SJRRP Flow Bench Evaluation

March 29, 2010

Flows below Friant Dam will increase to 1100 cfs on March 29, 2010. The bench increase was shifted from the illustrative hydrographs in the Restoration Administrator 2010 Interim Flow Recommendations for the San Joaquin River Restoration Program, February 1 through December 1, 2010 to allow additional time for the system to stabilize per the March 25th evaluation. The evaluation of the increase is provided below.

As of March 29, 2010:

1. Flows rates from provisional real-time data are below known conveyance thresholds (8,000 cfs in Reach 2A, 1,300 cfs in Reach 2B, and 1,300 cfs in Reach 3).

2. Mendota Pool operations calls identified a potential need to change gate operations at Chowchilla Bifurcation Structure to pass a sand dune through the structure.

3. The seepage hotline received four calls, described below. All evaluations determined the planned releases could proceed.

4. Real-time provisional groundwater data does not show groundwater depths crossing identified thresholds.

5. Manually monitored groundwater wells do not show unaddressed groundwater depths crossing identified thresholds and appear to have stabilized.

6. Measured losses in Reach 2A from operations estimates show approximately 165 cfs, and are stabilizing. Changes in flows below Sack Dam appear stable based on CDEC stage telemetry.

7. Projected groundwater levels from the upcoming increase in flow are below thresholds except for wells R2B-1, MW-49B, MW-55B, and MW-47. Evaluations are described below.

8. The LSJLD was notified of potential increases in flows and identified concerns with approaching channel capacity in some reaches. The LSJLD provided information on Monday, March 29th that flows are adjacent to or inundating 12 flapgates and informed Reclamation that the LSJLD would need to increase monitoring activities in these locations.

9. The CCID was notified of potential increases in flows and identified high groundwater levels in CCID monitoring well 144. The landowner has been contacted to schedule a site visit.

10. The SLCC was notified of potential increases in flows and did not identify any potential issues.

A visit to the Chowchilla Bifurcation structure is scheduled for Wednesday March 31st. Changes to the gates should not impact SJRRP operations unless significant backwater occurs.

Seepage hotline call #1 was placed on March 4, 2010 and addressed through the March 16th evaluation. Conditions do not warrant changing the evaluation. Planned releases can occur.

Seepage hotline call #2 was placed on March 11, 2010 and addressed through the March 16th evaluation. Conditions do not warrant changing the evaluation. Planned releases can occur.

Seepage hotline call #3 was placed on March 15, 2010 and addressed through the March 16th evaluation. Conditions do not warrant changing the evaluation. Planned releases can occur.

Seepage hotline call #4 was emailed on March 26, 2010 regarding groundwater levels in CCID monitoring well 144 in reach 4A with reported levels near the top of the buffer zone. A site evaluation is planned. Flows can be recaptured at Mendota Pool if necessary pending the outcome of the site evaluation. Planned releases can occur.

Monitoring Well R2B-1 was addressed though hotline call #1 and addressed through the March 16th evaluation. Conditions do not warrant changing the evaluation. Planned releases can occur.

Monitoring Well 49B is in Reach 2A and addressed through the March 16th evaluation. Conditions do not warrant changing the evaluation. Planned releases can occur.

Monitoring Well 55B, at San Mateo Road on the left bank, shows encroachment within 0.1 feet of the top of the buffer zone. A site investigation and evaluation on March 29th identified the same groundwater elevations as the prior week and a water table sloping down, away from the river. Crops consist of young palm trees near the river and pistachios farther inland. Sequential measurement of similar water tables suggests conditions have peaked. Young trees are unlikely to have extensive root systems and pistachios are salt tolerant. Past predictions of bench increases in this area overestimated groundwater rise at this location due to the downstream control from Mendota Dam. The combination of shallower roots, a sloping water table, and conservative prediction provides confidence in approaching the top of the buffer zone. The real-time well in the same transect and daily evaluations will provide for close monitoring. Planned releases can occur.

Monitoring Well 47, in Reach 2A, shows predicted encroachment into the buffer zone. A site investigation and evaluation is planned. The groundwater level is not predicted to exceed the top of the buffer zone. Planned releases can occur.

Data

The weekly groundwater report with manual measurements via electronic well sounder and recent flow data is available at: http://restoresjr.net/activities/if/index.html.

Table 1 shows the anticipated changes in flows used to predict future groundwater depths based on Exhibit B loss assumptions and an estimated 300 cfs delivery to Arroyo Canal.

Table 1 Anticipated Change in Flows

	Current Target (cfs)	Future Target (cfs)	Change (cfs)
Reach 2A	675	975	300
Reach 2B	555	855	300
Reach 3 and 4A	855	1155	300

Table 2 shows the current and predicted rise in groundwater based on estimated changes in river stage and the conceptual model shown in Figure 1. Subsequent pages show the rating curves for each of the key wells from the Mussetter Engineering, Inc., 2008. San Joaquin HEC-RAS Model Documentation. Technical Memorandum prepared for California Dept. of Water Resources, Fresno, California, June 2. Rating curves were updated March 25, 2010.

Table 2 Predicted Increases in Groundwater Levels for Key Wells

Well_ID	Site	Buffer Zone (ft bgs)	Screen Depth (ft bgs)	Current Depth Week of March 21st (ft bgs)	Predicted Stage Increase (ft)	Anticipated Depth (ft)
FA-9	Reach 2A – Transect 12 – Left	4-6	12-32	8.76	0.515	8.2
MW-47	Reach 2A – Transect 12 – Right	**6-8**	**20-40**	**8.15**	**0.515**	**7.6**
MA-4	Reach 2A – Transect 13 – Right	6-8	15-25	11.47	0.72	10.75
MW-49B	Reach 2A – Transect 13 – Left	**4-6**	**10-20**	**5.30**	**0.72**	**4.6**
MW-54B	Reach 2B – San Mateo Ave. – Right	TBD	TBD	15.64	1.035	14.6
MW-55B[1]	Reach 2B – San Mateo Ave. – Left	**6-8**	**10-15**	**7.1**	**1.035**	**6.1**
R2B-1	Reach 2B – Right	**4-6**	**8-11**	**5.45**	**0.4635**	**5.0**
R2B-2	Reach 2B – Right	4-6	17-20	12.34	0.4635	11.9
R3-1	Reach 3 – Right	4-6	9-24	8.88	0.9641	7.9
R3-6	Reach 3 – Right	4-6	17-20	8.38	0.9012	7.5
R3-7	Reach 3 – Right	3-5	17-20	6.82	0.9798	5.8
MW-84	Reach 4A – Highway 152 – Right	4-6	32-52	33.73	0.8949	32.8
MW-87B	Reach 4A – Highway 152 - Left	4-6	TBD	>14 (dry)	0.8949	13.1 to dry

[1] MW55B measurement occurred on Wednesday, March 24th and again on Monday, March 29th depths were the same on both days.

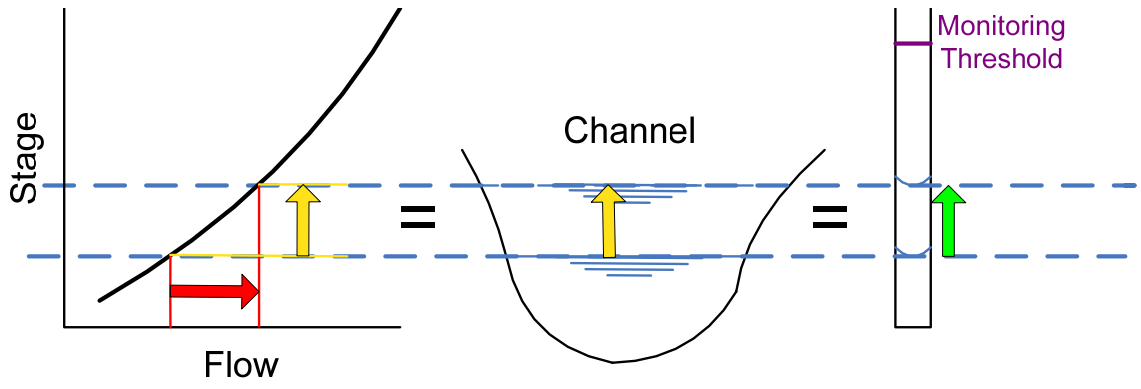
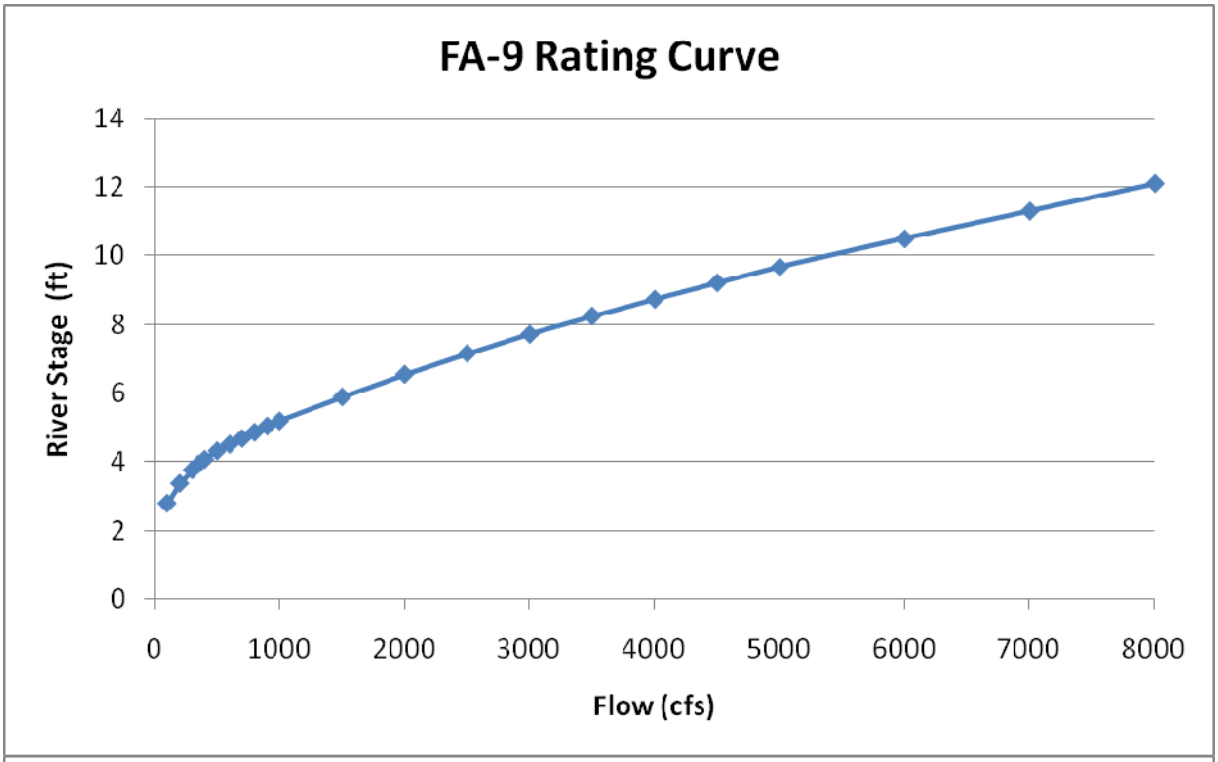
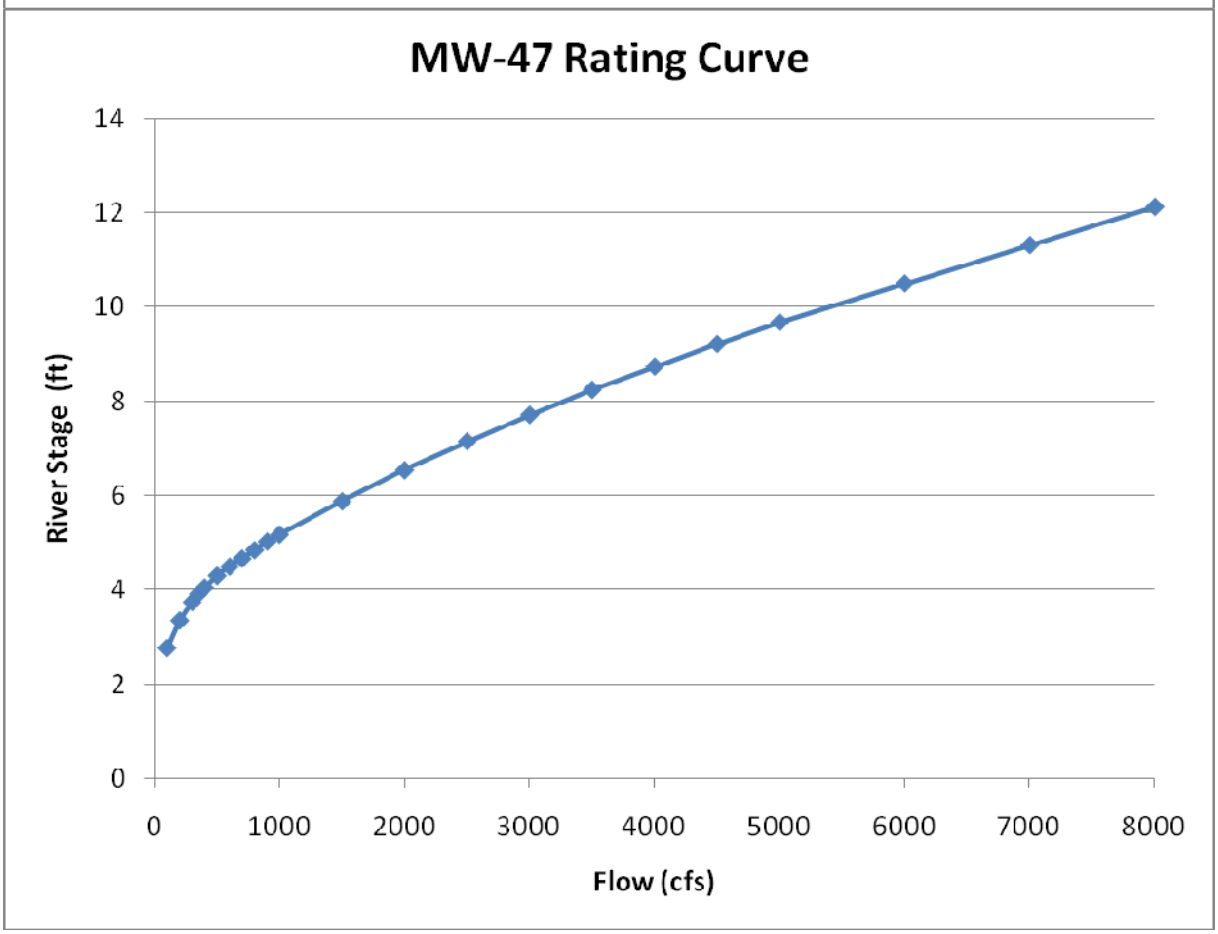
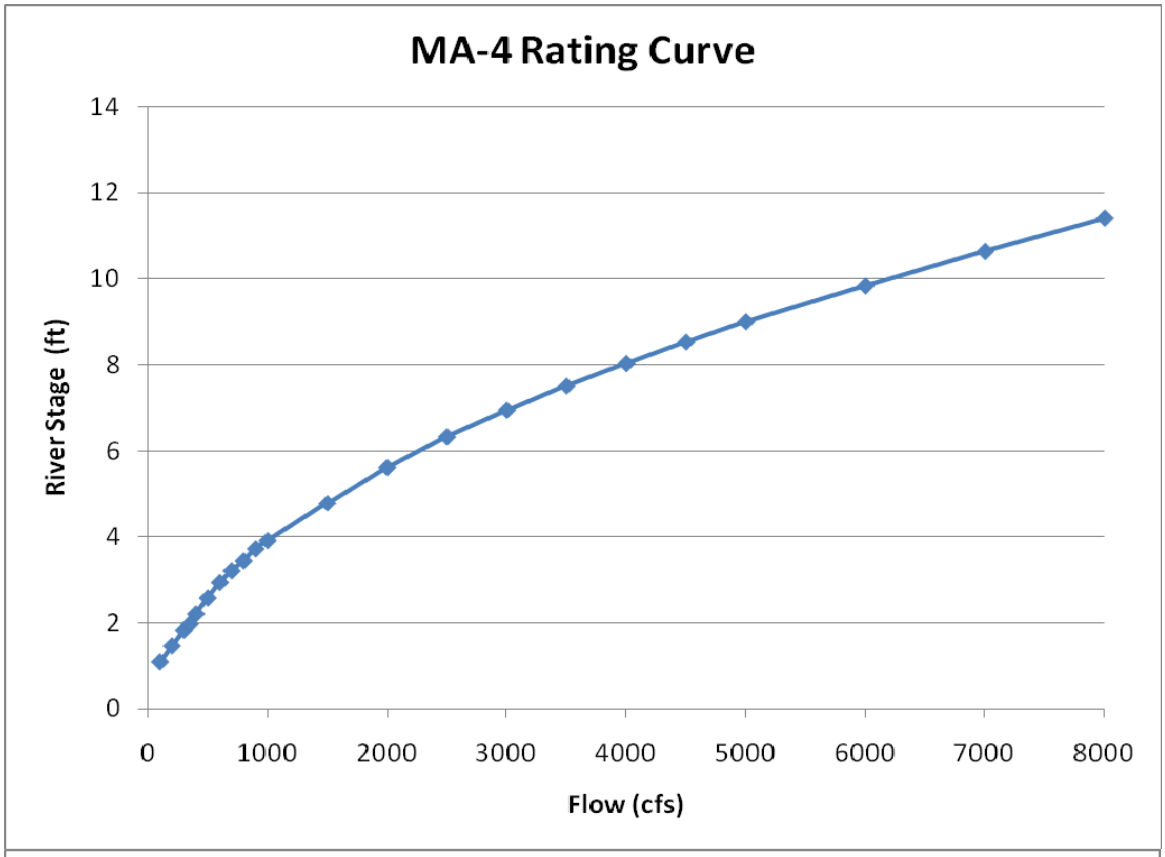
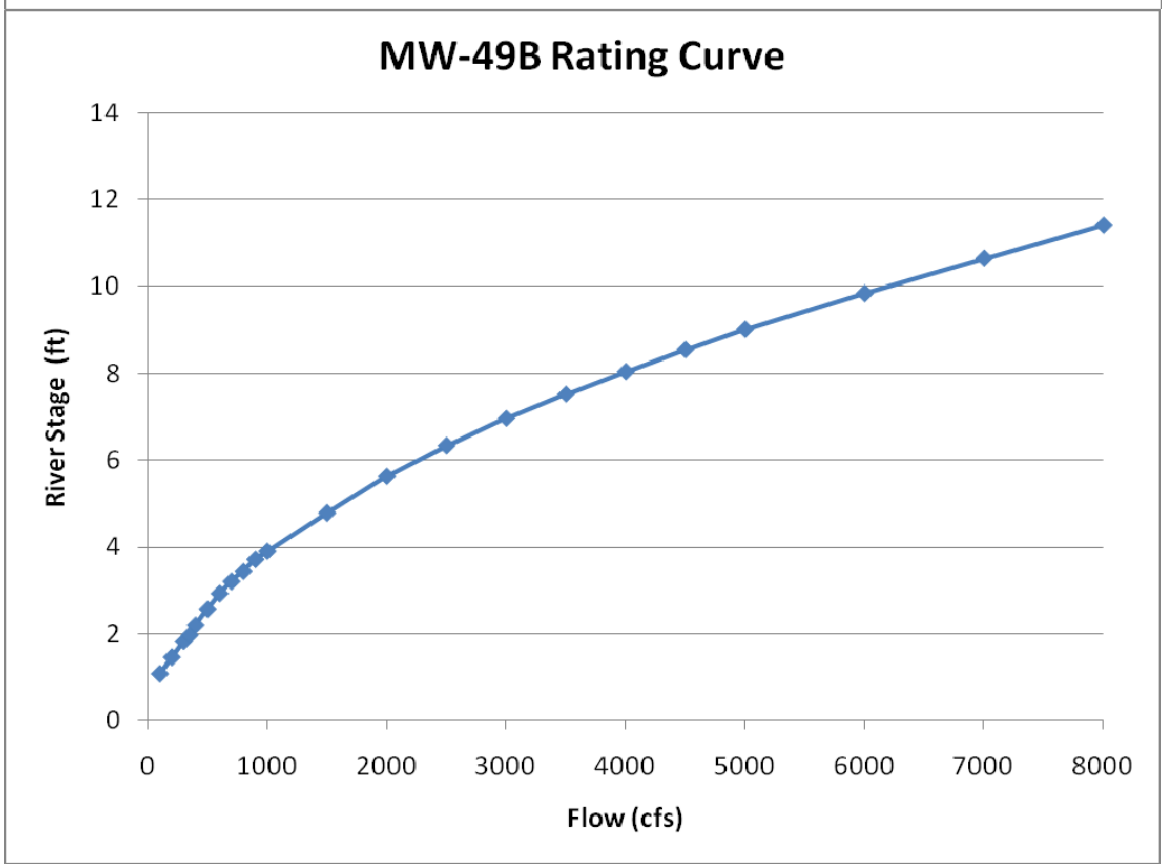


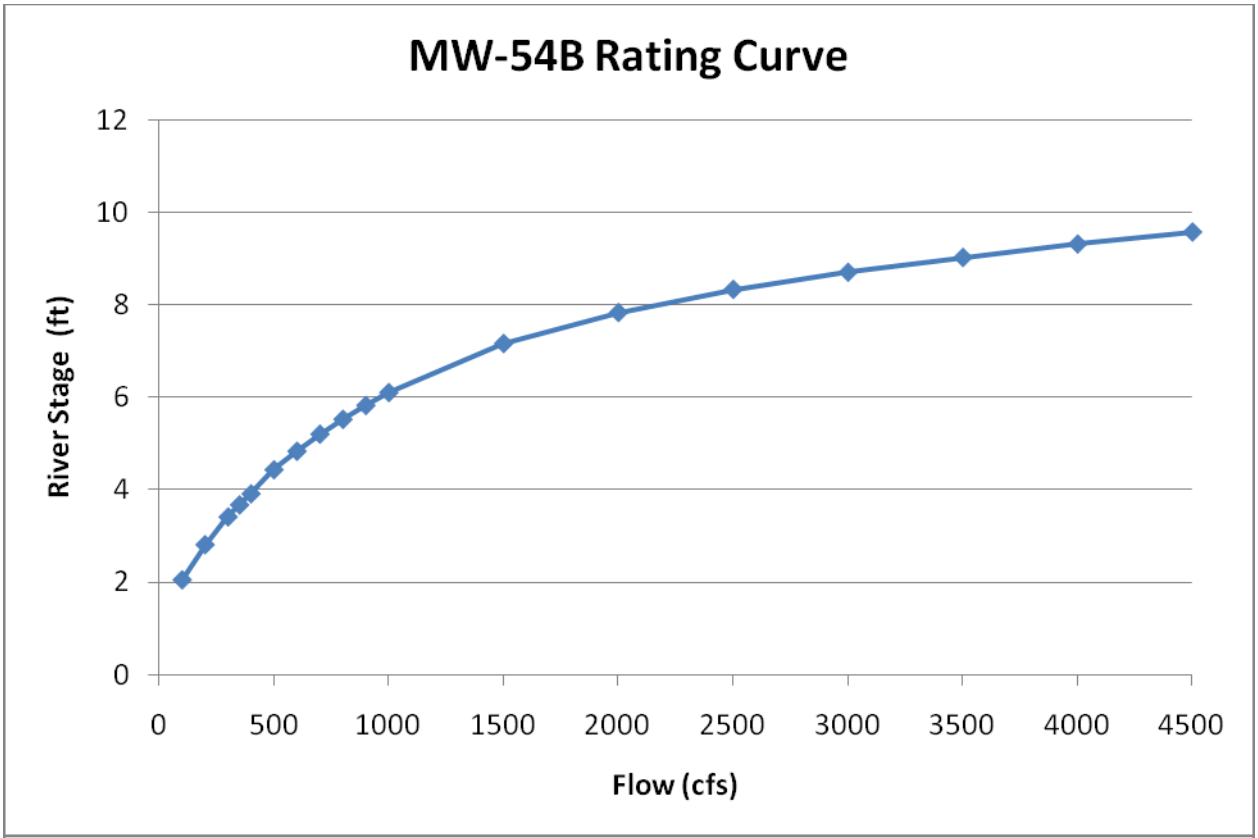
Figure 1 Conceptual Model for Flow Bench Evaluations Estimated Groundwater Depths

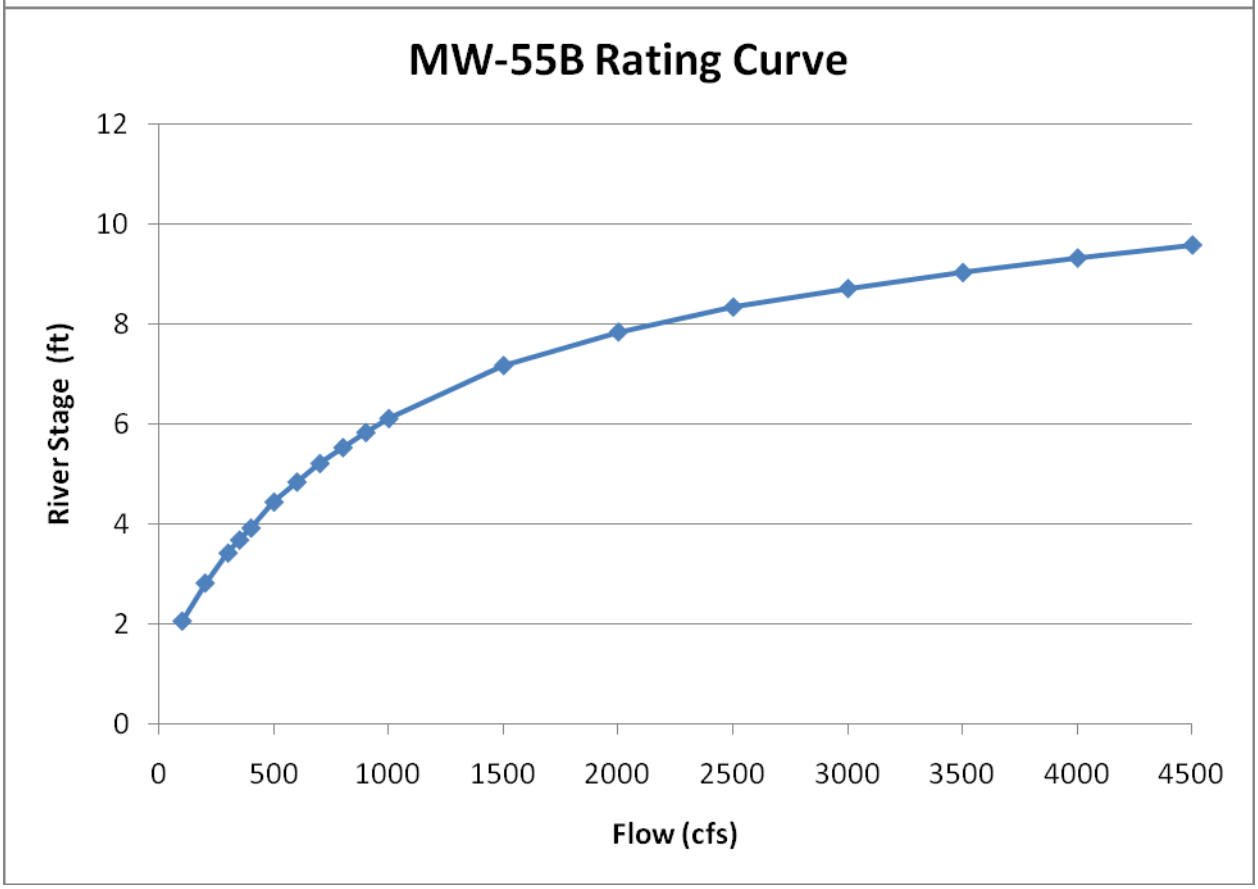

FA-9 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

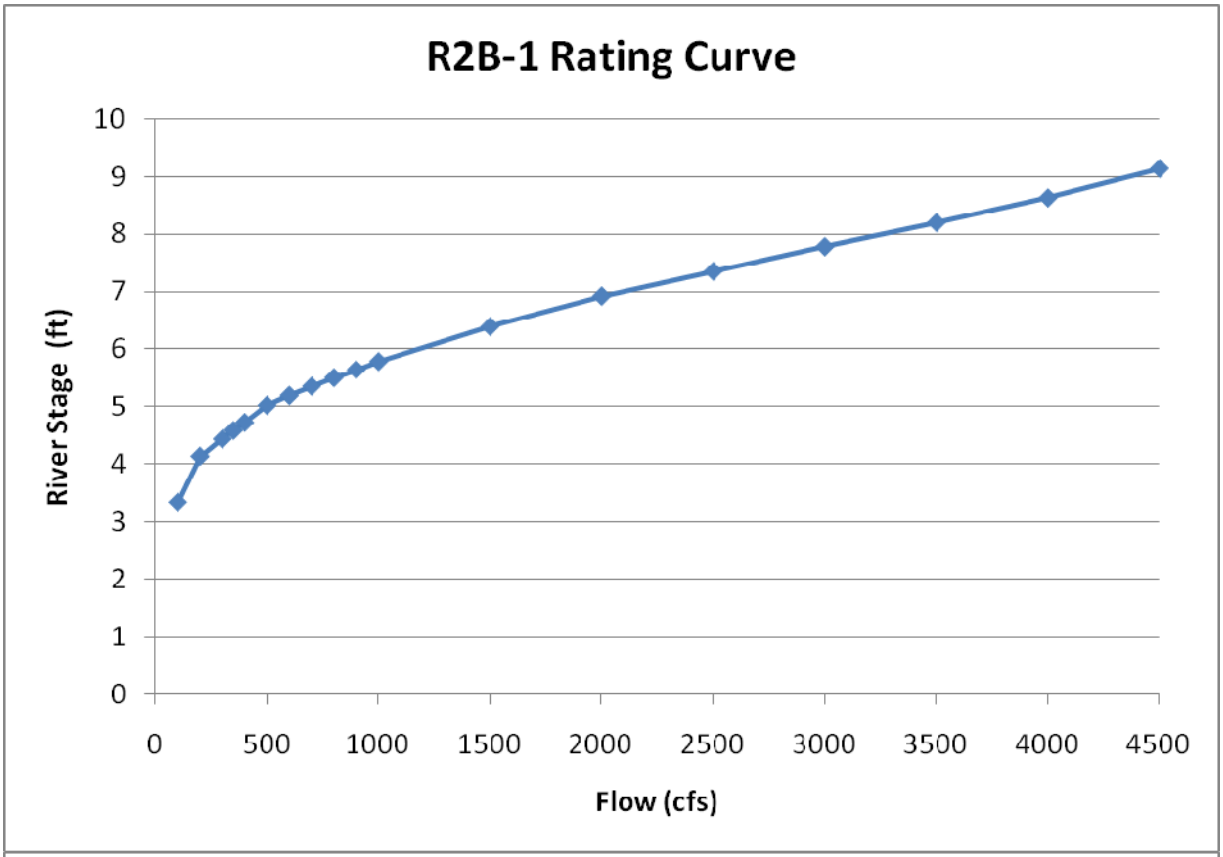

MW-47 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

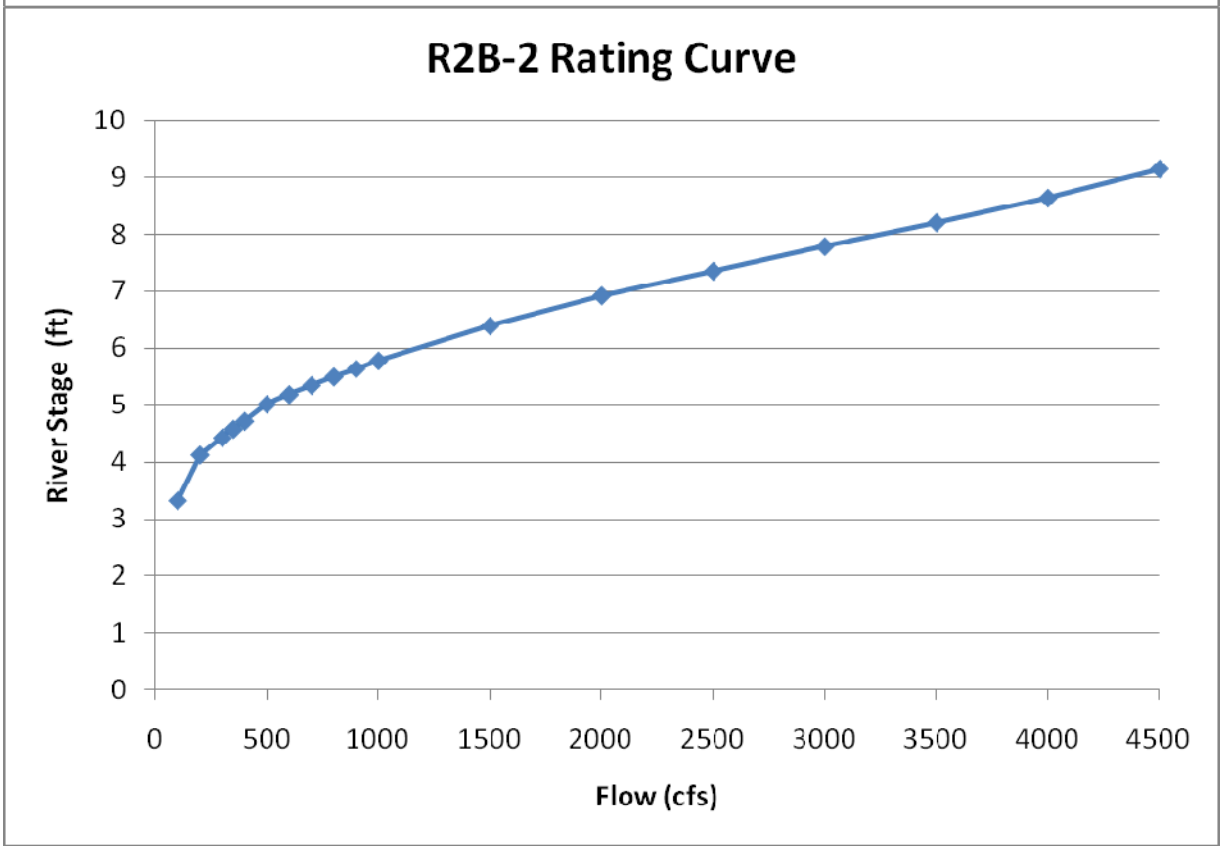

MA-4 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

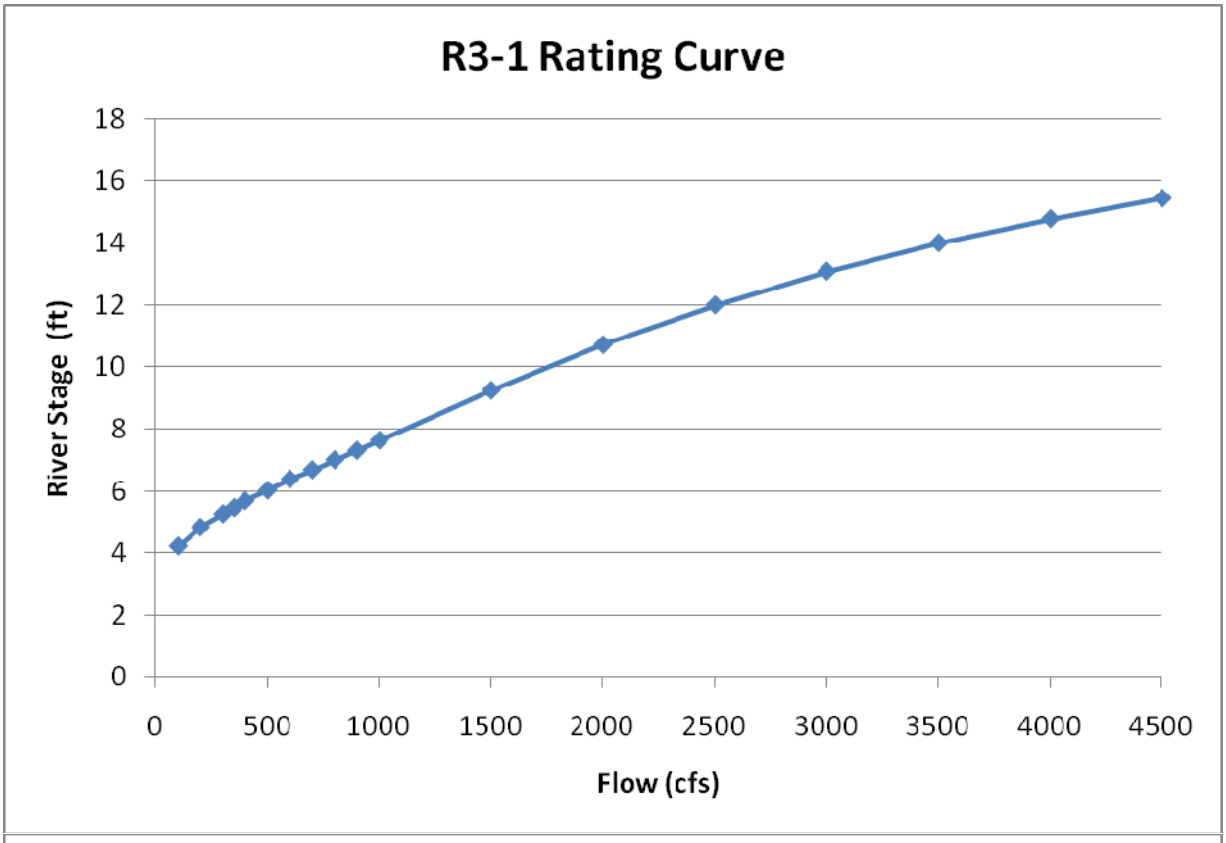

MW-49B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

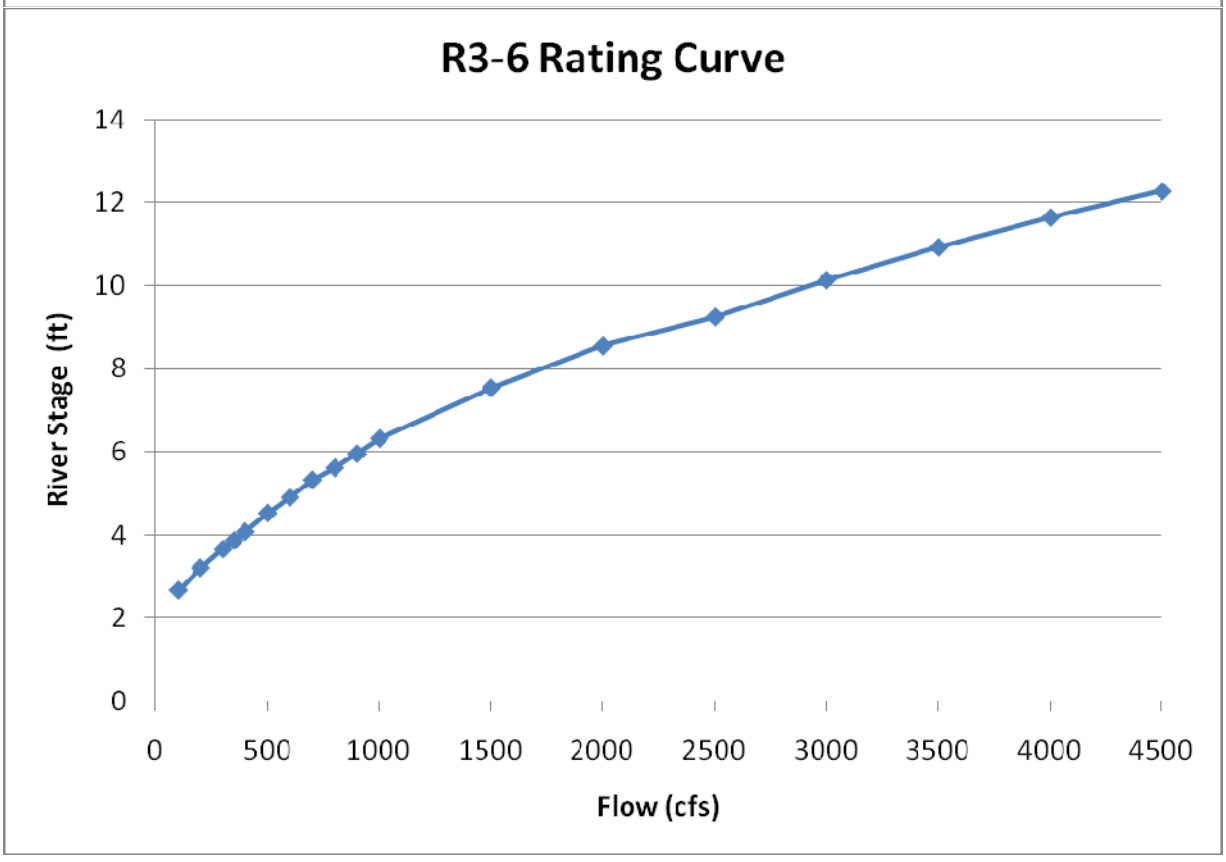

MW-54B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

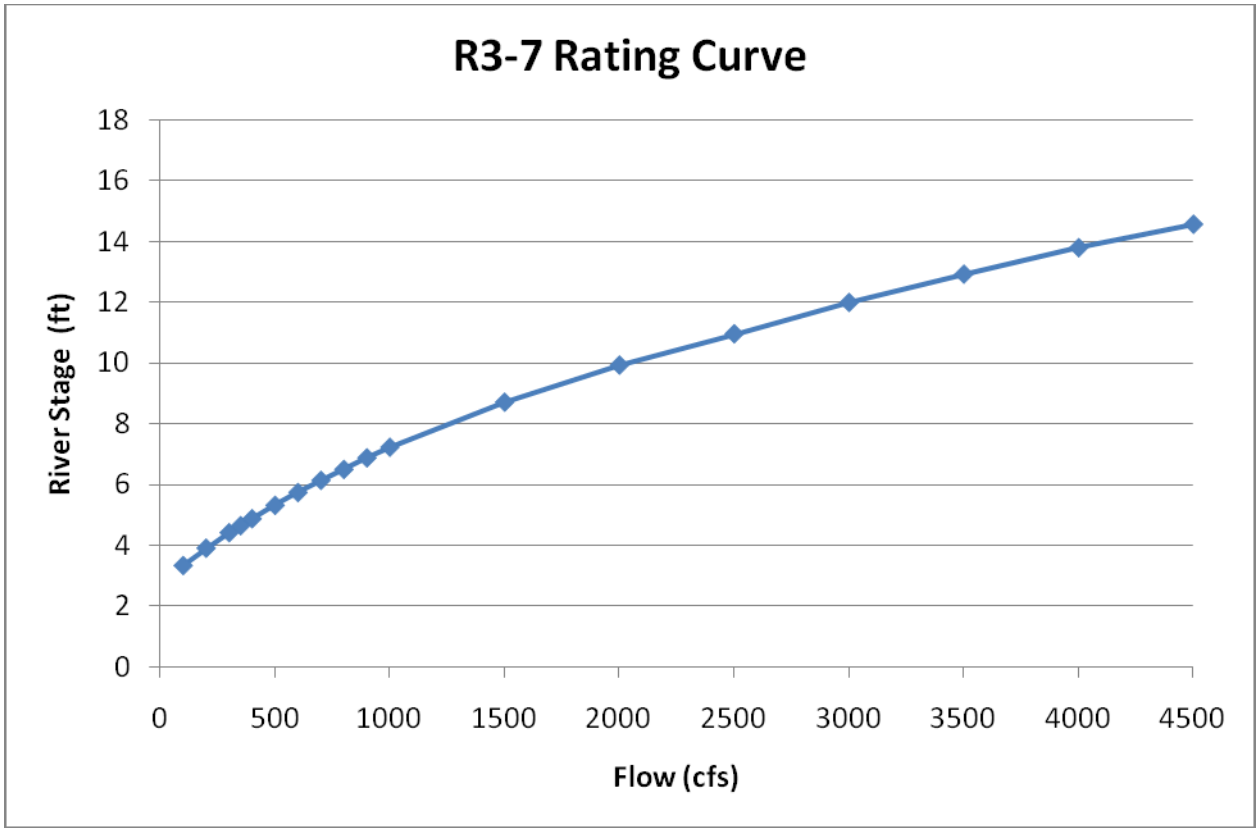

MW-55B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

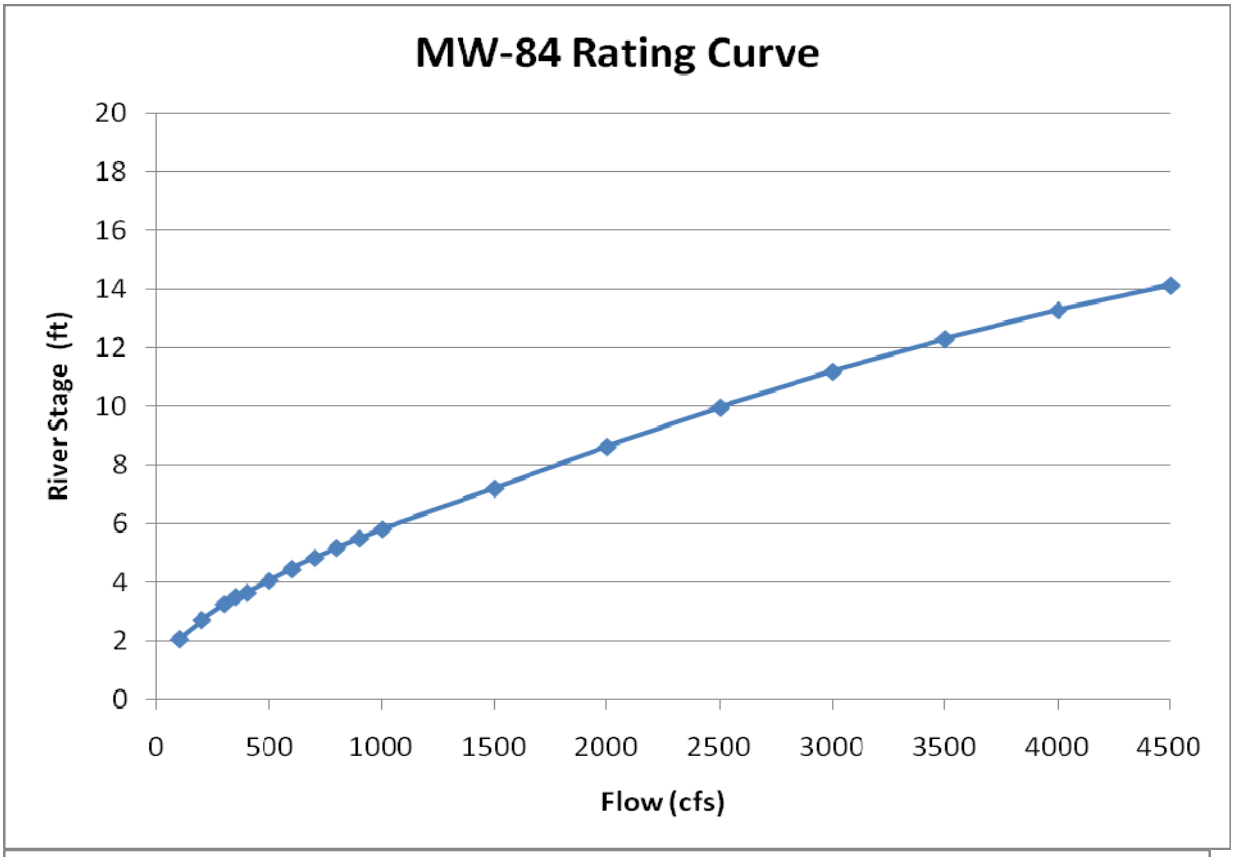

R2B-1 Rating Curve
River Stage (ft)
0
1
2
3
4
5
6
7
8
9
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

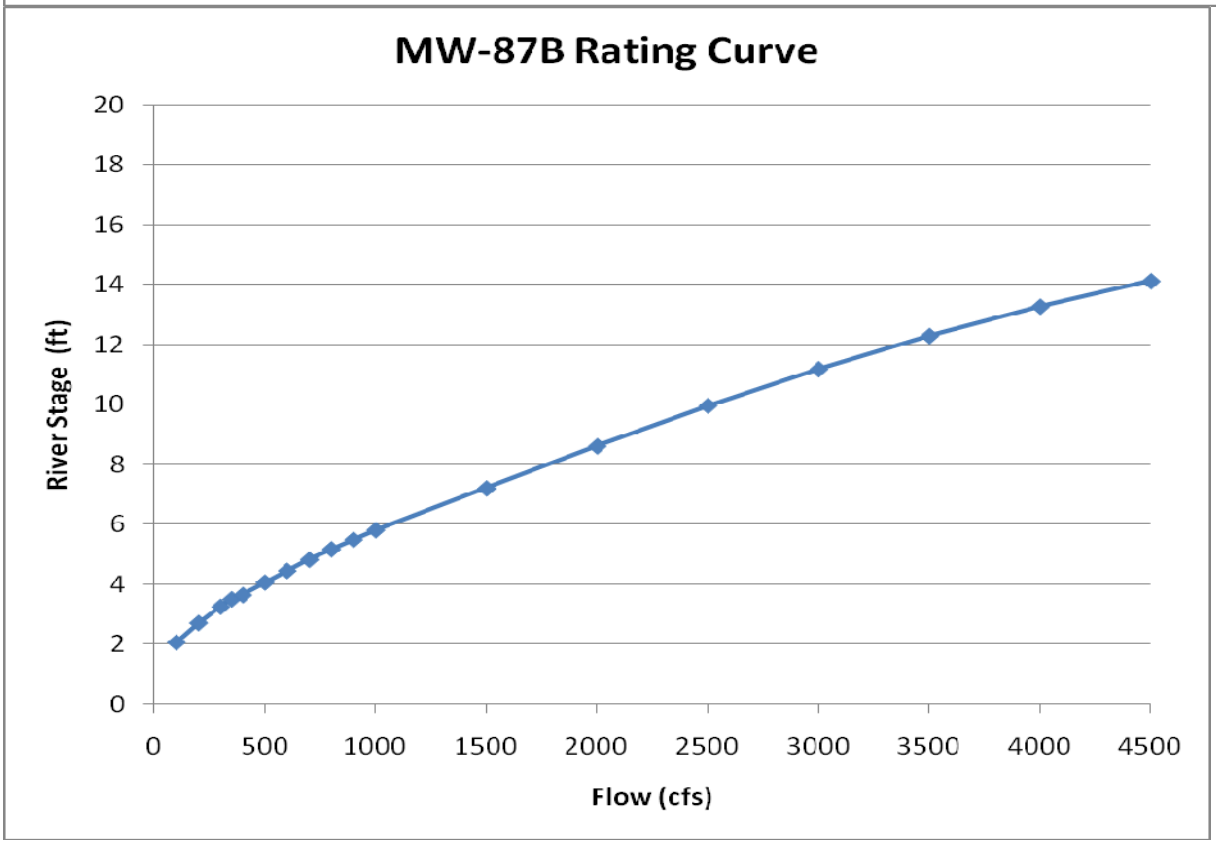

R2B-2 Rating Curve
River Stage (ft)
0
1
2
3
4
5
6
7
8
9
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-1 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-6 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-7 Rating Curve
River Stage (ft)
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


MW-84 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
20
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


MW-87B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
20
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)