

130 ENVIRONMENTAL PARK

ATTACHMENT C2

APPENDIX C2-B

EXISTING CONDITIONS HEC-HMS EVALUATION

Includes pages C2-B-1 through C2-B-17

Technically Complete October 28, 2014



Biggs & Mathews, Inc.
Firm Registration No. F-834

CONTENTS

Existing Condition Discharge Summary	C2-B-1
Watershed Characteristics	C2-B-3
Rainfall Data	C2-B-6
Site 21 Reservoir Data	C2-B-9
HEC-HMS Schematic.....	C2-B-11
Hydrologic Analysis.....	C2-B-13



EXISTING CONDITION DISCHARGE SUMMARY

**130 Environmental Park
Existing Conditions Discharge Summary**

Flow Change Location/Cross-Section	100-Year Peak Discharge (cfs)	25-Year Peak Discharge (cfs)	Hydrologic Element
A11.4	5381.0	3939.6	Basin: DC-2
A7.00	7266.0	5326.5	Junction: Dry Creek
B12.0	1933.4	1410.5	Basin: UNT-5
B7.17	2909.0	2127.1	Junction: North
B3.7	3803.2	2761.0	Junction: South
C1.71	975.7	716.6	Basin: UNT-4
D3.88	337.2	245.4	Basin: UNT-2

WATERSHED CHARACTERISTICS

**130 Environmental Park
Watershed Runoff Curve Numbers
Existing Watershed Characteristics**

Watershed Name	Watershed Area (ac)	Watershed Area (Mi. ²)	CN (Weighted)	Partial Areas of Cover Type and Soil Group (ac)						
				Brush (fair), Soil Group D, CN = 77	Pasture (good), Soil Group D, CN = 80	Pasture (fair), Soil Group D, CN = 84	Paved (w/ROW), Soil Group D, CN = 93	Residential (1 ac), Soil Group D, CN = 84	Woods (fair), Soil Group D, CN = 79	Water, CN = 98
UNT-1	161.82	0.253	82	15.73	1.56	10.40			106.03	28.09
UNT-2	134.66	0.210	78	82.05		4.78	0.32		44.85	2.66
UNT-3	141.81	0.222	79	31.94		4.82			104.89	0.16
UNT-4	448.48	0.701	81	166.95	105.08	3.25	91.85		81.36	
UNT-5	913.94	1.428	79	332.63	545.12	3.57	11.02		17.50	4.11
DC-1	884.64	1.382	82	424.10	31.58	4.67	4.00		245.70	174.59
DC-2	2905.38	4.540	80	677.49	1611.60		57.91	70.87	455.85	31.66

**130 Environmental Park
SCS Unit Hydrograph Lag Time
Existing Watershed Characteristics**

Watershed Name	Sheet Flow					Shallow Conc. Flow				Channel Flow			Time of Conc. (hr)	Lag Time (min)
	Manning's Roughness	Water Course Length (ft)	Precipitation 2yr Total (in.)	Water Course Slope (ft/ft)	Time (hr)	Water Course Length (ft)	Roughness Coefficient	Water Course Slope (ft/ft)	Time (hr)	Avg. Bank Full Velocity (fps)	Water Course Length (ft)	Time (hr.)		
DC-2	0.24	240	3.60	0.03	0.38	8945	16.13	0.01	1.62	4.08	14140	0.96	2.97	107
DC-1	0.13	270	3.60	0.01	0.40	6467	16.13	0.01	1.17	0.00	0	0.00	1.57	57
UNT-1	0.13	260	3.60	0.01	0.51	3384	16.13	0.03	0.37	0.00	0	0.00	0.88	32
UNT-2	0.40	280	3.60	0.01	1.17	2882	16.13	0.01	0.45	3.27	2948	0.25	1.87	67
UNT-3	0.13	260	3.60	0.01	0.51	1947	16.13	0.03	0.21	3.50	995	0.08	0.80	29
UNT-4	0.24	275	3.60	0.01	0.88	6501	16.13	0.01	1.34	2.86	1437	0.14	2.35	85
UNT-5	0.24	250	3.60	0.03	0.40	8589	16.13	0.01	1.78	3.52	2943	0.23	2.42	87

**130 Environmental Park
Kinematic Wave Routing Parameters
Existing Watershed Characteristics**

Reach Name	Water Course Length (ft)	Water Course Slope (ft/ft)	Manning's Roughness	Shape	Bottom Width (ft)	Side Slope (xH:1V)
Dry Creek	1000	0.010	0.045	Trapezoid	30.00	5
Reach-2.0	656	0.010	0.065	Trapezoid	17.00	12
Reach-2.1	3455	0.005	0.065	Trapezoid	15.00	25

C2-B-5a

RAINFALL DATA

130 Environmental Park Hypothetical Storm Data

Duration	15 min.	30 min.	1 hr.	2 hr.	3 hr.	6 hr.	12 hr.	24 hr.	2 day	3 day	5 day	7 day	10 day*
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Precipitaion Depth (in.)	25 Year Return Period												
	1.90	2.50	3.35	4.33	4.71	5.31	6.09	7.70	9.00	9.60	10.00	10.80	13.40

Precipitaion Depth (in.)	100 Year Return Period												
	2.46	3.13	4.42	5.80	6.38	7.00	8.34	10.40	11.70	13.00	13.20	14.20	16.80

Precipitaion Depths from: Asquith, W.H., and Roussel, M.C., 2004, Atlas of depth-duration frequency of precipitation annual maxima for Texas: U.S. Geological Survey Scientific Investigations Report 2004-5041, 106 p. (TxDOT Implementation Report 5-1301-01-1)

*Precipitation Depths from: Technical Paper No. 49; Two to Ten-Day Precipitation for Return Periods of 2 to 100 Year in the Contiguous United States

130 Environmental Park Hypothetical Storm Data

Duration	5 min.	15 min.	30 min.	1 hr.	2 hr.	3 hr.	6 hr.	12 hr.	24 hr.	2 day	4 day	7 day	10 day*
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Precipitaion Depth (in.)	25 Year Return Period												
	1.69	2.24	2.68	3.20	3.82	4.24	5.07	6.06	7.24	8.65	10.34	11.94	13.09

Precipitaion Depth (in.)	100 Year Return Period												
	2.21	2.94	3.52	4.21	5.04	5.59	6.69	8.00	9.57	11.45	13.70	15.83	17.36

Precipitation depths used in the 10 day frequency storm meteorological model within the HEC-HMS hydrological model for flood analysis. Precipitation depths were "smoothed" using regression methods as suggested in the HEC-HMS Technical Reference Manual.

SITE 21 RESERVOIR DATA

**130 Environmental Park
Pond Data for HEC-HMS
Site 21**

Reservoir

Description:
Downstream: CP8
Method: Outflow Structures
Storage Method: Elevation-Area-Discharge
Elev-Area Function: Site 21 Elev Area
Elev-Dis Function: Site 21 Elev-Discharge
Primary: Elevation-Discharge
Initial Condition: Elevation
Initial Elevation: 498.5 ft

Paired Data

Elevation Storage Functions
Site 21 Elev Area

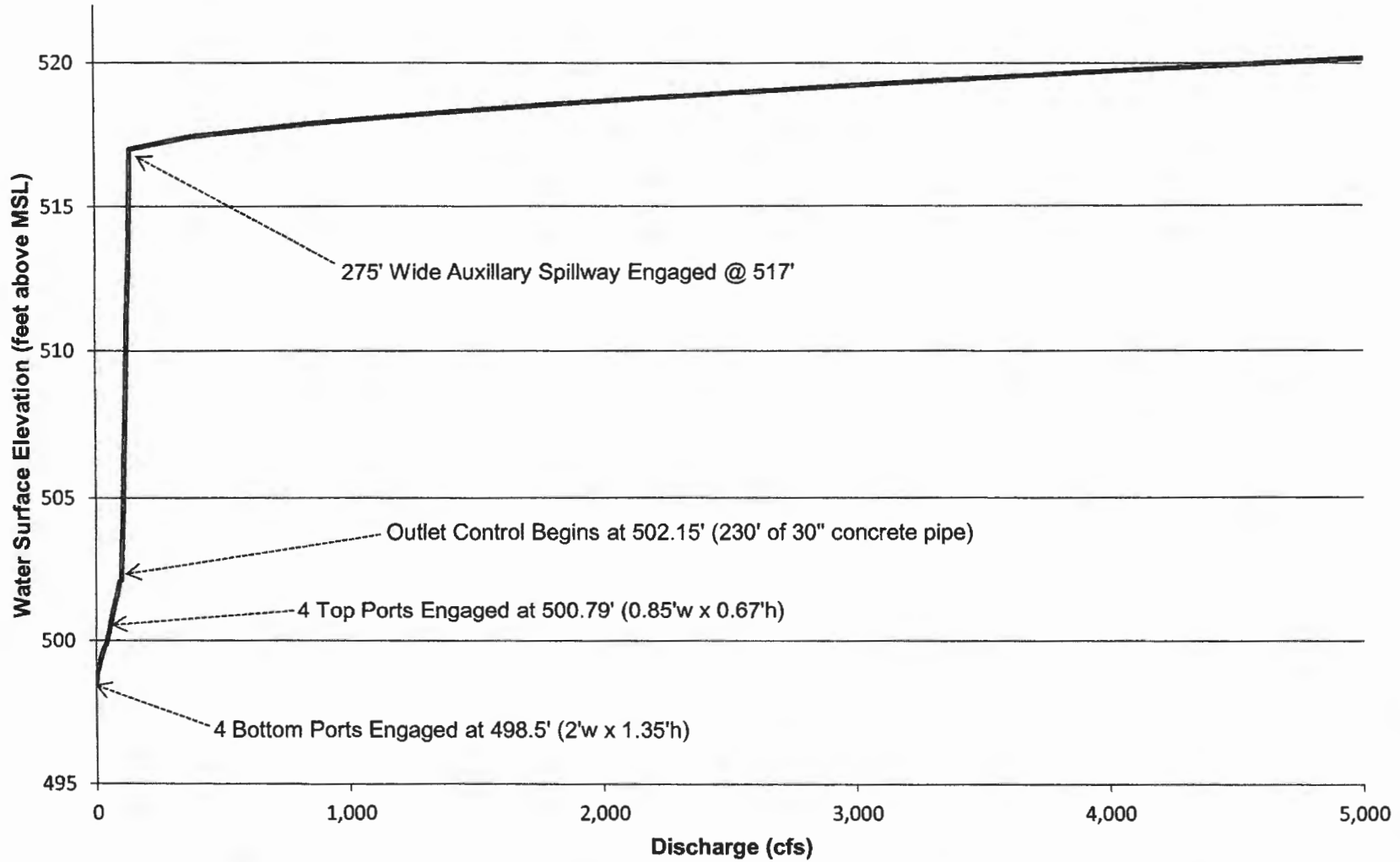
Elevation (ft)	Area (ac-ft)	Volume (ac-ft)
498.10	22.00	0.00
502	54.75	149.66
504	81.00	285.41
506	113.05	479.45
508	141.47	733.97
510	173.17	1048.60
512	204.87	1426.65
514	256.45	1887.97
516	296.24	2440.66
518	343.69	3080.59
520	411.10	3835.38
522	455.40	4701.88

Paired Data

Elevation Discharge Functions
Site 21 Elev-Discharge

Elevation (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)	Elevation (ft)	Discharge (cfs)
498.50	0.02	500.20	48.50	501.90	88.33	516.32	137.50
498.60	0.83	500.30	50.78	502.00	90.35	517.43	382.71
498.70	2.18	500.40	52.97	502.10	92.31	517.87	839.48
498.80	3.91	500.50	55.08	502.15	100.00	518.10	1134.54
498.90	5.94	500.60	57.10	502.96	102.50	518.32	1447.38
499.00	8.25	500.70	59.06	503.78	105.00	518.56	1819.62
499.10	10.79	500.80	60.96	504.62	107.50	518.78	2187.12
499.20	13.54	500.90	63.11	505.49	110.00	519.23	3010.38
499.30	16.50	501.00	65.43	506.37	112.50	519.70	3963.76
499.40	19.65	501.10	67.84	507.28	115.00	520.16	4981.12
499.50	22.98	501.20	70.33	508.20	117.50	520.63	6100.01
499.60	26.48	501.30	72.88	509.16	120.00	520.86	6675.17
499.70	30.13	501.40	75.49	510.12	122.50	521.10	7293.83
499.80	33.95	501.46	77.08	511.10	125.00	521.57	8558.14
499.84	39.16	501.50	79.45	512.10	127.50	522.04	9889.19
499.90	40.87	501.60	81.82	513.13	130.00		
500.00	43.56	501.70	84.07	514.17	132.50		
500.10	46.09	501.80	86.24	515.24	135.00		

Stage-Discharge Relationship **Plum Creek Watershed** **Floodwater Retarding Structure No. 21**



HEC-HMS SCHEMATIC

HYDROLOGIC ANALYSIS

Project: 130 Environmental Park Simulation Run: 100yr 10day (smoothed)

Start of Run: 01Jan2013, 00:00 Basin Model: Existing
 End of Run: 13Jan2013, 00:00 Meteorologic Model: 100 yr 10 day (smoothed)
 Compute Time: 21Jan2014, 17:36:47 Control Specifications: 12 days

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
DC-1	1.38	2046.3	06Jan2013, 01:30	1095.6
DC-2	4.54	5381.0	06Jan2013, 02:00	3532.9
Dry Creek	5.92	7252.1	06Jan2013, 01:45	4628.9
Dry Creek Junction	5.92	7266.0	06Jan2013, 01:45	4628.4
North Junction	2.13	2909.0	06Jan2013, 01:30	1651.6
Reach-2.0	2.81	3775.4	06Jan2013, 01:30	2179.3
Reach-2.1	2.13	2900.9	06Jan2013, 01:45	1651.0
Site 21	8.73	2346.5	06Jan2013, 05:00	4828.2
Site 21 Discharge	8.73	2346.5	06Jan2013, 05:00	4828.2
South Junction	2.81	3803.2	06Jan2013, 01:30	2179.0
UNT-1	0.25	442.7	06Jan2013, 01:00	198.5
UNT-2	0.21	337.2	06Jan2013, 01:15	160.0
UNT-3	0.22	397.8	06Jan2013, 01:00	169.4
UNT-4	0.70	975.7	06Jan2013, 01:30	550.2
UNT-5	1.43	1933.4	06Jan2013, 01:30	1101.3

Project: 130 Environmental Park
Simulation Run: 100yr 10day (smoothed) Reservoir: Site 21
Start of Run: 01Jan2013, 00:00 Basin Model: Existing
End of Run: 13Jan2013, 00:00 Meteorologic Model: 100 yr 10 day (smoothed)
Compute Time: 21Jan2014, 17:36:47 Control Specifications: 12 days

Volume Units: AC-FT

Computed Results

Peak Inflow :	11001.7 (CFS)	Date/Time of Peak Inflow :	06Jan2013, 01:45
Peak Outflow :	2346.5 (CFS)	Date/Time of Peak Outflow :	06Jan2013, 05:00
Total Inflow :	6808.3 (AC-FT)	Peak Storage :	3391.3 (AC-FT)
Total Outflow :	4828.2 (AC-FT)	Peak Elevation :	518.9 (FT)

Project: 130 Environmental Park Simulation Run: 25yr 10day (smoothed)

Start of Run: 01Jan2013, 00:00 Basin Model: Existing
 End of Run: 13Jan2013, 00:00 Meteorologic Model: 25 yr 10 day
 Compute Time: 24Jan2014, 12:45:08 Control Specifications: 12 days

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
DC-1	1.38	1508.5	06Jan2013, 01:30	788.3
DC-2	4.54	3939.6	06Jan2013, 02:00	2526.7
Dry Creek	5.92	5314.9	06Jan2013, 01:45	3315.5
Dry Creek Junction	5.92	5326.5	06Jan2013, 01:45	3315.1
North Junction	2.13	2127.1	06Jan2013, 01:30	1180.0
Reach-2.0	2.81	2740.0	06Jan2013, 01:45	1557.3
Reach-2.1	2.13	2118.9	06Jan2013, 01:45	1179.7
Site 21	8.73	382.9	06Jan2013, 16:00	3015.5
Site 21 Discharge	8.73	382.9	06Jan2013, 16:00	3015.5
South Junction	2.81	2761.0	06Jan2013, 01:30	1557.0
UNT-1	0.25	326.3	06Jan2013, 01:00	142.8
UNT-2	0.21	245.4	06Jan2013, 01:15	113.7
UNT-3	0.22	290.6	06Jan2013, 01:00	120.8
UNT-4	0.70	716.6	06Jan2013, 01:30	394.8
UNT-5	1.43	1410.5	06Jan2013, 01:30	785.2

Project: 130 Environmental Park
Simulation Run: 25yr 10day (smoothed) Reservoir: Site 21
Start of Run: 01Jan2013, 00:00 Basin Model: Existing
End of Run: 13Jan2013, 00:00 Meteorologic Model: 25 yr 10 day
Compute Time: 24Jan2014, 12:45:08 Control Specifications: 12 days

Volume Units: AC-FT

Computed Results

Peak Inflow :	8054.8 (CFS)	Date/Time of Peak Inflow :	06Jan2013, 01:45
Peak Outflow :	382.9 (CFS)	Date/Time of Peak Outflow :	06Jan2013, 16:00
Total Inflow :	4872.8 (AC-FT)	Peak Storage :	2888.1 (AC-FT)
Total Outflow :	3015.5 (AC-FT)	Peak Elevation :	517.4 (FT)

130 ENVIRONMENTAL PARK

ATTACHMENT C2

APPENDIX C2-C

EXISTING CONDITIONS HEC-RAS EVALUATION

Includes pages C2-C-1 through C2-C-77

Technically Complete October 28, 2014



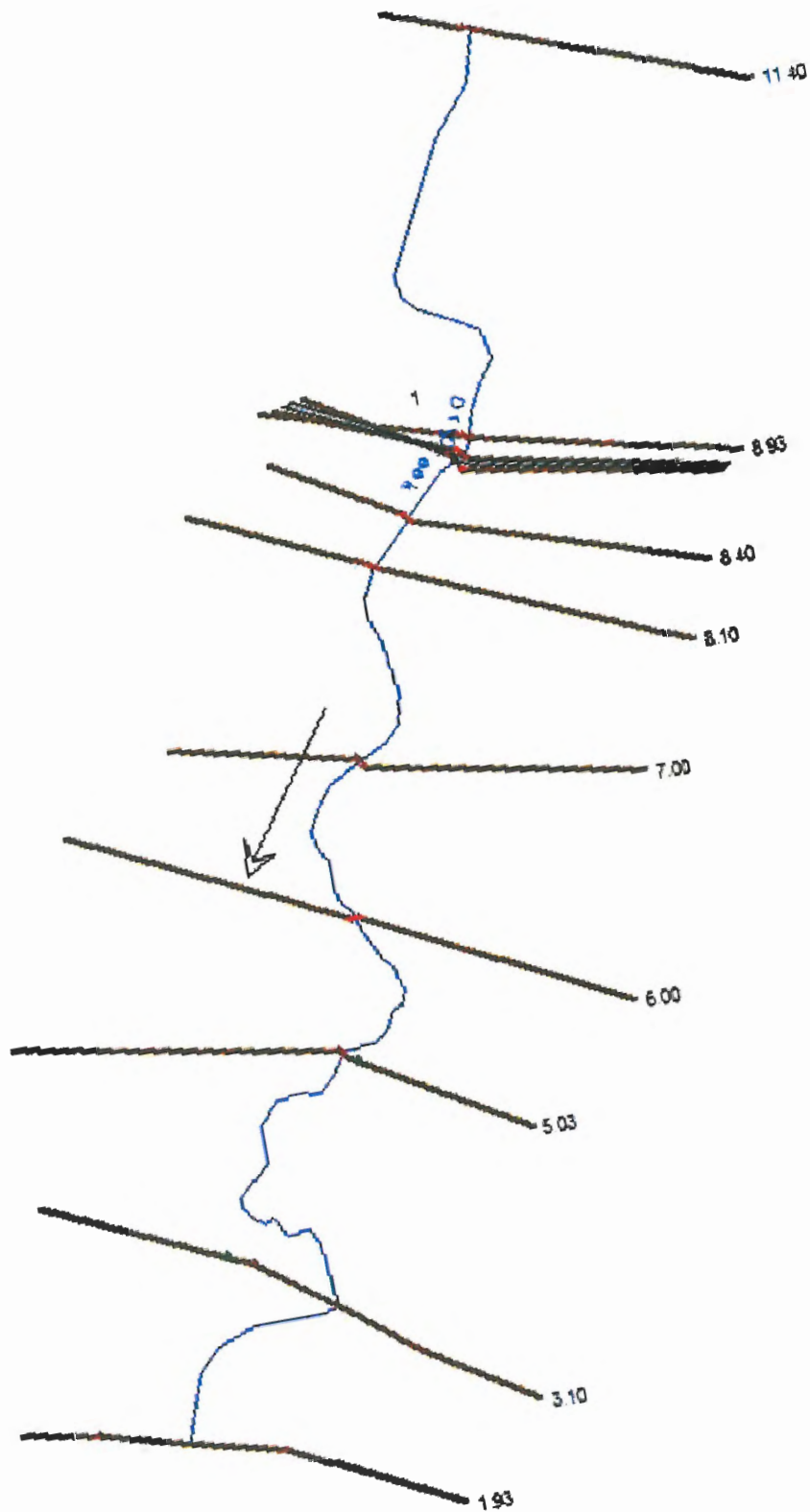
Biggs & Mathews, Inc.
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CONTENTS

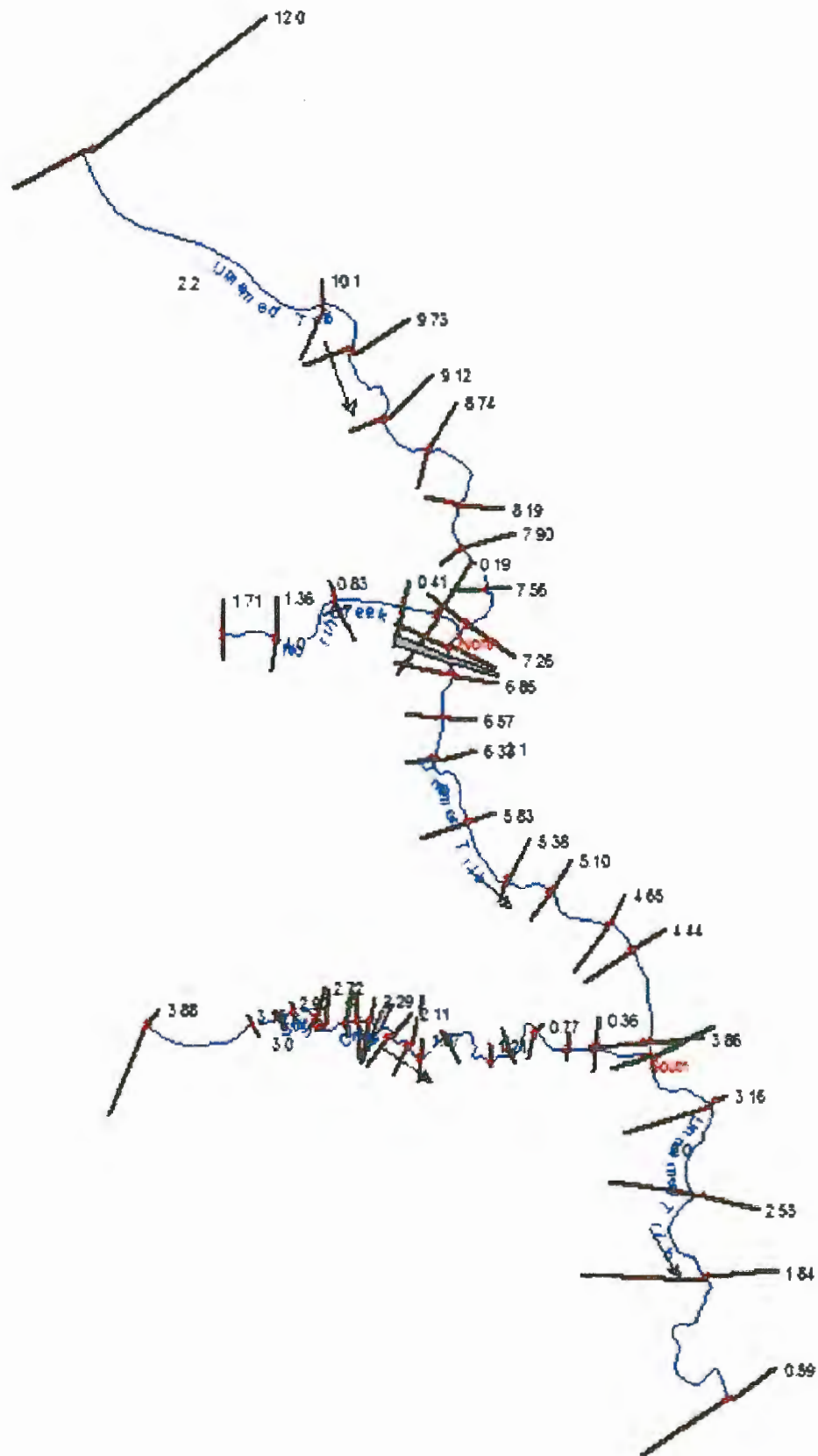
Existing Condition HEC-RAS Schematic	C2-C-1
Existing Condition HEC-RAS Analysis	C2-C-4



EXISTING CONDITION HEC-RAS SCHEMATIC



C2-C-2



EXISTING CONDITION HEC-RAS ANALYSIS

HEC-RAS Plan: Dry Creek River: Dry Creek Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Mfn Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	11.40	100 yr	5381.00	514.60	521.38	521.38	522.04	0.035746	8.80	1152.96	746.25	0.74
1	11.40	25 yr	3939.60	514.60	521.12	521.12	521.67	0.030491	7.80	957.88	725.27	0.67
1	8.93	100 yr	5381.00	506.00	519.14	513.23	519.15	0.000099	1.16	6021.98	1361.27	0.06
1	8.93	25 yr	3939.60	506.00	517.64	512.74	517.66	0.000147	1.29	4130.43	1171.05	0.07
1	8.84	100 yr	5381.00	506.00	519.13	514.07	519.14	0.000127	1.19	5885.99	1323.34	0.07
1	8.84	25 yr	3939.60	506.00	517.63	513.53	517.64	0.000178	1.27	4094.37	1088.03	0.08
1	8.81		Culvert									
1	8.78	100 yr	5381.00	505.89	519.07		519.09	0.000217	1.66	5951.36	1321.31	0.09
1	8.78	25 yr	3939.60	505.89	517.61		517.63	0.000278	1.70	4190.24	1101.00	0.10
1	8.40	100 yr	5381.00	505.09	519.00		519.01	0.000194	1.65	6714.24	1606.63	0.08
1	8.40	25 yr	3939.60	505.09	517.50		517.52	0.000283	1.82	4497.96	1346.86	0.10
1	8.10	100 yr	5381.00	504.56	518.96		518.97	0.000090	1.17	9146.12	1799.46	0.06
1	8.10	25 yr	3939.60	504.56	517.46		517.47	0.000114	1.21	6638.62	1561.55	0.06
1	7.00	100 yr	7266.00	502.00	518.92		518.92	0.000028	0.73	14286.76	1609.42	0.03
1	7.00	25 yr	5326.50	502.00	517.42		517.42	0.000025	0.65	11952.51	1499.68	0.03
1	6.00	100 yr	7266.00	502.00	518.91		518.91	0.000012	0.72	20236.27	2123.98	0.03
1	6.00	25 yr	5326.50	502.00	517.41		517.41	0.000009	0.60	17241.55	1843.82	0.03
1	5.03	100 yr	7266.00	500.00	518.90		518.91	0.000007	0.49	23576.79	2115.32	0.02
1	5.03	25 yr	5326.50	500.00	517.40		517.40	0.000006	0.41	20489.25	1987.57	0.02
1	3.10	100 yr	7266.00	498.12	518.90		518.90	0.000001	0.28	32791.92	2343.33	0.01
1	3.10	25 yr	5326.50	498.12	517.40		517.40	0.000001	0.23	29346.24	2239.22	0.01
1	1.93	100 yr	7266.00	497.59	518.90	499.05	518.90	0.000001	0.27	32373.33	2207.92	0.01
1	1.93	25 yr	5326.50	497.59	517.40	498.83	517.40	0.000001	0.22	29172.10	1995.17	0.01

HEC-RAS Plan: Existing

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Unnamed Trib	2.2	12.0	100 yr	1933.40	555.00	559.03	558.97	560.08	0.017247	8.24	234.68	106.61	0.98
Unnamed Trib	2.2	12.0	25 yr	1410.50	555.00	558.52	558.47	559.43	0.017541	7.66	184.19	94.56	0.97
Unnamed Trib	2.2	10.1	100 yr	1933.40	546.00	550.74		550.93	0.002164	4.06	724.38	403.54	0.35
Unnamed Trib	2.2	10.1	25 yr	1410.50	546.00	550.30		550.47	0.002101	3.73	553.98	375.28	0.33
Unnamed Trib	2.2	9.73	100 yr	1933.40	544.26	548.64		549.05	0.013985	6.36	515.06	305.53	0.59
Unnamed Trib	2.2	9.73	25 yr	1410.50	544.26	548.18	547.76	548.59	0.015071	6.04	383.87	274.34	0.60
Unnamed Trib	2.2	9.12	100 yr	1933.40	539.18	546.15		546.26	0.002355	3.47	1014.55	539.36	0.26
Unnamed Trib	2.2	9.12	25 yr	1410.50	539.18	545.68		545.79	0.002290	3.23	773.58	494.42	0.25
Unnamed Trib	2.2	8.74	100 yr	1933.40	538.94	545.06		545.18	0.003943	4.02	864.84	439.63	0.32
Unnamed Trib	2.2	8.74	25 yr	1410.50	538.94	544.46		544.59	0.004989	4.13	617.91	381.95	0.36
Unnamed Trib	2.2	8.19	100 yr	1933.40	536.67	543.85		543.95	0.001608	3.19	941.12	365.22	0.22
Unnamed Trib	2.2	8.19	25 yr	1410.50	536.67	543.20		543.28	0.001534	2.90	722.52	303.07	0.21
Unnamed Trib	2.2	7.90	100 yr	1933.40	535.72	543.21		543.34	0.003135	4.25	771.96	314.25	0.29
Unnamed Trib	2.2	7.90	25 yr	1410.50	535.72	542.57		542.69	0.003137	3.96	587.77	257.91	0.29
Unnamed Trib	2.2	7.56	100 yr	1933.40	535.18	541.97	540.31	542.14	0.004436	5.21	684.42	294.55	0.36
Unnamed Trib	2.2	7.56	25 yr	1410.50	535.18	541.24		541.42	0.004936	5.07	492.29	228.93	0.37
Unnamed Trib	2.2	7.26	100 yr	1933.40	533.95	540.99		541.15	0.002947	4.20	744.29	252.23	0.30
Unnamed Trib	2.2	7.26	25 yr	1410.50	533.95	540.15		540.31	0.003254	4.01	549.23	211.36	0.30
Unnamed Trib	2.1	7.17	100 yr	2909.00	534.38	540.57		540.81	0.004334	4.87	898.42	300.89	0.36
Unnamed Trib	2.1	7.17	25 yr	2118.90	534.38	539.73		539.95	0.004509	4.48	673.28	242.25	0.35
Unnamed Trib	2.1	7.06	100 yr	2909.00	533.20	540.14		540.40	0.003616	4.61	809.58	228.77	0.33
Unnamed Trib	2.1	7.06	25 yr	2118.90	533.20	539.32		539.54	0.003492	4.12	638.29	194.58	0.31
Unnamed Trib	2.1	6.99	100 yr	2909.00	531.88	539.90		540.17	0.003521	4.92	812.67	244.53	0.33
Unnamed Trib	2.1	6.99	25 yr	2118.90	531.88	539.08		539.31	0.003367	4.42	631.71	200.48	0.31
Unnamed Trib	2.1	6.84	100 yr	2909.00	531.63	539.66		539.76	0.001525	3.52	1566.13	446.12	0.22
Unnamed Trib	2.1	6.84	25 yr	2118.90	531.63	538.80		538.90	0.001638	3.38	1193.94	424.77	0.23
Unnamed Trib	2.1	6.57	100 yr	2909.00	530.49	538.99		539.21	0.002606	4.31	975.43	269.30	0.28
Unnamed Trib	2.1	6.57	25 yr	2118.90	530.49	538.18		538.36	0.002393	3.81	769.57	237.89	0.27

HEC-RAS Plan: Existing (Continued)

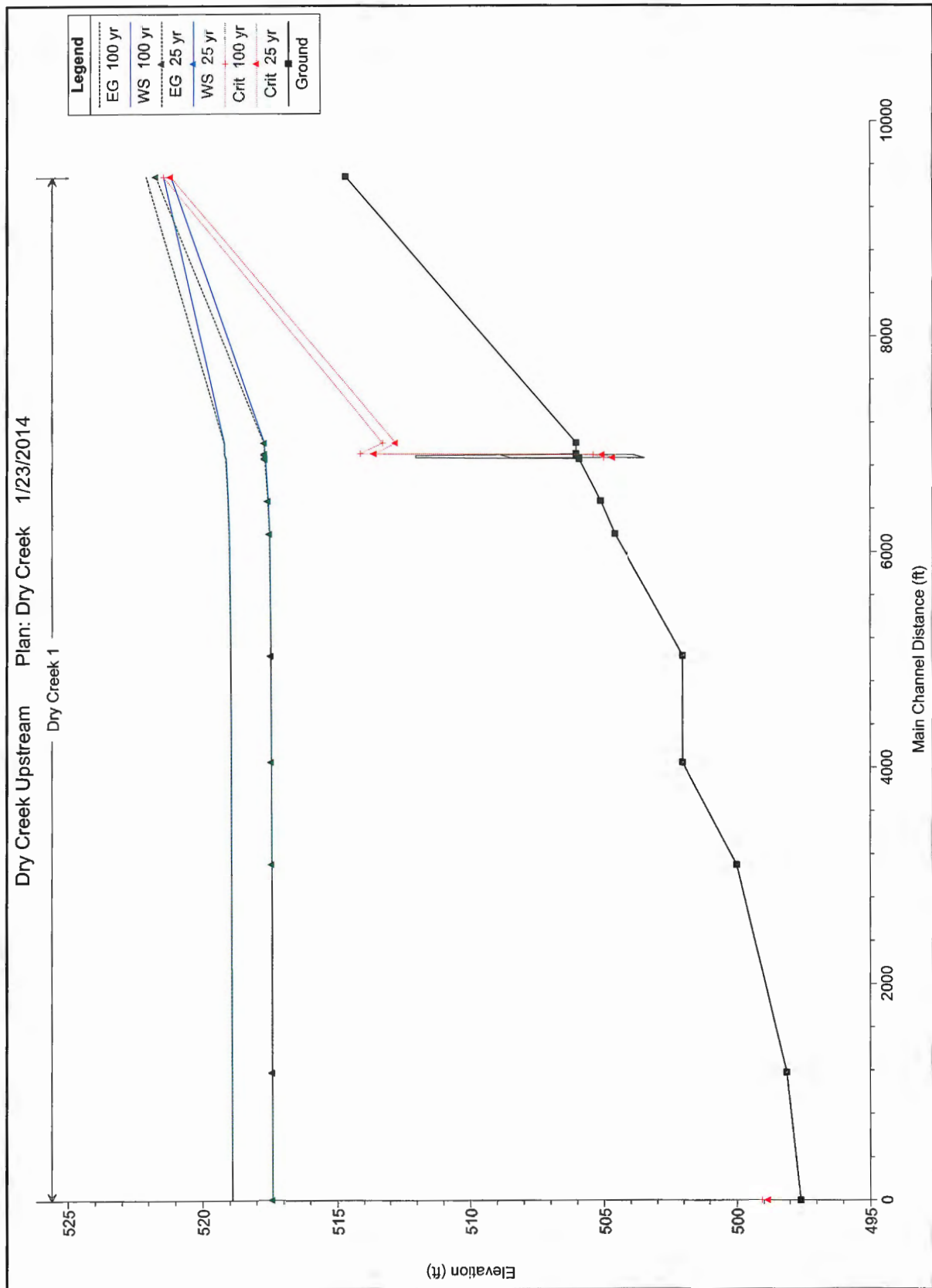
River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Unnamed Trib	2.1	6.33	100 yr	2909.00	530.55	537.97		538.31	0.005338	5.87	810.94	256.11	0.40
Unnamed Trib	2.1	6.33	25 yr	2118.90	530.55	537.22		537.52	0.005142	5.32	630.40	223.29	0.38
Unnamed Trib	2.1	5.83	100 yr	2909.00	527.28	535.23		535.55	0.006706	6.51	778.38	255.77	0.44
Unnamed Trib	2.1	5.83	25 yr	2118.90	527.28	534.51		534.80	0.006652	6.03	606.39	225.92	0.43
Unnamed Trib	2.1	5.38	100 yr	2909.00	525.29	532.81		533.07	0.004352	5.28	928.24	296.77	0.36
Unnamed Trib	2.1	5.38	25 yr	2118.90	525.29	532.11		532.35	0.004286	4.87	727.49	281.24	0.35
Unnamed Trib	2.1	5.10	100 yr	2909.00	523.57	531.49		531.77	0.004970	5.40	898.23	300.25	0.38
Unnamed Trib	2.1	5.10	25 yr	2118.90	523.57	530.91		531.14	0.004435	4.78	728.12	277.14	0.35
Unnamed Trib	2.1	4.65	100 yr	2909.00	521.27	528.96		529.27	0.006901	6.62	945.43	431.63	0.45
Unnamed Trib	2.1	4.65	25 yr	2118.90	521.27	528.43		528.75	0.007022	6.32	722.03	408.82	0.45
Unnamed Trib	2.1	4.44	100 yr	2909.00	520.53	527.62		527.83	0.006230	5.87	1017.00	414.56	0.42
Unnamed Trib	2.1	4.44	25 yr	2118.90	520.53	527.10		527.30	0.006096	5.47	807.07	389.06	0.41
Unnamed Trib	2.1	3.86	100 yr	2909.00	518.57	525.13		525.27	0.003320	4.06	1264.89	519.55	0.31
Unnamed Trib	2.1	3.86	25 yr	2118.90	518.57	524.48		524.62	0.003657	3.91	942.35	463.22	0.32
Unnamed Trib	2.0	3.70	100 yr	3775.40	516.79	524.06		524.51	0.006314	6.16	948.69	319.19	0.43
Unnamed Trib	2.0	3.70	25 yr	2740.00	516.79	523.66		523.96	0.004487	4.97	825.96	290.58	0.36
Unnamed Trib	2.0	3.16	100 yr	3775.40	512.97	519.32		519.92	0.012554	7.26	775.41	311.24	0.58
Unnamed Trib	2.0	3.16	25 yr	2740.00	512.97	518.02	518.02	519.03	0.027811	8.76	421.32	234.95	0.82
Unnamed Trib	2.0	2.53	100 yr	3775.40	509.18	518.96		519.00	0.000445	1.99	2838.78	644.04	0.12
Unnamed Trib	2.0	2.53	25 yr	2740.00	509.18	517.45	512.96	517.50	0.000625	2.06	1919.93	557.07	0.14
Unnamed Trib	2.0	1.84	100 yr	3775.40	504.96	518.92		518.93	0.000043	0.80	6750.90	1032.00	0.04
Unnamed Trib	2.0	1.84	25 yr	2740.00	504.96	517.42		517.42	0.000043	0.73	5320.17	867.01	0.04
Unnamed Trib	2.0	0.59	100 yr	3775.40	498.13	518.90	506.54	518.90	0.000018	0.65	9669.92	938.57	0.03
Unnamed Trib	2.0	0.59	25 yr	2740.00	498.13	517.40	505.58	517.40	0.000015	0.56	8288.81	903.26	0.02
South Creek	3.0	3.88	100 yr	337.20	580.00	581.50	580.97	581.60	0.009409	2.91	147.05	151.83	0.42
South Creek	3.0	3.88	25 yr	245.40	580.00	581.30	580.82	581.38	0.009012	2.59	118.20	137.49	0.40
South Creek	3.0	3.16	100 yr	337.20	567.00	568.68		569.01	0.041998	6.61	81.58	76.00	0.90

HEC-RAS Plan: Existing (Continued)

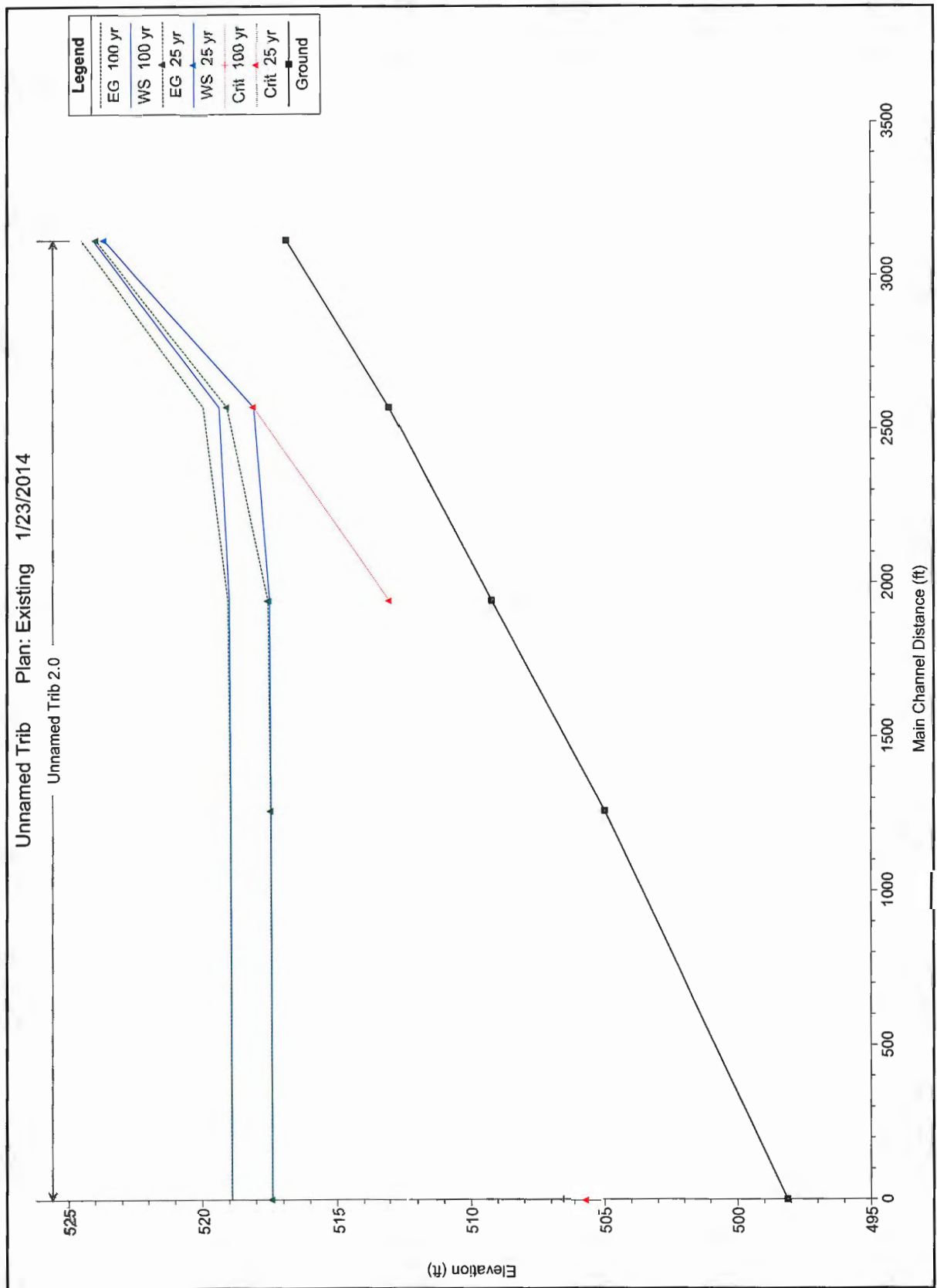
River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
South Creek	3.0	3.16	25 yr	245.40	567.00	568.43	568.36	568.74	0.046657	6.27	63.24	72.50	0.92
South Creek	3.0	2.99	100 yr	337.20	563.05	565.43		565.64	0.011701	3.80	100.17	68.96	0.48
South Creek	3.0	2.99	25 yr	245.40	563.05	565.14		565.30	0.011388	3.35	80.63	63.56	0.47
South Creek	3.0	2.90	100 yr	337.20	561.91	563.82	563.49	564.12	0.021087	4.87	89.06	75.85	0.64
South Creek	3.0	2.90	25 yr	245.40	561.91	563.55	563.25	563.80	0.021287	4.38	69.66	67.84	0.63
South Creek	3.0	2.72	100 yr	337.20	554.76	557.72	557.72	558.56	0.053903	7.33	46.01	27.62	1.00
South Creek	3.0	2.72	25 yr	245.40	554.76	557.32	557.32	558.06	0.057514	6.91	35.50	24.45	1.01
South Creek	3.0	2.65	100 yr	337.20	554.11	556.58	555.84	556.79	0.010276	3.82	102.57	67.06	0.46
South Creek	3.0	2.65	25 yr	245.40	554.11	556.21	555.58	556.39	0.011275	3.51	78.46	60.31	0.47
South Creek	3.0	2.48	100 yr	337.20	550.38	553.70		554.17	0.022857	5.50	62.16	32.46	0.67
South Creek	3.0	2.48	25 yr	245.40	550.38	553.39		553.74	0.020694	4.70	52.37	30.68	0.62
South Creek	3.0	2.36	100 yr	337.20	549.54	551.79		552.13	0.024346	5.22	85.03	78.41	0.69
South Creek	3.0	2.36	25 yr	245.40	549.54	551.52		551.82	0.024728	4.72	65.63	68.89	0.68
South Creek	3.0	2.29	100 yr	337.20	547.28	549.93	549.64	550.38	0.022999	5.98	76.01	57.85	0.70
South Creek	3.0	2.29	25 yr	245.40	547.28	549.62	549.32	549.99	0.022131	5.32	59.40	49.97	0.67
South Creek	3.0	2.11	100 yr	337.20	544.58	546.93		547.21	0.015195	4.55	88.86	59.80	0.56
South Creek	3.0	2.11	25 yr	245.40	544.58	546.61		546.84	0.015274	4.08	70.49	55.72	0.54
South Creek	3.0	1.97	100 yr	337.20	542.05	544.91		545.20	0.013285	4.67	92.31	62.12	0.53
South Creek	3.0	1.97	25 yr	245.40	542.05	544.54		544.79	0.013833	4.26	70.69	54.42	0.53
South Creek	3.0	1.87	100 yr	337.20	541.35	543.84		544.04	0.008963	3.69	97.66	52.87	0.43
South Creek	3.0	1.87	25 yr	245.40	541.35	543.54		543.69	0.007834	3.13	82.33	50.23	0.40
South Creek	3.0	1.66	100 yr	337.20	539.78	541.98		542.13	0.009260	3.45	126.21	106.48	0.43
South Creek	3.0	1.66	25 yr	245.40	539.78	541.63		541.78	0.010786	3.27	91.86	90.12	0.45
South Creek	3.0	1.21	100 yr	337.20	532.89	535.40	535.00	535.88	0.026395	6.46	76.22	60.92	0.75
South Creek	3.0	1.21	25 yr	245.40	532.89	535.13		535.46	0.021140	5.32	61.78	45.29	0.66
South Creek	3.0	1.08	100 yr	337.20	531.07	534.07		534.21	0.006541	3.17	127.35	83.73	0.37
South Creek	3.0	1.08	25 yr	245.40	531.07	533.63		533.76	0.007915	3.01	92.82	71.80	0.39

HEC-RAS Plan: Existing (Continued)

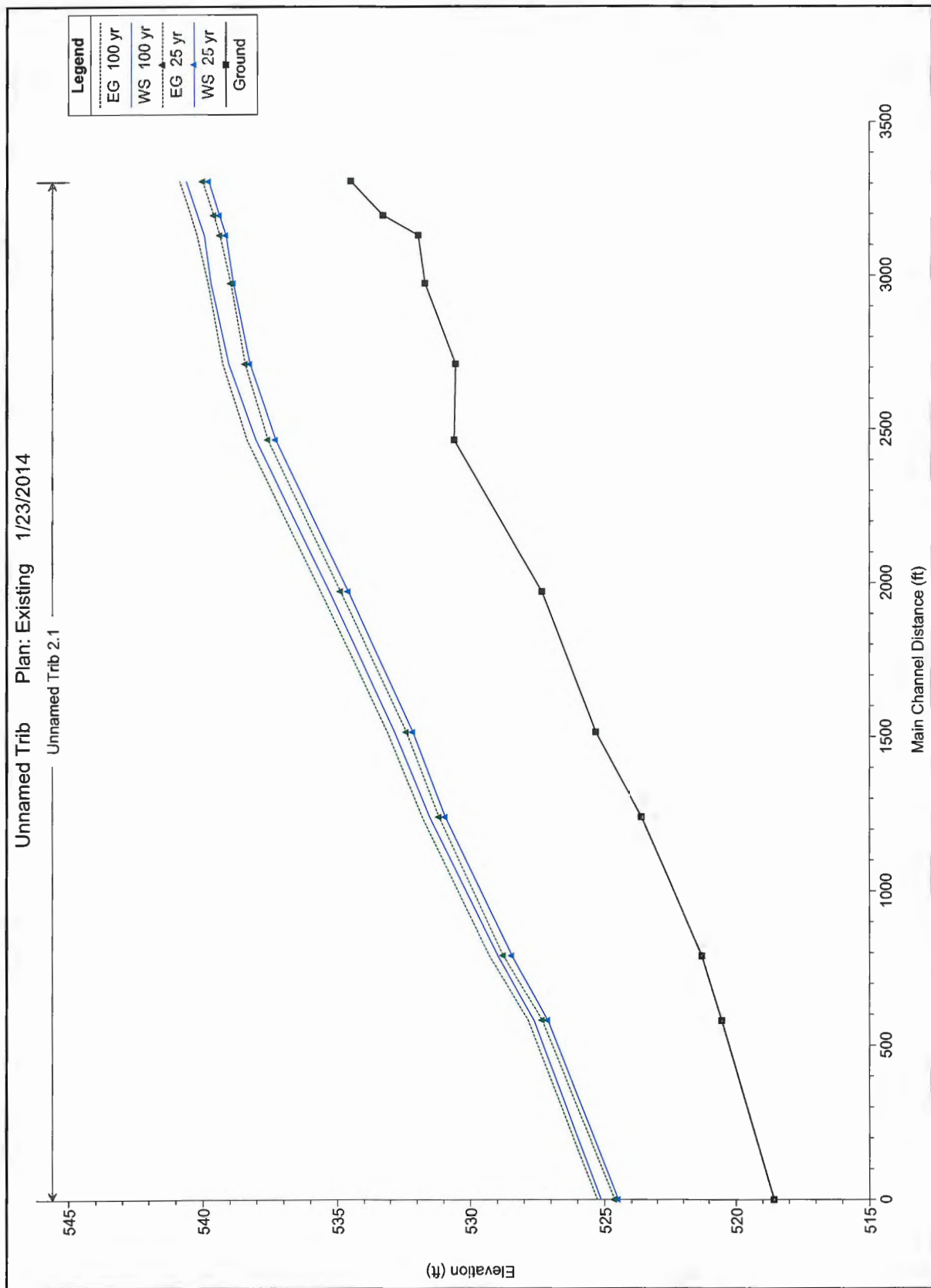
River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
South Creek	3.0	0.77	100 yr	337.20	527.80	532.35	530.73	532.54	0.004760	3.76	128.92	85.76	0.34
South Creek	3.0	0.77	25 yr	245.40	527.80	531.92		532.06	0.004171	3.24	96.07	51.41	0.31
South Creek	3.0	0.53	100 yr	337.20	528.00	529.45	529.45	529.87	0.050737	5.85	75.03	91.66	0.94
South Creek	3.0	0.53	25 yr	245.40	528.00	529.27	529.27	529.63	0.051032	5.28	59.36	85.93	0.91
South Creek	3.0	0.36	100 yr	337.20	523.75	526.26	524.84	526.29	0.000755	1.62	304.77	206.14	0.18
South Creek	3.0	0.36	25 yr	245.40	523.75	525.46	524.67	525.52	0.002102	2.06	159.84	155.10	0.29
North Creek	4.0	1.71	100 yr	975.70	552.00	553.90	553.75	554.36	0.035119	6.57	223.42	186.46	0.84
North Creek	4.0	1.71	25 yr	716.60	552.00	553.48	553.48	554.00	0.051292	6.74	152.31	156.89	0.97
North Creek	4.0	1.36	100 yr	975.70	546.00	550.70		550.90	0.004631	4.23	360.83	152.39	0.35
North Creek	4.0	1.36	25 yr	716.60	546.00	550.25	548.55	550.40	0.003985	3.66	295.64	136.88	0.32
North Creek	4.0	0.83	100 yr	975.70	544.00	547.08		547.33	0.011148	4.85	309.59	185.15	0.51
North Creek	4.0	0.83	25 yr	716.60	544.00	546.55		546.82	0.014462	4.82	218.78	159.96	0.56
North Creek	4.0	0.41	100 yr	975.70	539.61	543.12		543.36	0.008447	4.48	306.54	173.87	0.45
North Creek	4.0	0.41	25 yr	716.60	539.61	542.90		543.07	0.006196	3.66	270.42	165.37	0.38
North Creek	4.0	0.19	100 yr	975.70	538.00	541.61		541.75	0.006128	3.99	400.20	255.47	0.39
North Creek	4.0	0.19	25 yr	716.60	538.00	540.82		541.09	0.014078	5.05	222.51	196.11	0.56



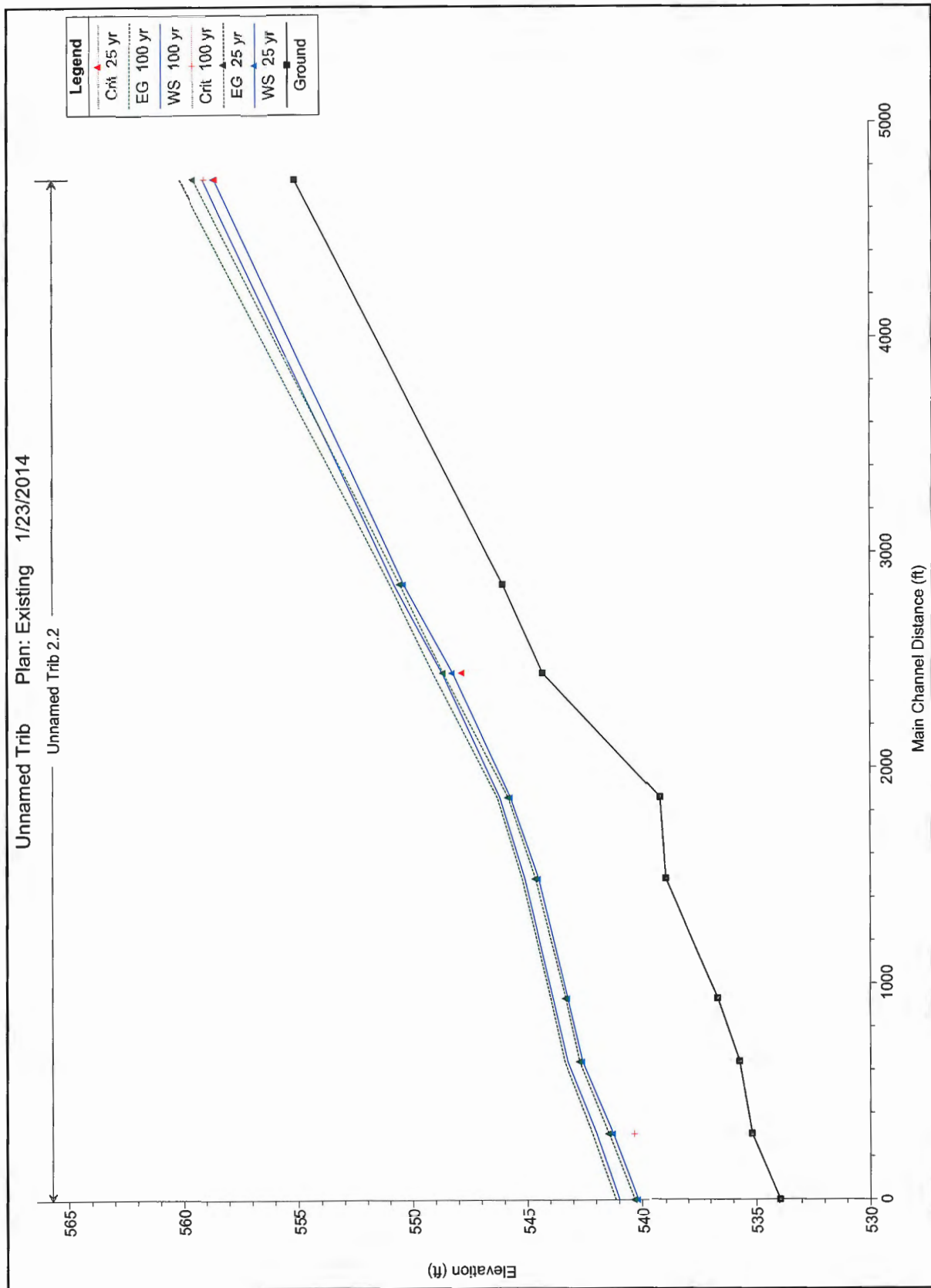
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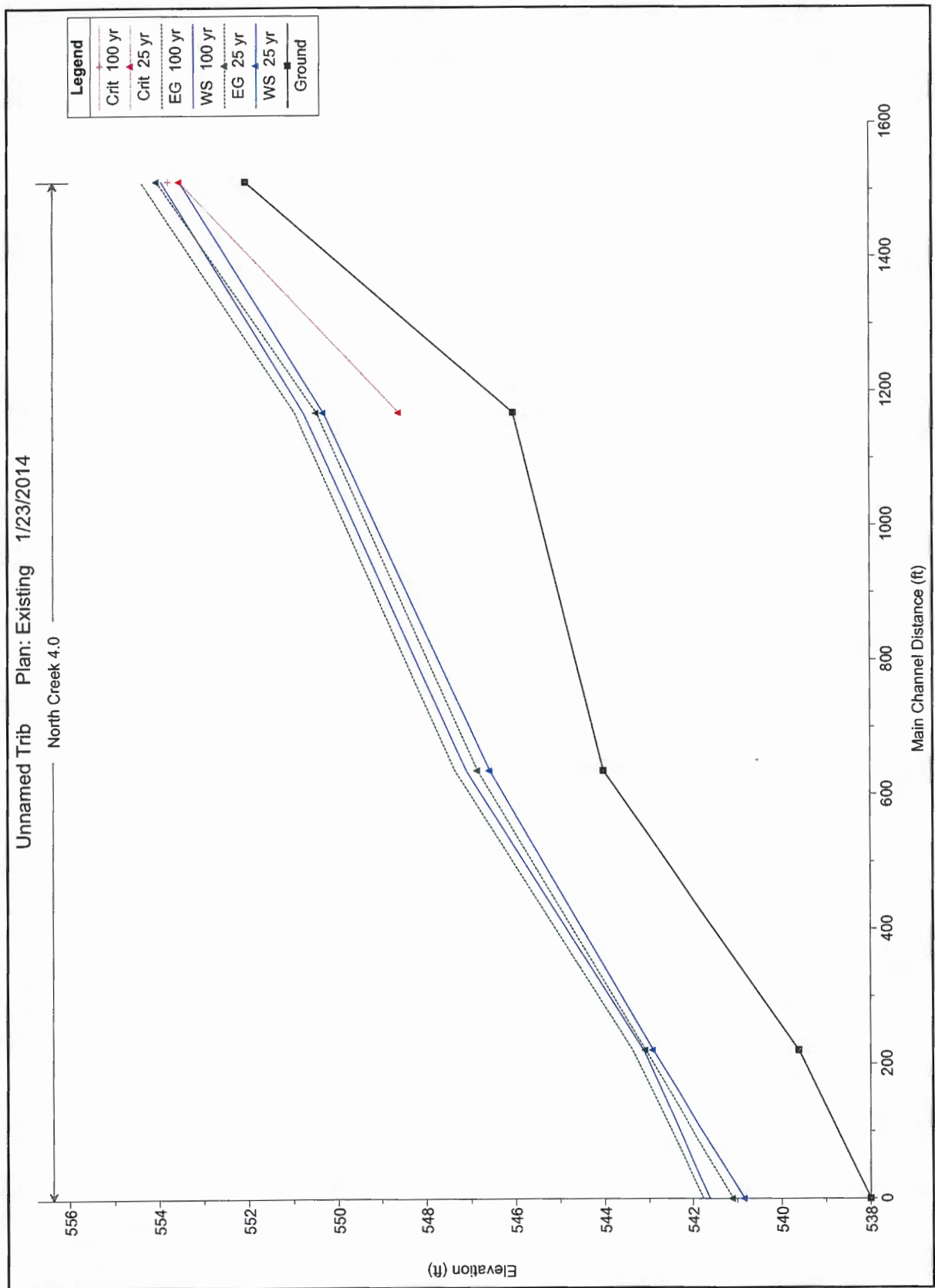


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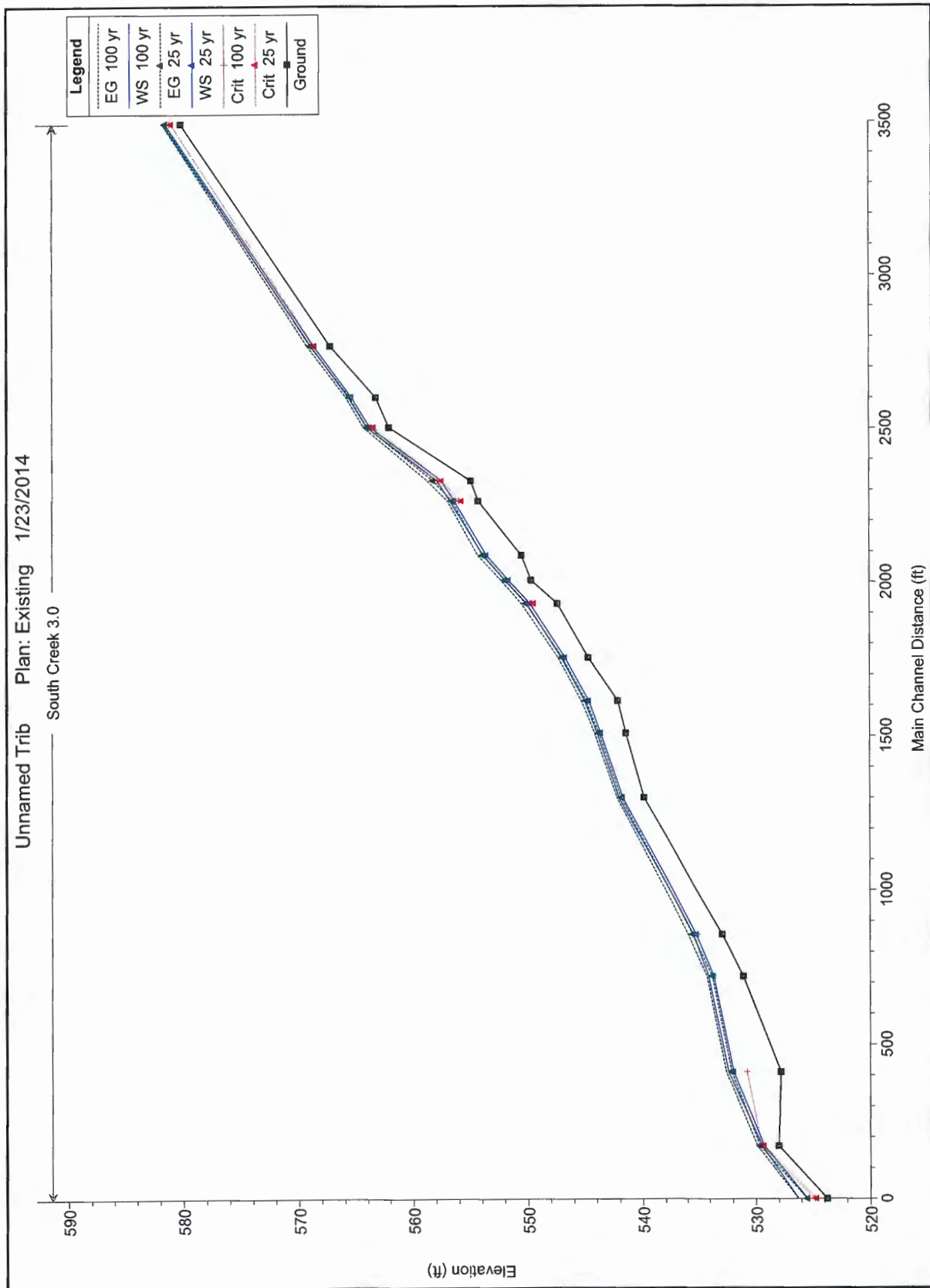


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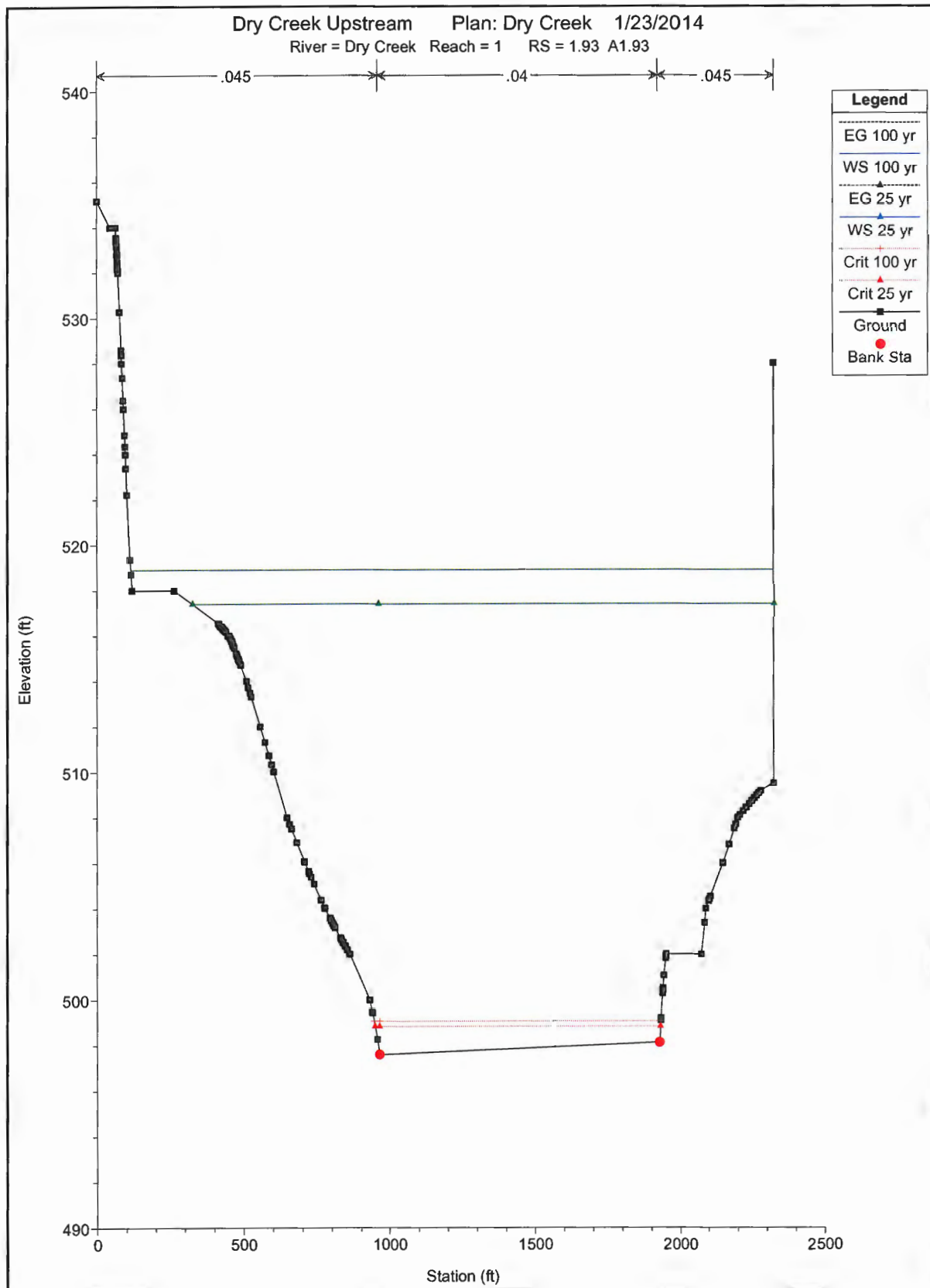


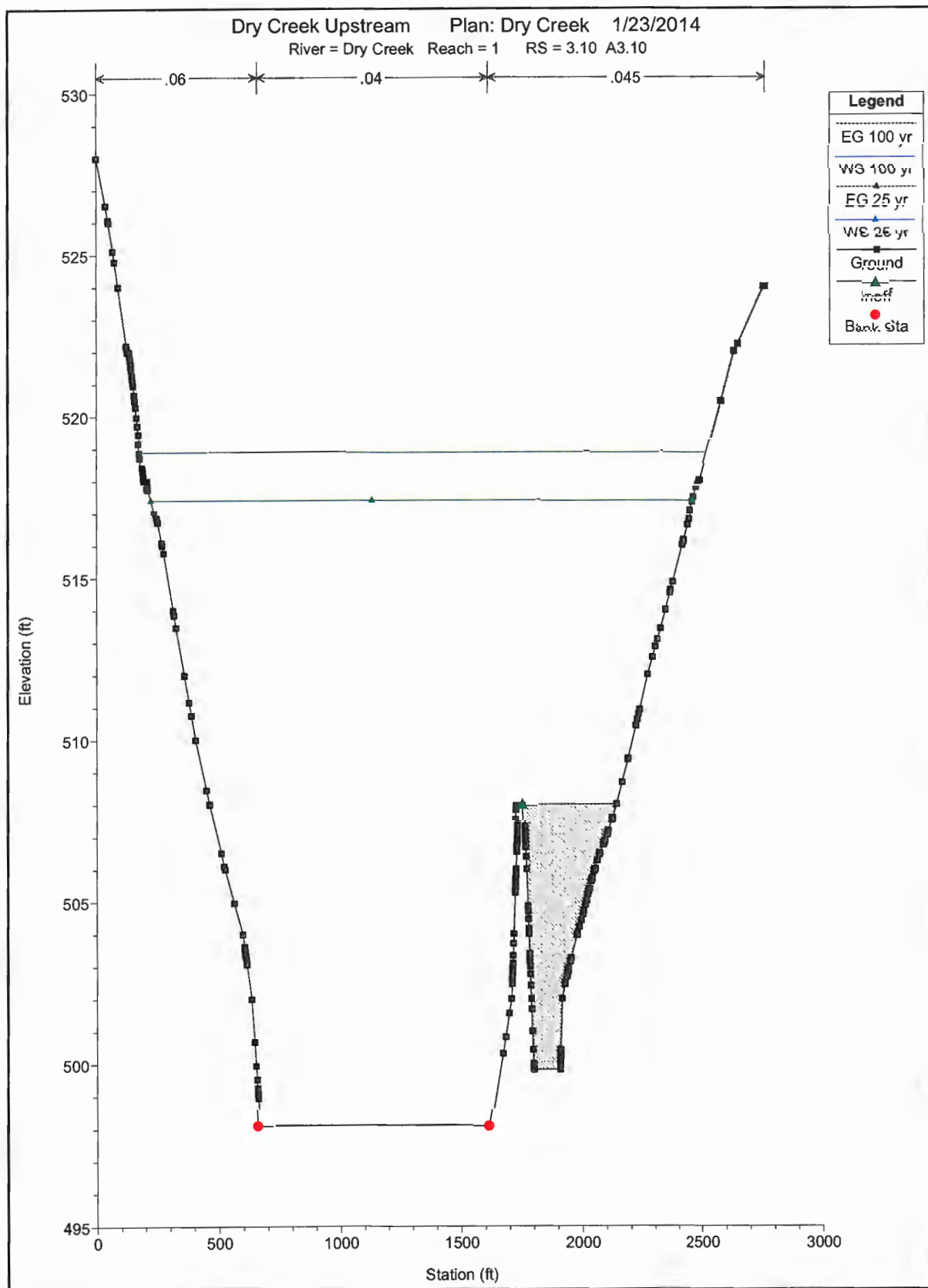


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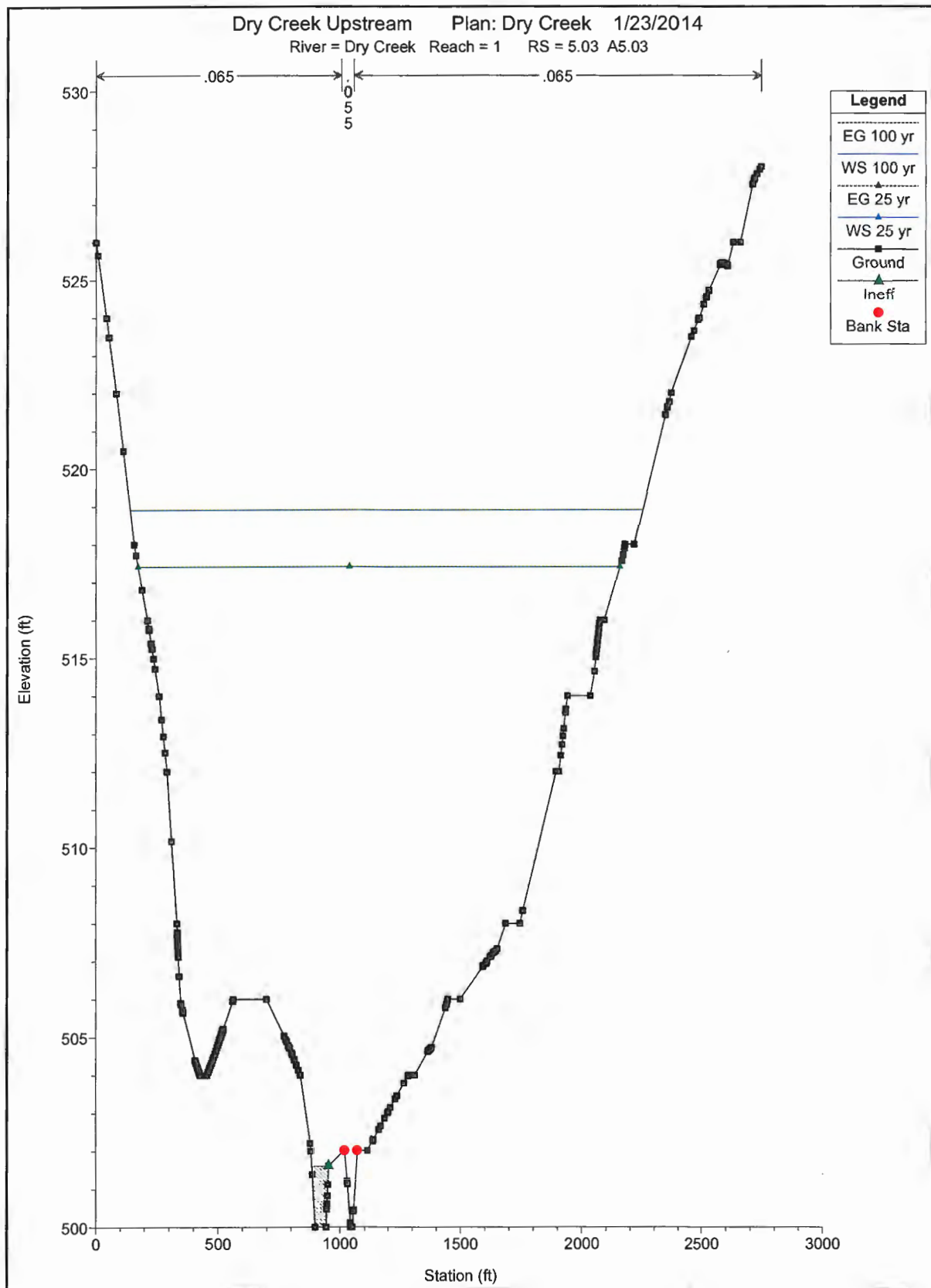


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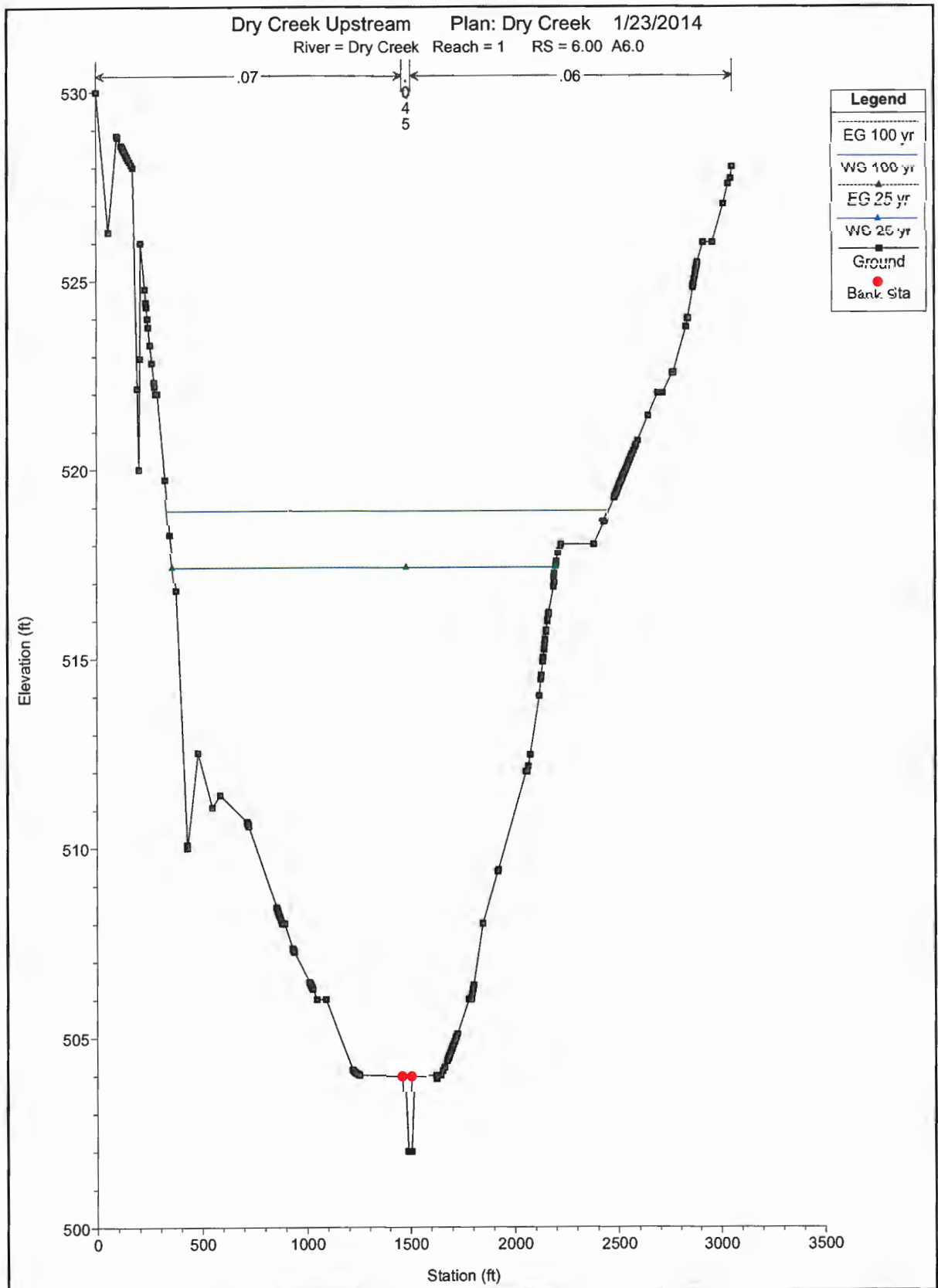


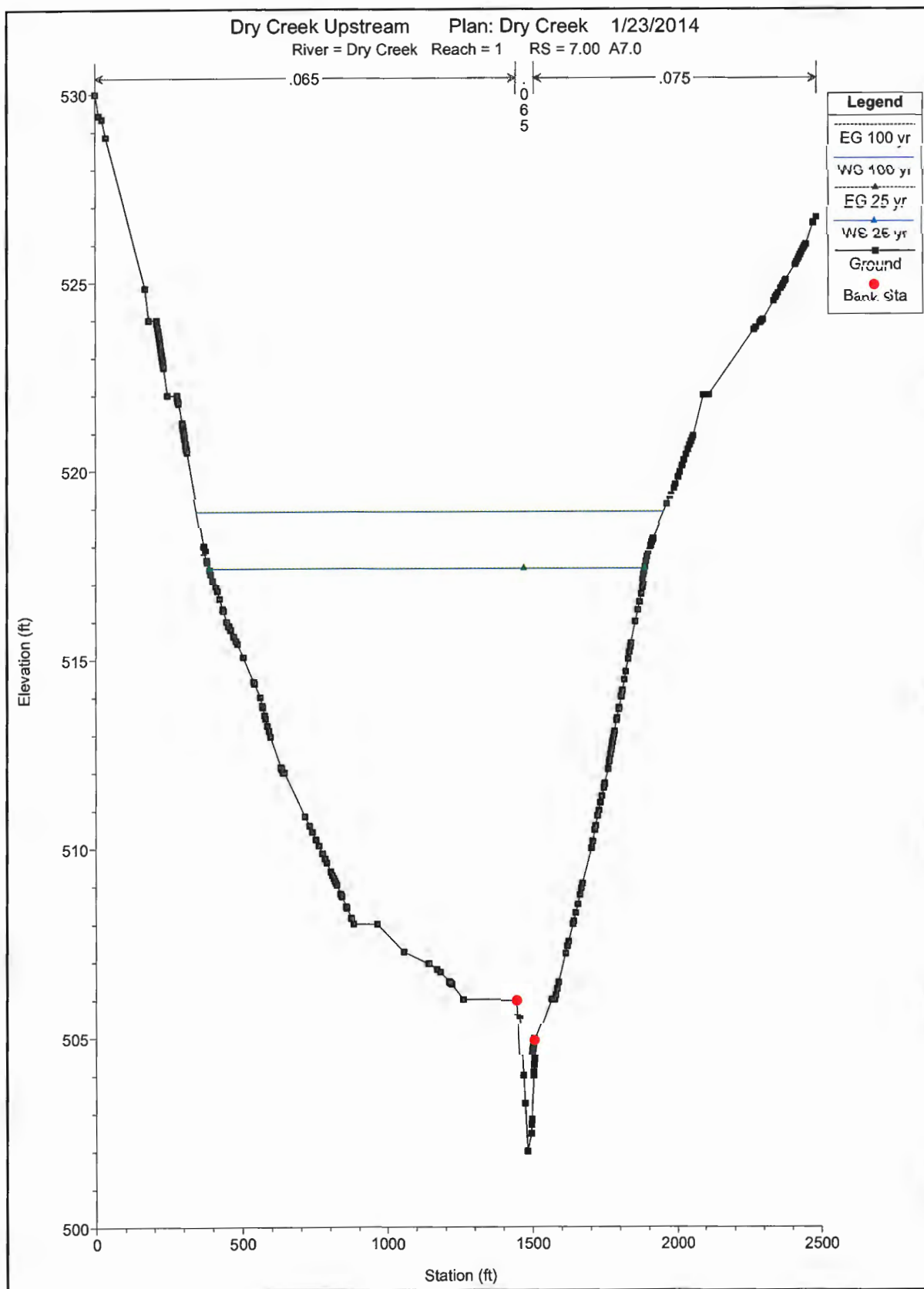


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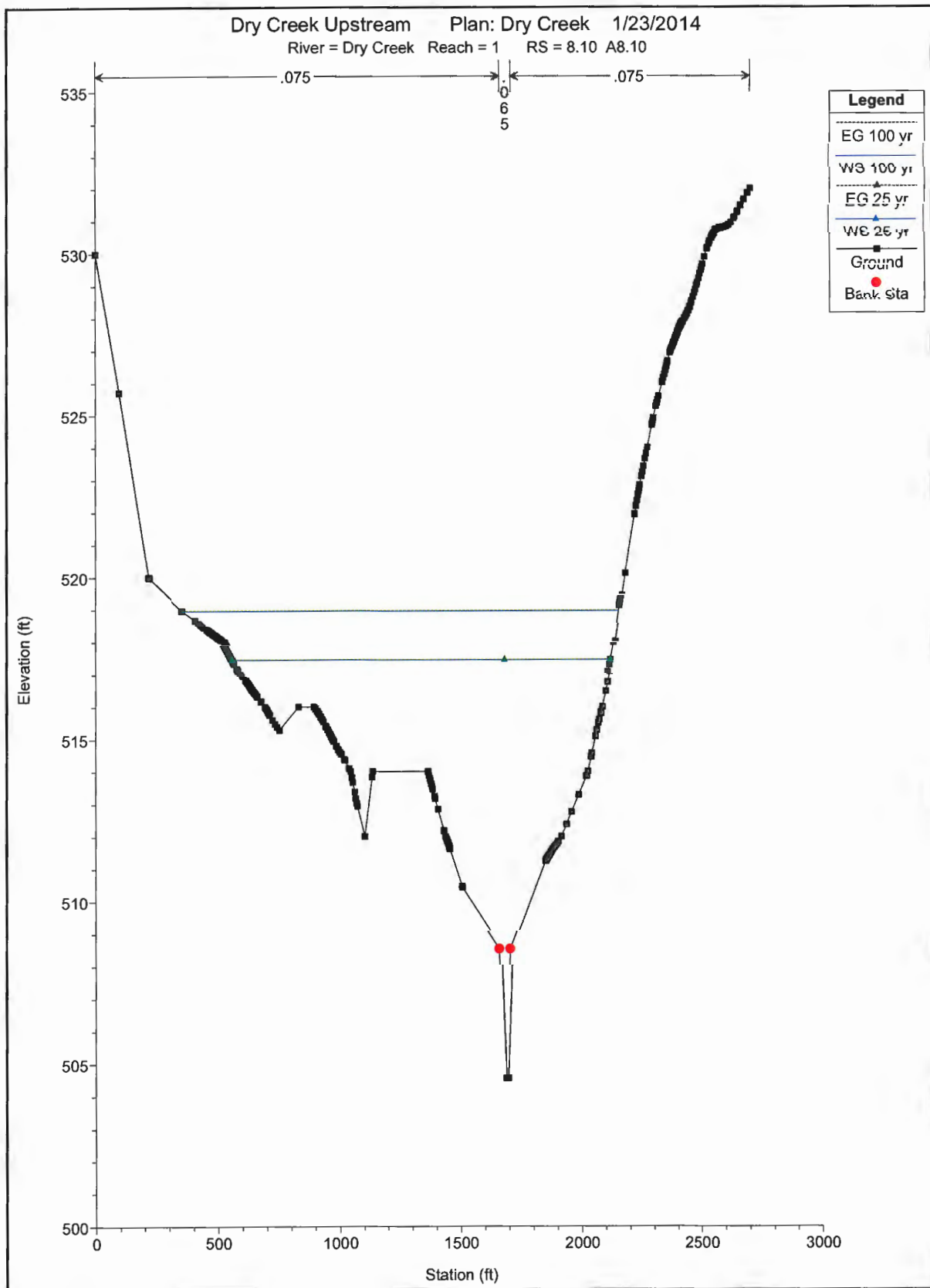


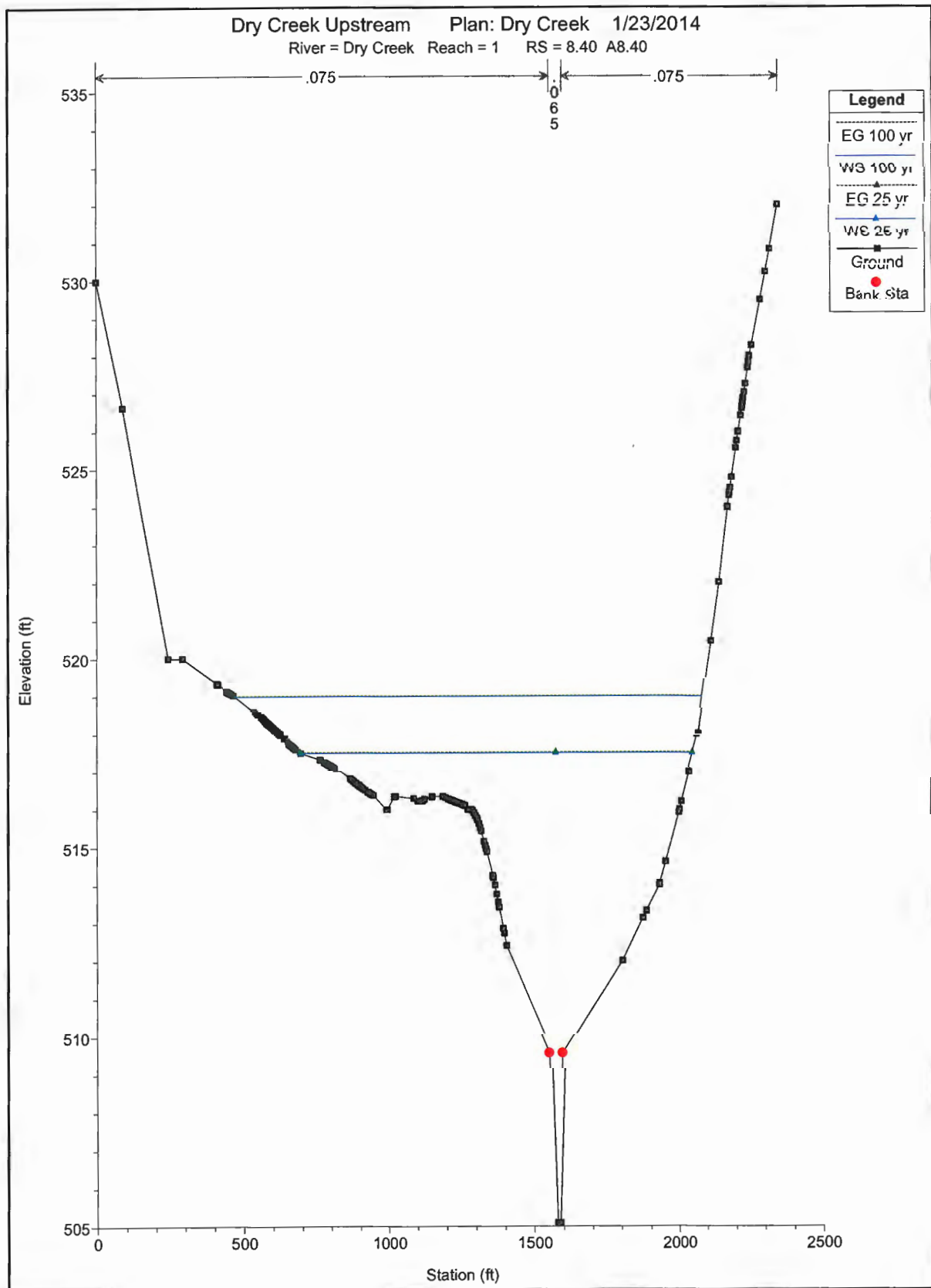
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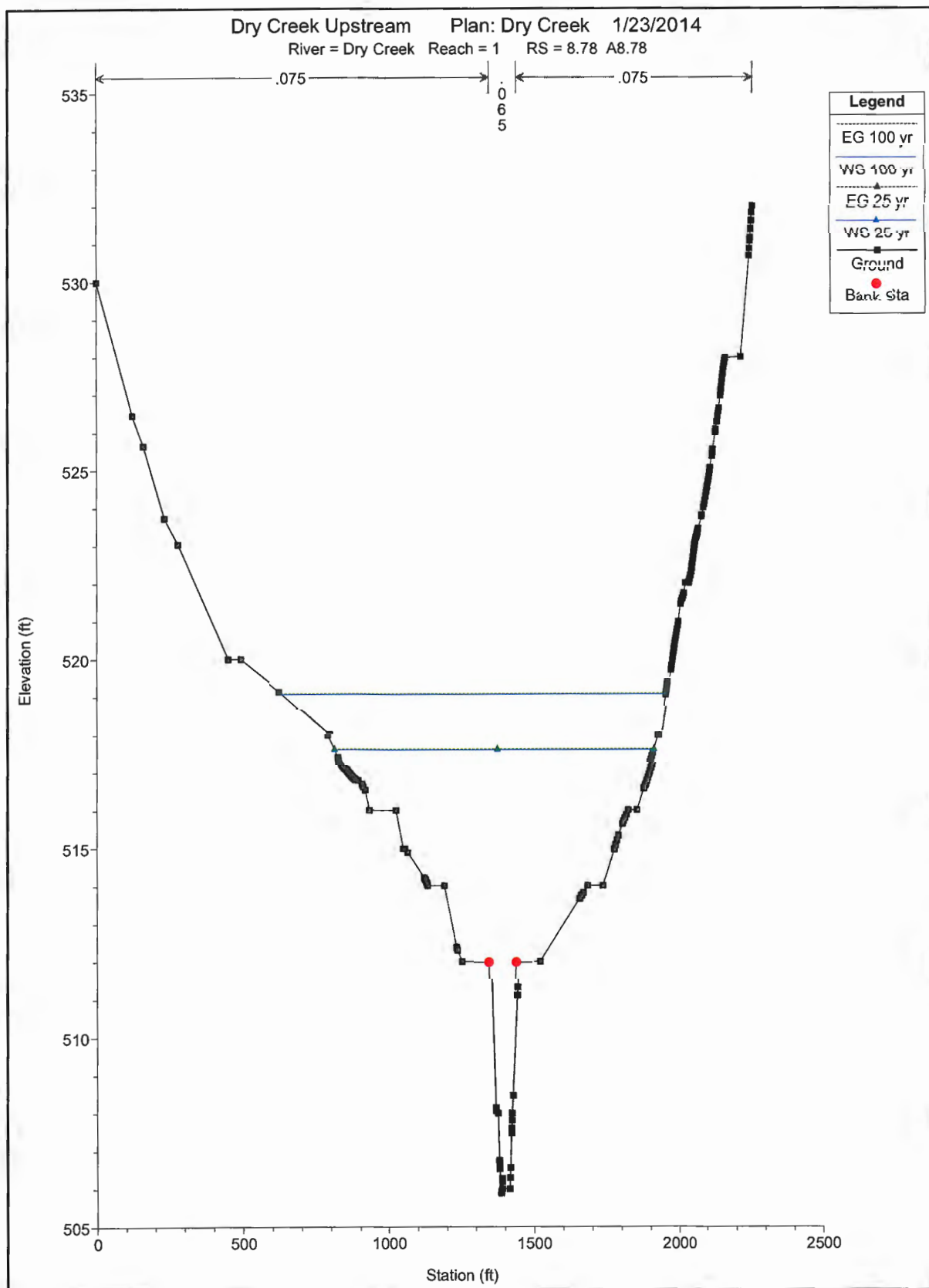




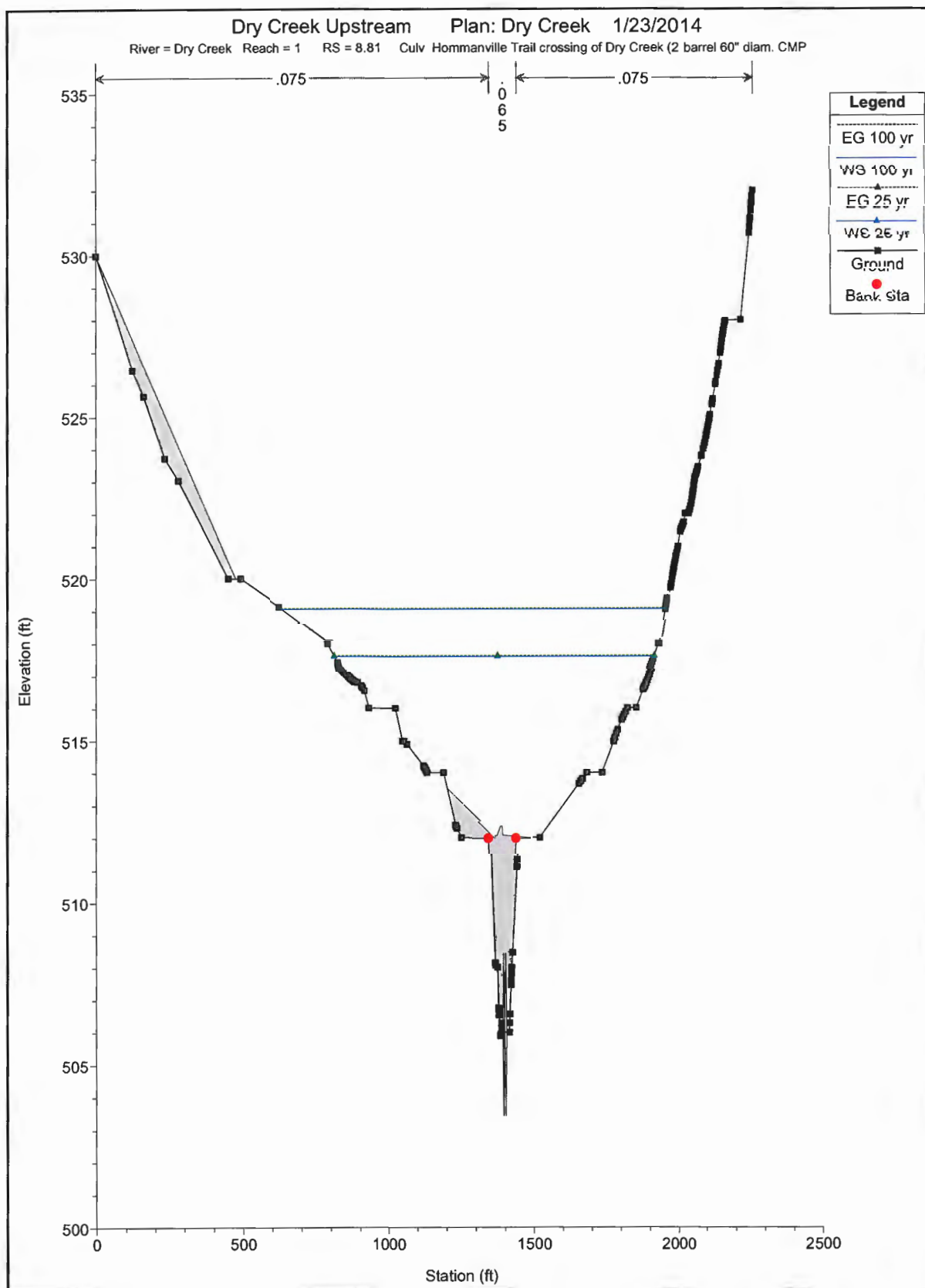
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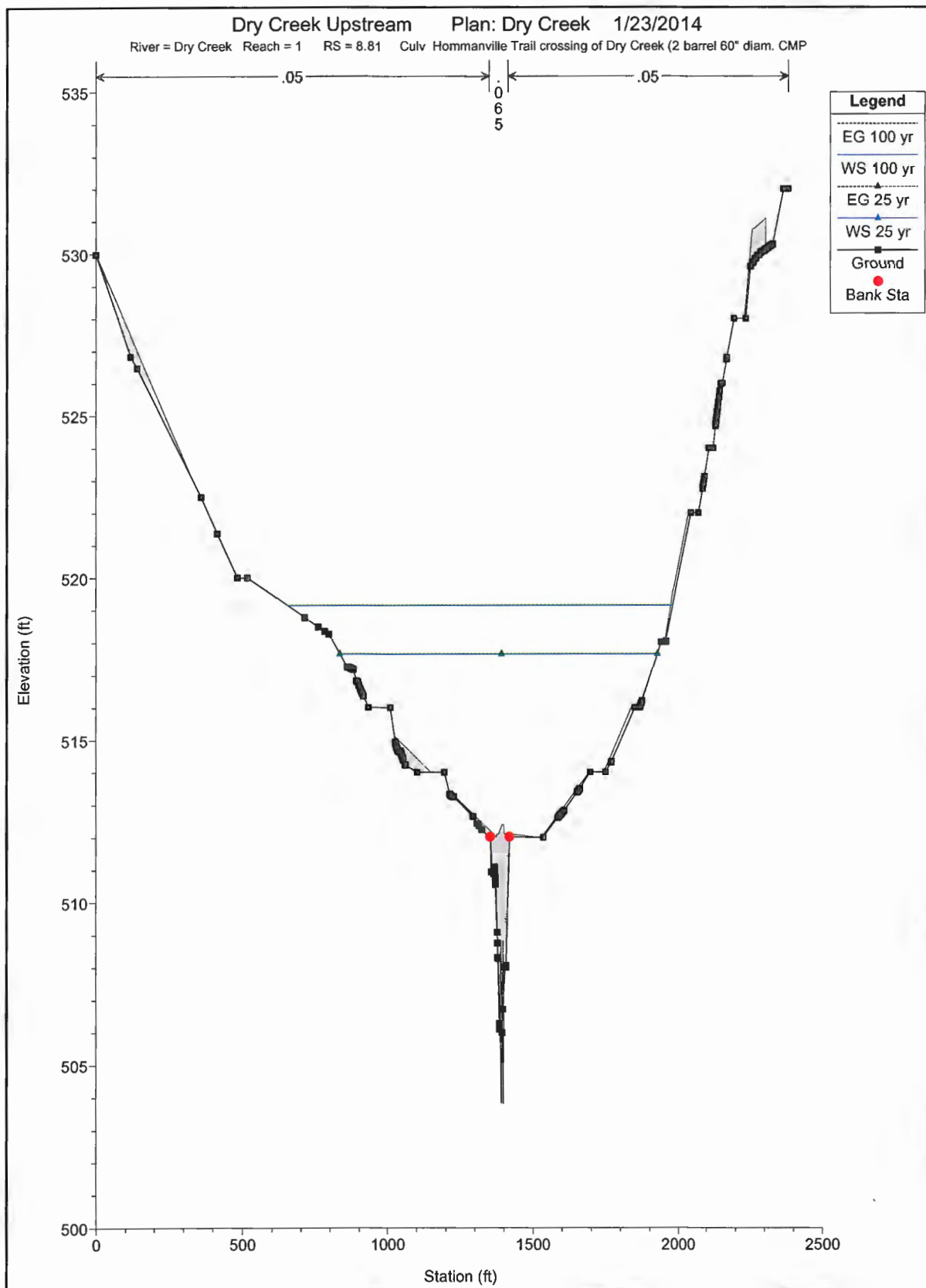




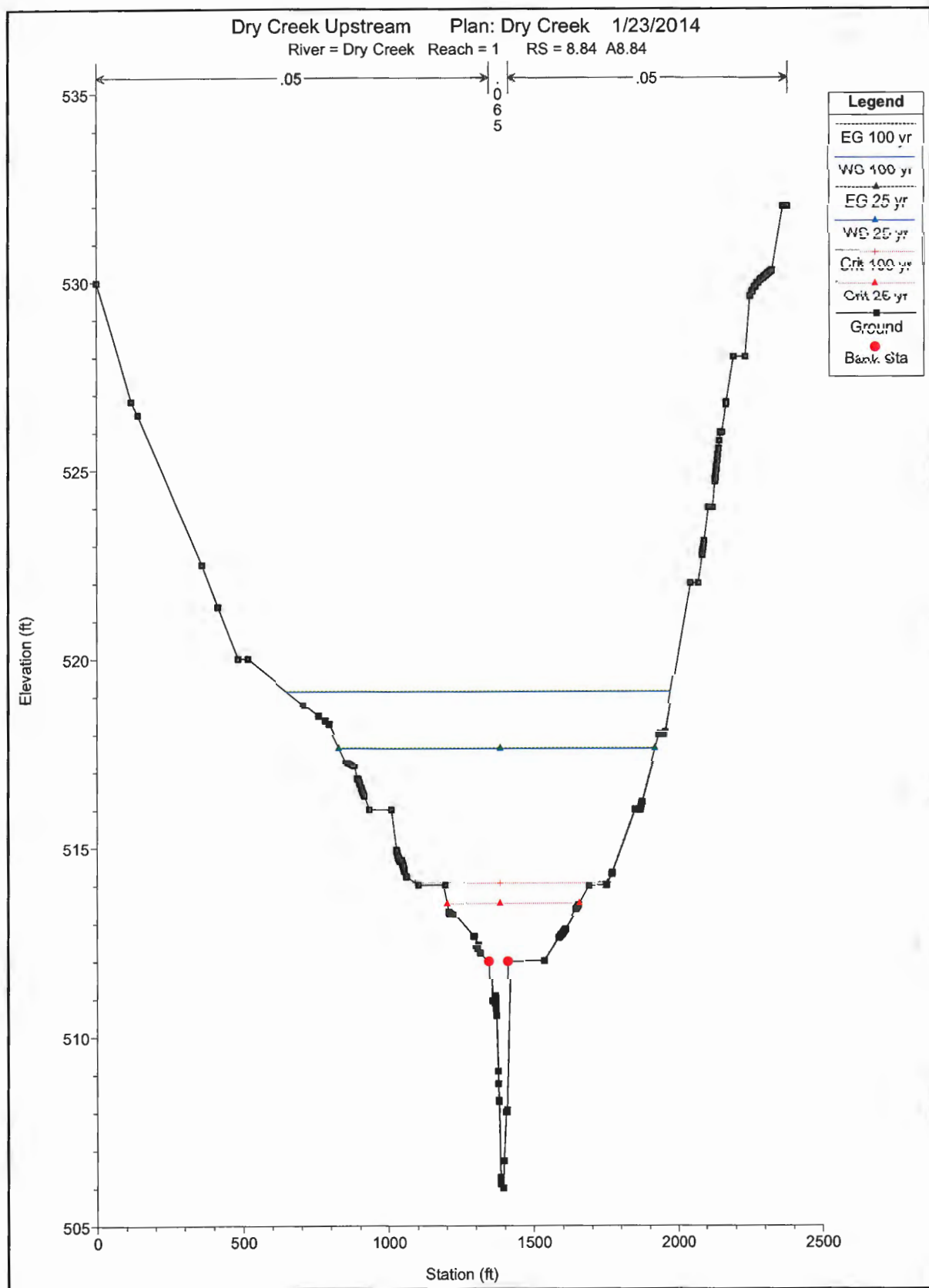
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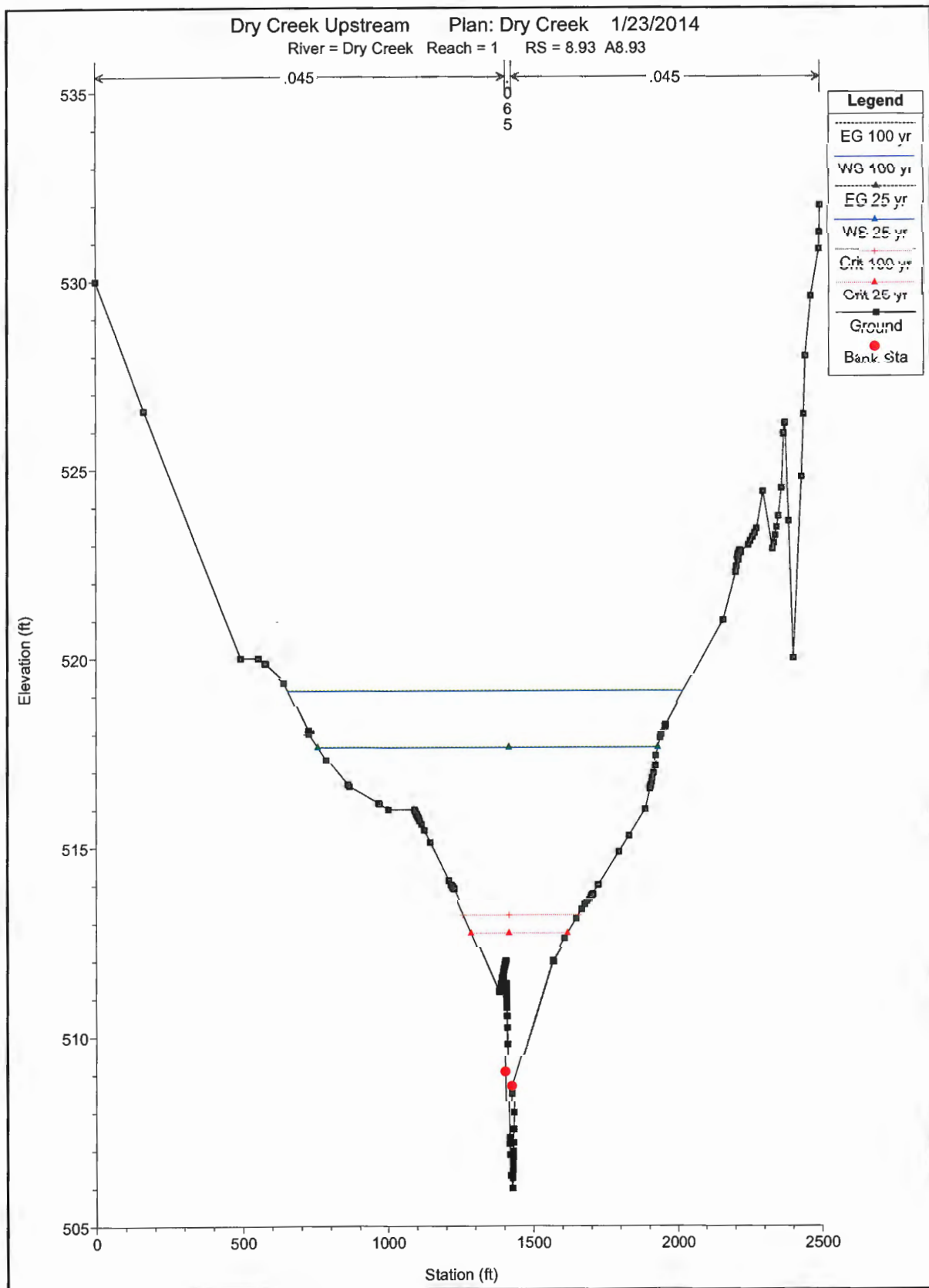


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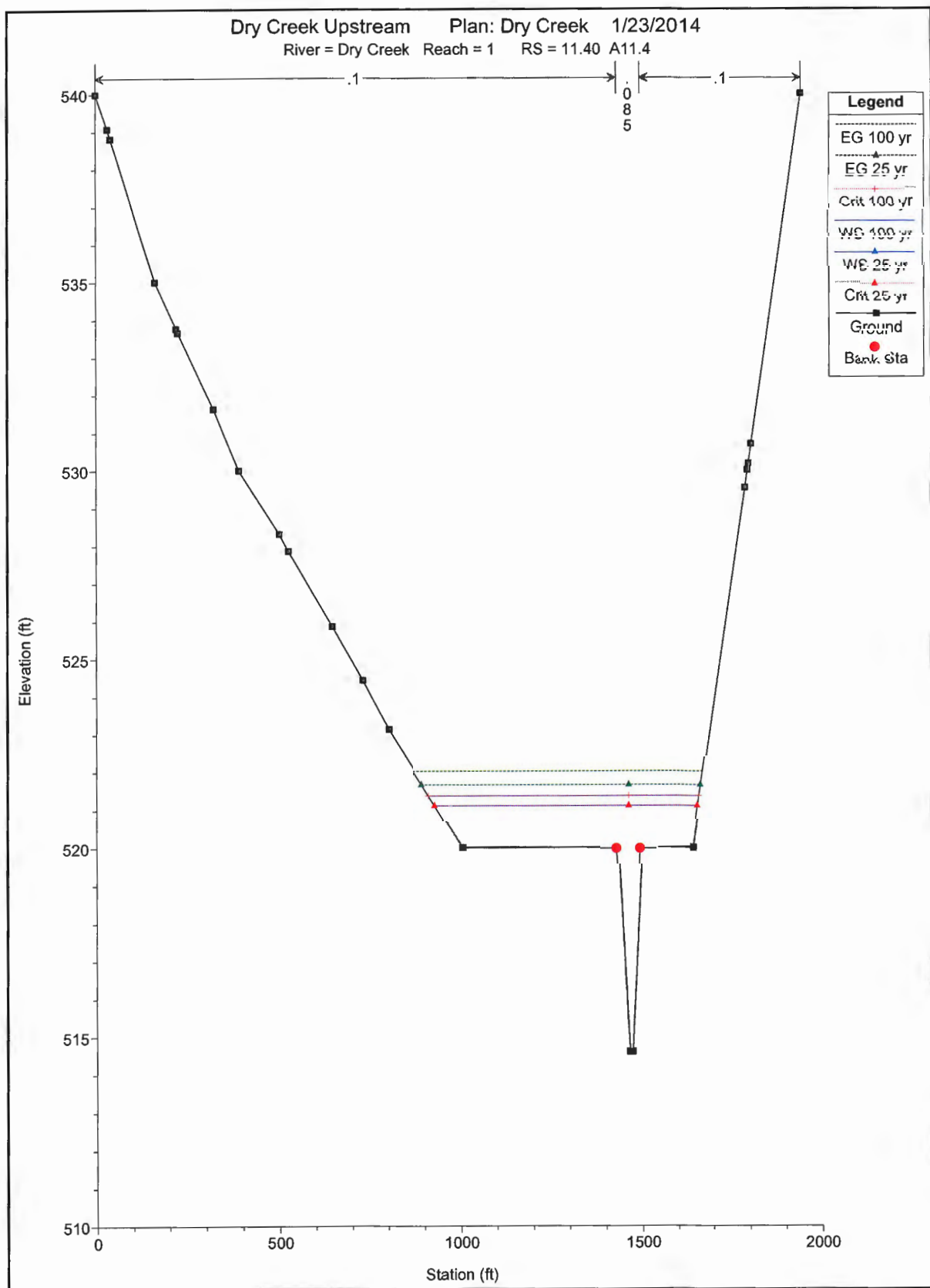


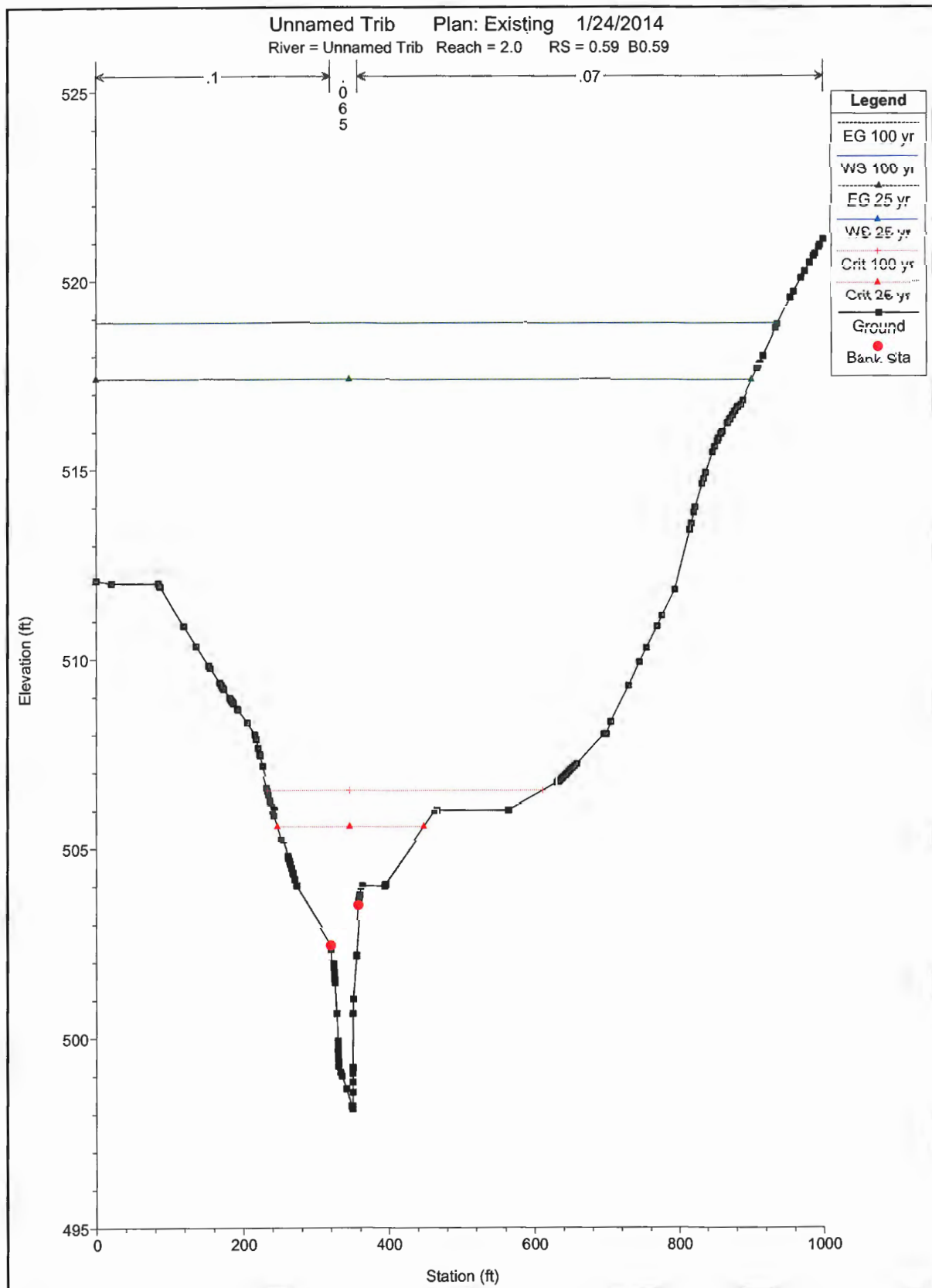
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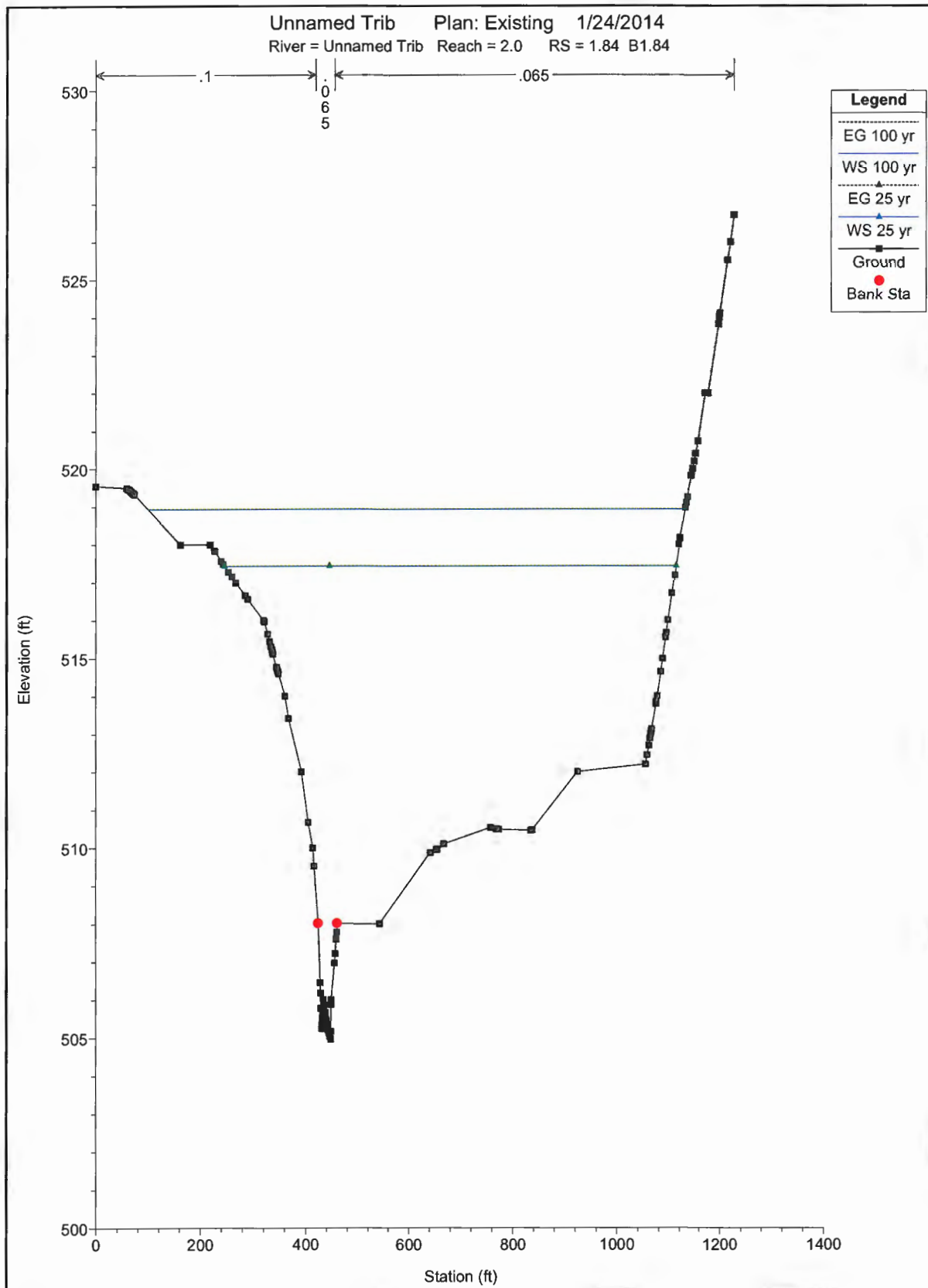


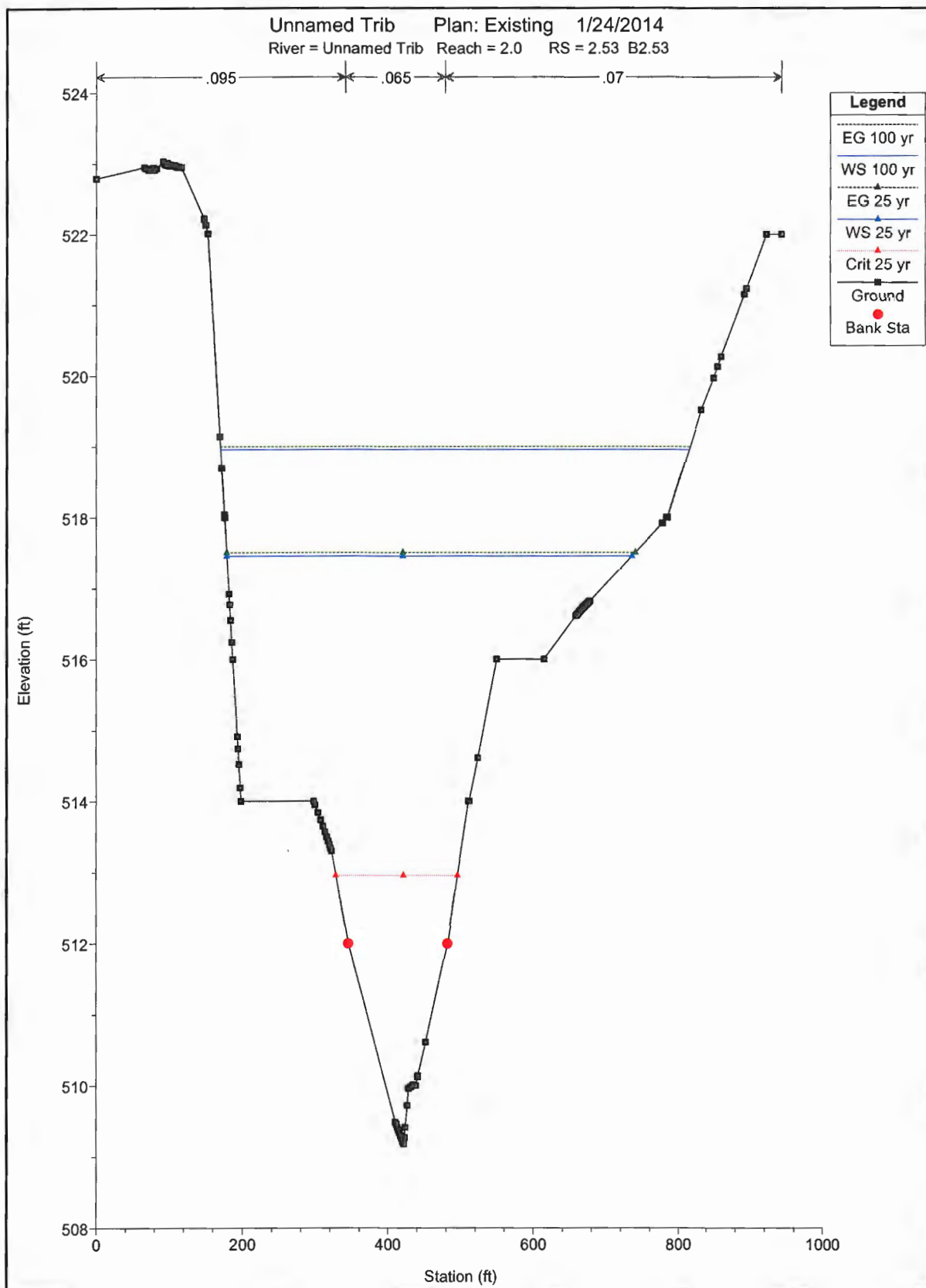
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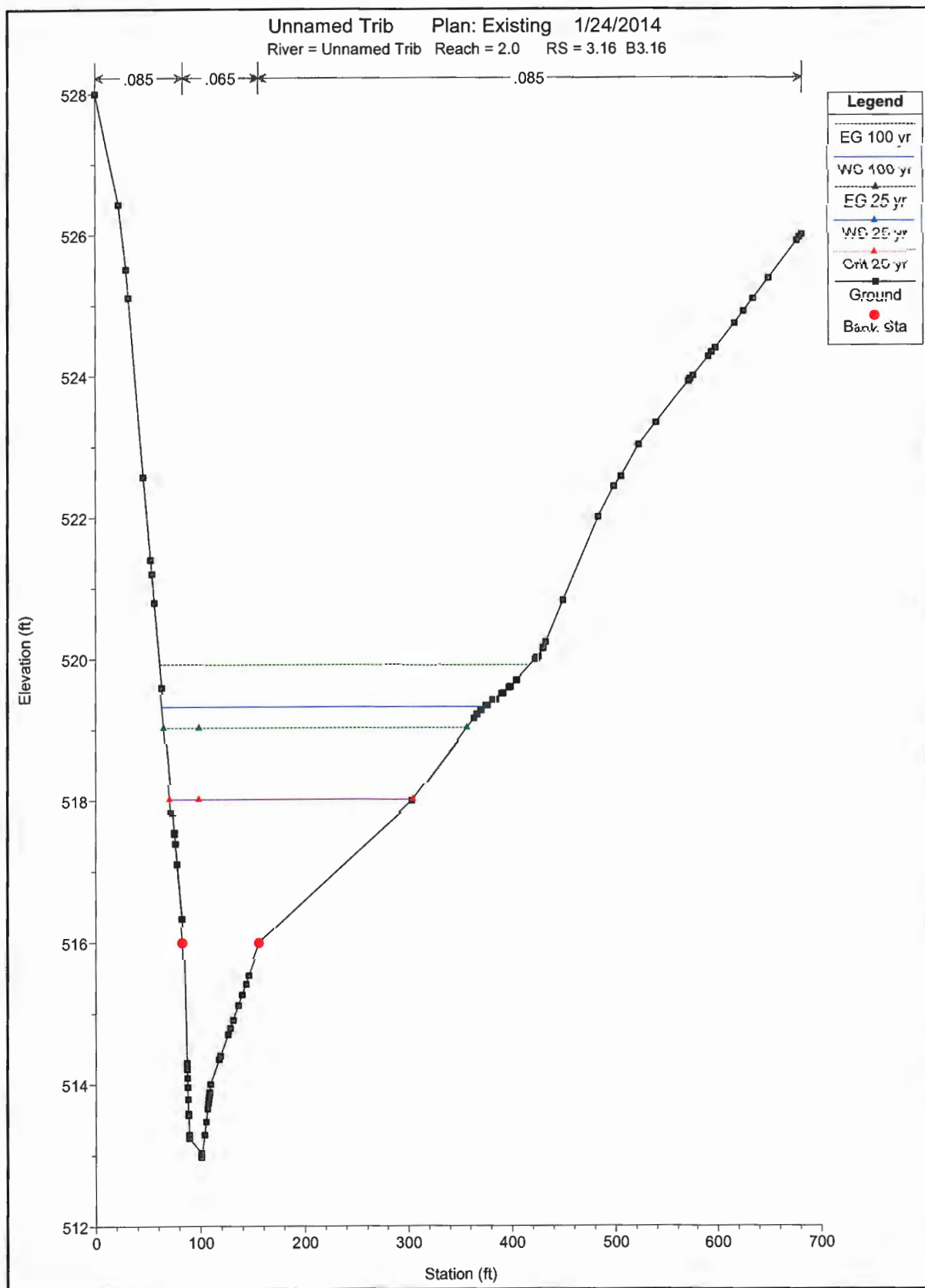


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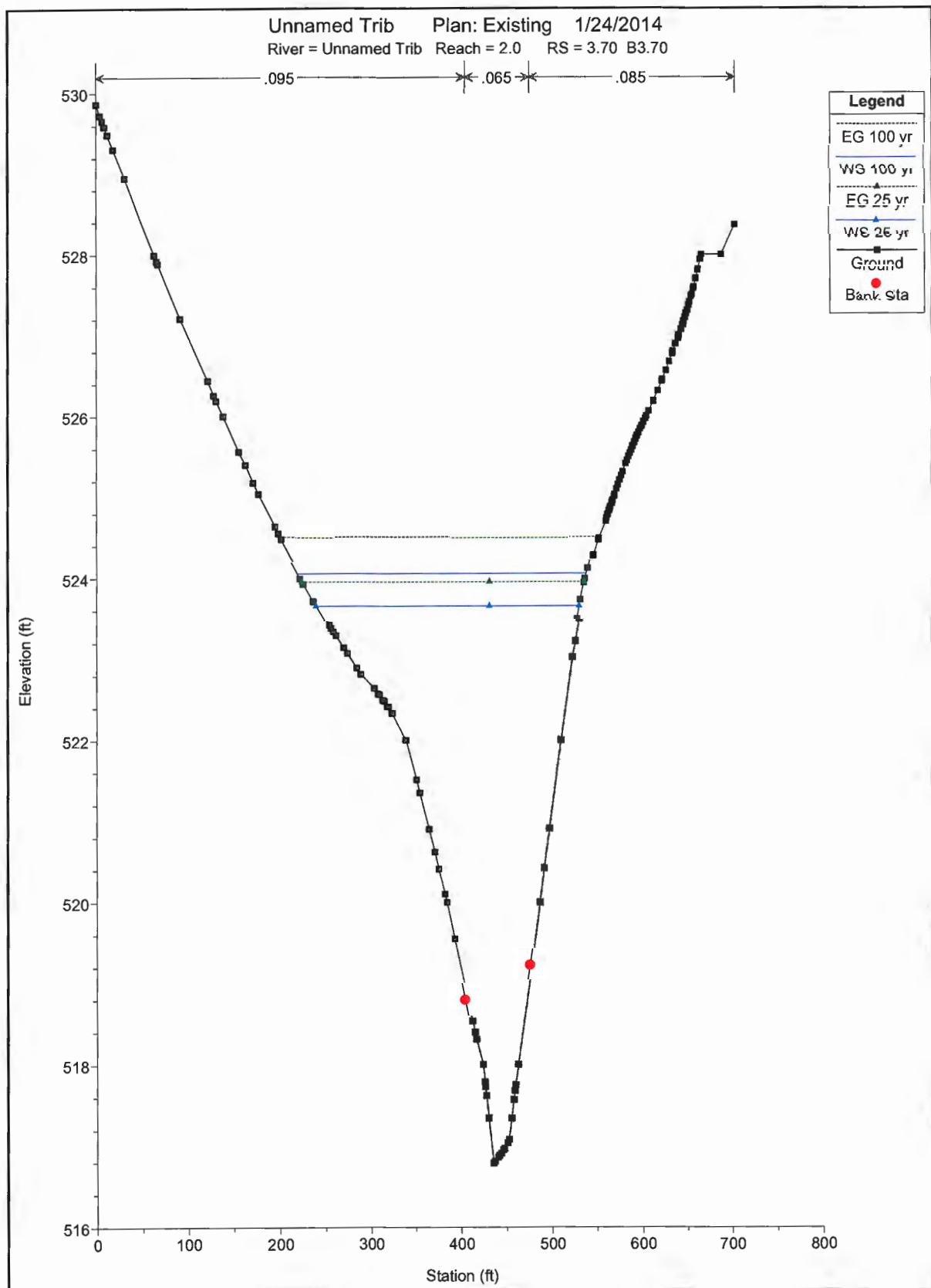




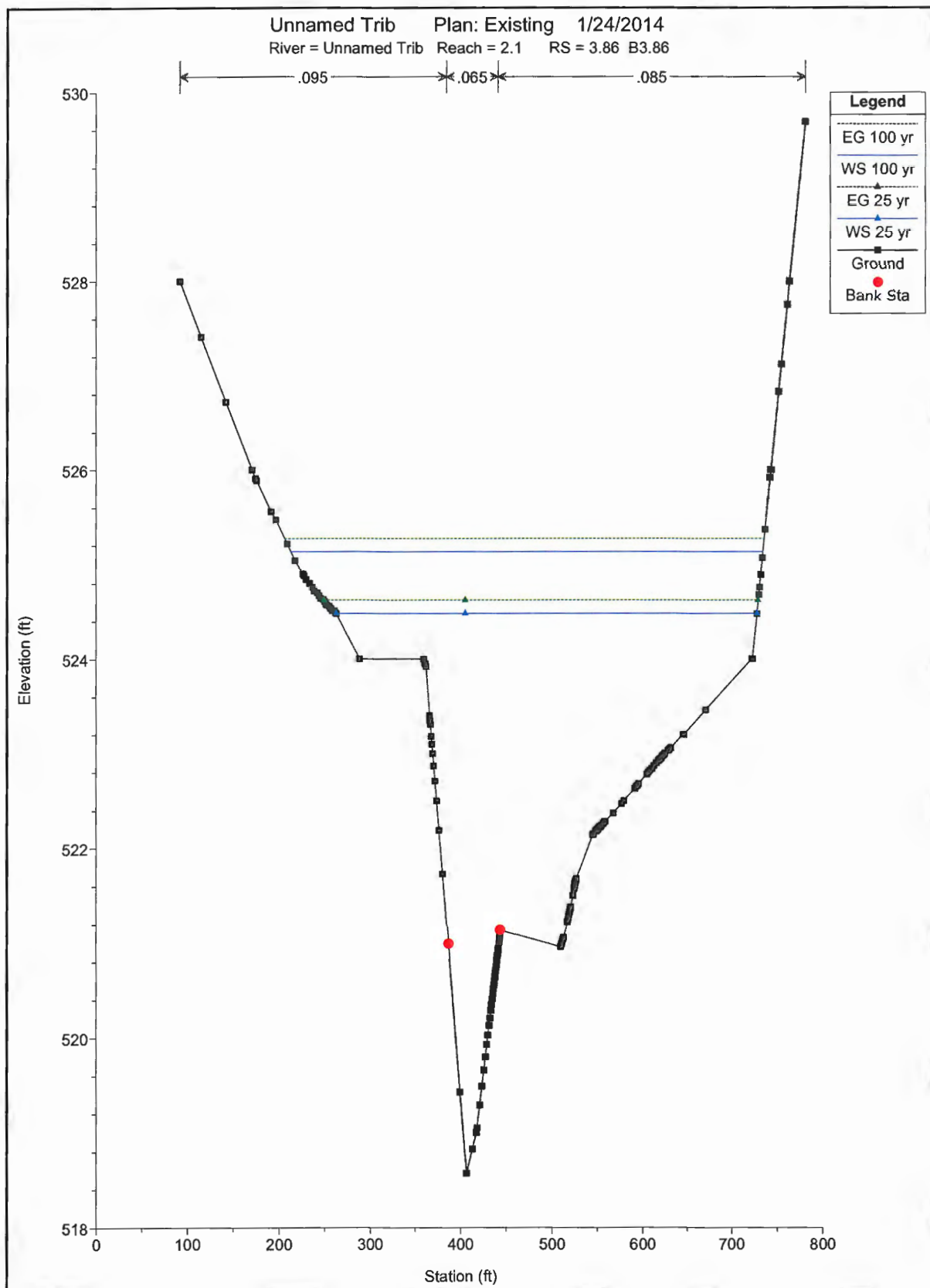
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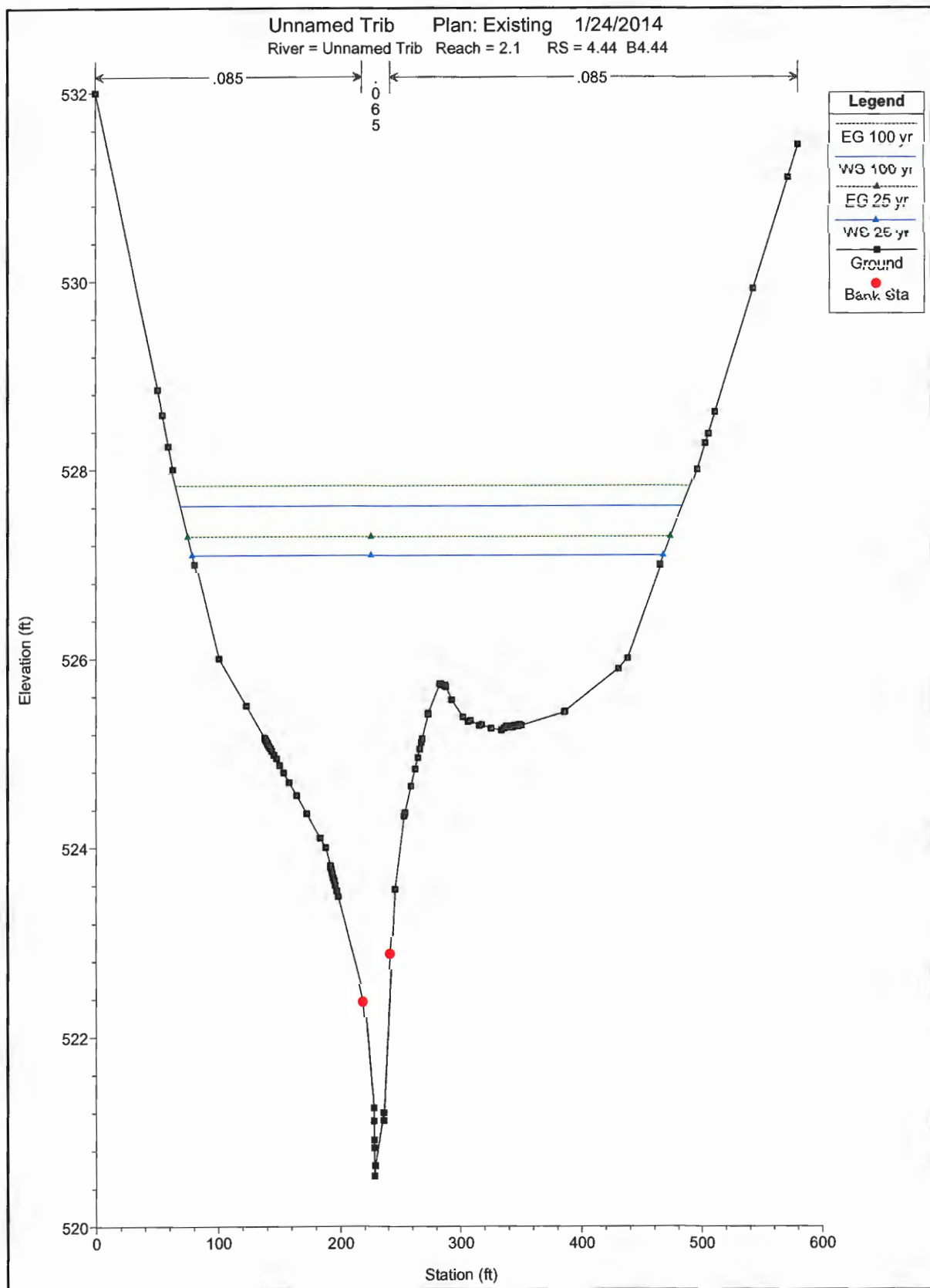
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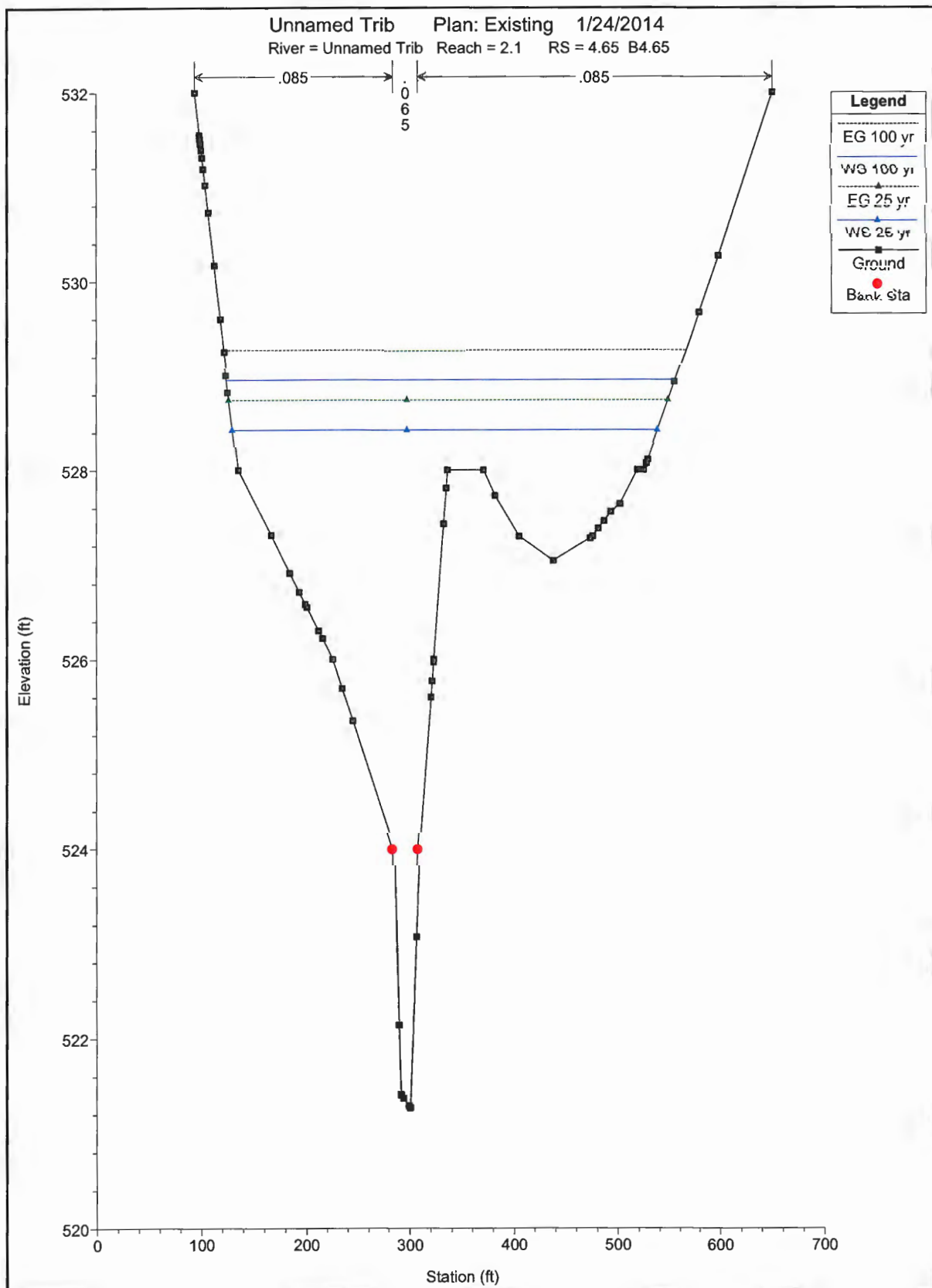
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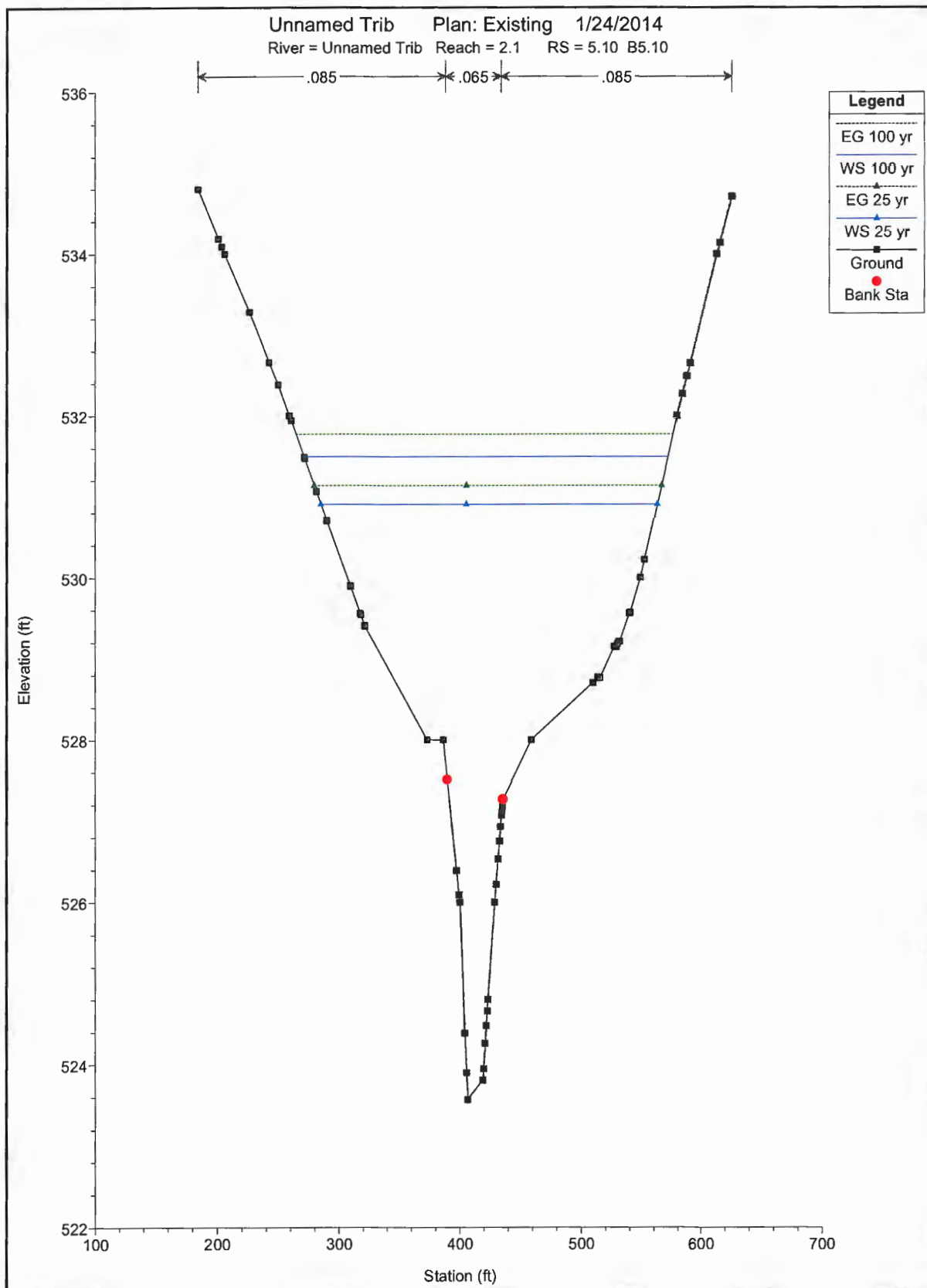
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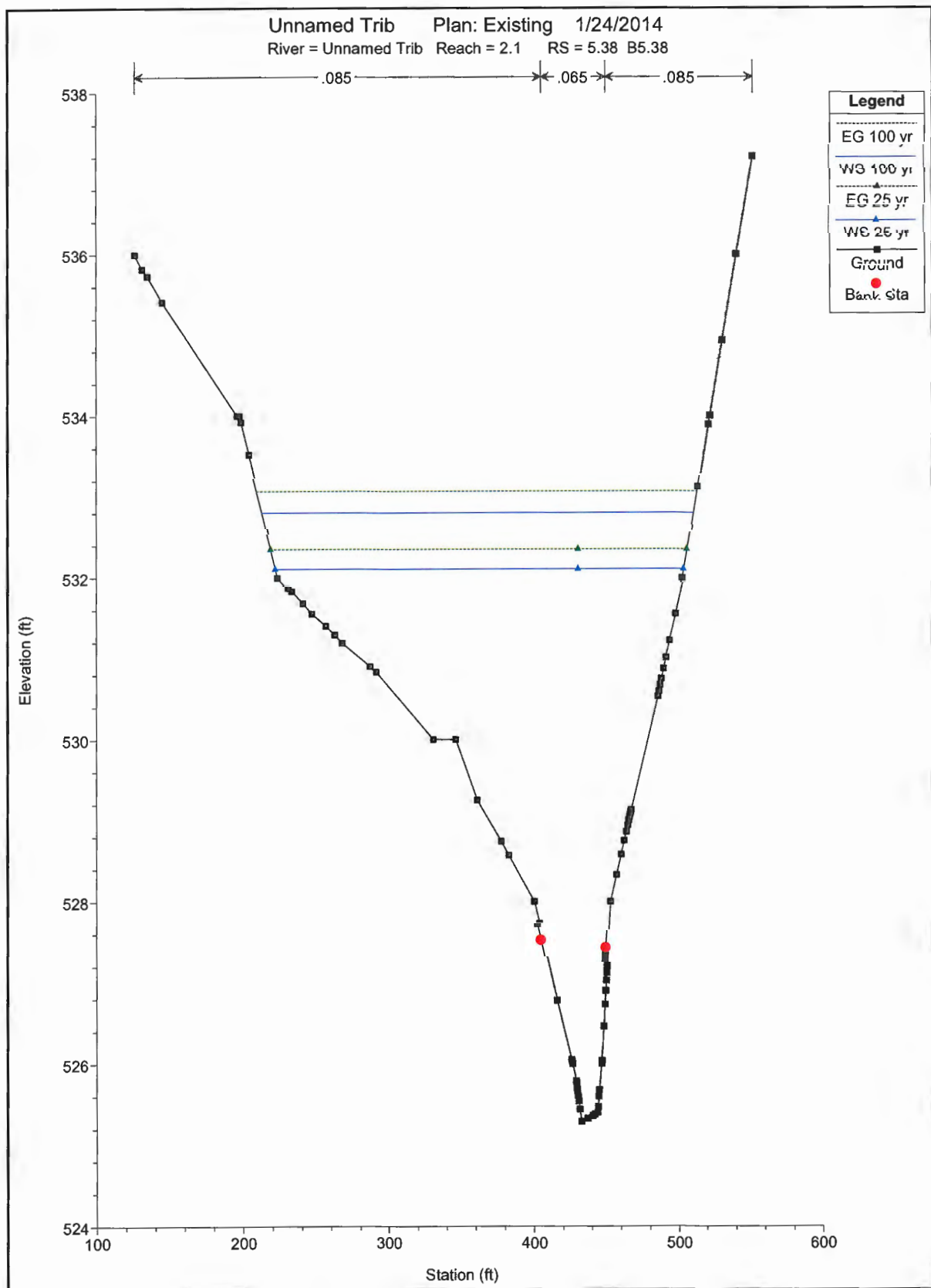
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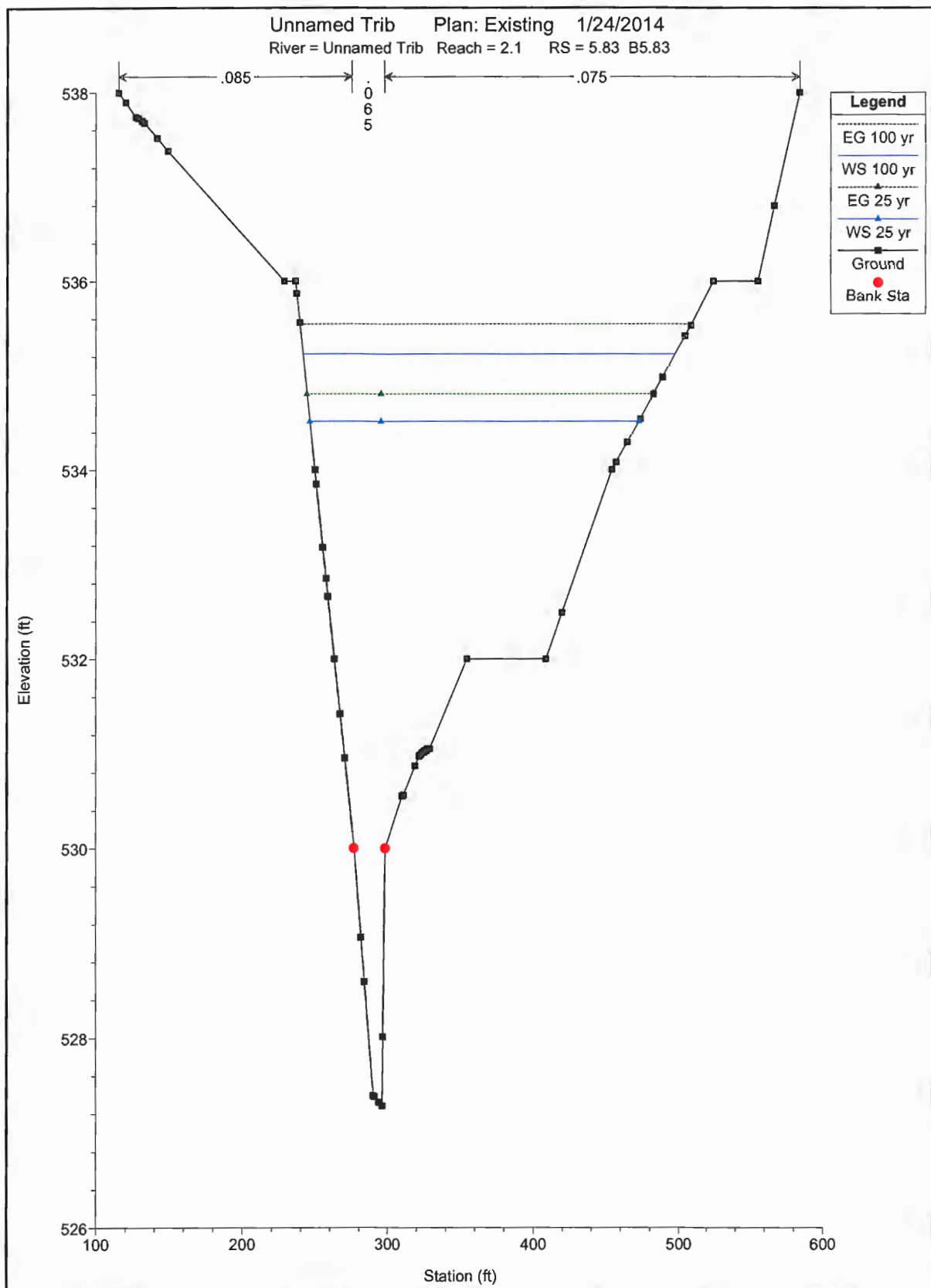
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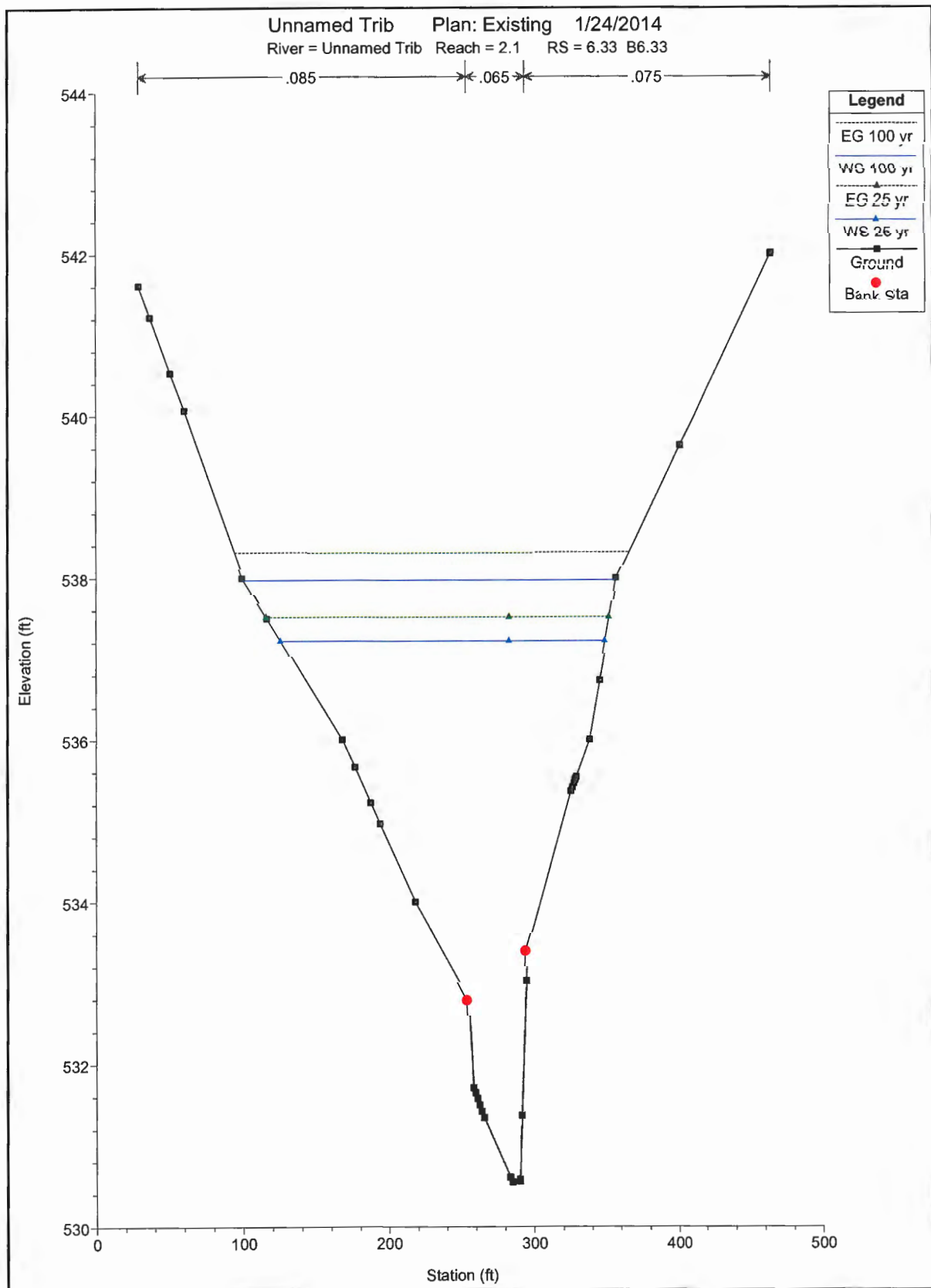


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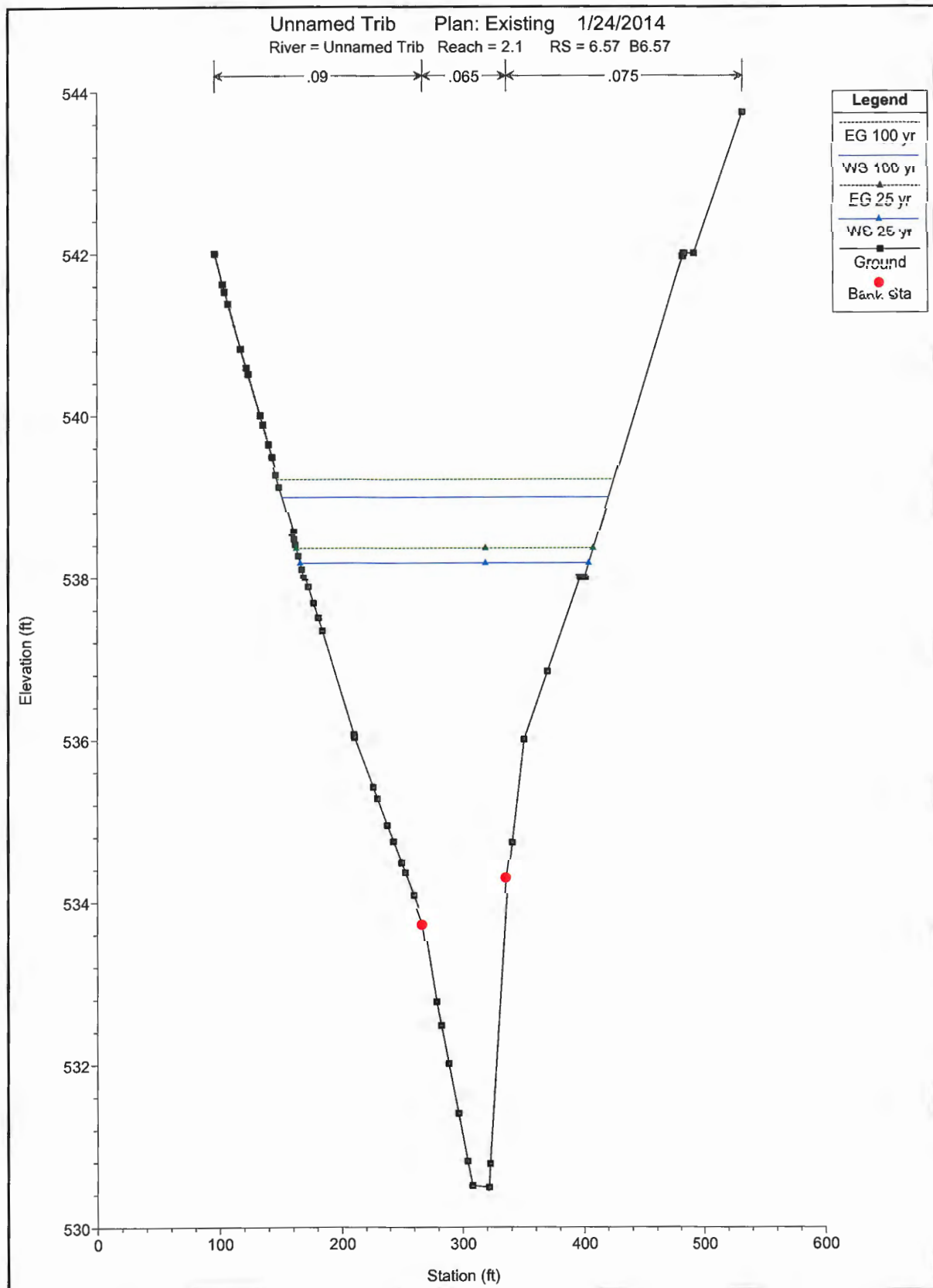


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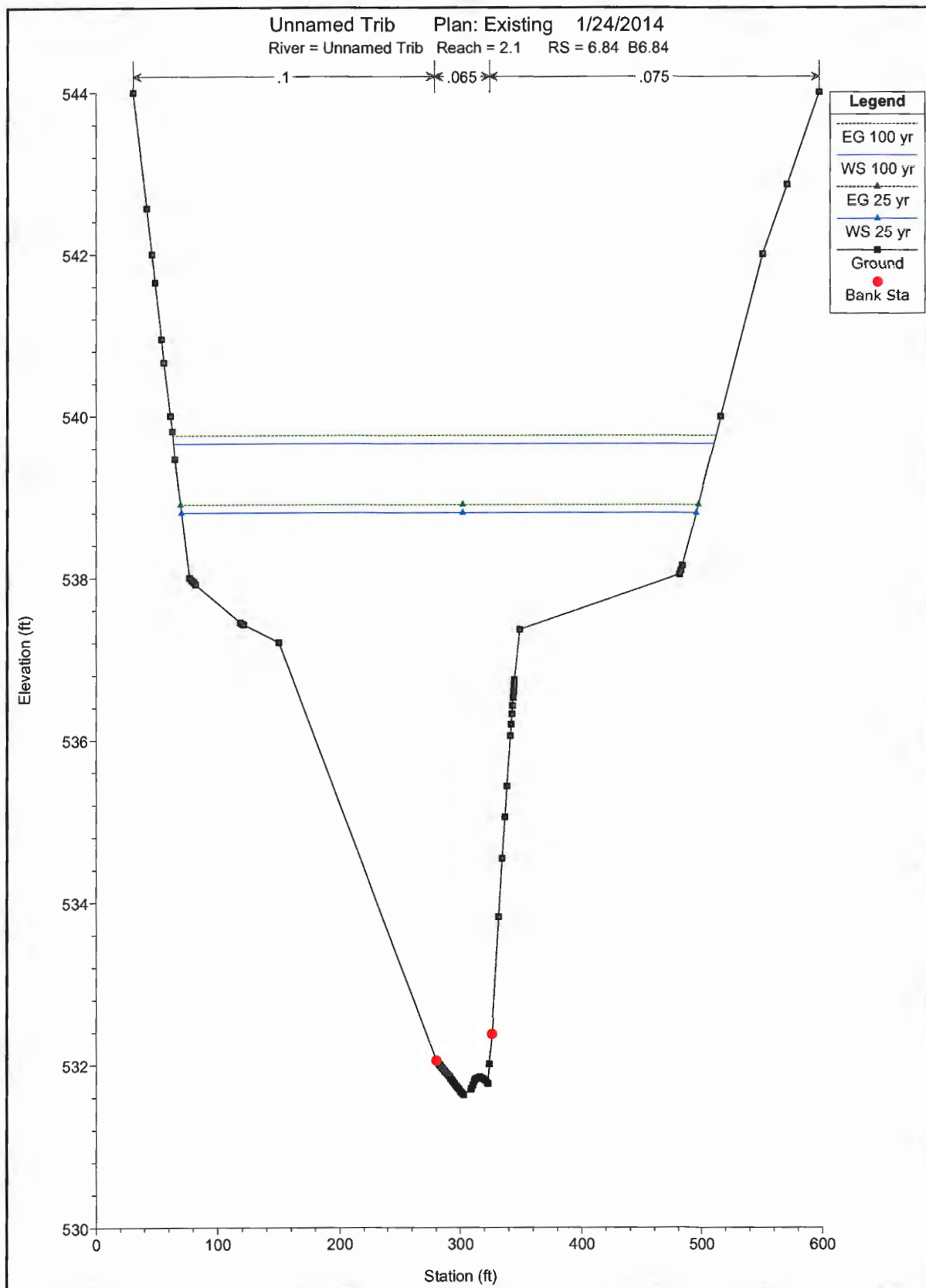


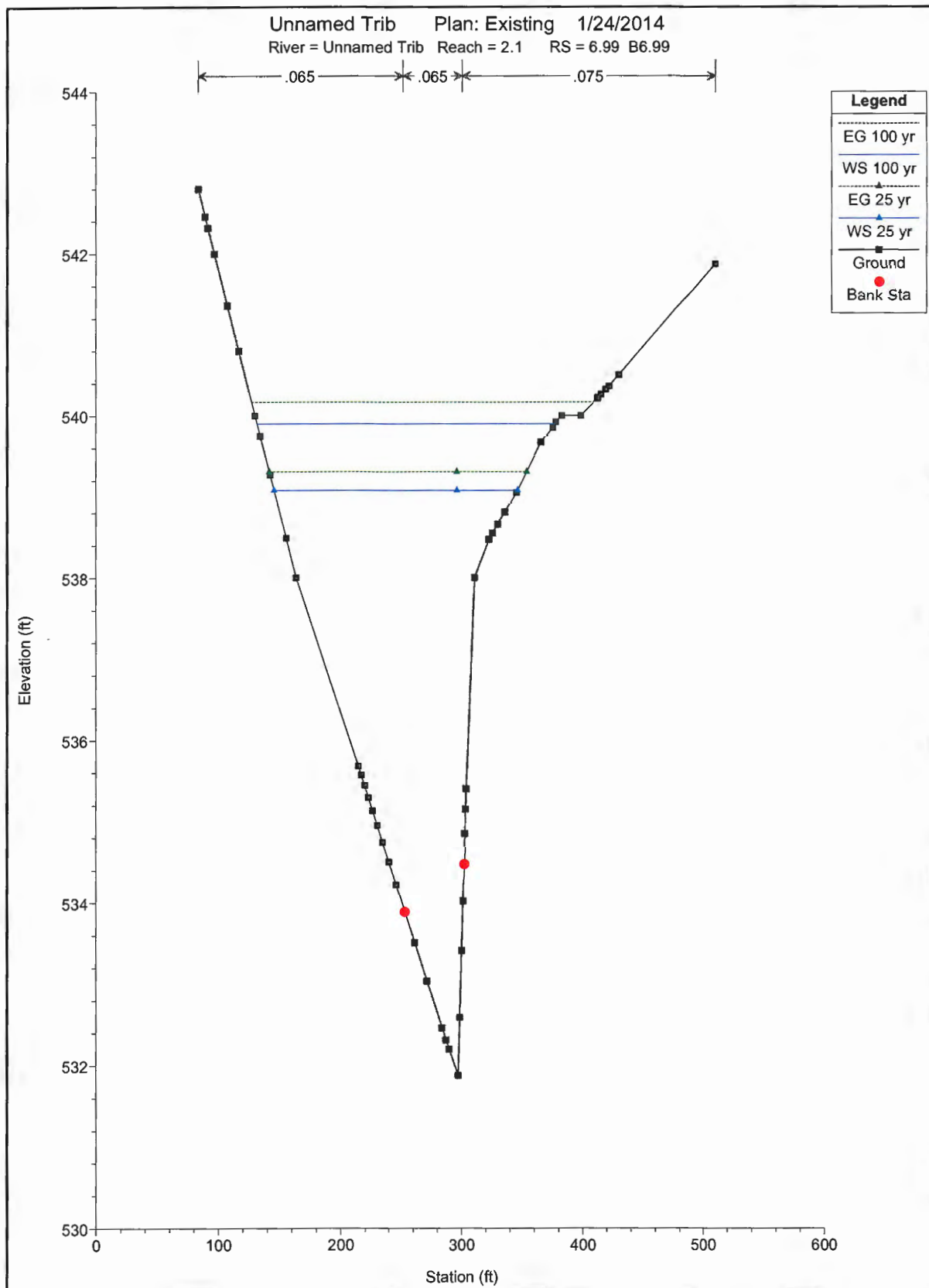


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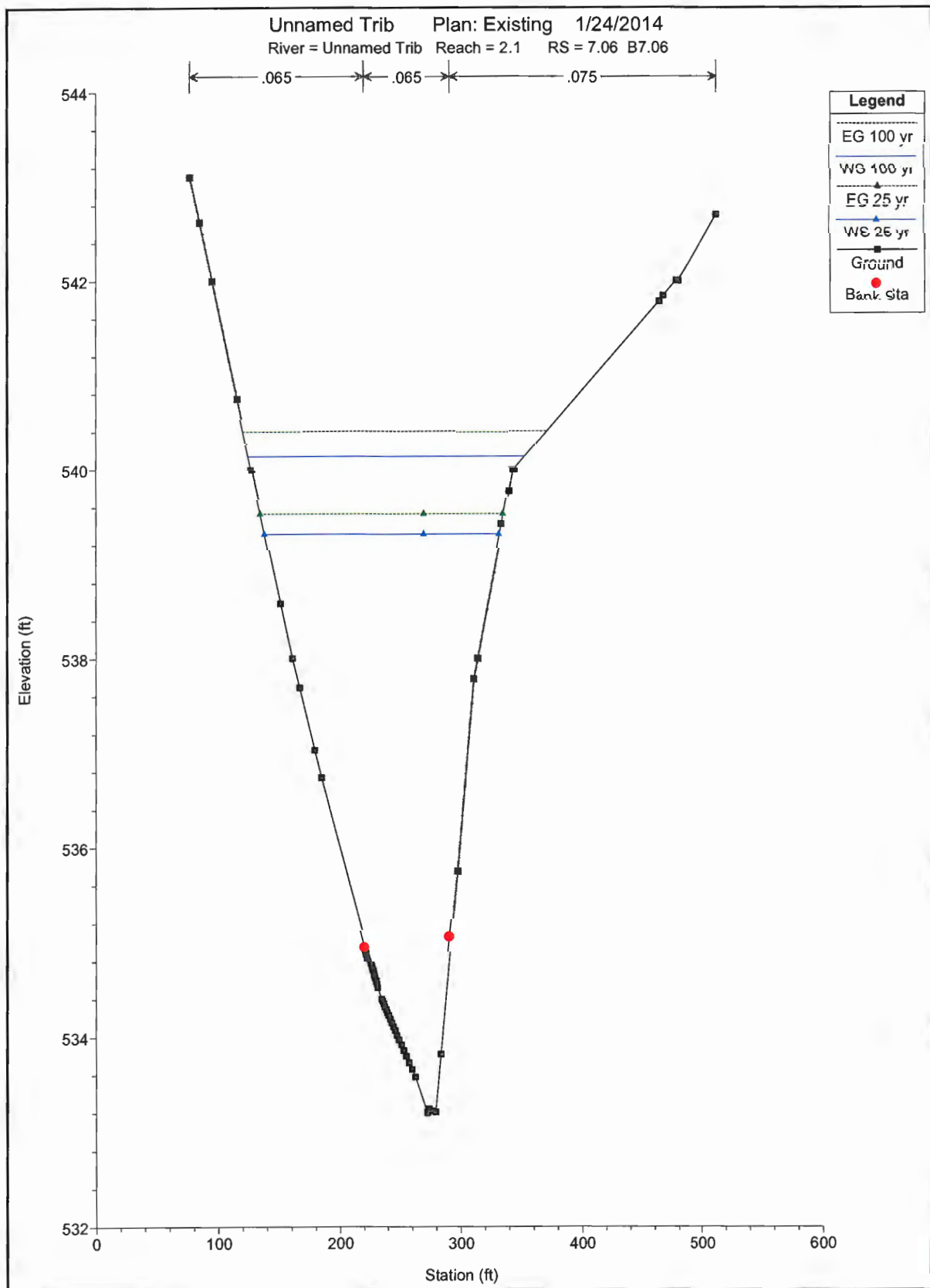


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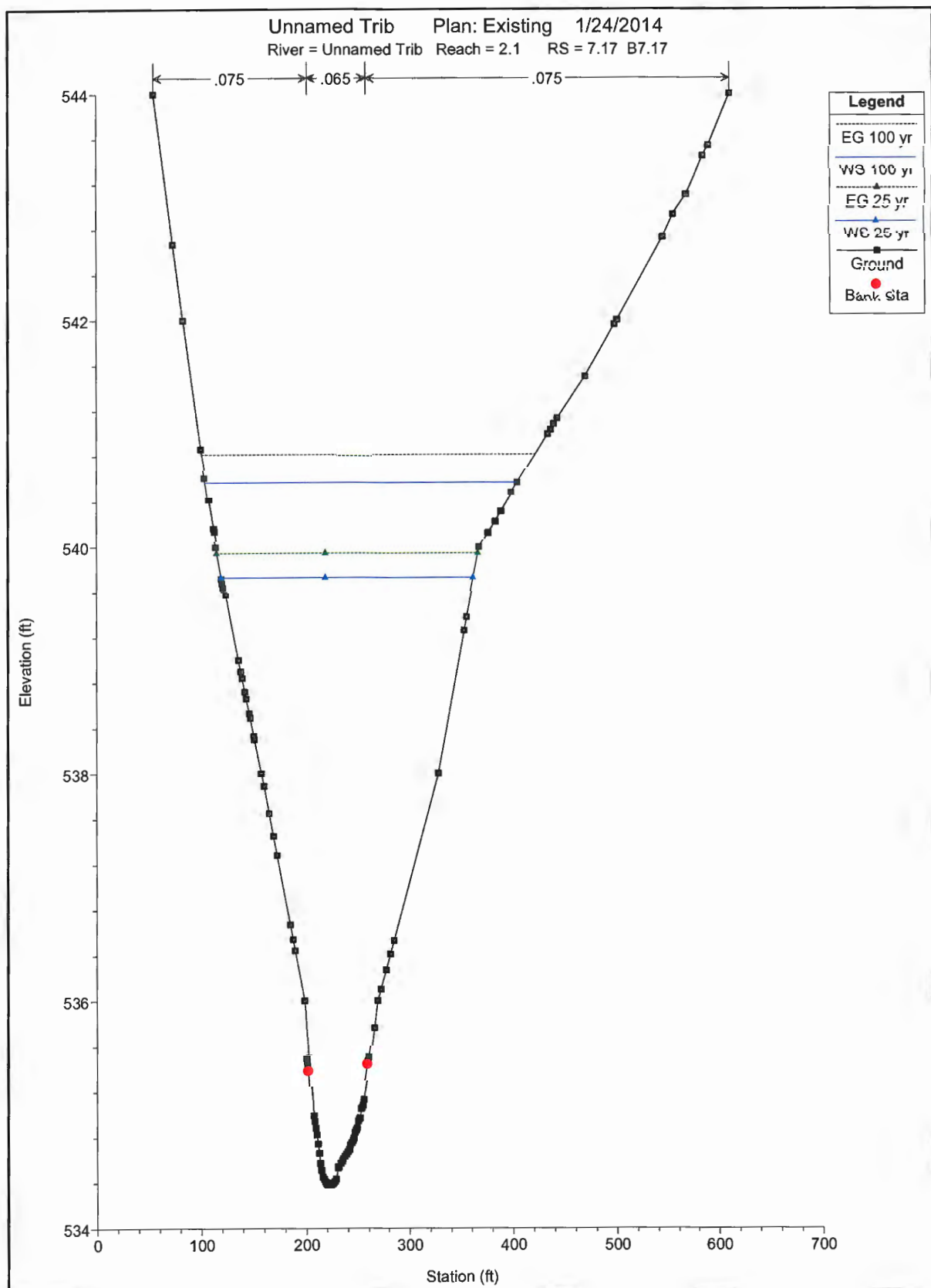




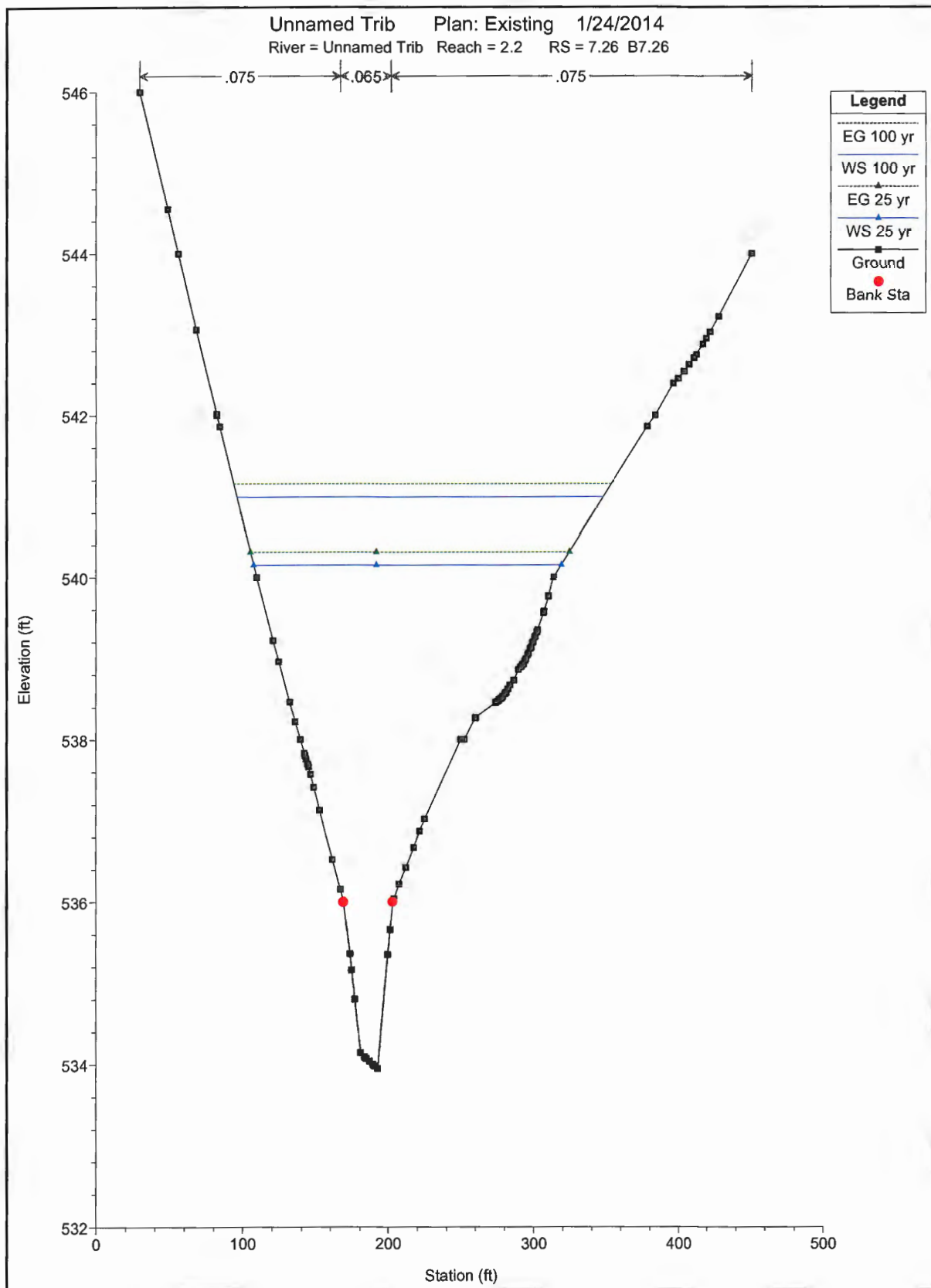
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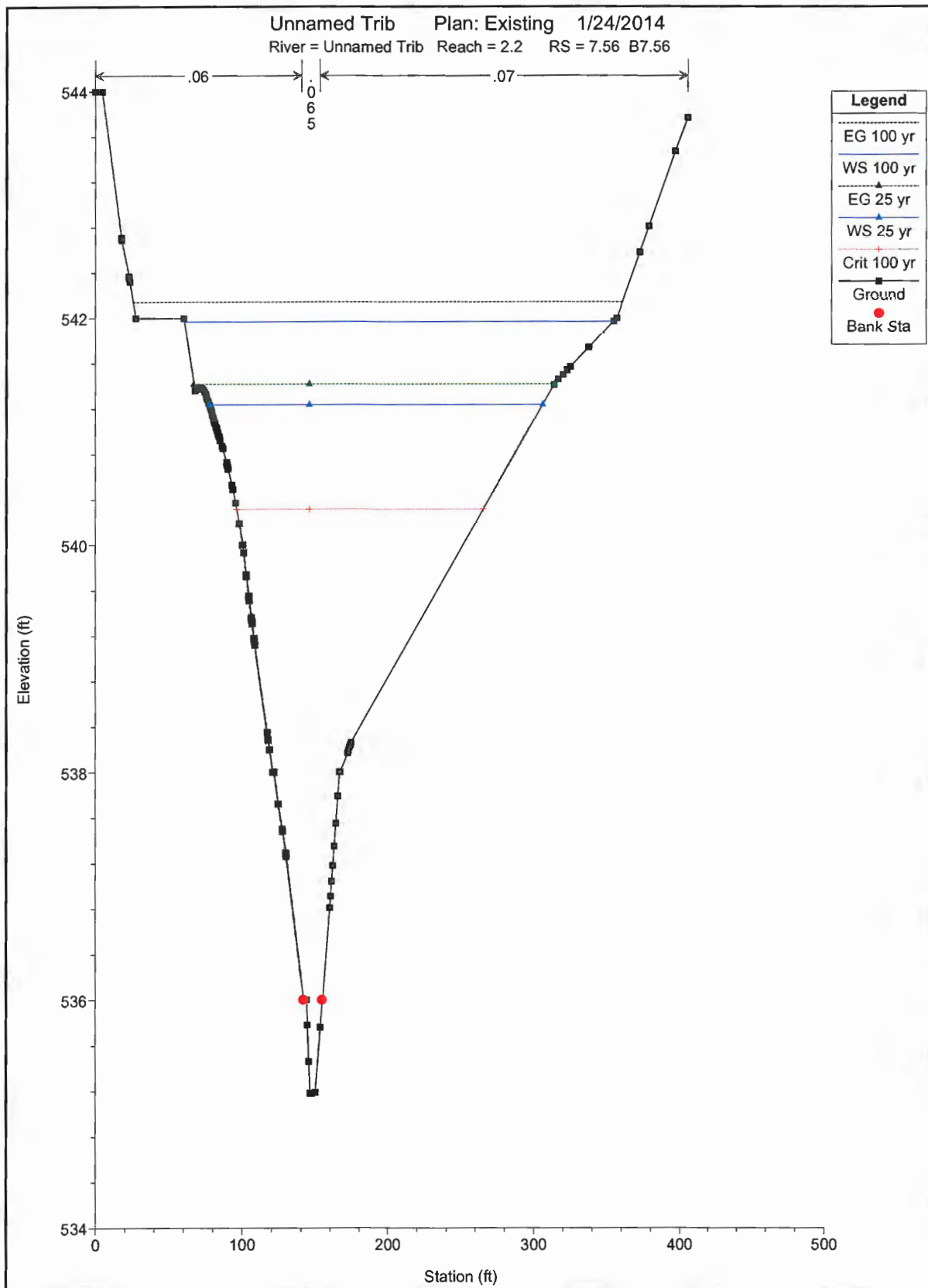
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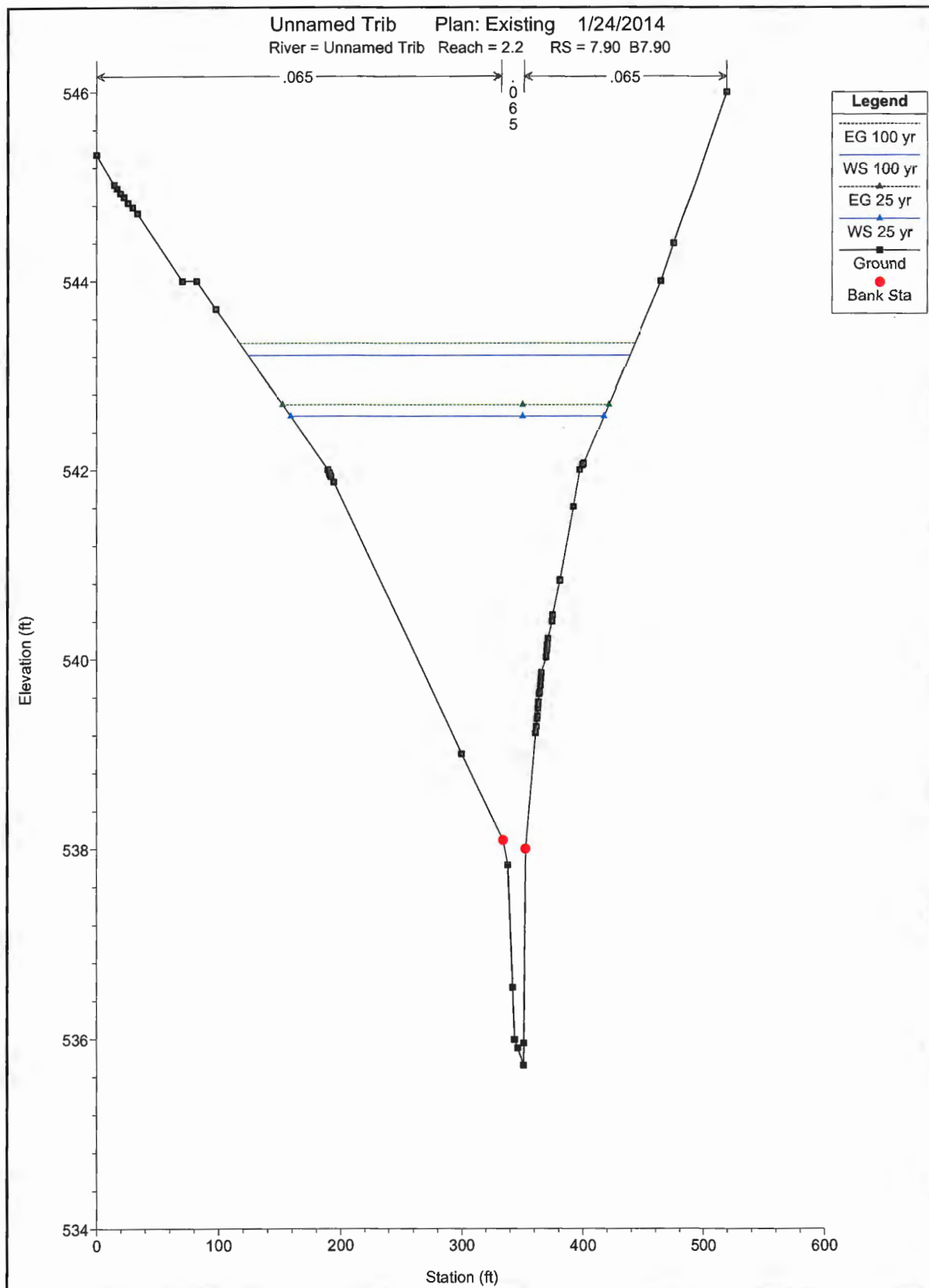
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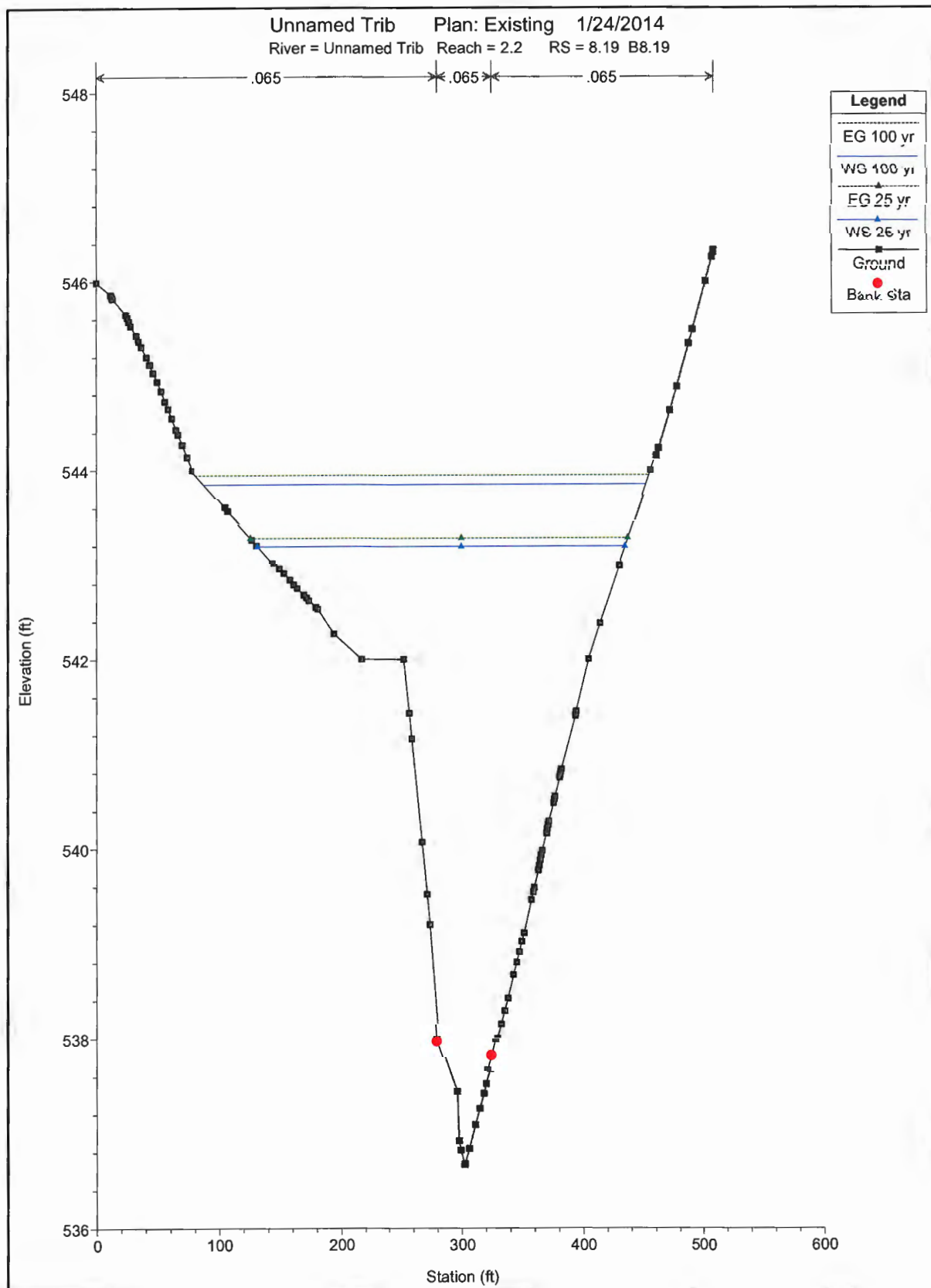


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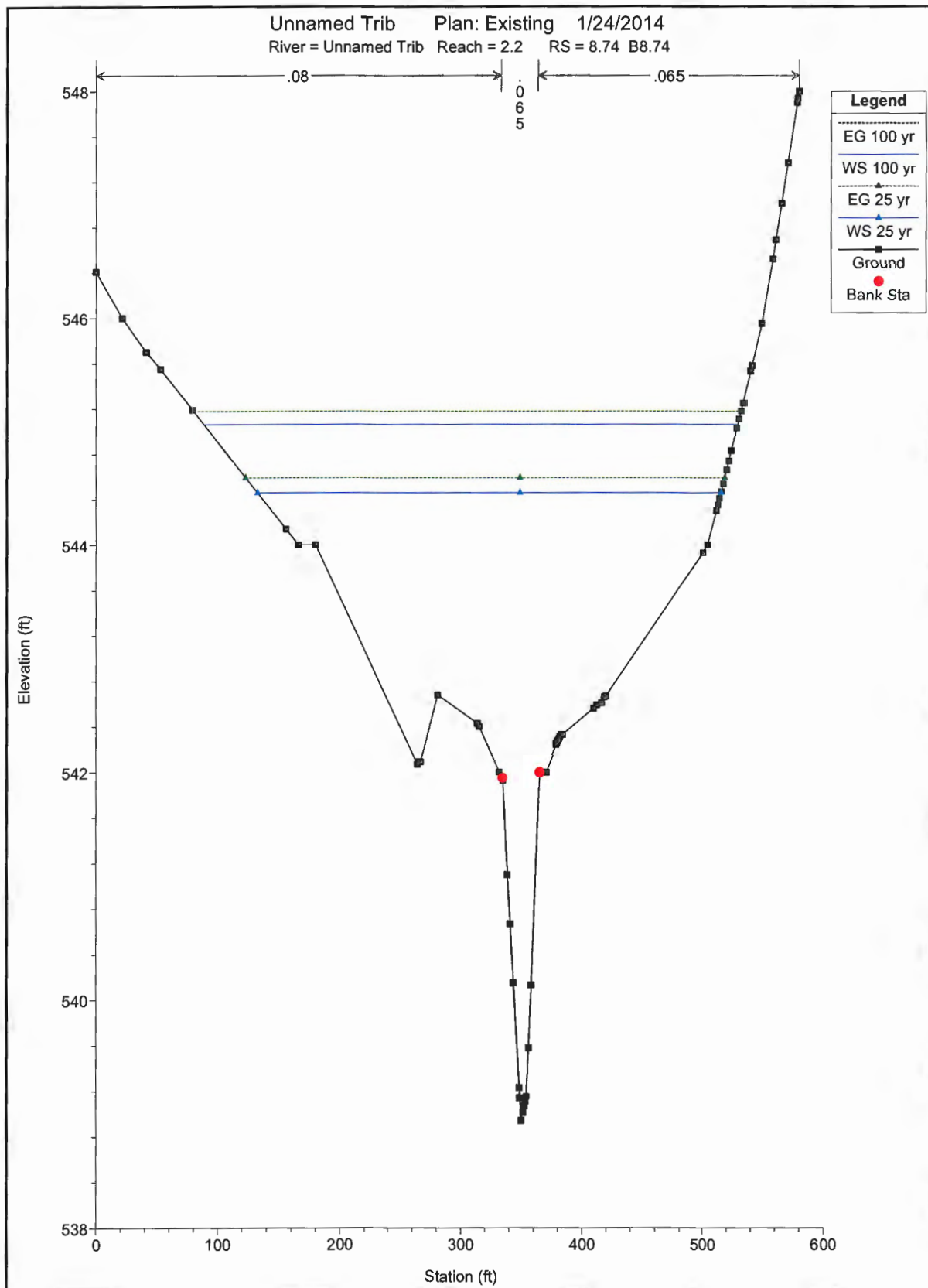


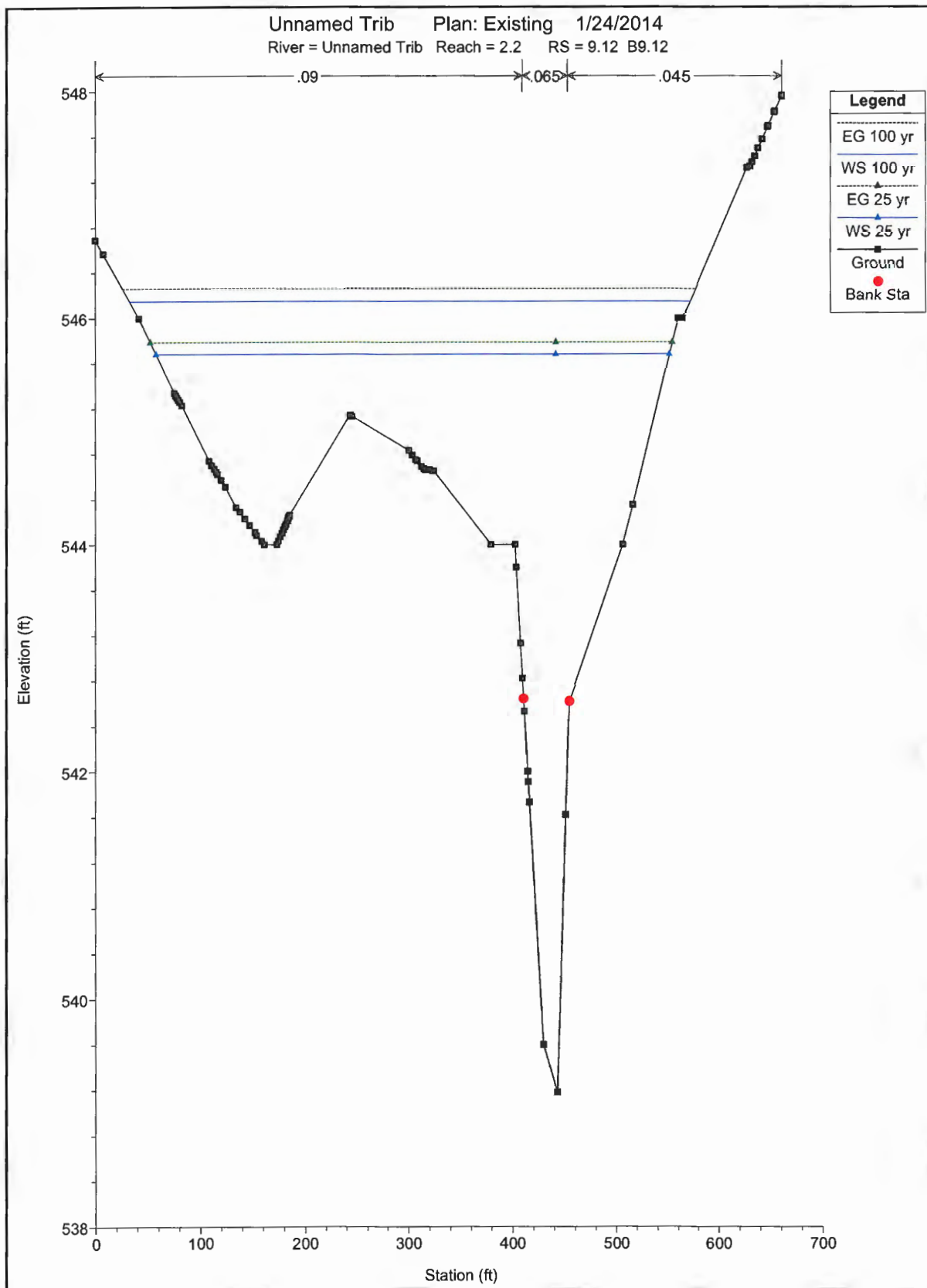
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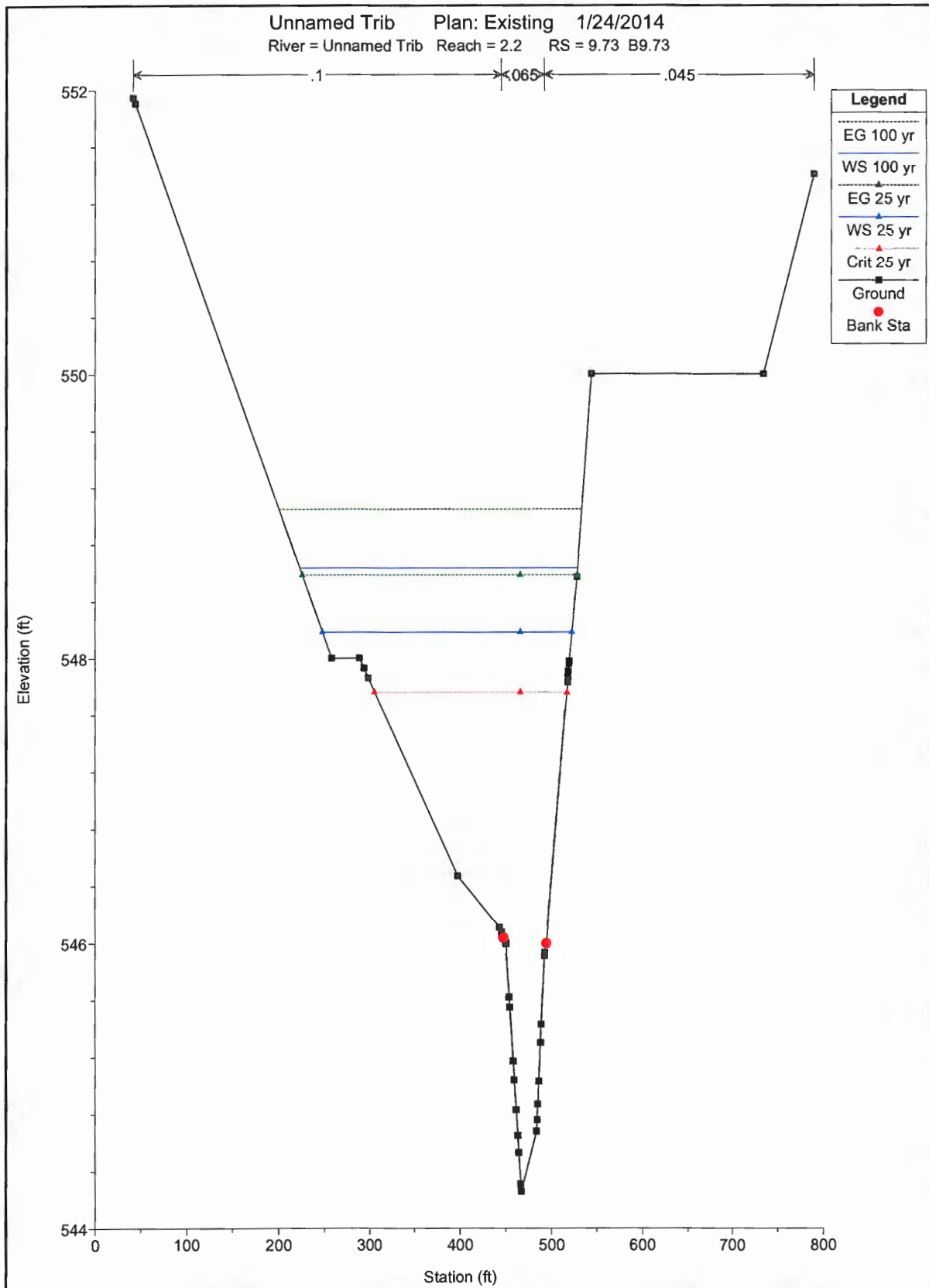




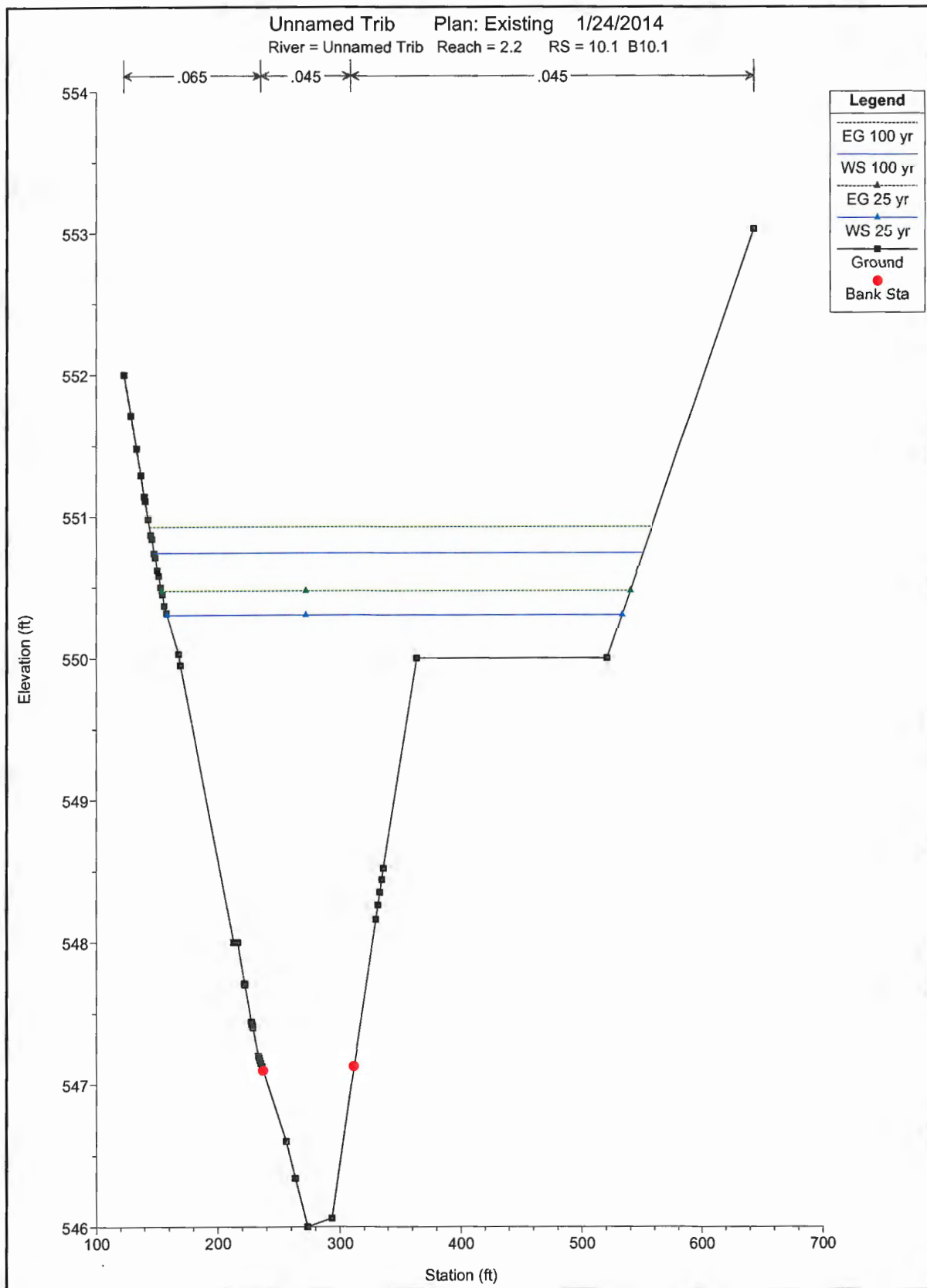
C2-C-49

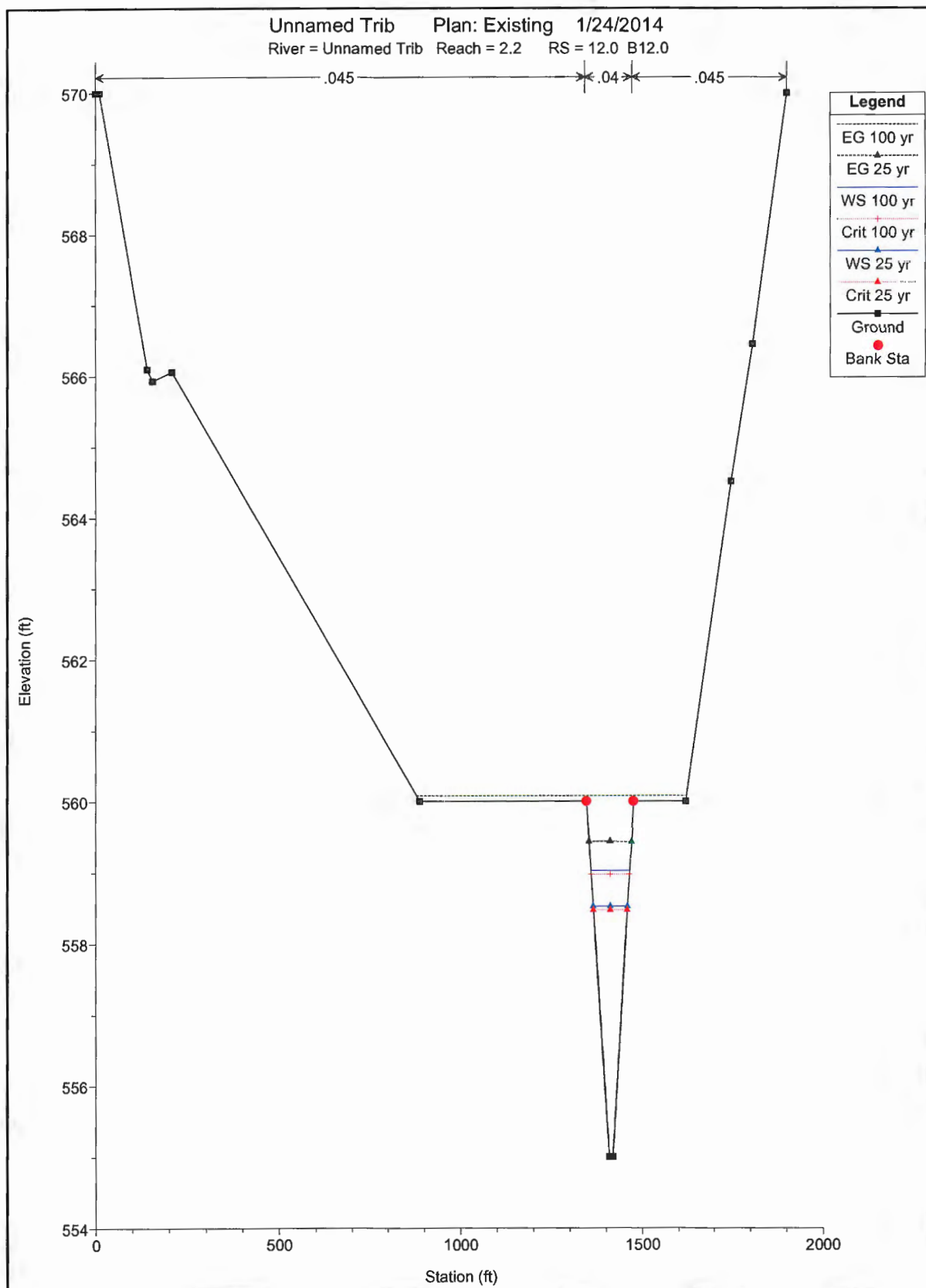


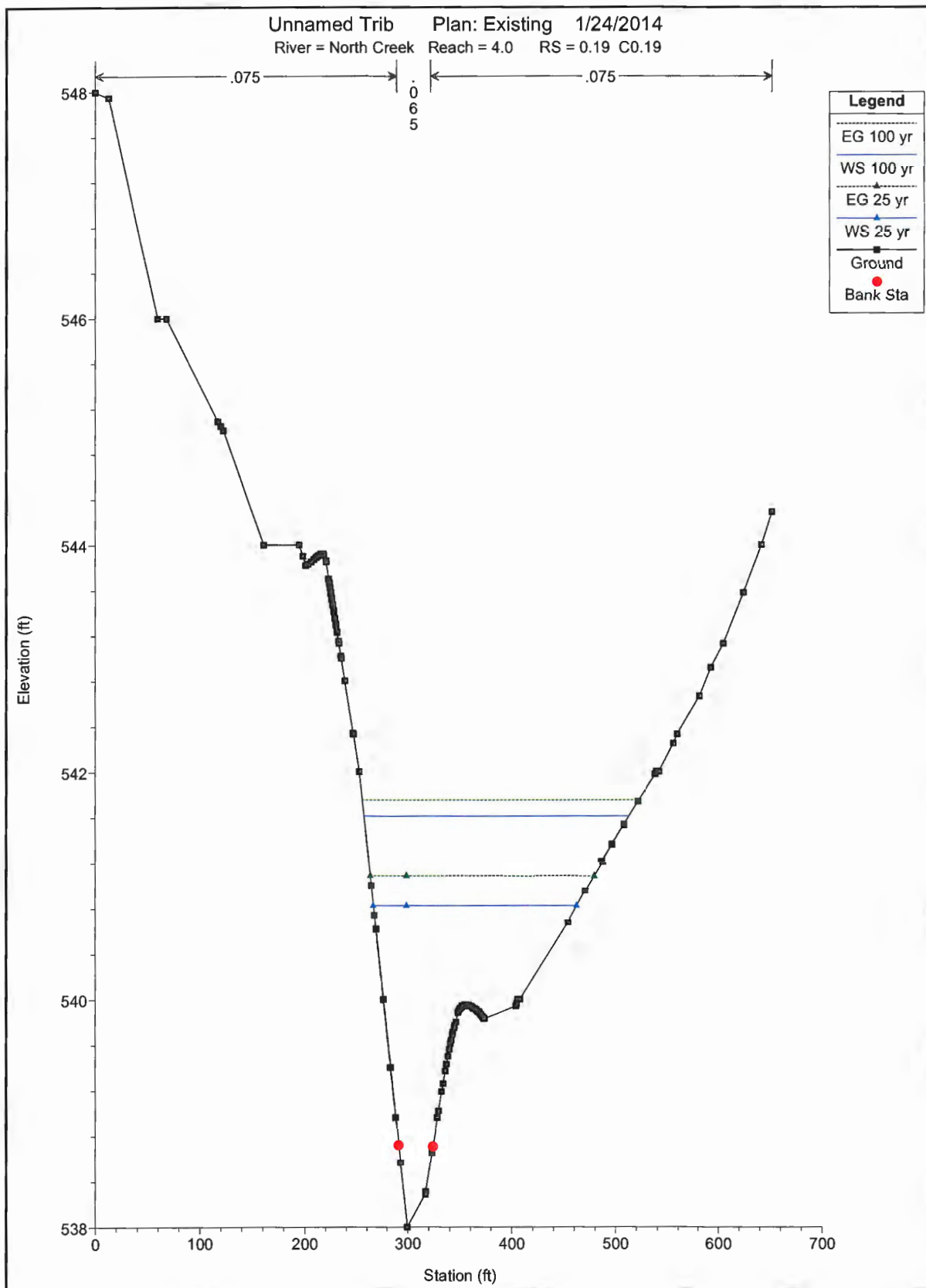




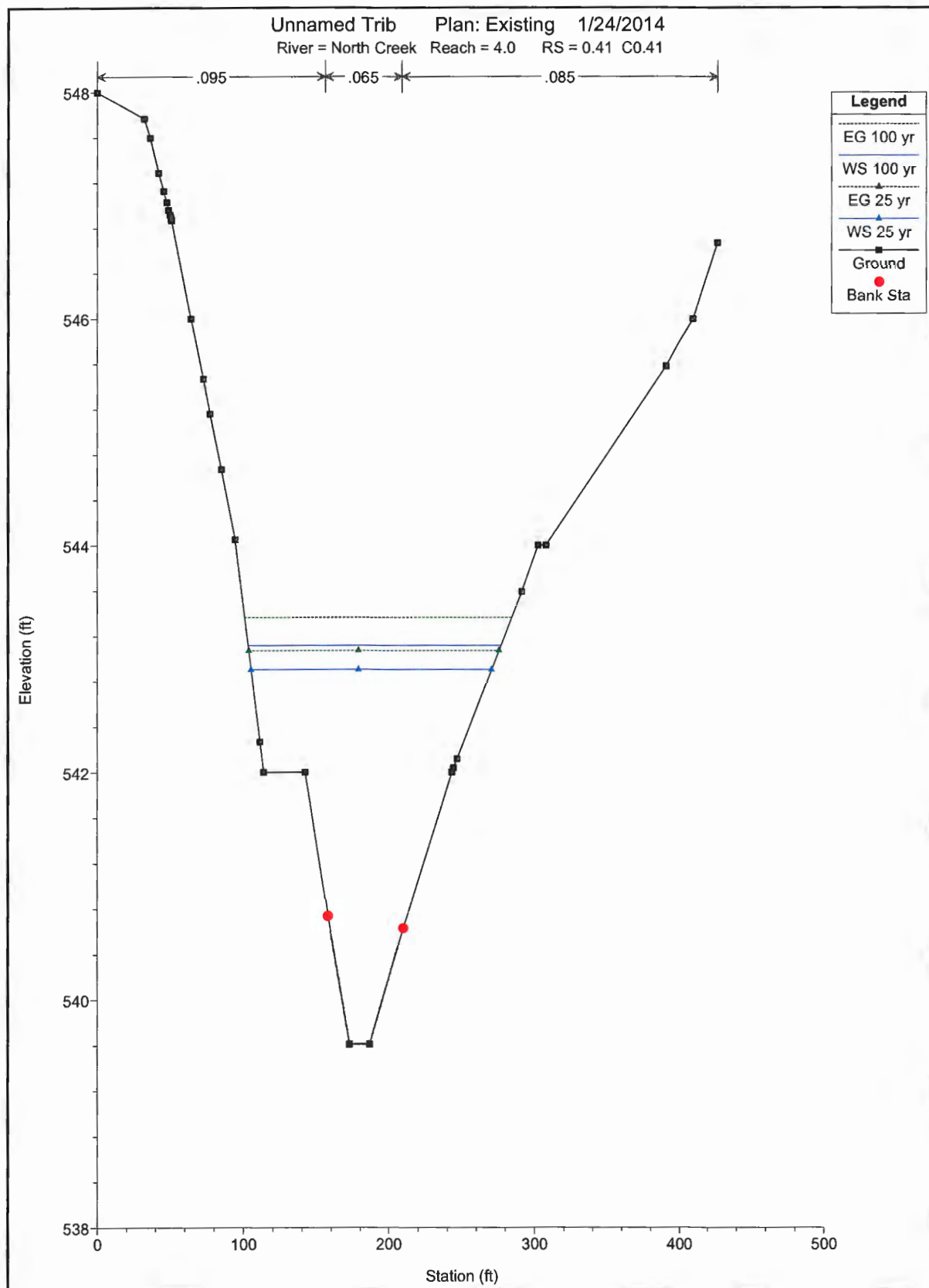
C2-C-52

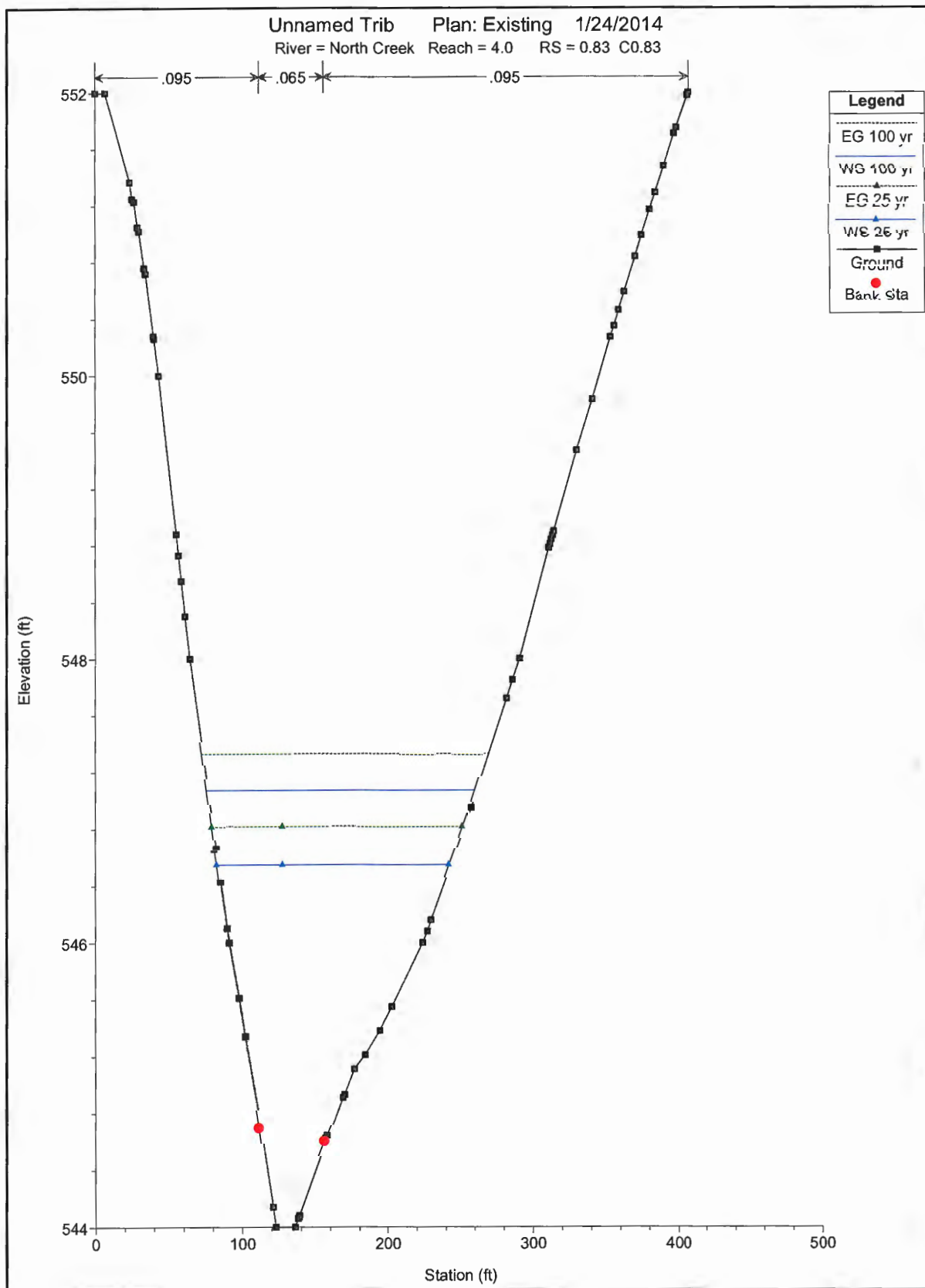




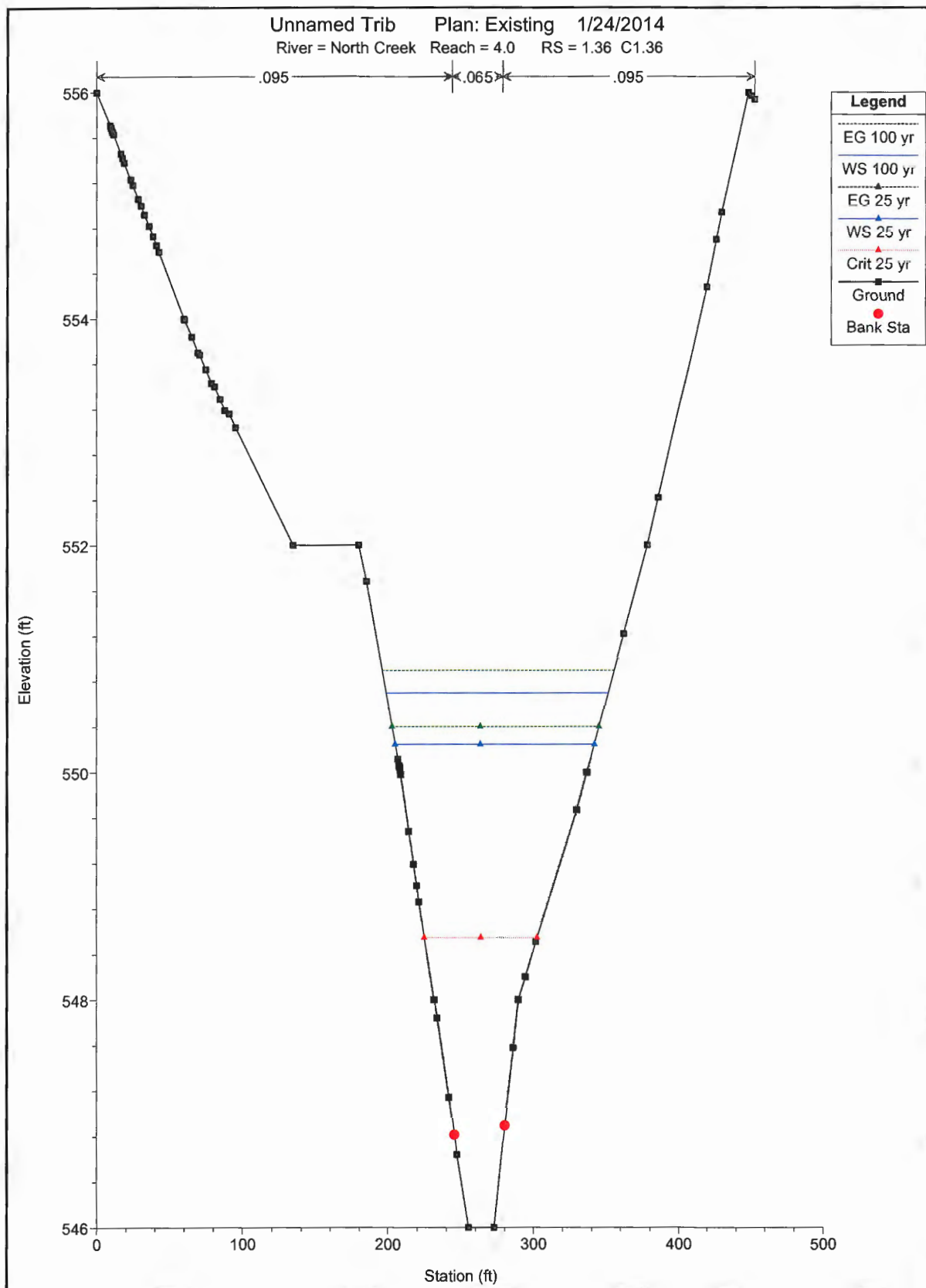


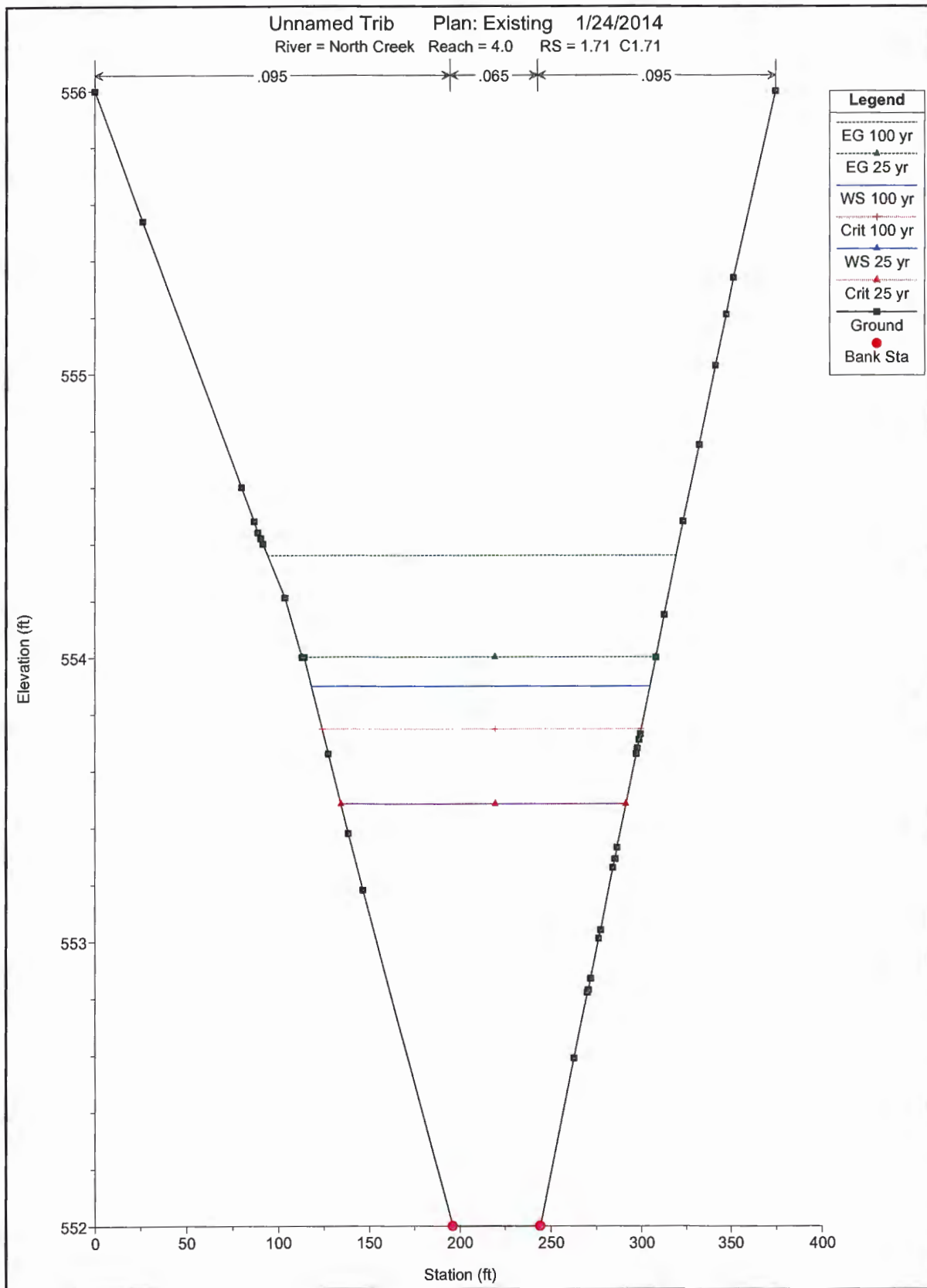
C2-C-55



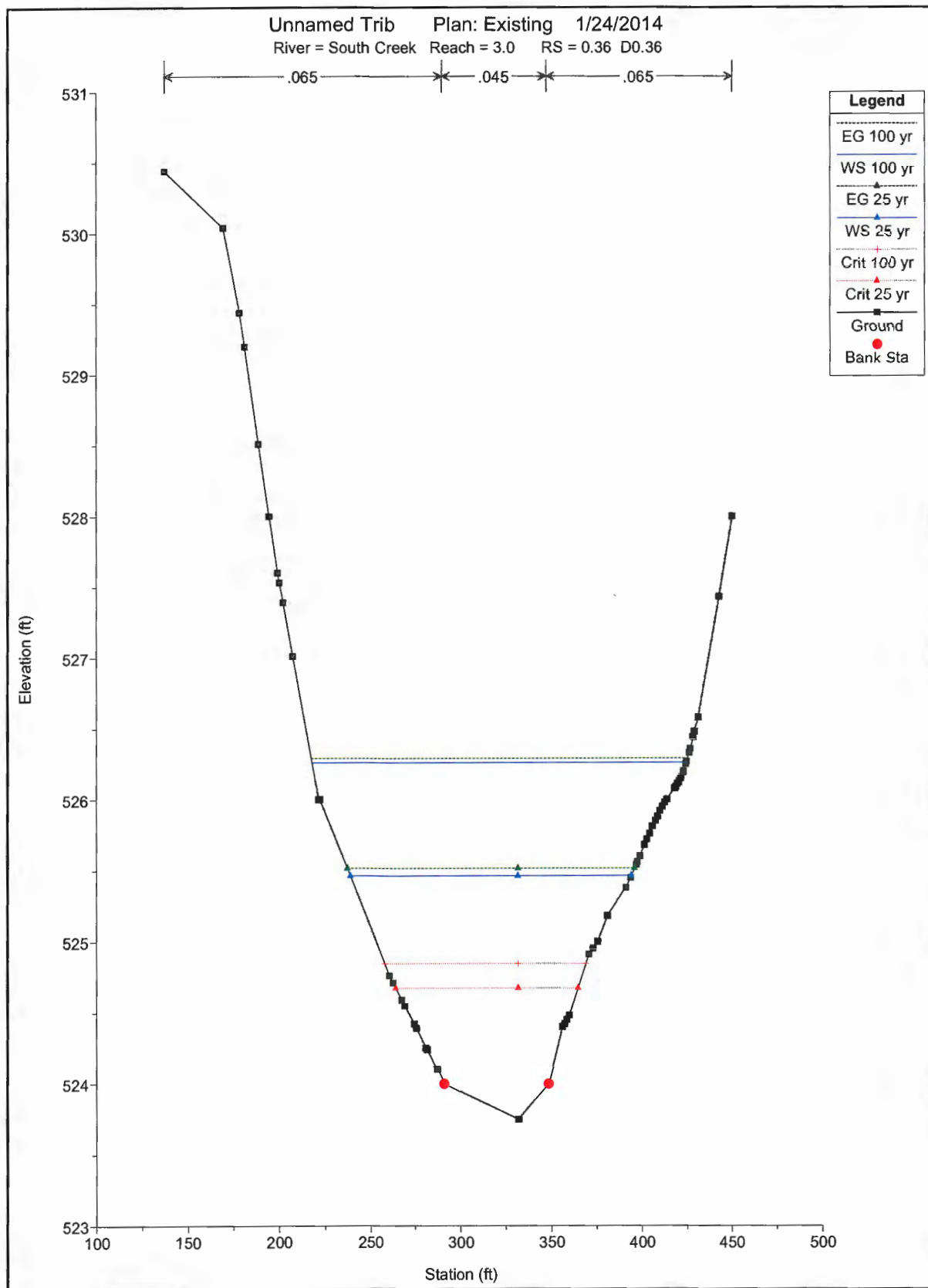


C2-C-57

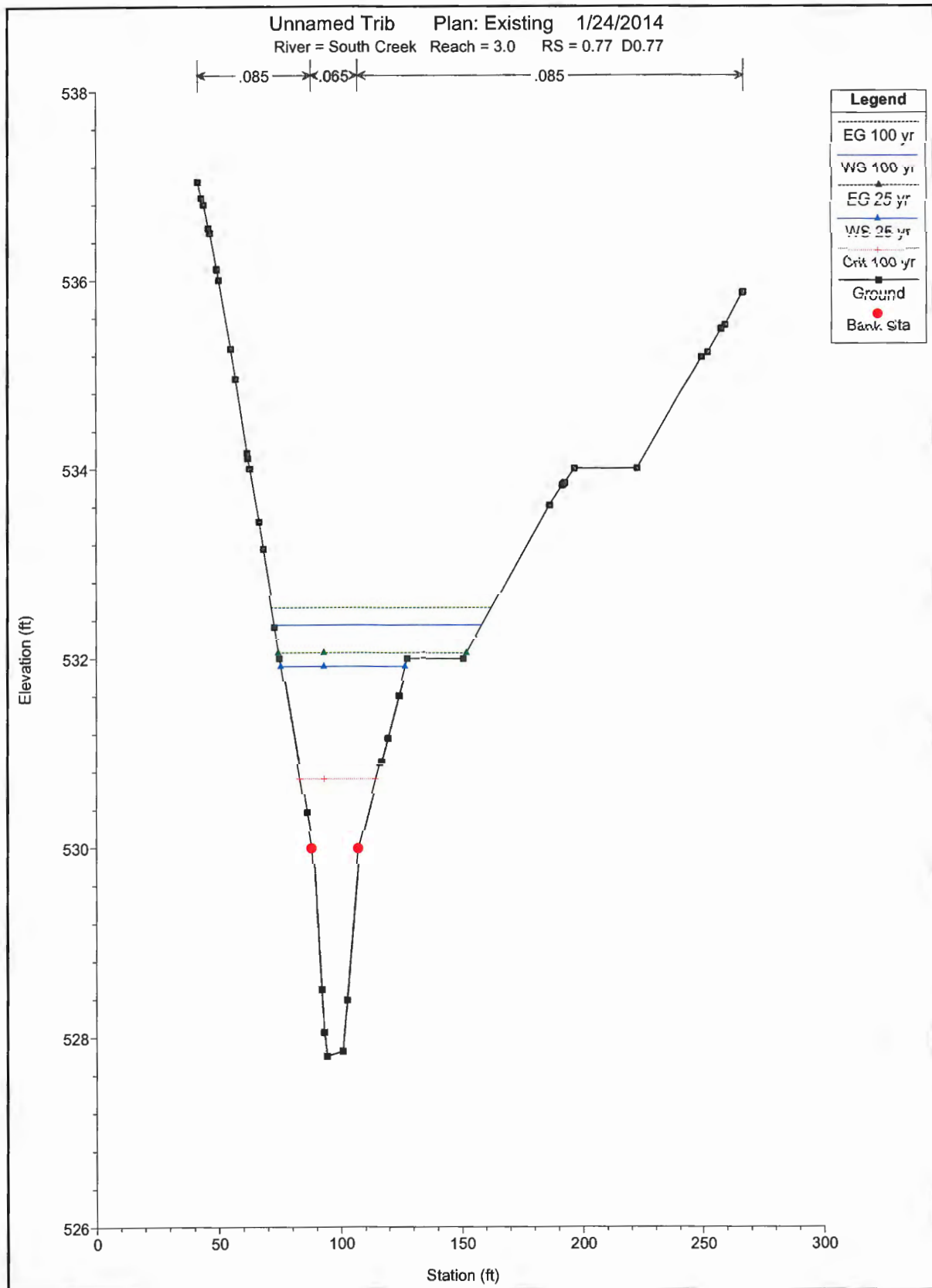




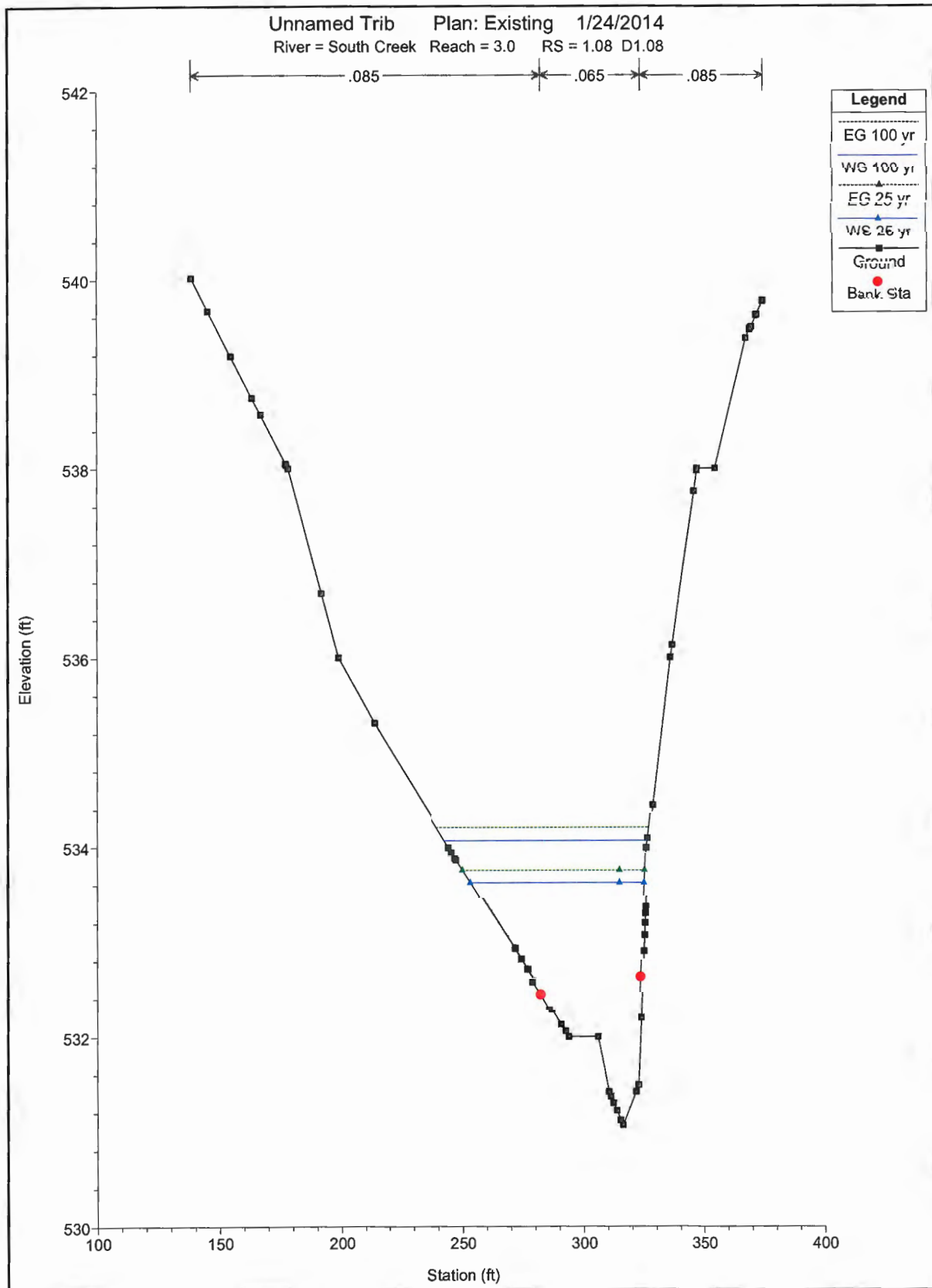
C2-C-59



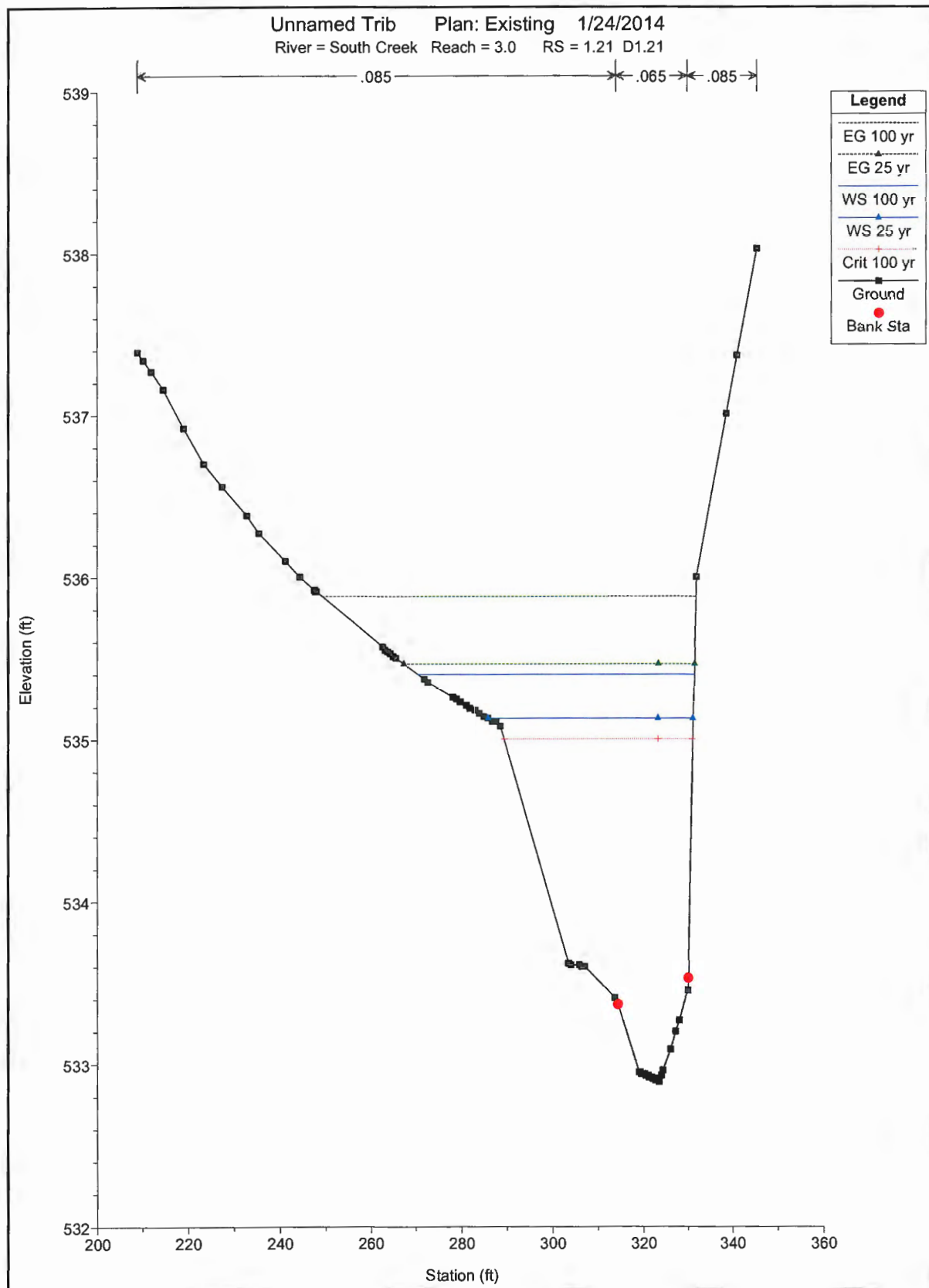
C2-C-60



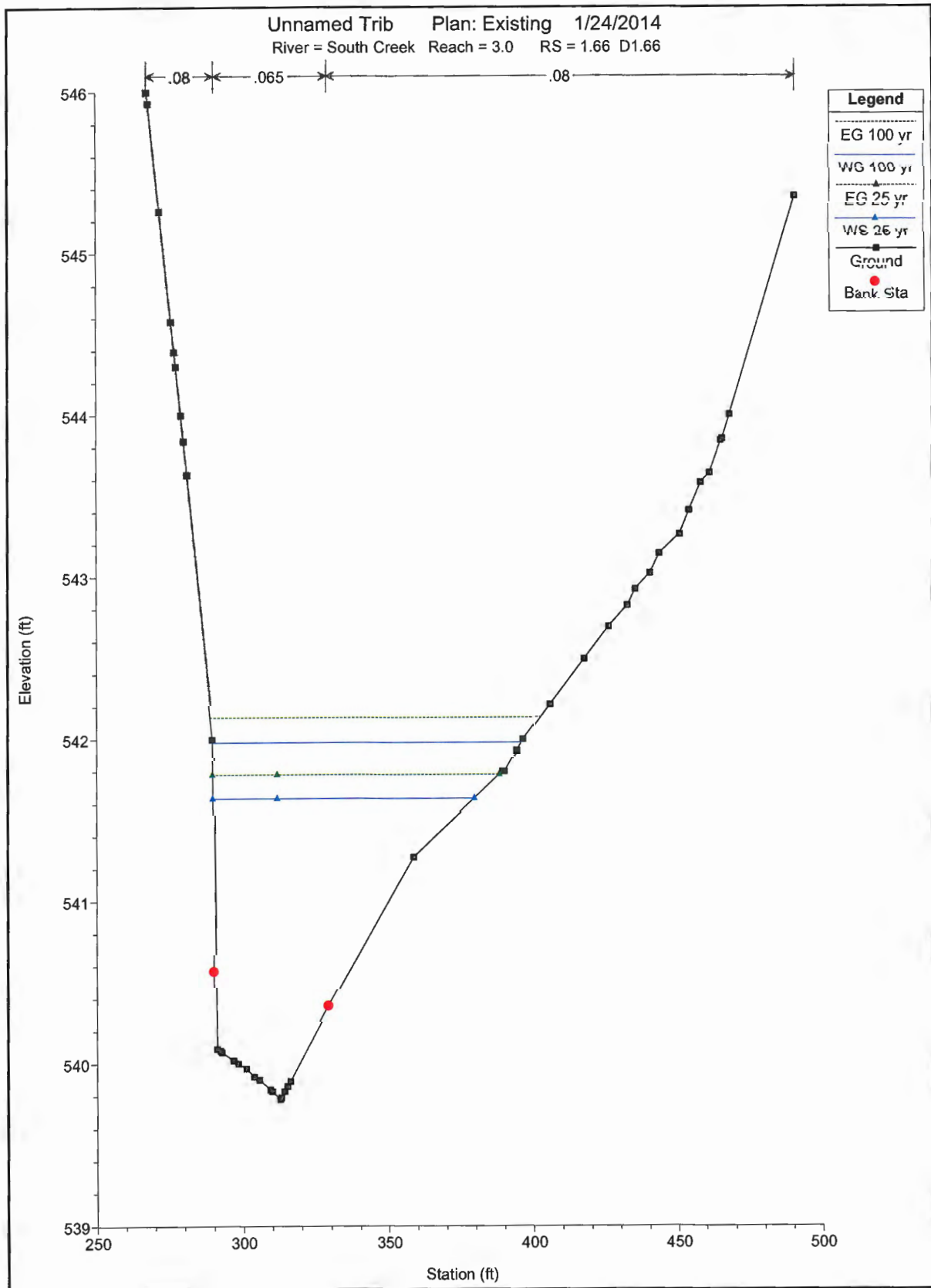
C2-C-62

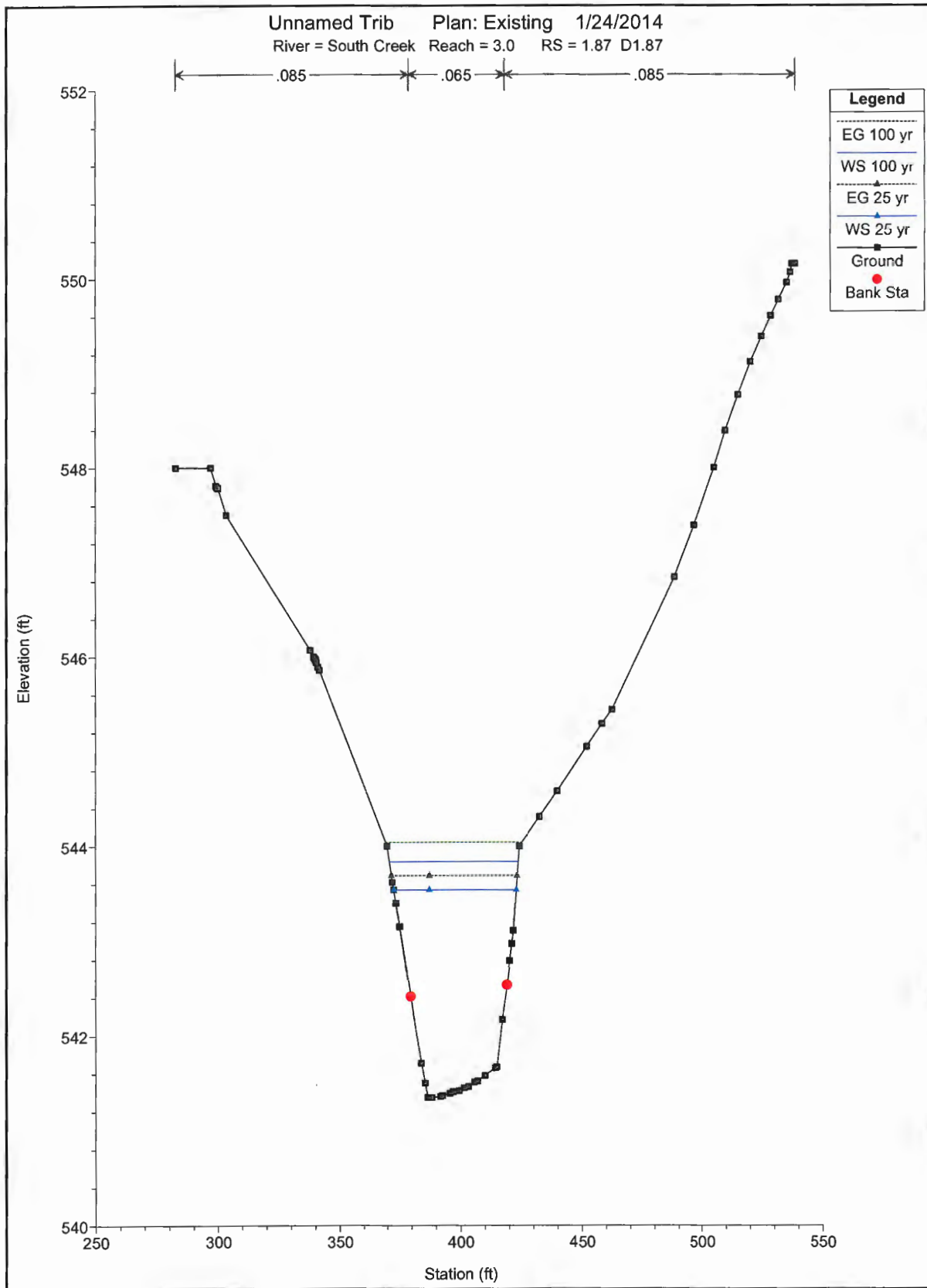


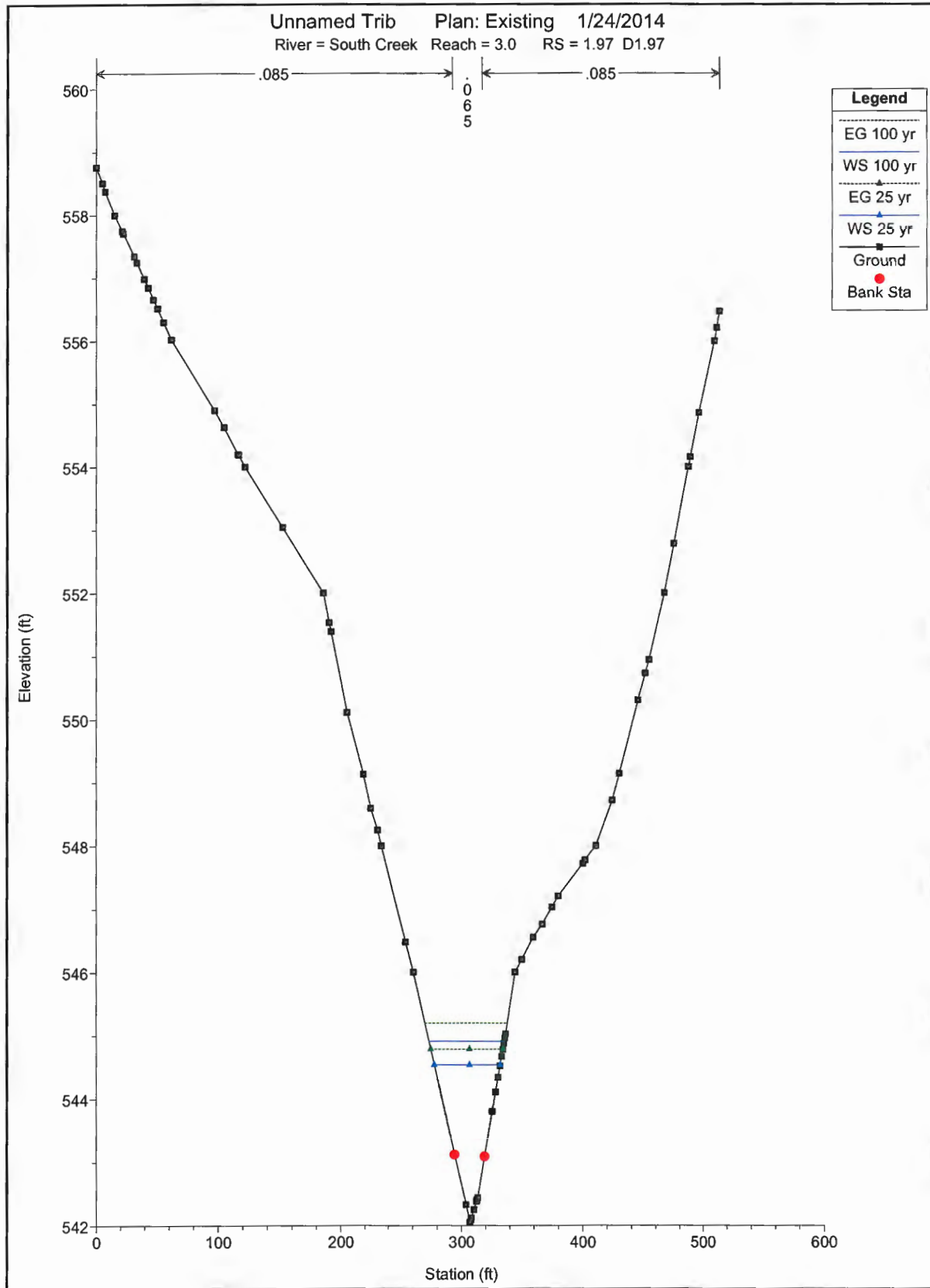
C2-C-63



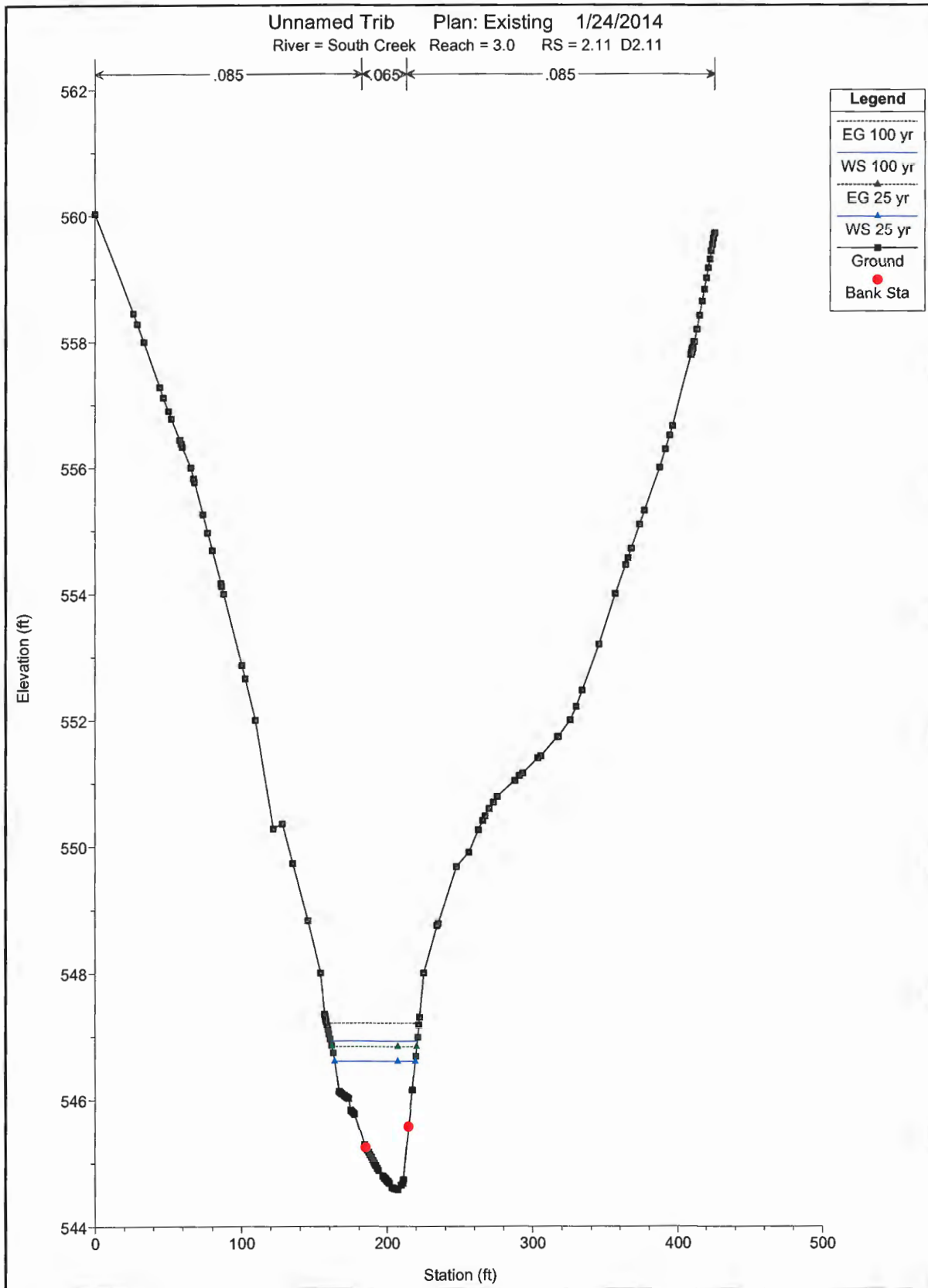
C2-C-64



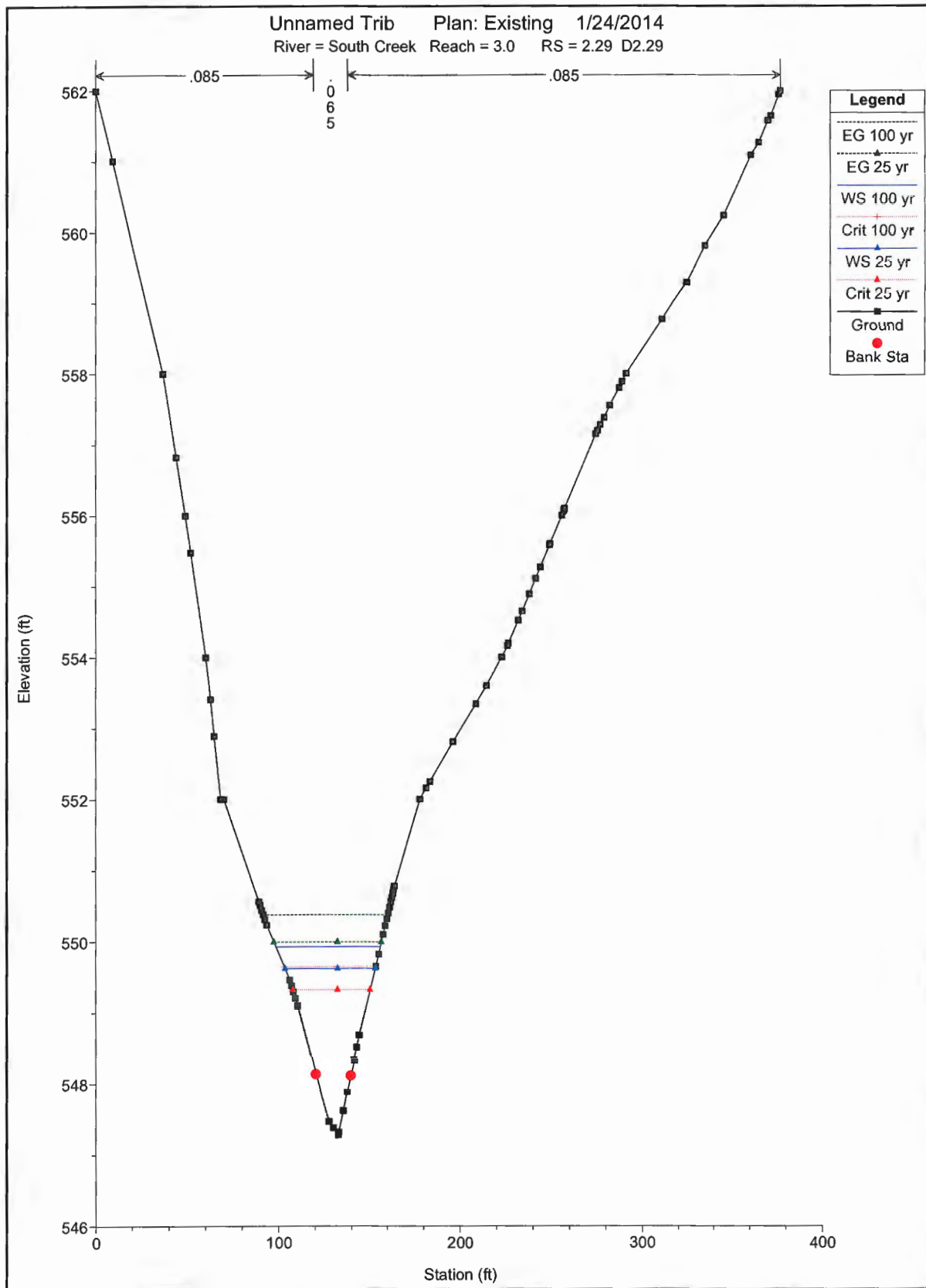




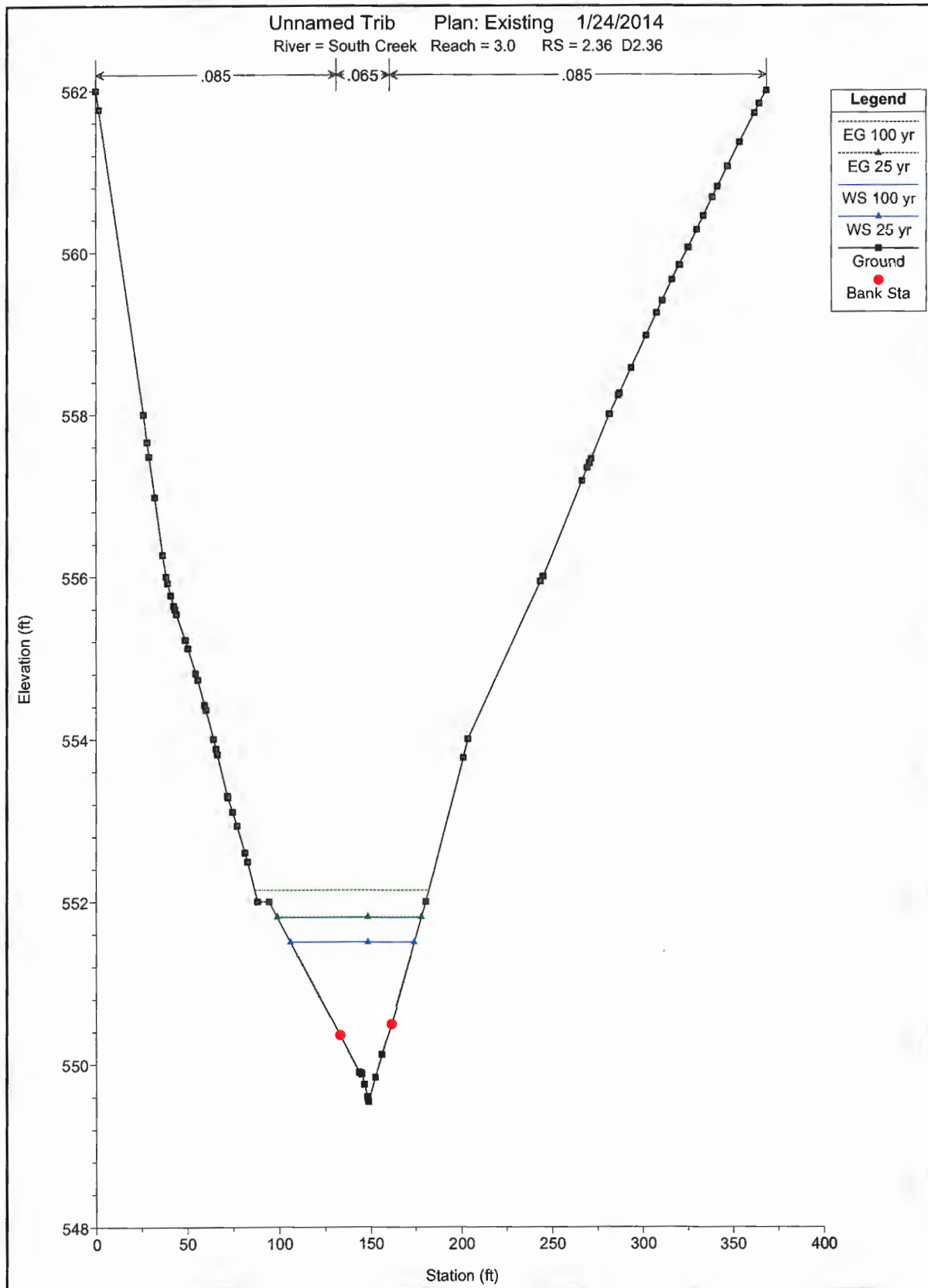
C2-C-67



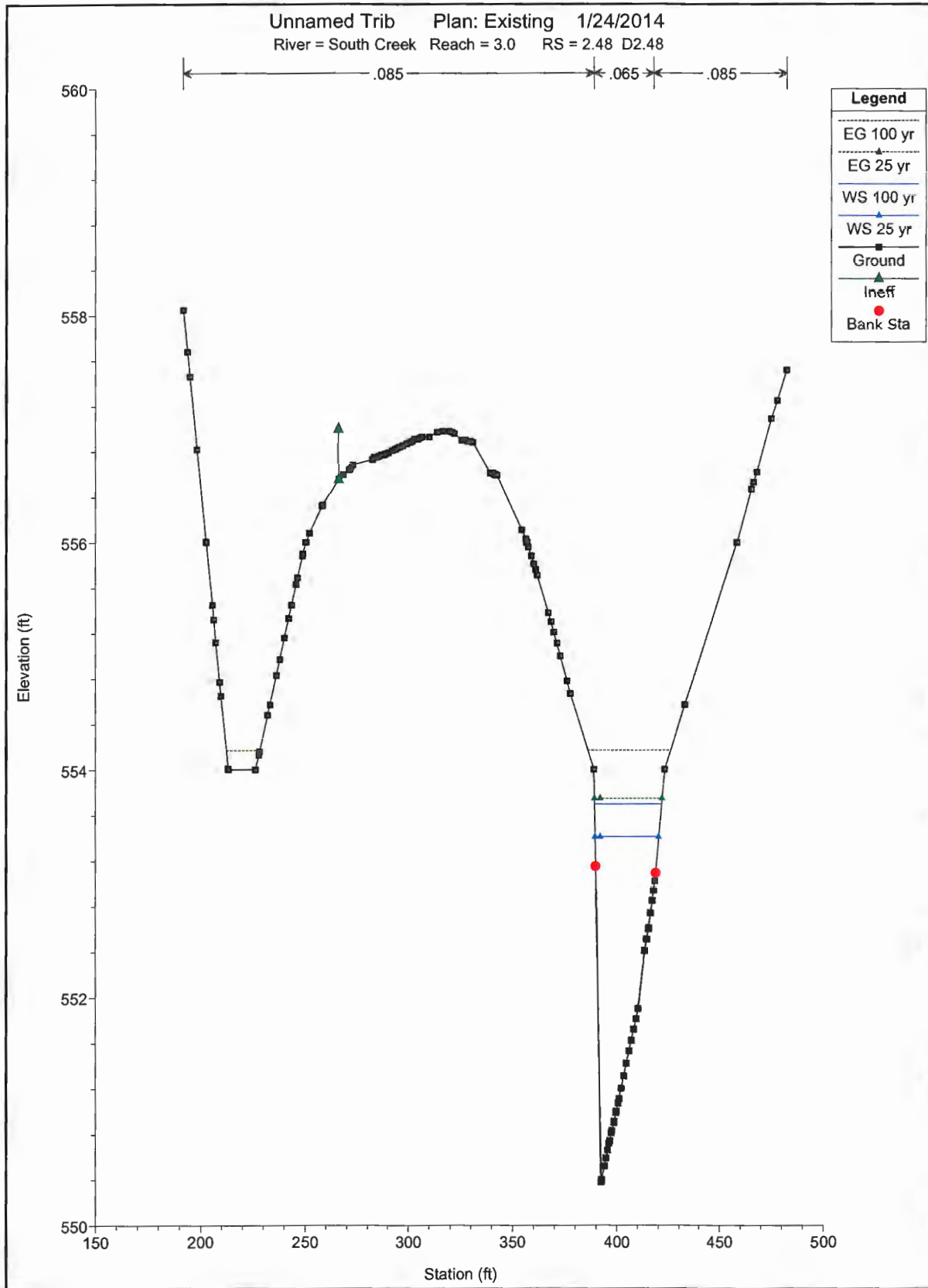
C2-C-68



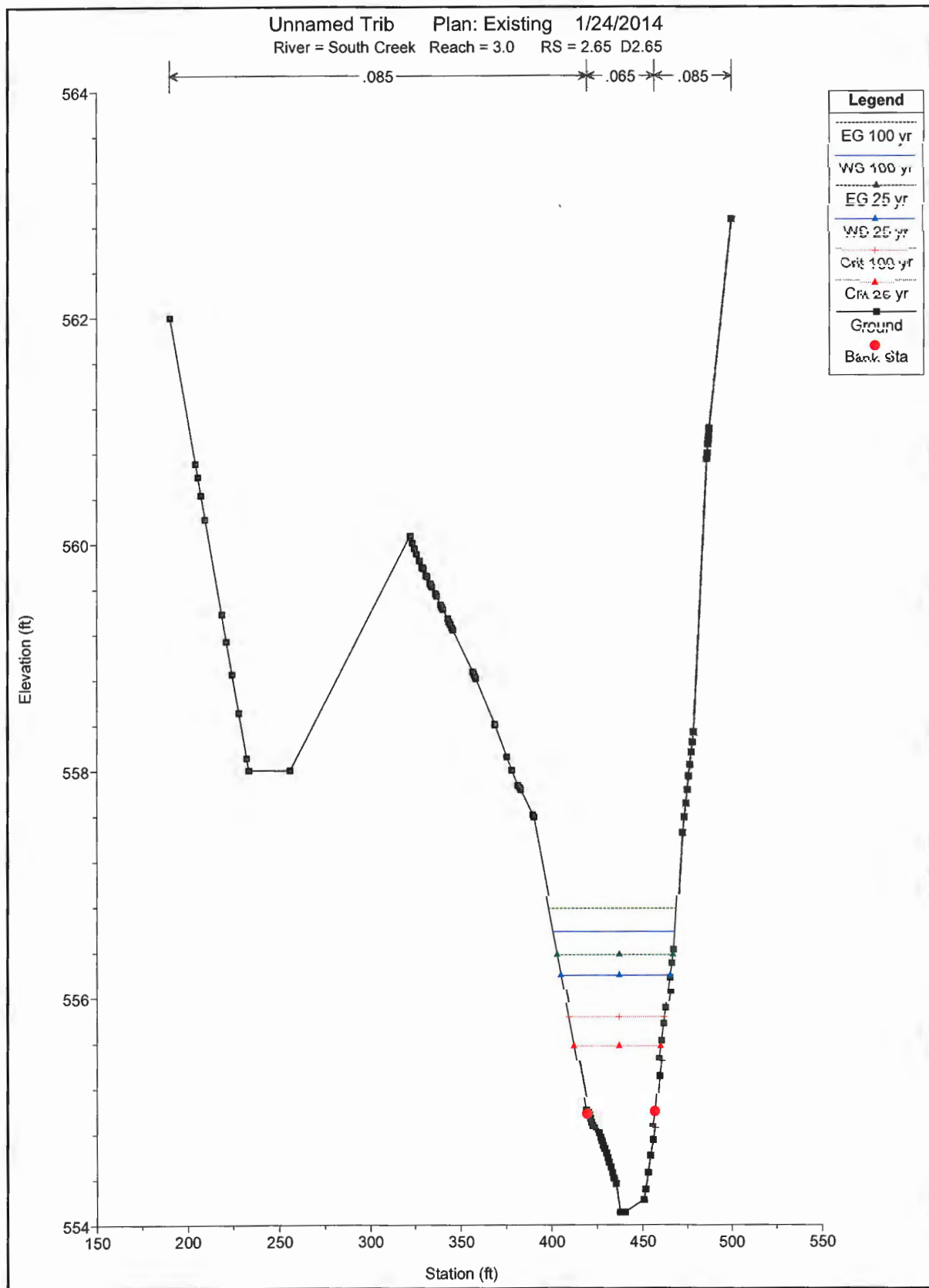
C2-C-69



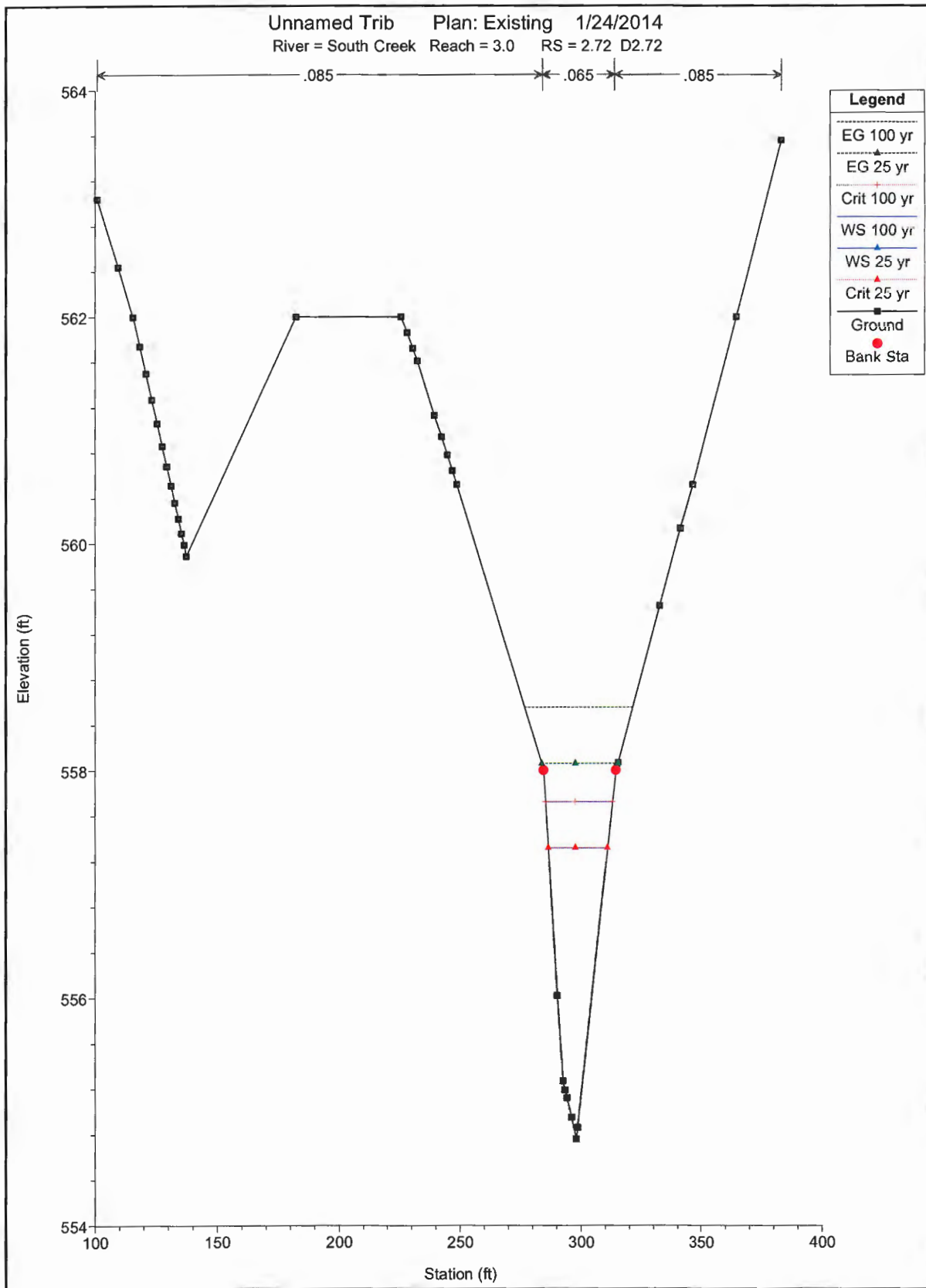
C2-C-70



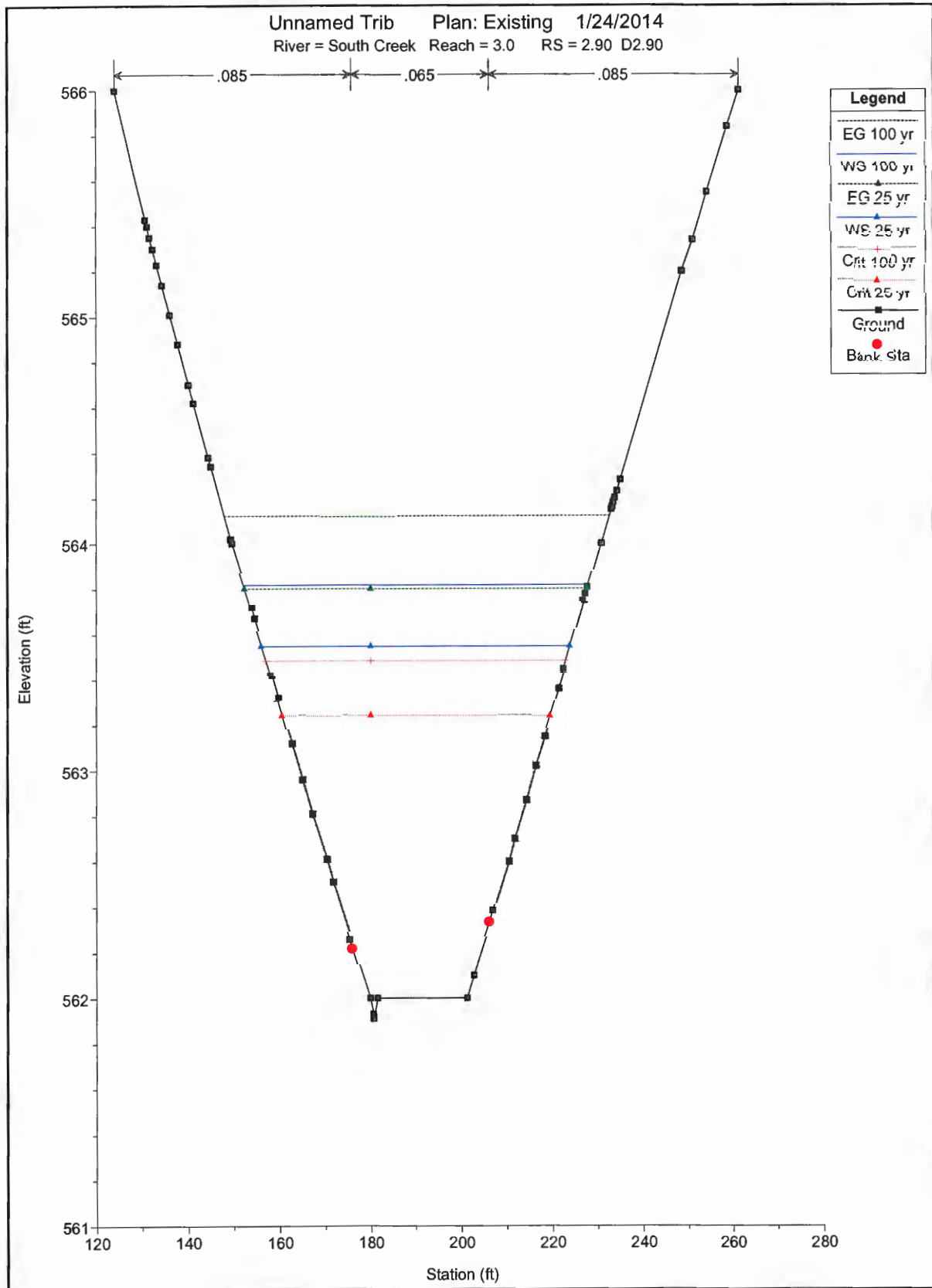
C2-C-71



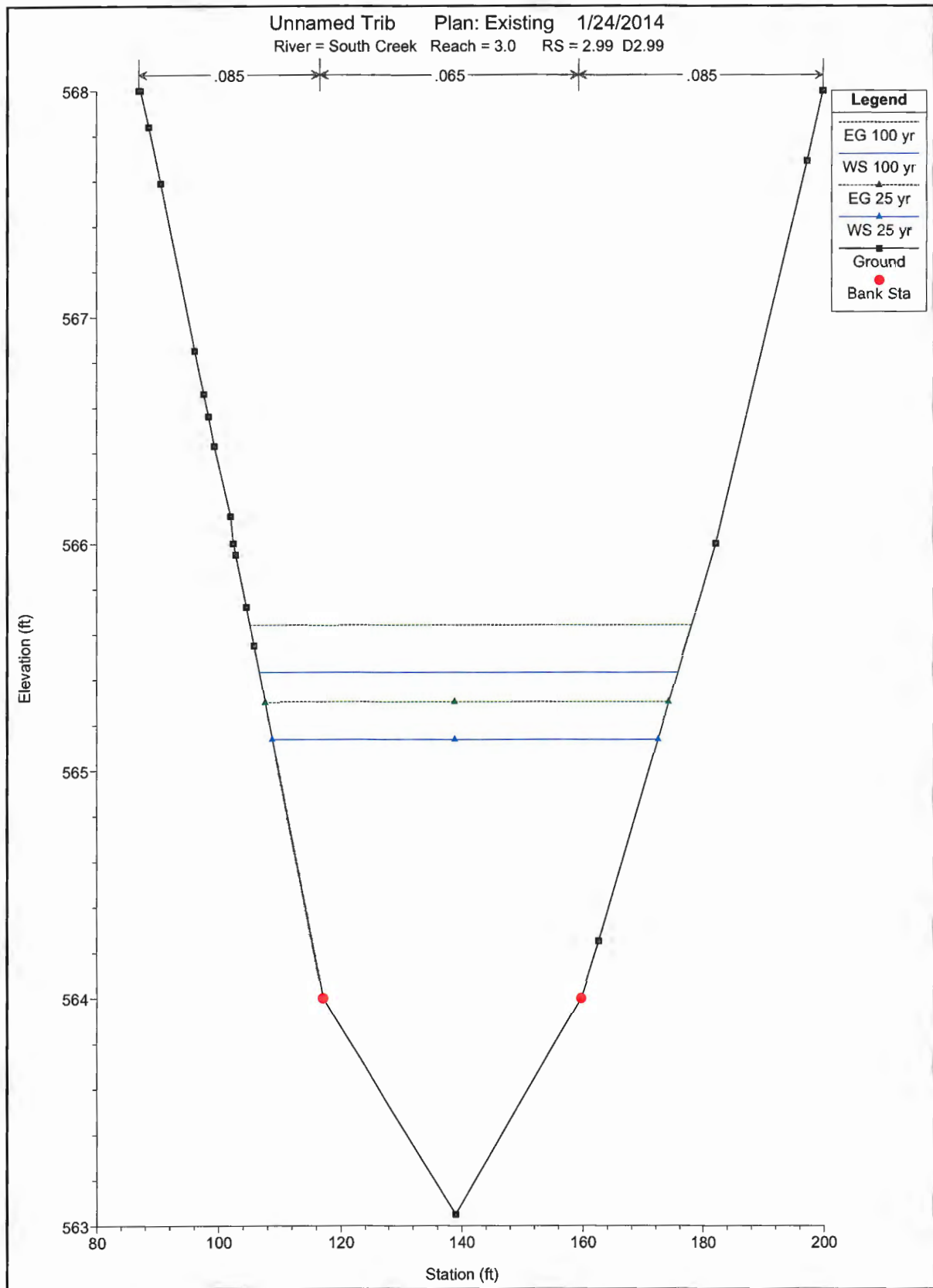
C2-C-72

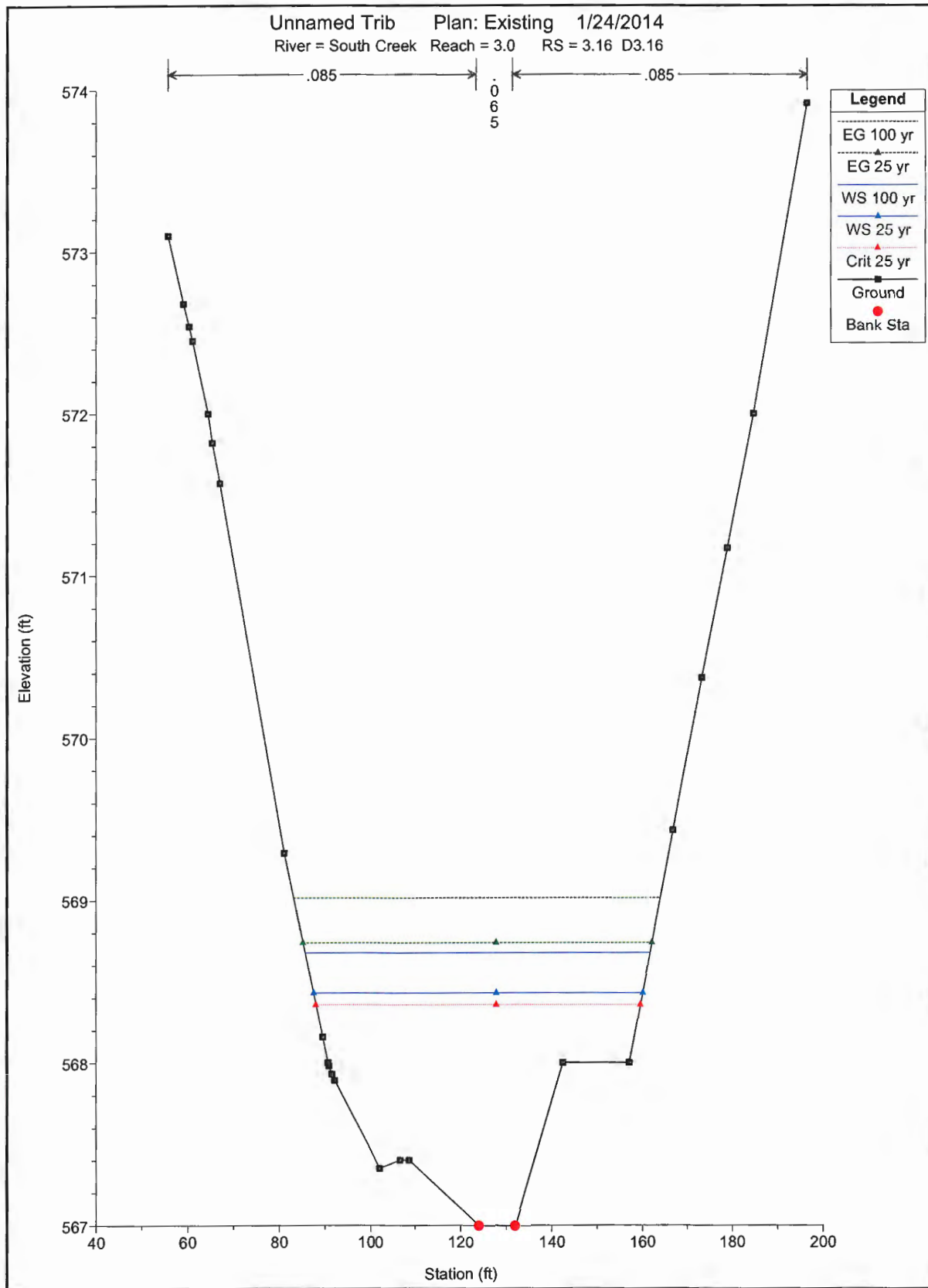


C2-C-73

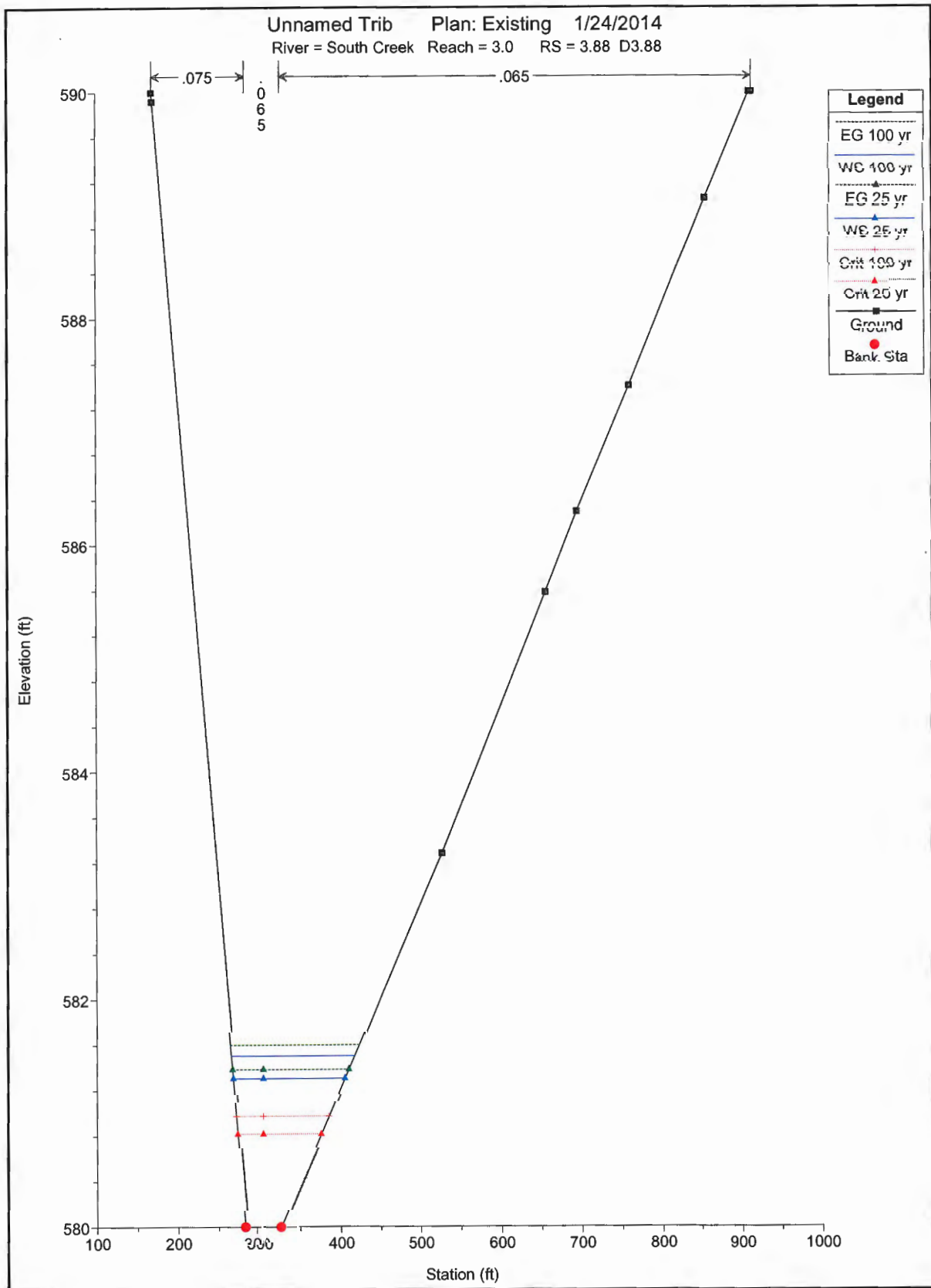


C2-C-74





C2-C-76



C2-C-77