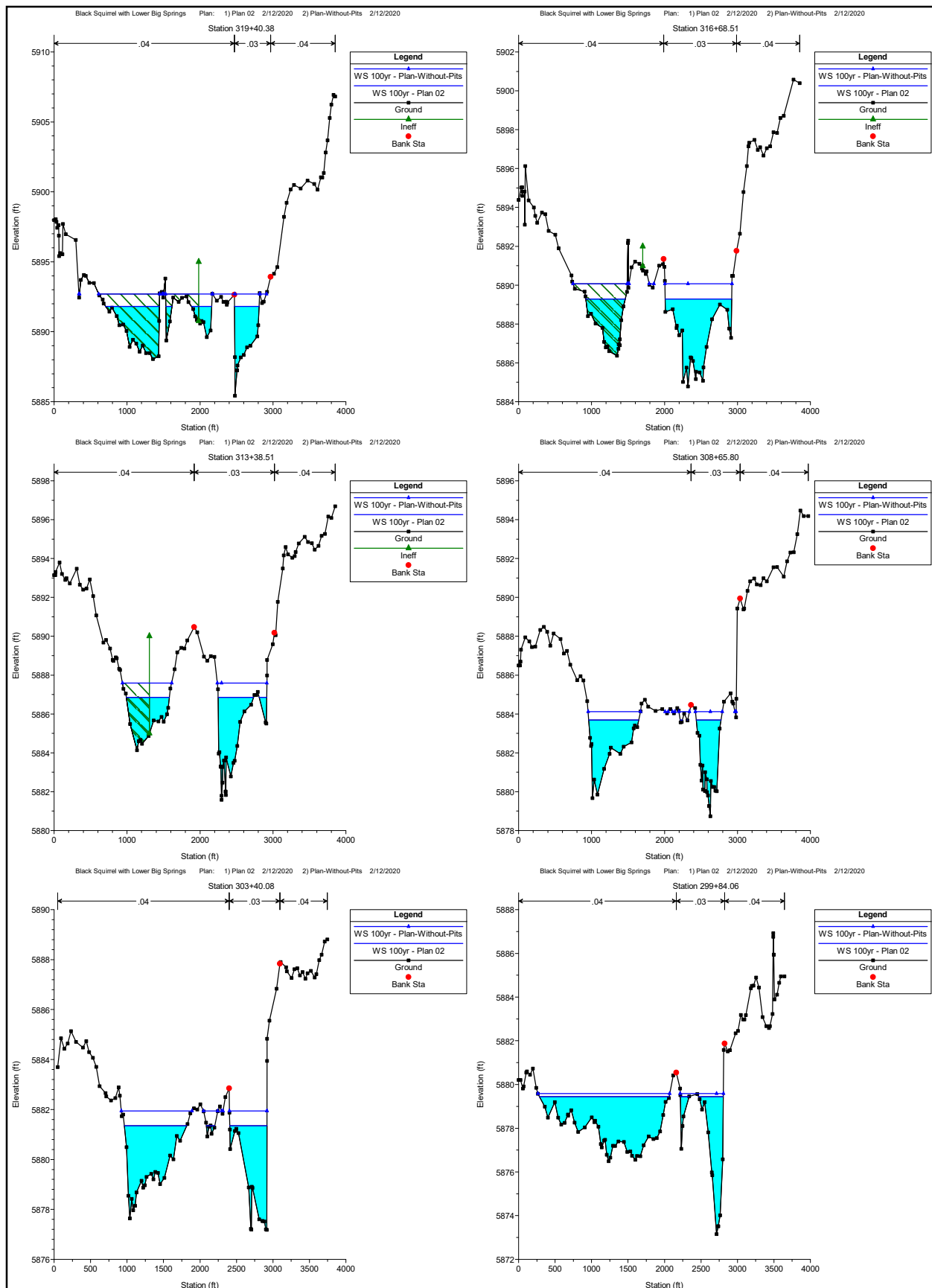
WS 100yr - Plan 02

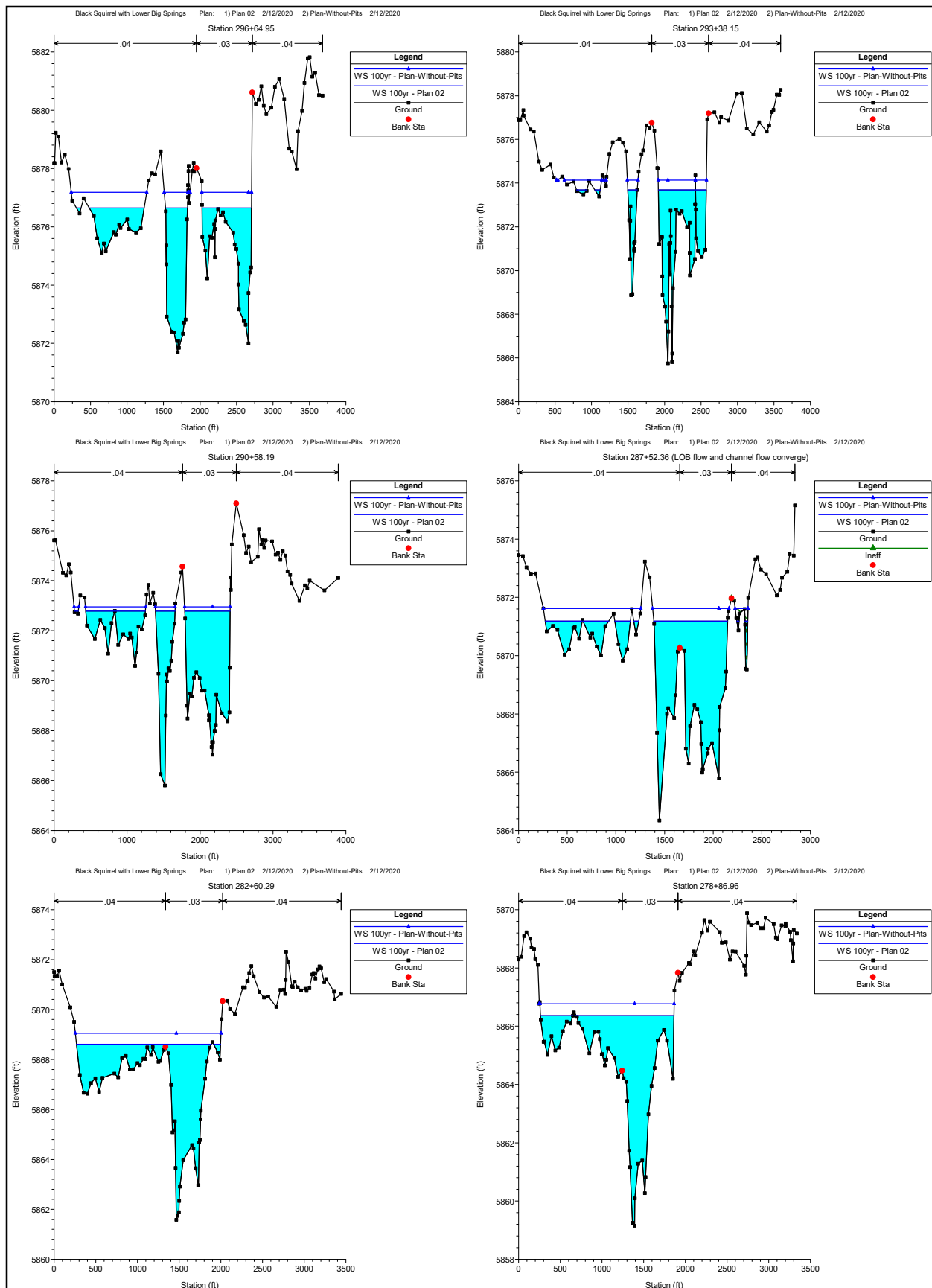
Ground

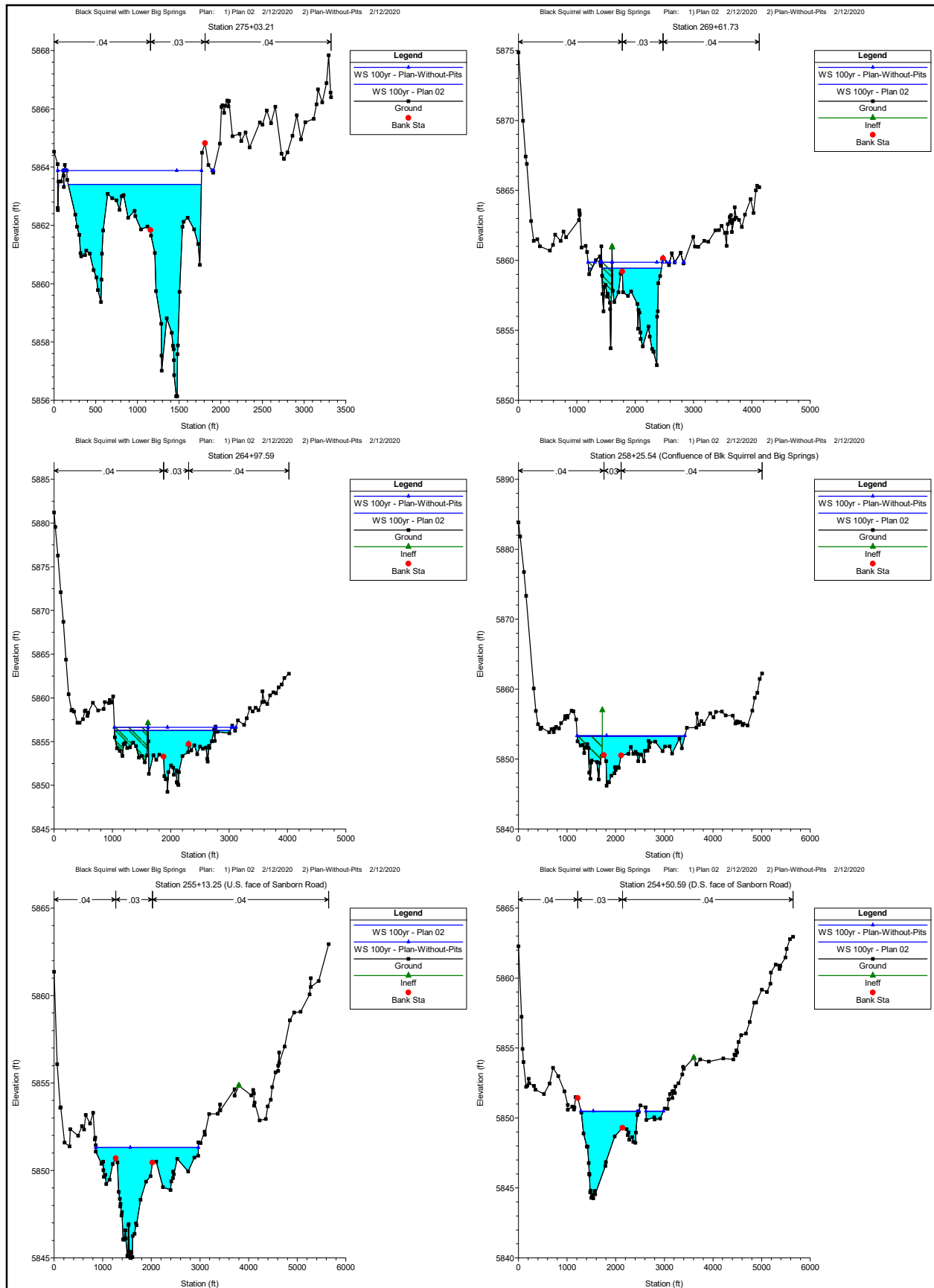


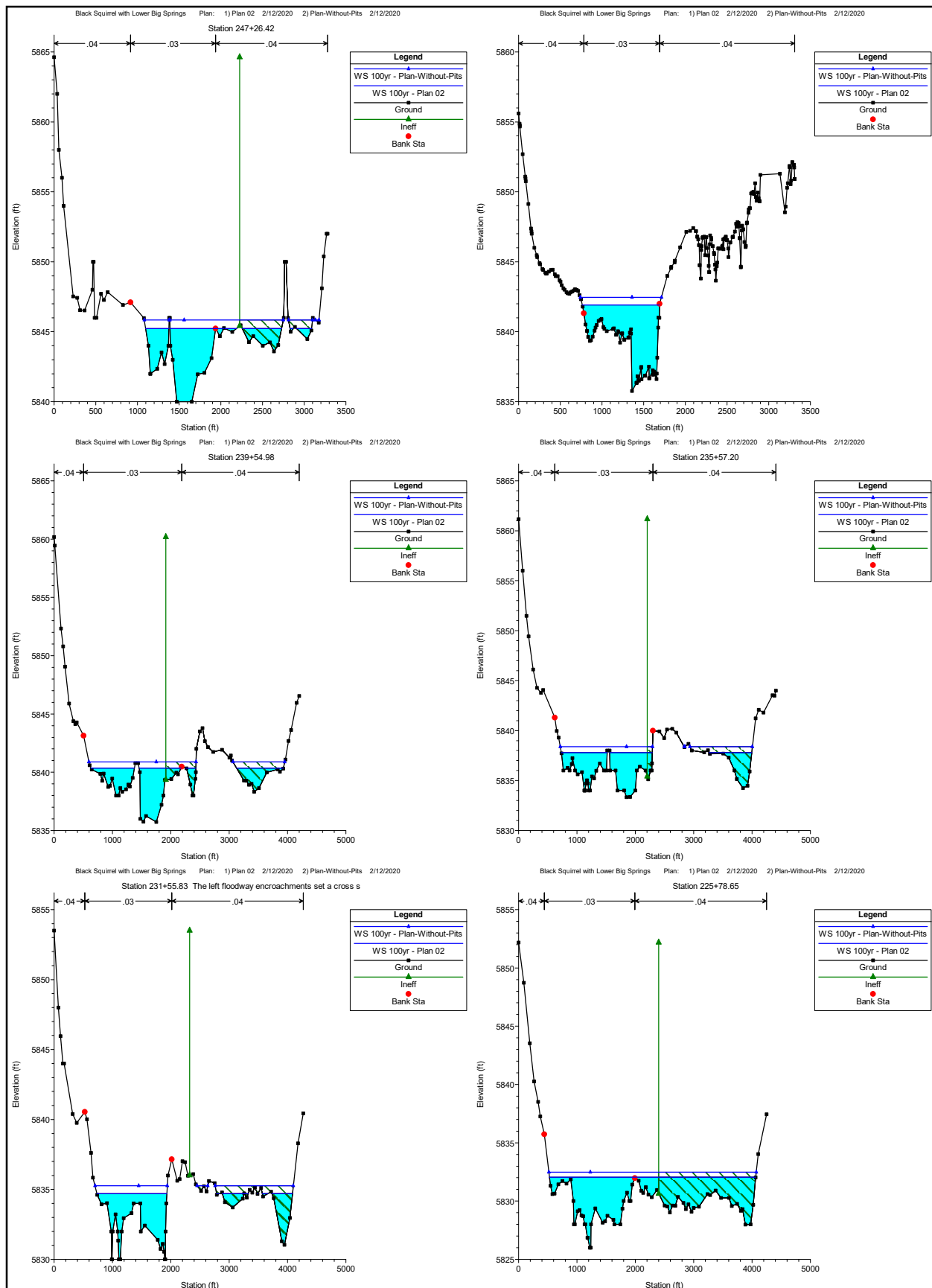
Appendix C. Detailed Cross Section Information

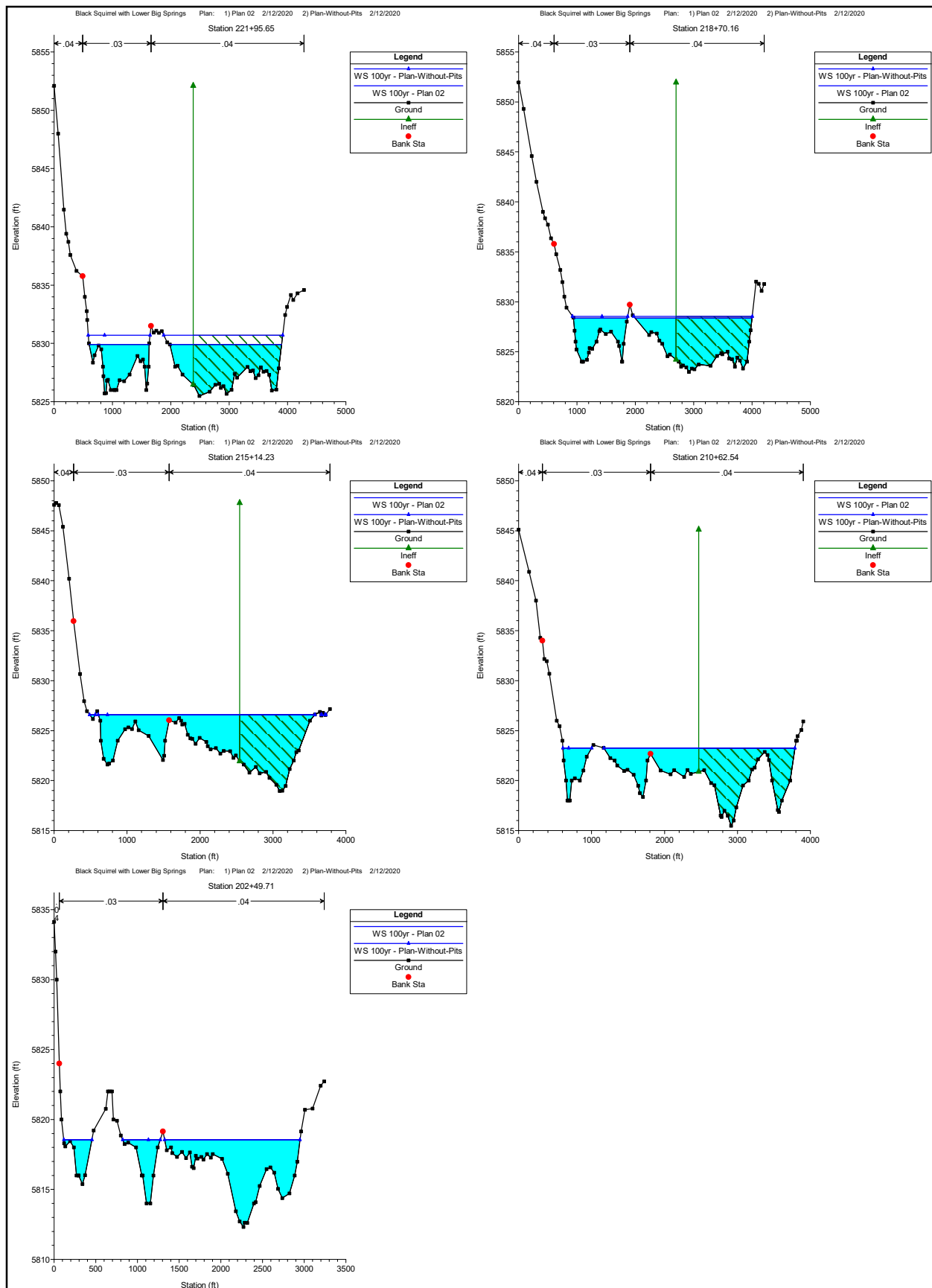












Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 34498 Profile: 100yr

E.G. Elev (ft)	5911.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5911.23	Reach Len. (ft)	299.30	318.67	327.60
Crit W.S. (ft)	5910.65	Flow Area (sq ft)	2789.33	1463.06	
E.G. Slope (ft/ft)	0.003041	Area (sq ft)	4502.06	1463.06	
Q Total (cfs)	16863.00	Flow (cfs)	8475.68	8387.32	
Top Width (ft)	2670.29	Top Width (ft)	2189.18	481.11	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	3.04	5.73	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)	1.72	3.04	
Conv. Total (cfs)	305771.1	Conv. (cfs)	153686.6	152084.5	
Length Wtd. (ft)	310.62	Wetted Per. (ft)	1623.76	481.22	
Min Ch El (ft)	5906.10	Shear (lb/sq ft)	0.33	0.58	
Alpha	1.33	Stream Power (lb/ft s)	0.99	3.31	
Frctn Loss (ft)	1.13	Cum Volume (acre-ft)	419.92	311.08	0.54
C & E Loss (ft)	0.03	Cum SA (acres)	215.74	89.33	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 34180 Profile: 100yr

E.G. Elev (ft)	5910.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5909.75	Reach Len. (ft)	581.80	646.49	770.50
Crit W.S. (ft)	5909.28	Flow Area (sq ft)	1611.97	1521.97	
E.G. Slope (ft/ft)	0.004447	Area (sq ft)	4082.38	1521.97	
Q Total (cfs)	16863.00	Flow (cfs)	5546.55	11316.45	
Top Width (ft)	2763.61	Top Width (ft)	2313.14	450.47	
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	3.44	7.44	
Max Chl Dpth (ft)	6.02	Hydr. Depth (ft)	1.32	3.38	
Conv. Total (cfs)	252876.5	Conv. (cfs)	83175.8	169700.7	
Length Wtd. (ft)	630.41	Wetted Per. (ft)	1218.07	450.61	
Min Ch El (ft)	5903.73	Shear (lb/sq ft)	0.37	0.94	
Alpha	1.42	Stream Power (lb/ft s)	1.26	6.97	
Frctn Loss (ft)	3.40	Cum Volume (acre-ft)	390.43	300.16	0.54
C & E Loss (ft)	0.08	Cum SA (acres)	200.27	85.92	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 33533 Profile: 100yr

E.G. Elev (ft)	5906.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5905.48	Reach Len. (ft)	518.83	531.98	578.90
Crit W.S. (ft)	5905.48	Flow Area (sq ft)	627.07	1360.51	
E.G. Slope (ft/ft)	0.006698	Area (sq ft)	5605.89	1360.51	
Q Total (cfs)	16863.00	Flow (cfs)	2834.31	14028.69	
Top Width (ft)	2727.09	Top Width (ft)	2392.58	334.51	
Vel Total (ft/s)	8.48	Avg. Vel. (ft/s)	4.52	10.31	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)	1.81	4.07	
Conv. Total (cfs)	206038.7	Conv. (cfs)	34630.7	171408.1	
Length Wtd. (ft)	530.72	Wetted Per. (ft)	345.94	335.37	
Min Ch El (ft)	5898.57	Shear (lb/sq ft)	0.76	1.70	
Alpha	1.28	Stream Power (lb/ft s)	3.43	17.49	
Frctn Loss (ft)	3.94	Cum Volume (acre-ft)	325.73	278.77	0.54
C & E Loss (ft)	0.03	Cum SA (acres)	168.85	80.10	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 33001 Profile: 100yr

E.G. Elev (ft)	5902.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.70	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5900.43	Reach Len. (ft)	377.13	358.33	352.96
Crit W.S. (ft)	5900.43	Flow Area (sq ft)	93.57	1561.83	
E.G. Slope (ft/ft)	0.008258	Area (sq ft)	3883.59	1561.83	
Q Total (cfs)	16863.00	Flow (cfs)	386.45	16476.55	
Top Width (ft)	2539.15	Top Width (ft)	2104.95	434.20	
Vel Total (ft/s)	10.19	Avg. Vel. (ft/s)	4.13	10.55	
Max Chl Dpth (ft)	4.51	Hydr. Depth (ft)	0.94	3.60	
Conv. Total (cfs)	185564.7	Conv. (cfs)	4252.6	181312.1	
Length Wtd. (ft)	358.55	Wetted Per. (ft)	100.18	435.27	
Min Ch El (ft)	5895.91	Shear (lb/sq ft)	0.48	1.85	
Alpha	1.05	Stream Power (lb/ft s)	1.99	19.52	
Frctn Loss (ft)	1.88	Cum Volume (acre-ft)	269.22	260.92	0.54
C & E Loss (ft)	0.29	Cum SA (acres)	142.06	75.40	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 32643 Profile: 100yr

E.G. Elev (ft)	5897.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.030	
W.S. Elev (ft)	5897.15	Reach Len. (ft)	577.75	702.39	421.88
Crit W.S. (ft)	5896.21	Flow Area (sq ft)		2477.00	
E.G. Slope (ft/ft)	0.003623	Area (sq ft)	4589.04	2477.00	
Q Total (cfs)	16863.00	Flow (cfs)		16863.00	
Top Width (ft)	2571.16	Top Width (ft)	1857.08	714.08	
Vel Total (ft/s)	6.81	Avg. Vel. (ft/s)		6.81	
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)		3.47	
Conv. Total (cfs)	280144.5	Conv. (cfs)		280144.5	
Length Wtd. (ft)	692.11	Wetted Per. (ft)		717.88	
Min Ch El (ft)	5889.14	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		5.31	
Frctn Loss (ft)	3.72	Cum Volume (acre-ft)	232.54	244.31	0.54
C & E Loss (ft)	0.07	Cum SA (acres)	124.91	70.68	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 31940 Profile: 100yr

E.G. Elev (ft)	5894.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5892.70	Reach Len. (ft)	259.81	271.87	261.48
Crit W.S. (ft)	5892.70	Flow Area (sq ft)	536.58	1401.40	
E.G. Slope (ft/ft)	0.008795	Area (sq ft)	3271.83	1401.40	
Q Total (cfs)	16863.00	Flow (cfs)	2782.60	14080.40	
Top Width (ft)	2239.38	Top Width (ft)	1802.04	437.34	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)	5.19	10.05	
Max Chl Dpth (ft)	7.27	Hydr. Depth (ft)	1.10	3.20	
Conv. Total (cfs)	179812.8	Conv. (cfs)	29671.2	150141.6	
Length Wtd. (ft)	270.87	Wetted Per. (ft)	486.38	440.52	
Min Ch El (ft)	5885.43	Shear (lb/sq ft)	0.61	1.75	
Alpha	1.17	Stream Power (lb/ft s)	3.14	17.55	
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	180.41	213.04	0.54
C & E Loss (ft)	0.20	Cum SA (acres)	100.64	61.40	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 31669 Profile: 100yr

E.G. Elev (ft)	5890.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5890.07	Reach Len. (ft)	324.99	330.00	328.42
Crit W.S. (ft)	5889.51	Flow Area (sq ft)	7.24	2495.68	
E.G. Slope (ft/ft)	0.004923	Area (sq ft)	1415.70	2495.68	
Q Total (cfs)	16863.00	Flow (cfs)	4.41	16858.59	
Top Width (ft)	1736.87	Top Width (ft)	816.95	919.92	
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)	0.61	6.76	
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)	0.11	2.71	
Conv. Total (cfs)	240325.8	Conv. (cfs)	62.9	240263.0	
Length Wtd. (ft)	329.61	Wetted Per. (ft)	64.09	920.99	
Min Ch El (ft)	5884.78	Shear (lb/sq ft)	0.03	0.83	
Alpha	1.01	Stream Power (lb/ft s)	0.02	5.63	
Frctn Loss (ft)	2.14	Cum Volume (acre-ft)	166.43	200.88	0.54
C & E Loss (ft)	0.03	Cum SA (acres)	92.83	57.16	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 31339 Profile: 100yr

E.G. Elev (ft)	5888.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5887.59	Reach Len. (ft)	431.77	472.71	429.95
Crit W.S. (ft)	5887.54	Flow Area (sq ft)	525.28	1667.28	
E.G. Slope (ft/ft)	0.008961	Area (sq ft)	1388.99	1667.28	
Q Total (cfs)	16863.00	Flow (cfs)	2654.06	14208.94	
Top Width (ft)	1353.77	Top Width (ft)	675.12	678.65	
Vel Total (ft/s)	7.69	Avg. Vel. (ft/s)	5.05	8.52	
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)	1.72	2.46	
Conv. Total (cfs)	178142.6	Conv. (cfs)	28037.8	150104.9	
Length Wtd. (ft)	459.68	Wetted Per. (ft)	304.98	680.36	
Min Ch El (ft)	5881.58	Shear (lb/sq ft)	0.96	1.37	
Alpha	1.10	Stream Power (lb/ft s)	4.87	11.68	
Frctn Loss (ft)	3.67	Cum Volume (acre-ft)	155.97	185.11	0.54
C & E Loss (ft)	0.08	Cum SA (acres)	87.27	51.11	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 30866 Profile: 100yr

E.G. Elev (ft)	5884.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5884.12	Reach Len. (ft)	381.72	525.73	605.99
Crit W.S. (ft)	5883.96	Flow Area (sq ft)	1584.61	1067.59	
E.G. Slope (ft/ft)	0.007145	Area (sq ft)	1584.61	1067.59	
Q Total (cfs)	16863.00	Flow (cfs)	8076.26	8786.74	
Top Width (ft)	1329.44	Top Width (ft)	943.07	386.37	
Vel Total (ft/s)	6.36	Avg. Vel. (ft/s)	5.10	8.23	
Max Chl Dpth (ft)	5.38	Hydr. Depth (ft)	1.68	2.76	
Conv. Total (cfs)	199490.1	Conv. (cfs)	95542.6	103947.5	
Length Wtd. (ft)	456.17	Wetted Per. (ft)	943.53	387.35	
Min Ch El (ft)	5878.74	Shear (lb/sq ft)	0.75	1.23	
Alpha	1.18	Stream Power (lb/ft s)	3.82	10.12	
Frctn Loss (ft)	2.41	Cum Volume (acre-ft)	141.23	170.27	0.54
C & E Loss (ft)	0.10	Cum SA (acres)	79.25	45.33	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 30340 Profile: 100yr

E.G. Elev (ft)	5882.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5881.94	Reach Len. (ft)	335.79	356.02	418.52
Crit W.S. (ft)	5881.23	Flow Area (sq ft)	2165.00	1408.96	
E.G. Slope (ft/ft)	0.004060	Area (sq ft)	2165.00	1408.96	
Q Total (cfs)	16863.00	Flow (cfs)	8214.50	8648.50	
Top Width (ft)	1699.30	Top Width (ft)	1183.21	516.08	
Vel Total (ft/s)	4.72	Avg. Vel. (ft/s)	3.79	6.14	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)	1.83	2.73	
Conv. Total (cfs)	264659.2	Conv. (cfs)	128923.8	135735.4	
Length Wtd. (ft)	344.26	Wetted Per. (ft)	1183.41	519.42	
Min Ch El (ft)	5877.18	Shear (lb/sq ft)	0.46	0.69	
Alpha	1.18	Stream Power (lb/ft s)	1.76	4.22	
Frctn Loss (ft)	2.19	Cum Volume (acre-ft)	124.81	155.33	0.54
C & E Loss (ft)	0.02	Cum SA (acres)	69.93	39.88	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 29984 Profile: 100yr

E.G. Elev (ft)	5880.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5879.58	Reach Len. (ft)	281.57	319.11	328.22
Crit W.S. (ft)	5879.56	Flow Area (sq ft)	3020.91	1127.15	
E.G. Slope (ft/ft)	0.009459	Area (sq ft)	3020.91	1127.15	
Q Total (cfs)	23714.00	Flow (cfs)	15372.89	8341.11	
Top Width (ft)	2398.16	Top Width (ft)	1807.11	591.04	
Vel Total (ft/s)	5.72	Avg. Vel. (ft/s)	5.09	7.40	
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)	1.67	1.91	
Conv. Total (cfs)	243824.6	Conv. (cfs)	158062.3	85762.3	
Length Wtd. (ft)	295.68	Wetted Per. (ft)	1807.19	592.00	
Min Ch El (ft)	5873.15	Shear (lb/sq ft)	0.99	1.12	
Alpha	1.10	Stream Power (lb/ft s)	5.02	8.32	
Frctn Loss (ft)	2.37	Cum Volume (acre-ft)	104.82	144.96	0.54
C & E Loss (ft)	0.00	Cum SA (acres)	58.41	35.36	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 29665 Profile: 100yr

E.G. Elev (ft)	5877.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5877.18	Reach Len. (ft)	284.00	326.80	348.43
Crit W.S. (ft)	5876.86	Flow Area (sq ft)	2462.89	1419.78	
E.G. Slope (ft/ft)	0.006858	Area (sq ft)	2462.89	1419.78	
Q Total (cfs)	23714.00	Flow (cfs)	14229.93	9484.07	
Top Width (ft)	2054.52	Top Width (ft)	1372.91	681.61	
Vel Total (ft/s)	6.11	Avg. Vel. (ft/s)	5.78	6.68	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)	1.79	2.08	
Conv. Total (cfs)	286356.0	Conv. (cfs)	171832.1	114523.9	
Length Wtd. (ft)	311.63	Wetted Per. (ft)	1374.55	683.15	
Min Ch El (ft)	5872.00	Shear (lb/sq ft)	0.77	0.89	
Alpha	1.02	Stream Power (lb/ft s)	4.43	5.94	
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)	87.09	135.64	0.54
C & E Loss (ft)	0.07	Cum SA (acres)	48.13	30.70	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 29338 Profile: 100yr

E.G. Elev (ft)	5875.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.31	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5874.14	Reach Len. (ft)	252.33	279.96	309.87
Crit W.S. (ft)	5874.14	Flow Area (sq ft)	568.25	2205.35	
E.G. Slope (ft/ft)	0.007607	Area (sq ft)	568.25	2205.35	
Q Total (cfs)	23714.00	Flow (cfs)	2582.44	21131.57	
Top Width (ft)	1372.35	Top Width (ft)	712.05	660.31	
Vel Total (ft/s)	8.55	Avg. Vel. (ft/s)	4.54	9.58	
Max Chl Dpth (ft)	8.38	Hydr. Depth (ft)	0.80	3.34	
Conv. Total (cfs)	271899.7	Conv. (cfs)	29609.7	242290.0	
Length Wtd. (ft)	274.54	Wetted Per. (ft)	713.90	667.57	
Min Ch El (ft)	5865.76	Shear (lb/sq ft)	0.38	1.57	
Alpha	1.15	Stream Power (lb/ft s)	1.72	15.03	
Frctn Loss (ft)	1.39	Cum Volume (acre-ft)	77.21	122.04	0.54
C & E Loss (ft)	0.20	Cum SA (acres)	41.33	25.66	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 29058 Profile: 100yr

E.G. Elev (ft)	5873.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5872.96	Reach Len. (ft)	287.77	305.83	246.30
Crit W.S. (ft)	5872.16	Flow Area (sq ft)	1810.18	2356.28	
E.G. Slope (ft/ft)	0.003619	Area (sq ft)	1810.18	2356.28	
Q Total (cfs)	23714.00	Flow (cfs)	6722.50	16991.50	
Top Width (ft)	1788.76	Top Width (ft)	1164.23	624.53	
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)	3.71	7.21	
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)	1.55	3.77	
Conv. Total (cfs)	394194.1	Conv. (cfs)	111747.1	282447.0	
Length Wtd. (ft)	300.16	Wetted Per. (ft)	1165.28	625.85	
Min Ch El (ft)	5867.03	Shear (lb/sq ft)	0.35	0.85	
Alpha	1.27	Stream Power (lb/ft s)	1.30	6.13	
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	70.32	107.38	0.54
C & E Loss (ft)	0.01	Cum SA (acres)	35.90	21.54	1.00

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 28752 Profile: 100yr

E.G. Elev (ft)	5872.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5871.62	Reach Len. (ft)	417.55	492.07	349.60
Crit W.S. (ft)	5871.09	Flow Area (sq ft)	1921.91	1926.69	
E.G. Slope (ft/ft)	0.004470	Area (sq ft)	1921.91	1926.69	72.16
Q Total (cfs)	23714.00	Flow (cfs)	8157.19	15556.81	
Top Width (ft)	1920.88	Top Width (ft)	1282.51	504.92	133.46
Vel Total (ft/s)	6.16	Avg. Vel. (ft/s)	4.24	8.07	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)	1.50	3.82	
Conv. Total (cfs)	354703.1	Conv. (cfs)	122011.5	232691.6	
Length Wtd. (ft)	470.46	Wetted Per. (ft)	1283.20	506.02	
Min Ch El (ft)	5865.79	Shear (lb/sq ft)	0.42	1.06	
Alpha	1.29	Stream Power (lb/ft s)	1.77	8.58	
Frctn Loss (ft)	2.43	Cum Volume (acre-ft)	58.00	92.34	0.34
C & E Loss (ft)	0.01	Cum SA (acres)	27.82	17.57	0.62

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 28260 Profile: 100yr

E.G. Elev (ft)	5869.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5869.06	Reach Len. (ft)	295.34	373.33	252.51
Crit W.S. (ft)	5868.99	Flow Area (sq ft)	1536.94	2156.63	
E.G. Slope (ft/ft)	0.006016	Area (sq ft)	1536.94	2156.63	
Q Total (cfs)	23714.00	Flow (cfs)	5595.58	18118.42	
Top Width (ft)	1747.90	Top Width (ft)	1082.06	665.84	
Vel Total (ft/s)	6.42	Avg. Vel. (ft/s)	3.64	8.40	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)	1.42	3.24	
Conv. Total (cfs)	305729.2	Conv. (cfs)	72140.1	233589.0	
Length Wtd. (ft)	356.95	Wetted Per. (ft)	1082.12	666.92	
Min Ch El (ft)	5861.58	Shear (lb/sq ft)	0.53	1.21	
Alpha	1.38	Stream Power (lb/ft s)	1.94	10.20	
Frctn Loss (ft)	2.14	Cum Volume (acre-ft)	41.42	69.28	0.05
C & E Loss (ft)	0.01	Cum SA (acres)	16.48	10.96	0.09

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 27887 Profile: 100yr

E.G. Elev (ft)	5867.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5866.77	Reach Len. (ft)	397.19	383.75	354.51
Crit W.S. (ft)	5866.77	Flow Area (sq ft)	1281.25	2191.28	
E.G. Slope (ft/ft)	0.005947	Area (sq ft)	1281.25	2191.28	
Q Total (cfs)	23714.00	Flow (cfs)	4366.74	19347.26	
Top Width (ft)	1610.30	Top Width (ft)	987.43	622.87	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)	3.41	8.83	
Max Chl Dpth (ft)	7.62	Hydr. Depth (ft)	1.30	3.52	
Conv. Total (cfs)	307499.2	Conv. (cfs)	56623.4	250875.8	
Length Wtd. (ft)	386.86	Wetted Per. (ft)	987.50	623.54	
Min Ch El (ft)	5859.15	Shear (lb/sq ft)	0.48	1.30	
Alpha	1.41	Stream Power (lb/ft s)	1.64	11.52	
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	31.86	50.65	0.05
C & E Loss (ft)	0.11	Cum SA (acres)	9.47	5.44	0.09

Plan: Plan-Without-Pits BlackSquirrelCrk US to LBS RS: 27503 Profile: 100yr

E.G. Elev (ft)	5864.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5863.88	Reach Len. (ft)	541.48	541.48	541.48
Crit W.S. (ft)	5863.37	Flow Area (sq ft)	1947.60	2344.84	0.73
E.G. Slope (ft/ft)	0.003617	Area (sq ft)	1947.60	2344.84	0.73
Q Total (cfs)	23714.00	Flow (cfs)	6613.01	17100.82	0.17
Top Width (ft)	1721.05	Top Width (ft)	1089.10	611.01	20.95
Vel Total (ft/s)	5.52	Avg. Vel. (ft/s)	3.40	7.29	0.24
Max Chl Dpth (ft)	7.74	Hydr. Depth (ft)	1.79	3.84	0.03
Conv. Total (cfs)	394317.2	Conv. (cfs)	109961.4	284352.9	2.9
Length Wtd. (ft)	541.48	Wetted Per. (ft)	1089.98	612.08	20.95
Min Ch El (ft)	5856.14	Shear (lb/sq ft)	0.40	0.87	0.01
Alpha	1.36	Stream Power (lb/ft s)	1.37	6.31	0.00
Frctn Loss (ft)	2.89	Cum Volume (acre-ft)	17.14	30.67	0.04
C & E Loss (ft)	0.10	Cum SA (acres)			

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 26962 Profile: 100yr

E.G. Elev (ft)	5861.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.67	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5859.86	Reach Len. (ft)	465.72	464.14	428.10
Crit W.S. (ft)	5859.86	Flow Area (sq ft)	324.63	2589.24	
E.G. Slope (ft/ft)	0.007872	Area (sq ft)	810.69	2589.24	6.16
Q Total (cfs)	29100.00	Flow (cfs)	1649.87	27450.13	
Top Width (ft)	1233.44	Top Width (ft)	472.79	689.48	71.17
Vel Total (ft/s)	9.99	Avg. Vel. (ft/s)	5.08	10.60	
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)	1.92	3.76	
Conv. Total (cfs)	327984.1	Conv. (cfs)	18595.5	309388.5	
Length Wtd. (ft)	461.36	Wetted Per. (ft)	169.54	691.01	
Min Ch El (ft)	5852.51	Shear (lb/sq ft)	0.94	1.84	
Alpha	1.08	Stream Power (lb/ft s)	4.78	19.52	
Frctn Loss (ft)	2.76	Cum Volume (acre-ft)	402.02	1164.81	895.23
C & E Loss (ft)	0.19	Cum SA (acres)	158.34	371.93	377.51

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 26498 Profile: 100yr

E.G. Elev (ft)	5857.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.03	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5856.65	Reach Len. (ft)	589.32	672.05	619.01
Crit W.S. (ft)	5856.25	Flow Area (sq ft)	951.01	1983.20	1195.20
E.G. Slope (ft/ft)	0.004695	Area (sq ft)	2435.47	1983.20	1195.20
Q Total (cfs)	29100.00	Flow (cfs)	5642.85	18642.84	4814.31
Top Width (ft)	2049.78	Top Width (ft)	840.81	429.40	779.58
Vel Total (ft/s)	7.05	Avg. Vel. (ft/s)	5.93	9.40	4.03
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)	3.57	4.62	1.53
Conv. Total (cfs)	424673.5	Conv. (cfs)	82349.5	272066.0	70258.1
Length Wtd. (ft)	649.53	Wetted Per. (ft)	267.22	430.25	779.95
Min Ch El (ft)	5849.26	Shear (lb/sq ft)	1.04	1.35	0.45
Alpha	1.33	Stream Power (lb/ft s)	6.19	12.70	1.81
Frctn Loss (ft)	3.16	Cum Volume (acre-ft)	384.67	1140.45	889.32
C & E Loss (ft)	0.01	Cum SA (acres)	151.32	365.97	373.33

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 25826 Profile: 100yr

E.G. Elev (ft)	5854.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5853.37	Reach Len. (ft)	304.11	312.29	311.37
Crit W.S. (ft)	5853.37	Flow Area (sq ft)	97.96	1770.16	2523.48
E.G. Slope (ft/ft)	0.005034	Area (sq ft)	1606.43	1770.16	2523.48
Q Total (cfs)	29100.00	Flow (cfs)	516.60	18297.65	10285.75
Top Width (ft)	2215.69	Top Width (ft)	553.73	350.07	1311.89
Vel Total (ft/s)	6.63	Avg. Vel. (ft/s)	5.27	10.34	4.08
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)	2.83	5.06	1.92
Conv. Total (cfs)	410139.9	Conv. (cfs)	7281.1	257890.0	144968.9
Length Wtd. (ft)	311.78	Wetted Per. (ft)	34.61	350.91	1312.18
Min Ch El (ft)	5846.21	Shear (lb/sq ft)	0.89	1.59	0.60
Alpha	1.68	Stream Power (lb/ft s)	4.69	16.39	2.46
Frctn Loss (ft)	1.69	Cum Volume (acre-ft)	357.33	1111.50	862.90
C & E Loss (ft)	0.04	Cum SA (acres)	141.89	359.95	358.47

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 25513 Profile: 100yr

E.G. Elev (ft)	5852.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5851.31	Reach Len. (ft)	62.66	62.66	62.66
Crit W.S. (ft)	5851.31	Flow Area (sq ft)	468.51	2663.68	1230.80
E.G. Slope (ft/ft)	0.005878	Area (sq ft)	468.51	2663.68	1230.80
Q Total (cfs)	29100.00	Flow (cfs)	1458.72	23465.79	4175.50
Top Width (ft)	2109.77	Top Width (ft)	409.84	753.22	946.71
Vel Total (ft/s)	6.67	Avg. Vel. (ft/s)	3.11	8.81	3.39
Max Chl Dpth (ft)	6.31	Hydr. Depth (ft)	1.14	3.54	1.30
Conv. Total (cfs)	379543.2	Conv. (cfs)	19025.7	306057.7	54459.9
Length Wtd. (ft)	62.66	Wetted Per. (ft)	409.92	753.89	946.81
Min Ch El (ft)	5845.00	Shear (lb/sq ft)	0.42	1.30	0.48
Alpha	1.45	Stream Power (lb/ft s)	1.31	11.42	1.62
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	350.09	1095.61	849.48
C & E Loss (ft)	0.03	Cum SA (acres)	138.52	356.00	350.40

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 25451 Profile: 100yr

E.G. Elev (ft)	5851.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5850.49	Reach Len. (ft)	614.30	724.17	589.89
Crit W.S. (ft)	5850.47	Flow Area (sq ft)		2861.02	677.78
E.G. Slope (ft/ft)	0.007112	Area (sq ft)		2861.02	677.78
Q Total (cfs)	29100.00	Flow (cfs)		26721.46	2378.54
Top Width (ft)	1556.96	Top Width (ft)		855.48	701.48
Vel Total (ft/s)	8.22	Avg. Vel. (ft/s)		9.34	3.51
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		3.34	0.97
Conv. Total (cfs)	345069.6	Conv. (cfs)		316864.8	28204.8
Length Wtd. (ft)	717.51	Wetted Per. (ft)		855.67	701.58
Min Ch El (ft)	5844.26	Shear (lb/sq ft)		1.48	0.43
Alpha	1.20	Stream Power (lb/ft s)		13.87	1.51
Frctn Loss (ft)	4.64	Cum Volume (acre-ft)	349.75	1091.63	848.11
C & E Loss (ft)	0.00	Cum SA (acres)	138.23	354.84	349.22

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 24726 Profile: 100yr

E.G. Elev (ft)	5847.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5845.84	Reach Len. (ft)	568.78	559.66	318.68
Crit W.S. (ft)	5845.57	Flow Area (sq ft)		3141.25	215.37
E.G. Slope (ft/ft)	0.005913	Area (sq ft)		3141.25	1196.47
Q Total (cfs)	29100.00	Flow (cfs)		28593.00	507.00
Top Width (ft)	1987.31	Top Width (ft)		849.41	1137.89
Vel Total (ft/s)	8.67	Avg. Vel. (ft/s)		9.10	2.35
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		3.70	0.75
Conv. Total (cfs)	378426.4	Conv. (cfs)		371833.2	6593.2
Length Wtd. (ft)	557.55	Wetted Per. (ft)		850.25	287.89
Min Ch El (ft)	5840.00	Shear (lb/sq ft)		1.36	0.28
Alpha	1.08	Stream Power (lb/ft s)		12.41	0.65
Frctn Loss (ft)	3.38	Cum Volume (acre-ft)	349.75	1041.74	835.42
C & E Loss (ft)	0.00	Cum SA (acres)	138.23	340.67	336.76

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 24167 Profile: 100yr

E.G. Elev (ft)	5843.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5842.46	Reach Len. (ft)	195.53	211.79	527.93
Crit W.S. (ft)	5842.13	Flow Area (sq ft)	22.82	3212.28	4.90
E.G. Slope (ft/ft)	0.006205	Area (sq ft)	22.82	3212.28	4.90
Q Total (cfs)	29100.00	Flow (cfs)	43.67	29050.94	5.39
Top Width (ft)	972.78	Top Width (ft)	43.12	908.46	21.19
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)	1.91	9.04	1.10
Max Chl Dpth (ft)	6.69	Hydr. Depth (ft)	0.53	3.54	0.23
Conv. Total (cfs)	369424.0	Conv. (cfs)	554.5	368801.1	68.4
Length Wtd. (ft)	211.81	Wetted Per. (ft)	43.14	910.24	21.20
Min Ch El (ft)	5835.77	Shear (lb/sq ft)	0.20	1.37	0.09
Alpha	1.01	Stream Power (lb/ft s)	0.39	12.36	0.10
Frctn Loss (ft)	1.60	Cum Volume (acre-ft)	349.60	1000.92	831.02
C & E Loss (ft)	0.02	Cum SA (acres)	137.95	329.38	332.52

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 23955 Profile: 100yr

E.G. Elev (ft)	5842.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.030	
W.S. Elev (ft)	5840.90	Reach Len. (ft)	391.60	397.78	392.04
Crit W.S. (ft)	5840.90	Flow Area (sq ft)		3289.76	
E.G. Slope (ft/ft)	0.009435	Area (sq ft)		3608.77	1460.93
Q Total (cfs)	29100.00	Flow (cfs)		29100.00	
Top Width (ft)	2724.26	Top Width (ft)		1588.87	1135.39
Vel Total (ft/s)	8.85	Avg. Vel. (ft/s)		8.85	
Max Chl Dpth (ft)	5.16	Hydr. Depth (ft)		2.49	
Conv. Total (cfs)	299582.7	Conv. (cfs)		299582.7	
Length Wtd. (ft)	397.78	Wetted Per. (ft)		1319.62	
Min Ch El (ft)	5835.74	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		12.99	
Frctn Loss (ft)	2.51	Cum Volume (acre-ft)	349.55	984.34	822.14
C & E Loss (ft)	0.15	Cum SA (acres)	137.85	323.31	325.51

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 23557 Profile: 100yr

E.G. Elev (ft)	5839.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.030	
W.S. Elev (ft)	5838.39	Reach Len. (ft)	393.92	401.37	367.59
Crit W.S. (ft)	5837.74	Flow Area (sq ft)		4311.04	
E.G. Slope (ft/ft)	0.004508	Area (sq ft)		4542.51	1560.86
Q Total (cfs)	29100.00	Flow (cfs)		29100.00	
Top Width (ft)	2666.95	Top Width (ft)		1580.23	1086.72
Vel Total (ft/s)	6.75	Avg. Vel. (ft/s)		6.75	
Max Chl Dpth (ft)	5.05	Hydr. Depth (ft)		2.89	
Conv. Total (cfs)	433417.3	Conv. (cfs)		433417.3	
Length Wtd. (ft)	401.37	Wetted Per. (ft)		1490.76	
Min Ch El (ft)	5833.34	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		5.49	
Frctn Loss (ft)	2.52	Cum Volume (acre-ft)	349.55	947.12	808.54
C & E Loss (ft)	0.06	Cum SA (acres)	137.85	308.84	315.51

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 23156 Profile: 100yr

E.G. Elev (ft)	5836.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.030	
W.S. Elev (ft)	5835.26	Reach Len. (ft)	530.91	577.18	509.09
Crit W.S. (ft)	5835.26	Flow Area (sq ft)		3222.45	
E.G. Slope (ft/ft)	0.009321	Area (sq ft)		3222.45	1695.45
Q Total (cfs)	29100.00	Flow (cfs)		29100.00	
Top Width (ft)	2765.14	Top Width (ft)		1240.18	1524.96
Vel Total (ft/s)	9.03	Avg. Vel. (ft/s)		9.03	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		2.60	
Conv. Total (cfs)	301412.0	Conv. (cfs)		301412.0	
Length Wtd. (ft)	575.02	Wetted Per. (ft)		1241.75	
Min Ch El (ft)	5830.00	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		13.64	
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	349.55	911.35	794.80
C & E Loss (ft)	0.21	Cum SA (acres)	137.85	295.84	304.49

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 22579 Profile: 100yr

E.G. Elev (ft)	5833.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5832.48	Reach Len. (ft)	358.55	383.00	362.63
Crit W.S. (ft)	5831.76	Flow Area (sq ft)		4367.06	618.87
E.G. Slope (ft/ft)	0.003729	Area (sq ft)		4367.06	5135.75
Q Total (cfs)	29100.00	Flow (cfs)		27255.64	1844.36
Top Width (ft)	3554.89	Top Width (ft)		1472.37	2082.52
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)		6.24	2.98
Max Chl Dpth (ft)	6.48	Hydr. Depth (ft)		2.97	1.51
Conv. Total (cfs)	476550.2	Conv. (cfs)		446346.4	30203.8
Length Wtd. (ft)	380.20	Wetted Per. (ft)		1473.25	410.97
Min Ch El (ft)	5826.00	Shear (lb/sq ft)		0.69	0.35
Alpha	1.09	Stream Power (lb/ft s)		4.31	1.04
Frctn Loss (ft)	1.62	Cum Volume (acre-ft)	349.55	861.07	754.89
C & E Loss (ft)	0.01	Cum SA (acres)	137.85	277.87	283.41

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 22196 Profile: 100yr

E.G. Elev (ft)	5831.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5830.70	Reach Len. (ft)	314.79	325.49	318.98
Crit W.S. (ft)	5829.93	Flow Area (sq ft)		3172.91	1273.43
E.G. Slope (ft/ft)	0.004939	Area (sq ft)		3172.91	7258.15
Q Total (cfs)	29100.00	Flow (cfs)		22953.03	6146.97
Top Width (ft)	3099.76	Top Width (ft)		1058.39	2041.37
Vel Total (ft/s)	6.54	Avg. Vel. (ft/s)		7.23	4.83
Max Chl Dpth (ft)	5.21	Hydr. Depth (ft)		3.00	2.51
Conv. Total (cfs)	414077.9	Conv. (cfs)		326609.7	87468.2
Length Wtd. (ft)	323.83	Wetted Per. (ft)		1059.04	506.48
Min Ch El (ft)	5825.71	Shear (lb/sq ft)		0.92	0.78
Alpha	1.08	Stream Power (lb/ft s)		6.68	3.74
Frctn Loss (ft)	1.98	Cum Volume (acre-ft)	349.55	827.92	703.30
C & E Loss (ft)	0.02	Cum SA (acres)	137.85	266.75	266.25

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 21870 Profile: 100yr

E.G. Elev (ft)	5829.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5828.53	Reach Len. (ft)	350.43	355.93	352.22
Crit W.S. (ft)	5828.26	Flow Area (sq ft)		2466.51	1578.68
E.G. Slope (ft/ft)	0.007800	Area (sq ft)		2466.51	7399.65
Q Total (cfs)	29100.00	Flow (cfs)		20412.44	8687.56
Top Width (ft)	2979.38	Top Width (ft)		947.56	2031.82
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)		8.28	5.50
Max Chl Dpth (ft)	5.55	Hydr. Depth (ft)		2.60	2.17
Conv. Total (cfs)	329494.1	Conv. (cfs)		231126.4	98367.7
Length Wtd. (ft)	354.56	Wetted Per. (ft)		947.86	726.71
Min Ch El (ft)	5824.00	Shear (lb/sq ft)		1.27	1.06
Alpha	1.10	Stream Power (lb/ft s)		10.49	5.82
Frctn Loss (ft)	2.19	Cum Volume (acre-ft)	349.55	806.85	649.63
C & E Loss (ft)	0.11	Cum SA (acres)	137.85	259.25	251.33

Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 21514 Profile: 100yr

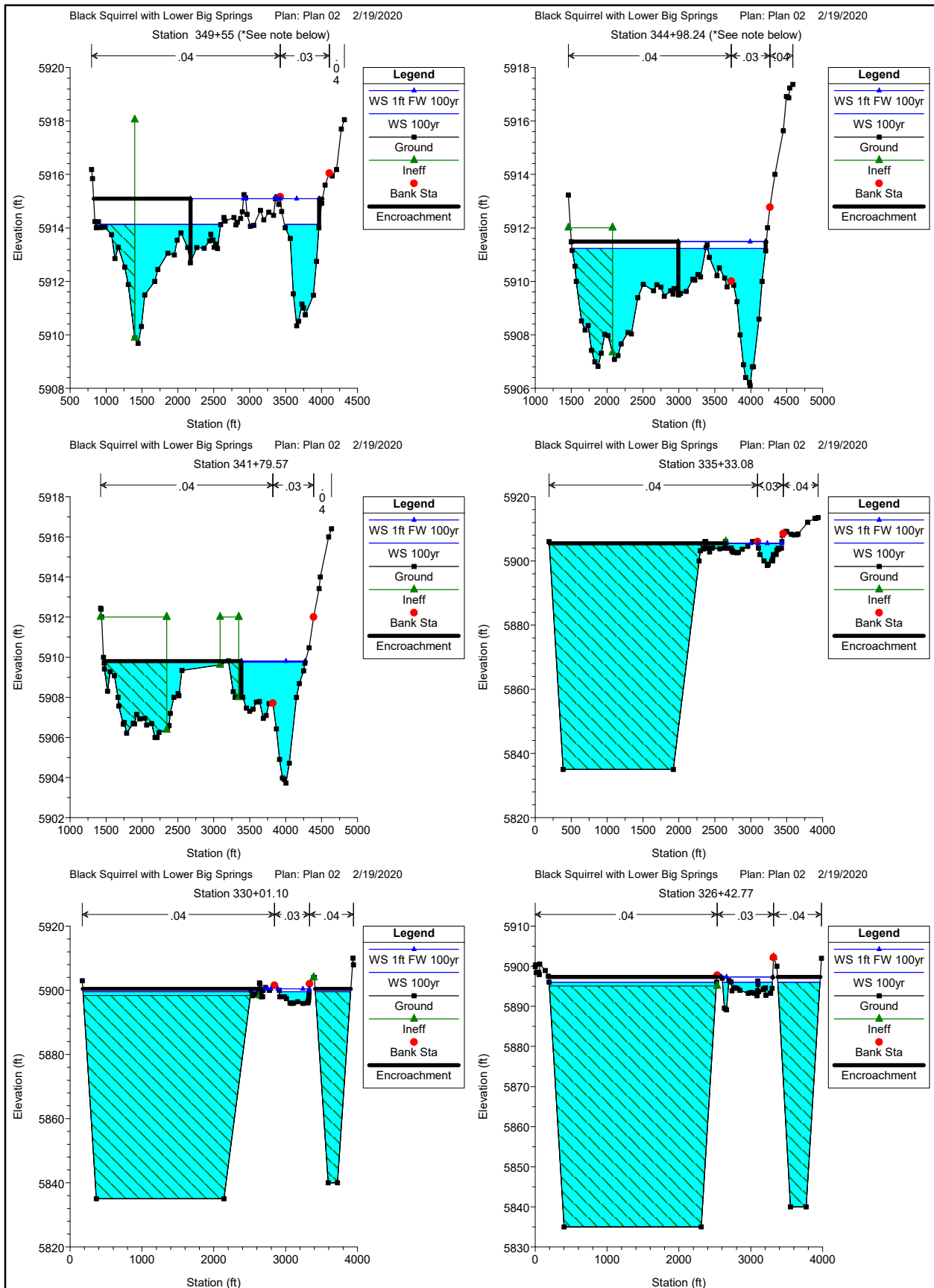
E.G. Elev (ft)	5827.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5826.60	Reach Len. (ft)	433.05	451.69	437.90
Crit W.S. (ft)	5825.81	Flow Area (sq ft)		2565.72	2544.67
E.G. Slope (ft/ft)	0.005023	Area (sq ft)		2565.72	7623.99
Q Total (cfs)	29100.00	Flow (cfs)		16327.36	12772.63
Top Width (ft)	3070.38	Top Width (ft)		1050.69	2019.69
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)		6.36	5.02
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		2.44	2.63
Conv. Total (cfs)	410594.1	Conv. (cfs)		230375.3	180218.9
Length Wtd. (ft)	446.54	Wetted Per. (ft)		1051.19	966.68
Min Ch El (ft)	5821.60	Shear (lb/sq ft)		0.77	0.83
Alpha	1.04	Stream Power (lb/ft s)		4.87	4.14
Frctn Loss (ft)	2.94	Cum Volume (acre-ft)	349.55	786.29	588.89
C & E Loss (ft)	0.04	Cum SA (acres)	137.85	251.09	234.95

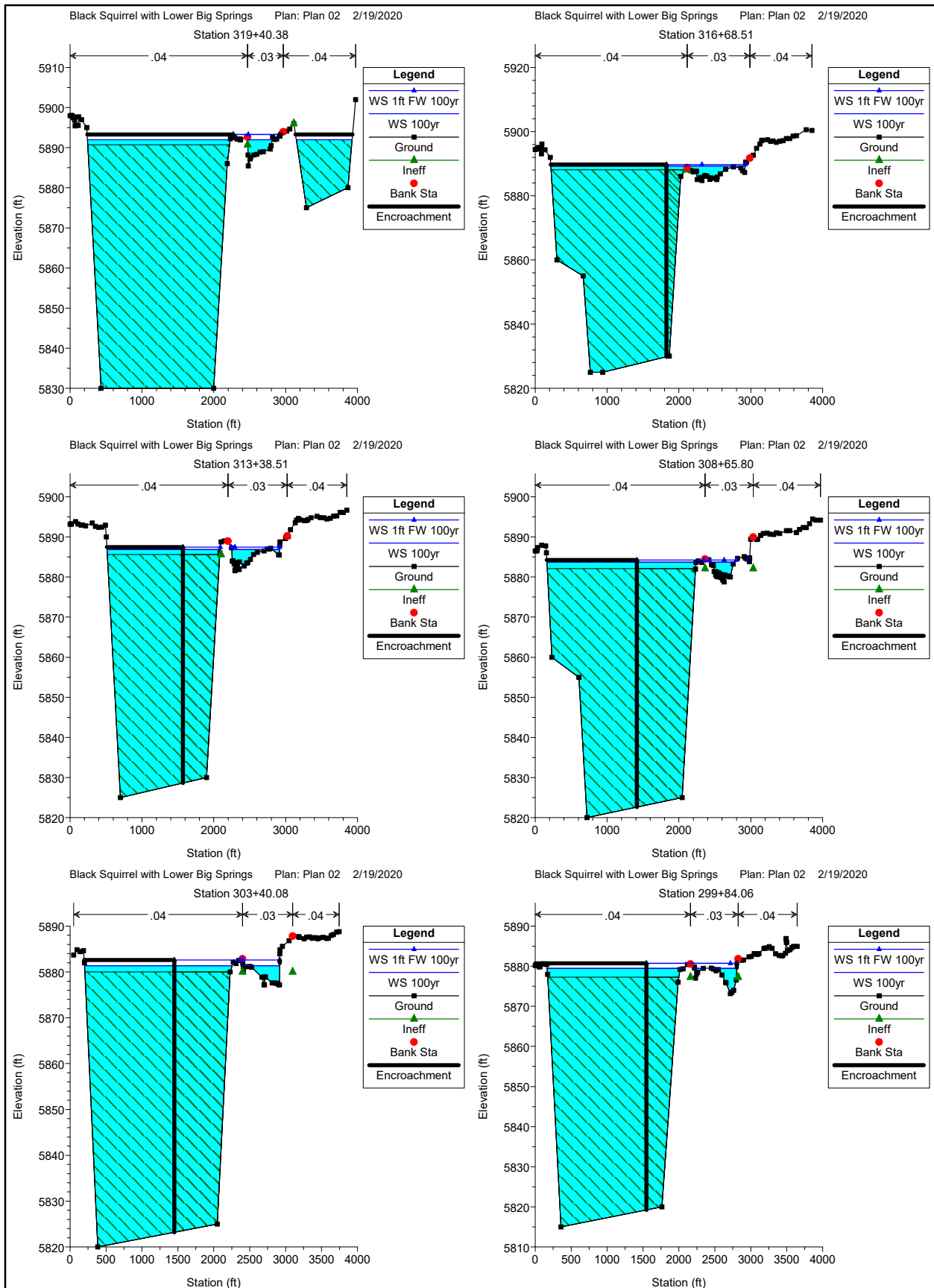
Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 21063 Profile: 100yr

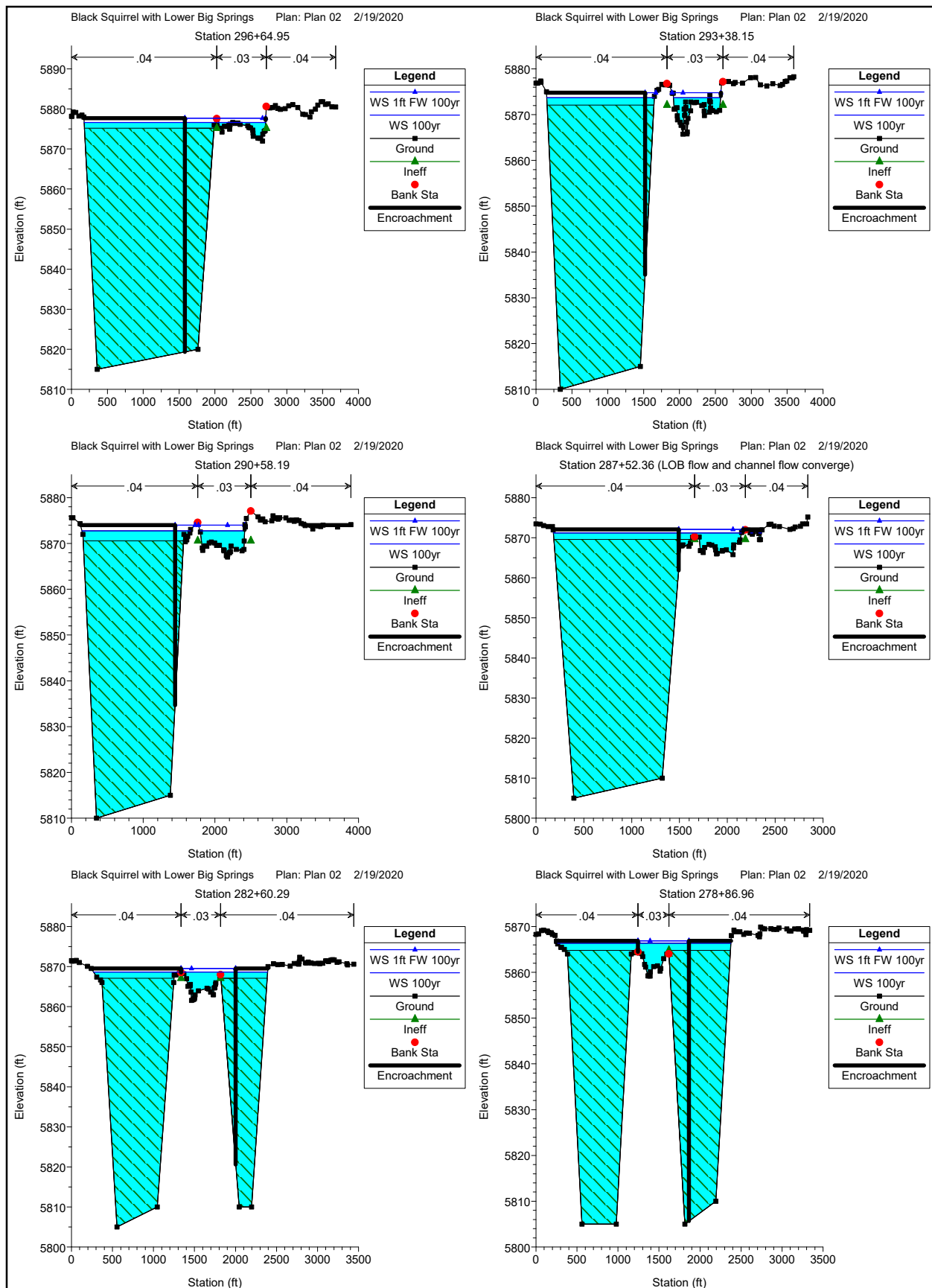
E.G. Elev (ft)	5824.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5823.24	Reach Len. (ft)	934.05	812.83	579.12
Crit W.S. (ft)	5823.12	Flow Area (sq ft)		2430.26	1484.24
E.G. Slope (ft/ft)	0.008973	Area (sq ft)		2430.26	6497.01
Q Total (cfs)	29100.00	Flow (cfs)		20135.41	8964.59
Top Width (ft)	3014.72	Top Width (ft)		1035.06	1979.66
Vel Total (ft/s)	7.43	Avg. Vel. (ft/s)		8.29	6.04
Max Chl Dpth (ft)	7.77	Hydr. Depth (ft)		2.35	2.25
Conv. Total (cfs)	307208.6	Conv. (cfs)		212569.4	94639.2
Length Wtd. (ft)	686.34	Wetted Per. (ft)		1035.60	660.02
Min Ch El (ft)	5818.00	Shear (lb/sq ft)		1.31	1.26
Alpha	1.06	Stream Power (lb/ft s)		10.89	7.61
Frctn Loss (ft)	5.01	Cum Volume (acre-ft)	349.55	760.39	517.91
C & E Loss (ft)	0.14	Cum SA (acres)	137.85	240.27	214.85

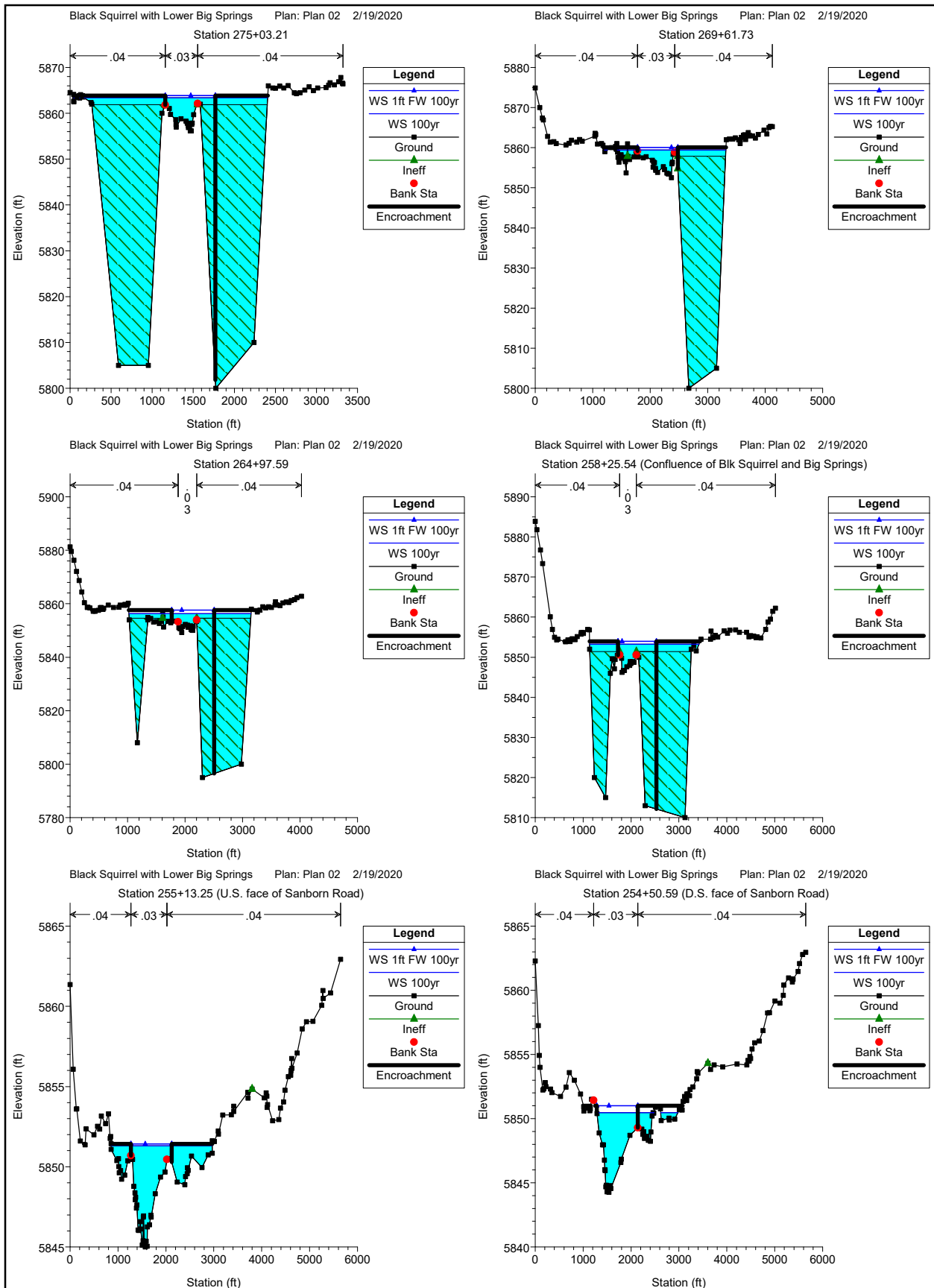
Plan: Plan-Without-Pits BlackSquirrelCrk LBS to ROB Split RS: 20250 Profile: 100yr

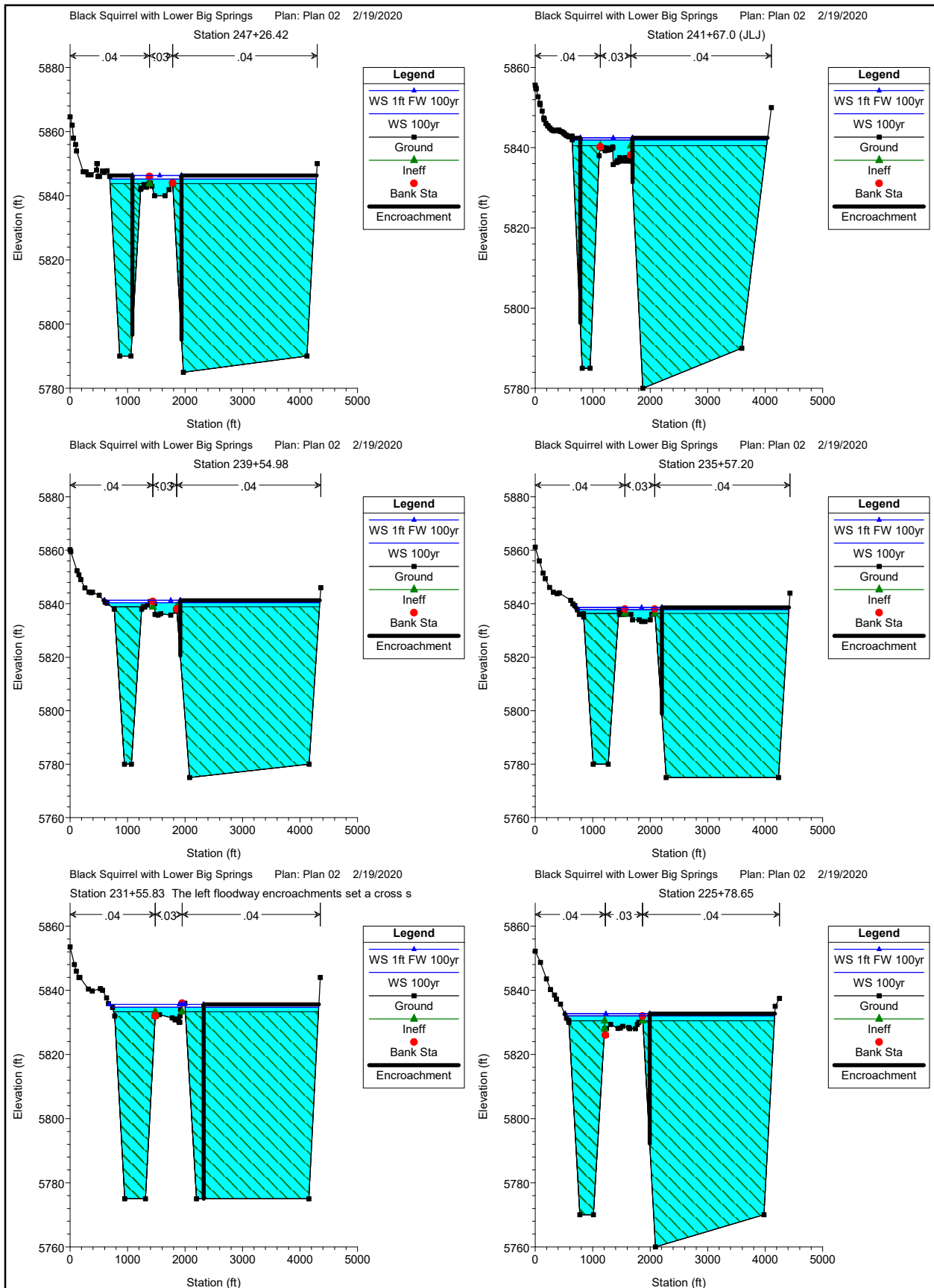
E.G. Elev (ft)	5819.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5818.56	Reach Len. (ft)	651.38	749.71	617.28
Crit W.S. (ft)	5817.68	Flow Area (sq ft)		1251.53	4161.67
E.G. Slope (ft/ft)	0.006059	Area (sq ft)		1251.53	4161.67
Q Total (cfs)	29100.00	Flow (cfs)		6565.18	22534.82
Top Width (ft)	2412.04	Top Width (ft)		788.27	1623.76
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)		5.25	5.41
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		1.59	2.56
Conv. Total (cfs)	373848.2	Conv. (cfs)		84343.0	289505.2
Length Wtd. (ft)	643.85	Wetted Per. (ft)		788.57	1624.00
Min Ch El (ft)	5814.00	Shear (lb/sq ft)		0.60	0.97
Alpha	1.00	Stream Power (lb/ft s)		3.15	5.25
Frctn Loss (ft)	5.15	Cum Volume (acre-ft)	349.55	726.04	447.06
C & E Loss (ft)	0.03	Cum SA (acres)	137.85	223.26	190.90

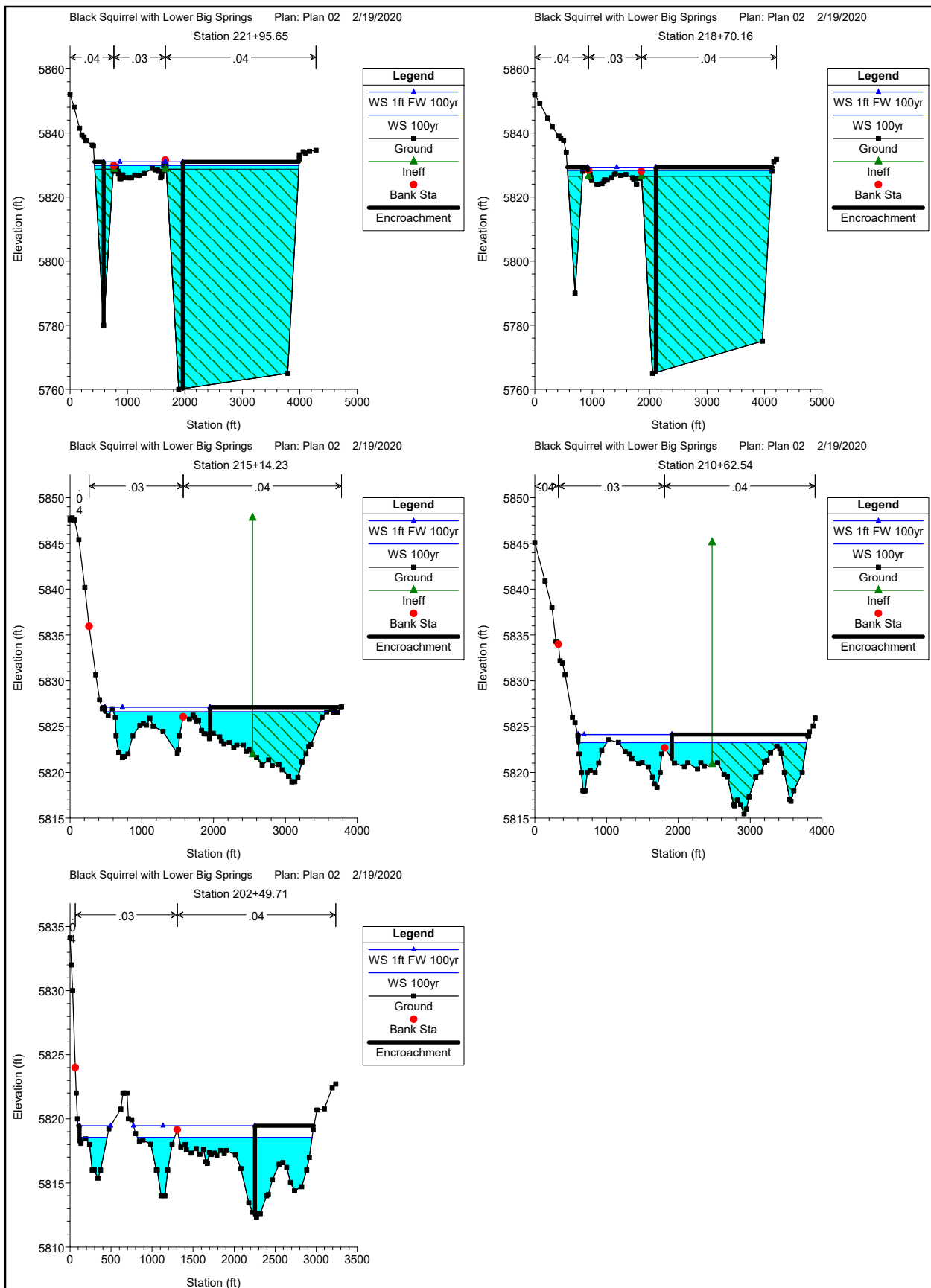












Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 34955 Profile: 100yr

E.G. Elev (ft)	5914.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5914.13	Reach Len. (ft)	455.61	456.76	458.45
Crit W.S. (ft)	5914.13	Flow Area (sq ft)	1750.86	1089.17	
E.G. Slope (ft/ft)	0.009128	Area (sq ft)	2370.87	1089.17	
Q Total (cfs)	16863.00	Flow (cfs)	7994.98	8868.02	
Top Width (ft)	2263.50	Top Width (ft)	1781.02	482.49	
Vel Total (ft/s)	5.94	Avg. Vel. (ft/s)	4.57	8.14	
Max Chl Dpth (ft)	4.45	Hydr. Depth (ft)	1.39	2.26	
Conv. Total (cfs)	176501.4	Conv. (cfs)	83681.7	92819.7	
Length Wtd. (ft)	456.20	Wetted Per. (ft)	1261.39	482.60	
Min Ch El (ft)	5910.34	Shear (lb/sq ft)	0.79	1.29	
Alpha	1.27	Stream Power (lb/ft s)	3.61	10.47	
Frctn Loss (ft)	2.23	Cum Volume (acre-ft)	12647.19	268.80	1482.44
C & E Loss (ft)	0.11	Cum SA (acres)	296.57	84.07	29.64

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 34498 Profile: 100yr

E.G. Elev (ft)	5911.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5911.23	Reach Len. (ft)	299.30	318.67	327.60
Crit W.S. (ft)	5910.65	Flow Area (sq ft)	2788.54	1462.83	
E.G. Slope (ft/ft)	0.003043	Area (sq ft)	4500.99	1462.83	
Q Total (cfs)	16863.00	Flow (cfs)	8474.89	8388.11	
Top Width (ft)	2670.19	Top Width (ft)	2189.09	481.09	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	3.04	5.73	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)	1.72	3.04	
Conv. Total (cfs)	305667.1	Conv. (cfs)	153620.0	152047.1	
Length Wtd. (ft)	310.62	Wetted Per. (ft)	1623.69	481.20	
Min Ch El (ft)	5906.10	Shear (lb/sq ft)	0.33	0.58	
Alpha	1.33	Stream Power (lb/ft s)	0.99	3.31	
Frctn Loss (ft)	1.13	Cum Volume (acre-ft)	12611.25	255.42	1482.44
C & E Loss (ft)	0.03	Cum SA (acres)	275.80	79.02	29.64

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 34180 Profile: 100yr

E.G. Elev (ft)	5910.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5909.75	Reach Len. (ft)	581.80	646.49	770.50
Crit W.S. (ft)	5909.28	Flow Area (sq ft)	1612.56	1522.19	
E.G. Slope (ft/ft)	0.004444	Area (sq ft)	4083.50	1522.19	
Q Total (cfs)	16863.00	Flow (cfs)	5547.79	11315.21	
Top Width (ft)	2763.96	Top Width (ft)	2313.45	450.51	
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	3.44	7.43	
Max Chl Dpth (ft)	6.02	Hydr. Depth (ft)	1.32	3.38	
Conv. Total (cfs)	252951.0	Conv. (cfs)	83218.8	169732.2	
Length Wtd. (ft)	630.41	Wetted Per. (ft)	1218.07	450.64	
Min Ch El (ft)	5903.73	Shear (lb/sq ft)	0.37	0.94	
Alpha	1.42	Stream Power (lb/ft s)	1.26	6.97	
Frctn Loss (ft)	3.40	Cum Volume (acre-ft)	12581.76	244.50	1482.44
C & E Loss (ft)	0.08	Cum SA (acres)	260.33	75.61	29.64

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 33533 Profile: 100yr

E.G. Elev (ft)	5906.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5905.48	Reach Len. (ft)	518.83	531.98	578.90
Crit W.S. (ft)	5905.48	Flow Area (sq ft)	627.07	1360.51	
E.G. Slope (ft/ft)	0.006698	Area (sq ft)	129660.70	1360.51	
Q Total (cfs)	16863.00	Flow (cfs)	2834.31	14028.69	
Top Width (ft)	3112.39	Top Width (ft)	2777.88	334.51	
Vel Total (ft/s)	8.48	Avg. Vel. (ft/s)	4.52	10.31	
Max Chl Dpth (ft)	70.48	Hydr. Depth (ft)	1.81	4.07	
Conv. Total (cfs)	206038.7	Conv. (cfs)	34630.7	171408.1	
Length Wtd. (ft)	527.91	Wetted Per. (ft)	345.94	335.37	
Min Ch El (ft)	5898.57	Shear (lb/sq ft)	0.76	1.70	
Alpha	1.28	Stream Power (lb/ft s)	3.43	17.49	
Frctn Loss (ft)	3.33	Cum Volume (acre-ft)	11688.59	223.11	1482.44
C & E Loss (ft)	0.26	Cum SA (acres)	226.33	69.78	29.64

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 33001 Profile: 100yr

E.G. Elev (ft)	5900.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5899.55	Reach Len. (ft)	377.13	358.33	352.96
Crit W.S. (ft)	5899.55	Flow Area (sq ft)	2577.26	1194.08	
E.G. Slope (ft/ft)	0.005959	Area (sq ft)	132866.00	1194.08	18477.52
Q Total (cfs)	16863.00	Flow (cfs)	7599.48	9263.52	
Top Width (ft)	3367.68	Top Width (ft)	2464.74	412.34	490.60
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)	2.95	7.76	
Max Chl Dpth (ft)	64.55	Hydr. Depth (ft)	1.05	2.90	
Conv. Total (cfs)	218447.9	Conv. (cfs)	98445.7	120002.2	
Length Wtd. (ft)	365.54	Wetted Per. (ft)	2481.66	413.15	
Min Ch El (ft)	5895.91	Shear (lb/sq ft)	0.39	1.08	
Alpha	1.85	Stream Power (lb/ft s)	1.14	8.34	
Frctn Loss (ft)	2.10	Cum Volume (acre-ft)	10125.15	207.51	1359.66
C & E Loss (ft)	0.01	Cum SA (acres)	195.11	65.22	26.38

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 32643 Profile: 100yr

E.G. Elev (ft)	5896.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5896.00	Reach Len. (ft)	577.75	702.39	421.88
Crit W.S. (ft)	5896.00	Flow Area (sq ft)	2085.77	1679.02	
E.G. Slope (ft/ft)	0.005564	Area (sq ft)	129310.90	1679.02	22583.17
Q Total (cfs)	16863.00	Flow (cfs)	5340.61	11522.39	
Top Width (ft)	3579.56	Top Width (ft)	2330.97	659.99	588.60
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)	2.56	6.86	
Max Chl Dpth (ft)	61.00	Hydr. Depth (ft)	0.89	2.54	
Conv. Total (cfs)	226060.4	Conv. (cfs)	71594.7	154465.7	
Length Wtd. (ft)	653.32	Wetted Per. (ft)	2348.26	663.29	
Min Ch El (ft)	5889.14	Shear (lb/sq ft)	0.31	0.88	
Alpha	1.71	Stream Power (lb/ft s)	0.79	6.03	
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	8990.23	195.69	1193.31
C & E Loss (ft)	0.01	Cum SA (acres)	174.35	60.81	22.00

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 31940 Profile: 100yr

E.G. Elev (ft)	5892.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5891.96	Reach Len. (ft)	259.81	271.87	261.48
Crit W.S. (ft)	5891.96	Flow Area (sq ft)	2496.25	1112.35	
E.G. Slope (ft/ft)	0.005467	Area (sq ft)	109426.60	1112.35	9883.27
Q Total (cfs)	16863.00	Flow (cfs)	7937.67	8925.33	
Top Width (ft)	3103.97	Top Width (ft)	1987.58	340.07	776.33
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)	3.18	8.02	
Max Chl Dpth (ft)	61.96	Hydr. Depth (ft)	1.26	3.27	
Conv. Total (cfs)	228062.2	Conv. (cfs)	107352.3	120709.9	
Length Wtd. (ft)	266.64	Wetted Per. (ft)	2006.04	343.00	
Min Ch El (ft)	5885.43	Shear (lb/sq ft)	0.42	1.11	
Alpha	1.78	Stream Power (lb/ft s)	1.35	8.88	
Frctn Loss (ft)	1.42	Cum Volume (acre-ft)	7407.00	173.19	1036.09
C & E Loss (ft)	0.07	Cum SA (acres)	145.71	52.75	15.40

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 31669 Profile: 100yr

E.G. Elev (ft)	5889.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5889.29	Reach Len. (ft)	324.99	330.00	328.42
Crit W.S. (ft)	5889.08	Flow Area (sq ft)	2243.83	1718.79	
E.G. Slope (ft/ft)	0.005225	Area (sq ft)	91184.27	1718.79	
Q Total (cfs)	16863.00	Flow (cfs)	6694.27	10168.73	
Top Width (ft)	2705.52	Top Width (ft)	1897.16	808.36	
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	2.98	5.92	
Max Chl Dpth (ft)	64.29	Hydr. Depth (ft)	1.18	2.13	
Conv. Total (cfs)	233284.5	Conv. (cfs)	92609.2	140675.3	
Length Wtd. (ft)	327.82	Wetted Per. (ft)	1916.00	809.18	
Min Ch El (ft)	5884.78	Shear (lb/sq ft)	0.38	0.69	
Alpha	1.36	Stream Power (lb/ft s)	1.14	4.10	
Frctn Loss (ft)	2.22	Cum Volume (acre-ft)	6808.74	164.35	1006.42
C & E Loss (ft)	0.02	Cum SA (acres)	134.13	49.17	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 31339 Profile: 100yr

E.G. Elev (ft)	5887.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5886.85	Reach Len. (ft)	431.77	472.71	429.95
Crit W.S. (ft)	5886.85	Flow Area (sq ft)	1960.81	1181.34	
E.G. Slope (ft/ft)	0.009106	Area (sq ft)	82177.98	1181.34	
Q Total (cfs)	16863.00	Flow (cfs)	7981.91	8881.09	
Top Width (ft)	2162.48	Top Width (ft)	1575.08	587.39	
Vel Total (ft/s)	5.37	Avg. Vel. (ft/s)	4.07	7.52	
Max Chl Dpth (ft)	61.85	Hydr. Depth (ft)	1.24	2.01	
Conv. Total (cfs)	176715.8	Conv. (cfs)	83646.4	93069.4	
Length Wtd. (ft)	449.63	Wetted Per. (ft)	1593.39	588.90	
Min Ch El (ft)	5881.58	Shear (lb/sq ft)	0.70	1.14	
Alpha	1.31	Stream Power (lb/ft s)	2.85	8.57	
Frctn Loss (ft)	2.79	Cum Volume (acre-ft)	6162.03	153.37	1006.42
C & E Loss (ft)	0.08	Cum SA (acres)	121.18	43.88	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 30866 Profile: 100yr

E.G. Elev (ft)	5884.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5883.69	Reach Len. (ft)	381.72	525.73	605.99
Crit W.S. (ft)	5883.37	Flow Area (sq ft)	3288.46	912.94	
E.G. Slope (ft/ft)	0.004485	Area (sq ft)	102456.30	912.94	
Q Total (cfs)	16863.00	Flow (cfs)	11029.06	5833.94	
Top Width (ft)	2427.20	Top Width (ft)	2086.68	340.52	
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)	3.35	6.39	
Max Chl Dpth (ft)	63.69	Hydr. Depth (ft)	1.58	2.68	
Conv. Total (cfs)	251788.0	Conv. (cfs)	164679.2	87108.8	
Length Wtd. (ft)	437.24	Wetted Per. (ft)	2104.56	341.44	
Min Ch El (ft)	5878.74	Shear (lb/sq ft)	0.44	0.75	
Alpha	1.33	Stream Power (lb/ft s)	1.47	4.78	
Frctn Loss (ft)	2.28	Cum Volume (acre-ft)	5246.98	142.00	1006.42
C & E Loss (ft)	0.01	Cum SA (acres)	103.03	38.84	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 30340 Profile: 100yr

E.G. Elev (ft)	5881.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5881.35	Reach Len. (ft)	335.79	356.02	418.52
Crit W.S. (ft)	5881.23	Flow Area (sq ft)	2757.68	1108.12	
E.G. Slope (ft/ft)	0.006115	Area (sq ft)	108733.10	1108.12	
Q Total (cfs)	16863.00	Flow (cfs)	9693.80	7169.20	
Top Width (ft)	2563.65	Top Width (ft)	2053.27	510.37	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)	3.52	6.47	
Max Chl Dpth (ft)	61.35	Hydr. Depth (ft)	1.34	2.17	
Conv. Total (cfs)	215635.9	Conv. (cfs)	123959.7	91676.2	
Length Wtd. (ft)	342.61	Wetted Per. (ft)	2071.77	513.33	
Min Ch El (ft)	5877.18	Shear (lb/sq ft)	0.51	0.82	
Alpha	1.31	Stream Power (lb/ft s)	1.79	5.33	
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	4321.65	129.81	1006.42
C & E Loss (ft)	0.00	Cum SA (acres)	84.89	33.71	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 29984 Profile: 100yr

E.G. Elev (ft)	5879.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5879.45	Reach Len. (ft)	281.57	319.11	328.22
Crit W.S. (ft)	5879.05	Flow Area (sq ft)	3953.53	1054.58	
E.G. Slope (ft/ft)	0.005223	Area (sq ft)	100270.80	1054.58	
Q Total (cfs)	23714.00	Flow (cfs)	17195.58	6518.43	
Top Width (ft)	2363.76	Top Width (ft)	1899.91	463.84	
Vel Total (ft/s)	4.74	Avg. Vel. (ft/s)	4.35	6.18	
Max Chl Dpth (ft)	64.45	Hydr. Depth (ft)	2.08	2.27	
Conv. Total (cfs)	328130.6	Conv. (cfs)	237935.2	90195.5	
Length Wtd. (ft)	293.53	Wetted Per. (ft)	1917.25	464.77	
Min Ch El (ft)	5873.15	Shear (lb/sq ft)	0.67	0.74	
Alpha	1.08	Stream Power (lb/ft s)	2.92	4.57	
Frctn Loss (ft)	2.43	Cum Volume (acre-ft)	3516.07	120.97	1006.42
C & E Loss (ft)	0.03	Cum SA (acres)	69.65	29.73	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 29665 Profile: 100yr

E.G. Elev (ft)	5877.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5876.64	Reach Len. (ft)	284.00	326.80	348.43
Crit W.S. (ft)	5876.64	Flow Area (sq ft)	2618.72	1052.63	
E.G. Slope (ft/ft)	0.015151	Area (sq ft)	95122.95	1052.63	
Q Total (cfs)	23714.00	Flow (cfs)	15120.40	8593.60	
Top Width (ft)	2506.68	Top Width (ft)	1828.74	677.94	
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)	5.77	8.16	
Max Chl Dpth (ft)	61.64	Hydr. Depth (ft)	1.43	1.55	
Conv. Total (cfs)	192654.8	Conv. (cfs)	122839.6	69815.2	
Length Wtd. (ft)	304.98	Wetted Per. (ft)	1845.52	679.31	
Min Ch El (ft)	5872.00	Shear (lb/sq ft)	1.34	1.47	
Alpha	1.09	Stream Power (lb/ft s)	7.75	11.97	
Frctn Loss (ft)	2.71	Cum Volume (acre-ft)	2884.56	113.25	1006.42
C & E Loss (ft)	0.02	Cum SA (acres)	57.60	25.55	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 29338 Profile: 100yr

E.G. Elev (ft)	5874.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5873.69	Reach Len. (ft)	252.33	279.96	309.87
Crit W.S. (ft)	5873.52	Flow Area (sq ft)	2370.88	1908.33	
E.G. Slope (ft/ft)	0.005841	Area (sq ft)	79903.99	1908.33	
Q Total (cfs)	23714.00	Flow (cfs)	9060.61	14653.39	
Top Width (ft)	2152.54	Top Width (ft)	1499.04	653.50	
Vel Total (ft/s)	5.54	Avg. Vel. (ft/s)	3.82	7.68	
Max Chl Dpth (ft)	63.69	Hydr. Depth (ft)	1.58	2.92	
Conv. Total (cfs)	310297.4	Conv. (cfs)	118557.9	191739.5	
Length Wtd. (ft)	269.03	Wetted Per. (ft)	1518.03	660.51	
Min Ch El (ft)	5865.76	Shear (lb/sq ft)	0.57	1.05	
Alpha	1.37	Stream Power (lb/ft s)	2.18	8.09	
Frctn Loss (ft)	1.06	Cum Volume (acre-ft)	2314.00	102.14	1006.42
C & E Loss (ft)	0.07	Cum SA (acres)	46.75	20.55	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 29058 Profile: 100yr

E.G. Elev (ft)	5873.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	5872.79	Reach Len. (ft)	287.77	305.83	246.30
Crit W.S. (ft)	5872.14	Flow Area (sq ft)	3072.46	2250.44	
E.G. Slope (ft/ft)	0.002850	Area (sq ft)	73826.62	2250.44	
Q Total (cfs)	23714.00	Flow (cfs)	9697.36	14016.64	
Top Width (ft)	2132.85	Top Width (ft)	1511.67	621.18	
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)	3.16	6.23	
Max Chl Dpth (ft)	62.79	Hydr. Depth (ft)	2.03	3.62	
Conv. Total (cfs)	444230.0	Conv. (cfs)	181658.9	262571.1	
Length Wtd. (ft)	298.65	Wetted Per. (ft)	1530.15	622.46	
Min Ch El (ft)	5867.03	Shear (lb/sq ft)	0.36	0.64	
Alpha	1.36	Stream Power (lb/ft s)	1.13	4.01	
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	1868.74	88.78	1006.42
C & E Loss (ft)	0.04	Cum SA (acres)	38.03	16.46	13.07

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 28752 Profile: 100yr

E.G. Elev (ft)	5872.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5871.19	Reach Len. (ft)	417.55	492.07	349.60
Crit W.S. (ft)	5871.15	Flow Area (sq ft)	2325.80	1713.03	37.10
E.G. Slope (ft/ft)	0.005756	Area (sq ft)	72441.63	1713.03	37.85
Q Total (cfs)	23714.00	Flow (cfs)	8801.44	14808.21	104.35
Top Width (ft)	2018.32	Top Width (ft)	1476.06	489.86	52.40
Vel Total (ft/s)	5.82	Avg. Vel. (ft/s)	3.78	8.64	2.81
Max Chl Dpth (ft)	66.19	Hydr. Depth (ft)	1.58	3.50	0.71
Conv. Total (cfs)	312574.8	Conv. (cfs)	116012.0	195187.3	1375.5
Length Wtd. (ft)	461.15	Wetted Per. (ft)	1494.79	490.96	52.74
Min Ch El (ft)	5865.79	Shear (lb/sq ft)	0.56	1.25	0.25
Alpha	1.54	Stream Power (lb/ft s)	2.12	10.84	0.71
Frctn Loss (ft)	2.54	Cum Volume (acre-ft)	1385.60	74.86	1006.32
C & E Loss (ft)	0.00	Cum SA (acres)	28.16	12.56	12.92

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 28260 Profile: 100yr

E.G. Elev (ft)	5869.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5868.61	Reach Len. (ft)	295.34	373.33	252.51
Crit W.S. (ft)	5868.61	Flow Area (sq ft)	1486.06	1812.47	863.46
E.G. Slope (ft/ft)	0.005269	Area (sq ft)	42343.08	1812.47	21357.02
Q Total (cfs)	23714.00	Flow (cfs)	4940.00	15773.72	3000.28
Top Width (ft)	2122.34	Top Width (ft)	1067.76	480.20	574.38
Vel Total (ft/s)	5.70	Avg. Vel. (ft/s)	3.32	8.70	3.47
Max Chl Dpth (ft)	63.61	Hydr. Depth (ft)	1.39	3.77	1.50
Conv. Total (cfs)	326697.2	Conv. (cfs)	68056.1	217307.5	41333.6
Length Wtd. (ft)	339.82	Wetted Per. (ft)	1085.66	481.25	590.27
Min Ch El (ft)	5861.58	Shear (lb/sq ft)	0.45	1.24	0.48
Alpha	1.67	Stream Power (lb/ft s)	1.50	10.78	1.67
Frctn Loss (ft)	1.66	Cum Volume (acre-ft)	835.45	54.95	920.46
C & E Loss (ft)	0.00	Cum SA (acres)	15.97	7.08	10.40

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 27887 Profile: 100yr

E.G. Elev (ft)	5867.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5866.36	Reach Len. (ft)	397.19	383.75	354.51
Crit W.S. (ft)	5866.36	Flow Area (sq ft)	1468.07	1673.62	1178.24
E.G. Slope (ft/ft)	0.004533	Area (sq ft)	37398.05	1673.62	33607.47
Q Total (cfs)	23714.00	Flow (cfs)	4745.68	15068.21	3900.11
Top Width (ft)	2113.69	Top Width (ft)	980.20	376.85	756.64
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)	3.23	9.00	3.31
Max Chl Dpth (ft)	61.36	Hydr. Depth (ft)	1.50	4.44	1.56
Conv. Total (cfs)	352234.9	Conv. (cfs)	70489.7	223815.0	57930.1
Length Wtd. (ft)	381.42	Wetted Per. (ft)	999.03	377.24	773.81
Min Ch El (ft)	5859.15	Shear (lb/sq ft)	0.42	1.26	0.43
Alpha	1.84	Stream Power (lb/ft s)	1.34	11.30	1.43
Frctn Loss (ft)	1.71	Cum Volume (acre-ft)	565.13	40.01	761.15
C & E Loss (ft)	0.01	Cum SA (acres)	9.03	3.40	6.54

Plan: Plan 02 BlackSquirrelCrk US to LBS RS: 27503 Profile: 100yr

E.G. Elev (ft)	5864.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5863.40	Reach Len. (ft)	541.48	541.48	541.48
Crit W.S. (ft)	5863.40	Flow Area (sq ft)	1405.33	1733.70	1272.43
E.G. Slope (ft/ft)	0.004448	Area (sq ft)	36265.81	1733.70	37689.98
Q Total (cfs)	23714.00	Flow (cfs)	4342.88	15308.97	4062.14
Top Width (ft)	2247.47	Top Width (ft)	1000.05	395.86	851.56
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	3.09	8.83	3.19
Max Chl Dpth (ft)	63.40	Hydr. Depth (ft)	1.41	4.38	1.49
Conv. Total (cfs)	355582.3	Conv. (cfs)	65119.9	229552.2	60910.3
Length Wtd. (ft)	541.48	Wetted Per. (ft)	1014.28	396.66	869.87
Min Ch El (ft)	5856.14	Shear (lb/sq ft)	0.38	1.21	0.41
Alpha	1.86	Stream Power (lb/ft s)	1.19	10.72	1.30
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	229.29	25.00	471.03
C & E Loss (ft)	0.03	Cum SA (acres)			

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 26962 Profile: 100yr

E.G. Elev (ft)	5860.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5859.43	Reach Len. (ft)	465.72	464.14	428.10
Crit W.S. (ft)	5859.43	Flow Area (sq ft)	502.37	2289.31	1350.95
E.G. Slope (ft/ft)	0.006873	Area (sq ft)	624.75	2289.31	38094.59
Q Total (cfs)	29100.00	Flow (cfs)	1941.73	21723.14	5435.13
Top Width (ft)	1934.02	Top Width (ft)	395.88	650.21	887.93
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)	3.87	9.49	4.02
Max Chl Dpth (ft)	59.43	Hydr. Depth (ft)	1.27	3.52	1.52
Conv. Total (cfs)	351001.4	Conv. (cfs)	23421.0	262022.4	65558.0
Length Wtd. (ft)	457.52	Wetted Per. (ft)	397.67	651.73	904.82
Min Ch El (ft)	5852.51	Shear (lb/sq ft)	0.54	1.51	0.64
Alpha	1.44	Stream Power (lb/ft s)	2.10	14.30	2.58
Frctn Loss (ft)	2.63	Cum Volume (acre-ft)	2129.68	1029.84	11793.79
C & E Loss (ft)	0.06	Cum SA (acres)	204.42	322.40	459.92

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 26498 Profile: 100yr

E.G. Elev (ft)	5857.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5856.28	Reach Len. (ft)	589.32	672.05	619.01
Crit W.S. (ft)	5856.22	Flow Area (sq ft)	1812.72	1546.48	1584.65
E.G. Slope (ft/ft)	0.004885	Area (sq ft)	9618.54	1546.48	47612.08
Q Total (cfs)	29100.00	Flow (cfs)	8246.97	15145.09	5707.94
Top Width (ft)	2115.05	Top Width (ft)	846.09	324.12	944.85
Vel Total (ft/s)	5.89	Avg. Vel. (ft/s)	4.55	9.79	3.60
Max Chl Dpth (ft)	61.28	Hydr. Depth (ft)	2.14	4.77	1.68
Conv. Total (cfs)	416331.8	Conv. (cfs)	117988.9	216679.8	81663.1
Length Wtd. (ft)	641.64	Wetted Per. (ft)	861.09	325.04	969.83
Min Ch El (ft)	5849.26	Shear (lb/sq ft)	0.64	1.45	0.50
Alpha	1.68	Stream Power (lb/ft s)	2.92	14.21	1.80
Frctn Loss (ft)	3.02	Cum Volume (acre-ft)	2074.93	1009.40	11372.64
C & E Loss (ft)	0.00	Cum SA (acres)	197.78	317.21	450.91

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 25826 Profile: 100yr

E.G. Elev (ft)	5854.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5853.25	Reach Len. (ft)	304.11	312.29	311.37
Crit W.S. (ft)	5853.25	Flow Area (sq ft)	1154.09	1729.65	2261.09
E.G. Slope (ft/ft)	0.004533	Area (sq ft)	13100.01	1729.65	40890.34
Q Total (cfs)	29100.00	Flow (cfs)	4295.54	16706.52	8097.94
Top Width (ft)	2283.11	Top Width (ft)	625.11	350.07	1307.94
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)	3.72	9.66	3.58
Max Chl Dpth (ft)	43.25	Hydr. Depth (ft)	1.85	4.94	1.73
Conv. Total (cfs)	432199.1	Conv. (cfs)	63798.2	248128.6	120272.3
Length Wtd. (ft)	311.29	Wetted Per. (ft)	635.76	350.91	1319.62
Min Ch El (ft)	5846.21	Shear (lb/sq ft)	0.51	1.40	0.48
Alpha	1.85	Stream Power (lb/ft s)	1.91	13.47	1.74
Frctn Loss (ft)	1.60	Cum Volume (acre-ft)	1921.25	984.13	10743.80
C & E Loss (ft)	0.01	Cum SA (acres)	187.83	312.01	434.91

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 25513 Profile: 100yr

E.G. Elev (ft)	5852.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5851.31	Reach Len. (ft)	62.66	62.66	62.66
Crit W.S. (ft)	5851.31	Flow Area (sq ft)	468.51	2663.68	1230.80
E.G. Slope (ft/ft)	0.005878	Area (sq ft)	468.51	2663.68	1230.80
Q Total (cfs)	29100.00	Flow (cfs)	1458.72	23465.79	4175.50
Top Width (ft)	2109.77	Top Width (ft)	409.84	753.22	946.71
Vel Total (ft/s)	6.67	Avg. Vel. (ft/s)	3.11	8.81	3.39
Max Chl Dpth (ft)	6.31	Hydr. Depth (ft)	1.14	3.54	1.30
Conv. Total (cfs)	379543.2	Conv. (cfs)	19025.7	306057.7	54459.9
Length Wtd. (ft)	62.66	Wetted Per. (ft)	409.92	753.89	946.81
Min Ch El (ft)	5845.00	Shear (lb/sq ft)	0.42	1.30	0.48
Alpha	1.45	Stream Power (lb/ft s)	1.31	11.42	1.62
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	1873.88	968.38	10593.26
C & E Loss (ft)	0.03	Cum SA (acres)	184.22	308.06	426.85

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 25451 Profile: 100yr

E.G. Elev (ft)	5851.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5850.47	Reach Len. (ft)	614.30	724.17	589.89
Crit W.S. (ft)	5850.47	Flow Area (sq ft)		2839.33	660.04
E.G. Slope (ft/ft)	0.007260	Area (sq ft)		2839.33	660.04
Q Total (cfs)	29100.00	Flow (cfs)		26696.42	2403.58
Top Width (ft)	1547.47	Top Width (ft)		853.66	693.81
Vel Total (ft/s)	8.32	Avg. Vel. (ft/s)		9.40	3.64
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		3.33	0.95
Conv. Total (cfs)	341522.5	Conv. (cfs)		313313.7	28208.8
Length Wtd. (ft)	685.77	Wetted Per. (ft)		853.85	693.91
Min Ch El (ft)	5844.26	Shear (lb/sq ft)		1.51	0.43
Alpha	1.19	Stream Power (lb/ft s)		14.17	1.57
Frctn Loss (ft)	4.02	Cum Volume (acre-ft)	1873.55	964.42	10591.90
C & E Loss (ft)	0.18	Cum SA (acres)	183.92	306.90	425.67

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 24726 Profile: 100yr

E.G. Elev (ft)	5845.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5845.23	Reach Len. (ft)	568.78	559.66	318.68
Crit W.S. (ft)	5845.23	Flow Area (sq ft)	977.19	1621.09	3579.53
E.G. Slope (ft/ft)	0.004826	Area (sq ft)	20873.83	1621.09	134418.50
Q Total (cfs)	29100.00	Flow (cfs)	3135.37	14289.23	11675.40
Top Width (ft)	3584.02	Top Width (ft)	688.26	394.98	2500.78
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	3.21	8.81	3.26
Max Chl Dpth (ft)	60.23	Hydr. Depth (ft)	1.42	4.10	1.43
Conv. Total (cfs)	418907.3	Conv. (cfs)	45135.0	205699.7	168072.5
Length Wtd. (ft)	469.48	Wetted Per. (ft)	704.83	395.35	2518.97
Min Ch El (ft)	5840.00	Shear (lb/sq ft)	0.42	1.24	0.43
Alpha	1.96	Stream Power (lb/ft s)	1.34	10.89	1.40
Frctn Loss (ft)	2.15	Cum Volume (acre-ft)	1726.36	927.35	9677.28
C & E Loss (ft)	0.01	Cum SA (acres)	179.07	296.52	404.04

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 24167 Profile: 100yr

E.G. Elev (ft)	5842.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5841.92	Reach Len. (ft)	195.53	211.79	527.93
Crit W.S. (ft)	5841.84	Flow Area (sq ft)	686.19	2073.18	3355.91
E.G. Slope (ft/ft)	0.004336	Area (sq ft)	17652.44	2073.18	116322.90
Q Total (cfs)	29100.00	Flow (cfs)	2060.28	16737.79	10301.93
Top Width (ft)	3393.76	Top Width (ft)	486.75	531.00	2376.01
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)	3.00	8.07	3.07
Max Chl Dpth (ft)	61.92	Hydr. Depth (ft)	1.41	3.90	1.41
Conv. Total (cfs)	441901.5	Conv. (cfs)	31286.7	254173.7	156441.2
Length Wtd. (ft)	331.81	Wetted Per. (ft)	504.63	532.36	2387.27
Min Ch El (ft)	5835.77	Shear (lb/sq ft)	0.37	1.05	0.38
Alpha	1.83	Stream Power (lb/ft s)	1.11	8.51	1.17
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)	1474.83	903.62	8760.09
C & E Loss (ft)	0.00	Cum SA (acres)	171.40	290.57	386.20

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 23955 Profile: 100yr

E.G. Elev (ft)	5841.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5840.35	Reach Len. (ft)	391.60	397.78	392.04
Crit W.S. (ft)	5840.35	Flow Area (sq ft)	970.82	1597.56	3614.45
E.G. Slope (ft/ft)	0.004951	Area (sq ft)	18866.67	1597.56	143852.20
Q Total (cfs)	29100.00	Flow (cfs)	2978.81	14069.18	12052.01
Top Width (ft)	3631.93	Top Width (ft)	744.66	396.81	2490.46
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	3.07	8.81	3.33
Max Chl Dpth (ft)	65.35	Hydr. Depth (ft)	1.30	4.03	1.45
Conv. Total (cfs)	413577.9	Conv. (cfs)	42335.7	199955.4	171286.8
Length Wtd. (ft)	394.78	Wetted Per. (ft)	763.28	397.70	2508.56
Min Ch El (ft)	5835.74	Shear (lb/sq ft)	0.39	1.24	0.45
Alpha	1.94	Stream Power (lb/ft s)	1.21	10.93	1.48
Frctn Loss (ft)	2.20	Cum Volume (acre-ft)	1392.87	894.69	7183.48
C & E Loss (ft)	0.00	Cum SA (acres)	168.63	288.32	356.71

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 23557 Profile: 100yr

E.G. Elev (ft)	5838.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5837.79	Reach Len. (ft)	393.92	401.37	367.59
Crit W.S. (ft)	5837.79	Flow Area (sq ft)	931.73	1661.20	3245.63
E.G. Slope (ft/ft)	0.006318	Area (sq ft)	25829.36	1661.20	134487.20
Q Total (cfs)	29100.00	Flow (cfs)	3040.89	14183.00	11876.12
Top Width (ft)	3635.45	Top Width (ft)	783.52	519.48	2332.44
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	3.26	8.54	3.66
Max Chl Dpth (ft)	62.79	Hydr. Depth (ft)	1.19	3.20	1.39
Conv. Total (cfs)	366112.9	Conv. (cfs)	38258.0	178439.1	149415.8
Length Wtd. (ft)	385.99	Wetted Per. (ft)	801.91	520.16	2352.63
Min Ch El (ft)	5833.34	Shear (lb/sq ft)	0.46	1.26	0.54
Alpha	1.69	Stream Power (lb/ft s)	1.50	10.75	1.99
Frctn Loss (ft)	2.66	Cum Volume (acre-ft)	1191.97	879.81	5930.95
C & E Loss (ft)	0.00	Cum SA (acres)	161.77	284.13	335.00

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 23156 Profile: 100yr

E.G. Elev (ft)	5835.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5834.70	Reach Len. (ft)	530.91	577.18	509.09
Crit W.S. (ft)	5834.70	Flow Area (sq ft)	1032.28	1346.21	3255.02
E.G. Slope (ft/ft)	0.007520	Area (sq ft)	32314.00	1346.21	127671.30
Q Total (cfs)	29100.00	Flow (cfs)	4048.09	11995.84	13056.07
Top Width (ft)	3523.86	Top Width (ft)	750.12	449.86	2323.87
Vel Total (ft/s)	5.17	Avg. Vel. (ft/s)	3.92	8.91	4.01
Max Chl Dpth (ft)	59.70	Hydr. Depth (ft)	1.38	2.99	1.40
Conv. Total (cfs)	335578.1	Conv. (cfs)	46682.1	138334.8	150561.2
Length Wtd. (ft)	543.38	Wetted Per. (ft)	768.55	450.50	2342.71
Min Ch El (ft)	5830.00	Shear (lb/sq ft)	0.63	1.40	0.65
Alpha	1.58	Stream Power (lb/ft s)	2.47	12.50	2.62
Frctn Loss (ft)	2.79	Cum Volume (acre-ft)	929.07	865.96	4824.81
C & E Loss (ft)	0.06	Cum SA (acres)	154.83	279.67	315.36

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 22579 Profile: 100yr

E.G. Elev (ft)	5832.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5832.06	Reach Len. (ft)	358.55	383.00	362.63
Crit W.S. (ft)	5831.76	Flow Area (sq ft)	1093.26	2189.03	3578.84
E.G. Slope (ft/ft)	0.003734	Area (sq ft)	27340.91	2189.03	140521.00
Q Total (cfs)	29100.00	Flow (cfs)	3304.77	14953.81	10841.42
Top Width (ft)	3638.49	Top Width (ft)	693.46	644.94	2300.09
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)	3.02	6.83	3.03
Max Chl Dpth (ft)	72.06	Hydr. Depth (ft)	1.58	3.39	1.56
Conv. Total (cfs)	476229.3	Conv. (cfs)	54083.5	244723.1	177422.7
Length Wtd. (ft)	373.72	Wetted Per. (ft)	711.40	645.55	2321.37
Min Ch El (ft)	5826.00	Shear (lb/sq ft)	0.36	0.79	0.36
Alpha	1.58	Stream Power (lb/ft s)	1.08	5.40	1.09
Frctn Loss (ft)	1.90	Cum Volume (acre-ft)	565.53	842.54	3257.62
C & E Loss (ft)	0.02	Cum SA (acres)	146.03	272.41	288.34

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 22196 Profile: 100yr

E.G. Elev (ft)	5830.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5829.91	Reach Len. (ft)	314.79	325.49	318.98
Crit W.S. (ft)	5829.91	Flow Area (sq ft)	402.81	2225.13	2797.92
E.G. Slope (ft/ft)	0.007308	Area (sq ft)	8337.21	2225.13	141942.30
Q Total (cfs)	29100.00	Flow (cfs)	1400.38	17671.98	10027.64
Top Width (ft)	3515.24	Top Width (ft)	337.16	865.68	2312.40
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	3.48	7.94	3.58
Max Chl Dpth (ft)	69.91	Hydr. Depth (ft)	1.19	2.57	1.21
Conv. Total (cfs)	340392.8	Conv. (cfs)	16380.8	206715.2	117296.7
Length Wtd. (ft)	322.22	Wetted Per. (ft)	351.68	866.24	2333.79
Min Ch El (ft)	5825.71	Shear (lb/sq ft)	0.52	1.17	0.55
Alpha	1.51	Stream Power (lb/ft s)	1.82	9.31	1.96
Frctn Loss (ft)	1.66	Cum Volume (acre-ft)	418.69	823.13	2081.88
C & E Loss (ft)	0.10	Cum SA (acres)	141.79	265.77	269.14

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 21870 Profile: 100yr

E.G. Elev (ft)	5828.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.040	0.030	0.040
W.S. Elev (ft)	5828.36	Reach Len. (ft)	350.43	355.93	352.22
Crit W.S. (ft)	5827.79	Flow Area (sq ft)	499.54	2306.79	4230.15
E.G. Slope (ft/ft)	0.003826	Area (sq ft)	5109.82	2306.79	122329.60
Q Total (cfs)	29100.00	Flow (cfs)	1409.03	13085.39	14605.58
Top Width (ft)	3549.98	Top Width (ft)	356.48	915.34	2278.16
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	2.82	5.67	3.45
Max Chl Dpth (ft)	63.36	Hydr. Depth (ft)	1.40	2.52	1.86
Conv. Total (cfs)	470453.2	Conv. (cfs)	22779.5	211548.5	236125.2
Length Wtd. (ft)	354.05	Wetted Per. (ft)	367.29	915.63	2296.57
Min Ch El (ft)	5824.00	Shear (lb/sq ft)	0.32	0.60	0.44
Alpha	1.22	Stream Power (lb/ft s)	0.92	3.41	1.52
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)	370.10	806.20	1114.28
C & E Loss (ft)	0.02	Cum SA (acres)	139.29	259.12	252.33

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 21514 Profile: 100yr

E.G. Elev (ft)	5827.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5826.60	Reach Len. (ft)	433.05	451.69	437.90
Crit W.S. (ft)	5825.81	Flow Area (sq ft)		2565.72	2544.67
E.G. Slope (ft/ft)	0.005023	Area (sq ft)		2565.72	7623.99
Q Total (cfs)	29100.00	Flow (cfs)		16327.36	12772.63
Top Width (ft)	3070.38	Top Width (ft)		1050.69	2019.69
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)		6.36	5.02
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		2.44	2.63
Conv. Total (cfs)	410594.1	Conv. (cfs)		230375.3	180218.9
Length Wtd. (ft)	446.54	Wetted Per. (ft)		1051.19	966.68
Min Ch El (ft)	5821.60	Shear (lb/sq ft)		0.77	0.83
Alpha	1.04	Stream Power (lb/ft s)		4.87	4.14
Frctn Loss (ft)	2.94	Cum Volume (acre-ft)	349.55	786.29	588.89
C & E Loss (ft)	0.04	Cum SA (acres)	137.85	251.09	234.95

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 21063 Profile: 100yr

E.G. Elev (ft)	5824.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5823.24	Reach Len. (ft)	934.05	812.83	579.12
Crit W.S. (ft)	5823.12	Flow Area (sq ft)		2430.26	1484.24
E.G. Slope (ft/ft)	0.008973	Area (sq ft)		2430.26	6497.01
Q Total (cfs)	29100.00	Flow (cfs)		20135.41	8964.59
Top Width (ft)	3014.72	Top Width (ft)		1035.06	1979.66
Vel Total (ft/s)	7.43	Avg. Vel. (ft/s)		8.29	6.04
Max Chl Dpth (ft)	7.77	Hydr. Depth (ft)		2.35	2.25
Conv. Total (cfs)	307208.6	Conv. (cfs)		212569.4	94639.2
Length Wtd. (ft)	686.34	Wetted Per. (ft)		1035.60	660.02
Min Ch El (ft)	5818.00	Shear (lb/sq ft)		1.31	1.26
Alpha	1.06	Stream Power (lb/ft s)		10.89	7.61
Frctn Loss (ft)	5.01	Cum Volume (acre-ft)	349.55	760.39	517.91
C & E Loss (ft)	0.14	Cum SA (acres)	137.85	240.27	214.85

Plan: Plan 02 BlackSquirrelCrk LBS to ROB Split RS: 20250 Profile: 100yr

E.G. Elev (ft)	5819.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.030	0.040
W.S. Elev (ft)	5818.56	Reach Len. (ft)	651.38	749.71	617.28
Crit W.S. (ft)	5817.68	Flow Area (sq ft)		1251.53	4161.67
E.G. Slope (ft/ft)	0.006059	Area (sq ft)		1251.53	4161.67
Q Total (cfs)	29100.00	Flow (cfs)		6565.18	22534.82
Top Width (ft)	2412.04	Top Width (ft)		788.27	1623.76
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)		5.25	5.41
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		1.59	2.56
Conv. Total (cfs)	373848.2	Conv. (cfs)		84343.0	289505.2
Length Wtd. (ft)	643.85	Wetted Per. (ft)		788.57	1624.00
Min Ch El (ft)	5814.00	Shear (lb/sq ft)		0.60	0.97
Alpha	1.00	Stream Power (lb/ft s)		3.15	5.25
Frctn Loss (ft)	5.15	Cum Volume (acre-ft)	349.55	726.04	447.06
C & E Loss (ft)	0.03	Cum SA (acres)	137.85	223.26	190.90

Appendix D. Standard Table 1 and Standard Table 2
from the HEC-RAS Outputs

HEC-RAS Profile: 100yr

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
US to LBS	43811	100yr	Plan 02	25150.00	5980.85	5985.83	5985.73	5986.34	0.007506	7.42	5194.98	3716.81	0.87
US to LBS	43811	100yr	Plan-Without-Pits	25150.00	5980.85	5985.83	5985.73	5986.34	0.007506	7.42	5194.98	3716.81	0.87
US to LBS	43800			Lat Struct									
US to LBS	43661	100yr	Plan 02	24250.00	5979.11	5984.56	5984.56	5985.16	0.006550	8.86	5218.49	3769.32	0.86
US to LBS	43661	100yr	Plan-Without-Pits	24250.00	5979.11	5984.56	5984.56	5985.16	0.006550	8.86	5218.49	3769.32	0.86
US to LBS	43535	100yr	Plan 02	23479.00	5978.18	5983.43	5983.43	5983.96	0.005231	8.51	5548.62	4002.15	0.78
US to LBS	43535	100yr	Plan-Without-Pits	23479.00	5978.18	5983.43	5983.43	5983.96	0.005231	8.51	5548.62	4002.15	0.78
US to LBS	43259	100yr	Plan 02	20580.00	5976.37	5982.57	5981.87	5982.91	0.001657	6.30	5927.46	3246.39	0.47
US to LBS	43259	100yr	Plan-Without-Pits	20580.00	5976.37	5982.57	5981.87	5982.91	0.001657	6.30	5927.46	3246.39	0.47
US to LBS	43022	100yr	Plan 02	18183.00	5974.53	5981.61	5981.61	5982.35	0.003571	9.84	3972.48	2664.64	0.70
US to LBS	43022	100yr	Plan-Without-Pits	18183.00	5974.53	5981.61	5981.61	5982.35	0.003571	9.84	3972.48	2664.64	0.70
US to LBS	43020			Bridge									
US to LBS	42986	100yr	Plan 02	18183.00	5974.22	5980.58	5980.58	5981.42	0.004905	10.73	3855.60	2594.58	0.80
US to LBS	42986	100yr	Plan-Without-Pits	18183.00	5974.22	5980.58	5980.58	5981.42	0.004905	10.73	3855.60	2594.58	0.80
US to LBS	42985			Lat Struct									
US to LBS	42600	100yr	Plan 02	18053.00	5969.06	5975.97	5975.97	5976.43	0.004188	7.76	4569.51	3163.76	0.70
US to LBS	42600	100yr	Plan-Without-Pits	18053.00	5969.06	5975.97	5975.97	5976.43	0.004188	7.76	4569.51	3163.76	0.70
US to LBS	42004	100yr	Plan 02	18053.00	5963.99	5970.75	5970.75	5971.71	0.005505	8.23	2746.00	1879.96	0.79
US to LBS	42004	100yr	Plan-Without-Pits	18053.00	5963.99	5970.75	5970.75	5971.71	0.005505	8.23	2746.00	1879.96	0.79
US to LBS	41722	100yr	Plan 02	18053.00	5962.00	5969.17	5969.17	5969.81	0.004785	7.29	3766.93	3105.26	0.73
US to LBS	41722	100yr	Plan-Without-Pits	18053.00	5962.00	5969.17	5969.17	5969.81	0.004785	7.29	3766.93	3105.26	0.73
US to LBS	41431	100yr	Plan 02	18053.00	5960.00	5966.35	5966.35	5966.95	0.005274	7.14	3954.60	3381.14	0.75
US to LBS	41431	100yr	Plan-Without-Pits	18053.00	5960.00	5966.35	5966.35	5966.95	0.005274	7.14	3954.60	3381.14	0.75
US to LBS	41325	100yr	Plan 02	18053.00	5959.81	5964.95	5964.95	5965.88	0.007637	8.50	2833.40	2436.38	0.90
US to LBS	41325	100yr	Plan-Without-Pits	18053.00	5959.81	5964.95	5964.95	5965.88	0.007637	8.50	2833.40	2436.38	0.90
US to LBS	41200	100yr	Plan 02	18053.00	5958.00	5964.00	5963.67	5964.45	0.003559	6.26	4240.01	2832.59	0.63
US to LBS	41200	100yr	Plan-Without-Pits	18053.00	5958.00	5964.00	5963.67	5964.45	0.003559	6.26	4240.01	2832.59	0.63
US to LBS	41023	100yr	Plan 02	18053.00	5958.00	5963.19	5963.19	5963.77	0.004457	7.45	4133.81	3218.29	0.71
US to LBS	41023	100yr	Plan-Without-Pits	18053.00	5958.00	5963.19	5963.19	5963.77	0.004457	7.45	4133.81	3218.29	0.71
US to LBS	40602	100yr	Plan 02	18053.00	5955.57	5959.44	5959.44	5960.02	0.006891	7.79	3660.55	2928.82	0.85
US to LBS	40602	100yr	Plan-Without-Pits	18053.00	5955.57	5959.44	5959.44	5960.02	0.006891	7.79	3660.55	2928.82	0.85
US to LBS	40100	100yr	Plan 02	18053.00	5952.00	5955.65	5955.48	5955.98	0.007742	6.11	4319.41	3814.49	0.84
US to LBS	40100	100yr	Plan-Without-Pits	18053.00	5952.00	5955.65	5955.48	5955.98	0.007742	6.11	4319.41	3814.49	0.84
US to LBS	39500	100yr	Plan 02	18053.00	5948.00	5951.37	5951.30	5951.88	0.006493	7.45	4182.46	3671.71	0.82
US to LBS	39500	100yr	Plan-Without-Pits	18053.00	5948.00	5951.37	5951.30	5951.88	0.006493	7.45	4182.46	3671.71	0.82
US to LBS	39000	100yr	Plan 02	18053.00	5944.58	5947.34	5947.34	5947.83	0.011459	7.14	3708.82	3556.58	1.01
US to LBS	39000	100yr	Plan-Without-Pits	18053.00	5944.58	5947.34	5947.34	5947.83	0.011459	7.14	3708.82	3556.58	1.01
US to LBS	38735	100yr	Plan 02	18053.00	5940.49	5945.05	5944.63	5945.23	0.004112	4.33	5594.43	4020.42	0.60
US to LBS	38735	100yr	Plan-Without-Pits	18053.00	5940.49	5945.05	5944.63	5945.23	0.004112	4.33	5594.43	4020.42	0.60
US to LBS	38312	100yr	Plan 02	18053.00	5939.97	5943.33	5943.17	5943.66	0.004965	5.94	4830.73	3812.26	0.70
US to LBS	38312	100yr	Plan-Without-Pits	18053.00	5939.97	5943.33	5943.17	5943.66	0.004965	5.94	4830.73	3812.26	0.70
US to LBS	38000	100yr	Plan 02	18053.00	5939.03	5940.76	5940.73	5941.17	0.014851	6.61	3715.40	3796.50	1.09
US to LBS	38000	100yr	Plan-Without-Pits	18053.00	5939.03	5940.76	5940.73	5941.17	0.014851	6.61	3715.40	3796.50	1.09
US to LBS	37805	100yr	Plan 02	18053.00	5936.12	5939.61	5938.75	5939.74	0.002598	3.87	6399.96	3873.35	0.50
US to LBS	37805	100yr	Plan-Without-Pits	18053.00	5936.12	5939.61	5938.75	5939.74	0.002598	3.87	6399.96	3873.35	0.50
US to LBS	37800			Lat Struct									
US to LBS	37500	100yr	Plan 02	16863.00	5932.00	5937.78	5937.07	5937.94	0.003593	3.76	5227.96	3537.02	0.56
US to LBS	37500	100yr	Plan-Without-Pits	16863.00	5932.00	5937.78	5937.07	5937.94	0.003593	3.76	5227.96	3537.02	0.56
US to LBS	37481			Culvert									
US to LBS	37431	100yr	Plan 02	16863.00	5924.00	5937.16	5937.16	5937.55	0.007553	6.89	3812.04	2846.51	0.85
US to LBS	37431	100yr	Plan-Without-Pits	16863.00	5924.00	5937.16	5937.16	5937.55	0.007553	6.89	3812.04	2846.51	0.85
US to LBS	37000	100yr	Plan 02	16863.00	5924.00	5930.49	5930.49	5931.39	0.005458	8.82	2860.44	1613.56	0.80
US to LBS	37000	100yr	Plan-Without-Pits	16863.00	5924.00	5930.49	5930.49	5931.39	0.005458	8.82	2860.44	1613.56	0.80
US to LBS	36600	100yr	Plan 02	16863.00	5922.00	5927.34	5927.02	5927.94	0.005802	7.99	3336.83	1937.43	0.80
US to LBS	36600	100yr	Plan-Without-Pits	16863.00	5922.00	5927.34	5927.02	5927.94	0.005802	7.99	3336.83	1937.43	0.80
US to LBS	36150	100yr	Plan 02	16863.00	5919.96	5924.41	5924.41	5925.30	0.006719	8.42	2680.30	1652.29	0.86
US to LBS	36150	100yr	Plan-Without-Pits	16863.00	5919.96	5924.41	5924.41	5925.30	0.006719	8.42	2680.30	1652.29	0.86

HEC-RAS Profile: 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
US to LBS	35800	100yr	Plan 02	16863.00	5917.04	5920.81	5920.81	5921.93	0.012800	9.70	2103.51	1371.08	1.13
US to LBS	35800	100yr	Plan-Without-Pits	16863.00	5917.04	5920.81	5920.81	5921.93	0.012800	9.70	2103.51	1371.08	1.13
US to LBS	35400	100yr	Plan 02	16863.00	5913.88	5917.49	5917.34	5917.85	0.005155	6.07	3683.82	2163.61	0.72
US to LBS	35400	100yr	Plan-Without-Pits	16863.00	5913.88	5917.49	5917.34	5917.85	0.005155	6.07	3683.82	2163.61	0.72
US to LBS	34955	100yr	Plan 02	16863.00	5910.34	5914.13	5914.13	5914.83	0.009128	8.14	2840.03	2263.50	0.96
US to LBS	34955	100yr	Plan-Without-Pits	16863.00	5910.34	5914.13	5914.13	5914.83	0.009128	8.14	2840.03	2263.50	0.96
US to LBS	34498	100yr	Plan 02	16863.00	5906.10	5911.23	5910.65	5911.55	0.003043	5.73	4251.36	2670.19	0.58
US to LBS	34498	100yr	Plan-Without-Pits	16863.00	5906.10	5911.23	5910.65	5911.55	0.003041	5.73	4252.39	2670.29	0.58
US to LBS	34180	100yr	Plan 02	16863.00	5903.73	5909.75	5909.28	5910.39	0.004444	7.43	3134.75	2763.96	0.71
US to LBS	34180	100yr	Plan-Without-Pits	16863.00	5903.73	5909.75	5909.28	5910.39	0.004447	7.44	3133.93	2763.61	0.71
US to LBS	33533	100yr	Plan 02	16863.00	5898.57	5905.48	5905.48	5906.90	0.006698	10.31	1987.58	3112.39	0.90
US to LBS	33533	100yr	Plan-Without-Pits	16863.00	5898.57	5905.48	5905.48	5906.90	0.006698	10.31	1987.58	2727.09	0.90
US to LBS	33001	100yr	Plan 02	16863.00	5895.91	5899.55	5899.55	5900.12	0.005959	7.76	3771.33	3367.68	0.80
US to LBS	33001	100yr	Plan-Without-Pits	16863.00	5895.91	5900.43	5900.43	5902.12	0.008258	10.55	1655.40	2539.15	0.98
US to LBS	32643	100yr	Plan 02	16863.00	5889.14	5896.00	5896.00	5896.53	0.005564	6.86	3764.78	3579.56	0.76
US to LBS	32643	100yr	Plan-Without-Pits	16863.00	5889.14	5897.15	5896.21	5897.87	0.003623	6.81	2477.00	2571.16	0.64
US to LBS	31940	100yr	Plan 02	16863.00	5885.43	5891.96	5891.96	5892.57	0.005467	8.02	3608.60	3103.97	0.78
US to LBS	31940	100yr	Plan-Without-Pits	16863.00	5885.43	5892.70	5892.70	5894.08	0.008795	10.05	1937.98	2239.38	0.99
US to LBS	31669	100yr	Plan 02	16863.00	5884.78	5889.29	5889.08	5889.67	0.005225	5.92	3962.62	2705.52	0.72
US to LBS	31669	100yr	Plan-Without-Pits	16863.00	5884.78	5890.07	5889.51	5890.78	0.004923	6.76	2502.92	1736.87	0.72
US to LBS	31339	100yr	Plan 02	16863.00	5881.58	5886.85	5886.85	5887.43	0.009106	7.52	3142.15	2162.48	0.93
US to LBS	31339	100yr	Plan-Without-Pits	16863.00	5881.58	5887.59	5887.54	5888.61	0.008961	8.52	2192.56	1353.77	0.96
US to LBS	30866	100yr	Plan 02	16863.00	5878.74	5883.69	5883.37	5884.02	0.004485	6.39	4201.40	2427.20	0.69
US to LBS	30866	100yr	Plan-Without-Pits	16863.00	5878.74	5884.12	5883.96	5884.86	0.007145	8.23	2652.20	1329.44	0.87
US to LBS	30340	100yr	Plan 02	16863.00	5877.18	5881.35	5881.23	5881.74	0.006115	6.47	3865.80	2563.65	0.77
US to LBS	30340	100yr	Plan-Without-Pits	16863.00	5877.18	5881.94	5881.23	5882.35	0.004060	6.14	3573.97	1699.30	0.65
US to LBS	29984	100yr	Plan 02	23714.00	5873.15	5879.45	5879.05	5879.82	0.005223	6.18	5008.11	2363.76	0.72
US to LBS	29984	100yr	Plan-Without-Pits	23714.00	5873.15	5879.58	5879.56	5880.14	0.009459	7.40	4148.06	2398.16	0.94
US to LBS	29665	100yr	Plan 02	23714.00	5872.00	5876.64	5876.64	5877.35	0.015151	8.16	3671.35	2506.68	1.16
US to LBS	29665	100yr	Plan-Without-Pits	23714.00	5872.00	5877.18	5876.86	5877.77	0.006858	6.68	3882.67	2054.52	0.82
US to LBS	29338	100yr	Plan 02	23714.00	5865.76	5873.69	5873.52	5874.34	0.005841	7.68	4279.21	2152.54	0.79
US to LBS	29338	100yr	Plan-Without-Pits	23714.00	5865.76	5874.14	5874.14	5875.45	0.007607	9.58	2773.59	1372.35	0.92
US to LBS	29058	100yr	Plan 02	23714.00	5867.03	5872.79	5872.14	5873.21	0.002850	6.23	5322.91	2132.85	0.58
US to LBS	29058	100yr	Plan-Without-Pits	23714.00	5867.03	5872.96	5872.16	5873.60	0.003619	7.21	4166.46	1788.76	0.65
US to LBS	28752	100yr	Plan 02	23714.00	5865.79	5871.19	5871.15	5872.00	0.005756	8.64	4075.93	2018.32	0.81
US to LBS	28752	100yr	Plan-Without-Pits	23714.00	5865.79	5871.62	5871.09	5872.38	0.004470	8.07	3848.60	1920.88	0.73
US to LBS	28260	100yr	Plan 02	23714.00	5861.58	5868.61	5868.61	5869.46	0.005269	8.70	4161.98	2122.34	0.79
US to LBS	28260	100yr	Plan-Without-Pits	23714.00	5861.58	5869.06	5868.99	5869.94	0.006016	8.40	3693.56	1747.90	0.82
US to LBS	27887	100yr	Plan 02	23714.00	5859.15	5866.36	5866.36	5867.22	0.004533	9.00	4319.93	2113.69	0.75
US to LBS	27887	100yr	Plan-Without-Pits	23714.00	5859.15	5866.77	5866.77	5867.79	0.005947	8.83	3472.52	1610.30	0.83
US to LBS	27503	100yr	Plan 02	23714.00	5856.14	5863.40	5863.40	5864.24	0.004448	8.83	4411.46	2247.47	0.74
US to LBS	27503	100yr	Plan-Without-Pits	23714.00	5856.14	5863.88	5863.37	5864.53	0.003617	7.29	4293.17	1721.05	0.66
LBS to ROB Split	26962	100yr	Plan 02	29100.00	5852.51	5859.43	5859.43	5860.54	0.006873	9.49	4142.64	1934.02	0.89
LBS to ROB Split	26962	100yr	Plan-Without-Pits	29100.00	5852.51	5859.86	5859.86	5861.53	0.007872	10.60	2913.87	1233.44	0.96
LBS to ROB Split	26498	100yr	Plan 02	29100.00	5849.26	5856.28	5856.22	5857.19	0.004885	9.79	4943.85	2115.05	0.79
LBS to ROB Split	26498	100yr	Plan-Without-Pits	29100.00	5849.26	5856.65	5856.25	5857.68	0.004695	9.40	4129.41	2049.78	0.77
LBS to ROB Split	25826	100yr	Plan 02	29100.00	5846.21	5853.25	5853.25	5854.17	0.004533	9.66	5144.83	2283.11	0.77
LBS to ROB Split	25826	100yr	Plan-Without-Pits	29100.00	5846.21	5853.37	5853.37	5854.51	0.005034	10.34	4391.60	2215.69	0.81
LBS to ROB Split	25513	100yr	Plan 02	29100.00	5845.00	5851.31	5851.31	5852.31	0.005878	8.81	4362.99	2109.77	0.83
LBS to ROB Split	25513	100yr	Plan-Without-Pits	29100.00	5845.00	5851.31	5851.31	5852.31	0.005878	8.81	4362.99	2109.77	0.83
LBS to ROB Split	25451	100yr	Plan 02	29100.00	5844.26	5850.47	5850.47	5851.74	0.007260	9.40	3499.37	1547.47	0.91
LBS to ROB Split	25451	100yr	Plan-Without-Pits	29100.00	5844.26	5850.49	5850.47	5851.75	0.007112	9.34	3538.80	1556.96	0.90
LBS to ROB Split	24726	100yr	Plan 02	29100.00	5840.00	5845.23	5845.23	5845.91	0.004826	8.81	6177.81	3584.02	0.77
LBS to ROB Split	24726	100yr	Plan-Without-Pits	29100.00	5840.00	5845.84	5845.57	5847.11	0.005913	9.10	3356.62	1987.31	0.83
LBS to ROB Split	24167	100yr	Plan 02	29100.00	5835.77	5841.92	5841.84	5842.56	0.004336	8.07	6115.27	3393.76	0.72
LBS to ROB Split	24167	100yr	Plan-Without-Pits	29100.00	5835.77	5842.46	5842.13	5843.73	0.006205	9.04	3239.99	972.78	0.85
LBS to ROB Split	23955	100yr	Plan 02	29100.00	5835.74	5840.35	5840.35	5841.02	0.004951	8.81	6182.83	3631.93	0.77
LBS to ROB Split	23955	100yr	Plan-Without-Pits	29100.00	5835.74	5840.90	5840.90	5842.11	0.009435	8.85	3289.76	2724.26	0.99

HEC-RAS Profile: 100yr (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
LBS to ROB Split	23557	100yr	Plan 02	29100.00	5833.34	5837.79	5837.79	5838.45	0.006318	8.54	5838.56	3635.45	0.84
LBS to ROB Split	23557	100yr	Plan-Without-Pits	29100.00	5833.34	5838.39	5837.74	5839.10	0.004508	6.75	4311.04	2666.95	0.70
LBS to ROB Split	23156	100yr	Plan 02	29100.00	5830.00	5834.70	5834.70	5835.36	0.007520	8.91	5633.51	3523.86	0.91
LBS to ROB Split	23156	100yr	Plan-Without-Pits	29100.00	5830.00	5835.26	5835.26	5836.53	0.009321	9.03	3222.45	2765.14	0.99
LBS to ROB Split	22579	100yr	Plan 02	29100.00	5826.00	5832.06	5831.76	5832.50	0.003734	6.83	6861.13	3638.49	0.65
LBS to ROB Split	22579	100yr	Plan-Without-Pits	29100.00	5826.00	5832.48	5831.76	5833.06	0.003729	6.24	4985.93	3554.89	0.64
LBS to ROB Split	22196	100yr	Plan 02	29100.00	5825.71	5829.91	5829.91	5830.59	0.007308	7.94	5425.85	3515.24	0.87
LBS to ROB Split	22196	100yr	Plan-Without-Pits	29100.00	5825.71	5830.70	5829.93	5831.42	0.004939	7.23	4446.34	3099.76	0.74
LBS to ROB Split	21870	100yr	Plan 02	29100.00	5824.00	5828.36	5827.79	5828.69	0.003826	5.67	7036.48	3549.98	0.63
LBS to ROB Split	21870	100yr	Plan-Without-Pits	29100.00	5824.00	5828.53	5828.26	5829.42	0.007800	8.28	4045.19	2979.38	0.90
LBS to ROB Split	21514	100yr	Plan 02	29100.00	5821.60	5826.60	5825.81	5827.12	0.005023	6.36	5110.39	3070.38	0.72
LBS to ROB Split	21514	100yr	Plan-Without-Pits	29100.00	5821.60	5826.60	5825.81	5827.12	0.005023	6.36	5110.39	3070.38	0.72
LBS to ROB Split	21063	100yr	Plan 02	29100.00	5818.00	5823.24	5823.12	5824.16	0.008973	8.29	3914.50	3014.72	0.95
LBS to ROB Split	21063	100yr	Plan-Without-Pits	29100.00	5818.00	5823.24	5823.12	5824.16	0.008973	8.29	3914.50	3014.72	0.95
LBS to ROB Split	20250	100yr	Plan 02	29100.00	5814.00	5818.56	5817.68	5819.01	0.006059	5.25	5413.20	2412.04	0.73
LBS to ROB Split	20250	100yr	Plan-Without-Pits	29100.00	5814.00	5818.56	5817.68	5819.01	0.006059	5.25	5413.20	2412.04	0.73
LBS to ROB Split	19500	100yr	Plan 02	29100.00	5810.00	5813.06	5812.84	5813.82	0.011029	6.18	4159.33	1968.30	0.96
LBS to ROB Split	19500	100yr	Plan-Without-Pits	29100.00	5810.00	5813.06	5812.84	5813.82	0.011029	6.18	4159.33	1968.30	0.96
LBS to ROB Split	19000	100yr	Plan 02	29100.00	5806.00	5810.09	5809.36	5810.57	0.005122	4.54	5313.64	2120.46	0.66
LBS to ROB Split	19000	100yr	Plan-Without-Pits	29100.00	5806.00	5810.09	5809.36	5810.57	0.005122	4.54	5313.64	2120.46	0.66
LBS to ROB Split	18400	100yr	Plan 02	29100.00	5804.00	5806.56	5806.27	5807.31	0.009108	5.33	4255.98	1914.56	0.86
LBS to ROB Split	18400	100yr	Plan-Without-Pits	29100.00	5804.00	5806.56	5806.27	5807.31	0.009108	5.33	4255.98	1914.56	0.86
LBS to ROB Split	17902	100yr	Plan 02	29100.00	5800.06	5805.02	5805.02	5805.27	0.002097	4.36	7261.28	2362.38	0.47
LBS to ROB Split	17902	100yr	Plan-Without-Pits	29100.00	5800.06	5805.02	5805.02	5805.27	0.002097	4.36	7261.28	2362.38	0.47
LBS to ROB Split	17102	100yr	Plan 02	29850.00	5796.00	5799.08	5798.47	5799.66	0.006553	5.63	5014.27	2072.72	0.77
LBS to ROB Split	17102	100yr	Plan-Without-Pits	29850.00	5796.00	5799.08	5798.47	5799.66	0.006553	5.63	5014.27	2072.72	0.77
LBS to ROB Split	16116	100yr	Plan 02	29850.00	5790.00	5794.63	5793.80	5795.07	0.004661	6.20	5874.81	2595.34	0.69
LBS to ROB Split	16116	100yr	Plan-Without-Pits	29850.00	5790.00	5794.63	5793.80	5795.07	0.004661	6.20	5874.81	2595.34	0.69
LBS to ROB Split	15678	100yr	Plan 02	29850.00	5788.00	5792.88	5791.98	5793.22	0.004113	5.37	6707.24	3106.22	0.64
LBS to ROB Split	15678	100yr	Plan-Without-Pits	29850.00	5788.00	5792.88	5791.98	5793.22	0.004113	5.37	6707.24	3106.22	0.64
LBS to ROB Split	14323	100yr	Plan 02	37400.00	5779.05	5785.20	5785.16	5786.20	0.007774	10.10	5413.66	2290.48	0.95
LBS to ROB Split	14323	100yr	Plan-Without-Pits	37400.00	5779.05	5785.20	5785.16	5786.20	0.007774	10.10	5413.66	2290.48	0.95
LBS to ROB Split	13646	100yr	Plan 02	37400.00	5774.00	5780.74	5780.74	5781.91	0.005511	10.32	5364.60	2000.40	0.84
LBS to ROB Split	13646	100yr	Plan-Without-Pits	37400.00	5774.00	5780.74	5780.74	5781.91	0.005511	10.32	5364.60	2000.40	0.84
LBS to ROB Split	12828	100yr	Plan 02	37400.00	5768.11	5775.38	5774.48	5776.26	0.003460	8.62	5505.41	1362.62	0.67
LBS to ROB Split	12828	100yr	Plan-Without-Pits	37400.00	5768.11	5775.38	5774.48	5776.26	0.003460	8.62	5505.41	1362.62	0.67
LBS to ROB Split	12316	100yr	Plan 02	37400.00	5765.44	5772.35	5771.83	5773.90	0.008459	10.92	3847.82	1182.25	1.00
LBS to ROB Split	12316	100yr	Plan-Without-Pits	37400.00	5765.44	5772.35	5771.83	5773.90	0.008459	10.92	3847.82	1182.25	1.00
LBS to ROB Split	11794	100yr	Plan 02	37400.00	5761.47	5768.89	5768.36	5769.99	0.006254	9.91	4626.67	1193.83	0.87
LBS to ROB Split	11794	100yr	Plan-Without-Pits	37400.00	5761.47	5768.89	5768.36	5769.99	0.006254	9.91	4626.67	1193.83	0.87
LBS to ROB Split	11152	100yr	Plan 02	37400.00	5757.31	5763.35	5763.32	5764.69	0.009728	10.78	4280.30	1593.46	1.05
LBS to ROB Split	11152	100yr	Plan-Without-Pits	37400.00	5757.31	5763.35	5763.32	5764.69	0.009728	10.78	4280.30	1593.46	1.05
LBS to ROB Split	10798	100yr	Plan 02	37400.00	5754.00	5759.77	5759.77	5761.15	0.010376	10.96	4413.52	1759.10	1.08
LBS to ROB Split	10798	100yr	Plan-Without-Pits	37400.00	5754.00	5759.77	5759.77	5761.15	0.010376	10.96	4413.52	1759.10	1.08
LBS to ROB Split	10341	100yr	Plan 02	37400.00	5750.24	5755.39	5755.04	5756.63	0.006342	9.47	4415.03	1342.86	0.87
LBS to ROB Split	10341	100yr	Plan-Without-Pits	37400.00	5750.24	5755.39	5755.04	5756.63	0.006342	9.47	4415.03	1342.86	0.87
LBS to ROB Split	9906	100yr	Plan 02	37400.00	5746.99	5752.71	5752.29	5753.95	0.005812	9.61	4456.29	1227.84	0.84
LBS to ROB Split	9906	100yr	Plan-Without-Pits	37400.00	5746.99	5752.71	5752.29	5753.95	0.005812	9.61	4456.29	1227.84	0.84
LBS to ROB Split	9098	100yr	Plan 02	37400.00	5739.13	5747.14	5747.14	5748.96	0.006594	11.45	3764.00	988.95	0.92
LBS to ROB Split	9098	100yr	Plan-Without-Pits	37400.00	5739.13	5747.14	5747.14	5748.96	0.006594	11.45	3764.00	988.95	0.92
LBS to ROB Split	8267	100yr	Plan 02	37400.00	5734.00	5742.22	5741.71	5743.50	0.005929	9.23	4270.01	1252.03	0.84
LBS to ROB Split	8267	100yr	Plan-Without-Pits	37400.00	5734.00	5742.22	5741.71	5743.50	0.005929	9.23	4270.01	1252.03	0.84
LBS to ROB Split	7560	100yr	Plan 02	37400.00	5732.00	5738.43	5737.89	5739.53	0.005221	8.44	4474.01	1371.11	0.78
LBS to ROB Split	7560	100yr	Plan-Without-Pits	37400.00	5732.00	5738.43	5737.89	5739.53	0.005221	8.44	4474.01	1371.11	0.78
LBS to ROB Split	6915	100yr	Plan 02	37400.00	5727.97	5734.19	5734.19	5735.53	0.007425	9.93	4543.64	2429.45	0.93
LBS to ROB Split	6915	100yr	Plan-Without-Pits	37400.00	5727.97	5734.19	5734.19	5735.53	0.007425	9.93	4543.64	2429.45	0.93
LBS to ROB Split	6525	100yr	Plan 02	37400.00	5724.00	5730.87	5730.87	5732.54	0.006149	10.63	4014.16	1965.57	0.88
LBS to ROB Split	6525	100yr	Plan-Without-Pits	37400.00	5724.00	5730.87	5730.87	5732.54	0.006149	10.63	4014.16	1965.57	0.88

HEC-RAS Profile: 100yr

Reach	River Sta	Profile	Plan	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
US to LBS	43811	100yr	Plan 02	5986.34	5985.83	0.51	1.17	0.01	12867.68	11572.00	710.32	3716.81
US to LBS	43811	100yr	Plan-Without-Pits	5986.34	5985.83	0.51	1.17	0.01	12867.68	11572.00	710.32	3716.81
US to LBS	43800			Lat Struct								
US to LBS	43661	100yr	Plan 02	5985.16	5984.56	0.60	0.90	0.02	12528.04	9697.40	2024.56	3769.32
US to LBS	43661	100yr	Plan-Without-Pits	5985.16	5984.56	0.60	0.90	0.02	12528.04	9697.40	2024.56	3769.32
US to LBS	43535	100yr	Plan 02	5983.96	5983.43	0.52	0.81	0.09	11577.86	8785.19	3115.96	4002.15
US to LBS	43535	100yr	Plan-Without-Pits	5983.96	5983.43	0.52	0.81	0.09	11577.86	8785.19	3115.96	4002.15
US to LBS	43259	100yr	Plan 02	5982.91	5982.57	0.34	0.52	0.04	11185.17	9393.55	1.28	3246.39
US to LBS	43259	100yr	Plan-Without-Pits	5982.91	5982.57	0.34	0.52	0.04	11185.17	9393.55	1.28	3246.39
US to LBS	43022	100yr	Plan 02	5982.35	5981.61	0.74	0.01	0.13	10346.06	7836.94		2664.64
US to LBS	43022	100yr	Plan-Without-Pits	5982.35	5981.61	0.74	0.01	0.13	10346.06	7836.94		2664.64
US to LBS	43020			Bridge								
US to LBS	42986	100yr	Plan 02	5981.42	5980.58	0.84	1.01	0.19	10758.45	7424.55		2594.58
US to LBS	42986	100yr	Plan-Without-Pits	5981.42	5980.58	0.84	1.01	0.19	10758.45	7424.55		2594.58
US to LBS	42985			Lat Struct								
US to LBS	42600	100yr	Plan 02	5976.43	5975.97	0.47	2.79	0.05	7427.39	7397.68	3227.93	3163.76
US to LBS	42600	100yr	Plan-Without-Pits	5976.43	5975.97	0.47	2.79	0.05	7427.39	7397.68	3227.93	3163.76
US to LBS	42004	100yr	Plan 02	5971.71	5970.75	0.96	1.42	0.09	1793.92	16259.08		1879.96
US to LBS	42004	100yr	Plan-Without-Pits	5971.71	5970.75	0.96	1.42	0.09	1793.92	16259.08		1879.96
US to LBS	41722	100yr	Plan 02	5969.81	5969.17	0.64	1.47	0.01	4034.78	13612.25	405.97	3105.26
US to LBS	41722	100yr	Plan-Without-Pits	5969.81	5969.17	0.64	1.47	0.01	4034.78	13612.25	405.97	3105.26
US to LBS	41431	100yr	Plan 02	5966.95	5966.35	0.60	0.71	0.03	4832.37	13057.29	163.34	3381.14
US to LBS	41431	100yr	Plan-Without-Pits	5966.95	5966.35	0.60	0.71	0.03	4832.37	13057.29	163.34	3381.14
US to LBS	41325	100yr	Plan 02	5965.88	5964.95	0.93	0.67	0.14	3632.59	14420.41		2436.38
US to LBS	41325	100yr	Plan-Without-Pits	5965.88	5964.95	0.93	0.67	0.14	3632.59	14420.41		2436.38
US to LBS	41200	100yr	Plan 02	5964.45	5964.00	0.45	0.68	0.01	5622.12	12430.89	0.00	2832.59
US to LBS	41200	100yr	Plan-Without-Pits	5964.45	5964.00	0.45	0.68	0.01	5622.12	12430.89	0.00	2832.59
US to LBS	41023	100yr	Plan 02	5963.77	5963.19	0.57	2.45	0.00	6905.83	11147.17		3218.29
US to LBS	41023	100yr	Plan-Without-Pits	5963.77	5963.19	0.57	2.45	0.00	6905.83	11147.17		3218.29
US to LBS	40602	100yr	Plan 02	5960.02	5959.44	0.59	3.76	0.08	8596.89	9456.11		2928.82
US to LBS	40602	100yr	Plan-Without-Pits	5960.02	5959.44	0.59	3.76	0.08	8596.89	9456.11		2928.82
US to LBS	40100	100yr	Plan 02	5955.98	5955.65	0.33	4.09	0.02	11615.62	6437.38		3814.49
US to LBS	40100	100yr	Plan-Without-Pits	5955.98	5955.65	0.33	4.09	0.02	11615.62	6437.38		3814.49
US to LBS	39500	100yr	Plan 02	5951.88	5951.37	0.51	4.04	0.01	8772.61	9280.39		3671.71
US to LBS	39500	100yr	Plan-Without-Pits	5951.88	5951.37	0.51	4.04	0.01	8772.61	9280.39		3671.71
US to LBS	39000	100yr	Plan 02	5947.83	5947.34	0.48	1.80	0.09	9868.44	8184.56		3556.58
US to LBS	39000	100yr	Plan-Without-Pits	5947.83	5947.34	0.48	1.80	0.09	9868.44	8184.56		3556.58
US to LBS	38735	100yr	Plan 02	5945.23	5945.05	0.18	1.55	0.02	12463.10	5589.90		4020.42
US to LBS	38735	100yr	Plan-Without-Pits	5945.23	5945.05	0.18	1.55	0.02	12463.10	5589.90		4020.42
US to LBS	38312	100yr	Plan 02	5943.66	5943.33	0.33	2.48	0.01	9079.30	8973.70		3812.26
US to LBS	38312	100yr	Plan-Without-Pits	5943.66	5943.33	0.33	2.48	0.01	9079.30	8973.70		3812.26
US to LBS	38000	100yr	Plan 02	5941.17	5940.76	0.41	1.29	0.14	12902.91	5150.09		3796.50
US to LBS	38000	100yr	Plan-Without-Pits	5941.17	5940.76	0.41	1.29	0.14	12902.91	5150.09		3796.50
US to LBS	37805	100yr	Plan 02	5939.74	5939.61	0.14	1.79	0.00	13766.27	4286.55	0.18	3873.35
US to LBS	37805	100yr	Plan-Without-Pits	5939.74	5939.61	0.14	1.79	0.00	13766.27	4286.55	0.18	3873.35
US to LBS	37800			Lat Struct								
US to LBS	37500	100yr	Plan 02	5937.94	5937.78	0.16			14896.82	1831.37	134.81	3537.02
US to LBS	37500	100yr	Plan-Without-Pits	5937.94	5937.78	0.16			14896.82	1831.37	134.81	3537.02
US to LBS	37481			Culvert								
US to LBS	37431	100yr	Plan 02	5937.55	5937.16	0.39	2.79	0.15	11284.43	5578.55	0.02	2846.51
US to LBS	37431	100yr	Plan-Without-Pits	5937.55	5937.16	0.39	2.79	0.15	11284.43	5578.55	0.02	2846.51
US to LBS	37000	100yr	Plan 02	5931.39	5930.49	0.90	2.26	0.09	5066.95	11796.05		1613.56
US to LBS	37000	100yr	Plan-Without-Pits	5931.39	5930.49	0.90	2.26	0.09	5066.95	11796.05		1613.56
US to LBS	36600	100yr	Plan 02	5927.94	5927.34	0.59	2.61	0.03	8762.01	8100.99		1937.43
US to LBS	36600	100yr	Plan-Without-Pits	5927.94	5927.34	0.59	2.61	0.03	8762.01	8100.99		1937.43

HEC-RAS Profile: 100yr (Continued)

Reach	River Sta	Profile	Plan	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
US to LBS	36150	100yr	Plan 02	5925.30	5924.41	0.89	3.18	0.02	3804.01	13058.99		1652.29
US to LBS	36150	100yr	Plan-Without-Pits	5925.30	5924.41	0.89	3.18	0.02	3804.01	13058.99		1652.29
US to LBS	35800	100yr	Plan 02	5921.93	5920.81	1.12	3.44	0.23	7139.65	9723.35		1371.08
US to LBS	35800	100yr	Plan-Without-Pits	5921.93	5920.81	1.12	3.44	0.23	7139.65	9723.35		1371.08
US to LBS	35400	100yr	Plan 02	5917.85	5917.49	0.36	2.99	0.03	11903.56	4959.44		2163.61
US to LBS	35400	100yr	Plan-Without-Pits	5917.85	5917.49	0.36	2.99	0.03	11903.56	4959.44		2163.61
US to LBS	34955	100yr	Plan 02	5914.83	5914.13	0.70	2.23	0.11	7994.98	8868.02		2263.50
US to LBS	34955	100yr	Plan-Without-Pits	5914.83	5914.13	0.70	2.23	0.11	7994.98	8868.02		2263.50
US to LBS	34498	100yr	Plan 02	5911.55	5911.23	0.33	1.13	0.03	8474.89	8388.11		2670.19
US to LBS	34498	100yr	Plan-Without-Pits	5911.55	5911.23	0.33	1.13	0.03	8475.68	8387.32		2670.29
US to LBS	34180	100yr	Plan 02	5910.39	5909.75	0.64	3.40	0.08	5547.79	11315.21		2763.96
US to LBS	34180	100yr	Plan-Without-Pits	5910.39	5909.75	0.64	3.40	0.08	5546.55	11316.45		2763.61
US to LBS	33533	100yr	Plan 02	5906.90	5905.48	1.43	3.33	0.26	2834.31	14028.69		3112.39
US to LBS	33533	100yr	Plan-Without-Pits	5906.90	5905.48	1.43	3.94	0.03	2834.31	14028.69		2727.09
US to LBS	33001	100yr	Plan 02	5900.12	5899.55	0.57	2.10	0.01	7599.48	9263.52		3367.68
US to LBS	33001	100yr	Plan-Without-Pits	5902.12	5900.43	1.70	1.88	0.29	386.45	16476.55		2539.15
US to LBS	32643	100yr	Plan 02	5896.53	5896.00	0.53	3.60	0.01	5340.61	11522.39		3579.56
US to LBS	32643	100yr	Plan-Without-Pits	5897.87	5897.15	0.72	3.72	0.07		16863.00		2571.16
US to LBS	31940	100yr	Plan 02	5892.57	5891.96	0.60	1.42	0.07	7937.67	8925.33		3103.97
US to LBS	31940	100yr	Plan-Without-Pits	5894.08	5892.70	1.38	1.75	0.20	2782.60	14080.40		2239.38
US to LBS	31669	100yr	Plan 02	5889.67	5889.29	0.38	2.22	0.02	6694.27	10168.73		2705.52
US to LBS	31669	100yr	Plan-Without-Pits	5890.78	5890.07	0.71	2.14	0.03	4.41	16858.59		1736.87
US to LBS	31339	100yr	Plan 02	5887.43	5886.85	0.58	2.79	0.08	7981.91	8881.09		2162.48
US to LBS	31339	100yr	Plan-Without-Pits	5888.61	5887.59	1.01	3.67	0.08	2654.06	14208.94		1353.77
US to LBS	30866	100yr	Plan 02	5884.02	5883.69	0.33	2.28	0.01	11029.06	5833.94		2427.20
US to LBS	30866	100yr	Plan-Without-Pits	5884.86	5884.12	0.74	2.41	0.10	8076.26	8786.74		1329.44
US to LBS	30340	100yr	Plan 02	5881.74	5881.35	0.39	1.91	0.00	9693.80	7169.20		2563.65
US to LBS	30340	100yr	Plan-Without-Pits	5882.35	5881.94	0.41	2.19	0.02	8214.50	8648.50		1699.30
US to LBS	29984	100yr	Plan 02	5879.82	5879.45	0.38	2.43	0.03	17195.58	6518.43		2363.76
US to LBS	29984	100yr	Plan-Without-Pits	5880.14	5879.58	0.56	2.37	0.00	15372.89	8341.11		2398.16
US to LBS	29665	100yr	Plan 02	5877.35	5876.64	0.71	2.71	0.02	15120.40	8593.60		2506.68
US to LBS	29665	100yr	Plan-Without-Pits	5877.77	5877.18	0.59	2.25	0.07	14229.93	9484.07		2054.52
US to LBS	29338	100yr	Plan 02	5874.34	5873.69	0.65	1.06	0.07	9060.61	14653.39		2152.54
US to LBS	29338	100yr	Plan-Without-Pits	5875.45	5874.14	1.31	1.39	0.20	2582.44	21131.57		1372.35
US to LBS	29058	100yr	Plan 02	5873.21	5872.79	0.42	1.17	0.04	9697.36	14016.64		2132.85
US to LBS	29058	100yr	Plan-Without-Pits	5873.60	5872.96	0.64	1.20	0.01	6722.50	16991.50		1788.76
US to LBS	28752	100yr	Plan 02	5872.00	5871.19	0.81	2.54	0.00	8801.44	14808.21	104.35	2018.32
US to LBS	28752	100yr	Plan-Without-Pits	5872.38	5871.62	0.76	2.43	0.01	8157.19	15556.81		1920.88
US to LBS	28260	100yr	Plan 02	5869.46	5868.61	0.84	1.66	0.00	4940.00	15773.72	3000.28	2122.34
US to LBS	28260	100yr	Plan-Without-Pits	5869.94	5869.06	0.89	2.14	0.01	5595.58	18118.42		1747.90
US to LBS	27887	100yr	Plan 02	5867.22	5866.36	0.86	1.71	0.01	4745.68	15068.21	3900.11	2113.69
US to LBS	27887	100yr	Plan-Without-Pits	5867.79	5866.77	1.02	1.77	0.11	4366.74	19347.26		1610.30
US to LBS	27503	100yr	Plan 02	5864.24	5863.40	0.84	3.03	0.03	4342.88	15308.97	4062.14	2247.47
US to LBS	27503	100yr	Plan-Without-Pits	5864.53	5863.88	0.65	2.89	0.10	6613.01	17100.82	0.17	1721.05
LBS to ROB Split	26962	100yr	Plan 02	5860.54	5859.43	1.11	2.63	0.06	1941.73	21723.14	5435.13	1934.02
LBS to ROB Split	26962	100yr	Plan-Without-Pits	5861.53	5859.86	1.67	2.76	0.19	1649.87	27450.13		1233.44
LBS to ROB Split	26498	100yr	Plan 02	5857.19	5856.28	0.91	3.02	0.00	8246.97	15145.09	5707.94	2115.05
LBS to ROB Split	26498	100yr	Plan-Without-Pits	5857.68	5856.65	1.03	3.16	0.01	5642.85	18642.84	4814.31	2049.78
LBS to ROB Split	25826	100yr	Plan 02	5854.17	5853.25	0.92	1.60	0.01	4295.54	16706.52	8097.94	2283.11
LBS to ROB Split	25826	100yr	Plan-Without-Pits	5854.51	5853.37	1.14	1.69	0.04	516.80	18297.65	10285.75	2215.69
LBS to ROB Split	25513	100yr	Plan 02	5852.31	5851.31	1.01	0.41	0.03	1458.72	23465.79	4175.50	2109.77
LBS to ROB Split	25513	100yr	Plan-Without-Pits	5852.31	5851.31	1.01	0.40	0.03	1458.72	23465.79	4175.50	2109.77
LBS to ROB Split	25451	100yr	Plan 02	5851.74	5850.47	1.28	4.02	0.18		26696.42	2403.58	1547.47
LBS to ROB Split	25451	100yr	Plan-Without-Pits	5851.75	5850.49	1.26	4.64	0.00		26721.46	2378.54	1556.96
LBS to ROB Split	24726	100yr	Plan 02	5845.91	5845.23	0.68	2.15	0.01	3135.37	14289.23	11675.40	3584.02
LBS to ROB Split	24726	100yr	Plan-Without-Pits	5847.11	5845.84	1.27	3.38	0.00		28593.00	507.00	1987.31

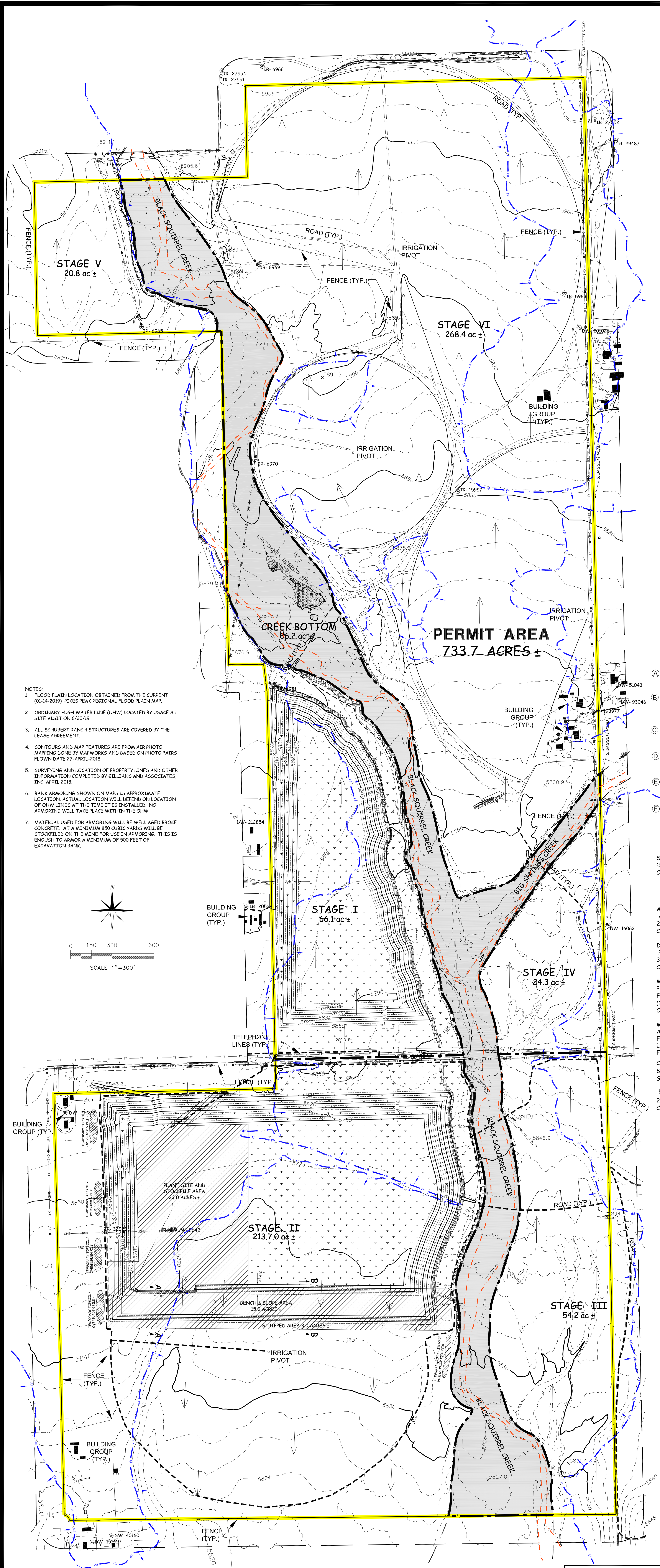
HEC-RAS Profile: 100yr (Continued)

Reach	River Sta	Profile	Plan	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LBS to ROB Split	24167	100yr	Plan 02	5842.56	5841.92	0.64	1.54	0.00	2060.28	16737.79	10301.93	3393.76
LBS to ROB Split	24167	100yr	Plan-Without-Pits	5843.73	5842.46	1.27	1.60	0.02	43.67	29050.94	5.39	972.78
LBS to ROB Split	23955	100yr	Plan 02	5841.02	5840.35	0.67	2.20	0.00	2978.81	14069.18	12052.01	3631.93
LBS to ROB Split	23955	100yr	Plan-Without-Pits	5842.11	5840.90	1.22	2.51	0.15		29100.00		2724.26
LBS to ROB Split	23557	100yr	Plan 02	5838.45	5837.79	0.65	2.66	0.00	3040.89	14183.00	11876.12	3635.45
LBS to ROB Split	23557	100yr	Plan-Without-Pits	5839.10	5838.39	0.71	2.52	0.06		29100.00		2666.95
LBS to ROB Split	23156	100yr	Plan 02	5835.36	5834.70	0.65	2.79	0.06	4048.09	11995.84	13056.07	3523.86
LBS to ROB Split	23156	100yr	Plan-Without-Pits	5836.53	5835.26	1.27	3.22	0.21		29100.00		2765.14
LBS to ROB Split	22579	100yr	Plan 02	5832.50	5832.06	0.44	1.90	0.02	3304.77	14953.81	10841.42	3638.49
LBS to ROB Split	22579	100yr	Plan-Without-Pits	5833.06	5832.48	0.58	1.62	0.01		27255.64	1844.36	3554.89
LBS to ROB Split	22196	100yr	Plan 02	5830.59	5829.91	0.67	1.66	0.10	1400.38	17671.98	10027.64	3515.24
LBS to ROB Split	22196	100yr	Plan-Without-Pits	5831.42	5830.70	0.72	1.98	0.02		22953.03	6146.97	3099.76
LBS to ROB Split	21870	100yr	Plan 02	5828.69	5828.36	0.32	1.54	0.02	1409.03	13085.39	14605.58	3549.98
LBS to ROB Split	21870	100yr	Plan-Without-Pits	5829.42	5828.53	0.89	2.19	0.11		20412.44	8687.56	2979.38
LBS to ROB Split	21514	100yr	Plan 02	5827.12	5826.60	0.52	2.94	0.04		16327.36	12772.63	3070.38
LBS to ROB Split	21514	100yr	Plan-Without-Pits	5827.12	5826.60	0.52	2.94	0.04		16327.36	12772.63	3070.38
LBS to ROB Split	21063	100yr	Plan 02	5824.16	5823.24	0.91	5.01	0.14		20135.41	8964.59	3014.72
LBS to ROB Split	21063	100yr	Plan-Without-Pits	5824.16	5823.24	0.91	5.01	0.14		20135.41	8964.59	3014.72
LBS to ROB Split	20250	100yr	Plan 02	5819.01	5818.56	0.45	5.15	0.03		6565.18	22534.82	2412.04
LBS to ROB Split	20250	100yr	Plan-Without-Pits	5819.01	5818.56	0.45	5.15	0.03		6565.18	22534.82	2412.04
LBS to ROB Split	19500	100yr	Plan 02	5813.82	5813.06	0.77	3.17	0.09		5113.71	23986.29	1968.30
LBS to ROB Split	19500	100yr	Plan-Without-Pits	5813.82	5813.06	0.77	3.17	0.09		5113.71	23986.29	1968.30
LBS to ROB Split	19000	100yr	Plan 02	5810.57	5810.09	0.48	3.23	0.03		5479.28	23620.72	2120.46
LBS to ROB Split	19000	100yr	Plan-Without-Pits	5810.57	5810.09	0.48	3.23	0.03		5479.28	23620.72	2120.46
LBS to ROB Split	18400	100yr	Plan 02	5807.31	5806.56	0.75	1.89	0.15		5002.25	24097.75	1914.56
LBS to ROB Split	18400	100yr	Plan-Without-Pits	5807.31	5806.56	0.75	1.89	0.15		5002.25	24097.75	1914.56
LBS to ROB Split	17902	100yr	Plan 02	5805.27	5805.02	0.25	2.67	0.03		11270.70	17829.30	2362.38
LBS to ROB Split	17902	100yr	Plan-Without-Pits	5805.27	5805.02	0.25	2.67	0.03		11270.70	17829.30	2362.38
LBS to ROB Split	17102	100yr	Plan 02	5799.66	5799.08	0.59	4.55	0.04	2139.37	3719.66	23990.97	2072.72
LBS to ROB Split	17102	100yr	Plan-Without-Pits	5799.66	5799.08	0.59	4.55	0.04	2139.37	3719.66	23990.97	2072.72
LBS to ROB Split	16116	100yr	Plan 02	5795.07	5794.63	0.44	1.82	0.03	13613.49	12961.80	3274.70	2595.34
LBS to ROB Split	16116	100yr	Plan-Without-Pits	5795.07	5794.63	0.44	1.82	0.03	13613.49	12961.80	3274.70	2595.34
LBS to ROB Split	15678	100yr	Plan 02	5793.22	5792.88	0.33	6.95	0.07	17870.56	9256.26	2723.18	3106.22
LBS to ROB Split	15678	100yr	Plan-Without-Pits	5793.22	5792.88	0.33	6.95	0.07	17870.56	9256.26	2723.18	3106.22
LBS to ROB Split	14323	100yr	Plan 02	5786.20	5785.20	1.01	4.28	0.02	11330.12	18468.68	7601.21	2290.48
LBS to ROB Split	14323	100yr	Plan-Without-Pits	5786.20	5785.20	1.01	4.28	0.02	11330.12	18468.68	7601.21	2290.48
LBS to ROB Split	13646	100yr	Plan 02	5781.91	5780.74	1.17	3.35	0.09	8530.77	23982.71	4886.52	2000.40
LBS to ROB Split	13646	100yr	Plan-Without-Pits	5781.91	5780.74	1.17	3.35	0.09	8530.77	23982.71	4886.52	2000.40
LBS to ROB Split	12828	100yr	Plan 02	5776.26	5775.38	0.88	2.30	0.07	12950.23	24449.77		1362.62
LBS to ROB Split	12828	100yr	Plan-Without-Pits	5776.26	5775.38	0.88	2.30	0.07	12950.23	24449.77		1362.62
LBS to ROB Split	12316	100yr	Plan 02	5773.90	5772.35	1.55	3.76	0.14	16158.32	21211.74	29.94	1182.25
LBS to ROB Split	12316	100yr	Plan-Without-Pits	5773.90	5772.35	1.55	3.76	0.14	16158.32	21211.74	29.94	1182.25
LBS to ROB Split	11794	100yr	Plan 02	5769.99	5768.89	1.10	5.27	0.02	21819.40	15580.60		1193.83
LBS to ROB Split	11794	100yr	Plan-Without-Pits	5769.99	5768.89	1.10	5.27	0.02	21819.40	15580.60		1193.83
LBS to ROB Split	11152	100yr	Plan 02	5764.69	5763.35	1.35	3.54	0.00	18148.08	18990.83	261.09	1593.46
LBS to ROB Split	11152	100yr	Plan-Without-Pits	5764.69	5763.35	1.35	3.54	0.00	18148.08	18990.83	261.09	1593.46
LBS to ROB Split	10798	100yr	Plan 02	5761.15	5759.77	1.38	3.79	0.04	6955.79	23121.55	7322.67	1759.10
LBS to ROB Split	10798	100yr	Plan-Without-Pits	5761.15	5759.77	1.38	3.79	0.04	6955.79	23121.55	7322.67	1759.10
LBS to ROB Split	10341	100yr	Plan 02	5756.63	5755.39	1.24	2.68	0.00		30840.55	6559.45	1342.86
LBS to ROB Split	10341	100yr	Plan-Without-Pits	5756.63	5755.39	1.24	2.68	0.00		30840.55	6559.45	1342.86
LBS to ROB Split	9906	100yr	Plan 02	5753.95	5752.71	1.23	4.92	0.06		29042.95	8357.05	1227.84
LBS to ROB Split	9906	100yr	Plan-Without-Pits	5753.95	5752.71	1.23	4.92	0.06		29042.95	8357.05	1227.84
LBS to ROB Split	9098	100yr	Plan 02	5748.96	5747.14	1.83	5.17	0.17	4877.69	32522.31		988.95
LBS to ROB Split	9098	100yr	Plan-Without-Pits	5748.96	5747.14	1.83	5.17	0.17	4877.69	32522.31		988.95
LBS to ROB Split	8267	100yr	Plan 02	5743.50	5742.22	1.28	3.91	0.05	1667.78	35732.22		1252.03
LBS to ROB Split	8267	100yr	Plan-Without-Pits	5743.50	5742.22	1.28	3.91	0.05	1667.78	35732.22		1252.03

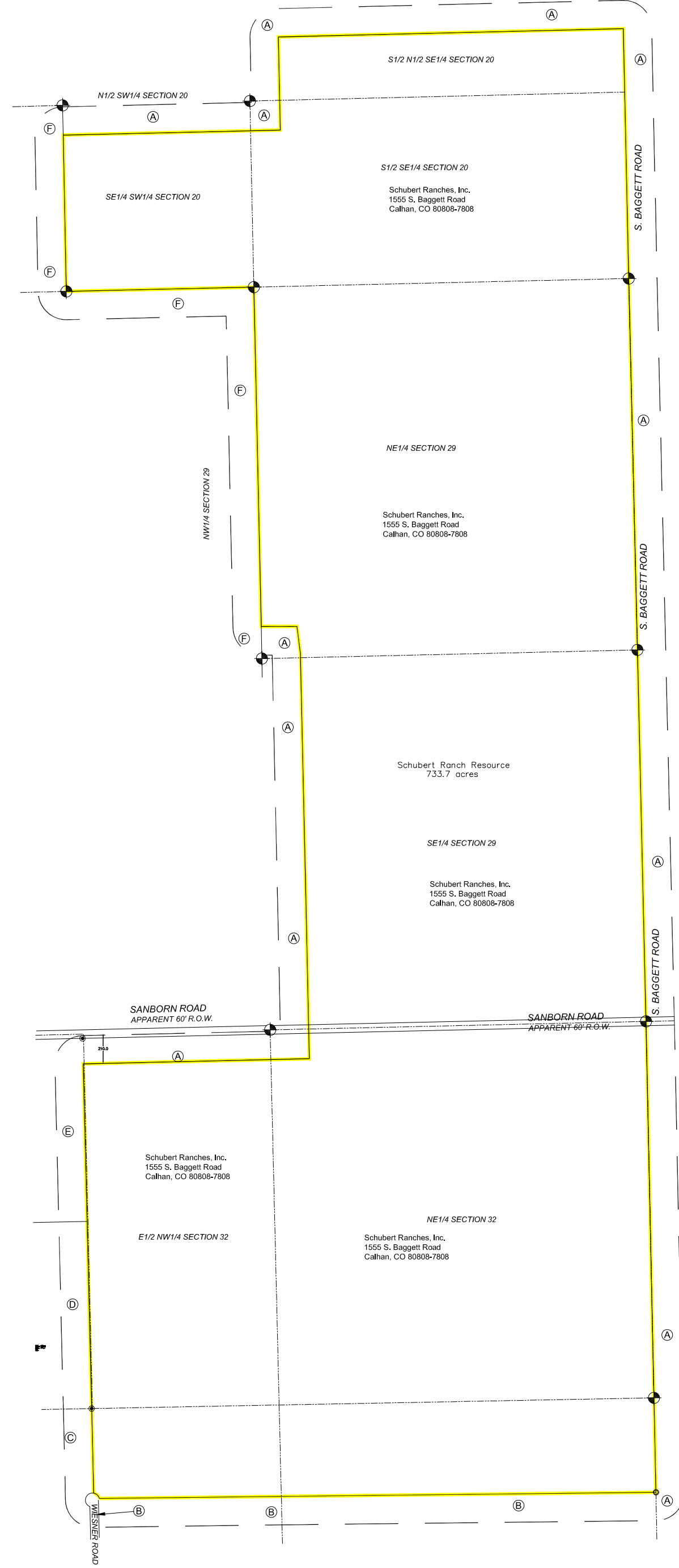
HEC-RAS Profile: 100yr (Continued)

Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
LBS to ROB Split	7560	100yr	Plan 02	5739.53	5738.43	1.10	3.99	0.02	39.06	37333.40	27.54	1371.11
LBS to ROB Split	7560	100yr	Plan-Without-Pits	5739.53	5738.43	1.10	3.99	0.02	39.06	37333.40	27.54	1371.11
LBS to ROB Split	6915	100yr	Plan 02	5735.53	5734.19	1.34	2.64	0.03	191.01	31584.59	5624.40	2429.45
LBS to ROB Split	6915	100yr	Plan-Without-Pits	5735.53	5734.19	1.34	2.64	0.03	191.01	31584.59	5624.40	2429.45
LBS to ROB Split	6525	100yr	Plan 02	5732.54	5730.87	1.68	2.56	0.01		35603.59	1796.41	1965.57
LBS to ROB Split	6525	100yr	Plan-Without-Pits	5732.54	5730.87	1.68	2.56	0.01		35603.59	1796.41	1965.57

Appendix E. Construction Plans and Stream Bank and Pit Armoring Details



- NOTES:
1. FLOOD PLAIN LOCATION OBTAINED FROM THE CURRENT (01-14-2019) Pikes Peak Regional Flood Plain Map.
 2. ORDINARY HIGH WATER LINE (OHW) LOCATED BY USACE AT SITE VISIT ON 6/20/19.
 3. ALL SCHUBERT RANCH STRUCTURES ARE COVERED BY THE LEASE AGREEMENT.
 4. CONTOURS AND MAP FEATURES ARE FROM AIR PHOTO MAPPING DONE BY MAPWORKS AND BASED ON PHOTO PAIRS FLOWN DATE 27-APRIL-2018.
 5. SURVEYING AND LOCATION OF PROPERTY LINES AND OTHER INFORMATION COMPLETED BY GILLIANS AND ASSOCIATES, INC. APRIL 2018.
 6. BANK ARMORING SHOWN ON MAPS IS APPROXIMATE LOCATION. ACTUAL LOCATION WILL DEPEND ON LOCATION OF OHW LINES AT THE TIME IT IS INSTALLED. NO ARMORING WILL TAKE PLACE WITHIN THE OHW.
 7. MATERIAL USED FOR ARMORING WILL BE WELL AGED BROKE CONCRETE. AT A MINIMUM 850 CUBIC YARDS WILL BE STOCKPILED ON THE MINE FOR USE IN ARMORING. THIS IS ENOUGH TO ARMOR A MINIMUM OF 500 FEET OF EXCAVATION BANK.



- OWNERSHIP MAP AND LIST (SEE EXHIBIT O)
- | | | |
|---|---|---|
| A | SCHUBERT RANCHES LLC
1555 S. BAGGETT RD
CALHAN, CO 80808 | R.O.W'S WITHIN 200 FT.
EL PASO BOARD OF COUNTY COMMISSIONERS
200 SOUTH CASCADE AVENUE, SUITE 100
COLORADO SPRINGS, CO 80903-2202 |
| B | DANIEL FONTES REYES & FRED L WIESNER
3255 WIESNER RD
CALHAN, CO 80808-9536 | MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC.
FALCON OPERATIONS CENTER
1140 E. WOODMEN RD.
FALCON, CO 80831 |
| C | ARIEL LORIGA DE ANDRES YORNIEL
ARIESKY RODRIGUEZ
24820 MEIER RD
CALHAN, CO 80808 | CENTURYLINK
8400 EAST CRESCENT PARKWAY, SUITE 600
GREENWOOD VILLAGE, CO 80111 |
| D | BENJAMINE & MAKENSEY VALLEJO
2795 S EAST ELLICOTT RD
CALHAN, CO 80808 | |
| E | DORIS J. HAYS
24975 SANBORN RD
CALHAN, CO 80808 | |
| F | MILDRED J DUNCAN
1798 S EAST ELLICOTT RD
CALHAN, CO 80808 | |

- STRUCTURES ON OR WITHIN 200 FT
- | | |
|--|--|
| Schubert Ranches, LLC,
1555 S. Baggett Road
Calhan, CO 80808-7808 | Section 20 - 6 water wells, fences, sprinkler pivot
Section 21 - fences, 3 water wells
Section 28 - 3 houses, 3 buildings, 3 water wells, fences
Section 29 - 3 houses, 7 water wells, 3 sprinkler pivots,
13 buildings, 4 trailer houses, 4 sheds, fences
Section 32 - 2-houses, 2-garages, 3 buildings, 3 water wells,
sprinkler pivot, fences |
| Ariel Loriga De
Andres Yorniel
24820 Meier Rd
Calhan, CO 80808 | wire fence |
| Daniel Fontes Reyes &
Fred L Wiesner
3255 Wiesner Rd
Calhan CO 80808-9536 | wire fences, house, garage, shed,
water well DW-151419, stock well SW-140160 |
| Mildred J Duncan
PO Box 1057
Fort Benton, MT 59442-1057
(1798 S East Ellicott Rd
Calhan, CO 80808) | wire fences |
| Mountain View Electric
Association, Inc.
Falcon Operations Center
1140 E. Woodmen Rd.
Falcon, CO | Powerlines |
| Century Link Communications
8400 East Crescent Parkway, Suite 600
Greenwood Village, CO 80111 | underground communication lines |
| El Paso County
200 South Cascade Avenue, Suite 100
Colorado Springs, CO 80903-2202 | Baggett Road & Sanborn Road |

- LEGEND
- PERMIT BOUNDARY / AFFECTED LANDS
 - 200 FOOT LIMIT
 - STAGE LINE
 - ROADS (HAUL, ACCESS) (TYP.)
 - FENCE
 - BURIED TELEPHONE/COMMUNICATION LINES
 - OVERHEAD ELECTRIC LINES
 - BUILDING
 - WATER WELL
 - 2 FOOT CONTOURS
 - TOPO CONTOUR
 - EPHEMERAL DRAINAGE
 - FLOOD PLAIN (100 YR)
 - ORDINARY HIGH WATER LINE (2019)
 - MINING DIRECTION
 - REVEGETATED AREA
 - PLANT & STOCKPILE AREA - 40 AC±
 - STRIPPED
 - LANDOWNER BANK ARMORING
 - BANK ARMORING

Map Exhibit C-1 - Mining Plan Map

ELLCOTT SAND AND GRAVEL, LLC.

**SCHUBERT RANCH SAND
RESOURCE**

112 MLRB PERMIT

Parts of the S½[SE], S½[SE], S½[SW], Section 20, The E½[SE], 4NW½[NE] and Parts of the SW½[NE], SW½[SE] & NW½[SE], Section 29 and The E½[NE], SW½[NE], SE½[NW] and parts of the NW½[NE] & NE½[NW], Section 32, T-14-S, R-62-W, 6th P.M., El Paso County, Colorado
Containing 733.7 acres more or less.

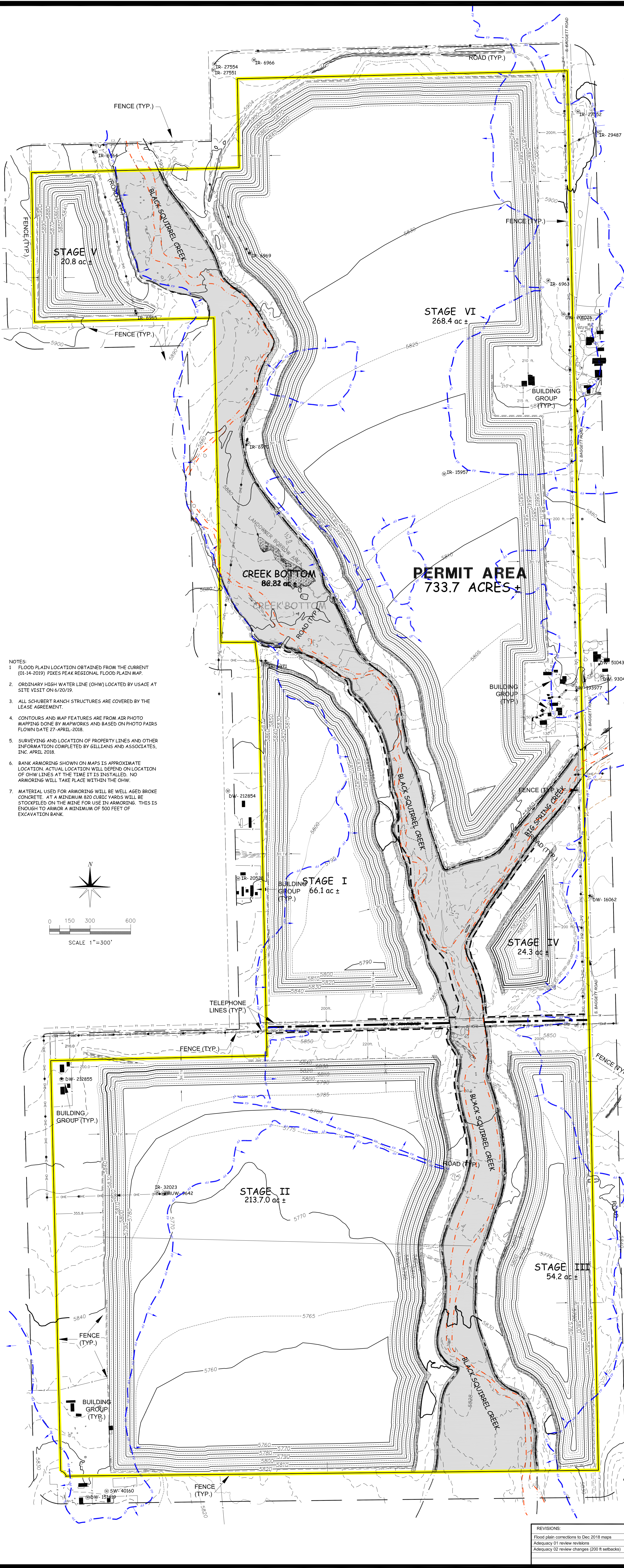
REVISIONS:

1/14/2018	DATE:
9/19/2019	Flood plain corrections to Dec 2018 maps
10/31/2019	Adequacy review changes
	Adequacy review changes (200 ft setbacks)

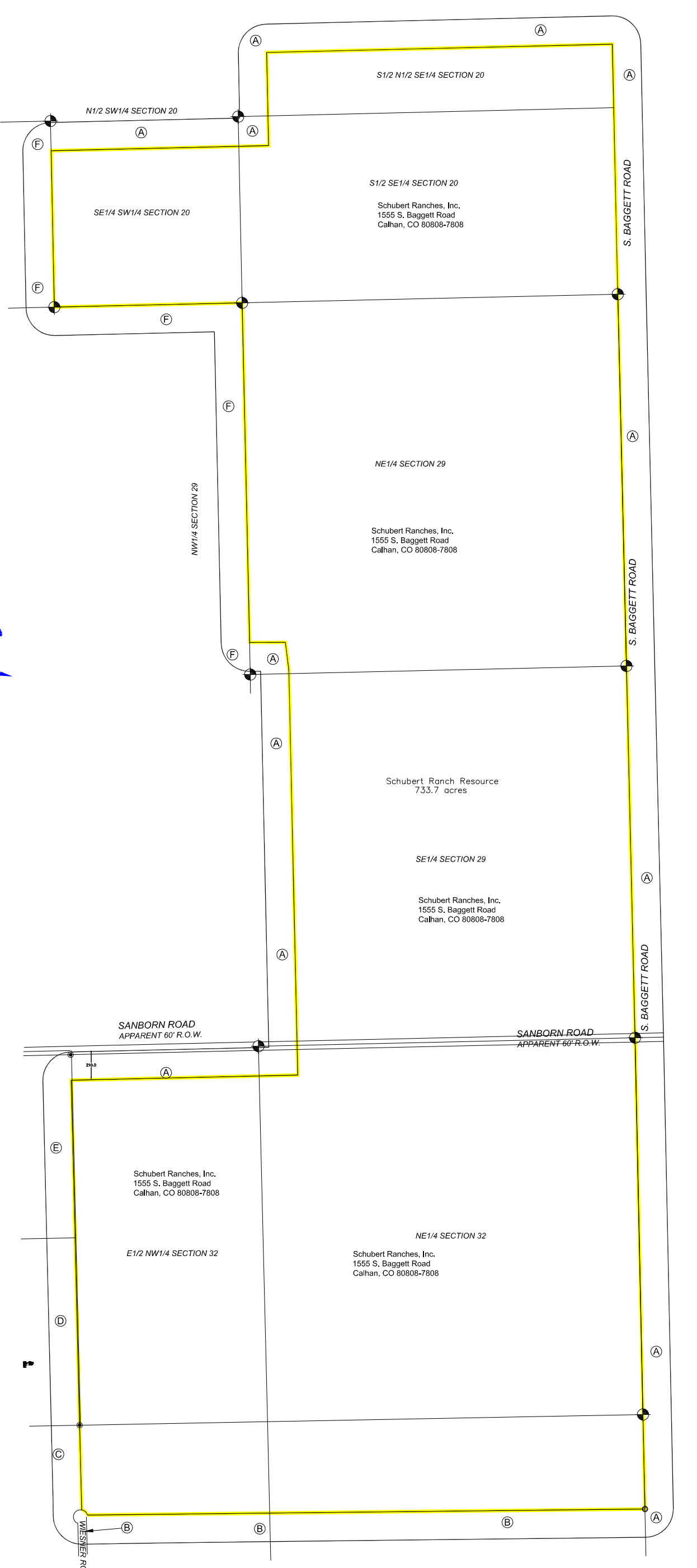
DATE: 11/29/2018

SCALE 1" = 300'

REVISED: OCT 31, 2019 - 12:21:34



- NOTES:
1. FLOOD PLAIN LOCATION OBTAINED FROM THE CURRENT (01-14-2019) PIKES PEAK REGIONAL FLOOD PLAIN MAP.
 2. ORDINARY HIGH WATER LINE (OHW) LOCATED BY USACE AT SITE VISIT ON 6/20/19.
 3. ALL SCHUBERT RANCH STRUCTURES ARE COVERED BY THE LEASE AGREEMENT.
 4. CONTOURS AND MAP FEATURES ARE FROM AIR PHOTO MAPPING DONE BY MAPWORKS AND BASED ON PHOTO PAIRS FLOWN DATE 27-APRIL-2018.
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 7. MATERIAL USED FOR ARMORING WILL BE WELL AGED BROKE CONCRETE. AT A MINIMUM 820 CUBIC YARDS WILL BE STOCKPILED ON THE MINE FOR USE IN ARMORING. THIS IS ENOUGH TO ARMOR A MINIMUM OF 500 FEET OF EXCAVATION BANK.



- OWNERSHIP MAP AND LIST (SEE EXHIBIT O)
- | OWNER | ADDRESS |
|---|--|
| SCHUBERT RANCHES LLC | 1555 S. BAGGETT RD
CALHAN CO 80808 |
| DANIEL FONTES REYES & FRED L WIESNER | 3255 WIESNER RD
CALHAN CO 80808-9536 |
| ARIEL LORIGA DE ANDRES YORNIEL
ARIESKY RODRIGUEZ | 24820 MEIER RD
CALHAN CO 80808 |
| BENJAMINE A MAKENSEY VALLEJO | 2755 S EAST ELLICOTT RD
CALHAN CO 80808 |
| DORIS J HAYS | 24975 SANBORN RD
CALHAN CO 80808 |
| MILDRED J DUNCAN | 1798 S EAST ELLICOTT RD
CALHAN CO 80808 |
- R.O.W.'S WITHIN 200 FT.
- EL PASO BOARD OF COUNTY COMMISSIONERS
200 SOUTH CASCADE AVENUE, SUITE 100
COLORADO SPRINGS, CO 80903-2202
- MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC.
FALCON OPERATIONS CENTER
11140 E. WOODMEN RD.
FALCON, CO 80831
- CENTURYLINK
8400 EAST CRESCENT PARKWAY, SUITE 600
GREENWOOD VILLAGE, CO 80111

- STRUCTURES ON OR WITHIN 200 FT
- | STRUCTURE | LOCATION |
|--|--|
| Schubert Ranches, LLC | 1555 S. Baggett Road
Calhan, CO 80808-7808 |
| Ariel Loriga De Andres Yorniel | 24820 Meier Rd
Calhan, CO 80808 |
| Daniel Fontes Reyes & Fred L Wiesner | 3255 Wiesner Rd
Calhan CO 80808-9536 |
| Mildred J Duncan | PO Box 1057
Fort Benton, MT 59442-1057
(1798 S East Ellicott Rd
Calhan, CO 80808) |
| Mountain View Electric Association, Inc. | Falcon Operations Center
11140 E. Woodmen Rd.
Falcon, CO |
| Century Link Communications | 8400 East Crescent Parkway, Suite 600
Greenwood Village, CO 80111 |
| El Paso County | 200 South Cascade Avenue, Suite 100
Colorado Springs, CO 80903-2202 |
- Section 20 - 6 water wells, fences, sprinkler pivot
Section 21 - fences, 3 water wells
Section 28 - 3 houses, 3 buildings, 3 water wells, fences
Section 29 - 3 houses, 7 water wells, 3 sprinkler pivots,
13 buildings, 4 trailer houses, 4 sheds, fence
Section 32 - 2-houses, 2-garages, 3 buildings, 3 water wells,
sprinkler pivot, fences
- wire fence
- wire fences, house, garage, shed,
water well DW-151419, stock well SW-140160
- wire fences
- Powerlines
- underground communication lines
- Baggett Road & Sanborn Road

- LEGEND
- PERMIT BOUNDARY/ AFFECTED LANDS
 - 200 FOOT LIMIT
 - STAGE LINE
 - ROADS (HAUL, ACCESS) (TYP.)
 - FENCE
 - BURIED TELEPHONE/COMMUNICATION LINES
 - OVERHEAD ELECTRIC LINES
 - BUILDING
 - WATER WELL
 - 2 FOOT CONTOURS
 - TOPO CONTOUR
 - EPHEMERAL DRAINAGE
 - FLOOD PLAIN (100 YR)
 - ORDINARY HIGH-WATER LINE 2019
 - REVEGETATED AREA
 - BANK ARMORING

Map Exhibit F - Reclamation Plan Map

ELLCOTT SAND AND GRAVEL, LLC.

SCHUBERT RANCH SAND RESOURCE

112 MLRB PERMIT

Parts of the S½NE¼, S½SE¼ & SE½SW¼, Section 20. The E½E¼, & NW¼NE¼ and Parts of the SW¼NE¼, SW¼SE¼ & NW¼SE¼, Section 29 and The E½NE¼, SW¼NE¼, SE½NW¼ and parts of the NW¼NE¼ & NE½NW¼, Section 32, T-14-S, R-62-W, 6th P.M., El Paso County, Colorado. Containing 733.7 acres more or less.

REVISIONS:

REVISIONS:	DATE:
Flood plain corrections to Dec 2018 maps	1/14/2019
Adequacy 01 review revisions	9/9/2019
Adequacy 02 review changes (200 ft setbacks)	10/31/2019

DATE:

PREPARED BY: ENVIRONMENT, INC.
2805 N. WILSON ST., SUITE 200
ARAPAHO, CO 80008
(303) 433-7297
environment-inc@elldm.net

SCALE 1" = 300'
DATE 11/29/2018

BANK PROTECTION PLAN

This bank protection plan is presented to explain the bank armoring on both side of the Black Squirrel Creek and the tops of the excavated slope that run parallel to the channel. This armoring is being proposed to keep the Black Squirrel Creek within in the historic banks so the excavated area will not capture if a epic flood event were to occur after reclamation is complete. The minimum width of the top of the armored banks will be 150 feet.

We have followed the 2013 Urban Drainage and Flood Control District (UDFCD) Publication guideline document for planning and design of the armoring on the mining side bank and the bank armoring on the creek channel side. Ellicott Sand & Gravel LLC has no way or predict is or when a storm event could occur that would cause flooding outside the historic channel. The armor is intended to define the channel and protect the banks should a 100 year event occur after an area has been mined. All armoring done in or along the dry channel will be done outside the Ordinary Highwater Line (OHW) to avoid needing a U.S. Army Corps of Engineers permit. The existing OHW is shown on all map exhibits in the permit packet as an orange line. If this changes a mining advances around the permit area the armoring locations will change to meet the conditions at that time. The armoring will be covered with a 6 inch layer of growth medium and seeded with the approved seed mix

We have no information on the flow velocities or volume of flows for a 100 year event in this stretch of Black Squirrel Creek. Black Squirrel Creek is a true ephemeral drainage where the only water that travels down the drainage is during isolated storm events that create mini floods. In most cases the OHW is 10 feet or less across. The 100-year Floodplain information provided by El Paso County has been added to all of the Map Exhibits in the Reclamation Packet and is shown as a blue line.

There are general items that will be common to both armoring areas. In general, all armoring material will be recycled concrete fragments with surface rebar removed that meets the definition of Inert Materials, there will be no exposed rebar in the concrete and it will be sized 12 to 24 inches with a few larger pieces and fines mixed in to fill voids. The toe of the armoring will be a minimum of 3 feet below the existing creek channel thalweg as described below. ESG will keep enough material stored on the mine to complete armoring needed on an area as it is mined and ready for armoring. At a minimum, 850 cubic yards will be stockpiled on the mine for use in armoring. This is enough to armor a minimum of 500 feet of excavation bank. The stockpile of armoring material will be placed parallel to the water flow so it will not interfere with flows in the flood plain

if flooding occurs and within the 150 foot setback so it is close to the area where it will be placed.

The attached **Figure 1** shows the cross sections of the areas discussed below and details of the armoring to protect the banks along Black Squirrel Creek and Big Spring Creek. **Map Exhibit F - Reclamation Plan Map** has been revised to show the location of the areas to be armored in the mine.

Channel Bank Armoring.

Along the banks of Black Squirrel Creek and Big Springs Creek banks armoring will be placed wherever mining will take place within 400 feet of the bank. The armoring will be done as mining advances in each stage so that if mining ended along the channels before mining reached the 400 foot line no armoring would need to be done. As mining approaches the 400 foot limit the channel adjacent to mining area will be armored following the UDFCD Guidelines.

Bank armoring will be done, using the concrete recycle material described above. The armored face of the bank will extend to 5 feet below the thalweg of the dry channel to the top of the existing bank and will be a minimum of 2 feet thick. This will leave an armored face along the surface that is 29 feet wide. On average this will require 2.77 cu-yds per linear foot. The armoring will not take place in the OHW but rather along the historic bank of the creeks. The face of the armoring will be sloped 2.5h to 1v per the guidelines.

Excavation Bank Armoring.

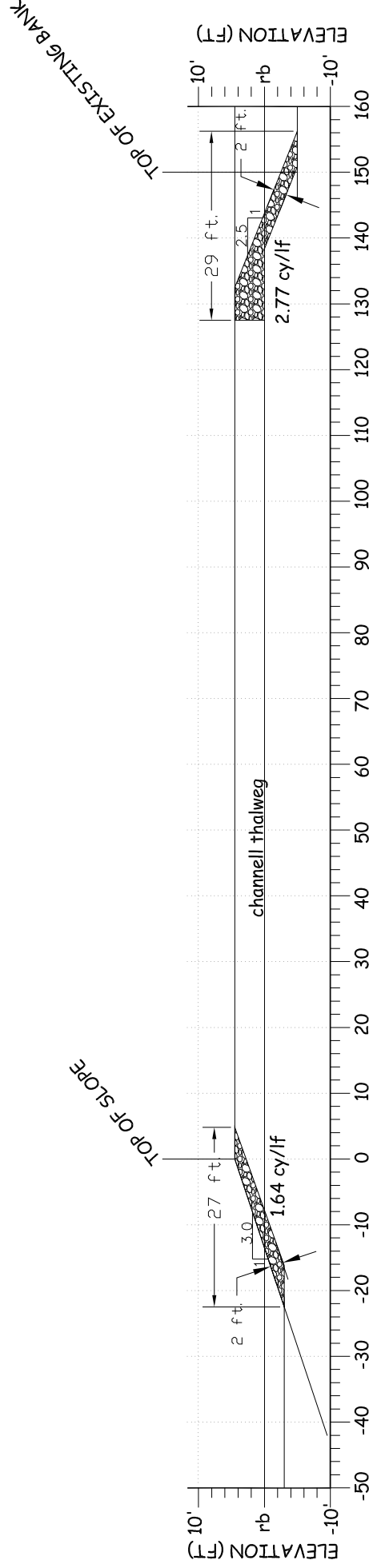
On the inside of the mined area adjacent to the creek channels the armoring will be placed from the existing elevation so the toe of the armoring will be a minimum of 3 feet below the creek thalweg and will be 2 feet or more thick. This is approximately 1.64 cyd/lft along the excavation bank slopes. The armoring will cover the bank slopes from the original ground surface to a depth of 3 feet below the channel thalweg and parallel to the channel. Once sloping begins the armoring will be installed on 500 foot sections until completed. This will leave an armored face along the surface that is 27 feet wide.

Supplied supporting documents

Figure 1 - Bank Protection Plan cross section (Revised 10-30-19)

BANK ARMORING PLAN

FIGURE 1



TYPICAL CREEK BERM ARMORING NO SCALE

NOTES:

1. BANK ARMORING SHOWN ON MAPS IS APPROXIMATE LOCATION. ACTUAL LOCATION WILL DEPEND ON LOCATION OF OHW LINES AT THE TIME IT IS INSTALLED. NO ARMORING WILL TAKE PLACE WITHIN THE OHW.
2. MATERIAL USED FOR ARMORING WILL BE WELL AGED BROKE CONCRETE THAT HAS ALL EXPOSED SURFACE REBAR REMOVED. AT A MINIMUM 850 CUBIC YARDS WILL BE STOCKPILED ON THE MINE FOR USE IN ARMORING. THIS IS ENOUGH TO ARMOR MATERIAL TO ARMOR A MINIMUM OF 500 FEET OF EXCAVATION BANK..
3. STOCKPILE OF ARMORING MATERIAL WILL BE PLACED PARALLEL TO THE WATER FLOW SO IT WILL NOT INTERFERE WITH FLOWS IN THE FLOOD PLAIN IF FLOODING OCCURS AND WITHIN THE 150 FOOT SETBACK SO IT IS CLOSE TO THE AREA WHERE IT WILL BE PLACED.
4. BANK ALONG THE EXCAVATED AREA WILL ARMORED FROM THE EXISTING SURFACE TO A POINT AT LEAST 3 FEET BELOW THE CREEK CHANNEL THALWEG. THE BANK ALONG THE CREEK SIDE WILL BE ARMORED FROM THE SURFACE TO AT LEAST 5 FEET BELOW THE THALWEG. OF THE CREEK CHANNEL.
5. CHANNEL SIDE ARMORING WILL BE DONE PRIOR TO MINING WITHIN 400 FEET OF THE AREA TO BE ARMORED IN ADVANCE OF MINING IN EACH STAGE.
6. THE SIZE OF THE MATERIAL WILL FALL IN THE RANGE OF 12 TO 24 INCHES OR GREATER AND WILL BE PLACED BELOW GRADE.
7. THE ARMORING WILL BE COVERED WITH A 6 INCH LAYER OF GROWTH MEDIUM AND SEEDED WITH THE APPROVED SEED MIX.