Camp Rainbow Gold Flood Study

September 19, 2016

Prepared as a Donation to Camp Rainbow Gold

RESOURCE SYSTEMS INC

PROFESSIONAL ENGINEER
REGISTERED
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STATE OF IDAHO
KARL A. GEBHARDT

Contents

Hydrology 3
Hydraulic Model 4
Recommendations 4
Watershed Map 5
Topographic Work Map 7
Flood Map 9
2-D Flood Map 11
Model Output 13
Sections 16
USGS Streamstats Printouts 69

Camp Rainbow Gold Project Flood Study

The purpose of this report is to conduct a flood study of the proposed Camp Rainbow Gold project area located within the East Fork Wood River drainage. Please see other reports for exact location and background information. This study utilizes hydrology developed from the USGS Streamstats program to establish a 100-year flood discharge for drainages impacting the project area. This study uses the Corps of Engineers Hydrologic Engineering Center River Analysis System version 5.0.1 to compute water surface profiles.

Topography was supplied by Quantum Spatial, Portland, Oregon via digital terrain file derived from LiDAR and provided by Mr. Steve Swartz, PLS, Orion Lane Surveying PLLC, Bellevue, Idaho.

The topography is in horizontal coordinate system Idaho State Plane, Central Zone, Foot on vertical datum NAVD88.

Hydrology

The USGS Streamstats program was used to develop a 100-year and 500-year flood originating from the surrounding watershed (see Watershed figure). The overall basin at the downstream limit of the project area was divided into watershed areas using basins computed in the Streamstats program. Much of the proposed project property is impacted by a very small drainage (called North Basin) totaling less than 1 square mile. This smaller drainage enters the East Fork Wood River on the south portion of the project property from a large drainage (called East Basin) and is also joined by a larger drainage (Cave Creek) identified on the watershed figure as the South Basin. The total basin at the downstream limit of the project is about 39.2 square miles. The small North Basin was below the threshold for Streamstats to compute a runoff amount, therefore a comparatively large 100-year flow of 100 cfs was used to model that portion of the watershed drainage channel. The flows used in the hydraulic model are shown below.

	Sq. Miles	100-year	500-year
North Basin	0.85	100	150
East Basin	19.9	335	418
South Basin	16.9	198	256
East + South	36.8	533	674
North + East + South	38.7	633	824
Total Basin (Streamstats)	38.7	519	651

All flow except North Basin derived from USGS Streamstats output.

The hydraulic model utilized the sum of North, East, and South which is lower than the Streamstats estimate. The FEMA study for East Fork further downstream used 1,100 cfs for the 100-year flow with a drainage area of 81 square miles, more than twice the drainage area of the project areas, which suggests the 633 cfs value used in this study is reasonable.

Hydraulic Model

HEC-RAS 5.0.1 was used to model water surface elevations. The terrain was analyzed using the 2-dimensional capabilities of the model in a 5x5 square foot grid in order to examine the natural valley behavior at flood flow. The Depth x Velocity raster output was used to locate thalwag centerline and water surface elevation contour lines were used to locate cross sections for the 1-dimensional model run. Manning's roughness values of 0.035 were used within the channels and 0.045 elsewhere. The water surface elevations for both the 1-D and 2-D models were compared and judged to have reasonable agreement. The inundation boundary for the 1-D model was plotted with project Base Flood Elevations on the floodplain workmaps.

Recommendations

This flood study is expected to be of a quality for use as a detailed hydraulic model for use as a Flood Insurance Study Letter of Map Revision for FEMA with minor modifications, which would include a higher density of cross sections, field cross sections to verify LiDAR, and more refined Manning's roughness values. However, because of the nature of the channel morphology and adjacent ground, this study should be adequate to use for establishing base flood elevations.

Note that the hydrology utilized has a large error range, but is generally accepted for flood analysis provided the results are not considered absolute. The hydraulic modeling appears to be reasonable when comparing the 1-D and 2-D products. Elevating structures well above (several feet or more) the computed water surface elevations is prudent. The 2-D model identified some additional very shallow potential flood zones (less than 4-inches deep) that might be of interest in planning use areas. Avoidance of the flood zones and appropriate elevation of structures is the prudent course of action.

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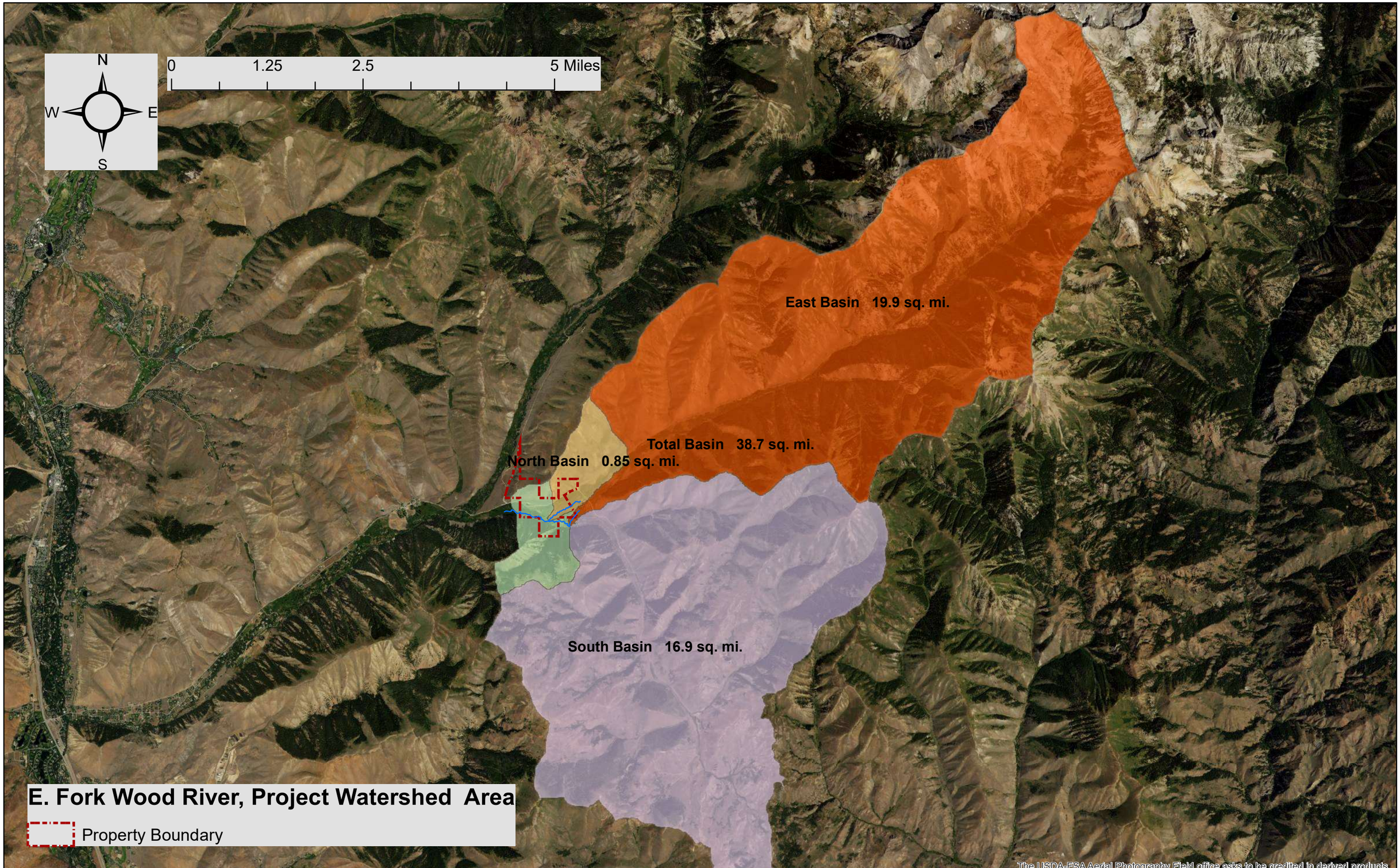
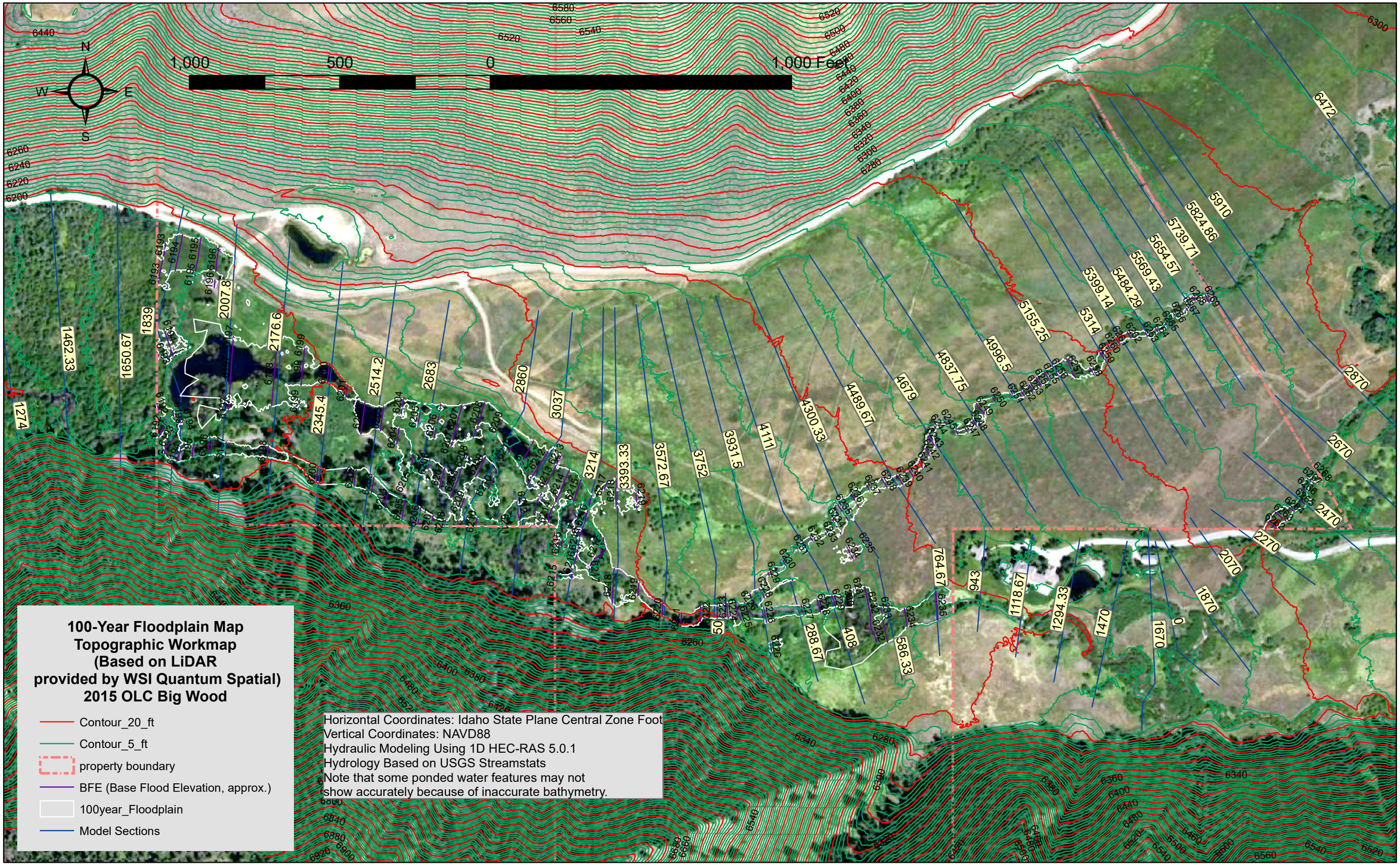
Hydraulic modeling data is available with permission from Camp Rainbow Gold and is approximately 500 mbytes in size.

September 19, 2016

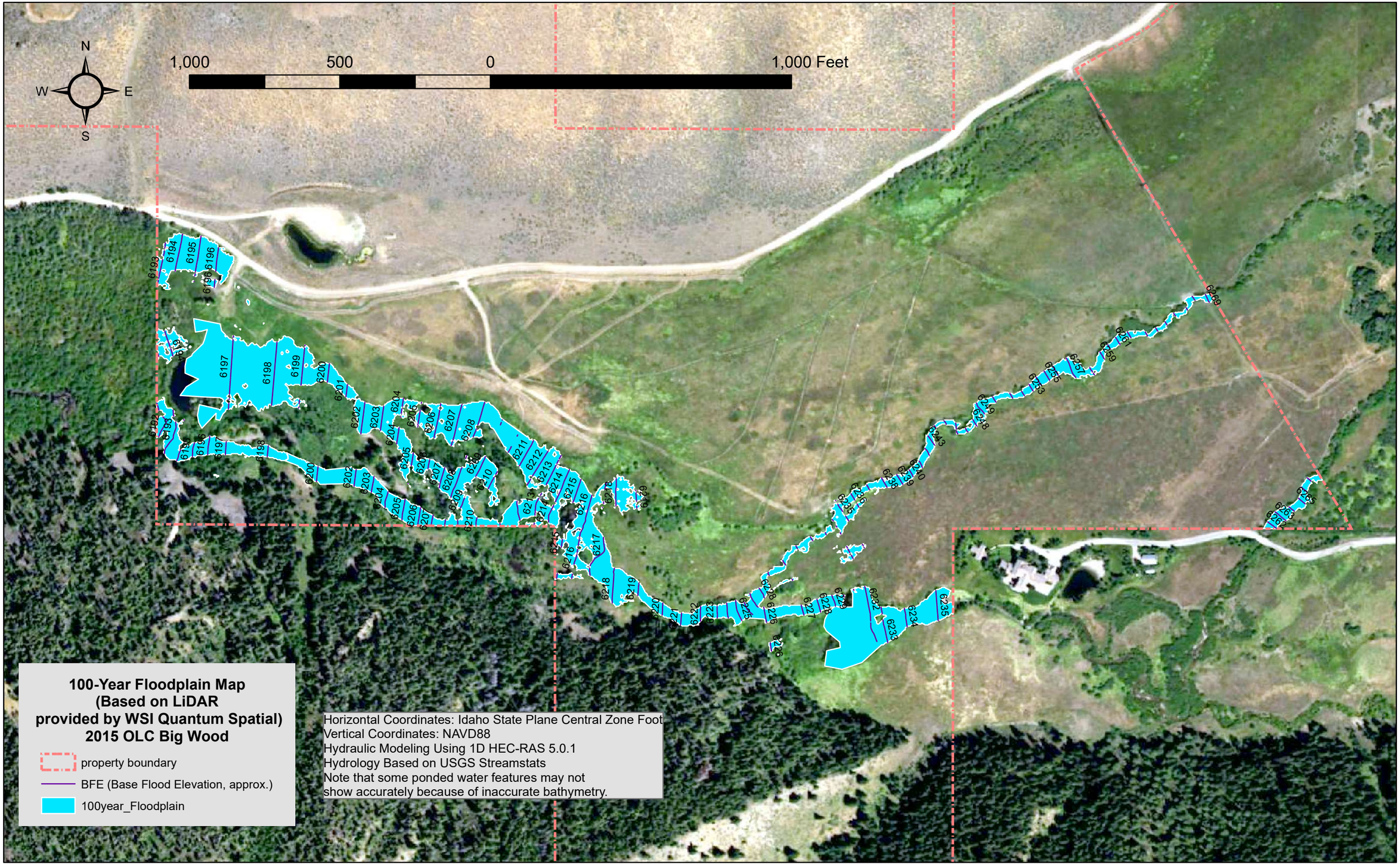
Watershed Map


N
W
E
S
0
1.25
2.5
5 Miles
East Basin 19.9 sq. mi.
Total Basin 38.7 sq. mi.
North Basin 0.85 sq. mi.
South Basin 16.9 sq. mi.
E. Fork Wood River, Project Watershed Area
Property Boundary
The USDA-FSA Aerial Photography Field office asks to be credited in derived products.

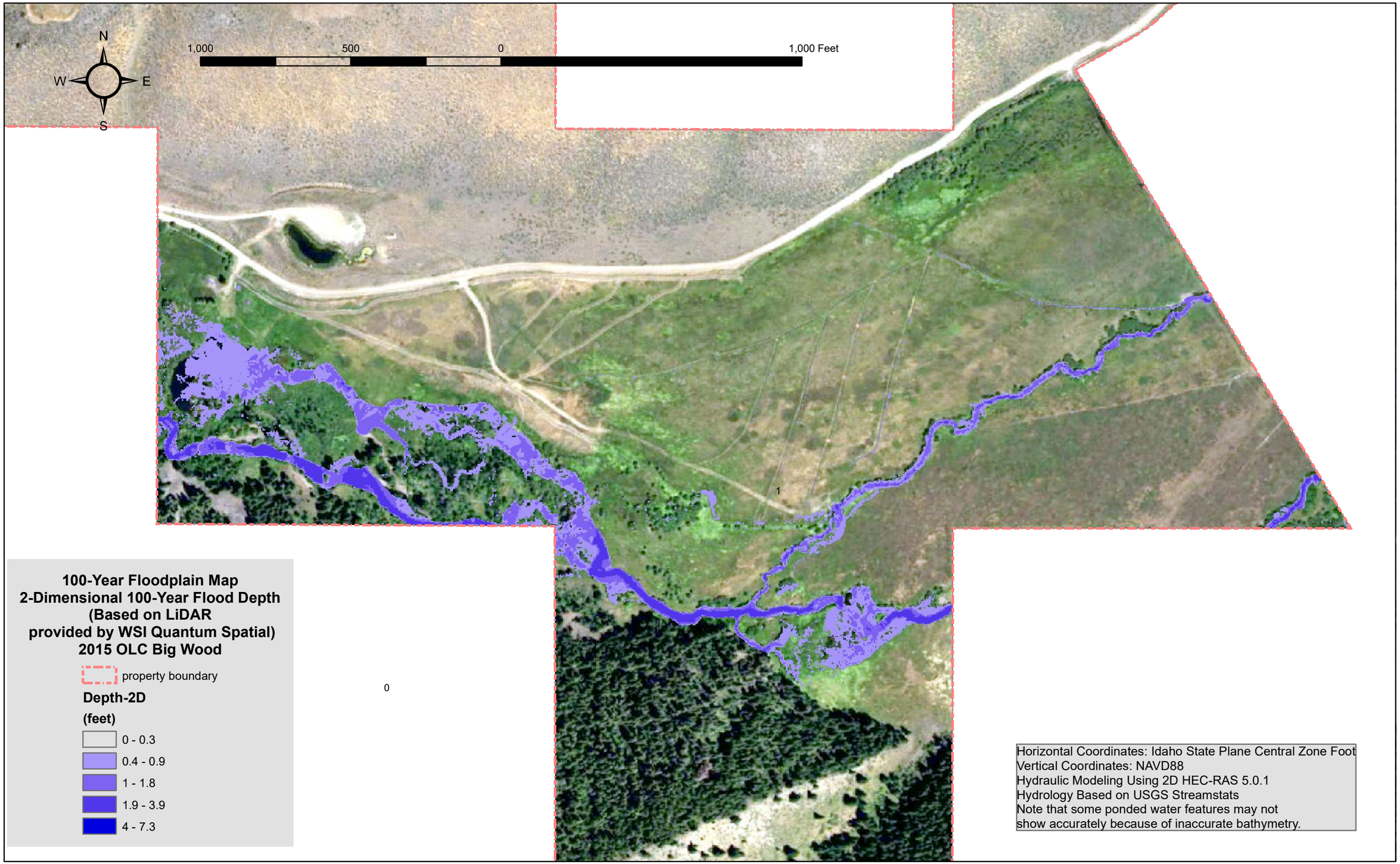
Topographic Work Map


100-Year Floodplain Map
Topographic Workmap
(Based on LiDAR
provided by WSI Quantum Spatial)
2015 OLC Big Wood
Contour_20_ft
Contour_5_ft
property boundary
BFE (Base Flood Elevation, approx.)
100year_Floodplain
Model Sections
Horizontal Coordinates: Idaho State Plane Central Zone Foot
Vertical Coordinates: NAVD88
Hydraulic Modeling Using 1D HEC-RAS 5.0.1
Hydrology Based on USGS Streamstats
Note that some ponded water features may not
show accurately because of inaccurate bathymetry.
N
S
E
W
1,000
500
0
1,000 Feet

Flood Map


N
W
E
S
1,000
500
0
1,000 Feet
100-Year Floodplain Map
(Based on LiDAR
provided by WSI Quantum Spatial)
2015 OLC Big Wood
property boundary
BFE (Base Flood Elevation, approx.)
100year_Floodplain
Horizontal Coordinates: Idaho State Plane Central Zone Foot
Vertical Coordinates: NAVD88
Hydraulic Modeling Using 1D HEC-RAS 5.0.1
Hydrology Based on USGS Streamstats
Note that some ponded water features may not
show accurately because of inaccurate bathymetry.

2-D Flood Map


N
W
E
S
1,000
500
0
1,000 Feet
1
0
100-Year Floodplain Map
2-Dimensional 100-Year Flood Depth
(Based on LiDAR
provided by WSI Quantum Spatial)
2015 OLC Big Wood
property boundary
Depth-2D
(feet)
0 - 0.3
0.4 - 0.9
1 - 1.8
1.9 - 3.9
4 - 7.3
Horizontal Coordinates: Idaho State Plane Central Zone Foot
Vertical Coordinates: NAVD88
Hydraulic Modeling Using 2D HEC-RAS 5.0.1
Hydrology Based on USGS Streamstats
Note that some ponded water features may not
show accurately because of inaccurate bathymetry.

Model Output

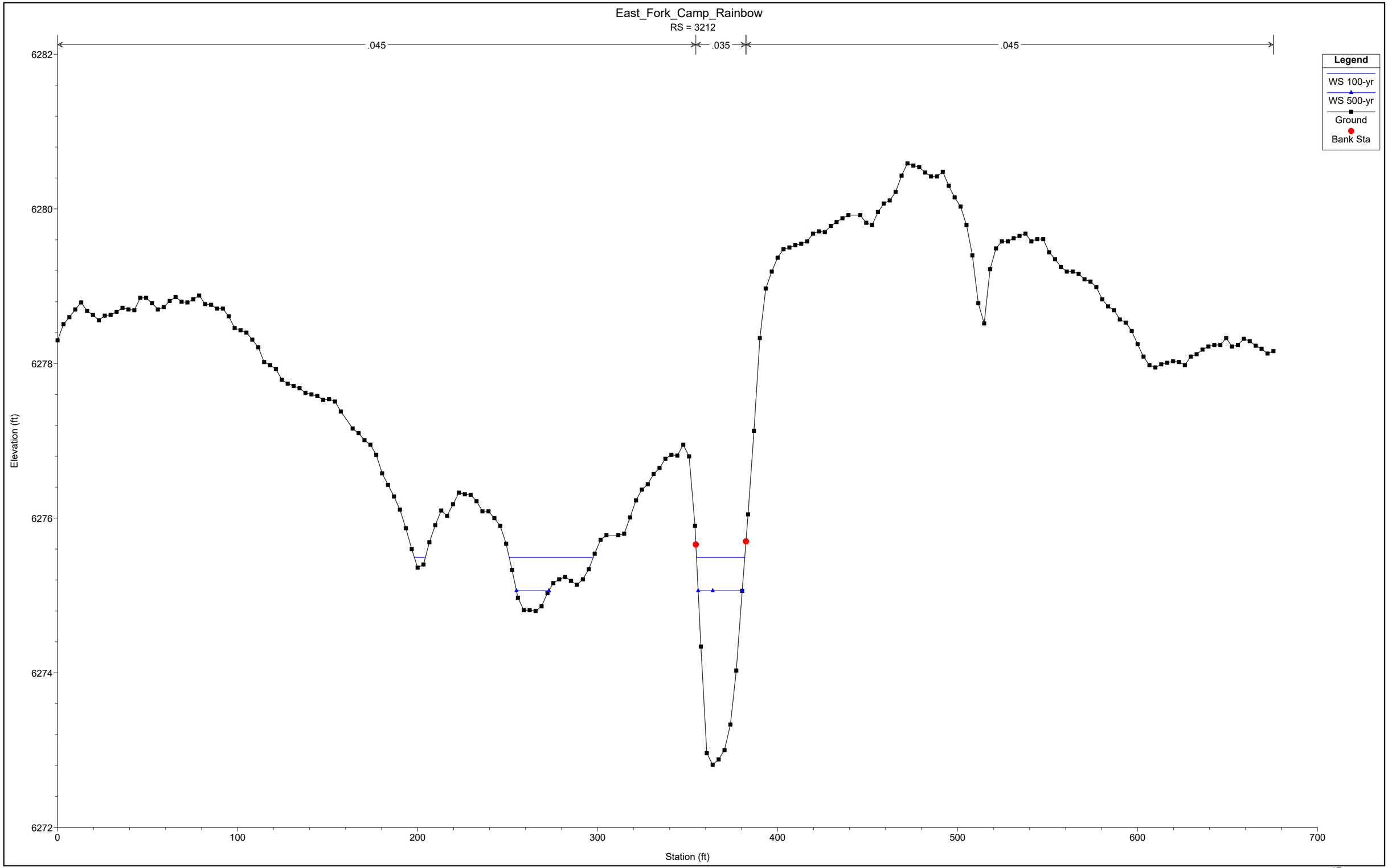
HEC-RAS Plan: EF V3

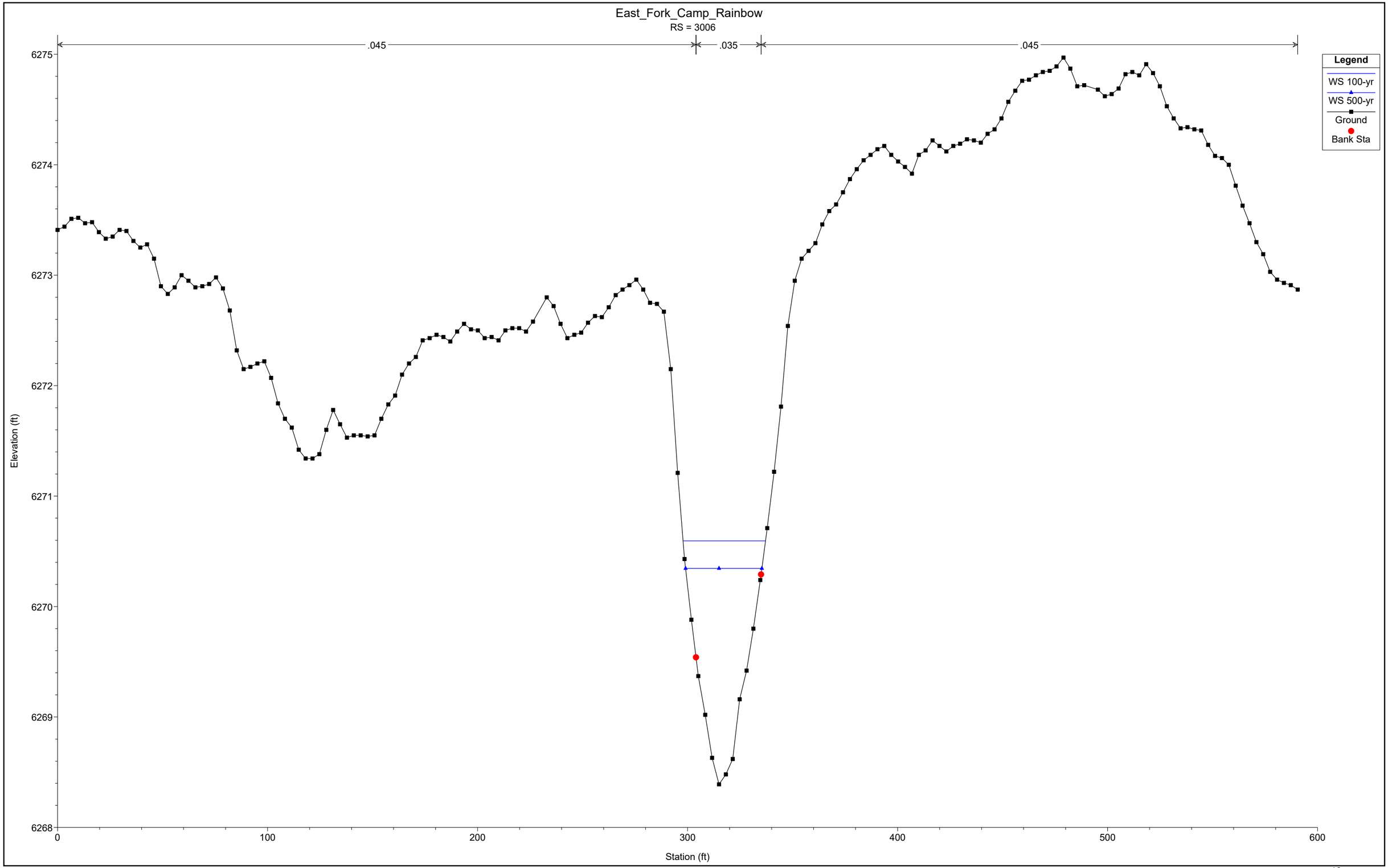
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
East_Fork	North_Arm	6608	100-yr	100.00	6286.86	6286.83	6286.76	6286.98	0.024924		32.87	73.66	0.00
East_Fork	North_Arm	6608	500-yr	150.00	6286.86	6286.96	6286.92	6287.15	0.025797	1.28	44.68	100.84	0.79
East_Fork	North_Arm	6046	100-yr	100.00	6272.86	6274.15	6274.15	6274.50	0.020693	4.75	21.03	30.46	1.01
East_Fork	North_Arm	6046	500-yr	150.00	6272.86	6274.38	6274.38	6274.81	0.019620	5.23	28.67	34.57	1.01
East_Fork	North_Arm	5939	100-yr	100.00	6270.81	6271.90	6271.90	6272.22	0.022165	4.54	22.03	35.85	1.02
East_Fork	North_Arm	5939	500-yr	150.00	6270.81	6272.10	6272.10	6272.51	0.020066	5.11	29.37	37.10	1.01
East_Fork	North_Arm	5847	100-yr	100.00	6268.19	6269.61	6269.61	6270.04	0.019757	5.29	18.92	22.42	1.01
East_Fork	North_Arm	5847	500-yr	150.00	6268.19	6269.89	6269.89	6270.42	0.018568	5.88	25.52	24.57	1.02
East_Fork	North_Arm	5744	100-yr	100.00	6266.51	6267.39	6267.39	6267.72	0.020919	4.63	21.58	32.82	1.01
East_Fork	North_Arm	5744	500-yr	150.00	6266.51	6267.61	6267.61	6268.02	0.019083	5.18	28.98	34.79	1.00
East_Fork	North_Arm	5648	100-yr	100.00	6264.09	6265.42	6265.42	6265.84	0.019376	5.23	19.13	22.77	1.01
East_Fork	North_Arm	5648	500-yr	150.00	6264.09	6265.71	6265.71	6266.22	0.018290	5.74	26.13	25.84	1.01
East_Fork	North_Arm	5561	100-yr	100.00	6261.55	6263.14	6263.14	6263.61	0.018675	5.53	18.07	19.09	1.00
East_Fork	North_Arm	5561	500-yr	150.00	6261.55	6263.61	6263.61	6264.00	0.021072	5.01	29.93	40.39	1.03
East_Fork	North_Arm	5462	100-yr	100.00	6259.70	6261.46	6261.46	6261.79	0.022106	4.66	21.46	33.55	1.03
East_Fork	North_Arm	5462	500-yr	150.00	6259.70	6261.68	6261.68	6262.07	0.021085	5.01	29.96	40.63	1.03
East_Fork	North_Arm	5375	100-yr	100.00	6257.98	6259.04	6258.99	6259.36	0.016524	4.53	22.08	29.04	0.92
East_Fork	North_Arm	5375	500-yr	150.00	6257.98	6259.27	6259.24	6259.69	0.017750	5.20	28.85	32.51	0.97
East_Fork	North_Arm	5175	100-yr	100.00	6255.02	6256.10	6256.10	6256.39	0.021599	4.37	22.89	38.96	1.00
East_Fork	North_Arm	5175	500-yr	150.00	6255.02	6256.31	6256.31	6256.66	0.020530	4.72	31.83	46.82	1.00
East_Fork	North_Arm	5016	100-yr	100.00	6249.70	6251.29	6251.28	6251.75	0.018859	5.48	18.26	19.77	1.00
East_Fork	North_Arm	5016	500-yr	150.00	6249.70	6251.63	6251.63	6252.16	0.018107	5.84	25.69	24.52	1.01
East_Fork	North_Arm	4837	100-yr	100.00	6247.12	6248.28	6248.28	6248.59	0.021024	4.46	22.41	36.22	1.00
East_Fork	North_Arm	4837	500-yr	150.00	6247.12	6248.52	6248.52	6248.85	0.020106	4.62	32.48	51.67	0.99
East_Fork	North_Arm	4631	100-yr	100.00	6242.02	6243.20	6243.20	6243.50	0.022293	4.41	22.66	38.92	1.02
East_Fork	North_Arm	4631	500-yr	150.00	6242.02	6243.42	6243.42	6243.76	0.020607	4.69	31.97	47.23	1.01
East_Fork	North_Arm	4422	100-yr	100.00	6237.15	6238.60	6238.60	6238.94	0.017806	4.68	22.38	39.11	0.95
East_Fork	North_Arm	4422	500-yr	150.00	6237.15	6238.82	6238.82	6239.22	0.015774	5.20	31.73	45.09	0.93
East_Fork	North_Arm	4228	100-yr	100.00	6233.50	6235.36	6235.36	6235.68	0.012067	4.65	25.98	59.03	0.82
East_Fork	North_Arm	4228	500-yr	150.00	6233.50	6235.64	6235.64	6235.90	0.008293	4.54	50.92	116.79	0.70
East_Fork	North_Arm	4025	100-yr	100.00	6230.06	6231.36		6231.58	0.013591	3.77	26.55	39.55	0.81
East_Fork	North_Arm	4025	500-yr	150.00	6230.06	6231.63		6231.88	0.010531	4.00	37.51	42.75	0.75
East_Fork	North_Arm	3765	100-yr	619.00	6224.50	6227.76	6227.76	6228.68	0.012201	8.28	88.99	51.37	0.94
East_Fork	North_Arm	3765	500-yr	800.00	6224.50	6228.13	6228.13	6229.18	0.011662	8.92	108.84	54.85	0.95
East_Fork	North_Arm	3596	100-yr	619.00	6219.79	6222.72	6222.72	6223.59	0.015620	7.48	82.70	48.71	1.01
East_Fork	North_Arm	3596	500-yr	800.00	6219.79	6223.08	6223.08	6224.06	0.014969	7.93	100.83	52.66	1.01
East_Fork	North_Arm	3420	100-yr	619.00	6217.04	6220.07	6220.07	6221.01	0.015087	7.77	79.73	44.10	1.01
East_Fork	North_Arm	3420	500-yr	800.00	6217.04	6220.43	6220.43	6221.52	0.013993	8.37	96.15	47.06	1.00
East_Fork	North_Arm	3217	100-yr	619.00	6215.31	6218.12	6218.12	6218.54	0.007628	5.76	158.47	228.82	0.73
East_Fork	North_Arm	3217	500-yr	800.00	6215.31	6218.31	6218.31	6218.75	0.007568	6.11	205.16	255.02	0.74
East_Fork	North_Arm	2954	100-yr	619.00	6215.14	6215.91	6215.77	6216.09	0.015588	3.10	184.52	271.65	0.82
East_Fork	North_Arm	2954	500-yr	800.00	6215.14	6216.10	6215.89	6216.28	0.012124	3.18	237.69	287.91	0.75
East_Fork	North_Arm	2731	100-yr	619.00	6210.99	6212.16	6212.16	6212.49	0.019213	5.90	148.78	222.20	1.04
East_Fork	North_Arm	2731	500-yr	800.00	6210.99	6212.22	6212.22	6212.68	0.026177	7.12	160.71	234.89	1.22
East_Fork	North_Arm	2517	100-yr	619.00	6206.32	6209.54	6209.54	6210.03	0.005281	6.26	157.96	193.64	0.65
East_Fork	North_Arm	2517	500-yr	800.00	6206.32	6209.73	6209.73	6210.29	0.005979	6.95	203.53	269.80	0.69
East_Fork	North_Arm	2342	100-yr	619.00	6202.95	6205.58	6205.58	6205.98	0.007813	6.07	165.64	225.77	0.74
East_Fork	North_Arm	2342	500-yr	800.00	6202.95	6205.77	6205.77	6206.19	0.007941	6.48	211.03	251.34	0.76
East_Fork	North_Arm	2138	100-yr	619.00	6201.25	6202.75	6202.58	6203.05	0.012684	4.96	144.83	141.11	0.85
East_Fork	North_Arm	2138	500-yr	800.00	6201.25	6202.92	6202.73	6203.29	0.013022	5.52	168.69	143.80	0.88
East_Fork	North_Arm	1972	100-yr	619.00	6197.76	6200.09	6200.09	6200.61	0.015341	6.40	119.77	119.60	0.97
East_Fork	North_Arm	1972	500-yr	800.00	6197.76	6200.33	6200.33	6200.90	0.014500	6.79	148.70	132.42	0.96
East_Fork	North_Arm	1799	100-yr	619.00	6196.01	6198.10		6198.32	0.006439	4.94	213.41	259.19	0.65
East_Fork	North_Arm	1799	500-yr	800.00	6196.01	6198.28		6198.51	0.006208	5.14	260.72	265.17	0.65
East_Fork	North_Arm	1632	100-yr	619.00	6194.09	6196.91	6196.91	6197.27	0.005948	5.22	183.33	297.55	0.64
East_Fork	North_Arm	1632	500-yr	800.00	6194.09	6197.09	6197.09	6197.45	0.006283	5.52	237.67	343.06	0.67
East_Fork	North_Arm	1468	100-yr	619.00	6190.98	6193.73	6193.73	6193.99	0.011034	4.96	194.83	380.61	0.80
East_Fork	North_Arm	1468	500-yr	800.00	6190.98	6193.84	6193.84	6194.13	0.011287	5.33	240.73	402.58	0.82
East_Fork	North_Arm	1146	100-yr	619.00	6187.14	6189.55	6189.55	6190.39	0.015716	7.34	84.35	51.69	1.01
East_Fork	North_Arm	1146	500-yr	800.00	6187.14	6189.89	6189.89	6190.84	0.014911	7.85	101.94	54.23	1.01
East_Fork	North_Arm	944	100-yr	619.00	6183.74	6185.08	6185.06	6185.46	0.018713	4.92	125.80	161.07	0.98
East_Fork	North_Arm	944	500-yr	800.00	6183.74	6185.26	6185.20	6185.67	0.015976	5.19	154.24	162.52	0.94
East_Fork	North_Arm	680	100-yr	619.00	6179.56	6182.16		6182.77	0.010428	6.23	99.38	56.94	0.83
East_Fork	North_Arm	680	500-yr	800.00	6179.56	6182.50	6182.24	6183.20	0.010089	6.72	119.48	67.86	0.84
East_Fork	North_Arm	437	100-yr	619.00	6176.88	6179.51	6179.51	6180.49	0.014973	7.91	78.26	40.94	1.01
East_Fork	North_Arm	437	500-yr	800.00	6176.88	6179.90	6179.90	6181.02	0.014069	8.47	94.55	43.11	1.00

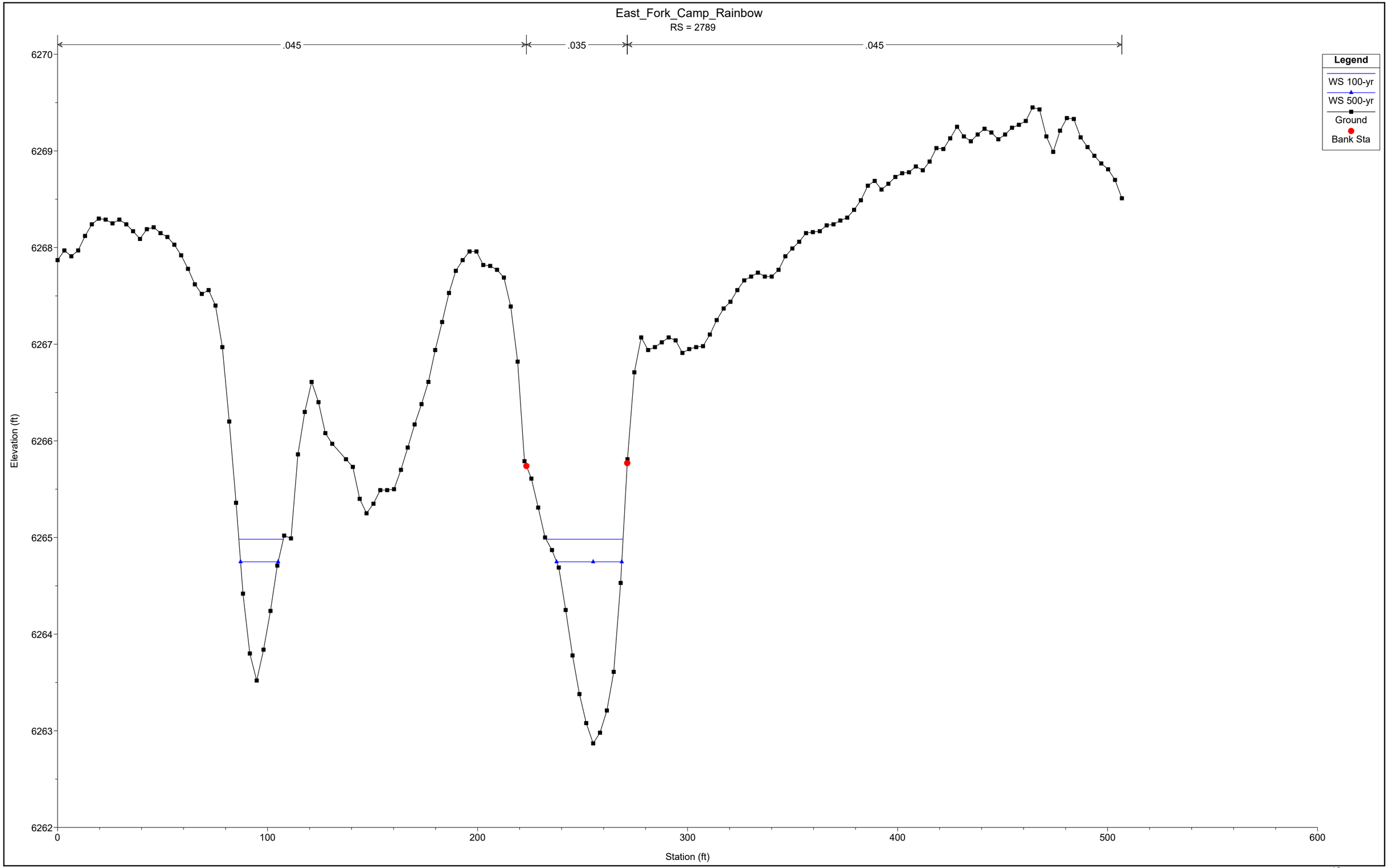
HEC-RAS Plan: EF V3 (Continued)

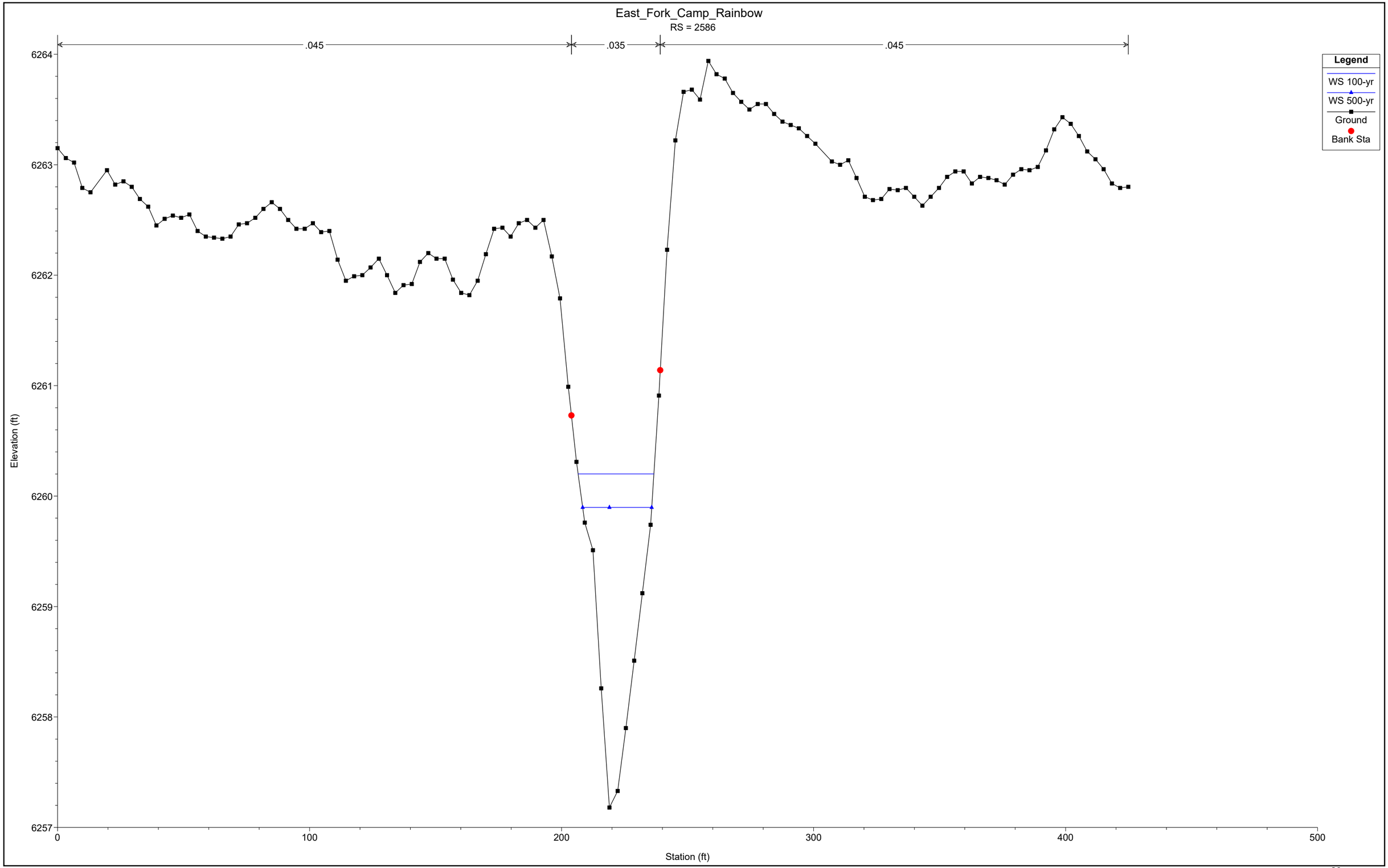
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
East_Fork	North_Arm	263	100-yr	619.00	6174.45	6176.91	6176.91	6177.75	0.015558	7.37	83.96	50.41	1.01
East_Fork	North_Arm	263	500-yr	800.00	6174.45	6177.25	6177.25	6178.21	0.014849	7.88	101.53	53.19	1.01
East_Fork	North_Arm	91	100-yr	619.00	6171.19	6174.86	6174.12	6175.27	0.005001	5.18	126.19	79.28	0.60
East_Fork	North_Arm	91	500-yr	800.00	6171.19	6175.24	6174.50	6175.70	0.005004	5.58	159.18	99.44	0.61
East Fork S	East Fork S	3212	100-yr	335.00	6272.81	6275.50	6275.50	6276.01	0.009142	6.03	69.54	79.75	0.78
East Fork S	East Fork S	3212	500-yr	256.00	6272.81	6275.06	6275.06	6275.70	0.012895	6.46	42.43	42.52	0.90
East Fork S	East Fork S	3006	100-yr	335.00	6268.39	6270.59	6270.59	6271.31	0.014969	6.87	51.13	39.26	0.98
East Fork S	East Fork S	3006	500-yr	256.00	6268.39	6270.35	6270.35	6270.96	0.016159	6.34	41.71	36.34	0.99
East Fork S	East Fork S	2789	100-yr	335.00	6262.87	6264.98	6264.98	6265.51	0.017029	6.20	60.92	57.84	1.00
East Fork S	East Fork S	2789	500-yr	256.00	6262.87	6264.75	6264.75	6265.24	0.016437	5.96	48.50	48.95	0.98
East Fork S	East Fork S	2586	100-yr	335.00	6257.18	6260.20	6260.20	6261.00	0.016307	7.16	46.78	30.06	1.01
East Fork S	East Fork S	2586	500-yr	256.00	6257.18	6259.90	6259.90	6260.60	0.016745	6.73	38.05	27.40	1.01
East Fork S	East Fork S	2426	100-yr	335.00	6254.21	6256.98	6256.98	6257.56	0.007955	6.97	74.80	77.10	0.78
East Fork S	East Fork S	2426	500-yr	256.00	6254.21	6256.53	6256.53	6257.17	0.010622	7.06	47.02	45.66	0.87
East Fork S	East Fork S	2279	100-yr	335.00	6251.89	6253.71	6253.63	6253.89	0.012873	3.79	108.43	191.16	0.80
East Fork S	East Fork S	2279	500-yr	256.00	6251.89	6253.61	6253.55	6253.76	0.014149	3.56	88.28	187.62	0.81
East Fork S	East Fork S	2087	100-yr	335.00	6249.39	6250.97	6250.97	6251.22	0.022517	4.78	86.12	155.95	1.04
East Fork S	East Fork S	2087	500-yr	256.00	6249.39	6250.88	6250.88	6251.10	0.019384	4.71	71.90	140.17	0.98
East Fork S	East Fork S	1719	100-yr	519.00	6244.66	6247.47	6247.47	6247.95	0.007884	6.55	129.32	141.46	0.76
East Fork S	East Fork S	1719	500-yr	651.00	6244.66	6247.66	6247.66	6248.16	0.008121	7.00	156.33	152.33	0.78
East Fork S	East Fork S	1406	100-yr	519.00	6240.86	6244.04	6243.84	6244.69	0.010197	6.52	81.91	50.02	0.83
East Fork S	East Fork S	1406	500-yr	651.00	6240.86	6244.13	6244.13	6245.06	0.013771	7.80	86.35	52.16	0.97
East Fork S	East Fork S	1182	100-yr	519.00	6238.09	6241.81	6241.81	6242.61	0.008561	7.52	88.95	98.72	0.80
East Fork S	East Fork S	1182	500-yr	651.00	6238.09	6242.36	6242.36	6242.87	0.005021	6.51	171.89	196.74	0.63
East Fork S	East Fork S	1016	100-yr	519.00	6235.82	6239.19		6239.76	0.006957	6.31	96.79	63.18	0.72
East Fork S	East Fork S	1016	500-yr	651.00	6235.82	6239.55		6240.15	0.006296	6.59	120.13	67.68	0.70
East Fork S	East Fork S	865	100-yr	519.00	6233.26	6237.22	6237.22	6238.31	0.012971	8.43	63.93	33.42	0.96
East Fork S	East Fork S	865	500-yr	651.00	6233.26	6237.63	6237.63	6238.82	0.011724	8.89	78.56	38.40	0.93
East Fork S	East Fork S	709	100-yr	519.00	6231.87	6234.95	6234.85	6235.40	0.007314	5.92	117.96	103.92	0.72
East Fork S	East Fork S	709	500-yr	651.00	6231.87	6235.18		6235.66	0.007112	6.25	141.91	105.25	0.72
East Fork S	East Fork S	540	100-yr	519.00	6231.12	6233.51	6233.51	6234.00	0.009564	6.65	117.57	112.65	0.82
East Fork S	East Fork S	540	500-yr	651.00	6231.12	6233.67	6233.67	6234.23	0.010255	7.24	135.92	115.13	0.86
East Fork S	East Fork S	298	100-yr	519.00	6226.38	6228.82	6228.82	6229.64	0.015861	7.27	71.36	44.45	1.01
East Fork S	East Fork S	298	500-yr	651.00	6226.38	6229.11	6229.11	6230.03	0.015049	7.70	84.57	46.75	1.01
East Fork S	East Fork S	183	100-yr	519.00	6224.11	6226.77	6226.77	6227.75	0.012242	8.30	70.91	38.62	0.95
East Fork S	East Fork S	183	500-yr	651.00	6224.11	6227.11	6227.11	6228.22	0.011765	8.90	84.44	40.99	0.95
East Fork S	East Fork S	61	100-yr	519.00	6222.36	6225.96	6225.62	6226.47	0.005003	6.55	120.88	96.04	0.64
East Fork S	East Fork S	61	500-yr	651.00	6222.36	6226.29	6225.90	6226.84	0.004996	6.99	160.61	134.92	0.65

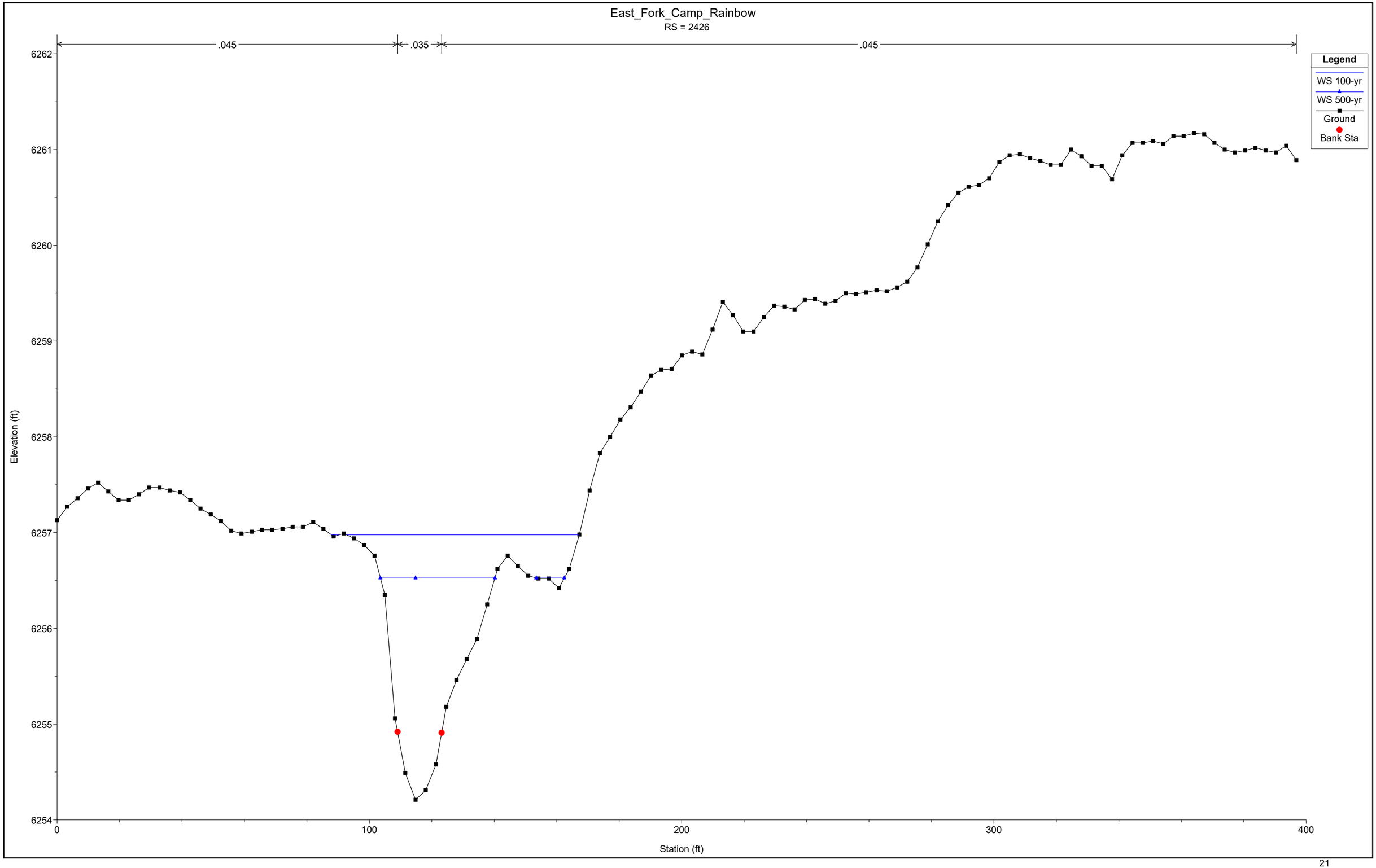
Sections

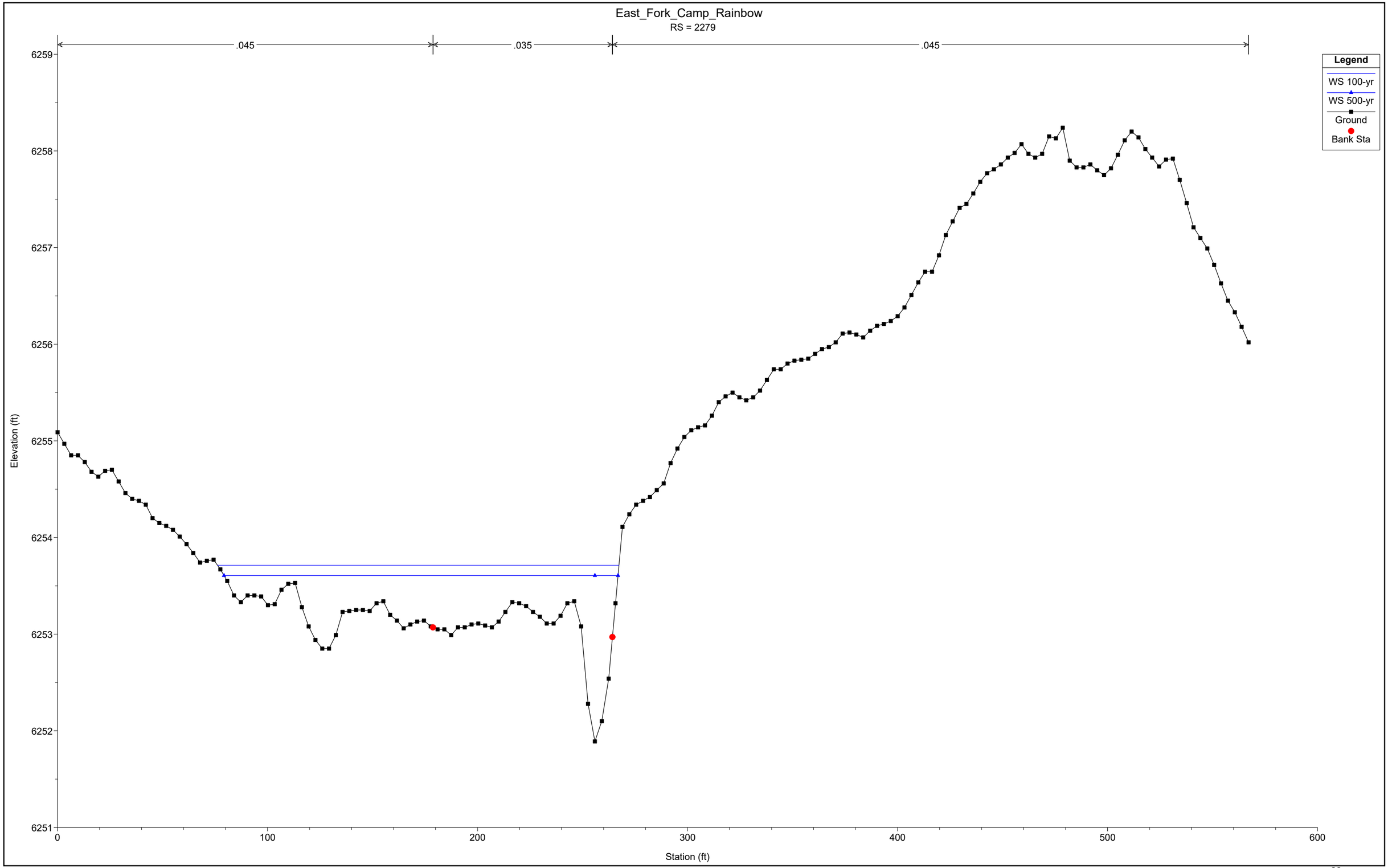

East_Fork_Camp_Rainbow
RS = 3212
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6282
6280
6278
6276
6274
6272
Station (ft)
0
100
200
300
400
500
600
700

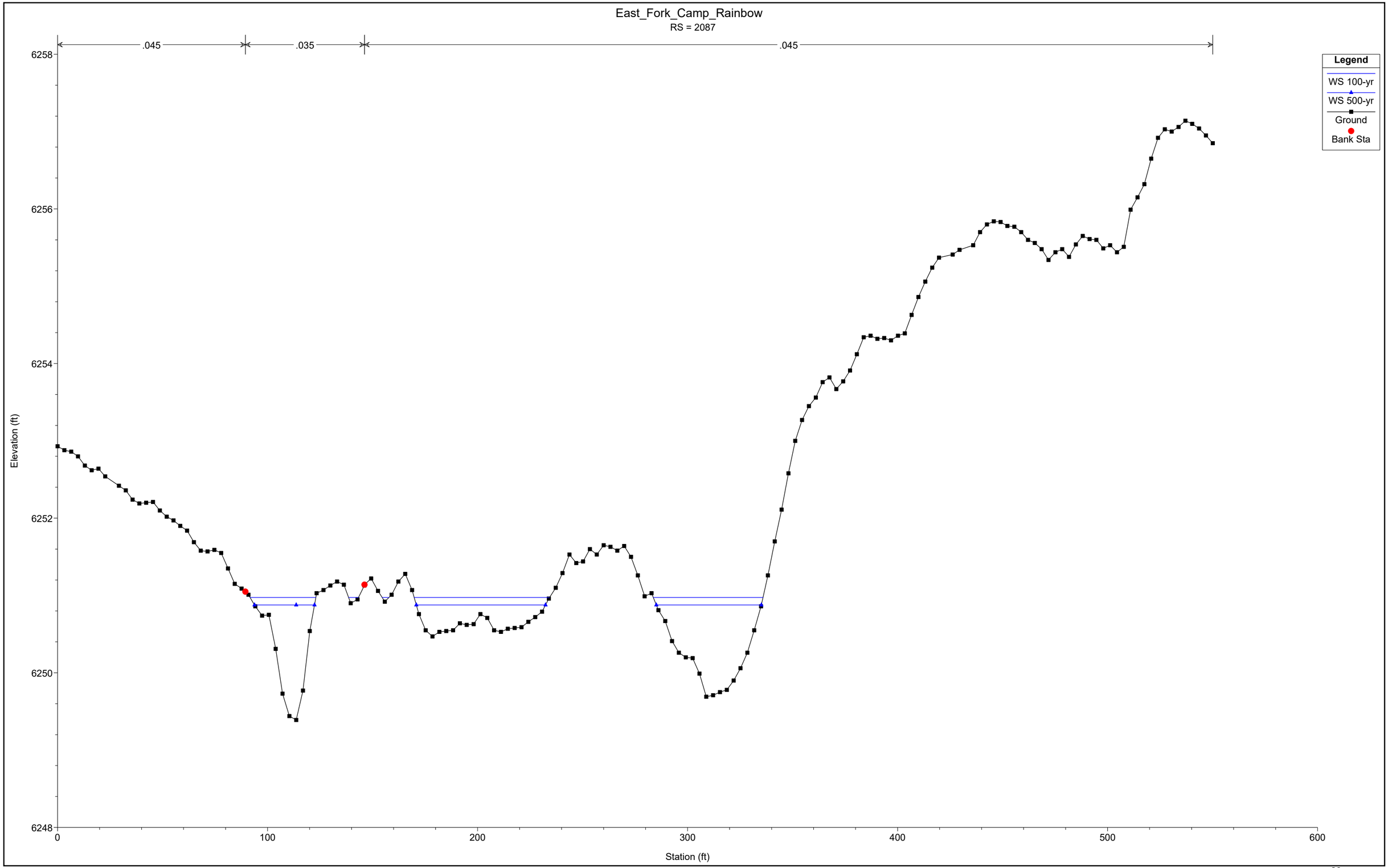

East_Fork_Camp_Rainbow
RS = 3006
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6275
6274
6273
6272
6271
6270
6269
6268
0
100
200
300
400
500
600
Station (ft)

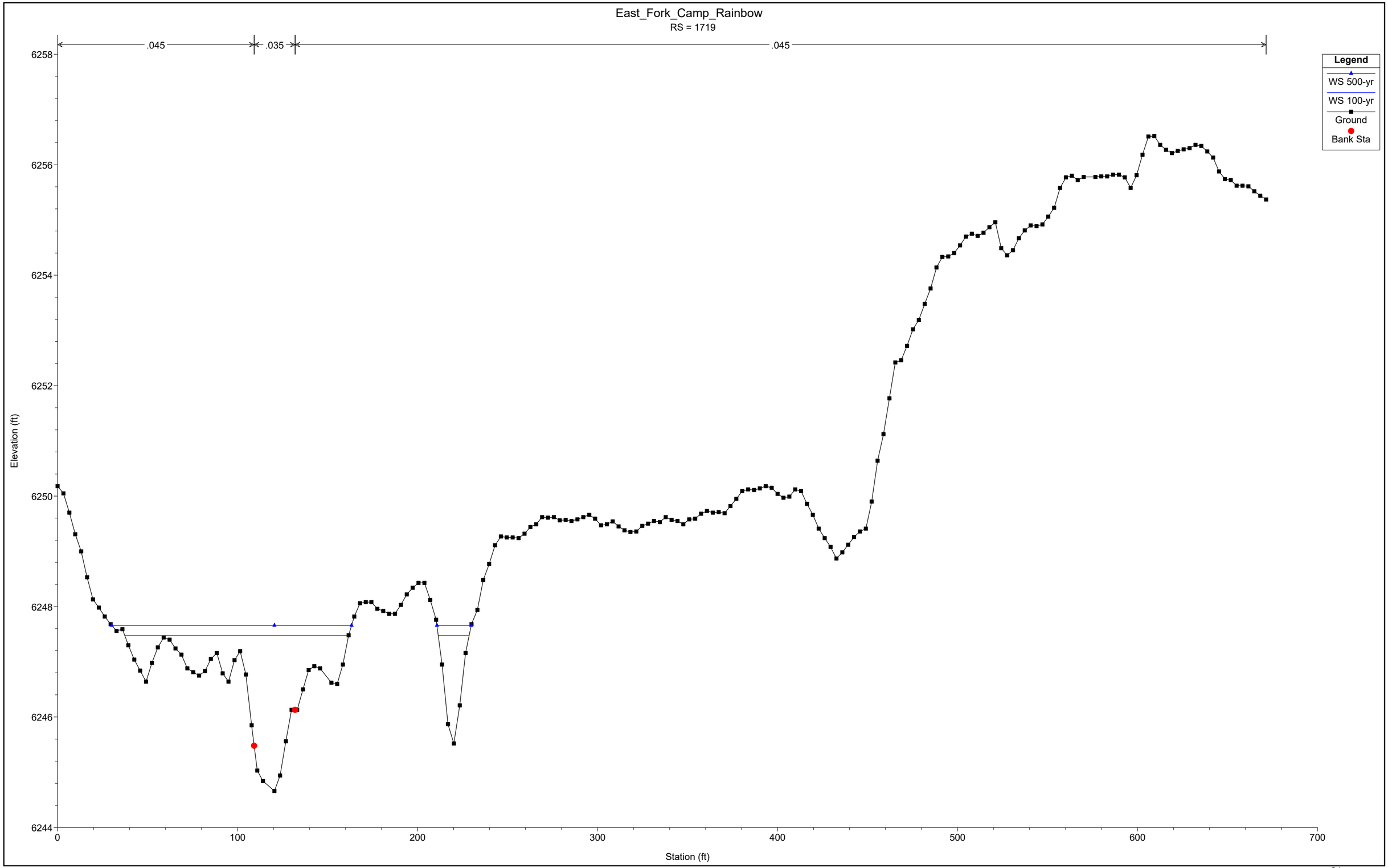

East_Fork_Camp_Rainbow
RS = 2789
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6270
6269
6268
6267
6266
6265
6264
6263
6262
0
100
200
300
400
500
600
Station (ft)

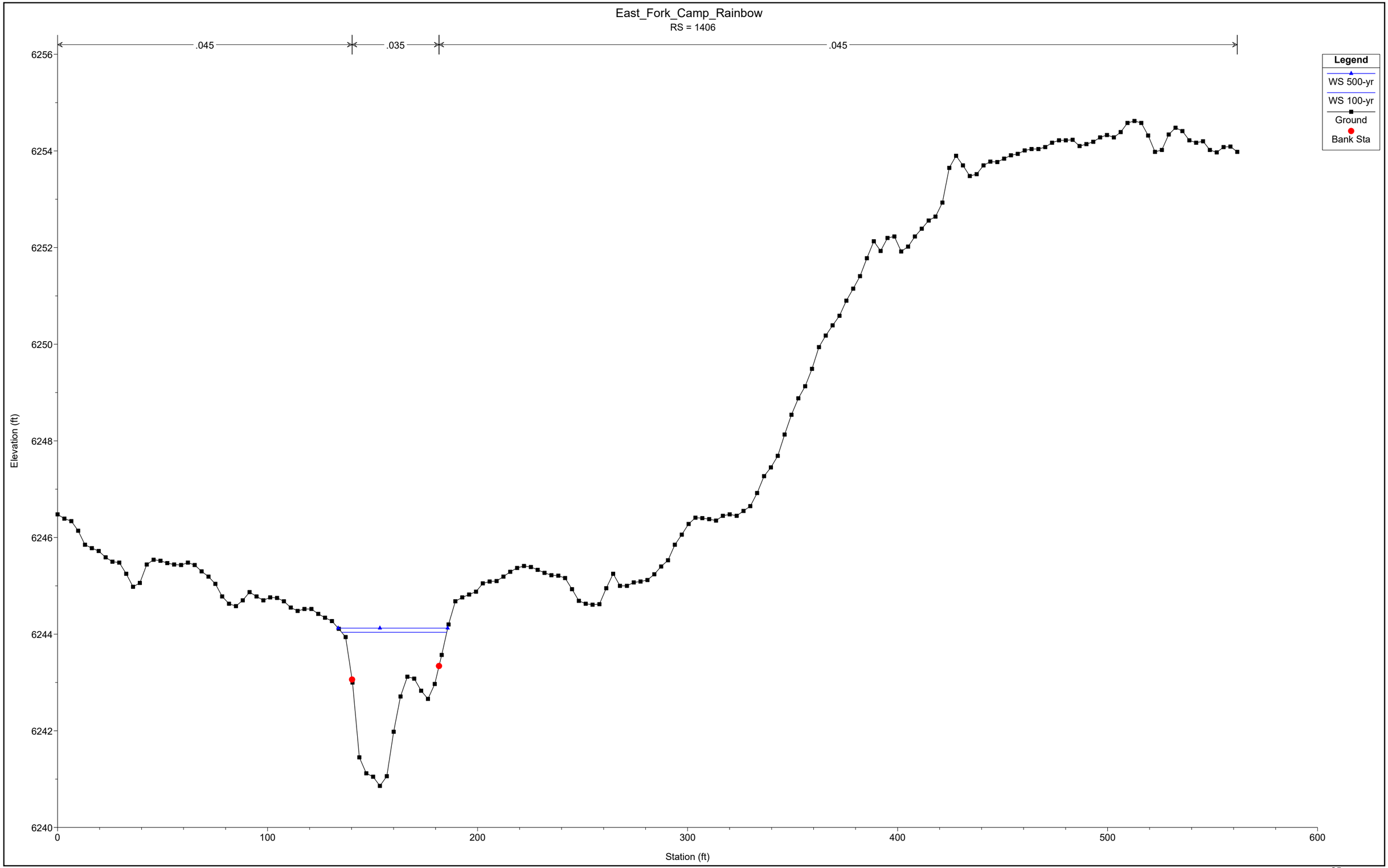

East_Fork_Camp_Rainbow
RS = 2586
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6264
6263
6262
6261
6260
6259
6258
6257
0
100
200
300
400
500
Station (ft)

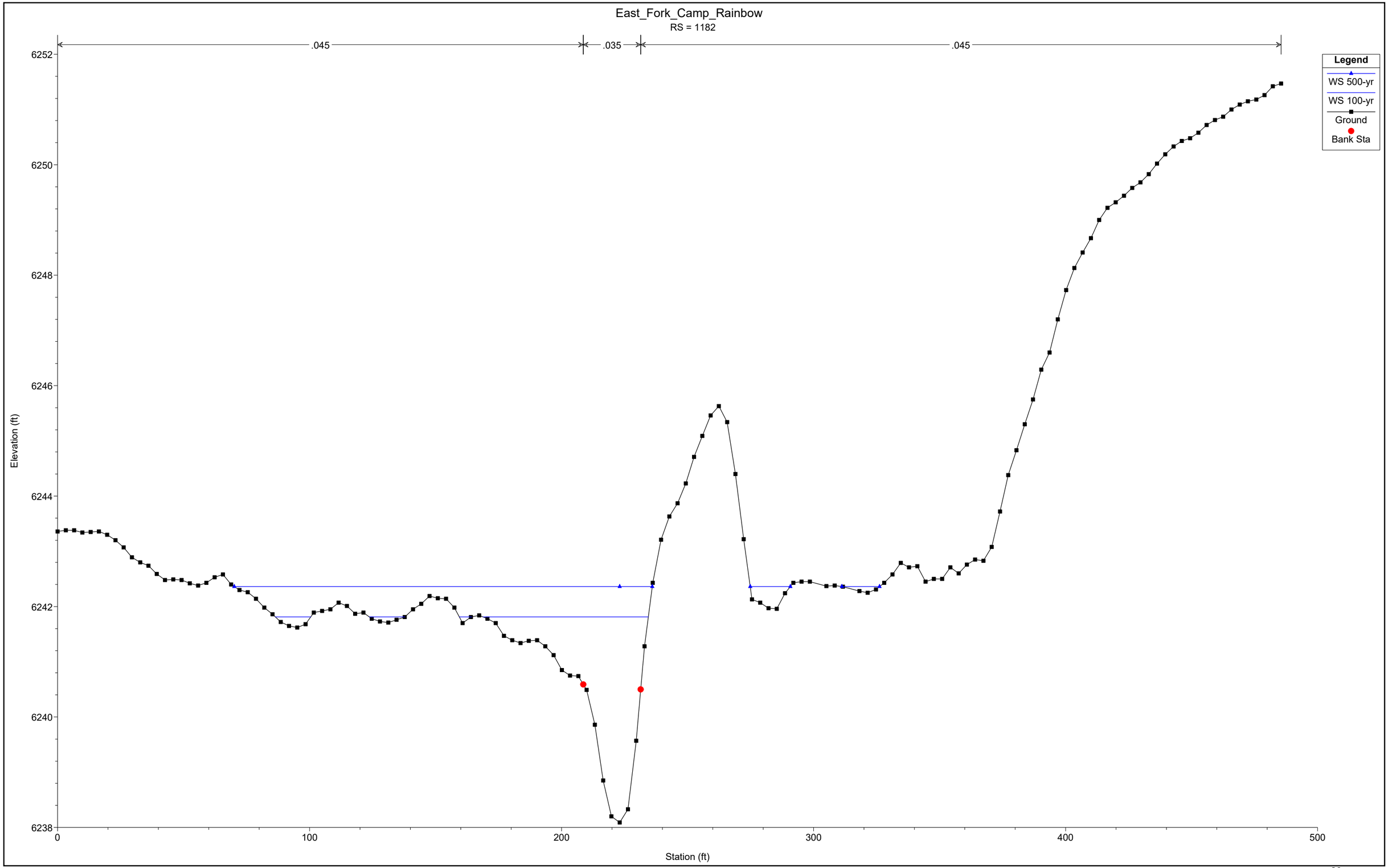

East_Fork_Camp_Rainbow
RS = 2426
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6262
6261
6260
6259
6258
6257
6256
6255
6254
0
100
200
300
400
Station (ft)

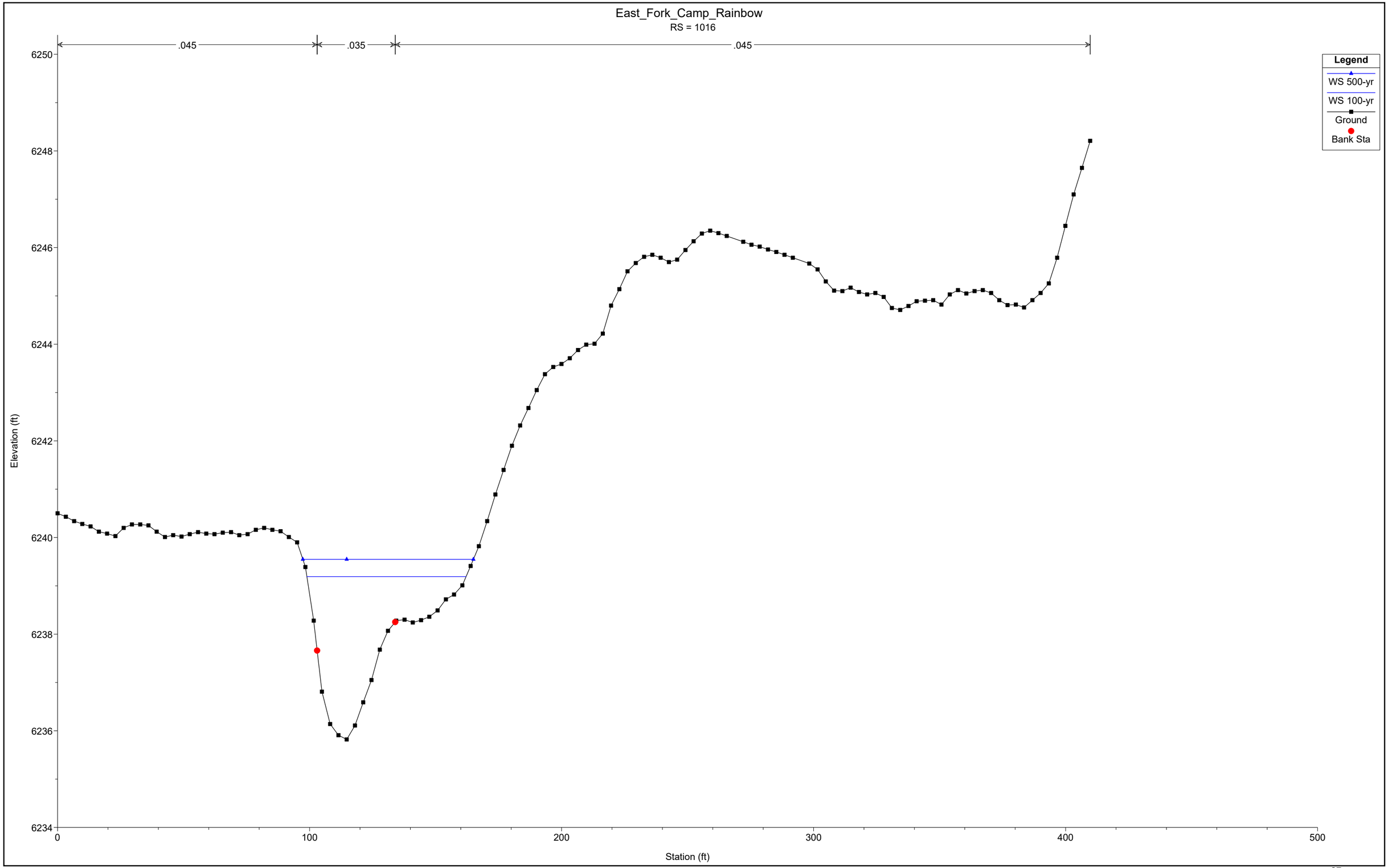

East_Fork_Camp_Rainbow
RS = 2279
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6259
6258
6257
6256
6255
6254
6253
6252
6251
0
100
200
300
400
500
600
Station (ft)

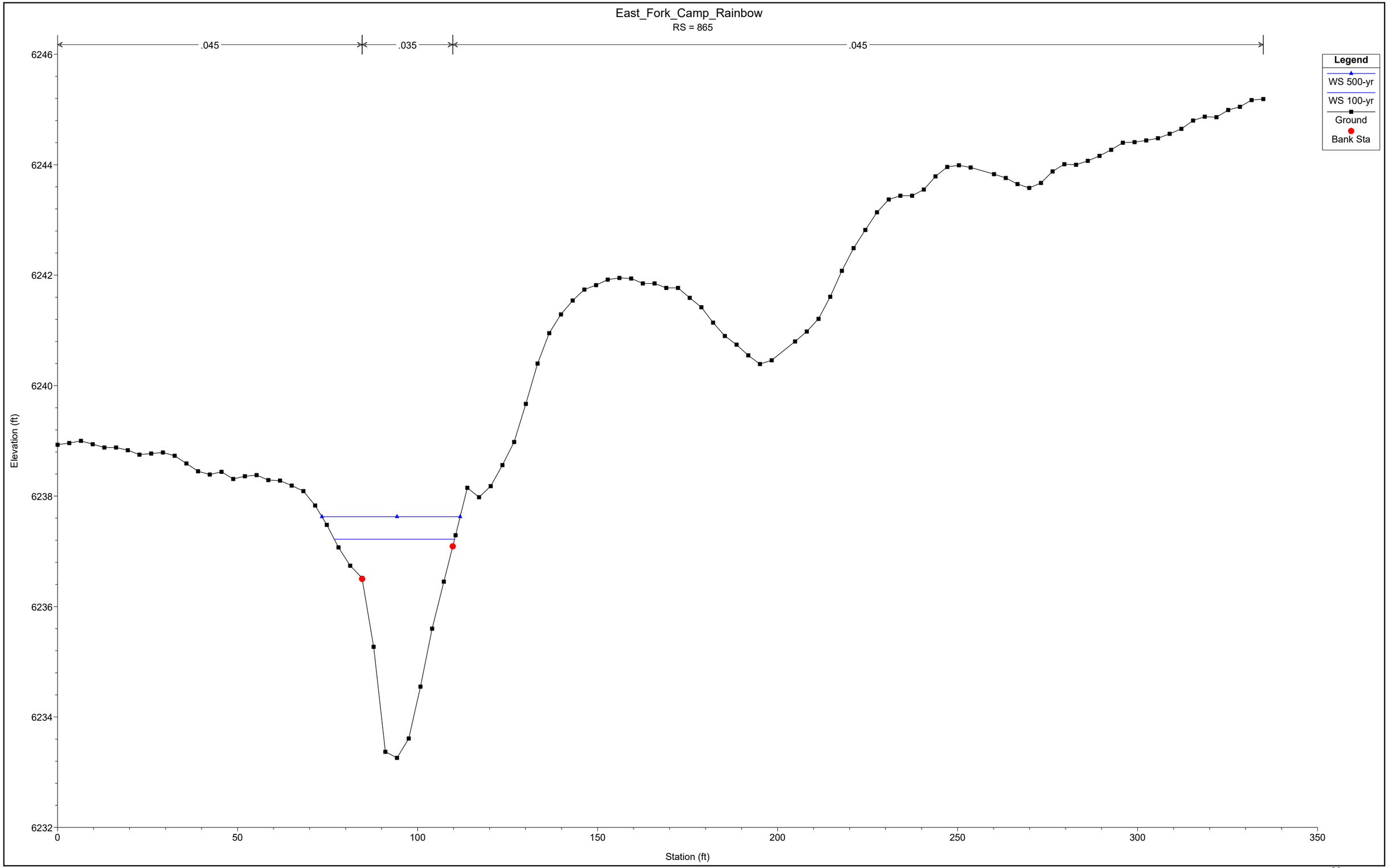

East_Fork_Camp_Rainbow
RS = 2087
.045
.035
.045
Legend
WS 100-yr
WS 500-yr
Ground
Bank Sta
Elevation (ft)
6258
6256
6254
6252
6250
6248
0
100
200
300
400
500
600
Station (ft)

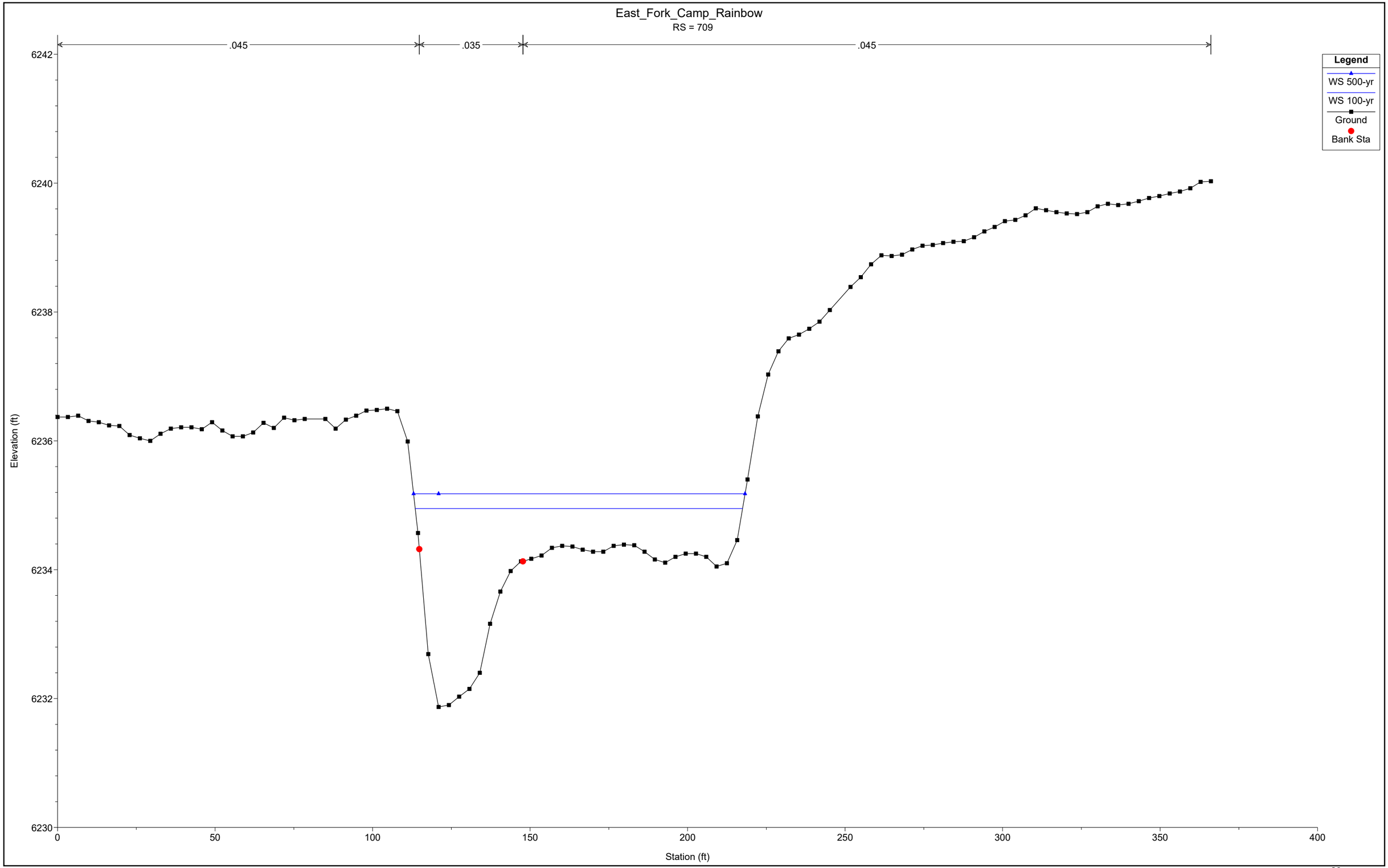

East_Fork_Camp_Rainbow
RS = 1719
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6258
6256
6254
6252
6250
6248
6246
6244
0
100
200
300
400
500
600
700
Station (ft)

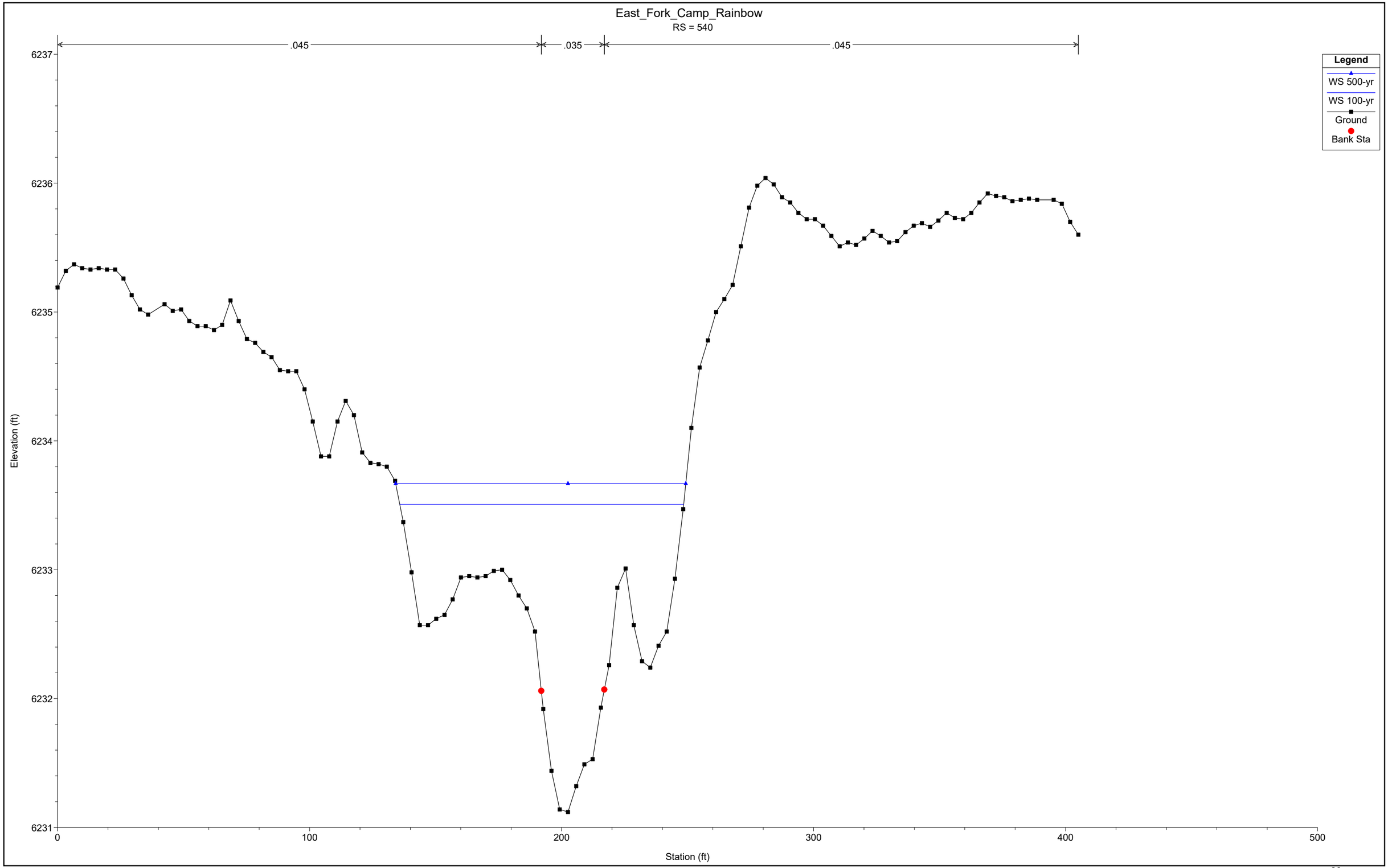

East_Fork_Camp_Rainbow
RS = 1406
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6256
6254
6252
6250
6248
6246
6244
6242
6240
0
100
200
300
400
500
600
Station (ft)

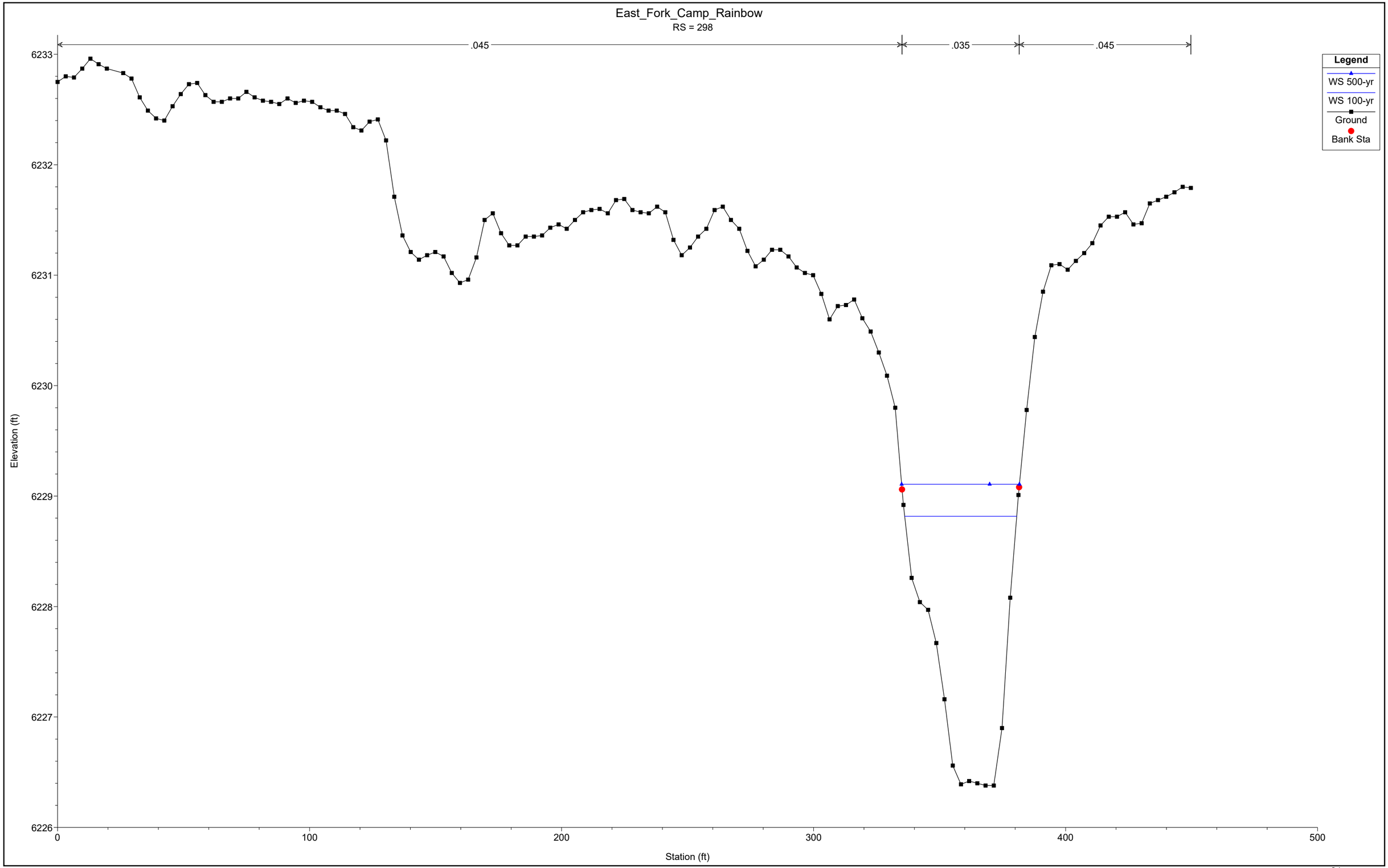

East_Fork_Camp_Rainbow
RS = 1182
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6252
6250
6248
6246
6244
6242
6240
6238
0
100
200
300
400
500
Station (ft)

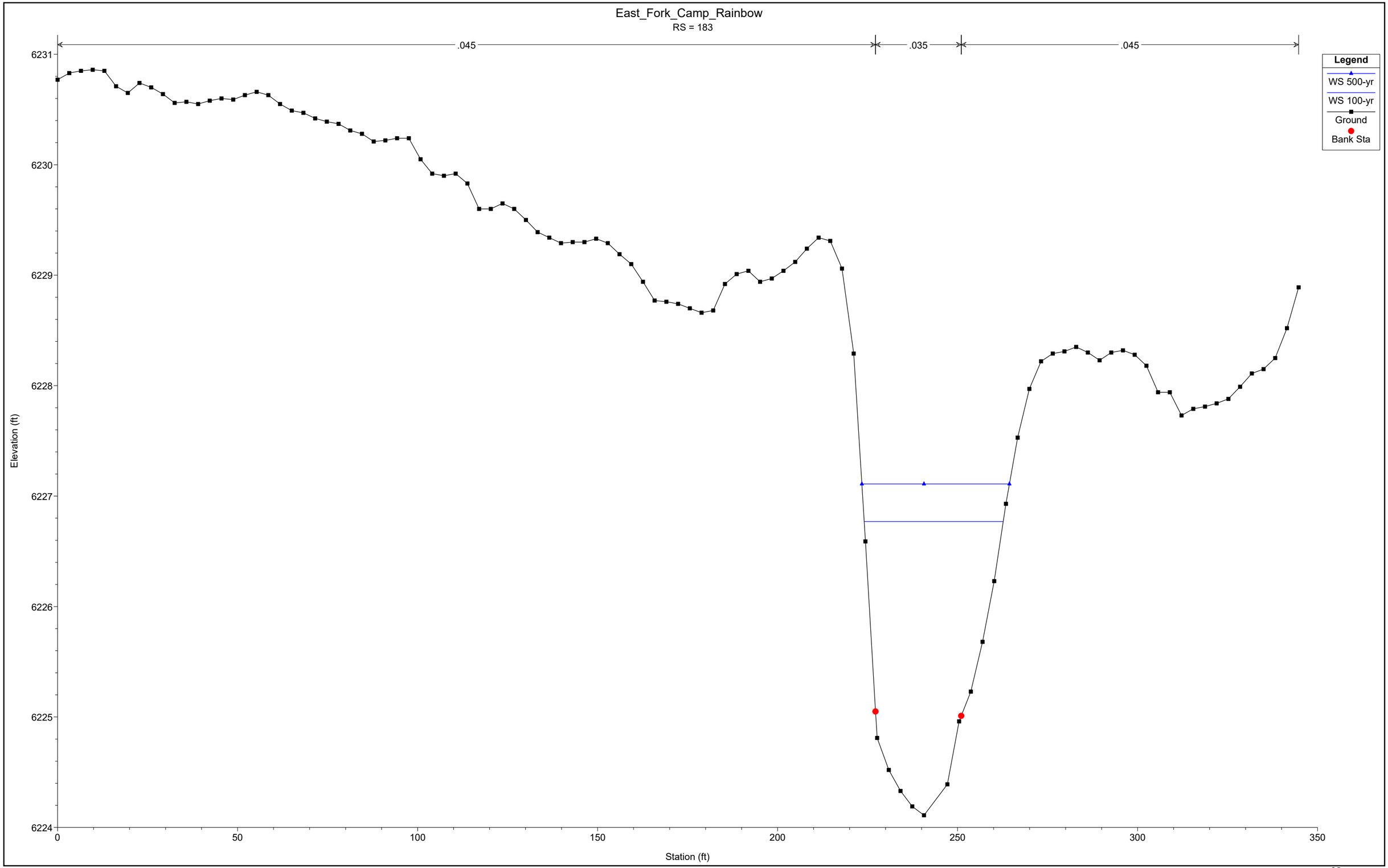

East_Fork_Camp_Rainbow
RS = 1016
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6250
6248
6246
6244
6242
6240
6238
6236
6234
0
100
200
300
400
500
Station (ft)

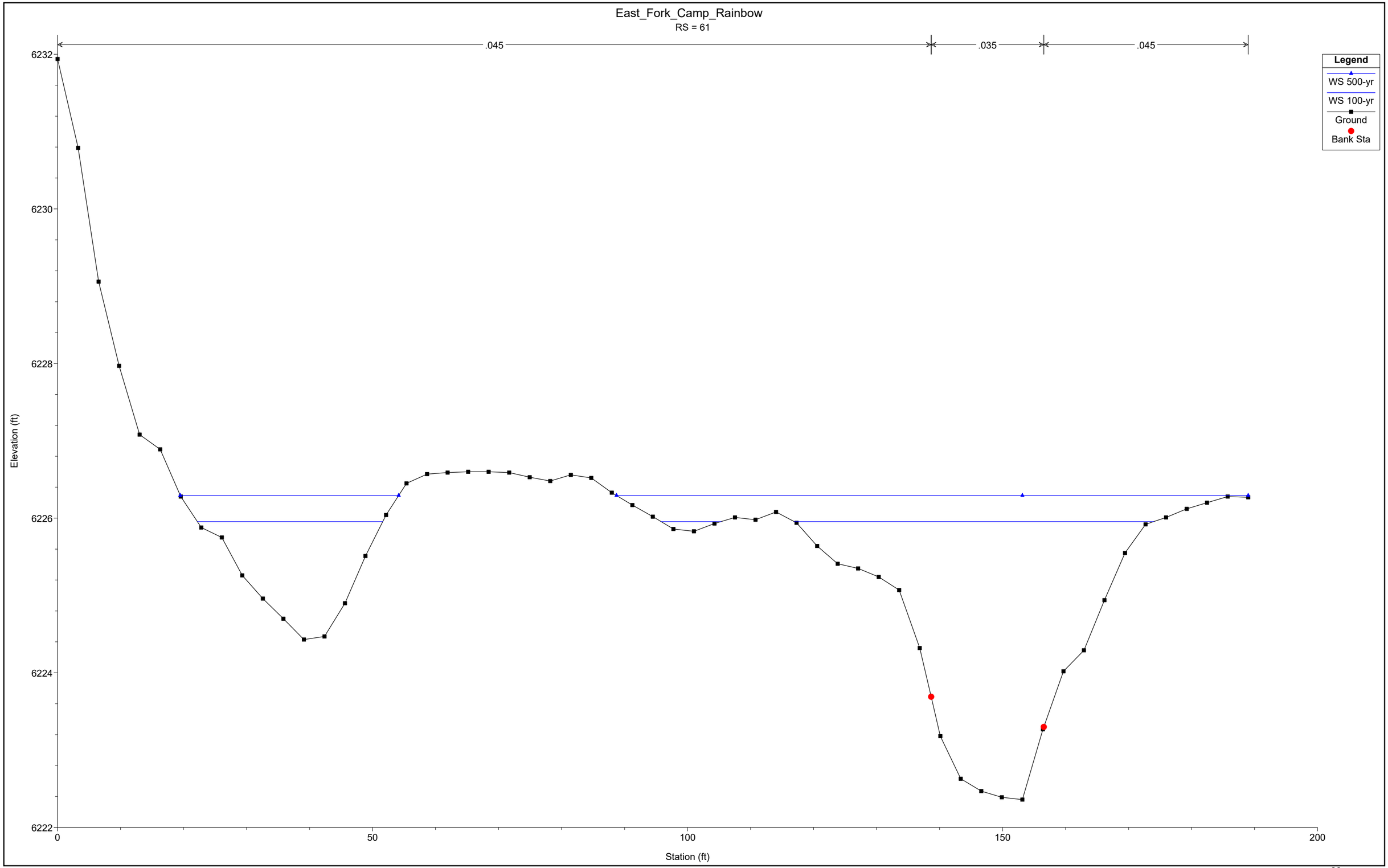

East_Fork_Camp_Rainbow
RS = 865
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6246
6244
6242
6240
6238
6236
6234
6232
0
50
100
150
200
250
300
350
Station (ft)

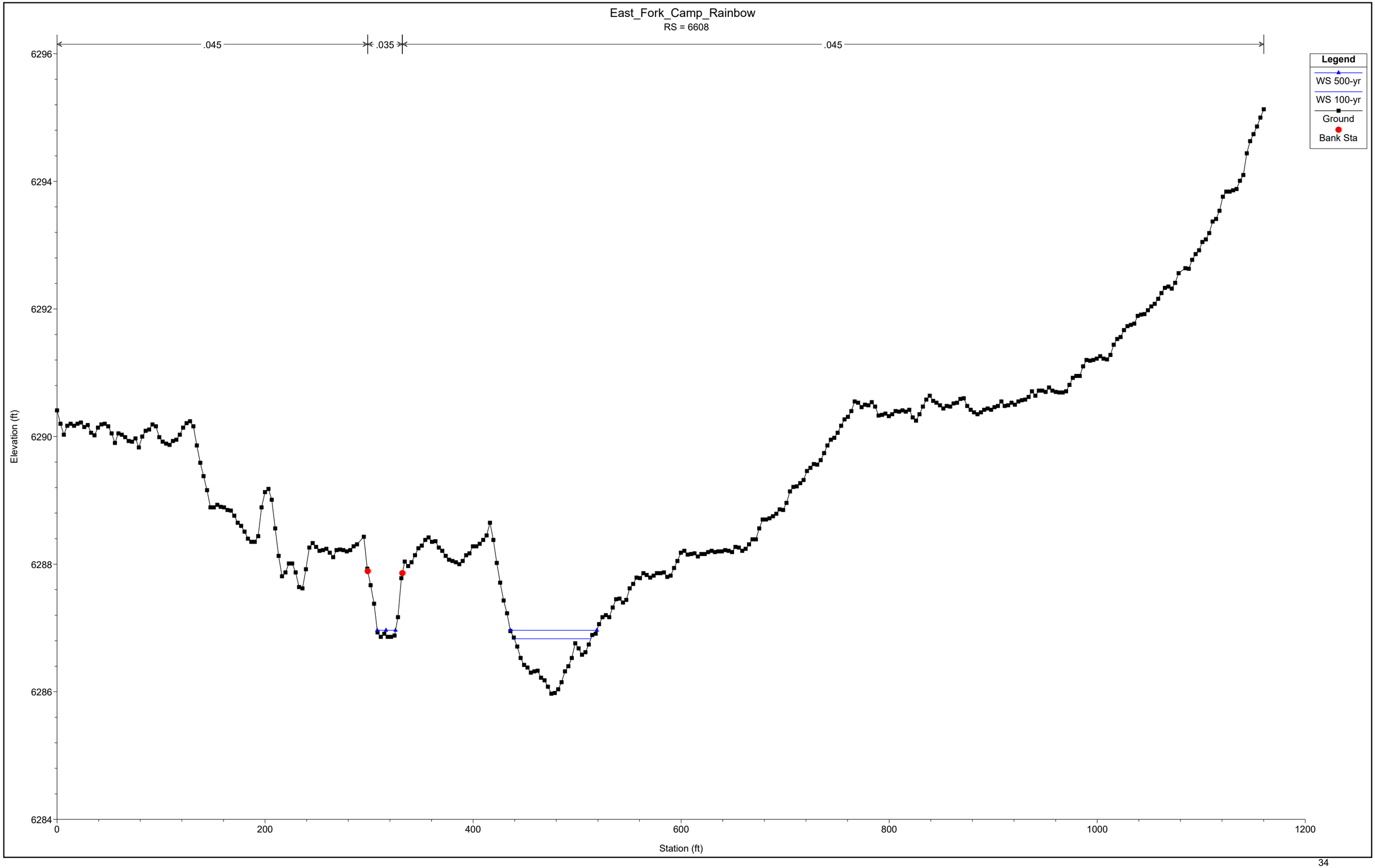

East_Fork_Camp_Rainbow
RS = 709
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6242
6240
6238
6236
6234
6232
6230
0
50
100
150
200
250
300
350
400
Station (ft)

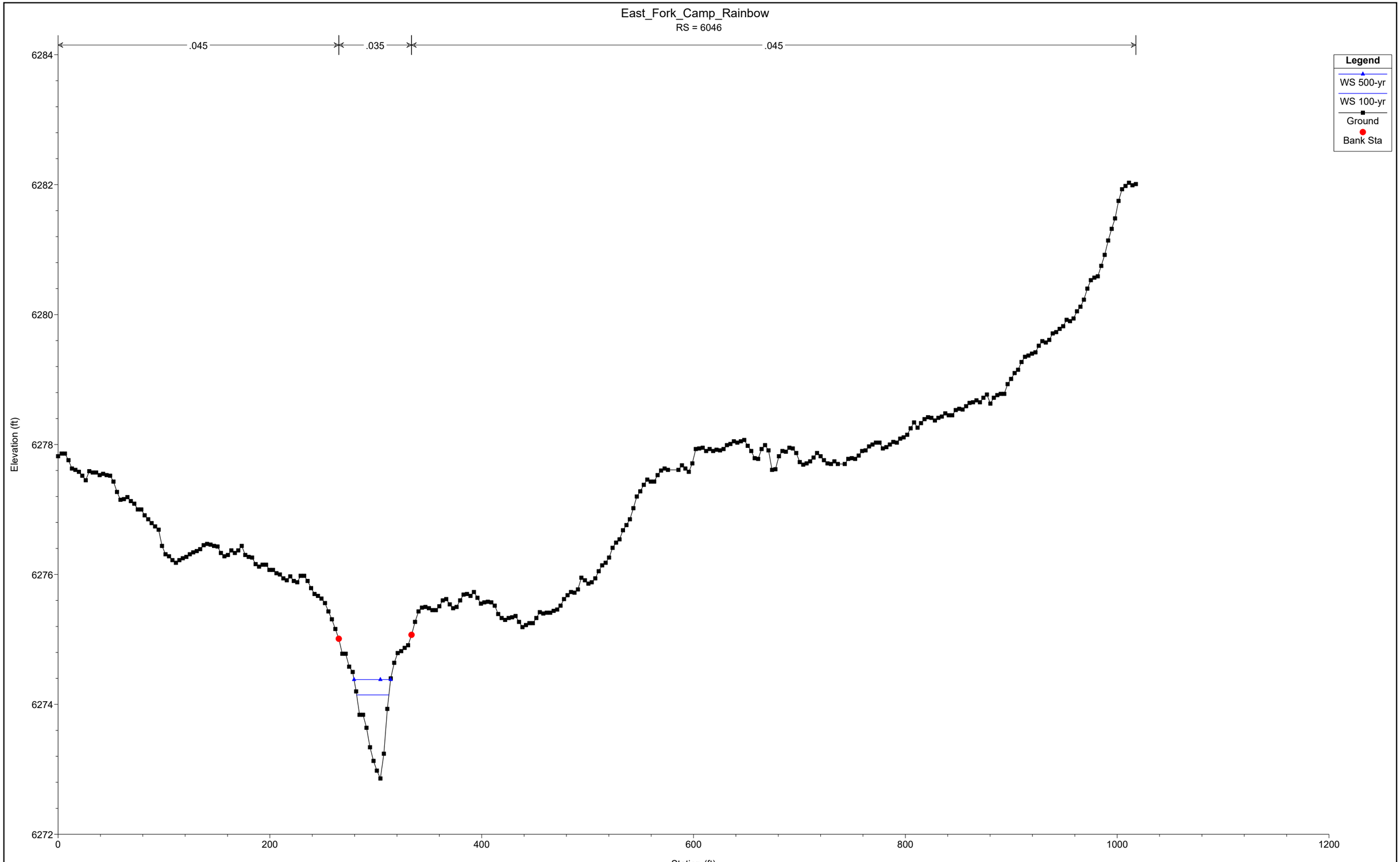

East_Fork_Camp_Rainbow
RS = 540
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6237
6236
6235
6234
6233
6232
6231
0
100
200
300
400
500
Station (ft)

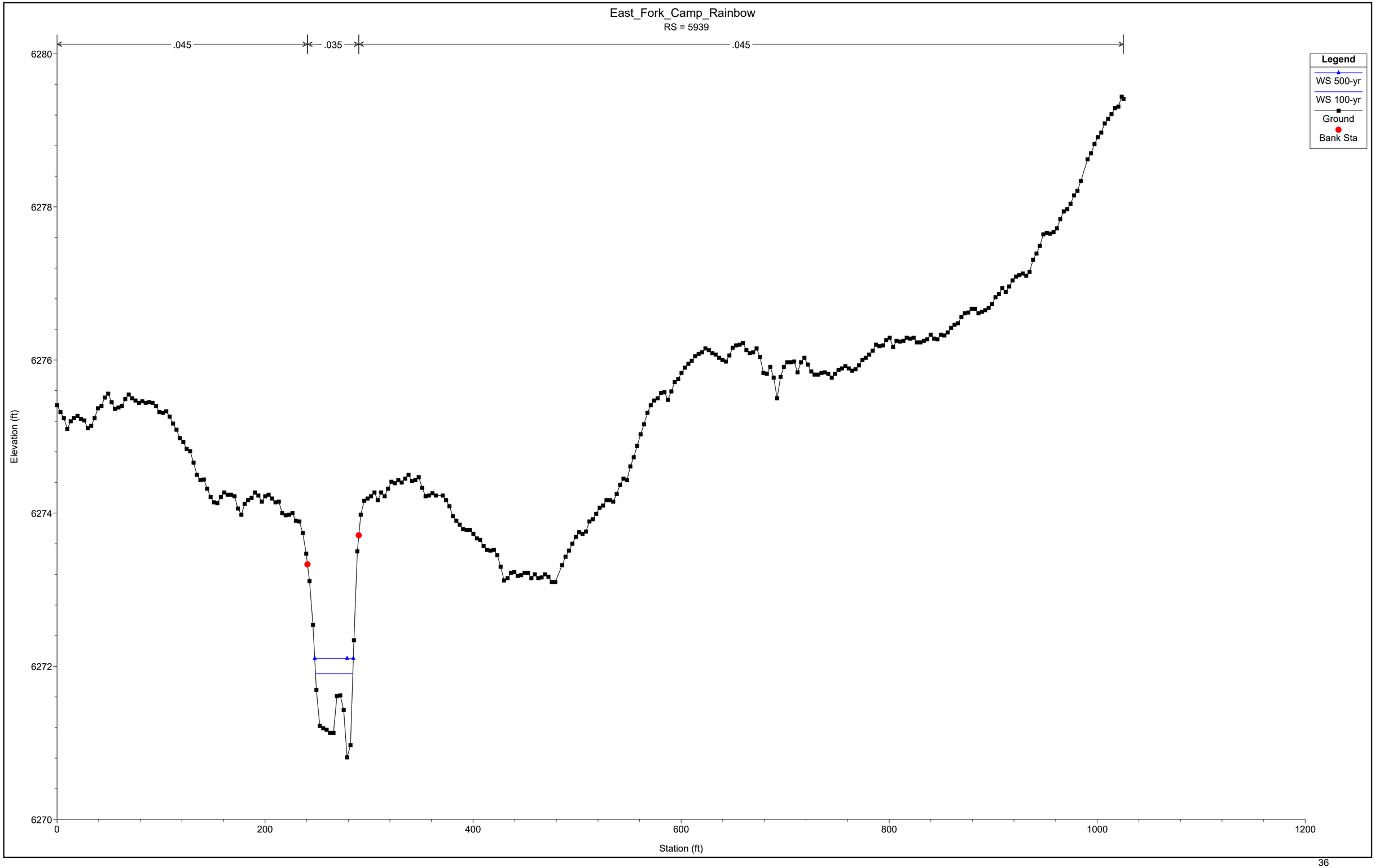

East_Fork_Camp_Rainbow
RS = 298
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6233
6232
6231
6230
6229
6228
6227
6226
0
100
200
300
400
500
Station (ft)

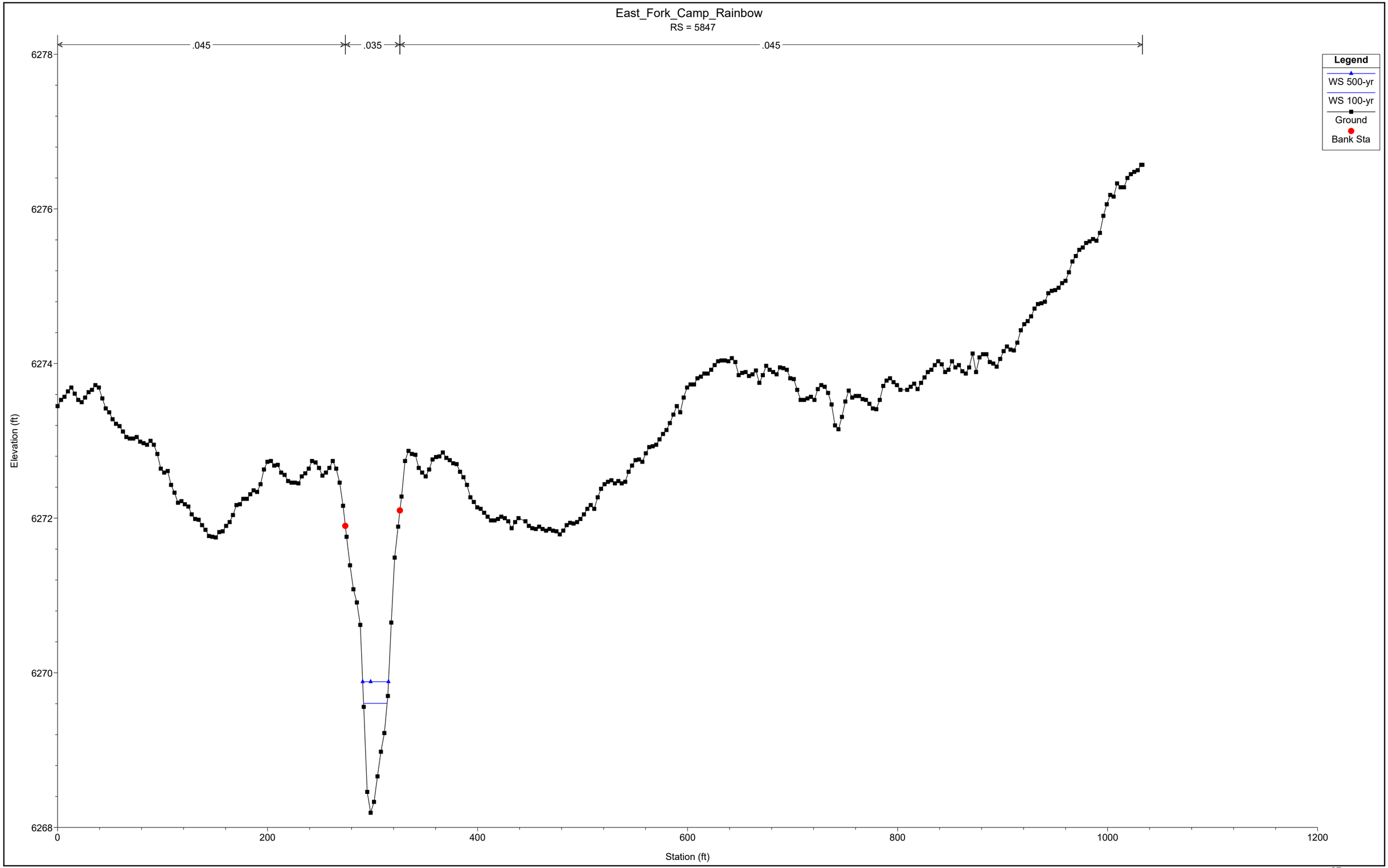

East_Fork_Camp_Rainbow
RS = 183
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6231
6230
6229
6228
6227
6226
6225
6224
Station (ft)
0
50
100
150
200
250
300
350

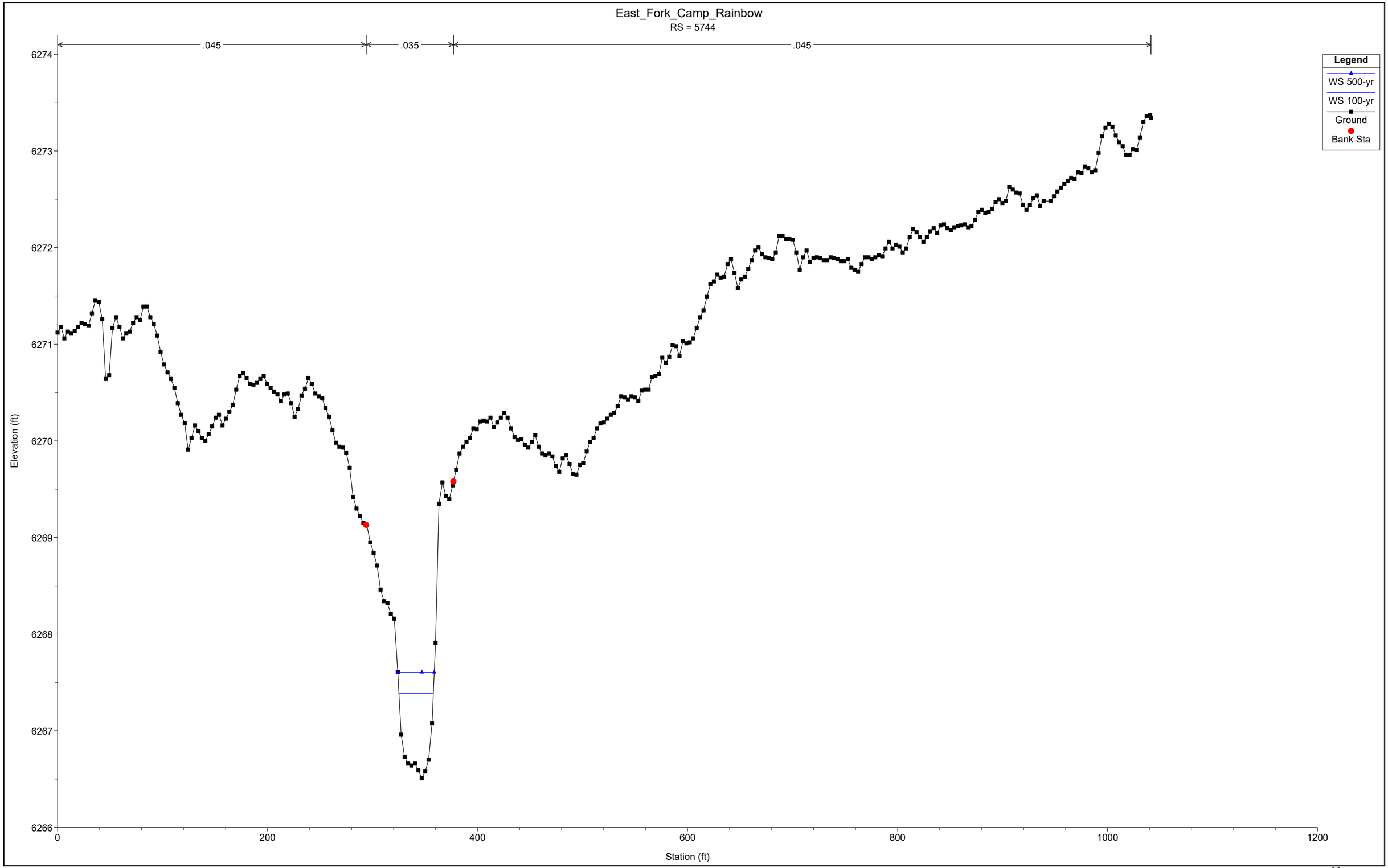

East_Fork_Camp_Rainbow
RS = 61
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6232
6230
6228
6226
6224
6222
0
50
100
150
200
Station (ft)

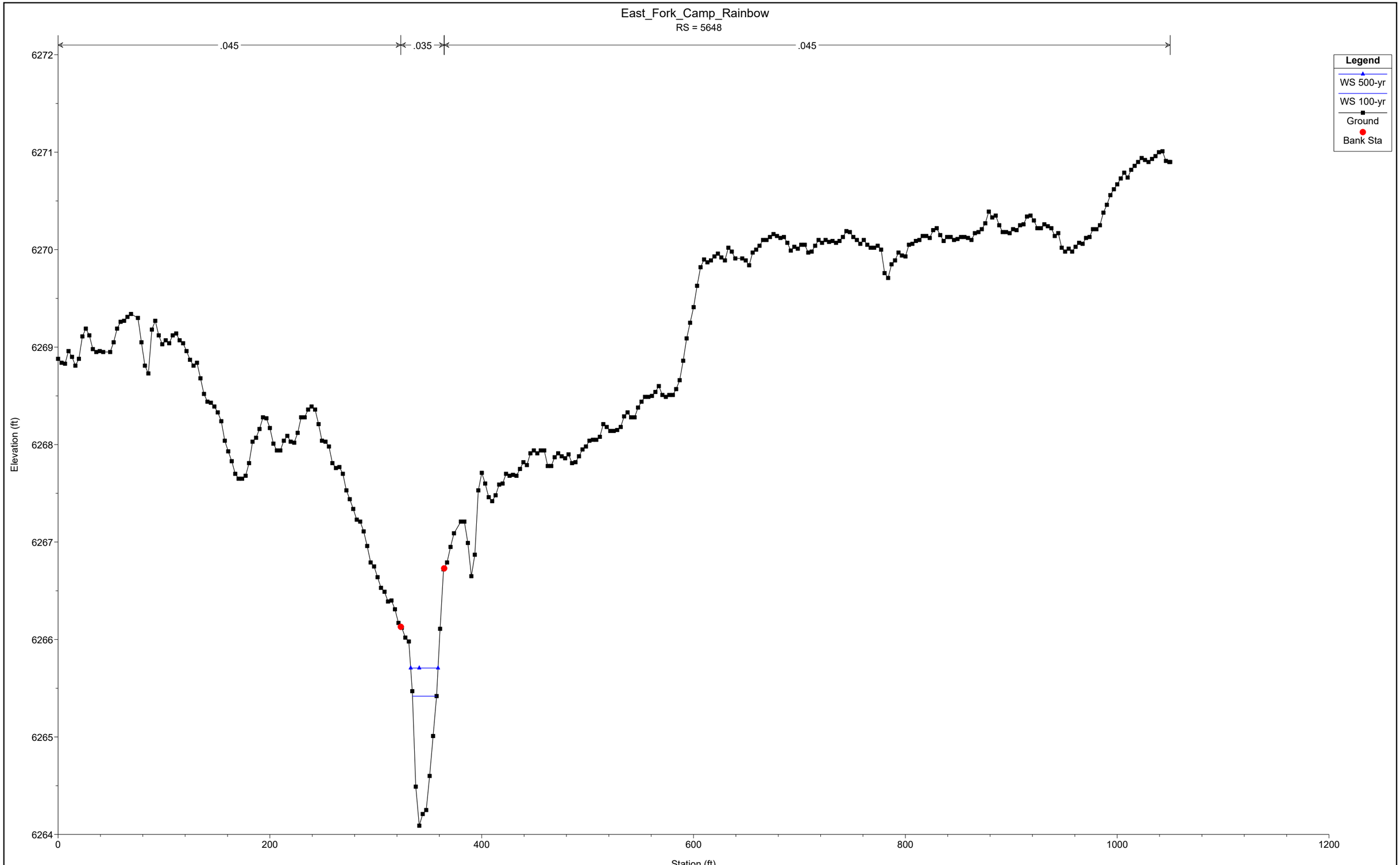

East_Fork_Camp_Rainbow
RS = 6608
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6296
6294
6292
6290
6288
6286
6284
0
200
400
600
800
1000
1200
Station (ft)

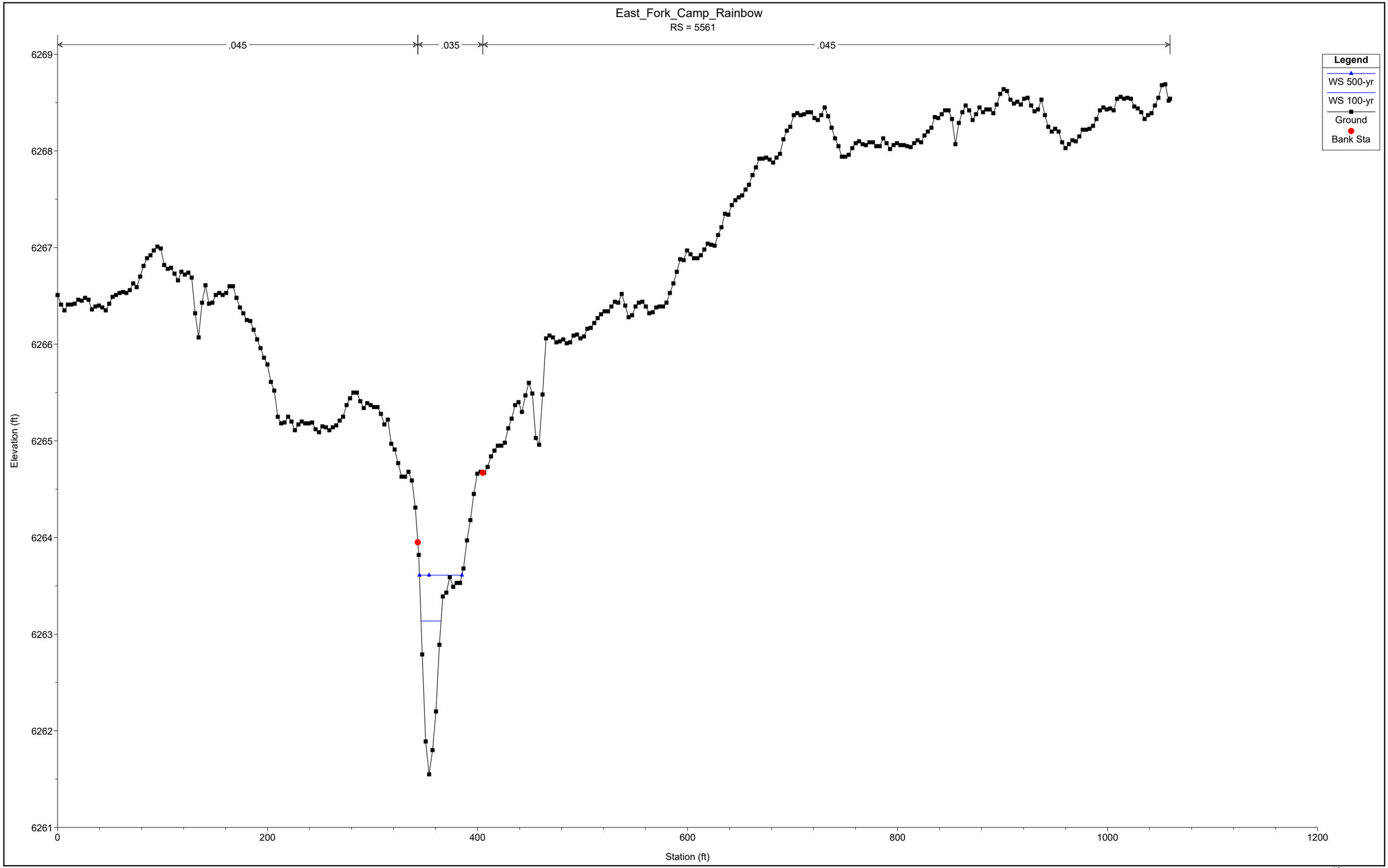

East_Fork_Camp_Rainbow
RS = 6046
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6284
6282
6280
6278
6276
6274
6272
0
200
400
600
800
1000
1200
Station (ft)

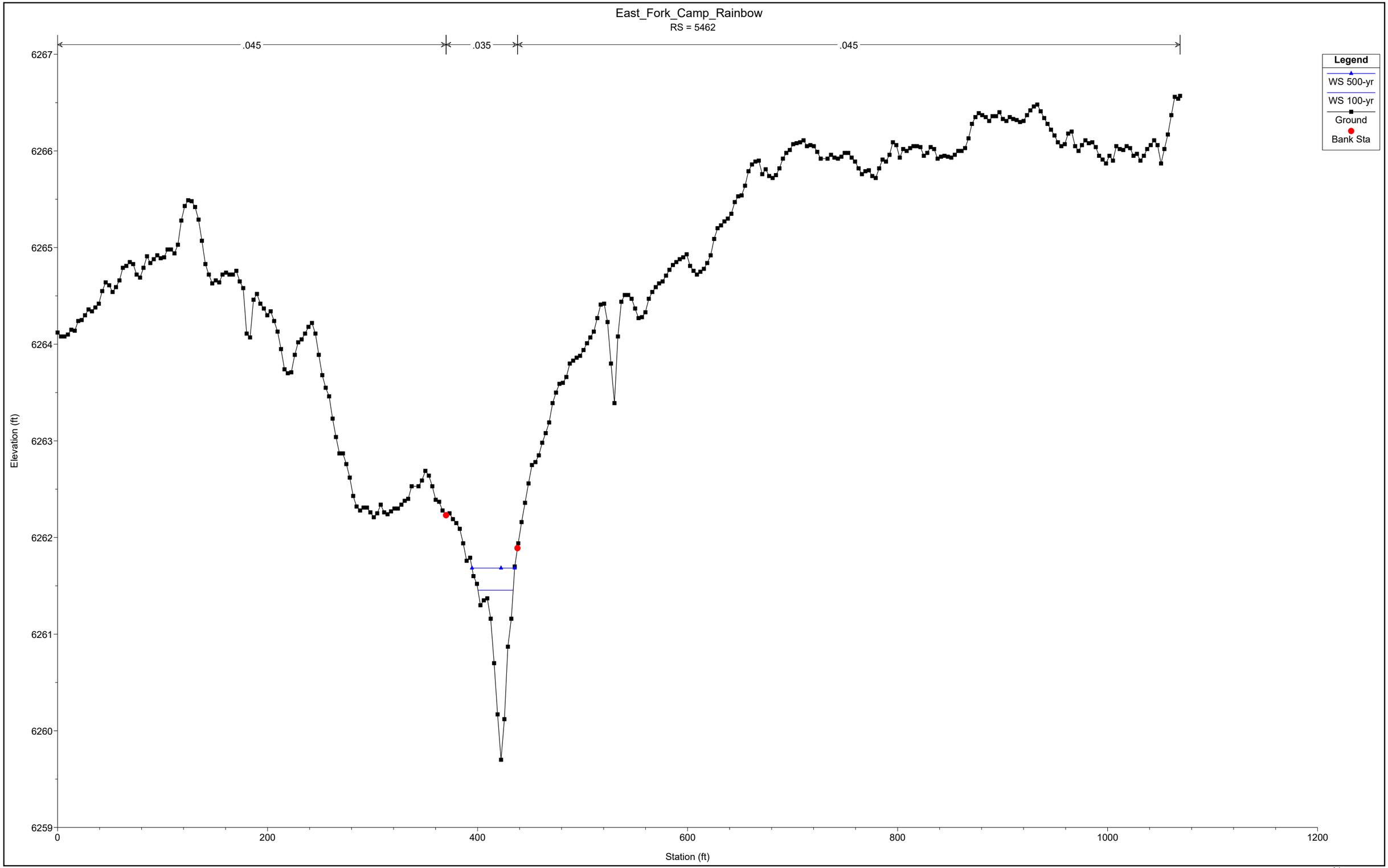

East_Fork_Camp_Rainbow
RS = 5939
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6280
6278
6276
6274
6272
6270
0
200
400
600
800
1000
1200
Station (ft)

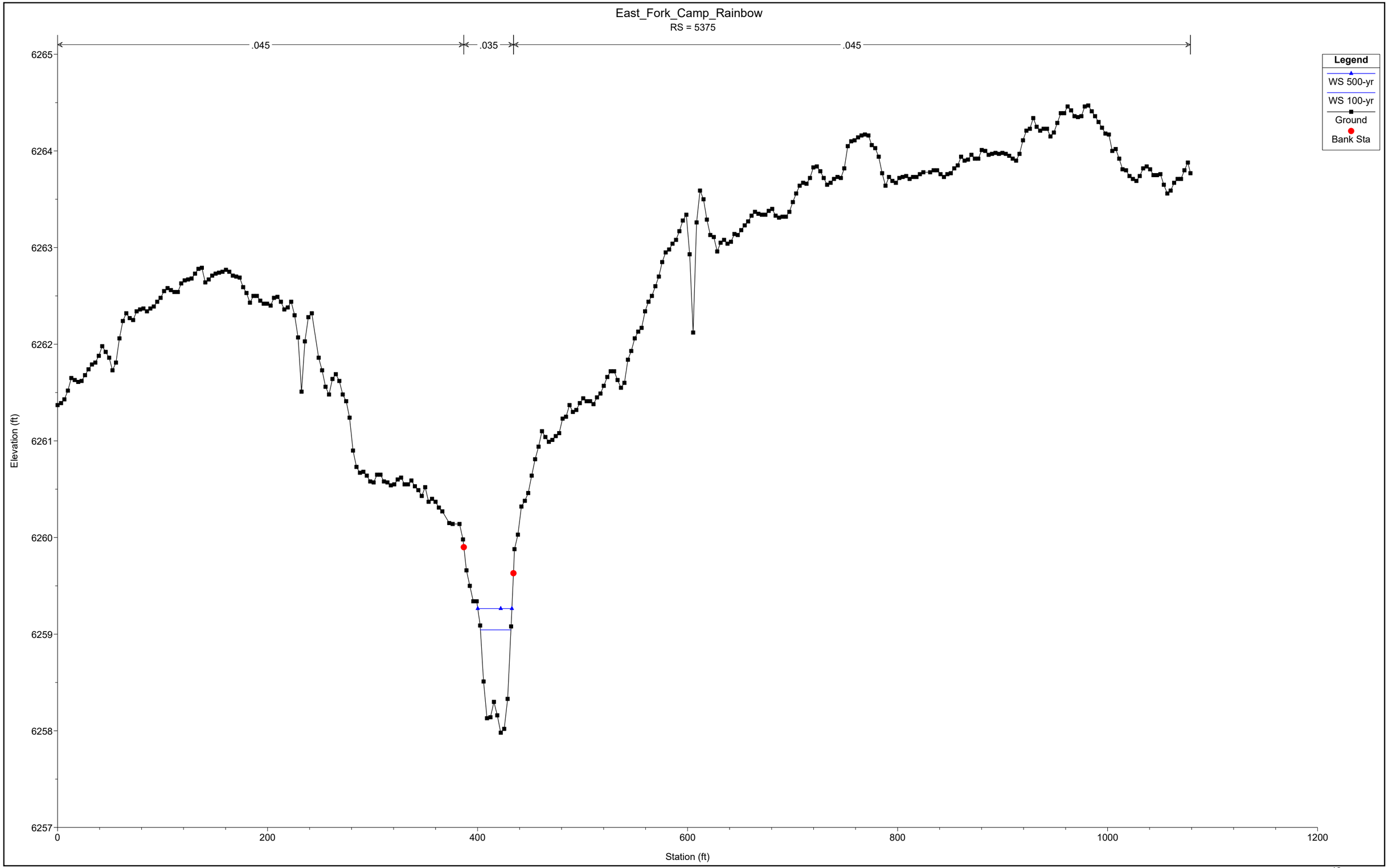

East_Fork_Camp_Rainbow
RS = 5847
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6278
6276
6274
6272
6270
6268
Station (ft)
0
200
400
600
800
1000
1200

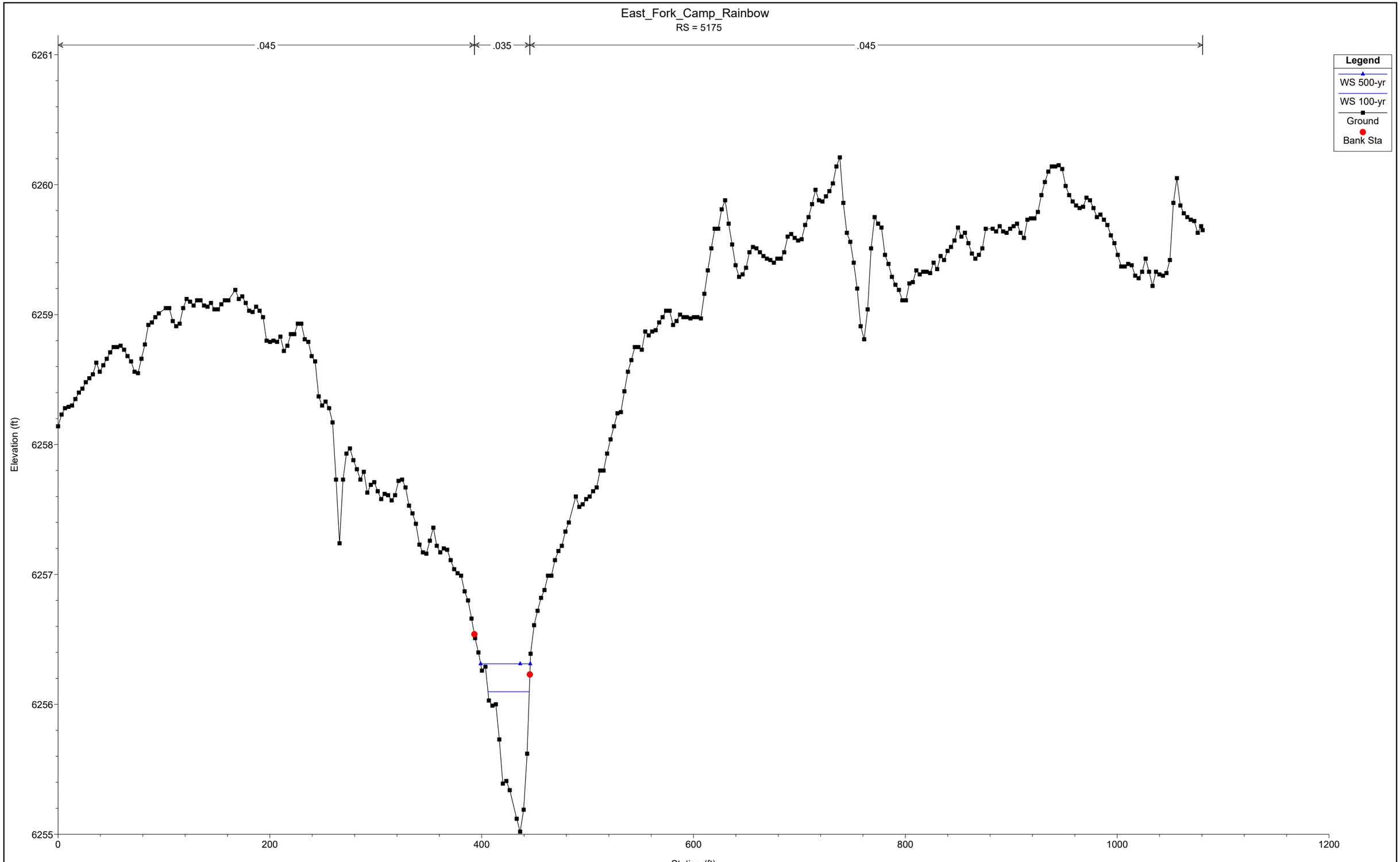

East_Fork_Camp_Rainbow
RS = 5744
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6274
6273
6272
6271
6270
6269
6268
6267
6266
0
200
400
600
800
1000
1200
Station (ft)

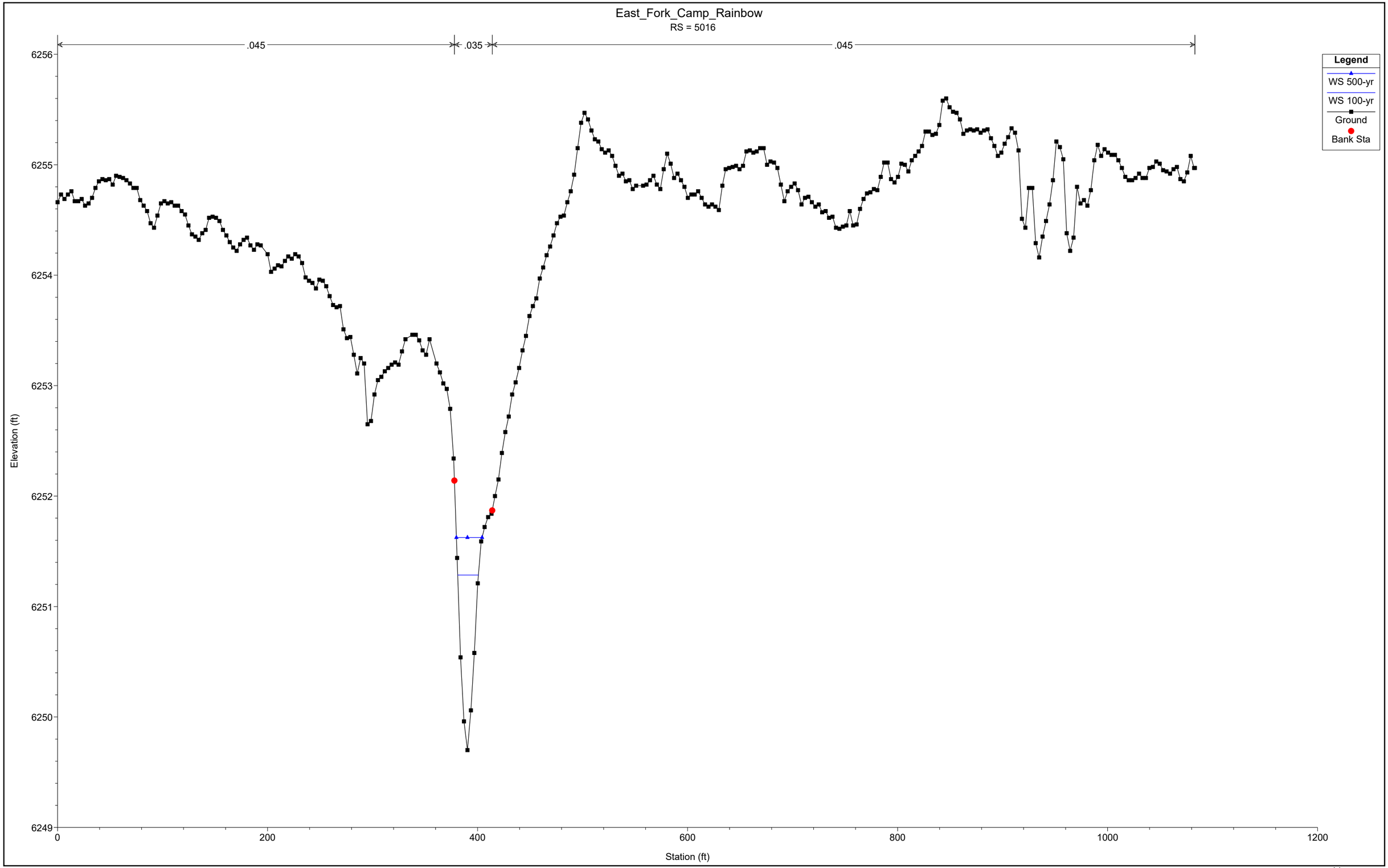

East_Fork_Camp_Rainbow
RS = 5648
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6264
6265
6266
6267
6268
6269
6270
6271
6272
Station (ft)
0
200
400
600
800
1000
1200

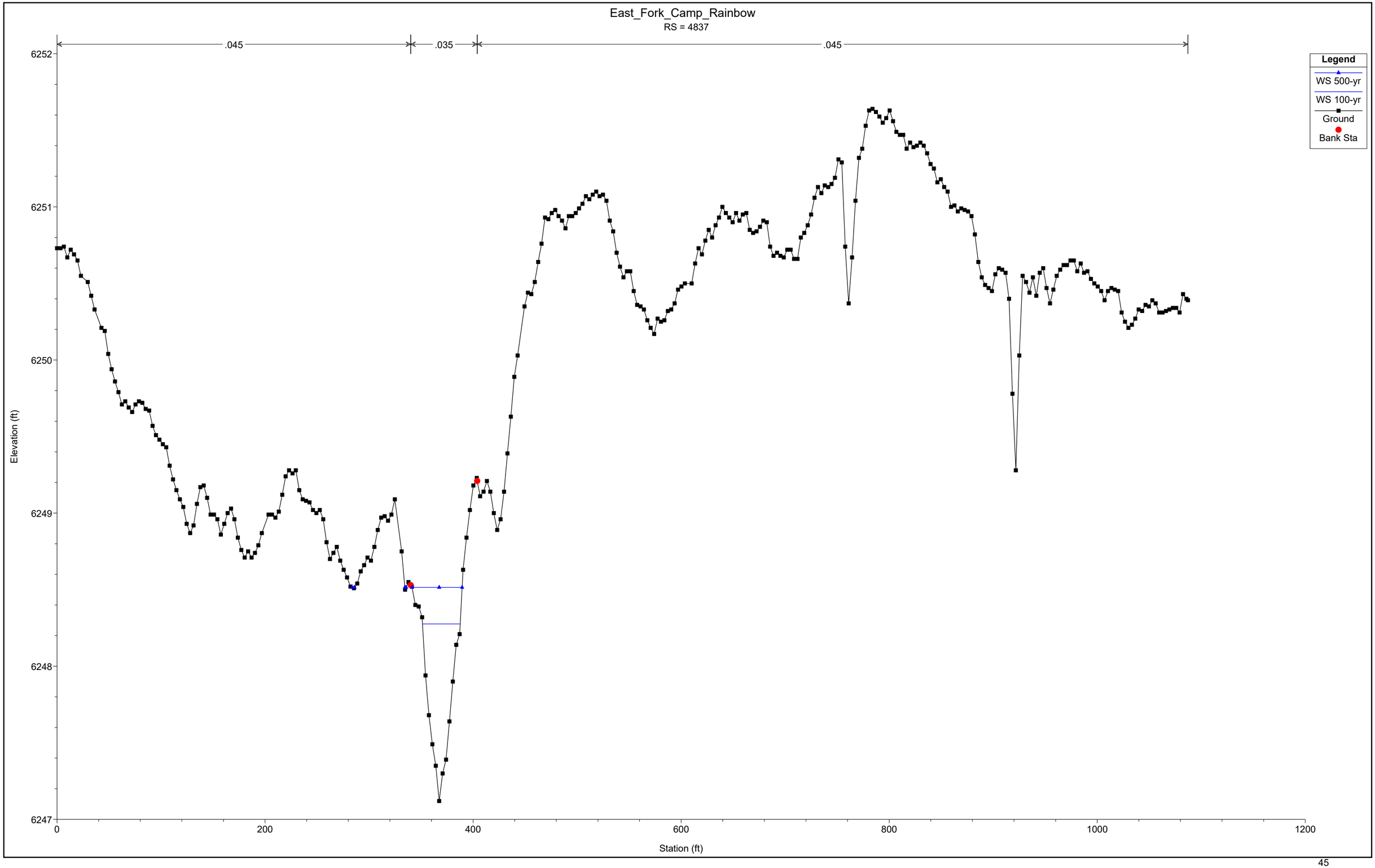

East_Fork_Camp_Rainbow
RS = 5561
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6269
6268
6267
6266
6265
6264
6263
6262
6261
0
200
400
600
800
1000
1200
Station (ft)

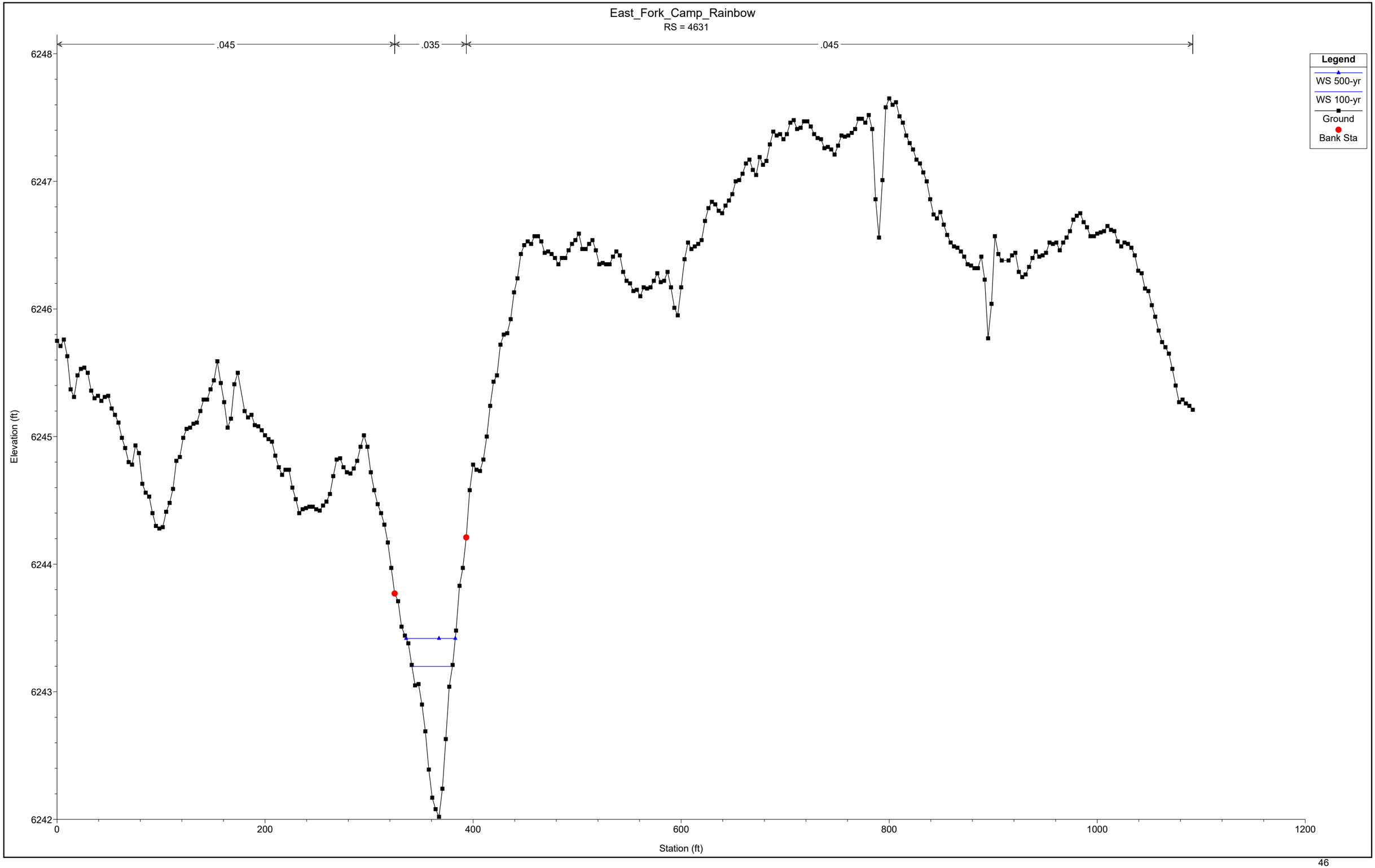

East_Fork_Camp_Rainbow
RS = 5462
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6267
6266
6265
6264
6263
6262
6261
6260
6259
0
200
400
600
800
1000
1200
Station (ft)

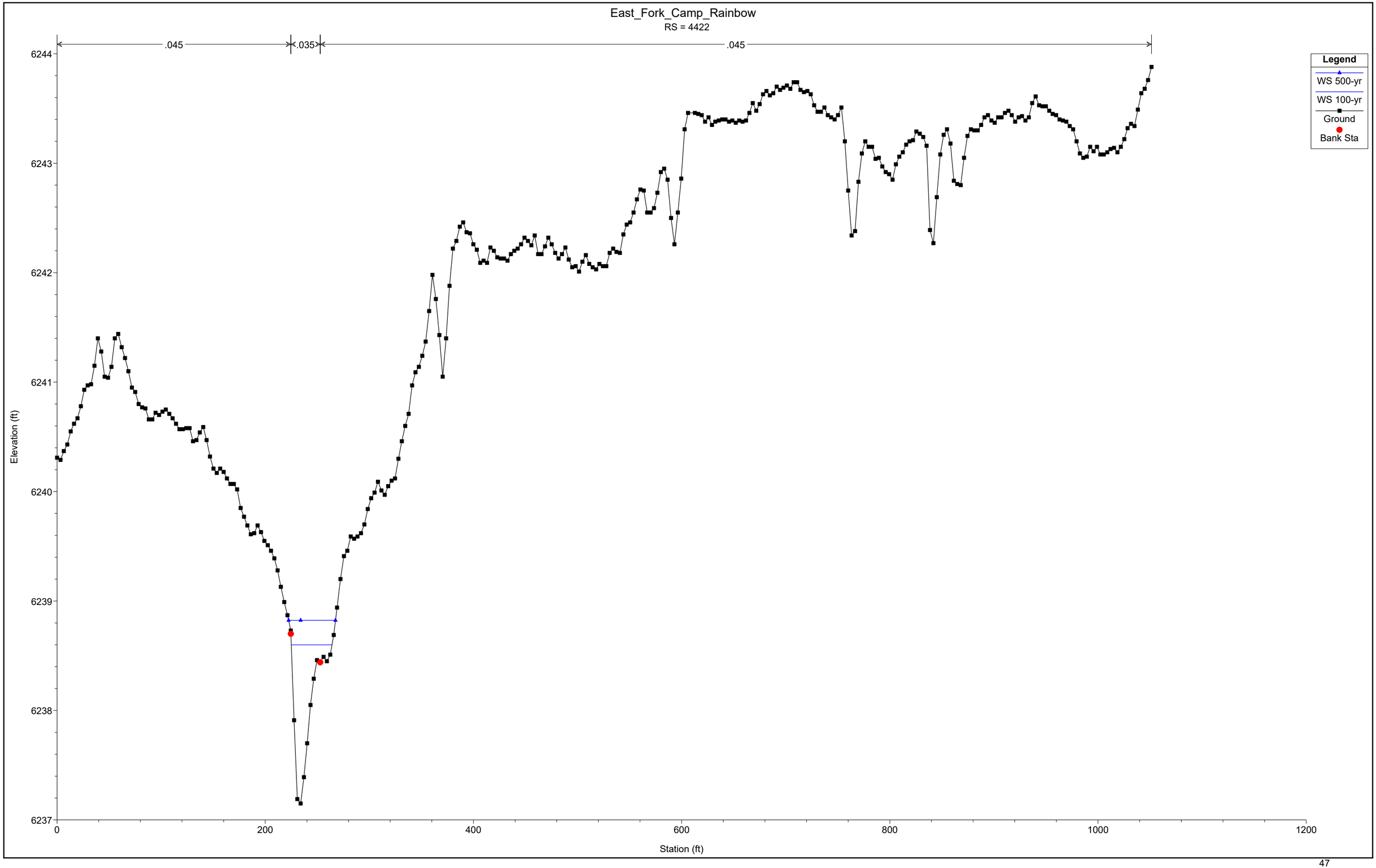

East_Fork_Camp_Rainbow
RS = 5375
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6265
6264
6263
6262
6261
6260
6259
6258
6257
0
200
400
600
800
1000
1200
Station (ft)

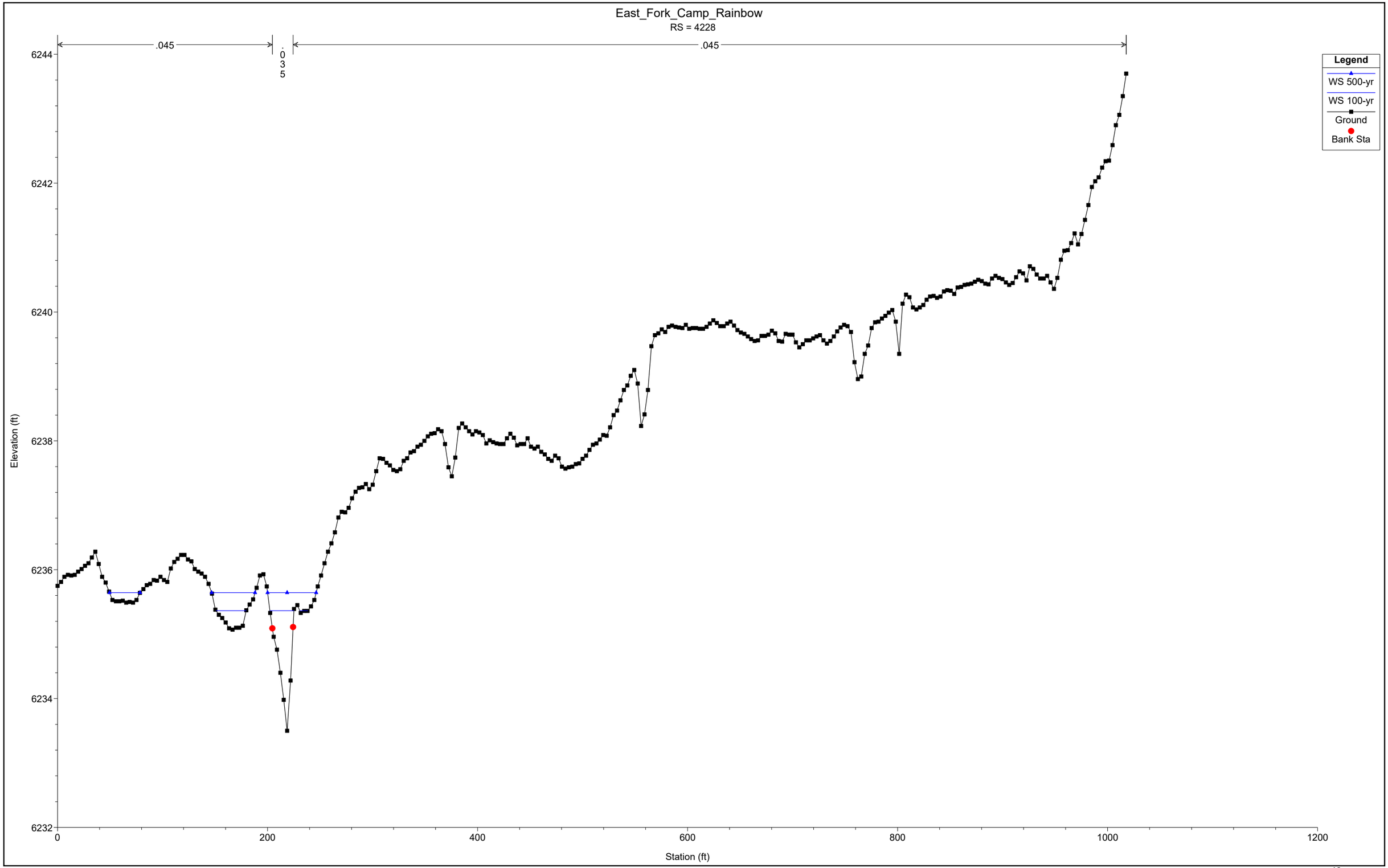

East_Fork_Camp_Rainbow
RS = 5175
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6261
6260
6259
6258
6257
6256
6255
0
200
400
600
800
1000
1200
Station (ft)

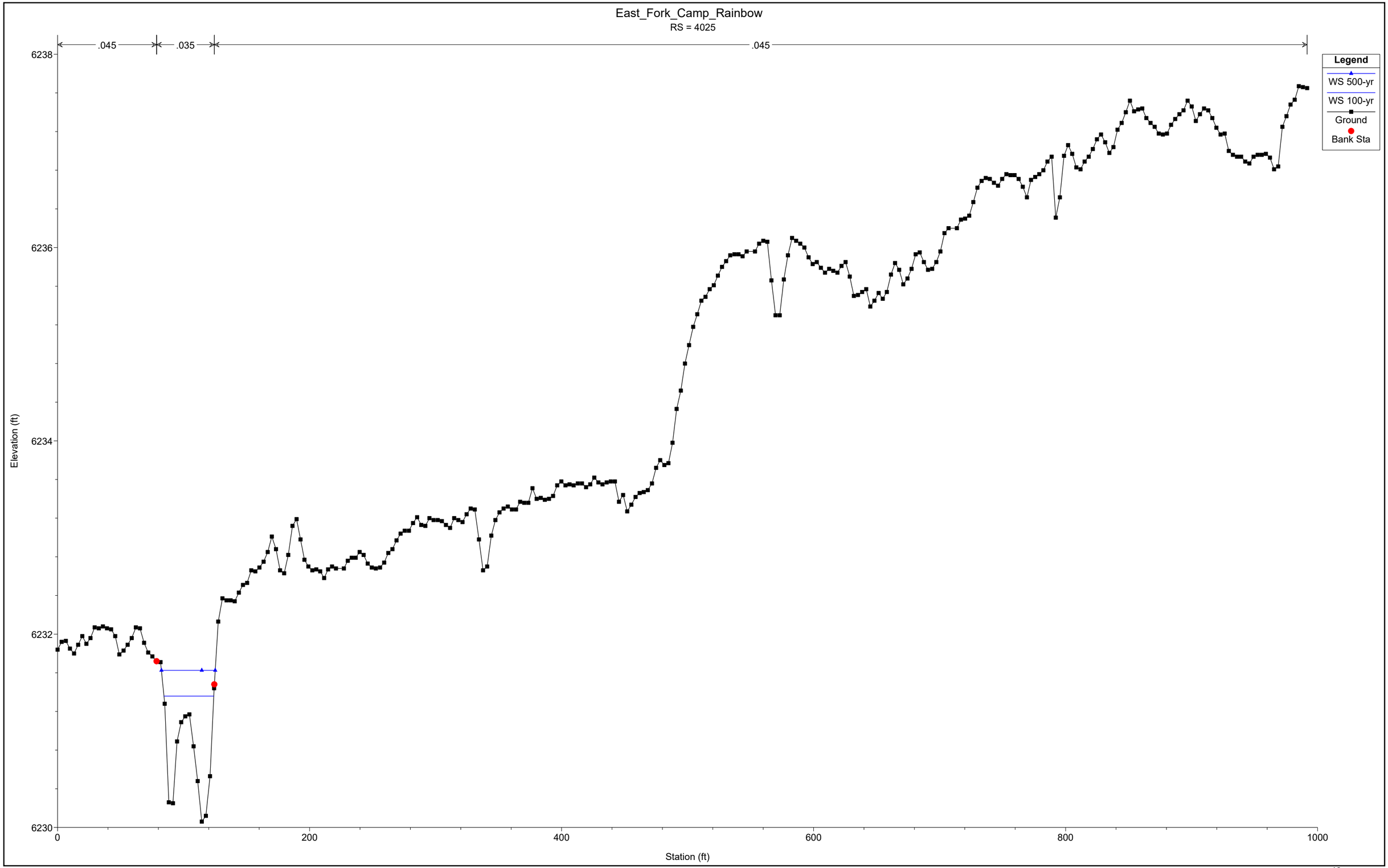

East_Fork_Camp_Rainbow
RS = 5016
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6256
6255
6254
6253
6252
6251
6250
6249
0
200
400
600
800
1000
1200
Station (ft)

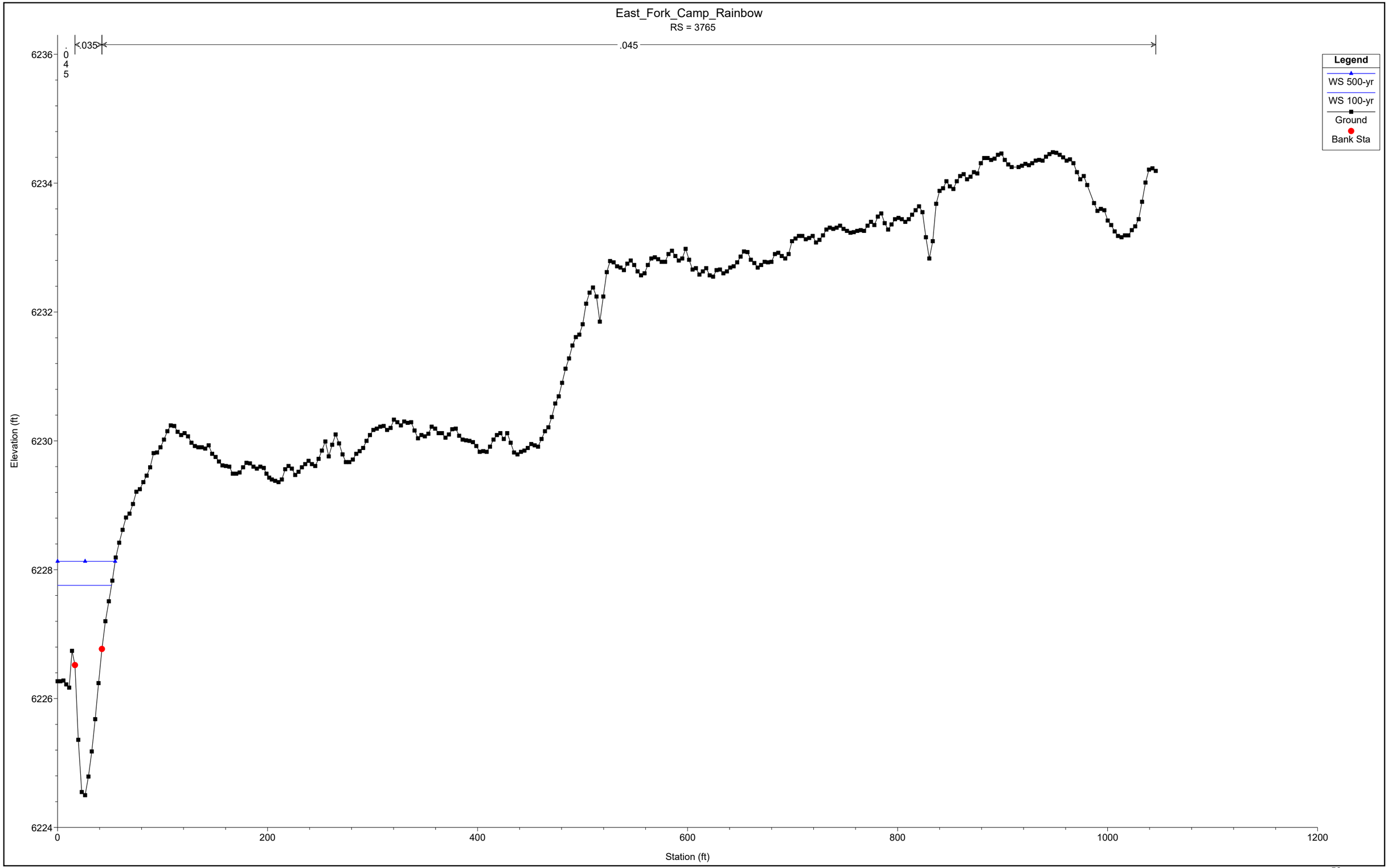

East_Fork_Camp_Rainbow
RS = 4837
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6252
6251
6250
6249
6248
6247
Station (ft)
0
200
400
600
800
1000
1200

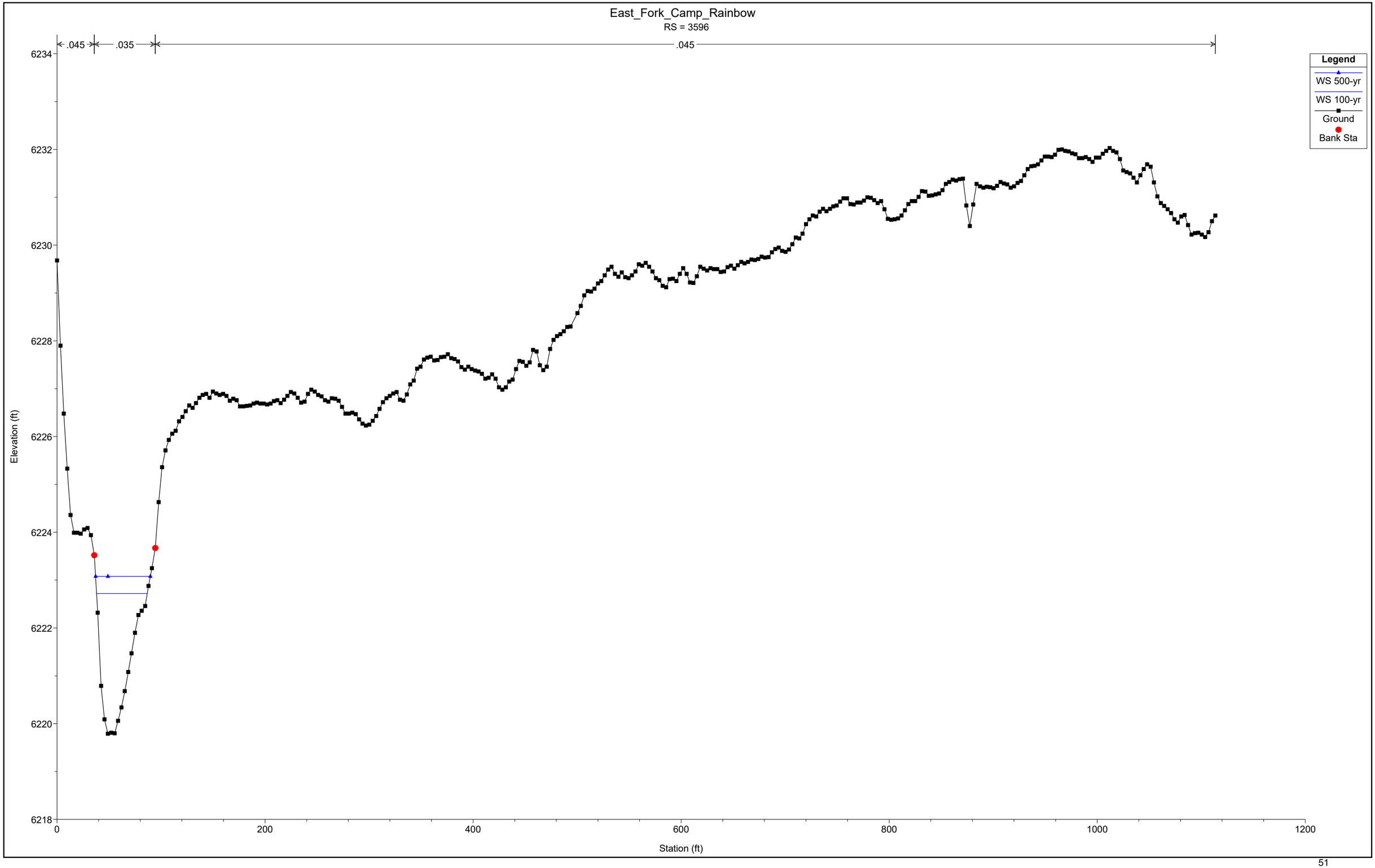

East_Fork_Camp_Rainbow
RS = 4631
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6248
6247
6246
6245
6244
6243
6242
0
200
400
600
800
1000
1200
Station (ft)

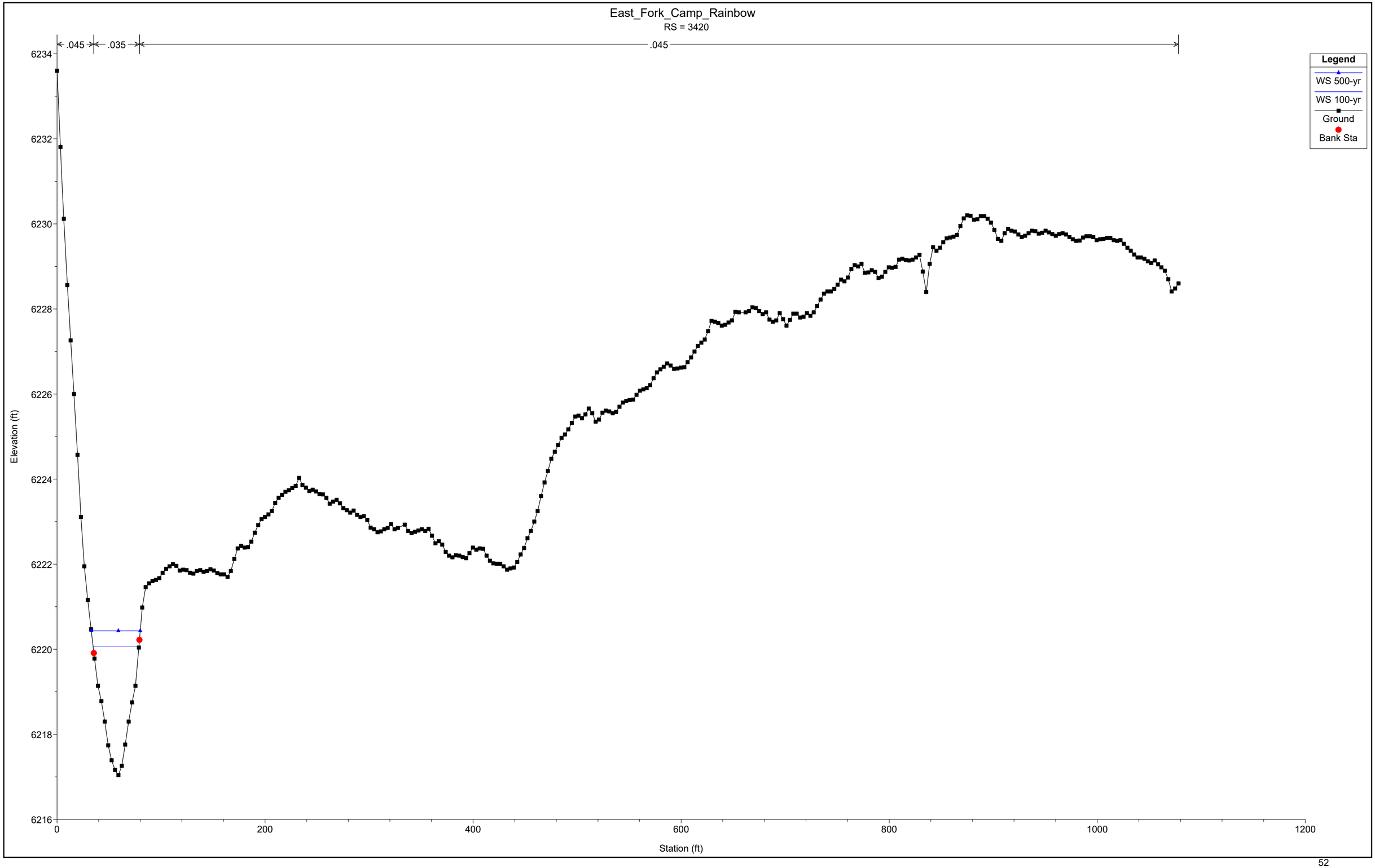

East_Fork_Camp_Rainbow
RS = 4422
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6244
6243
6242
6241
6240
6239
6238
6237
0
200
400
600
800
1000
1200
Station (ft)

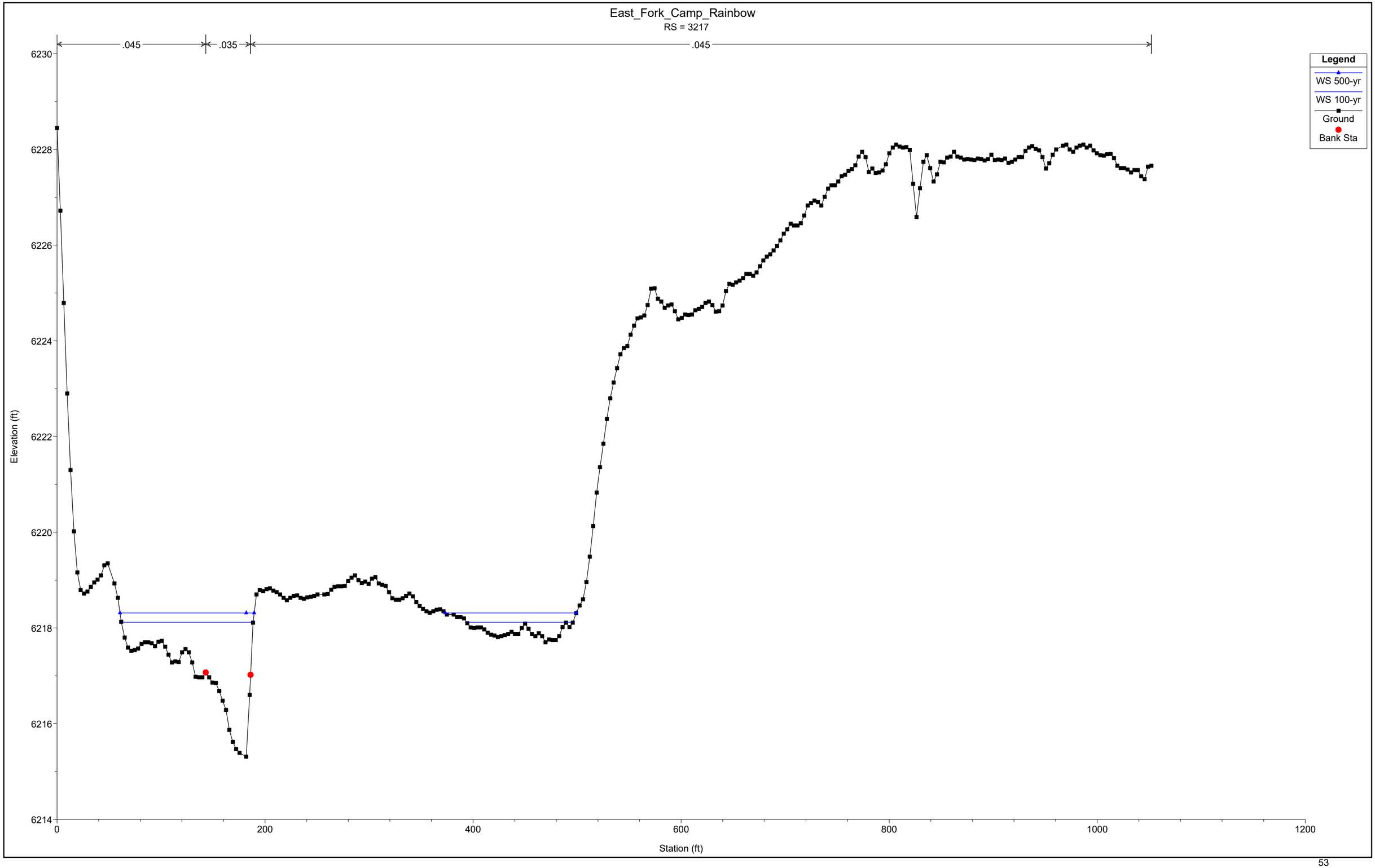

East_Fork_Camp_Rainbow
RS = 4228
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6244
6242
6240
6238
6236
6234
6232
0
200
400
600
800
1000
1200
Station (ft)

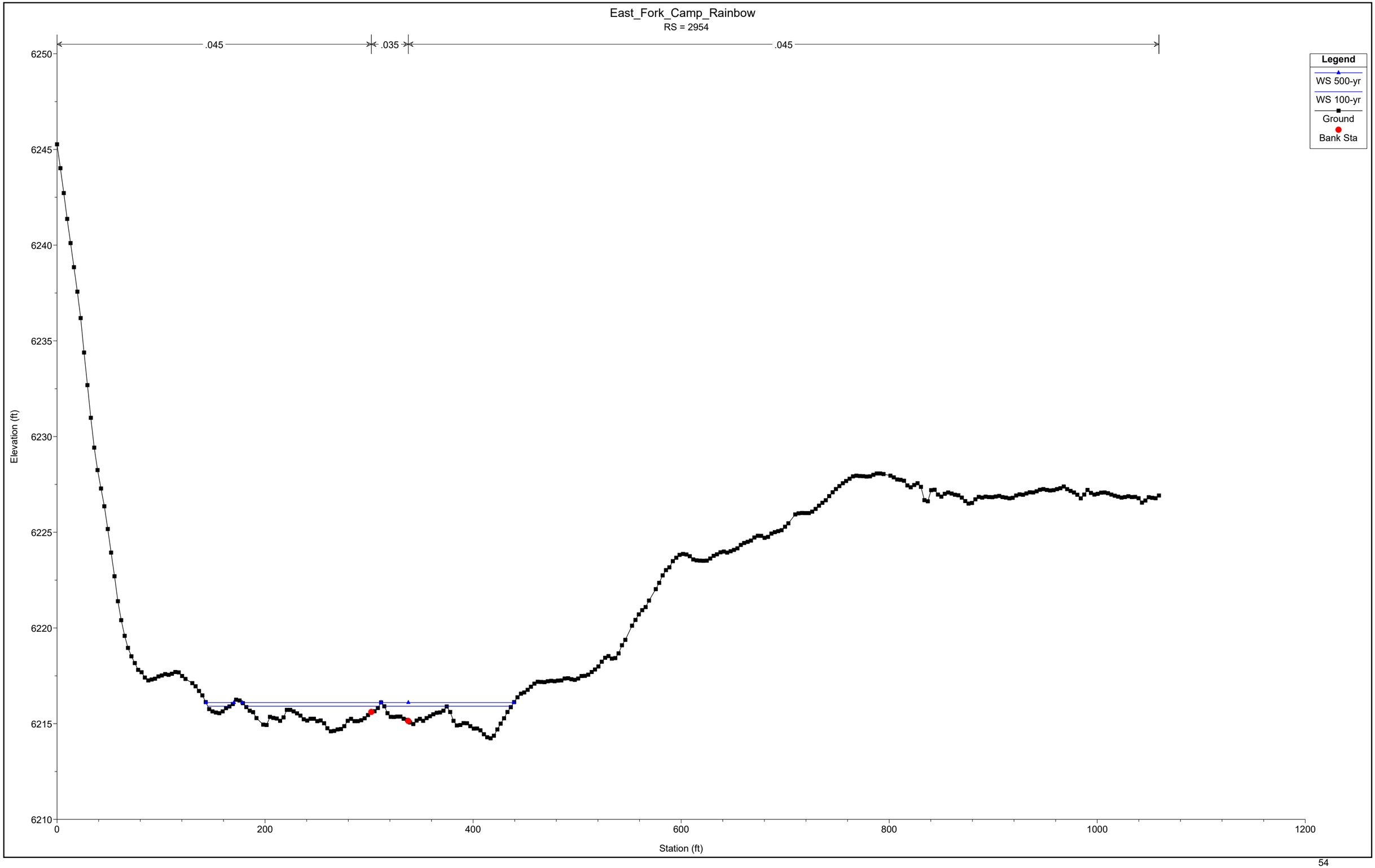

East_Fork_Camp_Rainbow
RS = 4025
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6238
6236
6234
6232
6230
0
200
400
600
800
1000
Station (ft)

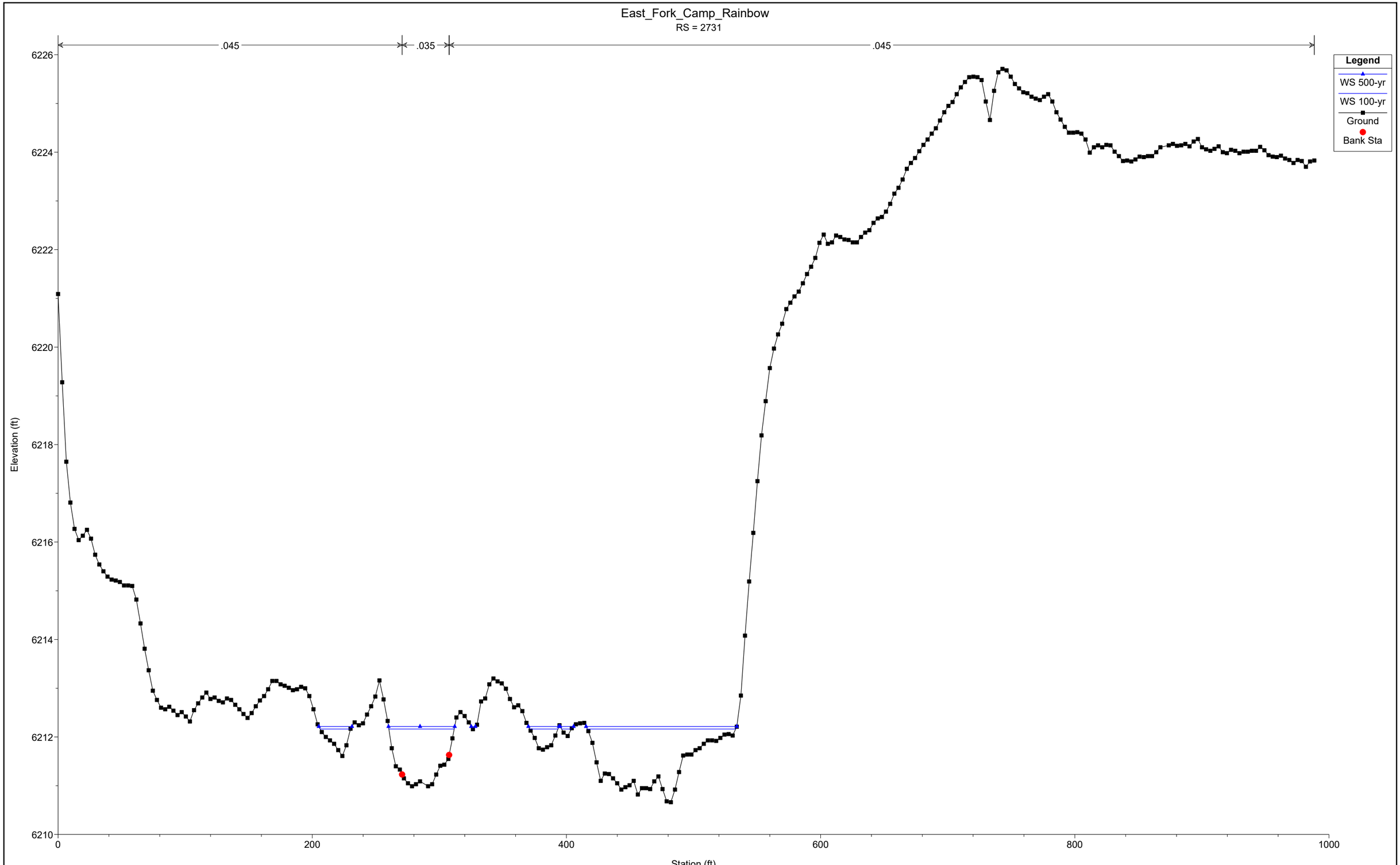

East_Fork_Camp_Rainbow
RS = 3765
.035
.045
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6236
6234
6232
6230
6228
6226
6224
0
200
400
600
800
1000
1200
Station (ft)

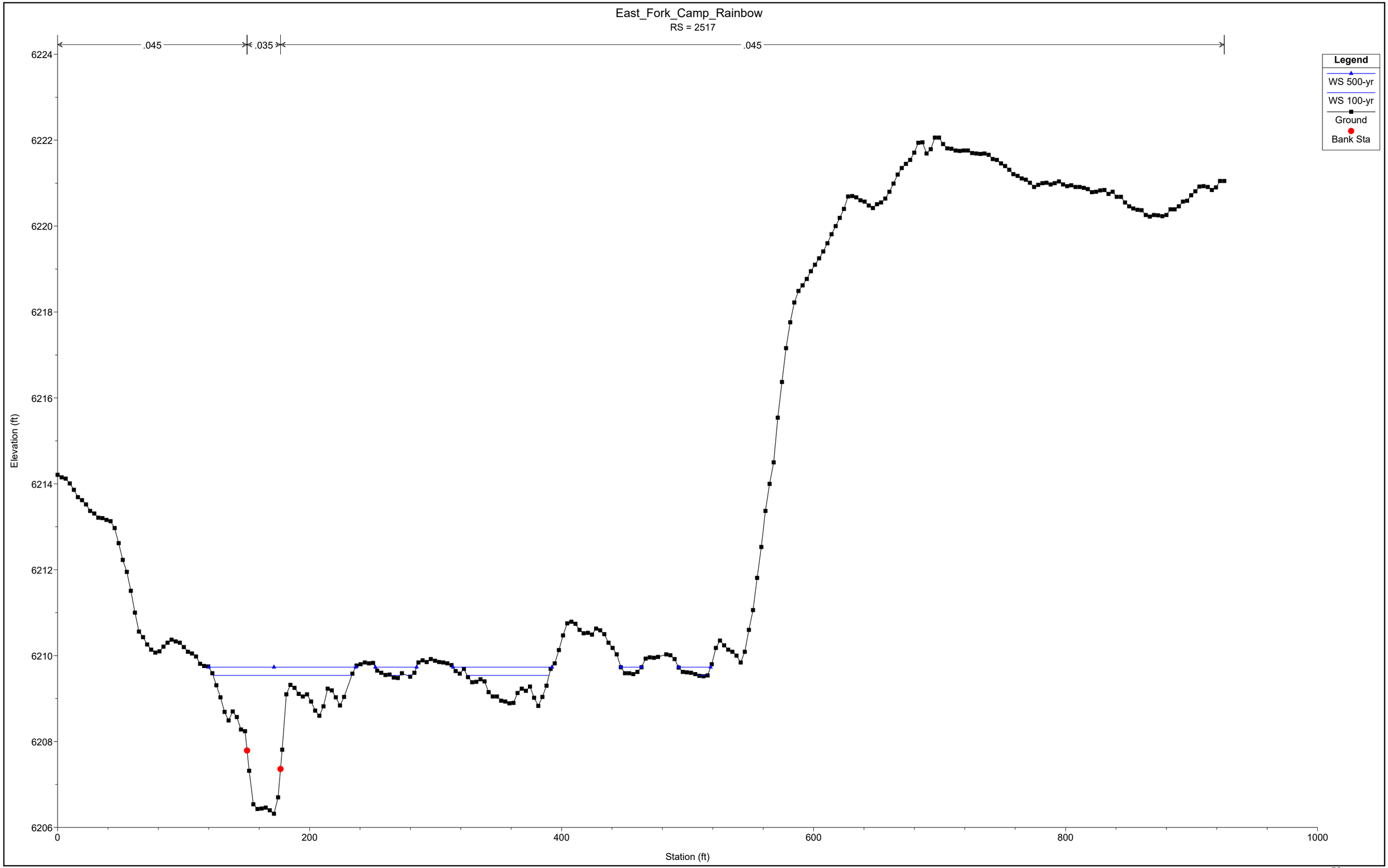

East_Fork_Camp_Rainbow
RS = 3596
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6234
6232
6230
6228
6226
6224
6222
6220
6218
0
200
400
600
800
1000
1200
Station (ft)

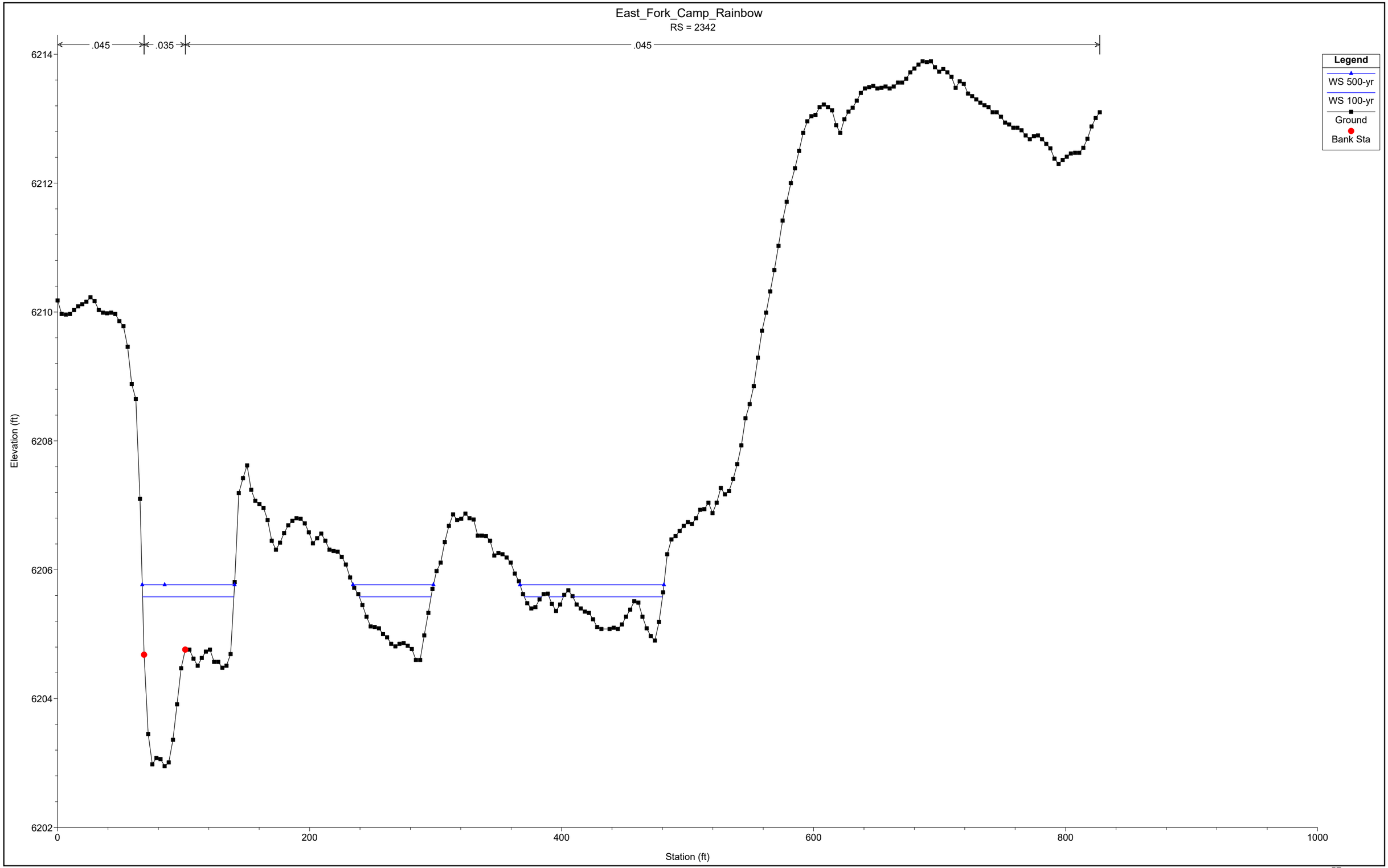

East_Fork_Camp_Rainbow
RS = 3420
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6234
6232
6230
6228
6226
6224
6222
6220
6218
6216
0
200
400
600
800
1000
1200
Station (ft)

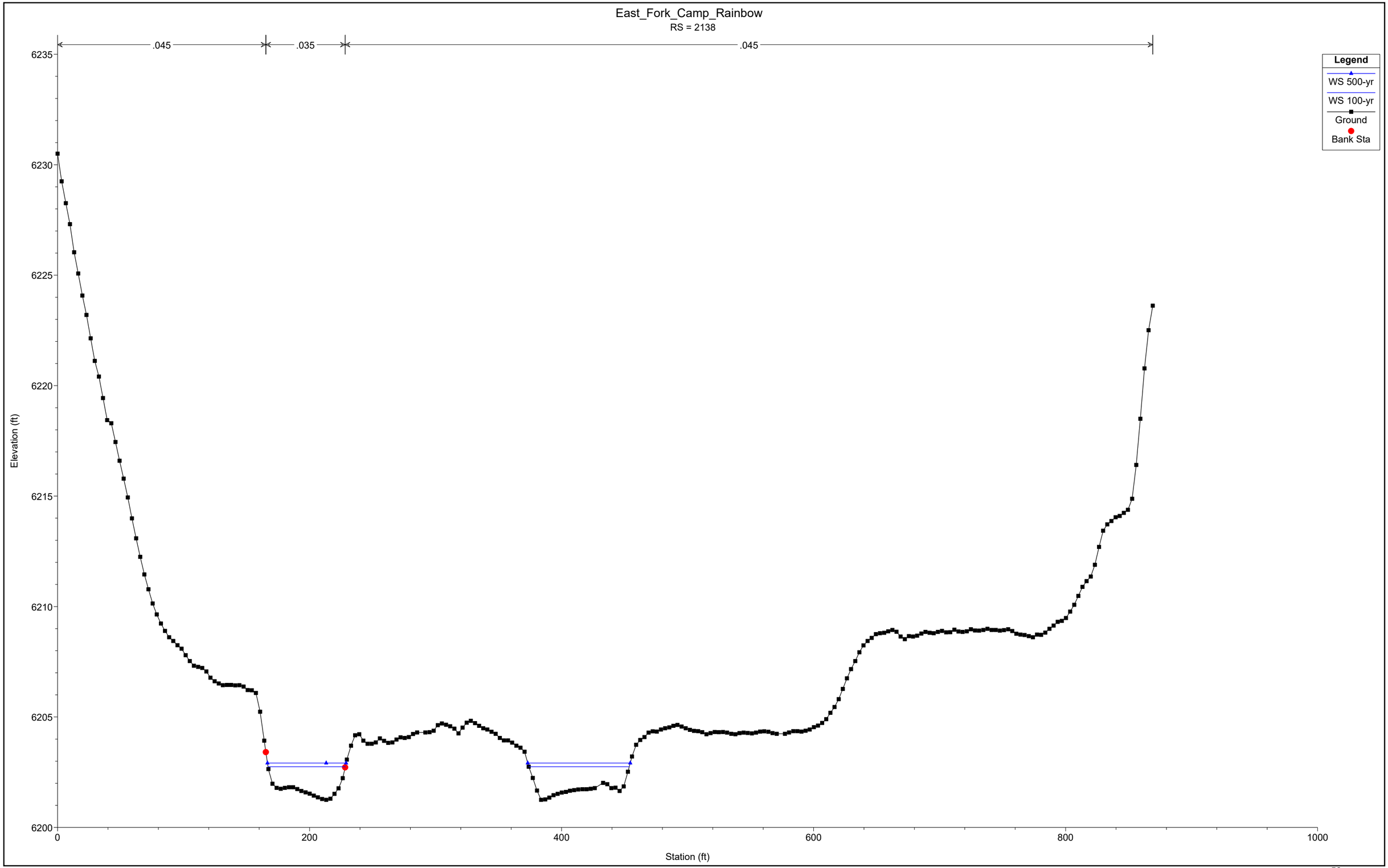

East_Fork_Camp_Rainbow
RS = 3217
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6230
6228
6226
6224
6222
6220
6218
6216
6214
0
200
400
600
800
1000
1200
Station (ft)

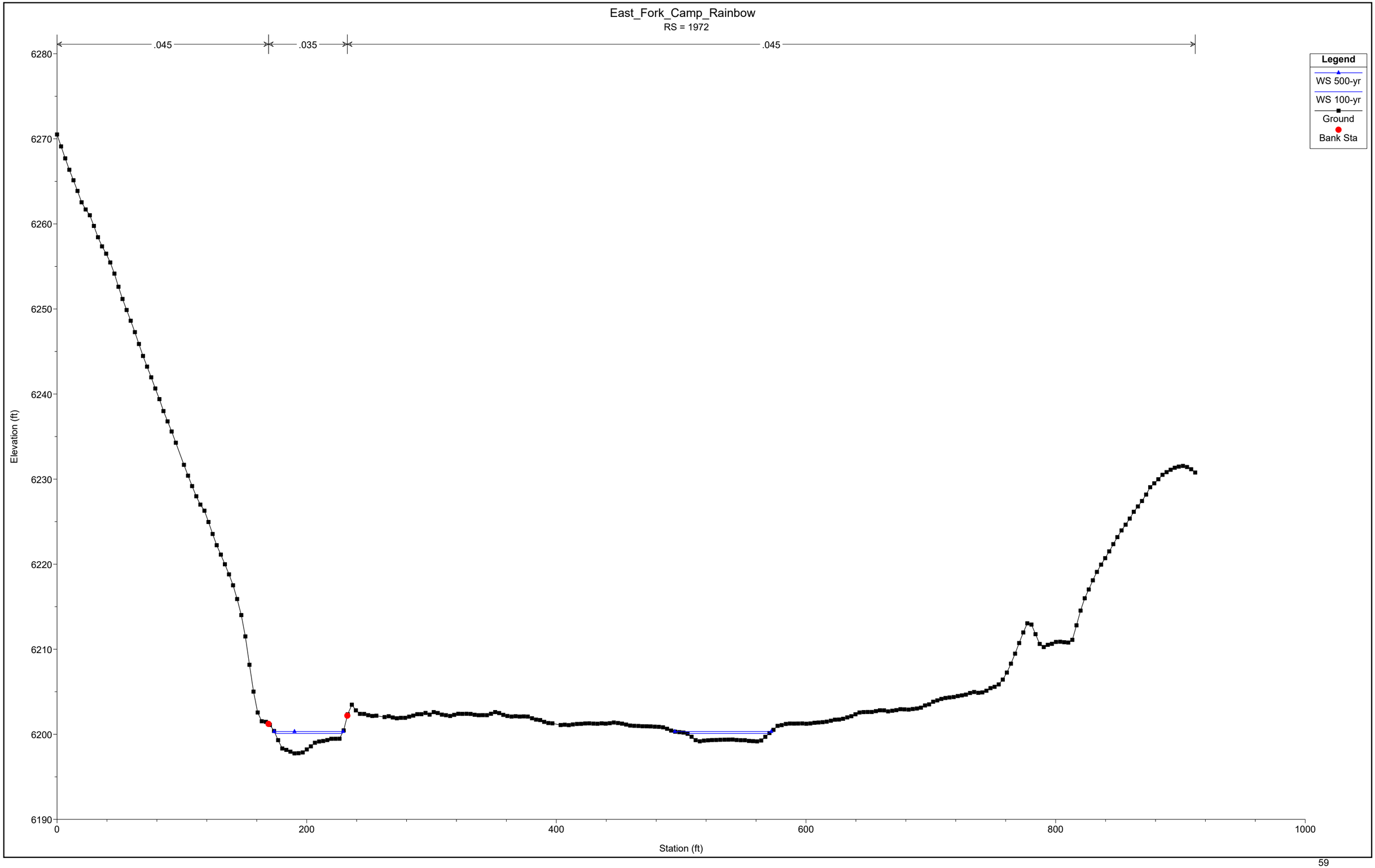

East_Fork_Camp_Rainbow
RS = 2954
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6250
6245
6240
6235
6230
6225
6220
6215
6210
0
200
400
600
800
1000
1200
Station (ft)

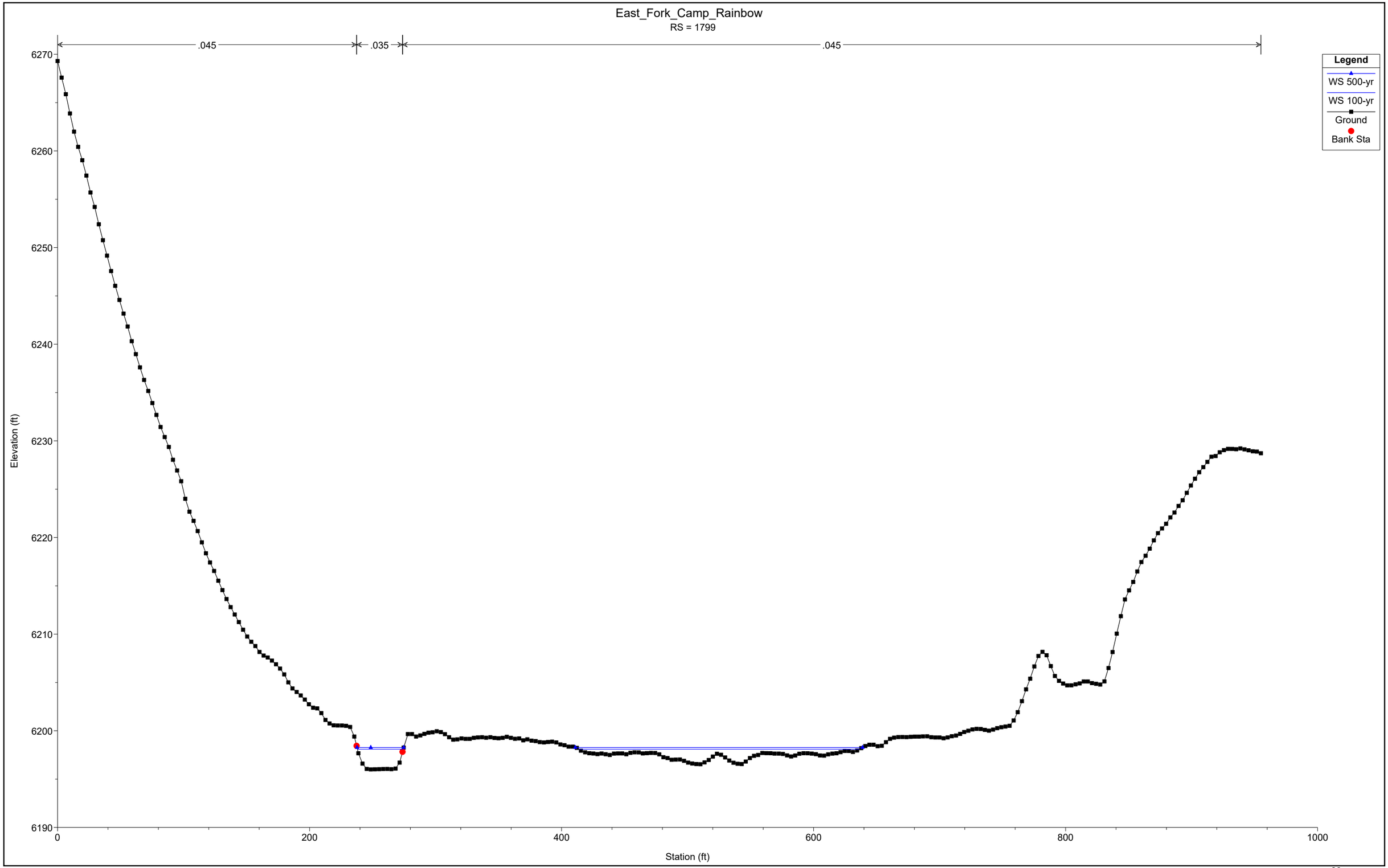

East_Fork_Camp_Rainbow
RS = 2731
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6226
6224
6222
6220
6218
6216
6214
6212
6210
0
200
400
600
800
1000
Station (ft)

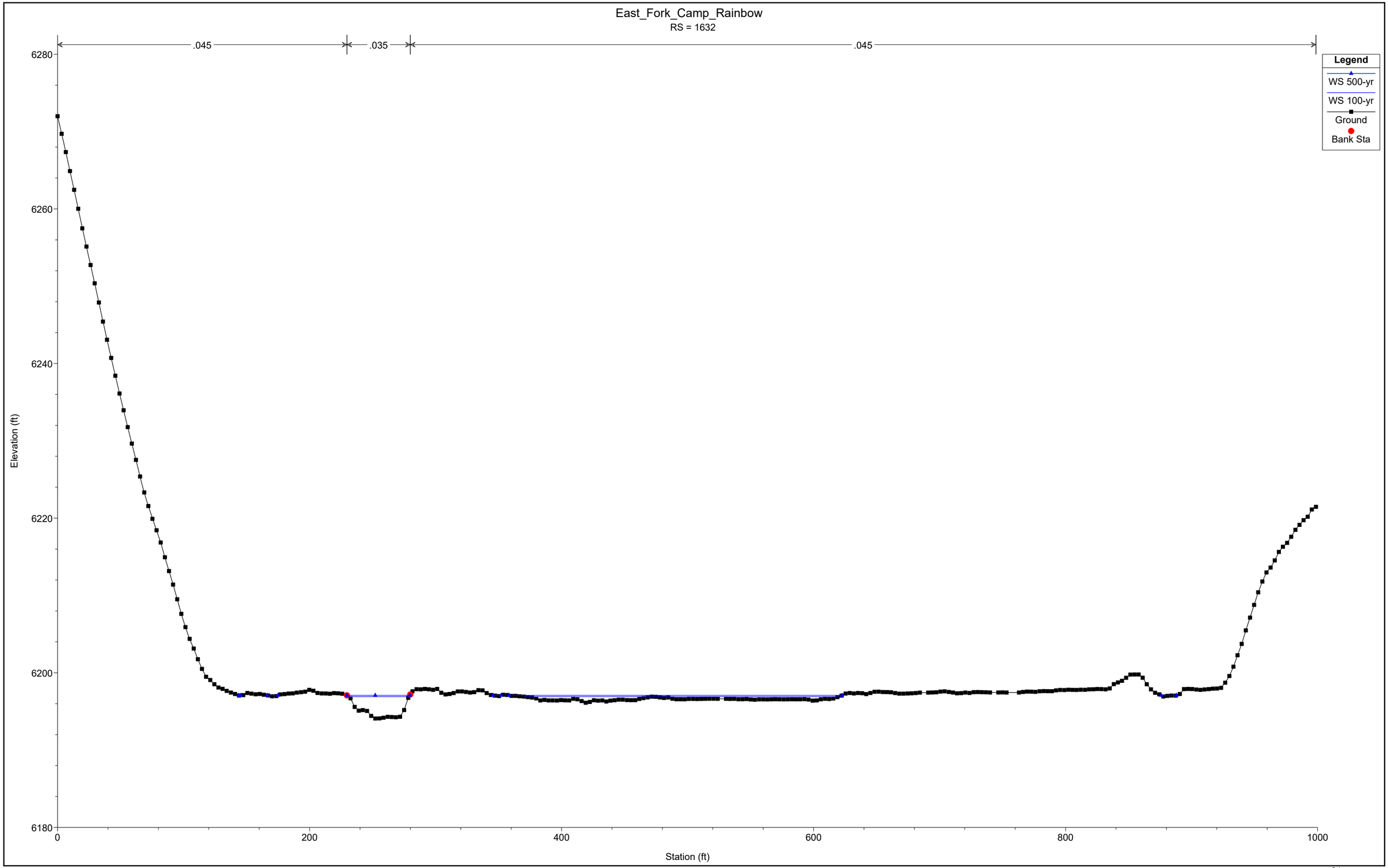

East_Fork_Camp_Rainbow
RS = 2517
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6224
6222
6220
6218
6216
6214
6212
6210
6208
6206
0
200
400
600
800
1000
Station (ft)

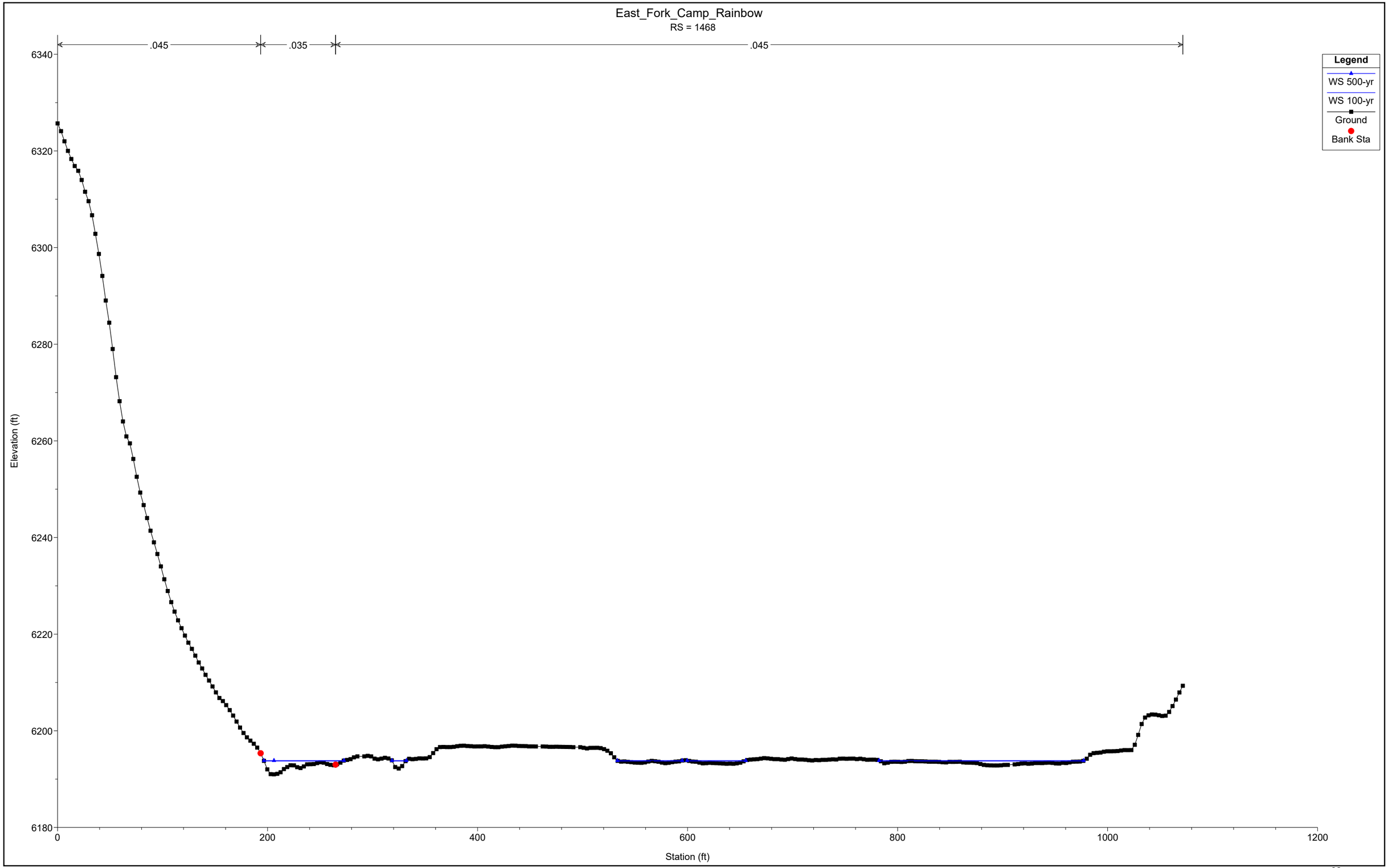

East_Fork_Camp_Rainbow
RS = 2342
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6214
6212
6210
6208
6206
6204
6202
0
200
400
600
800
1000
Station (ft)

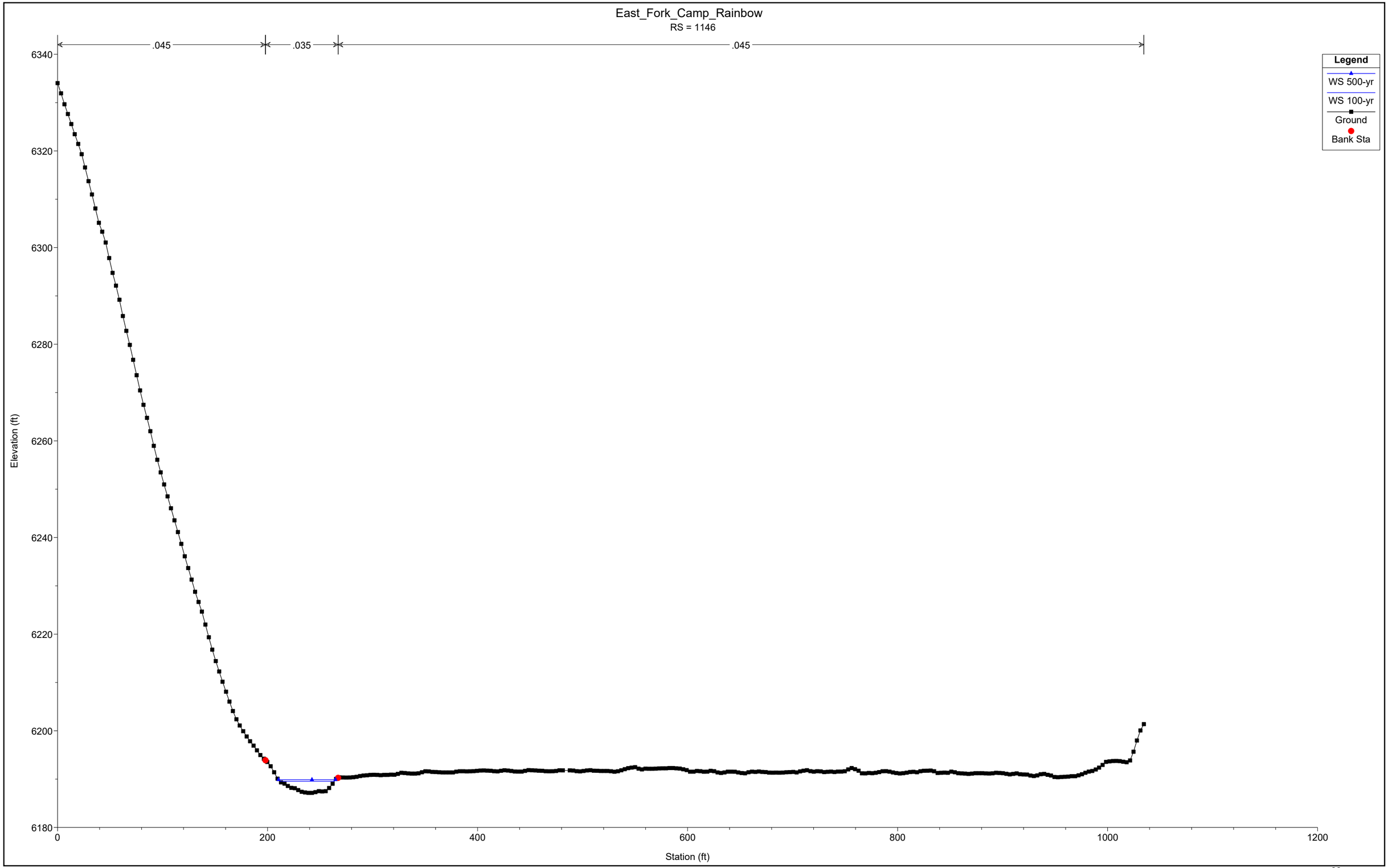

East_Fork_Camp_Rainbow
RS = 2138
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6235
6230
6225
6220
6215
6210
6205
6200
0
200
400
600
800
1000
Station (ft)

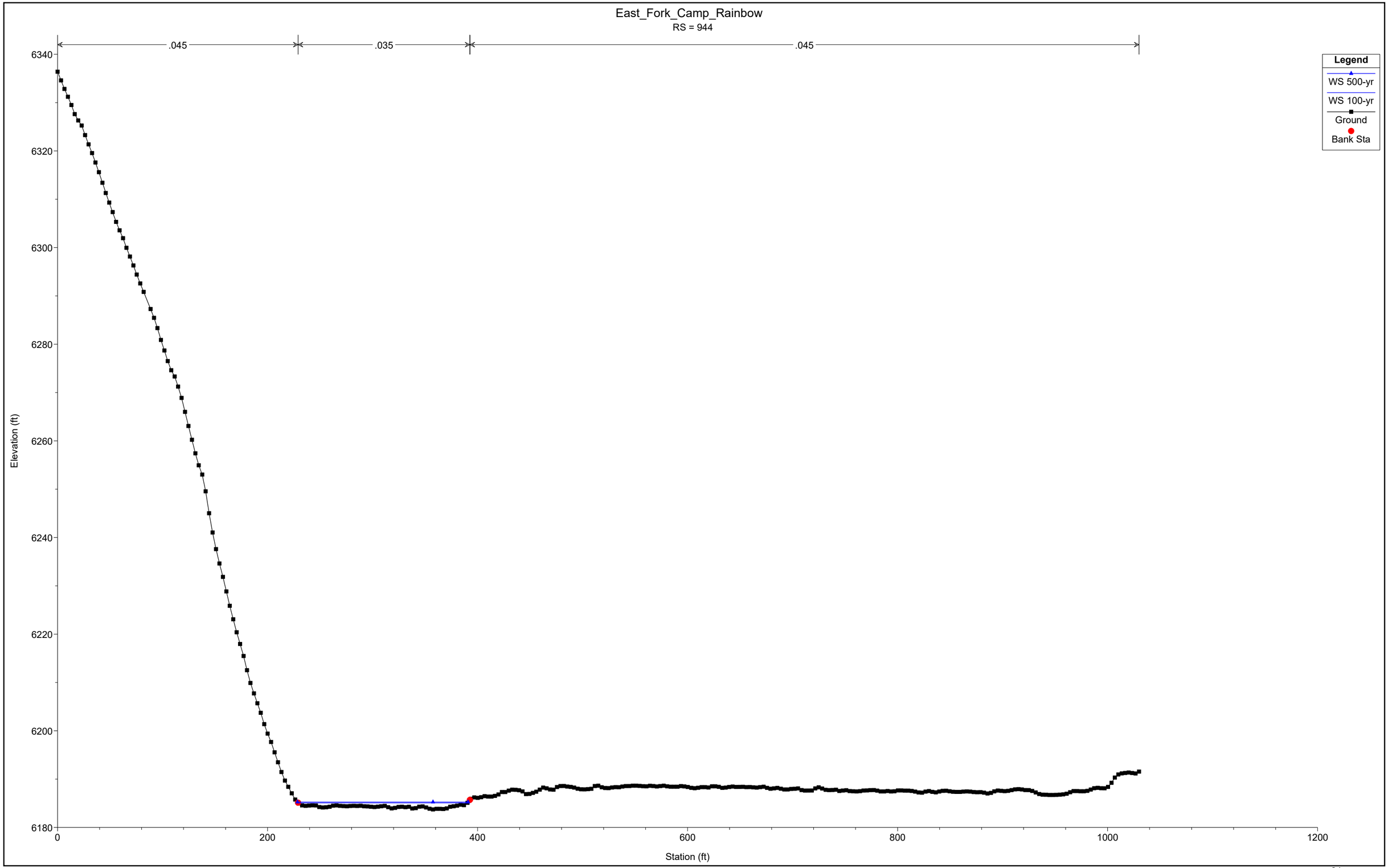

East_Fork_Camp_Rainbow
RS = 1972
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6280
6270
6260
6250
6240
6230
6220
6210
6200
6190
0
200
400
600
800
1000
Station (ft)

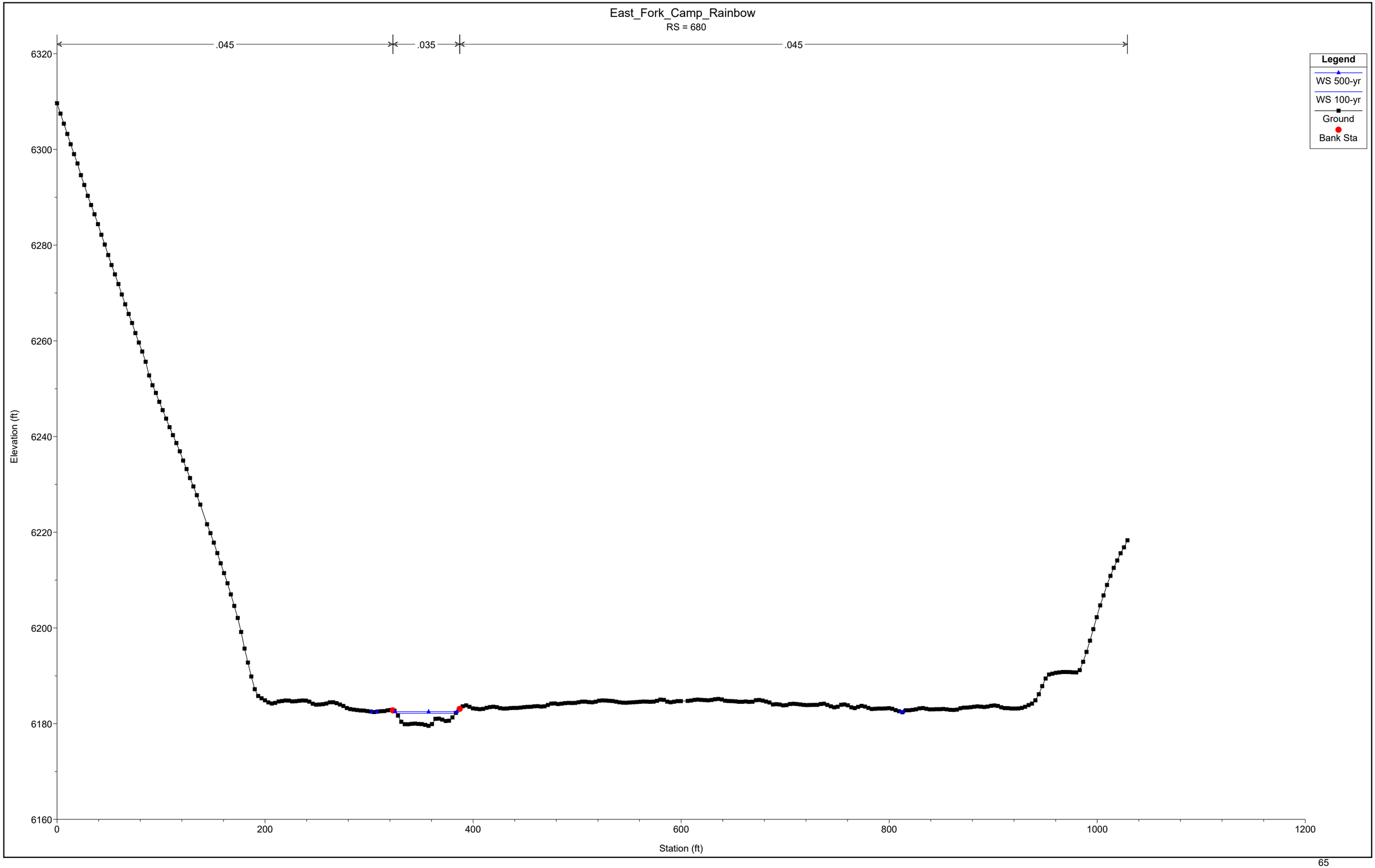

East_Fork_Camp_Rainbow
RS = 1799
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6270
6260
6250
6240
6230
6220
6210
6200
6190
0
200
400
600
800
1000
Station (ft)

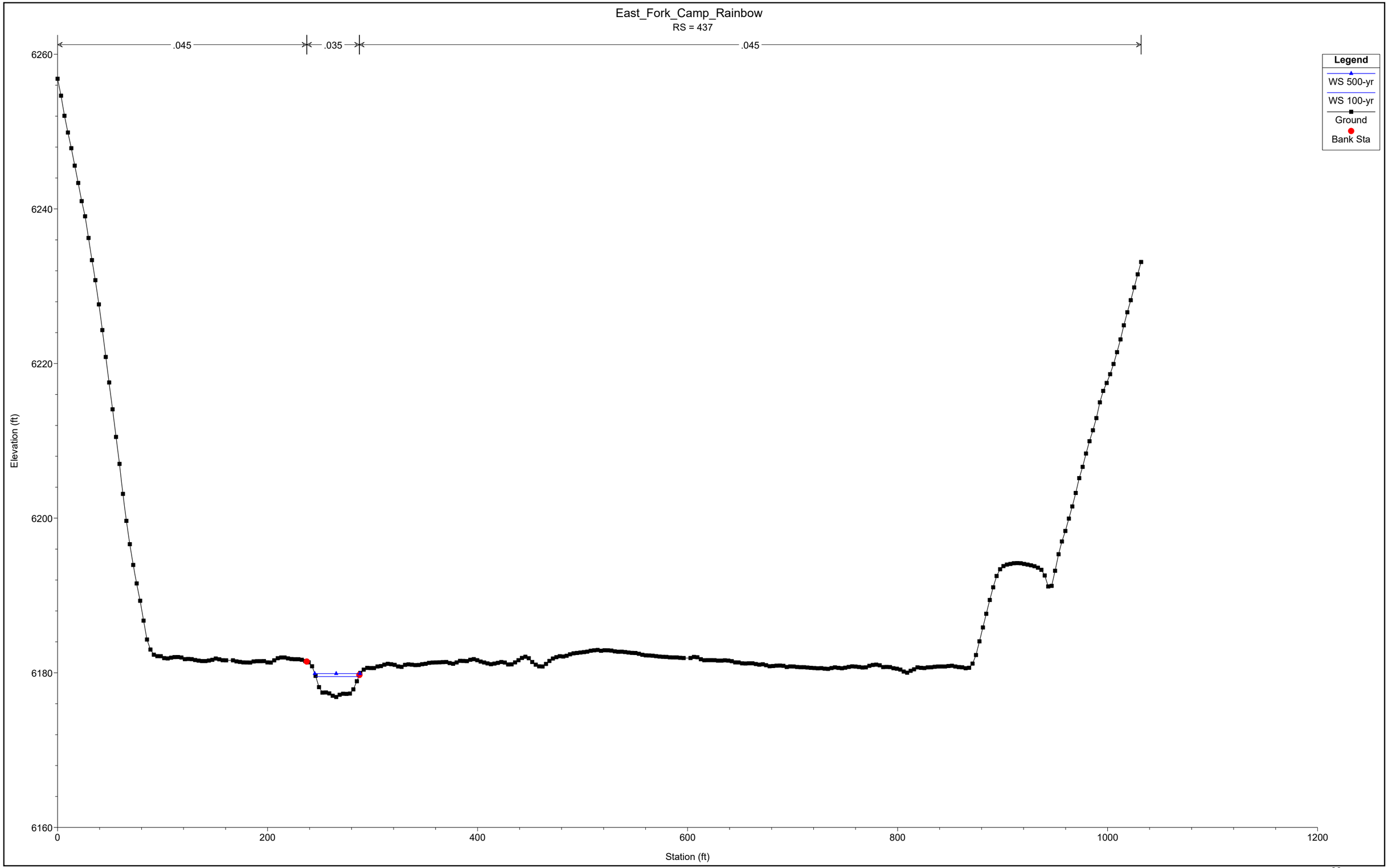

East_Fork_Camp_Rainbow
RS = 1632
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6280
6260
6240
6220
6200
6180
0
200
400
600
800
1000
Station (ft)

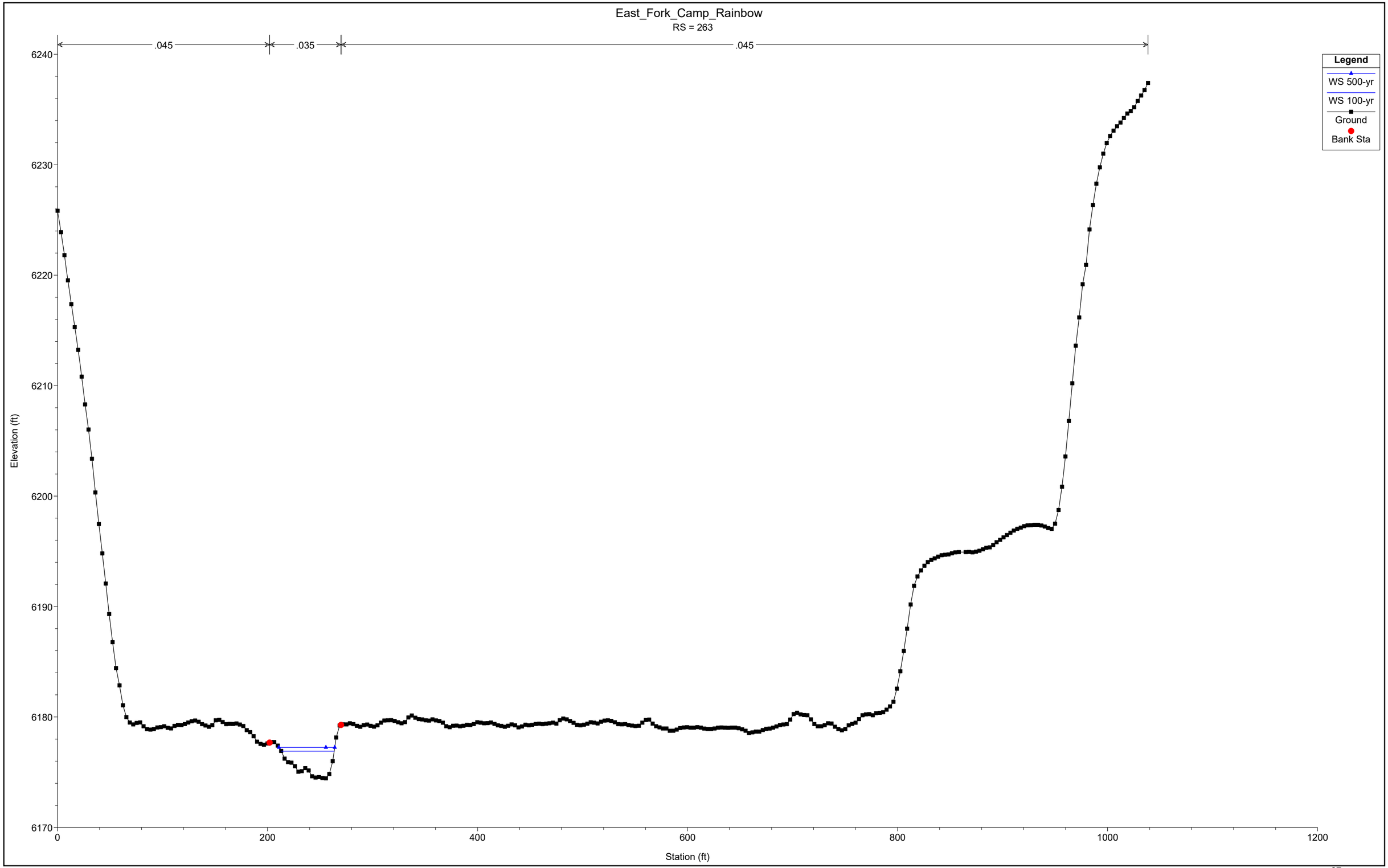

East_Fork_Camp_Rainbow
RS = 1468
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6340
6320
6300
6280
6260
6240
6220
6200
6180
0
200
400
600
800
1000
1200
Station (ft)

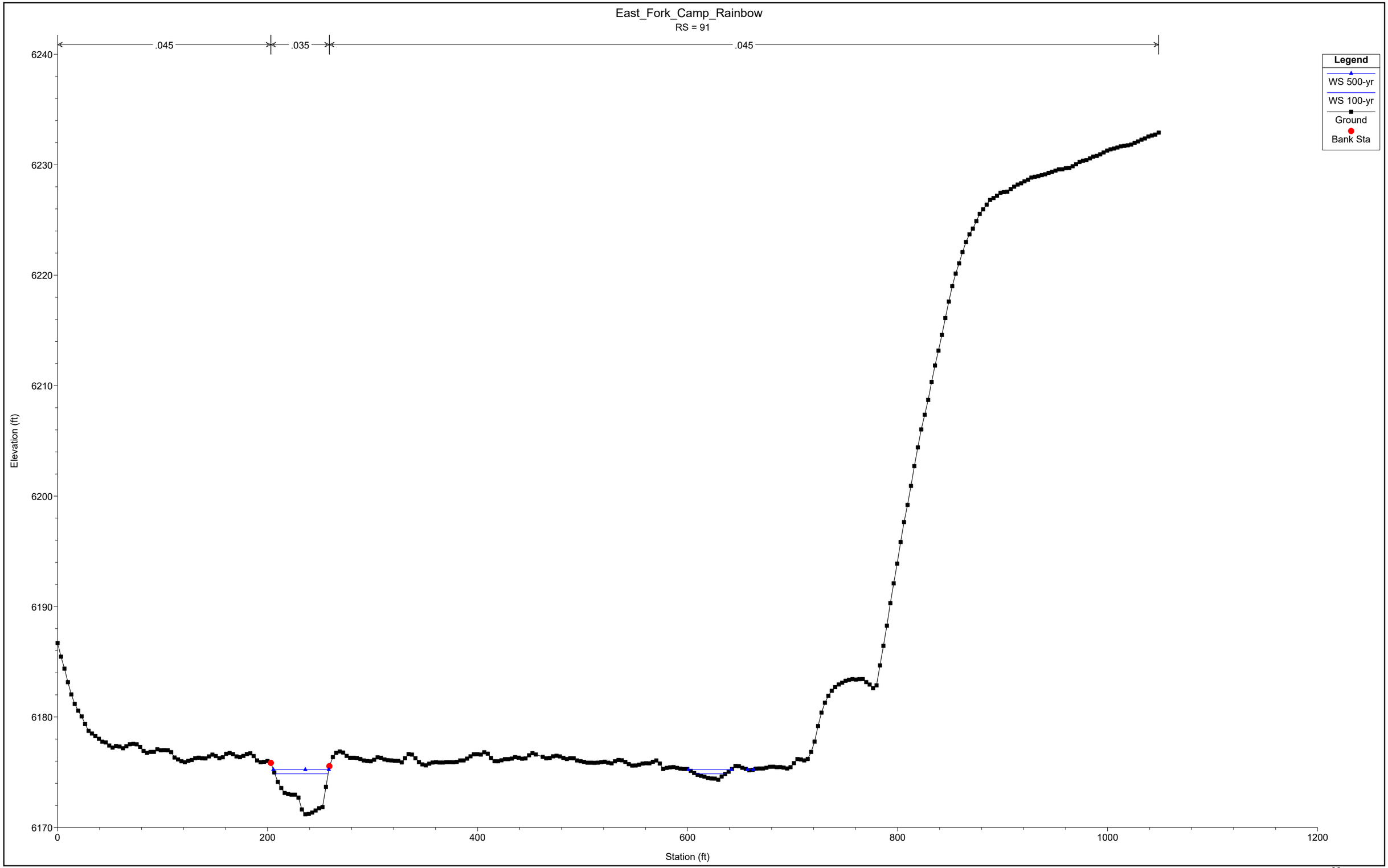

East_Fork_Camp_Rainbow
RS = 1146
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6340
6320
6300
6280
6260
6240
6220
6200
6180
0
200
400
600
800
1000
1200
Station (ft)


East_Fork_Camp_Rainbow
RS = 944
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6340
6320
6300
6280
6260
6240
6220
6200
6180
0
200
400
600
800
1000
1200
Station (ft)


East_Fork_Camp_Rainbow
RS = 680
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6320
6300
6280
6260
6240
6220
6200
6180
6160
0
200
400
600
800
1000
1200
Station (ft)


East_Fork_Camp_Rainbow
RS = 437
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6260
6240
6220
6200
6180
6160
0
200
400
600
800
1000
1200
Station (ft)


East_Fork_Camp_Rainbow
RS = 263
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6240
6230
6220
6210
6200
6190
6180
6170
0
200
400
600
800
1000
1200
Station (ft)


East_Fork_Camp_Rainbow
RS = 91
.045
.035
.045
Legend
WS 500-yr
WS 100-yr
Ground
Bank Sta
Elevation (ft)
6240
6230
6220
6210
6200
6190
6180
6170
0
200
400
600
800
1000
1200
Station (ft)

USGS Streamstats Printouts

StreamStats Version 3.0 Overall Basin

Flow Statistics Ungaged Site Report

Date: Fri Sept 16, 2016 8:47:20 PM GMT-6
Study Area: Idaho
NAD 1983 Latitude: 43.6437 (43 38 37)
NAD 1983 Longitude: -114.229 (-114 13 45)
Drainage Area: 38.67 mi2
2001 NLCD Impervious: 0.0519 percent

Peak-Flow Basin Characteristics			
100% Peak Flow Region 5 (38.7 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	38.7	3.6	12228
Mean Annual Precipitation (inches)	25.3	19.8	49.73
N Facing Slopes gt 30pct from 30m DEM (percent)	22	2.5	32.9

Low-Flow Basin Characteristics			
100% Low Flow Region 5 (38.7 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	38.7	19.3	12228
Mean Basin Slope from 30m DEM (percent)	42.3	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	74.3	24.7	77.8
Percent Forest (percent)	26	22.4	88.7
Mean Basin Elevation (feet)	7790	6171.1	8204
Percent Volcanic (percent)	18.6 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Zero-Flow Probability Basin Characteristics
100% Undefined Region (38.67 mi2)

The selected watershed is entirely in an area for which flow equations were not defined.

Monthly and Annual Basin Characteristics			
100% Low Flow Region 5 (38.7 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	38.7	19.3	12228
Mean Basin Slope from 30m DEM (percent)	42.3	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	74.3	24.7	77.8
Percent Forest (percent)	26	22.4	88.7
Mean Basin Elevation (feet)	7790	6171.1	8204
Percent Volcanic (percent)	18.6 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak-Flow Statistics						
Statistic	**Value**	**Unit**	**Prediction Error (percent)**	**Equivalent years of record**	**90-Percent Prediction Interval**	
					Min	**Max**

PK1 5	136	ft3/s	41		66.6	279
PK2	172	ft3/s	40		76.6	385
PK2 33	183	ft3/s	39		94.7	354
PK5	257	ft3/s	38		135	492
PK10	319	ft3/s	39		165	617
PK25	396	ft3/s	39		202	774
PK50	451	ft3/s	40		227	898
PK100	519	ft3/s	41		256	1050
PK200	575	ft3/s	42		278	1190
PK500	651	ft3/s	44		307	1380

http://id.water.usgs.gov/PDF/wri024170/index.html (http://id.water.usgs.gov/PDF/wri024170/index.html)
Berenbrock_ Charles_ 2002_ Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho: U.S. Geological Survey Water-Resources Investigations Report 02–4170_ 59 p.

Low-Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M1D10Y	0.58	ft3/s				
M7D10Y	0.74	ft3/s				
M7D2Y	1.81	ft3/s				
M30D5Y	1.21	ft3/s				

http://idaho.usgs.gov/PDF/wri014093/index.html (http://idaho.usgs.gov/PDF/wri014093/index.html)
Hortness_ J.E._ and Berenbrock_ Charles_ 2001_ Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01–4093_ 36 p.

Monthly and Annual Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	40.6	ft3/s				
JAND20	21.2	ft3/s				
JAND50	16.5	ft3/s				
JAND80	12.8	ft3/s				
FEBD20	20.5	ft3/s				
FEBD50	16.3	ft3/s				
FEBD80	13.1	ft3/s				
MARD20	21.1	ft3/s				
MARD50	16.1	ft3/s				
MARD80	12.1	ft3/s				
APRD20	79.8	ft3/s				
APRD50	35.9	ft3/s				
APRD80	19.8	ft3/s				
MAYD20	278	ft3/s				
MAYD50	175	ft3/s				
MAYD80	101	ft3/s				
JUND20	122	ft3/s				
JUND50	72.2	ft3/s				
JUND80	44.4	ft3/s				
JULD20	46.9	ft3/s				
JULD50	23.1	ft3/s				
JULD80	13.7	ft3/s				
AUGD20	17.1	ft3/s				

AUGD50	11	ft3/s				
AUGD80	6.74	ft3/s				
SEPD20	14.7	ft3/s				
SEPD50	10.3	ft3/s				
SEPD80	5.56	ft3/s				
OCTD20	16.9	ft3/s				
OCTD50	11.4	ft3/s				
OCTD80	6.57	ft3/s				
NOVD20	18.8	ft3/s				
NOVD50	13	ft3/s				
NOVD80	7.17	ft3/s				
DECD20	24.2	ft3/s				
DECD50	18.2	ft3/s				
DECD80	13.4	ft3/s				

http://idaho.usgs.gov/PDF/wri014093/index.html (http://idaho.usgs.gov/PDF/wri014093/index.html)
Hortness_ J.E._ and Berenbrock_ Charles_ 2001_ Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01-4093_ 36 p.

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Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 12:32:58 (Web2)
Streamstats Status News

StreamStats Version 3.0

North Basin

Flow Statistics Ungaged Site Report

Date: Sat Sept 17, 2016 7:33:59 PM GMT-6
Study Area: Idaho
NAD 1983 Latitude: 43.642 (43 38 31)
NAD 1983 Longitude: -114.2203 (-114 13 13)
Drainage Area: 0.85 mi2
2001 NLCD Impervious: 0.26 percent

Peak-Flow Basin Characteristics			
100% Peak Flow Region 5 (0.85 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	0.85 (below min value 3.6)	3.6	12228
Mean Annual Precipitation (inches)	21.8	19.8	49.73
N Facing Slopes gt 30pct from 30m DEM (percent)	-1 (below min value 2.5)	2.5	32.9

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Low-Flow Basin Characteristics			
100% Low Flow Region 5 (0.85 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	0.85 (below min value 19.3)	19.3	12228
Mean Basin Slope from 30m DEM (percent)	27.5	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	50	24.7	77.8
Percent Forest (percent)	0 (below min value 22.4)	22.4	88.7
Mean Basin Elevation (feet)	6700	6171.1	8204
Percent Volcanic (percent)	0 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Zero-Flow Probability Basin Characteristics
100% Undefined Region (0.85 mi2)

The selected watershed is entirely in an area for which flow equations were not defined.

Monthly and Annual Basin Characteristics			
100% Low Flow Region 5 (0.85 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	0.85 (below min value 19.3)	19.3	12228
Mean Basin Slope from 30m DEM (percent)	27.5	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	50	24.7	77.8
Percent Forest (percent)	0 (below min value 22.4)	22.4	88.7
Mean Basin Elevation (feet)	6700	6171.1	8204
Percent Volcanic (percent)	0 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak-Flow Statistics					
Statistic	**Value**	**Unit**	**Prediction Error (percent)**	**Equivalent years of record**	**90-Percent Prediction Interval**

					Min	Max
PK1 5	Infinity	ft3/s				
PK2	Infinity	ft3/s				
PK2 33	Infinity	ft3/s				
PK5	Infinity	ft3/s				
PK10	Infinity	ft3/s				
PK25	Infinity	ft3/s				
PK50	Infinity	ft3/s				
PK100	Infinity	ft3/s				
PK200	Infinity	ft3/s				
PK500	Infinity	ft3/s				

http://id.water.usgs.gov/PDF/wri024170/index.html (http://id.water.usgs.gov/PDF/wri024170/index.html)
Berenbrock_ Charles_ 2002_ Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho: U.S. Geological Survey Water-Resources Investigations Report 02–4170_ 59 p.

Low-Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M1D10Y	4.25E-05	ft3/s				
M7D10Y	5.6E-05	ft3/s				
M7D2Y	0.000383	ft3/s				
M30D5Y	0.000162	ft3/s				

http://idaho.usgs.gov/PDF/wri014093/index.html (http://idaho.usgs.gov/PDF/wri014093/index.html)
Hortness_ J.E._ and Berenbrock_ Charles_ 2001_ Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01–4093_ 36 p.

Monthly and Annual Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	0.14	ft3/s				
JAND20	0.33	ft3/s				
JAND50	0.29	ft3/s				
JAND80	0.32	ft3/s				
FEBD20	0.32	ft3/s				
FEBD50	0.28	ft3/s				
FEBD80	0.33	ft3/s				
MARD20	0.42	ft3/s				
MARD50	0.3	ft3/s				
MARD80	0.33	ft3/s				
APRD20	3.67	ft3/s				
APRD50	1.73	ft3/s				
APRD80	0.86	ft3/s				
MAYD20	5.01	ft3/s				
MAYD50	3.06	ft3/s				
MAYD80	1.85	ft3/s				
JUND20	0.0608	ft3/s				
JUND50	0.0241	ft3/s				
JUND80	0.0165	ft3/s				
JULD20	0.0354	ft3/s				
JULD50	0.0166	ft3/s				
JULD80	0.00585	ft3/s				

AUGD20	0.0168	ft3/s				
AUGD50	0.00765	ft3/s				
AUGD80	0.00263	ft3/s				
SEPD20	0.0334	ft3/s				
SEPD50	0.0147	ft3/s				
SEPD80	0.00283	ft3/s				
OCTD20	0.0639	ft3/s				
OCTD50	0.0335	ft3/s				
OCTD80	0.00779	ft3/s				
NOVD20	0.0927	ft3/s				
NOVD50	0.0544	ft3/s				
NOVD80	0.0132	ft3/s				
DECD20	0.35	ft3/s				
DECD50	0.31	ft3/s				
DECD80	0.33	ft3/s				

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Flow Statistics Ungaged Site Report

East Basin

Date: Sat Sept 17, 2016 7:41:31 PM GMT-6
Study Area: Idaho
NAD 1983 Latitude: 43.6413 (43 38 29)
NAD 1983 Longitude: -114.2147 (-114 12 53)
Drainage Area: 19.94 mi2
2001 NLCD Impervious: 0.0601 percent

Peak-Flow Basin Characteristics			
100% Peak Flow Region 5 (19.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	19.9	3.6	12228
Mean Annual Precipitation (inches)	28.8	19.8	49.73
N Facing Slopes gt 30pct from 30m DEM (percent)	23	2.5	32.9

Low-Flow Basin Characteristics			
100% Low Flow Region 5 (19.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	19.9	19.3	12228
Mean Basin Slope from 30m DEM (percent)	47.9 (above max value 46.7)	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	86.4 (above max value 77.8)	24.7	77.8
Percent Forest (percent)	37	22.4	88.7
Mean Basin Elevation (feet)	8320 (above max value 8204)	6171.1	8204
Percent Volcanic (percent)	0 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Zero-Flow Probability Basin Characteristics
100% Undefined Region (19.94 mi2)

The selected watershed is entirely in an area for which flow equations were not defined.

Monthly and Annual Basin Characteristics			
100% Low Flow Region 5 (19.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	19.9	19.3	12228
Mean Basin Slope from 30m DEM (percent)	47.9 (above max value 46.7)	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	86.4 (above max value 77.8)	24.7	77.8
Percent Forest (percent)	37	22.4	88.7
Mean Basin Elevation (feet)	8320 (above max value 8204)	6171.1	8204
Percent Volcanic (percent)	0 (below min value 27.1)	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak-Flow Statistics						
Statistic	**Value**	**Unit**	**Prediction Error (percent)**	**Equivalent years of record**	**90-Percent Prediction Interval**	
					Min	**Max**

PK1 5	91.8	ft3/s	41		44.8	188
PK2	115	ft3/s	40		48.2	274
PK2 33	122	ft3/s	39		63	235
PK5	169	ft3/s	38		88.5	324
PK10	208	ft3/s	39		108	403
PK25	257	ft3/s	39		131	502
PK50	292	ft3/s	40		147	580
PK100	335	ft3/s	41		166	679
PK200	370	ft3/s	42		179	765
PK500	418	ft3/s	44		197	888

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Berenbrock_ Charles_ 2002_ Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho: U.S. Geological Survey Water-Resources Investigations Report 02–4170_ 59 p.

Low-Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M1D10Y	0.000901	ft3/s				
M7D10Y	0.00115	ft3/s				
M7D2Y	0.0102	ft3/s				
M30D5Y	0.00358	ft3/s				

http://idaho.usgs.gov/PDF/wri014093/index.html (http://idaho.usgs.gov/PDF/wri014093/index.html)
Hortness_ J.E._ and Berenbrock_ Charles_ 2001_ Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01–4093_ 36 p.

Monthly and Annual Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	30	ft3/s				
JAND20	13	ft3/s				
JAND50	9.99	ft3/s				
JAND80	7.66	ft3/s				
FEBD20	12.3	ft3/s				
FEBD50	9.8	ft3/s				
FEBD80	7.83	ft3/s				
MARD20	11.2	ft3/s				
MARD50	8.8	ft3/s				
MARD80	6.58	ft3/s				
APRD20	38.4	ft3/s				
APRD50	16.6	ft3/s				
APRD80	9.15	ft3/s				
MAYD20	177	ft3/s				
MAYD50	113	ft3/s				
MAYD80	64.2	ft3/s				
JUND20	112	ft3/s				
JUND50	68.2	ft3/s				
JUND80	42.6	ft3/s				
JULD20	41.4	ft3/s				
JULD50	20.5	ft3/s				
JULD80	12.7	ft3/s				
AUGD20	14.3	ft3/s				

AUGD50	9.4	ft3/s				
AUGD80	6.1	ft3/s				
SEPD20	10.9	ft3/s				
SEPD50	7.91	ft3/s				
SEPD80	4.74	ft3/s				
OCTD20	11.8	ft3/s				
OCTD50	8.1	ft3/s				
OCTD80	5.09	ft3/s				
NOVD20	12.9	ft3/s				
NOVD50	8.88	ft3/s				
NOVD80	5.35	ft3/s				
DECD20	15.2	ft3/s				
DECD50	11.2	ft3/s				
DECD80	8.13	ft3/s				

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Flow Statistics Ungaged Site Report

South Basin

Date: Sat Sept 17, 2016 7:58:18 PM GMT-6
Study Area: Idaho
NAD 1983 Latitude: 43.641 (43 38 28)
NAD 1983 Longitude: -114.2146 (-114 12 53)
Drainage Area: 16.9 mi2
2001 NLCD Impervious: 0.0268 percent

Peak-Flow Basin Characteristics			
100% Peak Flow Region 5 (16.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	16.9	3.6	12228
Mean Annual Precipitation (inches)	21.9	19.8	49.73
N Facing Slopes gt 30pct from 30m DEM (percent)	21	2.5	32.9

Low-Flow Basin Characteristics			
100% Low Flow Region 5 (16.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	16.9 (below min value 19.3)	19.3	12228
Mean Basin Slope from 30m DEM (percent)	35.9	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	63.6	24.7	77.8
Percent Forest (percent)	14 (below min value 22.4)	22.4	88.7
Mean Basin Elevation (feet)	7270	6171.1	8204
Percent Volcanic (percent)	42	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Zero-Flow Probability Basin Characteristics
100% Undefined Region (16.90 mi2)

The selected watershed is entirely in an area for which flow equations were not defined.

Monthly and Annual Basin Characteristics			
100% Low Flow Region 5 (16.9 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	16.9 (below min value 19.3)	19.3	12228
Mean Basin Slope from 30m DEM (percent)	35.9	20.2	46.7
Slopes gt 30pct from 30m DEM (percent)	63.6	24.7	77.8
Percent Forest (percent)	14 (below min value 22.4)	22.4	88.7
Mean Basin Elevation (feet)	7270	6171.1	8204
Percent Volcanic (percent)	42	27.1	100

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak-Flow Statistics						
Statistic	**Value**	**Unit**	**Prediction Error (percent)**	**Equivalent years of record**	**90-Percent Prediction Interval**	
					Min	**Max**

PK1 5	43.5	ft3/s	41		20.6	91.9
PK2	56.5	ft3/s	40		23.3	137
PK2 33	61	ft3/s	39		30.6	122
PK5	89.8	ft3/s	38		45.4	178
PK10	114	ft3/s	39		56.8	230
PK25	146	ft3/s	39		71.8	297
PK50	170	ft3/s	40		81.9	352
PK100	198	ft3/s	41		93.7	419
PK200	222	ft3/s	42		103	481
PK500	256	ft3/s	44		115	570

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Berenbrock_ Charles_ 2002_ Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho: U.S. Geological Survey Water-Resources Investigations Report 02–4170_ 59 p.

Low-Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M1D10Y	1.22	ft3/s				
M7D10Y	1.57	ft3/s				
M7D2Y	2.51	ft3/s				
M30D5Y	2.12	ft3/s				

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Monthly and Annual Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	11	ft3/s				
JAND20	7.6	ft3/s				
JAND50	6.1	ft3/s				
JAND80	5.22	ft3/s				
FEBD20	7.41	ft3/s				
FEBD50	6.06	ft3/s				
FEBD80	5.36	ft3/s				
MARD20	8.61	ft3/s				
MARD50	6.39	ft3/s				
MARD80	5.31	ft3/s				
APRD20	44.3	ft3/s				
APRD50	20.6	ft3/s				
APRD80	11	ft3/s				
MAYD20	102	ft3/s				
MAYD50	63.5	ft3/s				
MAYD80	37	ft3/s				
JUND20	21.9	ft3/s				
JUND50	12	ft3/s				
JUND80	7.34	ft3/s				
JULD20	8.51	ft3/s				
JULD50	4.28	ft3/s				
JULD80	2.37	ft3/s				
AUGD20	3.52	ft3/s				

AUGD50	2.15	ft3/s				
AUGD80	1.2	ft3/s				
SEPD20	3.71	ft3/s				
SEPD50	2.41	ft3/s				
SEPD80	1.09	ft3/s				
OCTD20	4.68	ft3/s				
OCTD50	3.12	ft3/s				
OCTD80	1.55	ft3/s				
NOVD20	5.4	ft3/s				
NOVD50	3.71	ft3/s				
NOVD80	1.84	ft3/s				
DECD20	8.35	ft3/s				
DECD50	6.66	ft3/s				
DECD80	5.43	ft3/s				

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