121 Badger Lane | Response to Administrative Appeal on Floodplain Development Permit
February 5, 2024

The Floodplain Development Permit (permit #: P23-014) for 121 Badger Lane was approved by the City of Ketchum Planning Department on June 16, 2023 and the permit was appealed on July 11, 2023. The appeal was brought before the Planning and Zoning Commission on December 12, 2023.

The Planning and Zoning Commission determined and acknowledged the following:

- The Planning Director **did not make an error** in its review and approval of the Floodplain Development Permit for 121 Badger Lane, citing that the Application's designs achieved a 0' rise at the floodplain cross-section impacting the Appellant's property and therefore **did not create an "Adverse Impact" to the Appellant' property.**
- Acknowledged that the Planning Department specifically requested the location and orientation of the floodplain cross-sections impacting the Appellant's property, which were shown in the Approved 121 Badger Lane Permit designs.
- Acknowledged that the Approved Application's design and engineering achieved a 0' rise at the floodplain cross-sections that were requested by the Planning Department.

Despite the Planning and Zoning Commission's determination that the Application was not flawed and that the Planning Director did not make an error in approving the Floodplain Development Permit, the Planning and Zoning Commission requested additional information and engineering analysis above-and-beyond what would otherwise demonstrate "No Adverse Impact" to the Appellant's property. The Planning and Zoning Commission remanded the Application back to the Planning Department and asked the Planning Department to re-evaluate the Application to ensure that the Application's designs satisfy Ketchum Municipal Code §17.88.050 (5) and (6):

> ***§17.88.050 (5):*** *Landscaping and driveway plans to accommodate the function of the floodplain allow for sheet flooding. Surface drainage is controlled and shall not adversely impact adjacent properties including driveways drained away from paved roadways. Culvert(s) under driveways may be required. Landscaping berms shall be designed to not dam or otherwise obstruct floodwaters or divert same onto roads or other public pathways.*
>
> ***§17.88.050 (6):*** *Floodwater carrying capacity is not diminished by the proposal.*

The Planning Department requested that the Applicant provide a more detailed analysis of the proposed driveway, culverts, and the impact of the proposed driveway on the Appellant's property. The Applicant provided additional analysis and even modified its Floodplain Development Application designs to go above-and-beyond the design standards that are required by the City of Ketchum to demonstrate "No Adverse Impact". The design modifications that the Applicant opted to make, include:

1) Placing a floodplain cross-section along the entirety of the property boundary between the Applicant's property and the Appellant's property.
2) Adding one additional culvert under the 121 Badger Lane driveway.
3) Enlarging the two culverts under the 121 Badger Lane driveway from 12"x12" to 24"x36".

The modified Application designs demonstrate a 0' rise at the new floodplain cross-section along the property boundary between the Appellant's property and the Applicant's property, and the designs do not diminish the current floodwater carrying capacity. **As such, the revised designs and additional analysis continue to satisfy Criteria 5 and 6, and continue to show "No Adverse Impact" to the Appellant's property.**

The below section specifies the modified culvert design and hydrologic engineering, which were discussed above.

Attachments*:

1. **Revised Technical Narrative and Hydrology Analysis** (Brockway Engineering)
   Revisions include:
   - Revised cross section locations, which demonstrate a 0' rise and compliance with Criteria #5
   - The culvert design was modified to add one additional culvert under the driveway; the previous single 12"x12" culvert is replaced with two 24"x36" pipe arch culverts. This modification demonstrates compliance with Criteria #5 and #6 by creating additional flow capacity.
   - Updated hydraulic data

2. **Revised C-1 Civil Drawing** (Benchmark Engineering)
   - Updated Grading and Drainage Plan showing additional culvert under the driveway

***The attachments are limited to documents and drawings with revisions to the approved Floodplain Development Permit. No other changes have been made and all other previously submitted documents are not affected by the above modifications.*

Technical Narrative in Support of Floodplain Development Plan for 121 Badger Lane, Ketchum, Idaho

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Brockway Engineering, PLLC
February 24, 2023
Revised May 4, 2023
Revised January 5, 2024

A. Existing Conditions and Hydrology

The proposed floodplain development permit is located at 121 Badger Lane, Ketchum, Idaho. Most of the property is within the effective 100-year floodplain defined by FEMA (Figure 1). Based on previous flood events in 2017, 2006, and 1986 (Figure 2A-2C), it appears that the property was not inundated by Big Wood River flood flows. However, this evaluation assumes the flood flow from the Big Wood River will inundate the property based on the effective floodplain delineation and hydraulic model.

There is an elevated high area on the property, and this high elevation area was previously excluded from the floodplain through a LOMA application filed with FEMA and approved on May 15, 2014 (Appendix A). There are low elevation areas on the property, that have been delineated as wetlands. A joint application has been submitted and approved by the US Army Corps of Engineers (See approved Joint Application). No portion of 121 Badger Lane is within the effective regulatory floodway. In addition, the Ordinary High Water Mark (OHWM) has been estimated as well as the 25-ft riparian setback (Figure 1).

A floodplain development permit was filed with the City of Ketchum and reviewed by City Staff and Harmony Design and Engineering (Harmony) dated April 5, 2023. This memo has been revised to incorporate the review comments.

B. Proposed Project

The proposed project as outlined in the Floodplain Development Permit includes the following elements:

1. Construction of a residential structure, primarily on the high elevation area, but including a small area of the effective floodplain to the east of the high elevation area. Construction includes a driveway access through the property. Fill required for the residential construction will be fully mitigated by compensatory mitigation on the property.

2. Driveway construction will require fill of a wetland area. A mitigation wetland will be constructed adjacent to the existing wetland, as outlined in the approved Joint Application and shown on the grading plan. Enhancement to the wetland in the southern portion of the property will occur to ensure wetland preservation and compensatory mitigation for fill placed in the floodplain.

3. Installation of four culverts throughout the property to connect flood flow to downgradient areas. Three 24”x36” pipe arch culverts will be installed under the driveway, two culverts to connect flood flows from the north and another to connect flood flows from the west. Driveway culverts will connect flood flows to wetland area, as shown in the grading plan. The fourth culvert will connect wetland areas, and replace an existing culvert on the property.

Each of these elements is described below, followed by a hydraulic analysis of the comprehensive project to assess the impact on the flood elevations, and an analysis of cut and fill volumes within the floodplain.

B.1. Element #1: Residential Structure and Driveway

The proposed structure footprint for 121 Badger Lane is shown on the plan set, and greater detail may will be found in the architectural plans for the project. There is no platted building envelope on the property. The majority of the structure is outside of the floodplain based on elevation and the approved LOMA. A portion of the structure does extend into the effective floodplain. Fill will be placed in the floodplain for the structure foundation and driveway access.

The driveway elevations were calculated to ensure that there was less than 1-ft of flood elevations on the driveway for emergency vehicle access. Driveway elevations are shown on the associated plan set. The effective and current model-computed floodplain in this area is minimal both in terms of depth and flow, and this activity amounts to small effects on the floodplain. Culverts will be installed to ensure that flood flows are connected to down gradient areas. The driveway was modeled in HEC-RAS using the bridge function with two pipe arch culverts.

B.2. Element #2: Wetland Fill and Mitigation

A Joint Application has been filed and approved by the US Army Corps of Engineers regarding the fill and mitigation of wetlands associated with the residential construction for 121 Badger. Please review the Joint Application documents for more information regarding the wetland mitigation.

Additional removal of material within the floodplain was necessary for compensatory mitigation associated with fill in the floodplain. The compensatory mitigation removal is integrated into the landscaping plan and shown in the associated plan set.

B.3. Element #3: Culvert Installation

Four culverts will be installed on the property to connect flood flows to down gradient areas. Culvert locations can be seen on the floodplain development permit plat maps. Two culverts will be placed under the driveway at natural lower elevation areas, at their respective locations and will hydraulically connect the area to the north and west to the mitigation wetland area. Driveway culverts were required to ensure that flood flows on the driveway were less than 1-ft depth and flood flows would not back up on neighboring properties. The culverts from the north will be two 24"x36" pipe arch culverts with a surface inlet of 5785.5 ft (IE of 5782.8 ft), a length of 30-ft, with a slope of 0.85%. Another pipe arch culvert from the west will be a 24"x36" pipe arch with an inlet of 5784.0 ft, a length of 64-ft, and a slope of 2.35%. The fourth culvert will be placed on the property to connect wetland areas. This culvert also replaces an existing culvert on the property. The culvert will be a 24"x36" pipe arch with an inlet of 5782.5 ft, a length of 39-ft, and a slope of 0.5%.

C. HEC-RAS model analysis

HEC-RAS 6.3 was used to model the project. Topographic data used to develop cross-sections was derived from the 2017 Blaine County LiDAR data, and detailed ground survey and topographic contour map for the project. The sources were in close agreement. The effective FEMA model was used as a starting point and verified that it duplicated the effective model. New cross-sections representing current ground conditions were inserted at four different locations on the property. The orientation and number of cross sections were revised based on comments from Harmony and Biota. These sections are shown on the attached Figure 3 and described in Table 1.

New sections were located upstream and downstream of the property, as well as 5 cross sections in the subject property. Channel and overbank roughness and other parameters were the same as those in the effective model.

Since the LiDAR data reflects the water surface rather than the channel bottom in the Big Wood River when the flight was made (which was at low water), the channel bottom was approximated using the FEMA effective cross sections and linearly interpolating to the low elevation for each of the cross sections. The model cross-sections illustrating the baseline grades and modified project grades are attached (Appendix B).

The proposed driveway and culverts were modeled in HEC-RAS using the bridge function in the floodplain only and two pipe arch culverts conveying water from the north property line under the driveway and reconnecting with the rest of the floodplain.

Table 1. Cross-sections from upstream to downstream

Section	River Station	Remarks
EG	101583	Retained effective model section
B11	101175	New Badger cross section
B10	101096	New Badger cross section
B9	101027	New Badger cross section
B8	100954	New Badger cross section
Unpub	100887	Effective unpublished section used in duplicate effective model only
B7	100881	New Badger cross section
B6	100820	New Badger cross section – Located on northern property line, immediately upstream of driveway
B5	100764	New Badger cross section – Located immediately downstream of driveway
B4	100684	New Badger cross section – Located in middle of property
B3	100590	New Badger cross section – Located in middle of property
B2	100535	New Badger cross section – Located in Southeast corner of property
B1	100486	New Badger cross section
EF	100277	Retained effective model section
Unpub	99492	Retained effective unpublished model section
EE	98972	Retained effective model section
Unpub	98528	Retained effective unpublished model section
ED	98148	Retained effective model section

The current conditions model results are consistent with the effective model. However, the new cross-sections describe the channel in more detail between FEMA Section EF and EG. In the current conditions model, there is a lower elevation at cross section EG at river station 101583 (Table 2), but still within the 0.5-ft tolerance that FEMA requires. The baseline model was deemed to be a suitable current-conditions model from which to evaluate changes due to proposed project grading.

The computed water surface elevations with the project are similar and are zero or negative if rounded to the nearest tenth of a foot, except for Badger Cross Sections 3 and 5, which are located within the 121 Badger property, downstream of the proposed driveway. The proposed project does show a slight 0.1-ft rise at the Badger cross sections 3 and 5. However, there is no modeled rise in flood elevation at Badger-2 or Badger-6, south and north property points, respectively. Furthermore, no flood inundation was documented with aerial photography in 1986, 2006, and 2017.

Table 2 shows a comparison of water surface elevations. The project is outside the regulatory floodway and the FEMA “no-rise” requirement do not apply. However, the city’s no adverse impact statement is required. Given that the project shows no increase of flood depth along the Badger cross section 2 or Badger cross section 6, it was determined that the no-adverse impact statement was satisfied.

Table 2. Model-computed water surface elevations. Difference column is the difference between project WSL and baseline WSL. Positive numbers indicate a rise in WSL and negative number indicate a decrease in WSL.

Section	River Sta	Water surface elevation (ft)			
		Effective	Current Conditions Baseline	With Project	Difference (project – baseline)
EG	101583	5793.2	5792.8	5792.8	0.0
B11	101175	--	5789.7	5789.7	0.0
B10	101096	--	5788.9	5788.9	0.0
B9	101027	--	5788.1	5788.1	0.0
B8	100954	--	5787.8	5787.8	0.0
Unpub	100887	5787.9	--	--	--
B7	100881	--	5787.2	5787.0	-0.2
B6	100820	--	5787.0	5786.8	-0.2
B5	100764	--	5786.7	5786.8	0.1
B4	100684	--	5786.2	5786.2	0.0
B3	100590	--	5785.8	5785.9	0.1
B2	100535	--	5785.2	5785.2	0.0
B1	100486	--	5784.9	5784.9	0.0
EF	100277	5783.9	5783.9	5783.9	0.0
Unpub	99492	5778.1	5778.1	5778.1	0.0
EE	98972	5774.3	5774.3	5774.3	0.0
Unpub	98528	5772.4	5772.4	5772.4	0.0
ED	98148	5768.9	5768.9	5768.9	0.0

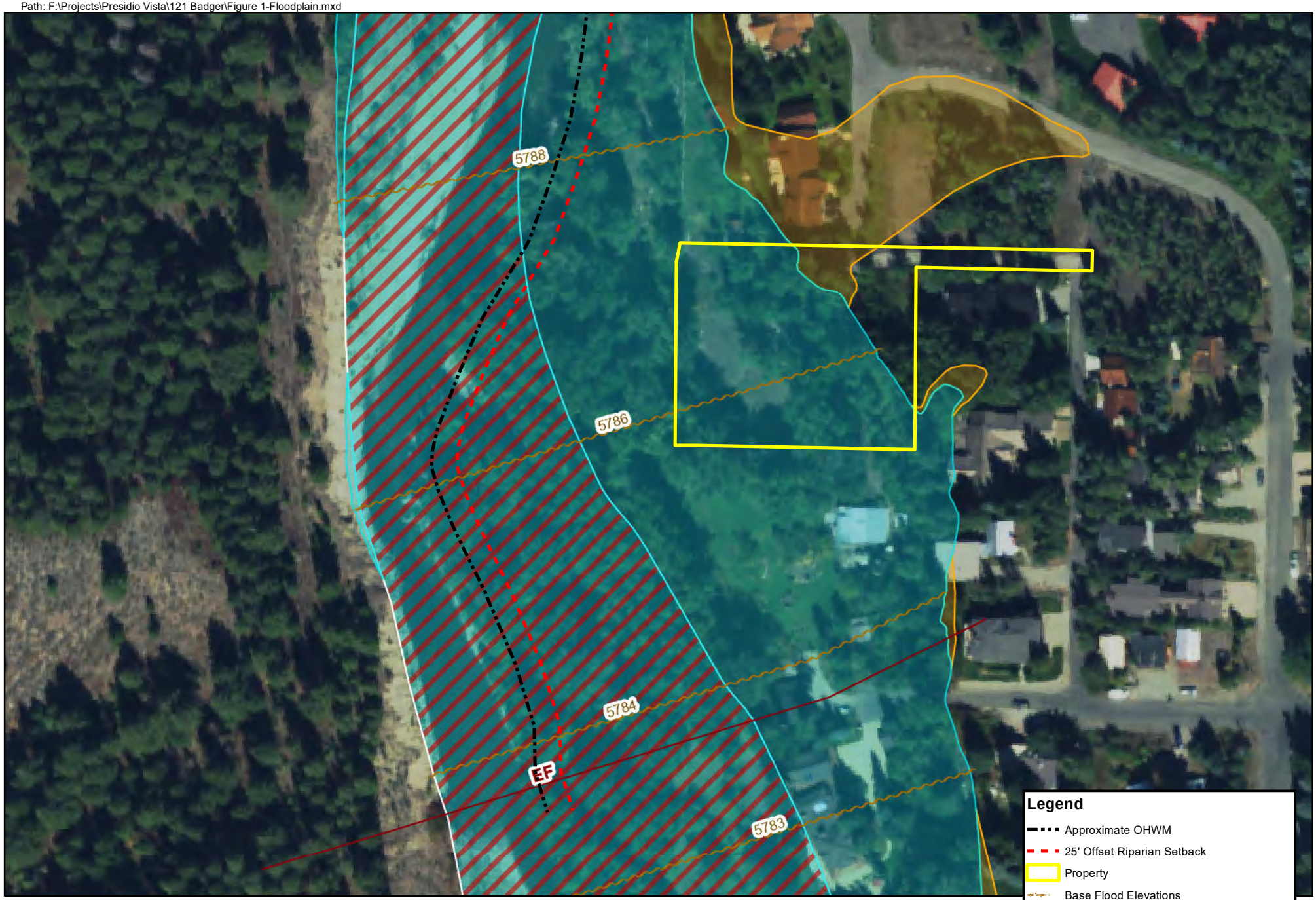
D. Material Quantities

The grading plan volume of cut and fill for impact to the floodplain were calculated from the current and project cross-sections utilized for the hydraulic modeling. Calculations are shown on the attached sheets (Appendix C). The areas of Cut/Fill are shown in Figure 4. The City requires compensatory storage for all fill placed within the effective floodplain on the property at a 1-for-1 ratio. In order to calculate the volumes of fill and cut, the effective base flood elevations (BFEs) were used and interpolated through the property and the LOMA area was included in this analysis, as requested by Harmony. If cut or fill volumes occurred at elevations higher than the BFEs, then the volume was considered outs of the floodplain by elevation. The cut volume below the calculated BFE is 274 cy. The fill volume below the calculated BFE is 258 cy. Final grading plans and maps for the entire project are provided by Benchmark Associates.

E. HEC-RAS Files

Harmony requested the HEC-RAS files for this project. They are included in the zip file provided to the City.

Path: F:\Projects\Presidio Vista\121 Badger\Figure 1-Floodplain.mxd



1 inch = 0.02 miles

121 BADGER LANE

FIGURE 1

BROCKWAY ENGINEERING, PLLC.

JJJ - Date: 2/24/2023

NAIP 2021 IMAGERY

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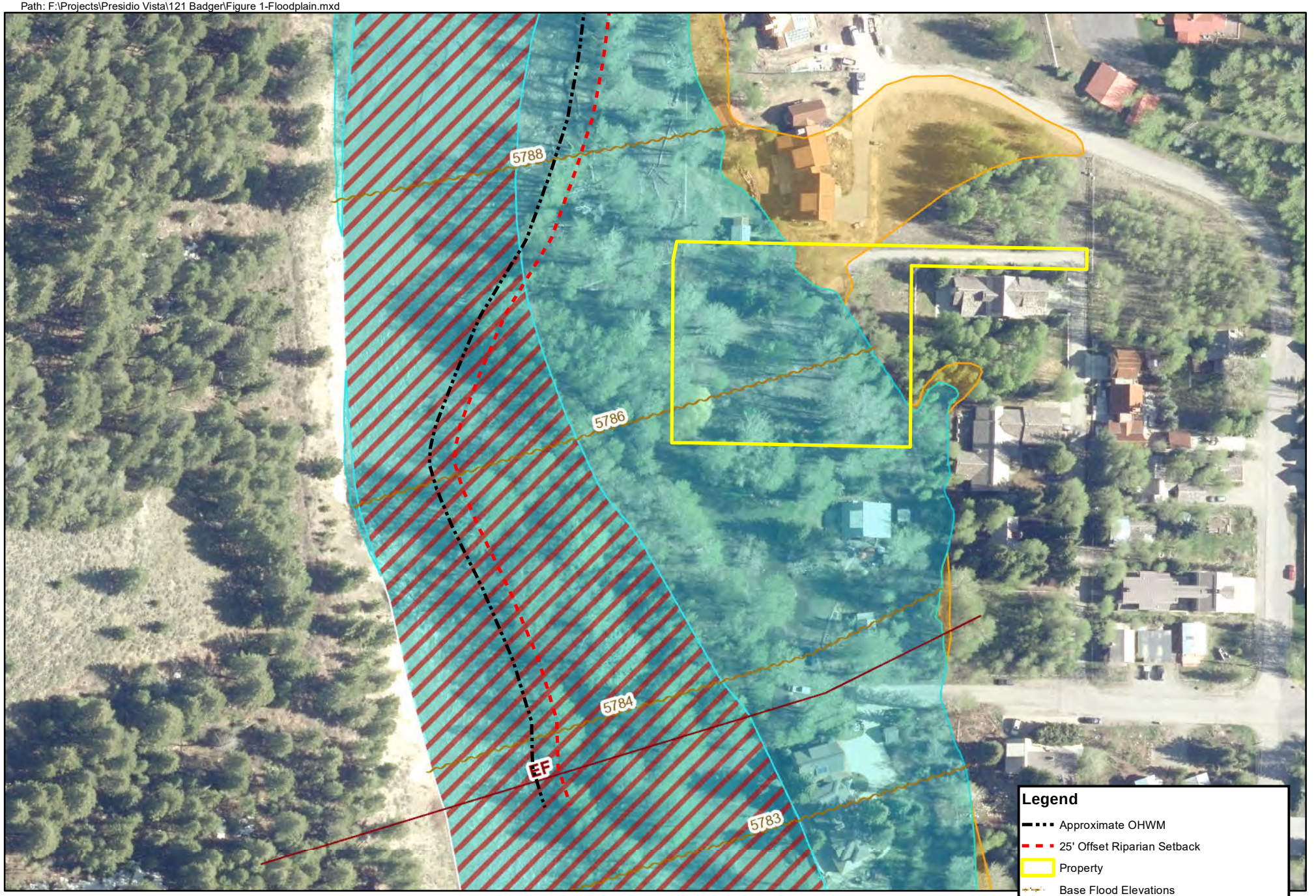


1 inch = 0.02 miles

121 BADGER LANE

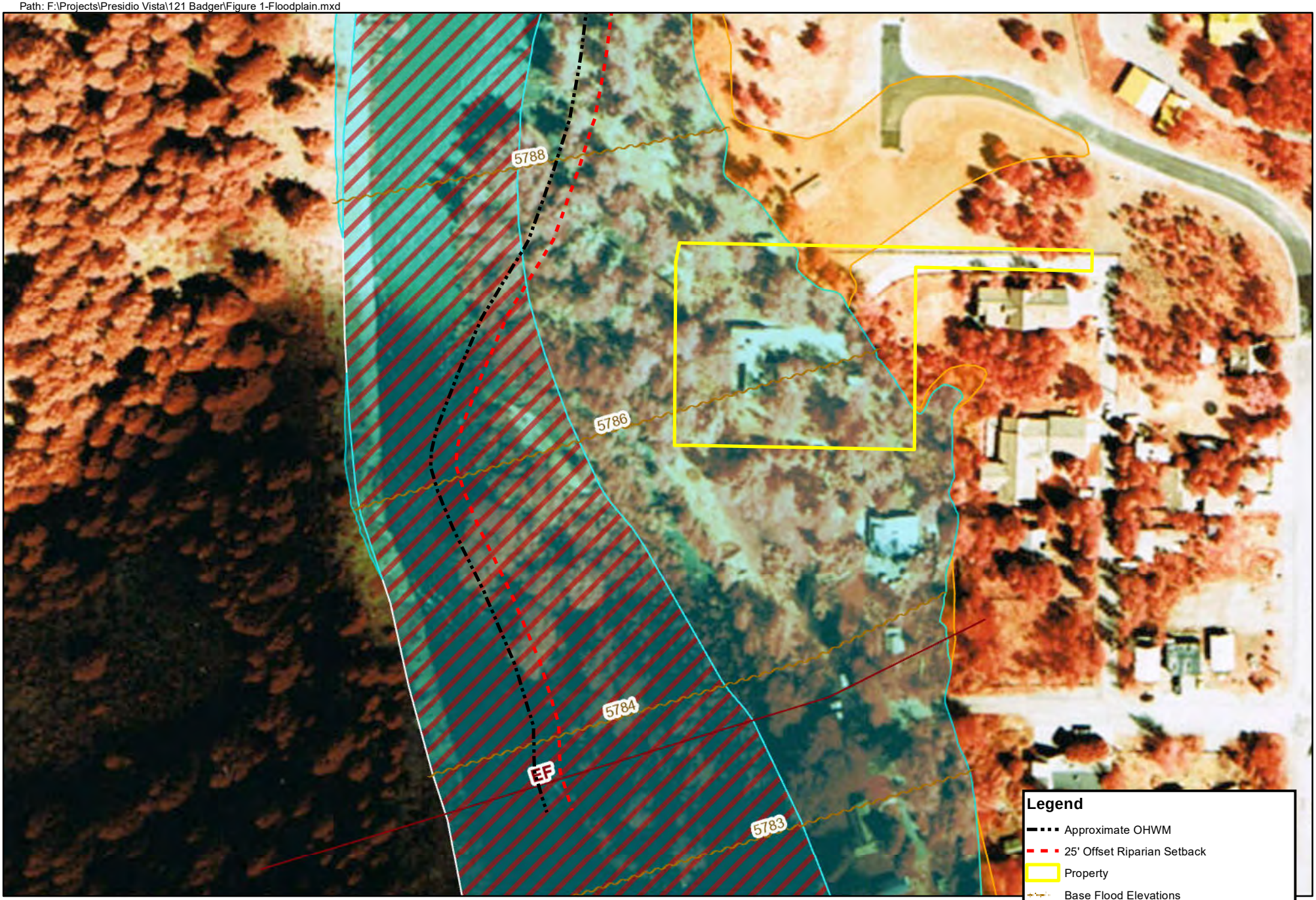
FIGURE 2A

BROCKWAY ENGINEERING, PLLC.

JJJ - Date: 2/24/2023

BIG WOOD IMAGERY 5-11-2017

Path: F:\Projects\Presidio Vista\121 Badger\Figure 1-Floodplain.mxd



1 inch = 0.02 miles

121 BADGER LANE

FIGURE 2B

BROCKWAY ENGINEERING, PLLC.

JJJ - Date: 2/24/2023

BIG WOOD IMAGERY 5-19-2006

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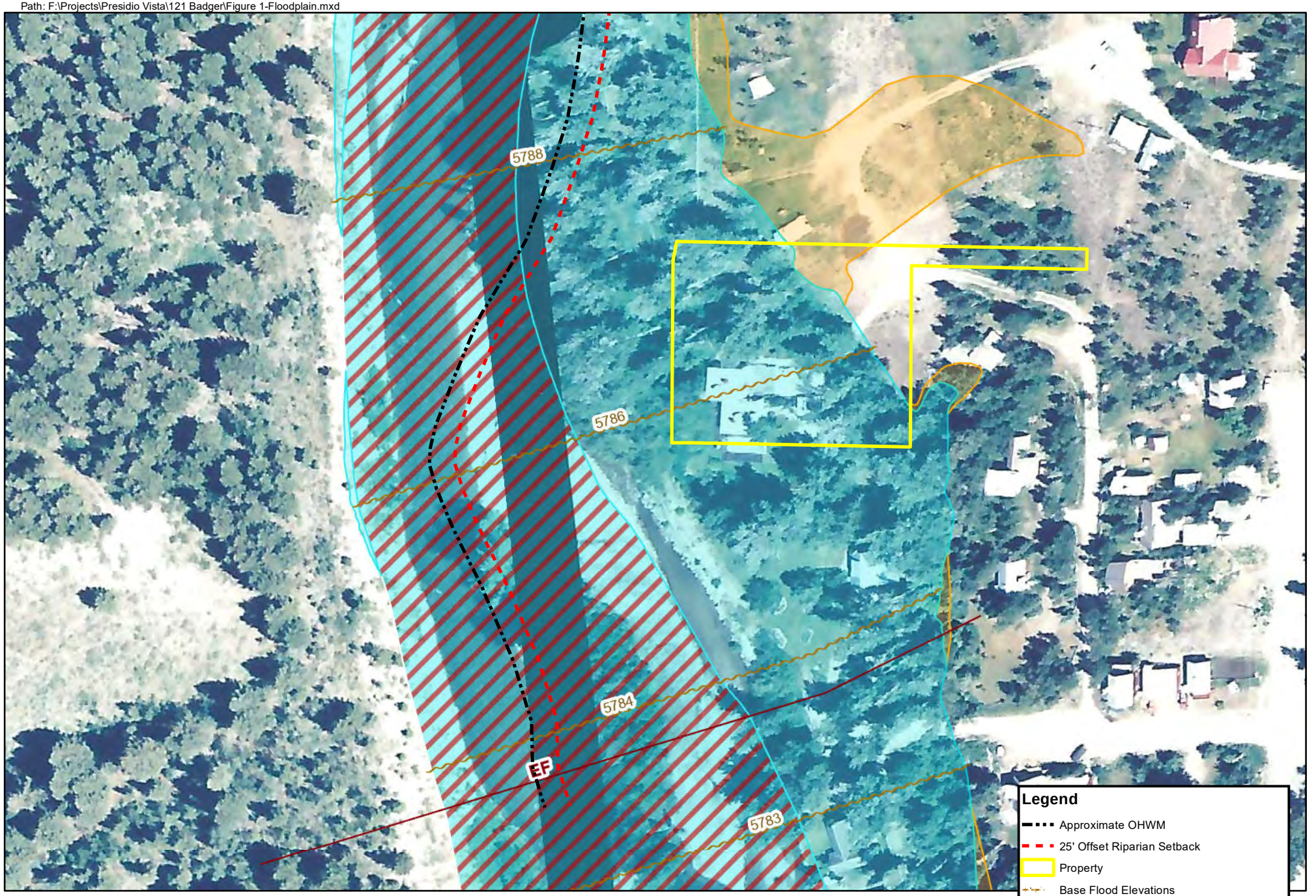


1 inch = 0.02 miles

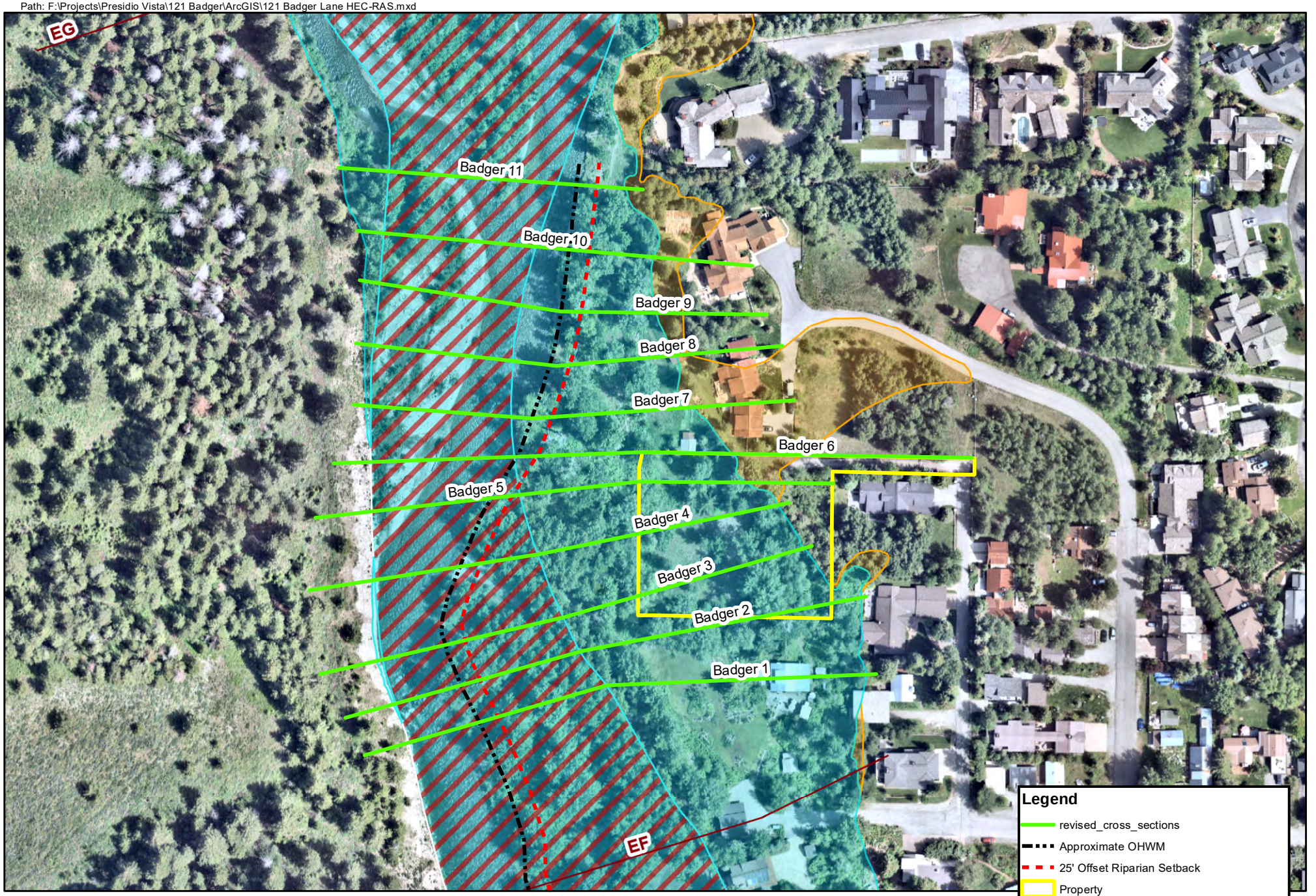
121 BADGER LANE

FIGURE 2C

BROCKWAY ENGINEERING, PLLC.
JJJ - Date: 2/24/2023

BIG WOOD IMAGERY 6-23-1986

Path: F:\Projects\Presidio Vista\121 Badger\ArcGIS\121 Badger Lane HEC-RAS.mxd



1 inch = 150 feet

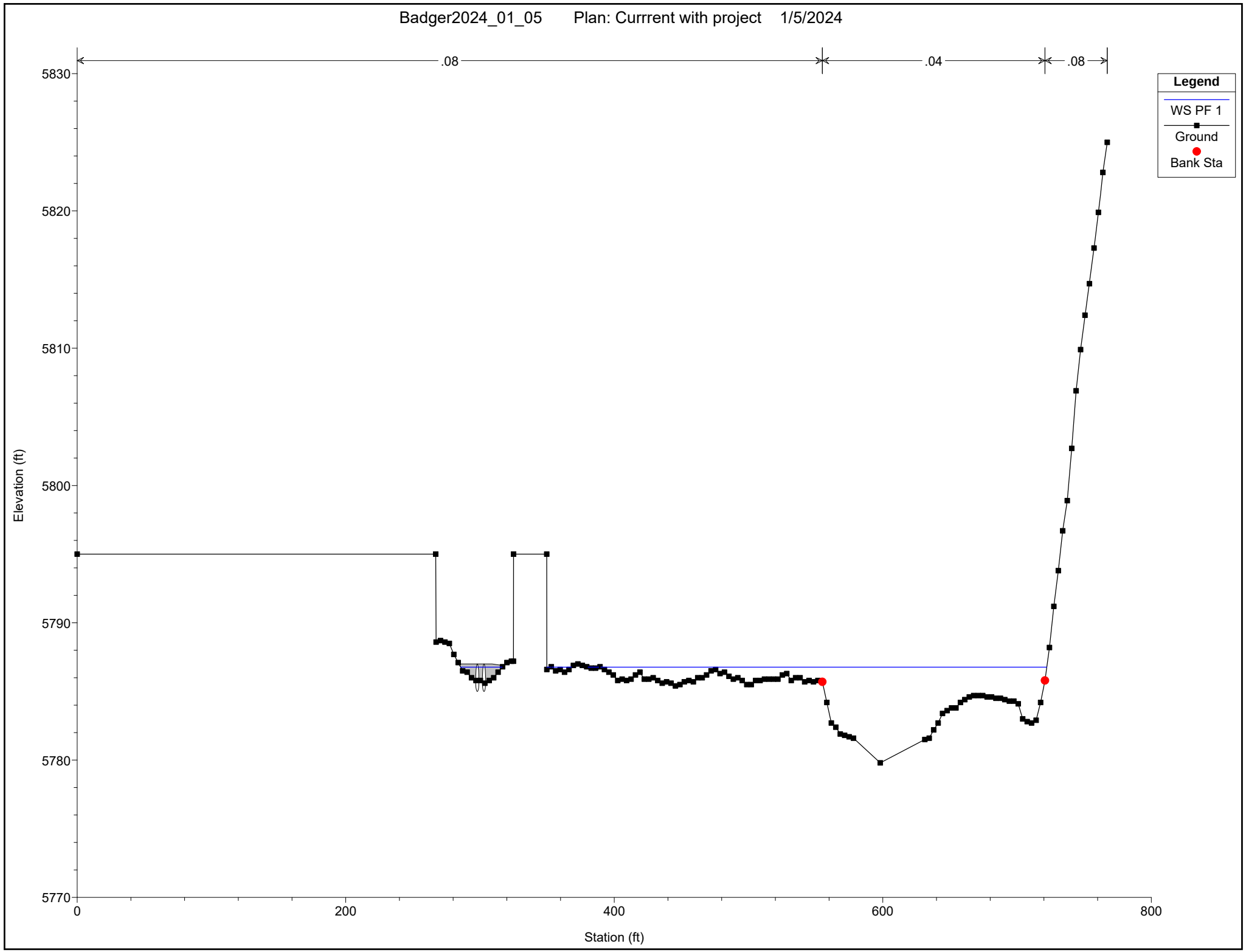
121 BADGER LANE

FIGURE 3

BROCKWAY ENGINEERING, PLLC.

JJJ - Date: 1/5/2024

2023 NEARMAP IMAGERY


Badger2024_01_05 Plan: Currrent with project 1/5/2024
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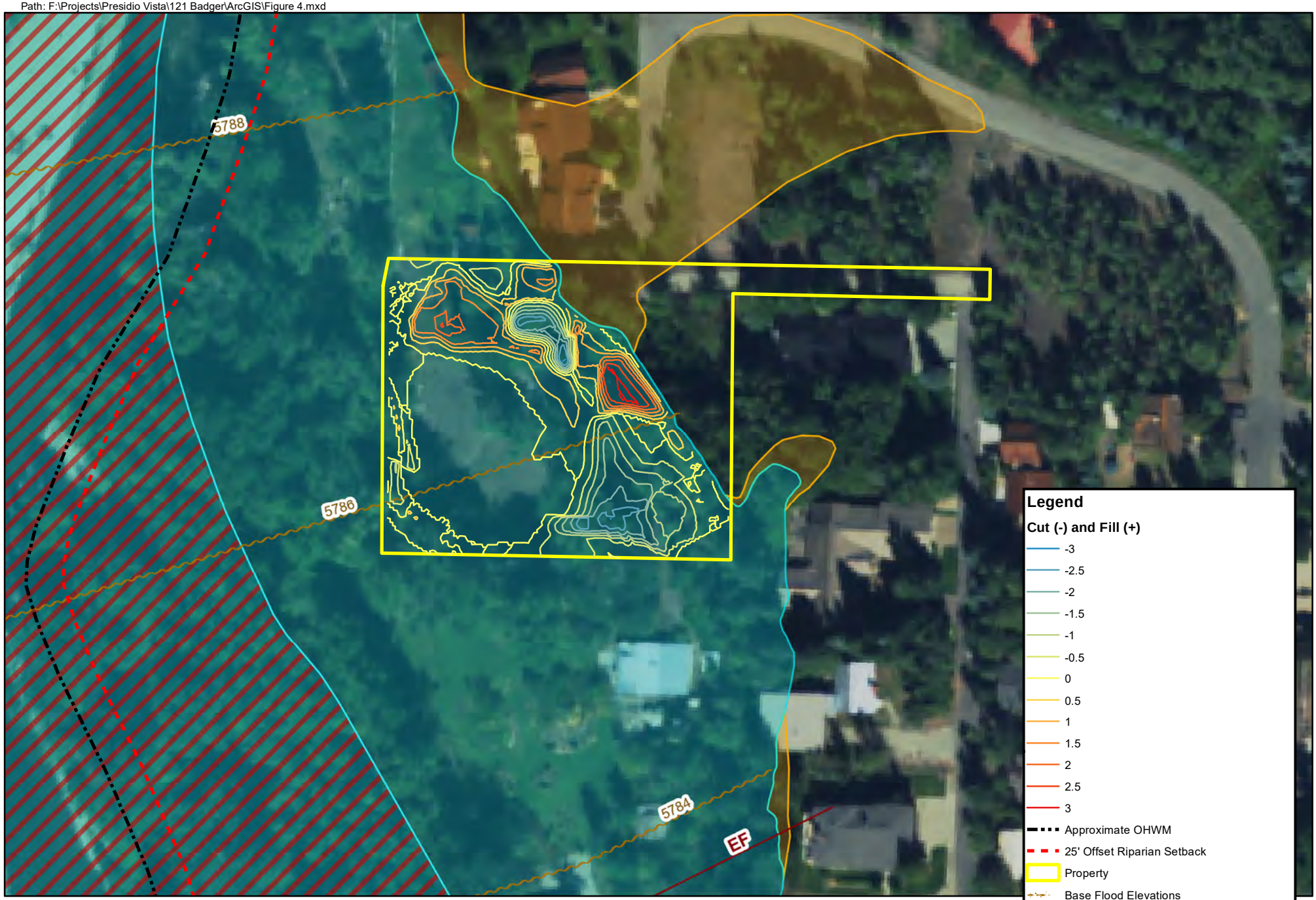
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
5830
5820
5810
5800
5790
5780
5770
0
200
400
600
800
Station (ft)

Path: F:\Projects\Presidio Vista\121 Badger\ArcGIS\Figure 4.mxd



1 inch = 0.02 miles

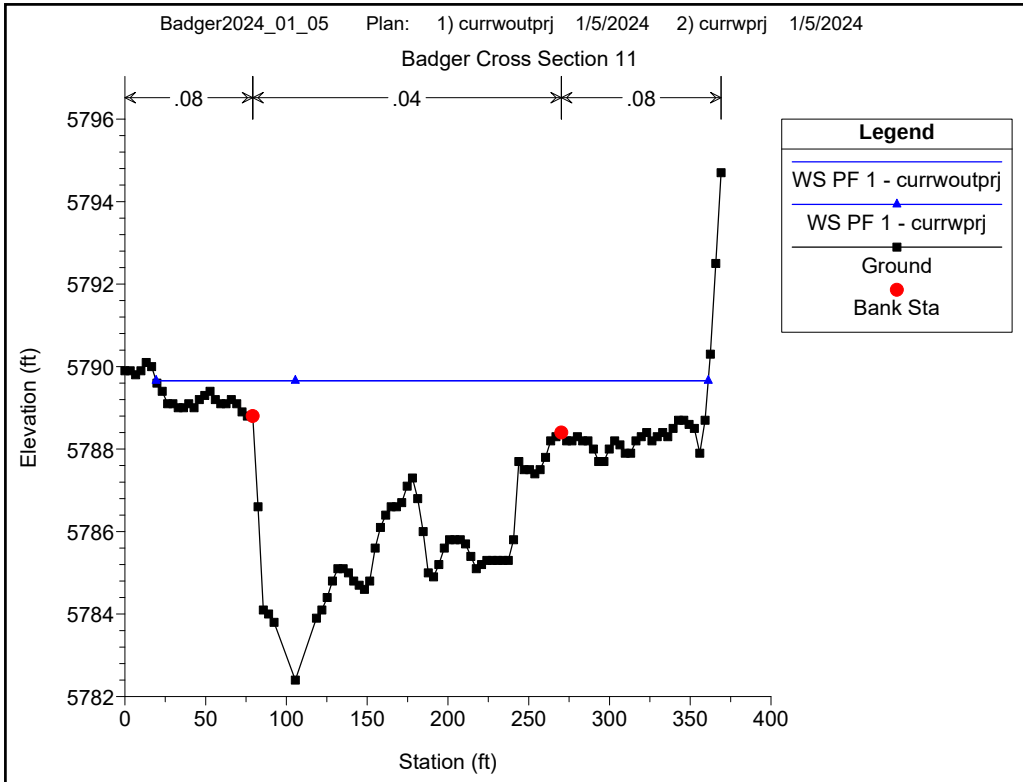
121 BADGER LANE

FIGURE 4

BROCKWAY ENGINEERING, PLLC.
JJJ - Date: 5/4/2023

NAIP 2021 IMAGERY

Appendix B
HEC-RAS Cross Sections and Data


Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
Badger Cross Section 11
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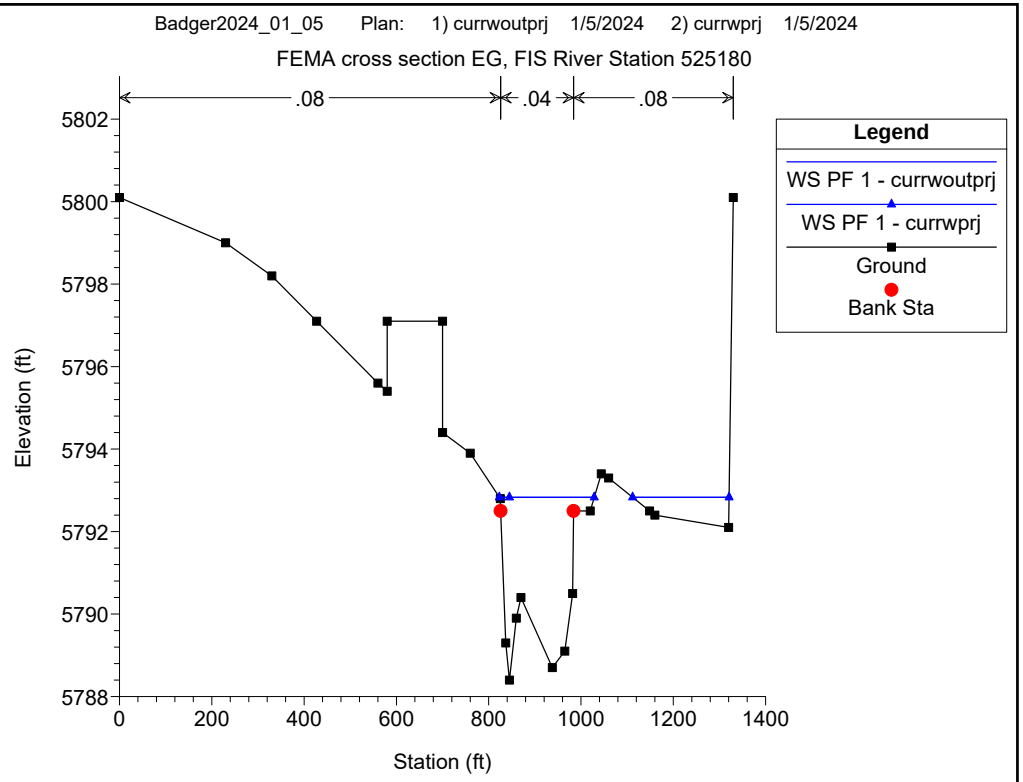
WS PF 1 - currwoutprj
WS PF 1 - currwprj
Ground
Bank Sta
Elevation (ft)
Station (ft)


Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
FEMA cross section EG, FIS River Station 525180
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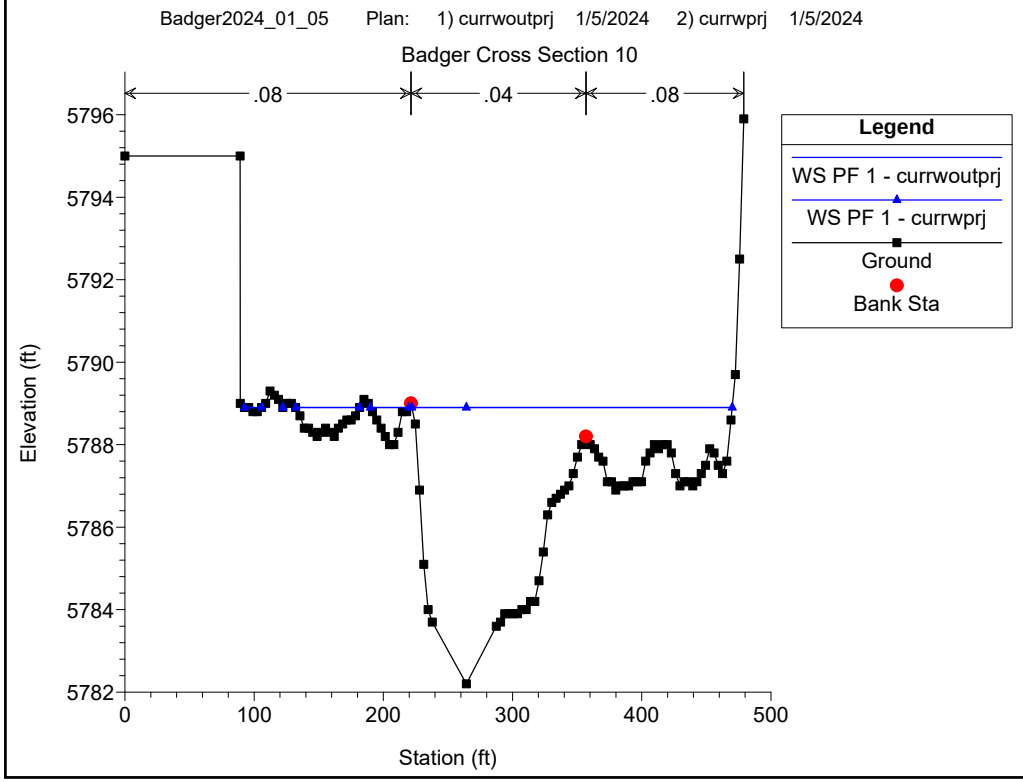
Legend
WS PF 1 - currwoutprj
WS PF 1 - currwprj
Ground
Bank Sta
Elevation (ft)
Station (ft)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Badger Cross Section 10
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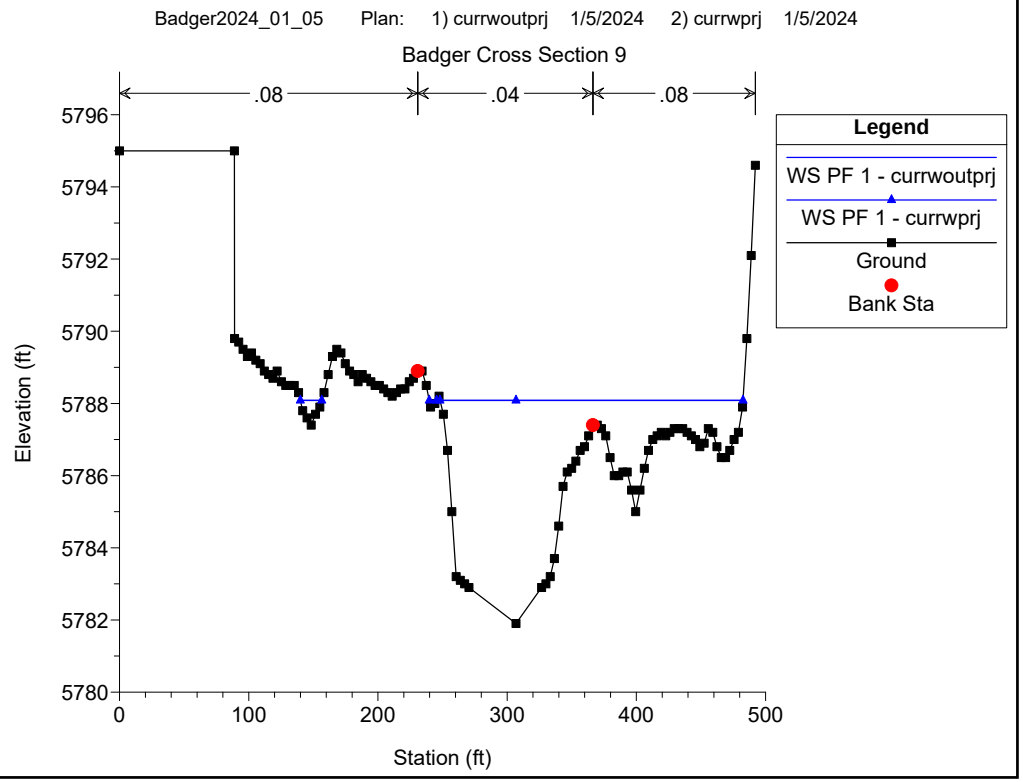
Legend
WS PF 1 - currwoutprj
WS PF 1 - currwprj
Ground
Bank Sta
Elevation (ft)
Station (ft)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Badger Cross Section 9
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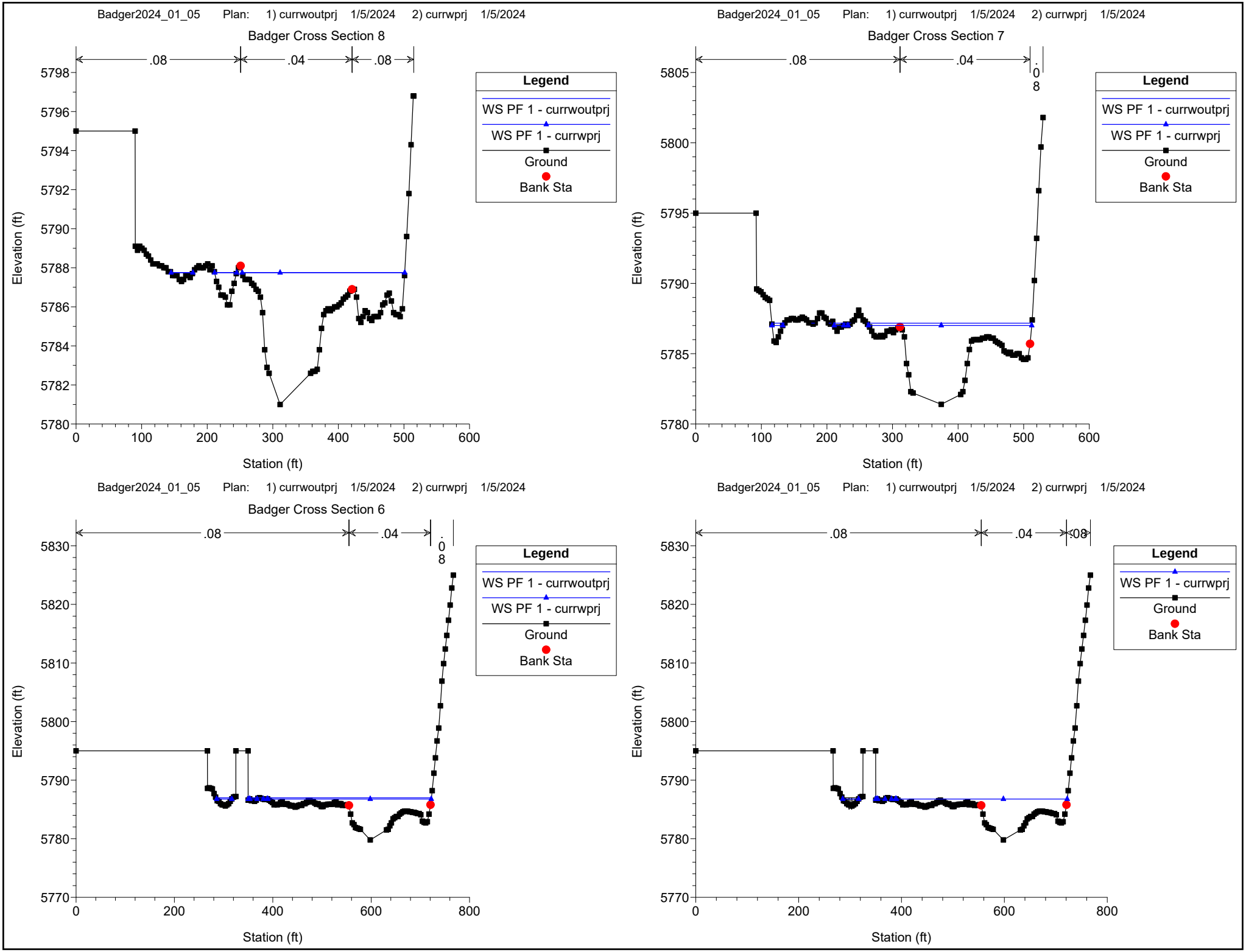
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Badger Cross Section 8
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WS PF 1 - currwprj
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Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
Badger Cross Section 7
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Elevation (ft)
Station (ft)
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
Badger Cross Section 6
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WS PF 1 - currwoutprj
WS PF 1 - currwprj
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Elevation (ft)
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Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
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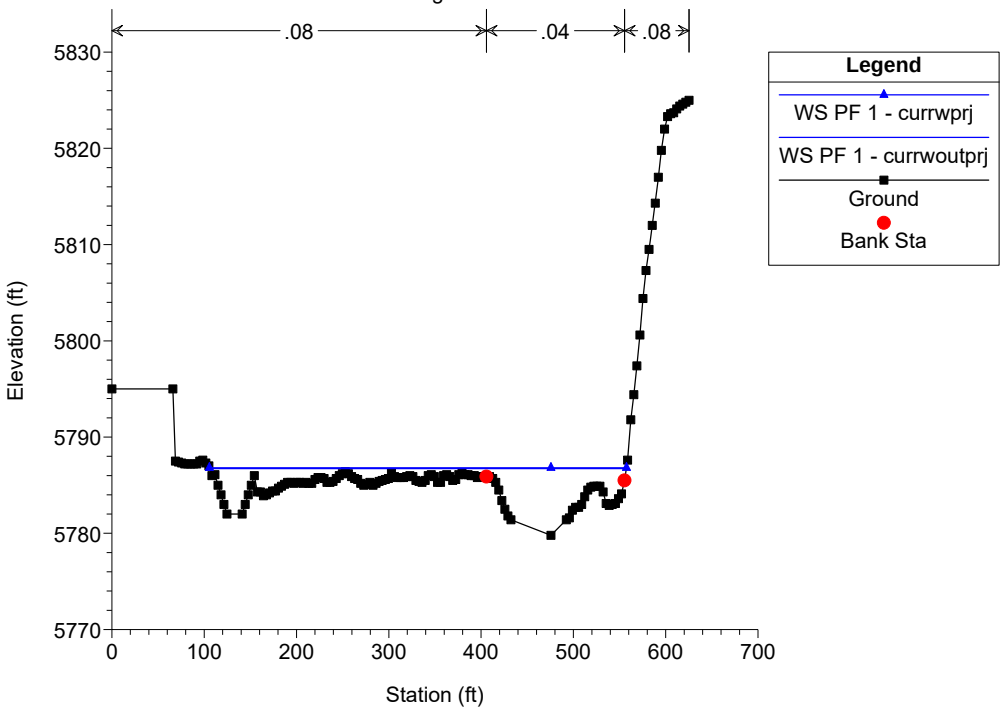
WS PF 1 - currwprj
Ground
Bank Sta
Elevation (ft)
Station (ft)

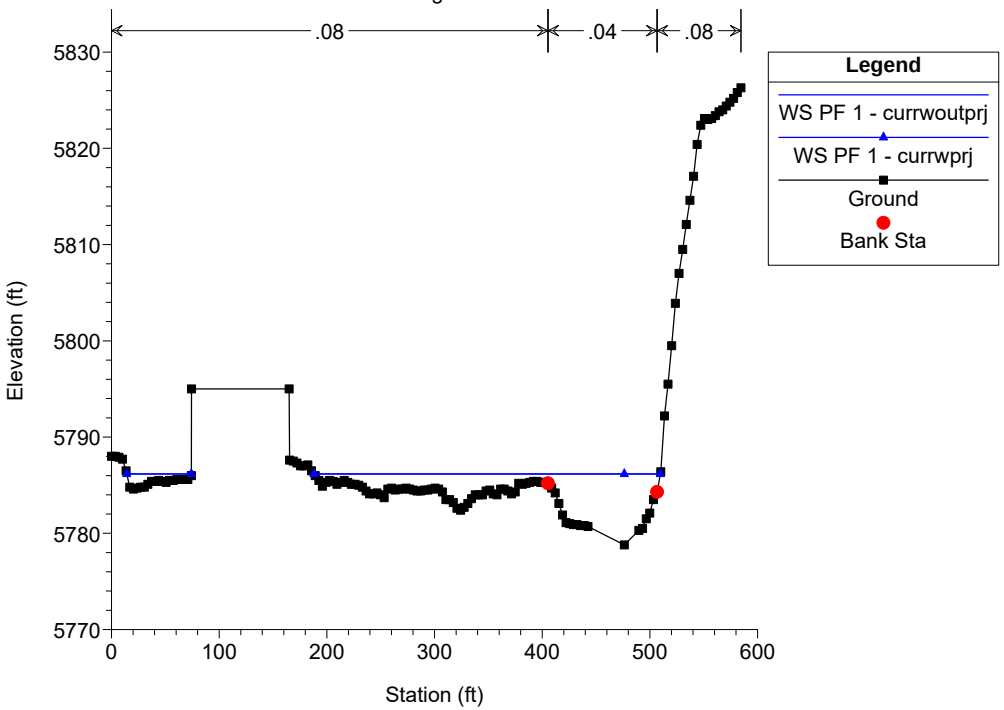
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

Badger Cross Section 5



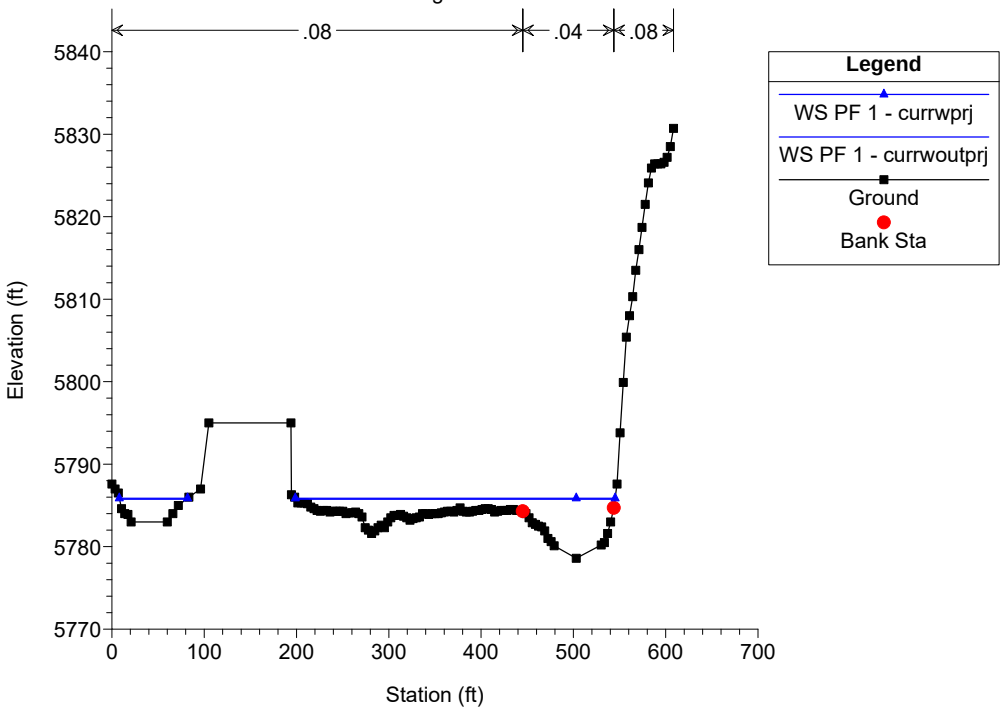
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

Badger Cross Section 4



Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

Badger Cross Section 3



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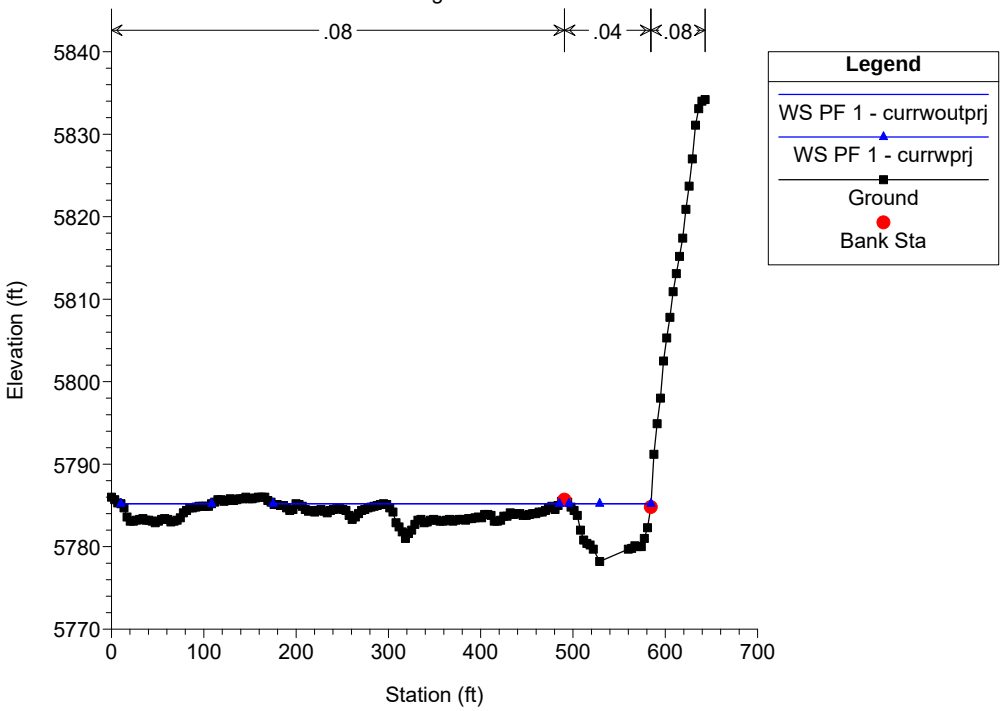
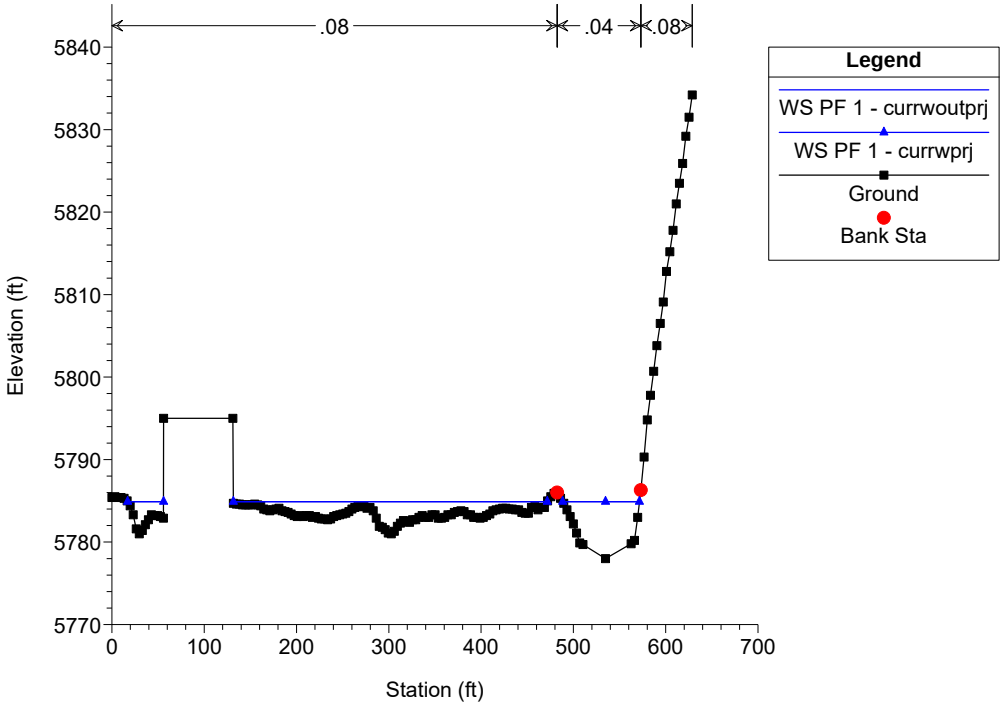
Badger Cross Section 2



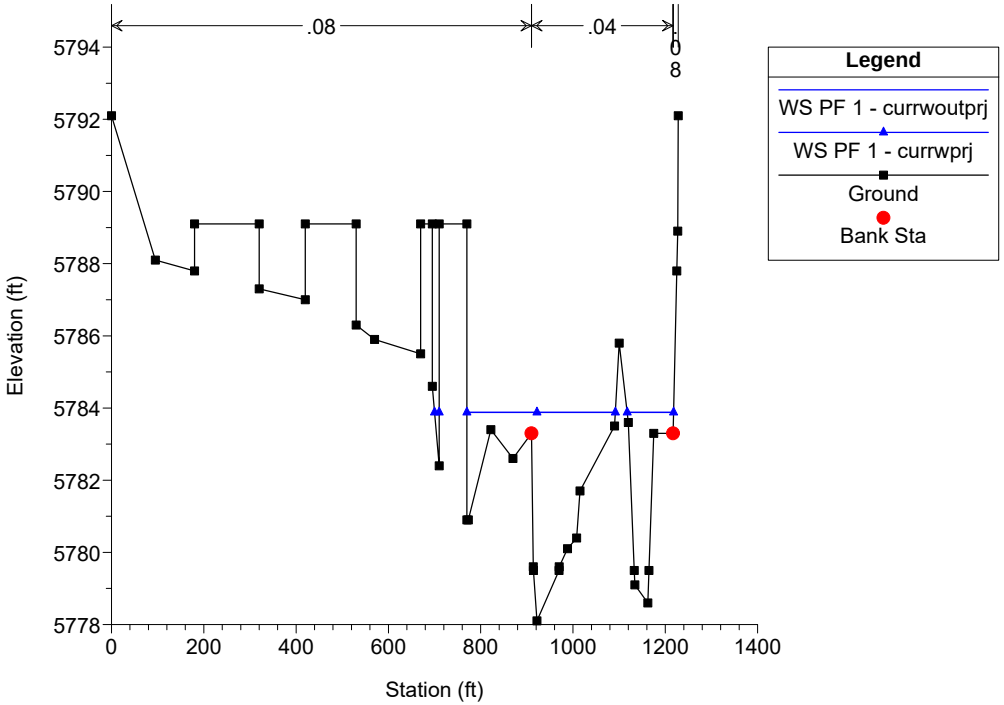
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

Badger Cross Section 1



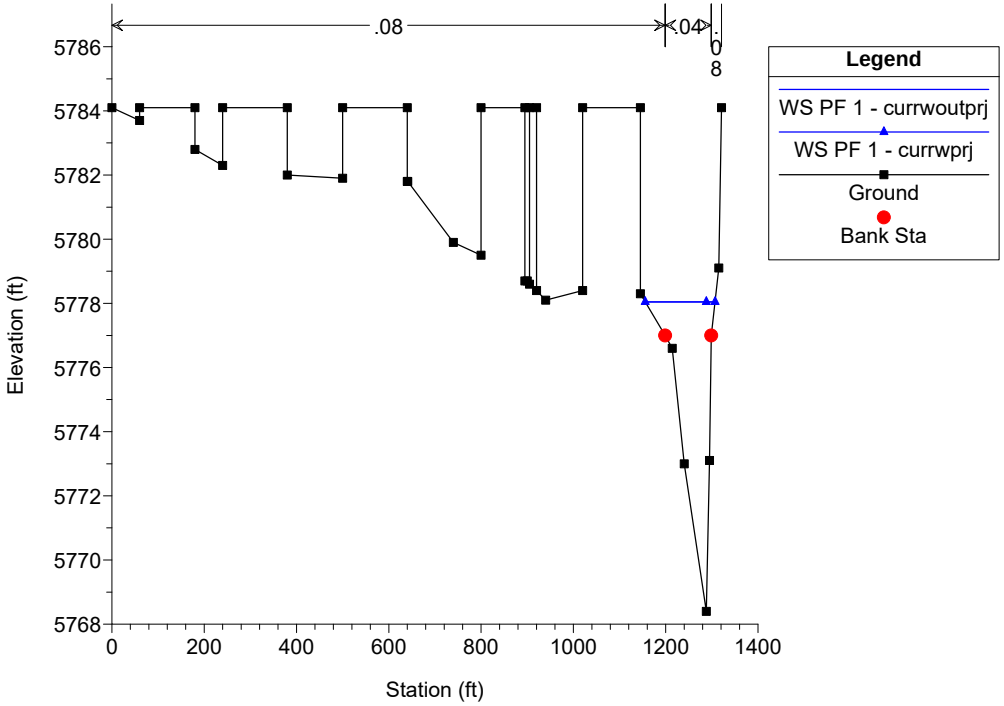
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

FEMA cross Section EF, FIS river station 523880



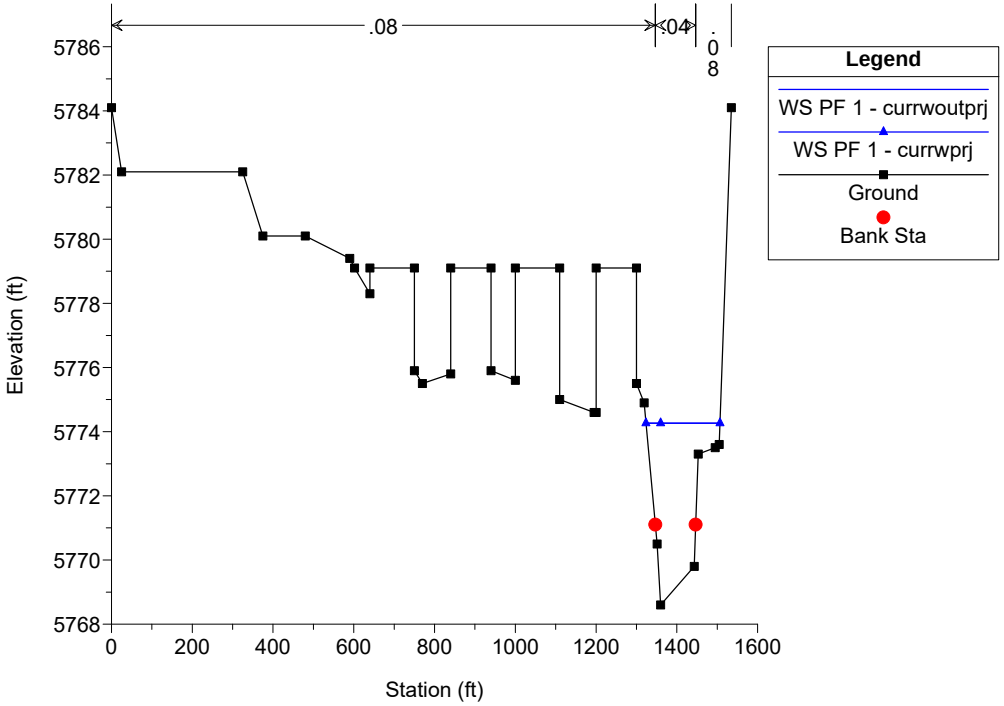
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

INEFFECTIVE FLOW AREA BLOCKED OUT BASED ON COLOR AERIAL PHOTOGRA



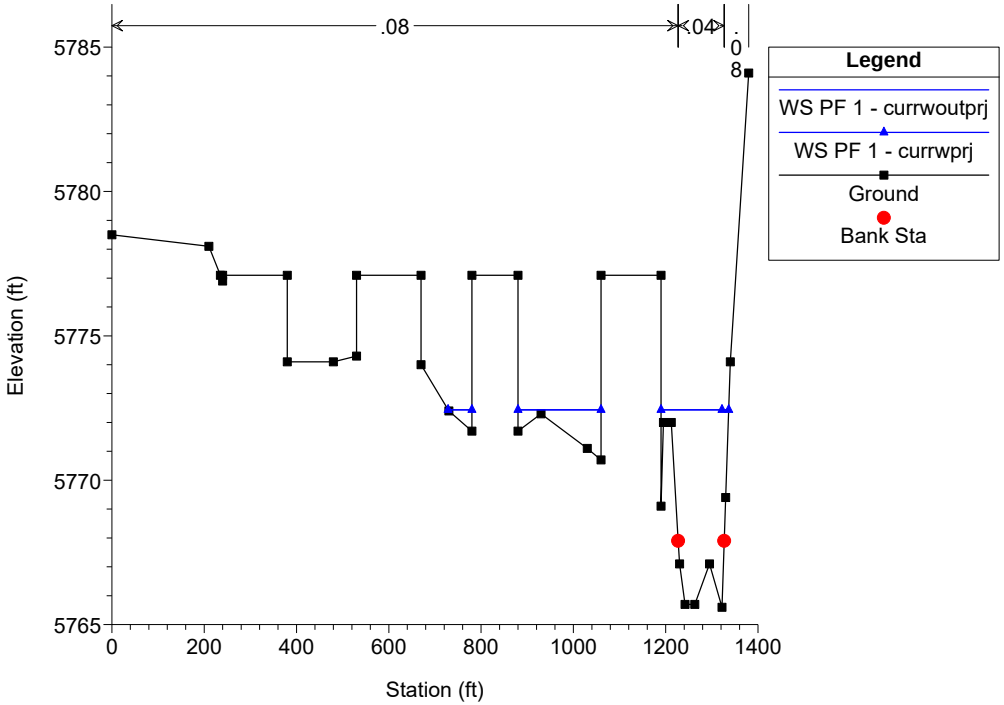
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

FEMA Cross Section EE, FIS River Station 522570



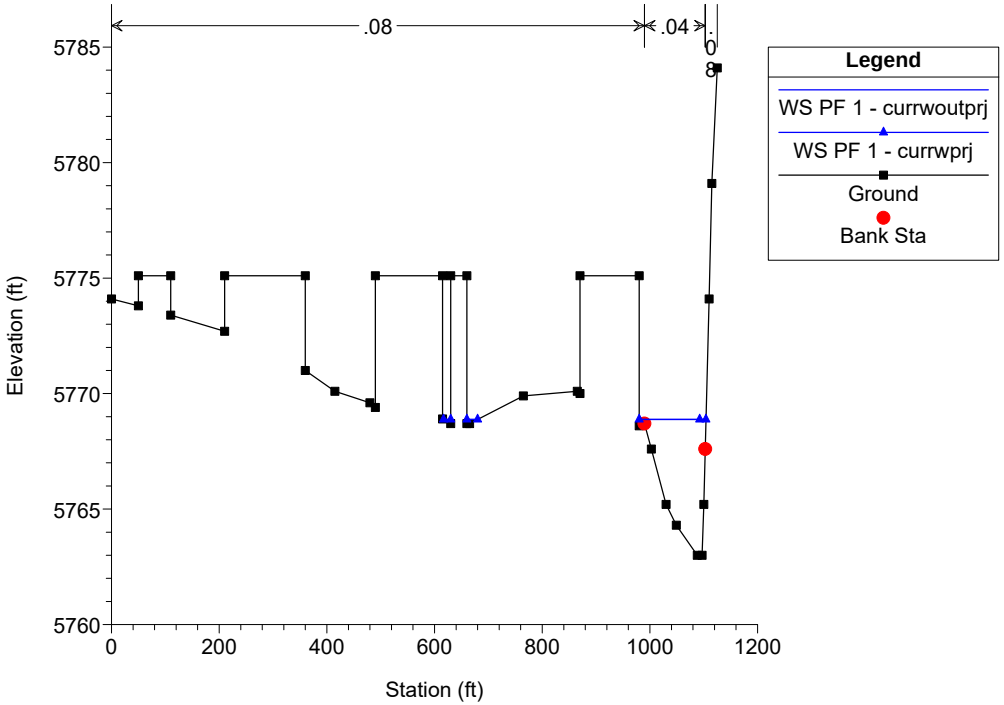
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

INEFFECTIVE FLOW AREA BLOCKED OUT BASED ON COLOR AERIAL PHOTOGRA



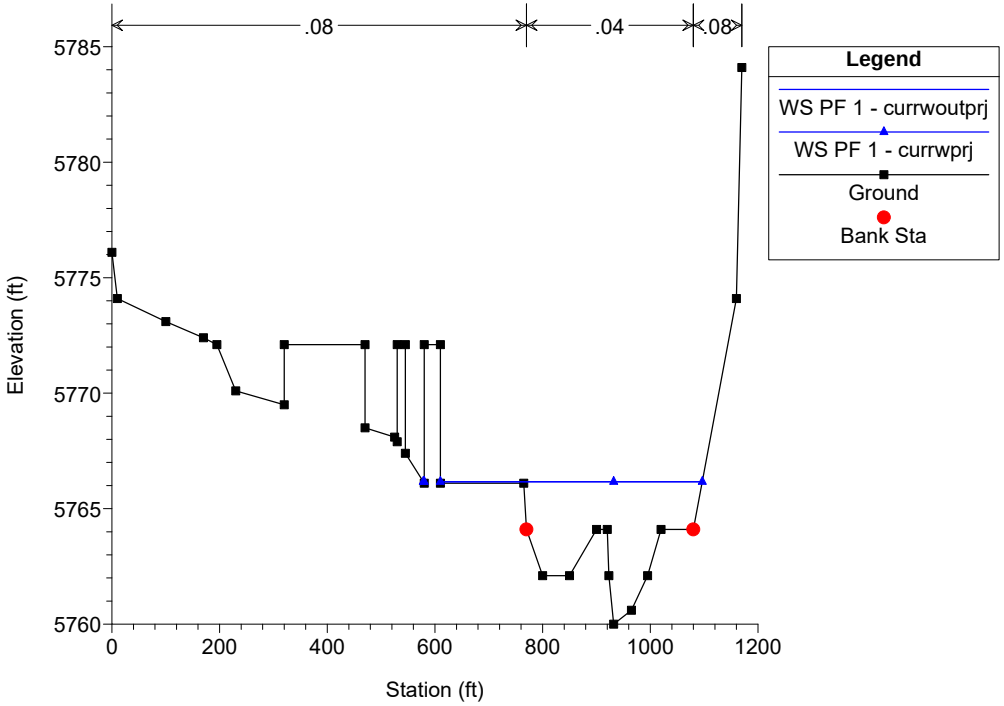
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

FEMA Cross Section ED, FIS River Station 521750



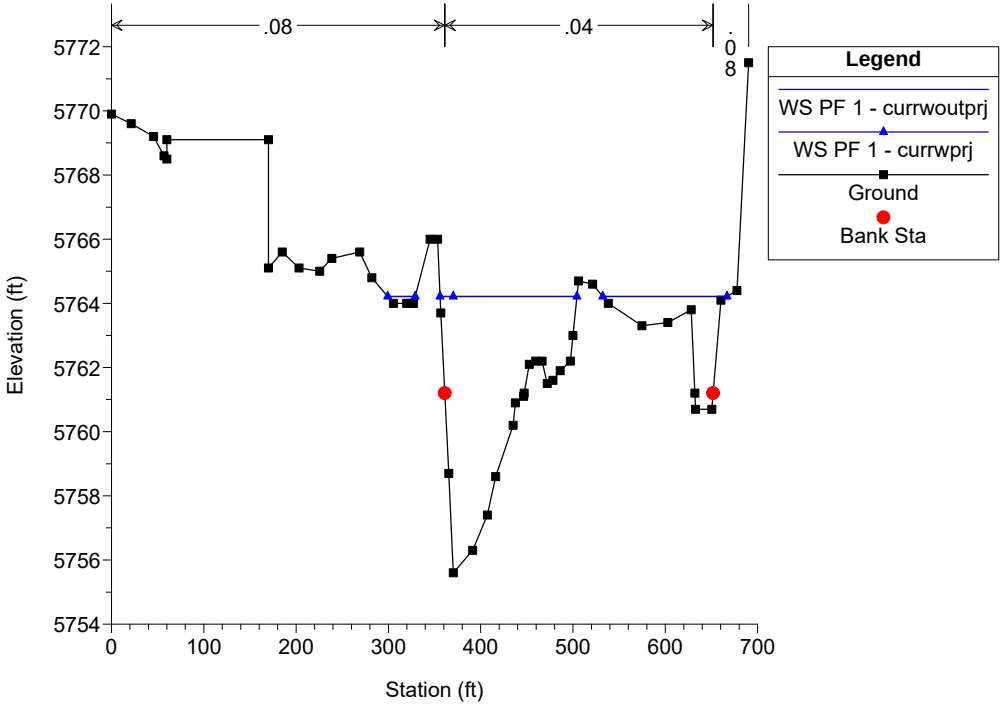
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

DATA FROM FLOOD PLAIN INFORMATION REPORT CORPS OF ENGINEERS JU

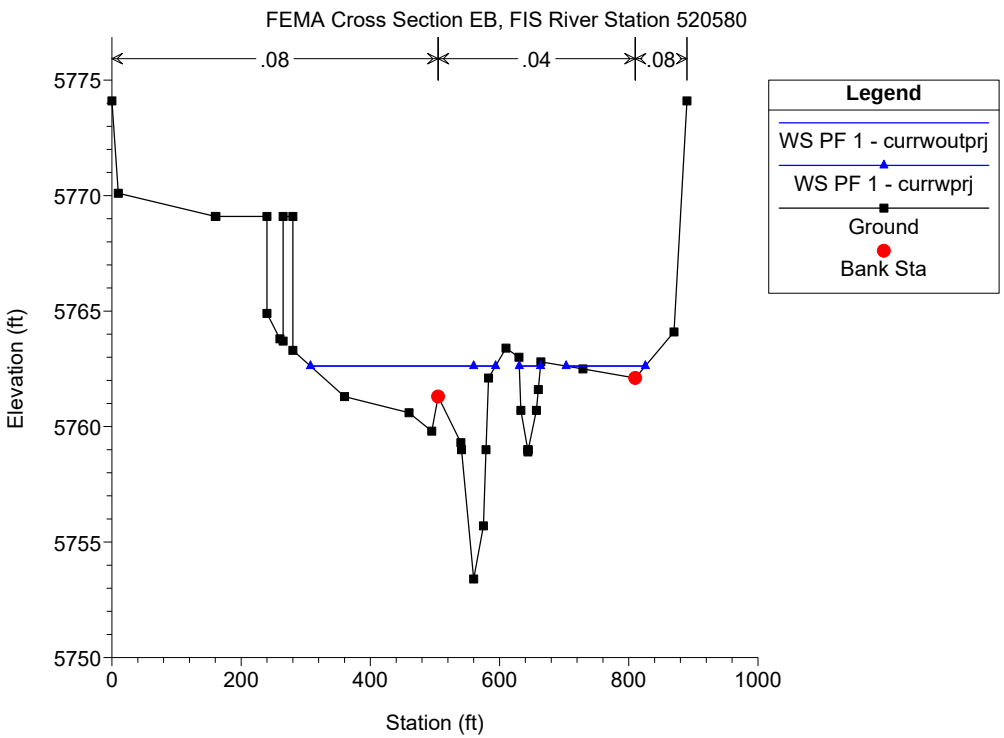


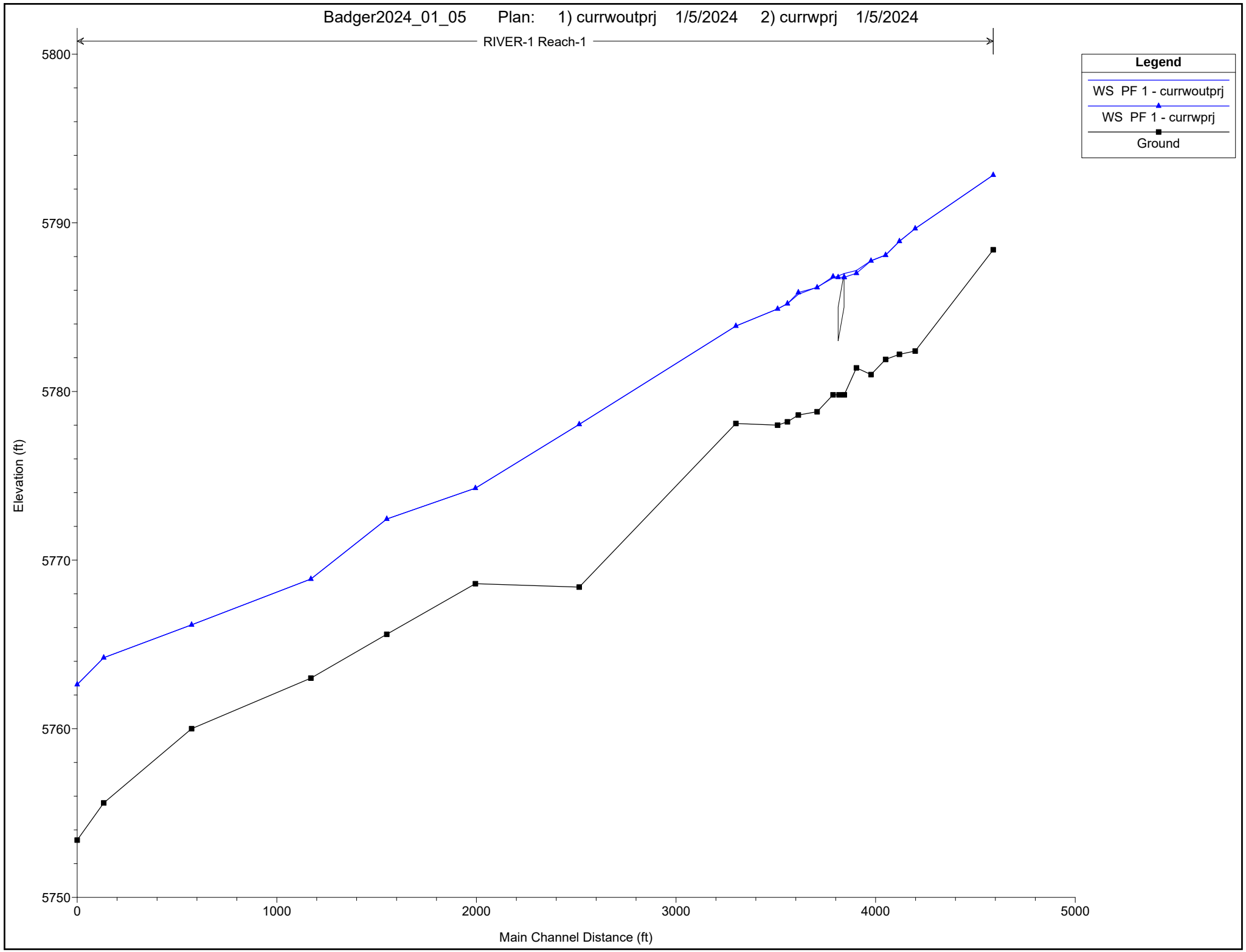
Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024

FEMA Cross Section EC, FIS River Station 520710



Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024




Badger2024_01_05 Plan: 1) currwoutprj 1/5/2024 2) currwprj 1/5/2024
RIVER-1 Reach-1
Legend
WS PF 1 - currwoutprj
WS PF 1 - currwprj
Ground
Elevation (ft)
5800
5790
5780
5770
5760
5750
0
1000
2000
3000
4000
5000
Main Channel Distance (ft)

Plan: currwoutprj RIVER-1 Reach-1 RS: 101583 Profile: PF 1

E.G. Elev (ft)	5794.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5792.83	Reach Len. (ft)	346.00	391.00	356.00
Crit W.S. (ft)	5792.83	Flow Area (sq ft)	0.21	518.55	117.13
E.G. Slope (ft/ft)	0.011823	Area (sq ft)	0.21	518.55	117.13
Q Total (cfs)	4740.00	Flow (cfs)	0.07	4596.62	143.30
Top Width (ft)	414.72	Top Width (ft)	2.85	158.00	253.87
Vel Total (ft/s)	7.45	Avg. Vel. (ft/s)	0.35	8.86	1.22
Max Chl Dpth (ft)	4.43	Hydr. Depth (ft)	0.07	3.28	0.46
Conv. Total (cfs)	43592.9	Conv. (cfs)	0.7	42274.3	1317.9
Length Wtd. (ft)	389.70	Wetted Per. (ft)	2.89	159.50	254.14
Min Ch El (ft)	5788.40	Shear (lb/sq ft)	0.05	2.40	0.34
Alpha	1.37	Stream Power (lb/ft s)	0.02	21.27	0.42
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	9.86	67.75	3.11
C & E Loss (ft)	0.21	Cum SA (acres)	11.19	17.73	3.26

Plan: currwoutprj RIVER-1 Reach-1 RS: 101175 Profile: PF 1

E.G. Elev (ft)	5790.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5789.66	Reach Len. (ft)	79.00	79.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)	31.79	796.47	128.26
E.G. Slope (ft/ft)	0.003579	Area (sq ft)	31.79	796.47	128.26
Q Total (cfs)	4740.00	Flow (cfs)	23.17	4538.25	178.58
Top Width (ft)	341.86	Top Width (ft)	59.78	191.10	90.98
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	0.73	5.70	1.39
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)	0.53	4.17	1.41
Conv. Total (cfs)	79235.4	Conv. (cfs)	387.3	75863.0	2985.2
Length Wtd. (ft)	78.70	Wetted Per. (ft)	59.83	193.99	91.44
Min Ch El (ft)	5782.40	Shear (lb/sq ft)	0.12	0.92	0.31
Alpha	1.27	Stream Power (lb/ft s)	0.09	5.23	0.44
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	9.74	61.85	2.11
C & E Loss (ft)	0.04	Cum SA (acres)	10.94	16.16	1.85

Plan: currwoutprj RIVER-1 Reach-1 RS: 101096 Profile: PF 1

E.G. Elev (ft)	5789.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5788.90	Reach Len. (ft)	72.00	69.00	61.00
Crit W.S. (ft)	5788.09	Flow Area (sq ft)	36.23	578.63	162.11
E.G. Slope (ft/ft)	0.006121	Area (sq ft)	36.23	578.63	162.11
Q Total (cfs)	4740.00	Flow (cfs)	30.35	4411.13	298.52
Top Width (ft)	340.69	Top Width (ft)	92.74	134.75	113.20
Vel Total (ft/s)	6.10	Avg. Vel. (ft/s)	0.84	7.62	1.84
Max Chl Dpth (ft)	6.70	Hydr. Depth (ft)	0.39	4.29	1.43
Conv. Total (cfs)	60585.7	Conv. (cfs)	387.9	56382.1	3815.7
Length Wtd. (ft)	68.49	Wetted Per. (ft)	92.87	136.20	113.65
Min Ch El (ft)	5782.20	Shear (lb/sq ft)	0.15	1.62	0.55
Alpha	1.46	Stream Power (lb/ft s)	0.12	12.38	1.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	9.68	60.60	1.87
C & E Loss (ft)	0.03	Cum SA (acres)	10.80	15.87	1.68

Plan: currwoutprj RIVER-1 Reach-1 RS: 101027 Profile: PF 1

E.G. Elev (ft)	5789.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.13	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5788.09	Reach Len. (ft)	61.00	73.00	76.00
Crit W.S. (ft)	5787.71	Flow Area (sq ft)	6.34	501.70	152.52
E.G. Slope (ft/ft)	0.008860	Area (sq ft)	6.34	501.70	152.52
Q Total (cfs)	4740.00	Flow (cfs)	5.83	4415.44	318.74
Top Width (ft)	256.83	Top Width (ft)	16.59	124.11	116.12
Vel Total (ft/s)	7.18	Avg. Vel. (ft/s)	0.92	8.80	2.09
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)	0.38	4.04	1.31
Conv. Total (cfs)	50355.9	Conv. (cfs)	61.9	46907.8	3386.1
Length Wtd. (ft)	73.14	Wetted Per. (ft)	16.66	125.64	116.71
Min Ch El (ft)	5781.90	Shear (lb/sq ft)	0.21	2.21	0.72

Plan: currwoutprj RIVER-1 Reach-1 RS: 101027 Profile: PF 1 (Continued)

Alpha	1.41	Stream Power (lb/ft s)	0.19	19.44	1.51
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	9.64	59.74	1.65
C & E Loss (ft)	0.11	Cum SA (acres)	10.71	15.66	1.52

Plan: currwoutprj RIVER-1 Reach-1 RS: 100954 Profile: PF 1

E.G. Elev (ft)	5788.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5787.75	Reach Len. (ft)	63.00	73.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)	39.51	593.23	149.09
E.G. Slope (ft/ft)	0.007244	Area (sq ft)	39.51	593.23	149.09
Q Total (cfs)	4740.00	Flow (cfs)	53.22	4332.84	353.93
Top Width (ft)	315.14	Top Width (ft)	67.34	167.65	80.15
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	1.35	7.30	2.37
Max Chl Dpth (ft)	6.75	Hydr. Depth (ft)	0.59	3.54	1.86
Conv. Total (cfs)	55690.8	Conv. (cfs)	625.3	50907.0	4158.4
Length Wtd. (ft)	72.88	Wetted Per. (ft)	67.60	168.97	81.02
Min Ch El (ft)	5781.00	Shear (lb/sq ft)	0.26	1.59	0.83
Alpha	1.34	Stream Power (lb/ft s)	0.36	11.60	1.98
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	9.61	58.83	1.39
C & E Loss (ft)	0.00	Cum SA (acres)	10.65	15.42	1.35

Plan: currwoutprj RIVER-1 Reach-1 RS: 100881 Profile: PF 1

E.G. Elev (ft)	5787.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5787.17	Reach Len. (ft)	48.00	61.00	67.00
Crit W.S. (ft)		Flow Area (sq ft)	52.83	648.28	2.10
E.G. Slope (ft/ft)	0.007853	Area (sq ft)	52.83	648.28	2.10
Q Total (cfs)	4740.00	Flow (cfs)	61.79	4675.60	2.61
Top Width (ft)	306.47	Top Width (ft)	105.31	198.30	2.86
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)	1.17	7.21	1.24
Max Chl Dpth (ft)	5.77	Hydr. Depth (ft)	0.50	3.27	0.74
Conv. Total (cfs)	53489.0	Conv. (cfs)	697.3	52762.3	29.4
Length Wtd. (ft)	60.59	Wetted Per. (ft)	105.75	199.91	3.21
Min Ch El (ft)	5781.40	Shear (lb/sq ft)	0.24	1.59	0.32
Alpha	1.13	Stream Power (lb/ft s)	0.29	11.47	0.40
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	9.54	57.79	1.26
C & E Loss (ft)	0.07	Cum SA (acres)	10.53	15.11	1.28

Plan: currwoutprj RIVER-1 Reach-1 RS: 100820 Profile: PF 1

E.G. Elev (ft)	5787.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.99	Reach Len. (ft)	41.00	56.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	213.33	721.95	0.98
E.G. Slope (ft/ft)	0.004021	Area (sq ft)	213.33	721.95	0.98
Q Total (cfs)	4740.00	Flow (cfs)	238.30	4500.99	0.71
Top Width (ft)	406.81	Top Width (ft)	239.37	165.80	1.64
Vel Total (ft/s)	5.06	Avg. Vel. (ft/s)	1.12	6.23	0.72
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)	0.89	4.35	0.60
Conv. Total (cfs)	74754.4	Conv. (cfs)	3758.2	70985.0	11.2
Length Wtd. (ft)	54.77	Wetted Per. (ft)	240.29	167.66	2.03
Min Ch El (ft)	5779.80	Shear (lb/sq ft)	0.22	1.08	0.12
Alpha	1.44	Stream Power (lb/ft s)	0.25	6.74	0.09
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	9.40	56.83	1.26
C & E Loss (ft)	0.00	Cum SA (acres)	10.34	14.86	1.28

Plan: currwoutprj RIVER-1 Reach-1 RS: 100764 Profile: PF 1

E.G. Elev (ft)	5787.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.73	Reach Len. (ft)	71.00	80.00	84.00
Crit W.S. (ft)		Flow Area (sq ft)	371.47	636.56	1.22
E.G. Slope (ft/ft)	0.004629	Area (sq ft)	371.47	636.56	1.22
Q Total (cfs)	4740.00	Flow (cfs)	541.97	4197.03	1.00
Top Width (ft)	450.16	Top Width (ft)	298.67	149.50	1.99

Plan: currwoutprj RIVER-1 Reach-1 RS: 100764 Profile: PF 1 (Continued)

Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)	1.46	6.59	0.82
Max Chl Dpth (ft)	6.93	Hydr. Depth (ft)	1.24	4.26	0.61
Conv. Total (cfs)	69670.2	Conv. (cfs)	7966.0	61689.4	14.8
Length Wtd. (ft)	78.82	Wetted Per. (ft)	299.45	151.07	2.34
Min Ch El (ft)	5779.80	Shear (lb/sq ft)	0.36	1.22	0.15
Alpha	1.76	Stream Power (lb/ft s)	0.52	8.03	0.12
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	9.12	55.95	1.25
C & E Loss (ft)	0.02	Cum SA (acres)	10.08	14.66	1.27

Plan: currwoutprj RIVER-1 Reach-1 RS: 100684 Profile: PF 1

E.G. Elev (ft)	5786.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.18	Reach Len. (ft)	82.00	94.00	98.00
Crit W.S. (ft)		Flow Area (sq ft)	418.18	532.66	2.87
E.G. Slope (ft/ft)	0.004630	Area (sq ft)	418.18	532.66	2.87
Q Total (cfs)	4740.00	Flow (cfs)	701.52	4035.34	3.13
Top Width (ft)	393.60	Top Width (ft)	289.15	101.40	3.05
Vel Total (ft/s)	4.97	Avg. Vel. (ft/s)	1.68	7.58	1.09
Max Chl Dpth (ft)	7.38	Hydr. Depth (ft)	1.45	5.25	0.94
Conv. Total (cfs)	69658.6	Conv. (cfs)	10309.5	59303.0	46.1
Length Wtd. (ft)	91.90	Wetted Per. (ft)	290.45	102.66	3.59
Min Ch El (ft)	5778.80	Shear (lb/sq ft)	0.42	1.50	0.23
Alpha	1.99	Stream Power (lb/ft s)	0.70	11.36	0.25
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	8.48	54.88	1.25
C & E Loss (ft)	0.01	Cum SA (acres)	9.60	14.43	1.27

Plan: currwoutprj RIVER-1 Reach-1 RS: 100590 Profile: PF 1

E.G. Elev (ft)	5786.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5785.76	Reach Len. (ft)	46.00	55.00	53.00
Crit W.S. (ft)		Flow Area (sq ft)	513.84	493.25	0.66
E.G. Slope (ft/ft)	0.005073	Area (sq ft)	513.84	493.25	0.66
Q Total (cfs)	4740.00	Flow (cfs)	954.93	3784.60	0.47
Top Width (ft)	409.83	Top Width (ft)	309.99	98.60	1.24
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)	1.86	7.67	0.72
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)	1.66	5.00	0.53
Conv. Total (cfs)	66547.8	Conv. (cfs)	13406.8	53134.3	6.6
Length Wtd. (ft)	53.13	Wetted Per. (ft)	311.20	99.89	1.63
Min Ch El (ft)	5778.60	Shear (lb/sq ft)	0.52	1.56	0.13
Alpha	2.16	Stream Power (lb/ft s)	0.97	12.00	0.09
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	7.60	53.77	1.25
C & E Loss (ft)	0.02	Cum SA (acres)	9.04	14.21	1.26

Plan: currwoutprj RIVER-1 Reach-1 RS: 100535 Profile: PF 1

E.G. Elev (ft)	5786.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5785.21	Reach Len. (ft)	47.00	49.00	51.00
Crit W.S. (ft)	5784.87	Flow Area (sq ft)	539.36	423.94	0.04
E.G. Slope (ft/ft)	0.007183	Area (sq ft)	539.36	423.94	0.04
Q Total (cfs)	4740.00	Flow (cfs)	1019.04	3720.95	0.01
Top Width (ft)	497.96	Top Width (ft)	408.87	88.87	0.22
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)	1.89	8.78	0.33
Max Chl Dpth (ft)	7.01	Hydr. Depth (ft)	1.32	4.77	0.20
Conv. Total (cfs)	55927.6	Conv. (cfs)	12023.7	43903.7	0.2
Length Wtd. (ft)	48.53	Wetted Per. (ft)	410.64	91.08	0.46
Min Ch El (ft)	5778.20	Shear (lb/sq ft)	0.59	2.09	0.04
Alpha	2.53	Stream Power (lb/ft s)	1.11	18.32	0.01
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	7.04	53.19	1.25
C & E Loss (ft)	0.02	Cum SA (acres)	8.66	14.09	1.26

Plan: currwoutprj RIVER-1 Reach-1 RS: 100486 Profile: PF 1

E.G. Elev (ft)	5785.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.080	0.040	
W.S. Elev (ft)	5784.90	Reach Len. (ft)	206.00	209.00	210.00
Crit W.S. (ft)	5784.77	Flow Area (sq ft)	583.72	404.26	
E.G. Slope (ft/ft)	0.007000	Area (sq ft)	583.72	404.26	
Q Total (cfs)	4740.00	Flow (cfs)	1209.50	3530.51	
Top Width (ft)	462.19	Top Width (ft)	378.93	83.26	
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)	2.07	8.73	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)	1.54	4.86	
Conv. Total (cfs)	56654.3	Conv. (cfs)	14456.4	42198.0	
Length Wtd. (ft)	208.53	Wetted Per. (ft)	382.99	85.82	
Min Ch El (ft)	5778.00	Shear (lb/sq ft)	0.67	2.06	
Alpha	2.52	Stream Power (lb/ft s)	1.38	17.98	
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	6.44	52.73	1.25
C & E Loss (ft)	0.13	Cum SA (acres)	8.24	13.99	1.26

Plan: currwoutprj RIVER-1 Reach-1 RS: 100277 Profile: PF 1

E.G. Elev (ft)	5784.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5783.88	Reach Len. (ft)	600.00	785.00	800.00
Crit W.S. (ft)	5782.76	Flow Area (sq ft)	180.61	794.65	0.30
E.G. Slope (ft/ft)	0.005789	Area (sq ft)	180.61	794.65	0.30
Q Total (cfs)	4740.00	Flow (cfs)	285.73	4454.10	0.17
Top Width (ft)	432.32	Top Width (ft)	150.09	281.20	1.03
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	1.58	5.61	0.57
Max Chl Dpth (ft)	5.78	Hydr. Depth (ft)	1.20	2.83	0.29
Conv. Total (cfs)	62295.7	Conv. (cfs)	3755.2	58538.2	2.2
Length Wtd. (ft)	778.98	Wetted Per. (ft)	154.73	284.57	1.18
Min Ch El (ft)	5778.10	Shear (lb/sq ft)	0.42	1.01	0.09
Alpha	1.26	Stream Power (lb/ft s)	0.67	5.66	0.05
Frctn Loss (ft)	4.94	Cum Volume (acre-ft)	4.63	49.85	1.25
C & E Loss (ft)	0.08	Cum SA (acres)	6.99	13.12	1.26

Plan: currwoutprj RIVER-1 Reach-1 RS: 99492 Profile: PF 1

E.G. Elev (ft)	5779.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5778.05	Reach Len. (ft)	420.00	520.00	570.00
Crit W.S. (ft)	5776.92	Flow Area (sq ft)	22.74	518.71	4.20
E.G. Slope (ft/ft)	0.006977	Area (sq ft)	22.74	518.71	4.20
Q Total (cfs)	4740.00	Flow (cfs)	22.92	4712.87	4.21
Top Width (ft)	151.46	Top Width (ft)	43.43	100.00	8.03
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	1.01	9.09	1.00
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)	0.52	5.19	0.52
Conv. Total (cfs)	56748.6	Conv. (cfs)	274.4	56423.7	50.5
Length Wtd. (ft)	519.41	Wetted Per. (ft)	43.44	103.52	8.10
Min Ch El (ft)	5768.40	Shear (lb/sq ft)	0.23	2.18	0.23
Alpha	1.09	Stream Power (lb/ft s)	0.23	19.83	0.23
Frctn Loss (ft)	3.76	Cum Volume (acre-ft)	3.23	38.02	1.20
C & E Loss (ft)	0.00	Cum SA (acres)	5.65	9.68	1.18

Plan: currwoutprj RIVER-1 Reach-1 RS: 98972 Profile: PF 1

E.G. Elev (ft)	5775.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5774.27	Reach Len. (ft)	444.00	444.00	444.00
Crit W.S. (ft)	5773.60	Flow Area (sq ft)	36.54	491.96	57.19
E.G. Slope (ft/ft)	0.007527	Area (sq ft)	36.54	491.96	57.19
Q Total (cfs)	4740.00	Flow (cfs)	79.47	4571.94	88.59
Top Width (ft)	183.28	Top Width (ft)	23.08	100.00	60.20
Vel Total (ft/s)	8.09	Avg. Vel. (ft/s)	2.18	9.29	1.55
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)	1.58	4.92	0.95
Conv. Total (cfs)	54634.9	Conv. (cfs)	916.0	52697.8	1021.1
Length Wtd. (ft)	444.00	Wetted Per. (ft)	23.30	100.47	60.69
Min Ch El (ft)	5768.60	Shear (lb/sq ft)	0.74	2.30	0.44

Plan: currwoutprj RIVER-1 Reach-1 RS: 98972 Profile: PF 1 (Continued)

Alpha	1.27	Stream Power (lb/ft s)	1.60	21.38	0.69
Frctn Loss (ft)	2.19	Cum Volume (acre-ft)	2.94	31.99	0.80
C & E Loss (ft)	0.15	Cum SA (acres)	5.33	8.49	0.73

Plan: currwoutprj RIVER-1 Reach-1 RS: 98528 Profile: PF 1

E.G. Elev (ft)	5773.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5772.44	Reach Len. (ft)	360.00	380.00	390.00
Crit W.S. (ft)		Flow Area (sq ft)	215.22	614.71	21.56
E.G. Slope (ft/ft)	0.003468	Area (sq ft)	215.22	614.71	21.56
Q Total (cfs)	4740.00	Flow (cfs)	212.38	4489.73	37.90
Top Width (ft)	377.89	Top Width (ft)	268.33	100.00	9.56
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)	0.99	7.30	1.76
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)	0.80	6.15	2.25
Conv. Total (cfs)	80487.8	Conv. (cfs)	3606.3	76238.0	643.5
Length Wtd. (ft)	379.59	Wetted Per. (ft)	276.23	100.77	10.59
Min Ch El (ft)	5765.60	Shear (lb/sq ft)	0.17	1.32	0.44
Alpha	1.63	Stream Power (lb/ft s)	0.17	9.65	0.78
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	1.66	26.35	0.40
C & E Loss (ft)	0.11	Cum SA (acres)	3.85	7.47	0.37

Plan: currwoutprj RIVER-1 Reach-1 RS: 98148 Profile: PF 1

E.G. Elev (ft)	5770.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5768.88	Reach Len. (ft)	600.00	598.00	560.00
Crit W.S. (ft)	5768.88	Flow Area (sq ft)	5.75	433.35	0.92
E.G. Slope (ft/ft)	0.014673	Area (sq ft)	5.75	433.35	0.92
Q Total (cfs)	4740.00	Flow (cfs)	3.61	4735.12	1.26
Top Width (ft)	157.61	Top Width (ft)	43.47	112.70	1.44
Vel Total (ft/s)	10.77	Avg. Vel. (ft/s)	0.63	10.93	1.38
Max Chl Dpth (ft)	5.88	Hydr. Depth (ft)	0.13	3.85	0.64
Conv. Total (cfs)	39130.3	Conv. (cfs)	29.8	39090.0	10.4
Length Wtd. (ft)	597.93	Wetted Per. (ft)	44.12	114.53	1.92
Min Ch El (ft)	5763.00	Shear (lb/sq ft)	0.12	3.47	0.44
Alpha	1.03	Stream Power (lb/ft s)	0.08	37.87	0.60
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	0.75	21.77	0.30
C & E Loss (ft)	0.47	Cum SA (acres)	2.56	6.54	0.33

Plan: currwoutprj RIVER-1 Reach-1 RS: 97550 Profile: PF 1

E.G. Elev (ft)	5766.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5766.16	Reach Len. (ft)	350.00	440.00	450.00
Crit W.S. (ft)		Flow Area (sq ft)	15.05	1082.73	17.02
E.G. Slope (ft/ft)	0.002612	Area (sq ft)	15.05	1082.73	17.02
Q Total (cfs)	4740.00	Flow (cfs)	2.94	4720.66	16.40
Top Width (ft)	488.18	Top Width (ft)	161.68	310.00	16.50
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.20	4.36	0.96
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)	0.09	3.49	1.03
Conv. Total (cfs)	92753.6	Conv. (cfs)	57.5	92375.2	320.9
Length Wtd. (ft)	439.85	Wetted Per. (ft)	162.19	311.08	16.63
Min Ch El (ft)	5760.00	Shear (lb/sq ft)	0.02	0.57	0.17
Alpha	1.05	Stream Power (lb/ft s)	0.00	2.47	0.16
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)	0.60	11.37	0.19
C & E Loss (ft)	0.03	Cum SA (acres)	1.15	3.64	0.21

Plan: currwoutprj RIVER-1 Reach-1 RS: 97110 Profile: PF 1

E.G. Elev (ft)	5764.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5764.21	Reach Len. (ft)	133.00	133.00	133.00
Crit W.S. (ft)		Flow Area (sq ft)	13.45	789.54	13.66
E.G. Slope (ft/ft)	0.006035	Area (sq ft)	13.45	789.54	13.66
Q Total (cfs)	4740.00	Flow (cfs)	16.45	4705.48	18.07
Top Width (ft)	312.81	Top Width (ft)	35.01	262.73	15.07

Plan: currwoutprj RIVER-1 Reach-1 RS: 97110 Profile: PF 1 (Continued)

Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)	1.22	5.96	1.32
Max Chl Dpth (ft)	8.61	Hydr. Depth (ft)	0.38	3.01	0.91
Conv. Total (cfs)	61015.6	Conv. (cfs)	211.8	60571.2	232.7
Length Wtd. (ft)	133.00	Wetted Per. (ft)	35.84	266.03	15.56
Min Ch El (ft)	5755.60	Shear (lb/sq ft)	0.14	1.12	0.33
Alpha	1.05	Stream Power (lb/ft s)	0.17	6.66	0.44
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)	0.49	1.91	0.03
C & E Loss (ft)	0.03	Cum SA (acres)	0.36	0.75	0.05

Plan: currwoutprj RIVER-1 Reach-1 RS: 96977 Profile: PF 1

E.G. Elev (ft)	5763.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5762.62	Reach Len. (ft)			
Crit W.S. (ft)	5762.62	Flow Area (sq ft)	307.19	462.65	4.05
E.G. Slope (ft/ft)	0.018535	Area (sq ft)	307.19	462.65	4.05
Q Total (cfs)	4740.00	Flow (cfs)	1041.31	3694.52	4.17
Top Width (ft)	442.01	Top Width (ft)	197.79	228.63	15.59
Vel Total (ft/s)	6.12	Avg. Vel. (ft/s)	3.39	7.99	1.03
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)	1.55	2.02	0.26
Conv. Total (cfs)	34815.9	Conv. (cfs)	7648.6	27136.7	30.6
Length Wtd. (ft)		Wetted Per. (ft)	197.93	233.19	15.59
Min Ch El (ft)	5753.40	Shear (lb/sq ft)	1.80	2.30	0.30
Alpha	1.39	Stream Power (lb/ft s)	6.09	18.33	0.31
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Plan: currwprj RIVER-1 Reach-1 RS: 101583 Profile: PF 1

E.G. Elev (ft)	5794.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5792.83	Reach Len. (ft)	346.00	391.00	356.00
Crit W.S. (ft)	5792.83	Flow Area (sq ft)	0.21	518.55	117.13
E.G. Slope (ft/ft)	0.011823	Area (sq ft)	0.21	518.55	117.13
Q Total (cfs)	4740.00	Flow (cfs)	0.07	4596.62	143.30
Top Width (ft)	414.72	Top Width (ft)	2.85	158.00	253.87
Vel Total (ft/s)	7.45	Avg. Vel. (ft/s)	0.35	8.86	1.22
Max Chl Dpth (ft)	4.43	Hydr. Depth (ft)	0.07	3.28	0.46
Conv. Total (cfs)	43592.9	Conv. (cfs)	0.7	42274.3	1317.9
Length Wtd. (ft)	389.70	Wetted Per. (ft)	2.89	159.50	254.14
Min Ch El (ft)	5788.40	Shear (lb/sq ft)	0.05	2.40	0.34
Alpha	1.37	Stream Power (lb/ft s)	0.02	21.27	0.42
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	9.77	67.62	3.11
C & E Loss (ft)	0.21	Cum SA (acres)	11.13	17.73	3.26

Plan: currwprj RIVER-1 Reach-1 RS: 101175 Profile: PF 1

E.G. Elev (ft)	5790.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5789.66	Reach Len. (ft)	79.00	79.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)	31.79	796.47	128.26
E.G. Slope (ft/ft)	0.003579	Area (sq ft)	31.79	796.47	128.26
Q Total (cfs)	4740.00	Flow (cfs)	23.17	4538.25	178.58
Top Width (ft)	341.86	Top Width (ft)	59.78	191.10	90.98
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	0.73	5.70	1.39
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)	0.53	4.17	1.41
Conv. Total (cfs)	79235.4	Conv. (cfs)	387.3	75863.0	2985.2
Length Wtd. (ft)	78.70	Wetted Per. (ft)	59.83	193.99	91.44
Min Ch El (ft)	5782.40	Shear (lb/sq ft)	0.12	0.92	0.31
Alpha	1.27	Stream Power (lb/ft s)	0.09	5.23	0.44
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	9.64	61.72	2.11
C & E Loss (ft)	0.04	Cum SA (acres)	10.88	16.16	1.85

Plan: currwprj RIVER-1 Reach-1 RS: 101096 Profile: PF 1

E.G. Elev (ft)	5789.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5788.90	Reach Len. (ft)	72.00	69.00	61.00
Crit W.S. (ft)	5788.09	Flow Area (sq ft)	36.19	578.56	162.06
E.G. Slope (ft/ft)	0.006123	Area (sq ft)	36.19	578.56	162.06
Q Total (cfs)	4740.00	Flow (cfs)	30.31	4411.27	298.42
Top Width (ft)	340.59	Top Width (ft)	92.65	134.74	113.20
Vel Total (ft/s)	6.10	Avg. Vel. (ft/s)	0.84	7.62	1.84
Max Chl Dpth (ft)	6.70	Hydr. Depth (ft)	0.39	4.29	1.43
Conv. Total (cfs)	60573.2	Conv. (cfs)	387.3	56372.3	3813.5
Length Wtd. (ft)	68.49	Wetted Per. (ft)	92.78	136.20	113.65
Min Ch El (ft)	5782.20	Shear (lb/sq ft)	0.15	1.62	0.55
Alpha	1.46	Stream Power (lb/ft s)	0.12	12.38	1.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	9.58	60.47	1.86
C & E Loss (ft)	0.03	Cum SA (acres)	10.75	15.87	1.68

Plan: currwprj RIVER-1 Reach-1 RS: 101027 Profile: PF 1

E.G. Elev (ft)	5789.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.13	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5788.08	Reach Len. (ft)	61.00	73.00	76.00
Crit W.S. (ft)	5787.71	Flow Area (sq ft)	6.28	501.21	152.06
E.G. Slope (ft/ft)	0.008883	Area (sq ft)	6.28	501.21	152.06
Q Total (cfs)	4740.00	Flow (cfs)	5.75	4416.67	317.58
Top Width (ft)	256.65	Top Width (ft)	16.53	124.00	116.12
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)	0.92	8.81	2.09
Max Chl Dpth (ft)	6.18	Hydr. Depth (ft)	0.38	4.04	1.31
Conv. Total (cfs)	50290.8	Conv. (cfs)	61.0	46860.3	3369.5
Length Wtd. (ft)	73.14	Wetted Per. (ft)	16.60	125.53	116.70
Min Ch El (ft)	5781.90	Shear (lb/sq ft)	0.21	2.21	0.72

Plan: currwprj RIVER-1 Reach-1 RS: 101027 Profile: PF 1 (Continued)

Alpha	1.41	Stream Power (lb/ft s)	0.19	19.51	1.51
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	9.55	59.62	1.64
C & E Loss (ft)	0.11	Cum SA (acres)	10.66	15.66	1.52

Plan: currwprj RIVER-1 Reach-1 RS: 100954 Profile: PF 1

E.G. Elev (ft)	5788.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5787.75	Reach Len. (ft)	63.00	73.00	73.00
Crit W.S. (ft)		Flow Area (sq ft)	38.96	591.84	148.43
E.G. Slope (ft/ft)	0.007304	Area (sq ft)	38.96	591.84	148.43
Q Total (cfs)	4740.00	Flow (cfs)	52.63	4334.58	352.79
Top Width (ft)	314.64	Top Width (ft)	66.91	167.59	80.14
Vel Total (ft/s)	6.08	Avg. Vel. (ft/s)	1.35	7.32	2.38
Max Chl Dpth (ft)	6.75	Hydr. Depth (ft)	0.58	3.53	1.85
Conv. Total (cfs)	55463.5	Conv. (cfs)	615.9	50719.6	4128.1
Length Wtd. (ft)	72.90	Wetted Per. (ft)	67.17	168.91	81.01
Min Ch El (ft)	5781.00	Shear (lb/sq ft)	0.26	1.60	0.84
Alpha	1.34	Stream Power (lb/ft s)	0.36	11.70	1.99
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	9.52	58.70	1.38
C & E Loss (ft)	0.01	Cum SA (acres)	10.60	15.42	1.35

Plan: currwprj RIVER-1 Reach-1 RS: 100881 Profile: PF 1

E.G. Elev (ft)	5787.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5787.01	Reach Len. (ft)	48.00	61.00	67.00
Crit W.S. (ft)	5786.50	Flow Area (sq ft)	38.14	616.62	1.67
E.G. Slope (ft/ft)	0.009348	Area (sq ft)	38.14	616.62	1.67
Q Total (cfs)	4740.00	Flow (cfs)	44.95	4692.96	2.09
Top Width (ft)	280.84	Top Width (ft)	79.99	198.30	2.55
Vel Total (ft/s)	7.22	Avg. Vel. (ft/s)	1.18	7.61	1.25
Max Chl Dpth (ft)	5.61	Hydr. Depth (ft)	0.48	3.11	0.66
Conv. Total (cfs)	49024.4	Conv. (cfs)	464.9	48537.9	21.6
Length Wtd. (ft)	60.69	Wetted Per. (ft)	80.37	199.91	2.86
Min Ch El (ft)	5781.40	Shear (lb/sq ft)	0.28	1.80	0.34
Alpha	1.10	Stream Power (lb/ft s)	0.33	13.70	0.43
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	9.46	57.69	1.26
C & E Loss (ft)	0.07	Cum SA (acres)	10.49	15.11	1.28

Plan: currwprj RIVER-1 Reach-1 RS: 100820 Profile: PF 1

E.G. Elev (ft)	5787.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.77	Reach Len. (ft)	41.00	56.00	60.00
Crit W.S. (ft)	5785.56	Flow Area (sq ft)	161.60	684.79	0.65
E.G. Slope (ft/ft)	0.004921	Area (sq ft)	161.60	684.79	0.65
Q Total (cfs)	4740.00	Flow (cfs)	179.71	4559.84	0.45
Top Width (ft)	388.66	Top Width (ft)	221.53	165.80	1.33
Vel Total (ft/s)	5.60	Avg. Vel. (ft/s)	1.11	6.66	0.70
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)	0.73	4.13	0.49
Conv. Total (cfs)	67568.9	Conv. (cfs)	2561.8	65000.6	6.4
Length Wtd. (ft)	56.00	Wetted Per. (ft)	222.17	167.66	1.65
Min Ch El (ft)	5779.80	Shear (lb/sq ft)	0.22	1.25	0.12
Alpha	1.36	Stream Power (lb/ft s)	0.25	8.36	0.08
Frctn Loss (ft)		Cum Volume (acre-ft)	9.35	56.78	1.26
C & E Loss (ft)		Cum SA (acres)	10.33	14.86	1.28

Plan: currwprj RIVER-1 Reach-1 RS: 100764 Profile: PF 1

E.G. Elev (ft)	5787.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.81	Reach Len. (ft)	71.00	80.00	84.00
Crit W.S. (ft)		Flow Area (sq ft)	485.15	648.67	1.39
E.G. Slope (ft/ft)	0.003888	Area (sq ft)	485.15	648.67	1.39
Q Total (cfs)	4740.00	Flow (cfs)	769.55	3969.36	1.09
Top Width (ft)	451.90	Top Width (ft)	300.27	149.50	2.12

Plan: currwprj RIVER-1 Reach-1 RS: 100764 Profile: PF 1 (Continued)

Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	1.59	6.12	0.78
Max Chl Dpth (ft)	7.01	Hydr. Depth (ft)	1.62	4.34	0.66
Conv. Total (cfs)	76018.4	Conv. (cfs)	12341.8	63659.1	17.5
Length Wtd. (ft)	78.61	Wetted Per. (ft)	302.68	151.07	2.49
Min Ch El (ft)	5779.80	Shear (lb/sq ft)	0.39	1.04	0.14
Alpha	1.82	Stream Power (lb/ft s)	0.62	6.38	0.11
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	9.35	55.98	1.26
C & E Loss (ft)	0.03	Cum SA (acres)	10.08	14.66	1.27

Plan: currwprj RIVER-1 Reach-1 RS: 100684 Profile: PF 1

E.G. Elev (ft)	5786.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5786.16	Reach Len. (ft)	82.00	94.00	98.00
Crit W.S. (ft)		Flow Area (sq ft)	409.82	530.38	2.81
E.G. Slope (ft/ft)	0.004714	Area (sq ft)	409.82	530.38	2.81
Q Total (cfs)	4740.00	Flow (cfs)	694.18	4042.76	3.06
Top Width (ft)	381.74	Top Width (ft)	277.32	101.40	3.01
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)	1.69	7.62	1.09
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)	1.48	5.23	0.93
Conv. Total (cfs)	69036.0	Conv. (cfs)	10110.4	58880.9	44.6
Length Wtd. (ft)	91.66	Wetted Per. (ft)	278.79	102.66	3.54
Min Ch El (ft)	5778.80	Shear (lb/sq ft)	0.43	1.52	0.23
Alpha	1.98	Stream Power (lb/ft s)	0.73	11.59	0.25
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	8.62	54.90	1.25
C & E Loss (ft)	0.05	Cum SA (acres)	9.61	14.43	1.27

Plan: currwprj RIVER-1 Reach-1 RS: 100590 Profile: PF 1

E.G. Elev (ft)	5786.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5785.87	Reach Len. (ft)	46.00	55.00	53.00
Crit W.S. (ft)		Flow Area (sq ft)	617.00	504.37	0.80
E.G. Slope (ft/ft)	0.004229	Area (sq ft)	617.00	504.37	0.80
Q Total (cfs)	4740.00	Flow (cfs)	1153.22	3586.22	0.57
Top Width (ft)	420.39	Top Width (ft)	320.42	98.60	1.37
Vel Total (ft/s)	4.22	Avg. Vel. (ft/s)	1.87	7.11	0.70
Max Chl Dpth (ft)	7.27	Hydr. Depth (ft)	1.93	5.12	0.59
Conv. Total (cfs)	72888.0	Conv. (cfs)	17733.3	55146.0	8.7
Length Wtd. (ft)	52.94	Wetted Per. (ft)	321.85	99.89	1.80
Min Ch El (ft)	5778.60	Shear (lb/sq ft)	0.51	1.33	0.12
Alpha	2.19	Stream Power (lb/ft s)	0.95	9.48	0.08
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	7.65	53.78	1.25
C & E Loss (ft)	0.03	Cum SA (acres)	9.05	14.21	1.26

Plan: currwprj RIVER-1 Reach-1 RS: 100535 Profile: PF 1

E.G. Elev (ft)	5786.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5785.21	Reach Len. (ft)	47.00	49.00	51.00
Crit W.S. (ft)	5784.87	Flow Area (sq ft)	539.36	423.94	0.04
E.G. Slope (ft/ft)	0.007183	Area (sq ft)	539.36	423.94	0.04
Q Total (cfs)	4740.00	Flow (cfs)	1019.04	3720.95	0.01
Top Width (ft)	497.96	Top Width (ft)	408.87	88.87	0.22
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)	1.89	8.78	0.33
Max Chl Dpth (ft)	7.01	Hydr. Depth (ft)	1.32	4.77	0.20
Conv. Total (cfs)	55927.6	Conv. (cfs)	12023.7	43903.7	0.2
Length Wtd. (ft)	48.53	Wetted Per. (ft)	410.64	91.08	0.46
Min Ch El (ft)	5778.20	Shear (lb/sq ft)	0.59	2.09	0.04
Alpha	2.53	Stream Power (lb/ft s)	1.11	18.32	0.01
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	7.04	53.19	1.25
C & E Loss (ft)	0.02	Cum SA (acres)	8.66	14.09	1.26

Plan: currwprj RIVER-1 Reach-1 RS: 100486 Profile: PF 1

E.G. Elev (ft)	5785.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.080	0.040	
W.S. Elev (ft)	5784.90	Reach Len. (ft)	206.00	209.00	210.00
Crit W.S. (ft)	5784.77	Flow Area (sq ft)	583.72	404.26	
E.G. Slope (ft/ft)	0.007000	Area (sq ft)	583.72	404.26	
Q Total (cfs)	4740.00	Flow (cfs)	1209.50	3530.51	
Top Width (ft)	462.19	Top Width (ft)	378.93	83.26	
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)	2.07	8.73	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)	1.54	4.86	
Conv. Total (cfs)	56654.3	Conv. (cfs)	14456.4	42198.0	
Length Wtd. (ft)	208.53	Wetted Per. (ft)	382.99	85.82	
Min Ch El (ft)	5778.00	Shear (lb/sq ft)	0.67	2.06	
Alpha	2.52	Stream Power (lb/ft s)	1.38	17.98	
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	6.44	52.73	1.25
C & E Loss (ft)	0.13	Cum SA (acres)	8.24	13.99	1.26

Plan: currwprj RIVER-1 Reach-1 RS: 100277 Profile: PF 1

E.G. Elev (ft)	5784.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5783.88	Reach Len. (ft)	600.00	785.00	800.00
Crit W.S. (ft)	5782.76	Flow Area (sq ft)	180.61	794.65	0.30
E.G. Slope (ft/ft)	0.005789	Area (sq ft)	180.61	794.65	0.30
Q Total (cfs)	4740.00	Flow (cfs)	285.73	4454.10	0.17
Top Width (ft)	432.32	Top Width (ft)	150.09	281.20	1.03
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	1.58	5.61	0.57
Max Chl Dpth (ft)	5.78	Hydr. Depth (ft)	1.20	2.83	0.29
Conv. Total (cfs)	62295.7	Conv. (cfs)	3755.2	58538.2	2.2
Length Wtd. (ft)	778.98	Wetted Per. (ft)	154.73	284.57	1.18
Min Ch El (ft)	5778.10	Shear (lb/sq ft)	0.42	1.01	0.09
Alpha	1.26	Stream Power (lb/ft s)	0.67	5.66	0.05
Frctn Loss (ft)	4.94	Cum Volume (acre-ft)	4.63	49.85	1.25
C & E Loss (ft)	0.08	Cum SA (acres)	6.99	13.12	1.26

Plan: currwprj RIVER-1 Reach-1 RS: 99492 Profile: PF 1

E.G. Elev (ft)	5779.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5778.05	Reach Len. (ft)	420.00	520.00	570.00
Crit W.S. (ft)	5776.92	Flow Area (sq ft)	22.74	518.71	4.20
E.G. Slope (ft/ft)	0.006977	Area (sq ft)	22.74	518.71	4.20
Q Total (cfs)	4740.00	Flow (cfs)	22.92	4712.87	4.21
Top Width (ft)	151.46	Top Width (ft)	43.43	100.00	8.03
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	1.01	9.09	1.00
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)	0.52	5.19	0.52
Conv. Total (cfs)	56748.6	Conv. (cfs)	274.4	56423.7	50.5
Length Wtd. (ft)	519.41	Wetted Per. (ft)	43.44	103.52	8.10
Min Ch El (ft)	5768.40	Shear (lb/sq ft)	0.23	2.18	0.23
Alpha	1.09	Stream Power (lb/ft s)	0.23	19.83	0.23
Frctn Loss (ft)	3.76	Cum Volume (acre-ft)	3.23	38.02	1.20
C & E Loss (ft)	0.00	Cum SA (acres)	5.65	9.68	1.18

Plan: currwprj RIVER-1 Reach-1 RS: 98972 Profile: PF 1

E.G. Elev (ft)	5775.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5774.27	Reach Len. (ft)	444.00	444.00	444.00
Crit W.S. (ft)	5773.60	Flow Area (sq ft)	36.54	491.96	57.19
E.G. Slope (ft/ft)	0.007527	Area (sq ft)	36.54	491.96	57.19
Q Total (cfs)	4740.00	Flow (cfs)	79.47	4571.94	88.59
Top Width (ft)	183.28	Top Width (ft)	23.08	100.00	60.20
Vel Total (ft/s)	8.09	Avg. Vel. (ft/s)	2.18	9.29	1.55
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)	1.58	4.92	0.95
Conv. Total (cfs)	54634.9	Conv. (cfs)	916.0	52697.8	1021.1
Length Wtd. (ft)	444.00	Wetted Per. (ft)	23.30	100.47	60.69
Min Ch El (ft)	5768.60	Shear (lb/sq ft)	0.74	2.30	0.44

Plan: currwprj RIVER-1 Reach-1 RS: 98972 Profile: PF 1 (Continued)

Alpha	1.27	Stream Power (lb/ft s)	1.60	21.38	0.69
Frctn Loss (ft)	2.19	Cum Volume (acre-ft)	2.94	31.99	0.80
C & E Loss (ft)	0.15	Cum SA (acres)	5.33	8.49	0.73

Plan: currwprj RIVER-1 Reach-1 RS: 98528 Profile: PF 1

E.G. Elev (ft)	5773.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5772.44	Reach Len. (ft)	360.00	380.00	390.00
Crit W.S. (ft)		Flow Area (sq ft)	215.22	614.71	21.56
E.G. Slope (ft/ft)	0.003468	Area (sq ft)	215.22	614.71	21.56
Q Total (cfs)	4740.00	Flow (cfs)	212.38	4489.73	37.90
Top Width (ft)	377.89	Top Width (ft)	268.33	100.00	9.56
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)	0.99	7.30	1.76
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)	0.80	6.15	2.25
Conv. Total (cfs)	80487.8	Conv. (cfs)	3606.3	76238.0	643.5
Length Wtd. (ft)	379.59	Wetted Per. (ft)	276.23	100.77	10.59
Min Ch El (ft)	5765.60	Shear (lb/sq ft)	0.17	1.32	0.44
Alpha	1.63	Stream Power (lb/ft s)	0.17	9.65	0.78
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	1.66	26.35	0.40
C & E Loss (ft)	0.11	Cum SA (acres)	3.85	7.47	0.37

Plan: currwprj RIVER-1 Reach-1 RS: 98148 Profile: PF 1

E.G. Elev (ft)	5770.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5768.88	Reach Len. (ft)	600.00	598.00	560.00
Crit W.S. (ft)	5768.88	Flow Area (sq ft)	5.75	433.35	0.92
E.G. Slope (ft/ft)	0.014673	Area (sq ft)	5.75	433.35	0.92
Q Total (cfs)	4740.00	Flow (cfs)	3.61	4735.12	1.26
Top Width (ft)	157.61	Top Width (ft)	43.47	112.70	1.44
Vel Total (ft/s)	10.77	Avg. Vel. (ft/s)	0.63	10.93	1.38
Max Chl Dpth (ft)	5.88	Hydr. Depth (ft)	0.13	3.85	0.64
Conv. Total (cfs)	39130.3	Conv. (cfs)	29.8	39090.0	10.4
Length Wtd. (ft)	597.93	Wetted Per. (ft)	44.12	114.53	1.92
Min Ch El (ft)	5763.00	Shear (lb/sq ft)	0.12	3.47	0.44
Alpha	1.03	Stream Power (lb/ft s)	0.08	37.87	0.60
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	0.75	21.77	0.30
C & E Loss (ft)	0.47	Cum SA (acres)	2.56	6.54	0.33

Plan: currwprj RIVER-1 Reach-1 RS: 97550 Profile: PF 1

E.G. Elev (ft)	5766.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5766.16	Reach Len. (ft)	350.00	440.00	450.00
Crit W.S. (ft)		Flow Area (sq ft)	15.05	1082.73	17.02
E.G. Slope (ft/ft)	0.002612	Area (sq ft)	15.05	1082.73	17.02
Q Total (cfs)	4740.00	Flow (cfs)	2.94	4720.66	16.40
Top Width (ft)	488.18	Top Width (ft)	161.68	310.00	16.50
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.20	4.36	0.96
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)	0.09	3.49	1.03
Conv. Total (cfs)	92753.6	Conv. (cfs)	57.5	92375.2	320.9
Length Wtd. (ft)	439.85	Wetted Per. (ft)	162.19	311.08	16.63
Min Ch El (ft)	5760.00	Shear (lb/sq ft)	0.02	0.57	0.17
Alpha	1.05	Stream Power (lb/ft s)	0.00	2.47	0.16
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)	0.60	11.37	0.19
C & E Loss (ft)	0.03	Cum SA (acres)	1.15	3.64	0.21

Plan: currwprj RIVER-1 Reach-1 RS: 97110 Profile: PF 1

E.G. Elev (ft)	5764.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5764.21	Reach Len. (ft)	133.00	133.00	133.00
Crit W.S. (ft)		Flow Area (sq ft)	13.45	789.54	13.66
E.G. Slope (ft/ft)	0.006035	Area (sq ft)	13.45	789.54	13.66
Q Total (cfs)	4740.00	Flow (cfs)	16.45	4705.48	18.07
Top Width (ft)	312.81	Top Width (ft)	35.01	262.73	15.07

Plan: currwprj RIVER-1 Reach-1 RS: 97110 Profile: PF 1 (Continued)

Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)	1.22	5.96	1.32
Max Chl Dpth (ft)	8.61	Hydr. Depth (ft)	0.38	3.01	0.91
Conv. Total (cfs)	61015.6	Conv. (cfs)	211.8	60571.2	232.7
Length Wtd. (ft)	133.00	Wetted Per. (ft)	35.84	266.03	15.56
Min Ch El (ft)	5755.60	Shear (lb/sq ft)	0.14	1.12	0.33
Alpha	1.05	Stream Power (lb/ft s)	0.17	6.66	0.44
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)	0.49	1.91	0.03
C & E Loss (ft)	0.03	Cum SA (acres)	0.36	0.75	0.05

Plan: currwprj RIVER-1 Reach-1 RS: 96977 Profile: PF 1

E.G. Elev (ft)	5763.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.080	0.040	0.080
W.S. Elev (ft)	5762.62	Reach Len. (ft)			
Crit W.S. (ft)	5762.62	Flow Area (sq ft)	307.19	462.65	4.05
E.G. Slope (ft/ft)	0.018535	Area (sq ft)	307.19	462.65	4.05
Q Total (cfs)	4740.00	Flow (cfs)	1041.31	3694.52	4.17
Top Width (ft)	442.01	Top Width (ft)	197.79	228.63	15.59
Vel Total (ft/s)	6.12	Avg. Vel. (ft/s)	3.39	7.99	1.03
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)	1.55	2.02	0.26
Conv. Total (cfs)	34815.9	Conv. (cfs)	7648.6	27136.7	30.6
Length Wtd. (ft)		Wetted Per. (ft)	197.93	233.19	15.59
Min Ch El (ft)	5753.40	Shear (lb/sq ft)	1.80	2.30	0.30
Alpha	1.39	Stream Power (lb/ft s)	6.09	18.33	0.31
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

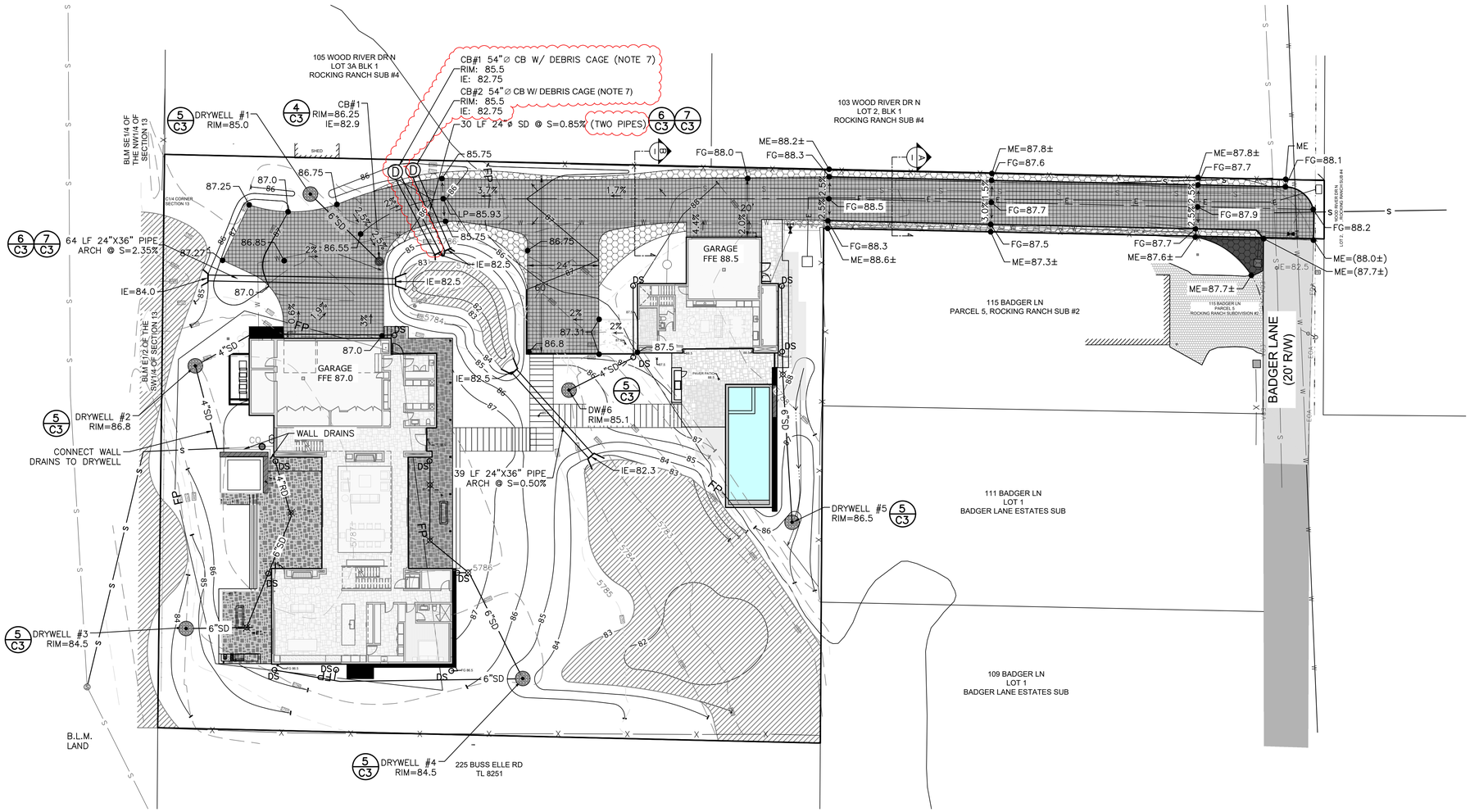
ISSUED FOR CONSTRUCTION

GENERAL NOTES

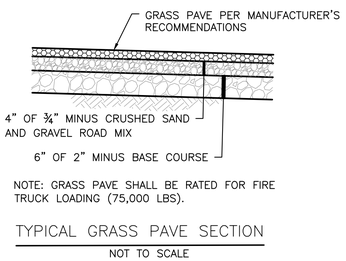
1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING CONSTRUCTION. ANY CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. CONTRACTOR SHALL NOTIFY DIGLINE (1-800-342-1585) AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING THE CONSTRUCTION OF ALL ITEMS HEREON. DUST CONTROL SHALL BE CONTINUOUS DURING CONSTRUCTION, 24 HOURS PER DAY 7 DAYS PER WEEK.
4. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM THE HOUSE.
5. STORM DRAINS SHALL HAVE A MINIMUM SLOPE OF 2%. ROOF DRAINS SHALL HAVE MINIMUM SLOPE OF 1%.
6. CULVERTS SHALL BE FITTED WITH BEVELED END TREATMENTS.
7. 54" DIAMETER CATCH BASINS SHALL BE FITTED WITH ROUND DEBRIS CAGES (CONTECH STORMRAX OR EQUAL).
8. ALL WORK WITHIN THE CITY RIGHT OF WAY SHALL CONFORM TO CITY OF KETCHUM STANDARDS.

LEGEND

PROPERTY LINE	
ADJOINING PROPERTY LINE	
CENTERLINE	
FENCE	X
FLOODPLAIN (FEMA 2010)	FP
EASEMENT	
SEWER	S
SEWER MANHOLE (MH)	
WATER	W
WATER GATE VALVE	
WATER METER (WM)	
GAS	G
POWER	E
OVERHEAD POWER	OHP
TELEPHONE	T
CABLE TV LINE	TV
ELEVATION CONTOUR	5775
PROPOSED ELEV CONTOUR	59
SAWCUT LINE	
FLOW LINE	
ROOF DRAIN	RD
STORM DRAIN PIPE	SD
DOWN SPOUT	DS
CATCH BASIN	
AREA DRAIN	
DRYWELL	
LANDSCAPE DRYWELL	
ASPHALT PAVEMENT	
ASPHALT WITH SNOWMELT	
GRAVEL	
GRASS PAVE	
FG	FINISHED GRADE
EG	EXISTING GROUND

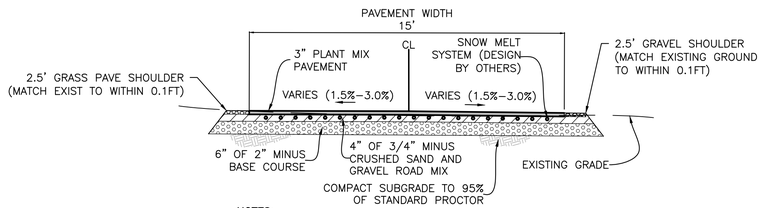


PLAN
SCALE IN FEET
0' 20' 40' 60'



NOTE: GRASS PAVE SHALL BE RATED FOR FIRE TRUCK LOADING (75,000 LBS).

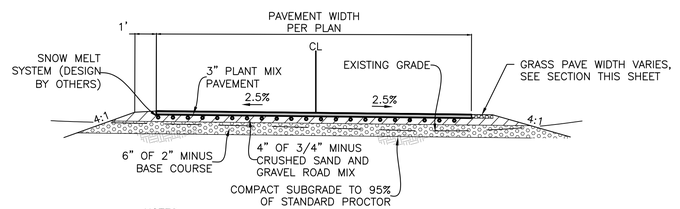
TYPICAL GRASS PAVE SECTION
NOT TO SCALE



NOTES:

1. COMPACT DRIVEWAY SUBGRADE AND ALL STRUCTURAL FILL MATERIAL TO AT LEAST 95% OF THE MAXIMUM DENSITY OF EACH MATERIAL ACCORDING TO STANDARD PROCTOR ASTM D-698.

15-FOOT ASPHALT DRIVEWAY WITH SNOW MELT (A)
SECTION
NOT TO SCALE



NOTES:

1. COMPACT DRIVEWAY SUBGRADE AND ALL STRUCTURAL FILL MATERIAL TO AT LEAST 95% OF THE MAXIMUM DENSITY OF EACH MATERIAL ACCORDING TO STANDARD PROCTOR ASTM D-698.

TYPICAL ASPHALT DRIVEWAY WITH SNOW MELT (B)
SECTION
NOT TO SCALE

PROFESSIONAL ENGINEER
LICENSED
17661
STATE OF IDAHO
PHOEBE JOHANNESSEN
2/1/2024

REVISIONS

No.	DESCRIPTION	DATE	BY
1	CITY COMMENTS	5/1/2023	PLJ
1	APPEAL COMMENTS	2/1/2024	PLJ

GALENA-BENCHMARK ENGINEERING
Civil Engineers & Land Surveyors
100 Bell Drive
P.O. Box 733
Ketchum, Idaho 83340
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www.benchmark-associates.com

GALENA ELEVATION ABOVE SEA 9235 FEET
SURVEYING ENGINEERING PLANNING BENCHMARK

GRADING & DRAINAGE PLAN

ROCKING RANCH #2 PARCEL 4
T4N, R17E, SEC 13, B.M., BLAINE COUNTY, IDAHO

PREPED FOR: PRESIDO VISTA PROPERTIES

DRAWN BY: PLJ
DESIGNED BY: PLJ
CHECKED BY:
DATE: 2/1/2024
PROJECT NO.: 22185

DRAWING NO.

C-1