

LMA: **NA0011 U02 Madera County FC** Waterway: **RB Ash Slough**  
 Site ID: **NA0011U02RM2.57** Status: **Existing Site**

Latitude: **37.055596** Longitude: **-120.412647** River\_Mile: **2.57** Levee\_Mile: **1.15** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>460</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Leaning &amp; visible roots</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>8.9</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>Migration opposite bank</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>5</b>	x2 <b>10</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>2</b>	x3 <b>6</b>

**Total Score (out of 265): 172 Normalized Score (out of 100%): 65**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Undermining</b>	Survey Date:	<b>9/3/2015</b>

**Comments:**

09/08/2015: No significant change observed.  
 07/22/2014: No significant change observed.  
 08/30/2013: No significant change observed.  
 07/31/2012: Site was visited on 07/24/2012. No significant change observed. Dense vegetation around the site  
 08/09/2011: Site was inspected. No visible change was observed from the previous condition. A fallen tree was seen at the levee toe about 20 feet upstream, and tree root exposed. There has been no report from the district that this site was corrected.  
 11/30/2010: Site was not inspected due to time constraints. There have been no reports from the district that the site was corrected. Continue to monitor site during flood events.  
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.  
 2009: Site is recommended as a local maintenance issue, per Critical Levee Repair Office, Critical Erosion Sites Evaluation 2008 Report; site was previously rated "M"  
 9/6/2007: Undercutting of the toe; several trees along the WS slope with roots exposed.



View of the erosion site from the levee crest.



Close view of the site.



Debris at the site.



Close view of the site with the dead tree.



LMA: **NA0013 U02 Merced Streams Gr** Waterway: **LB Black Rascal Diversio**  
 Site ID: **NA0013U02RM1.31** Status: **Repaired Site**

Latitude: **37.322615** Longitude: **-120.395948** River\_Mile: **1.31** Levee\_Mile: **1.31** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>23</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clays and Gravels</b>	Bank Soil Type:	<b>Silty Sand and Sandy Silt</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>Dense</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>3:1 or greater</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>No caving</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3	<b>0</b>	WS Berm Width (ft):	<b>0</b> x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4	<b>0</b>	WS Burrow Activity:	<b>0</b> x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4	<b>0</b>	Bank Soil Type:	<b>0</b> x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4	<b>0</b>	Bank Revetment:	<b>0</b> x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3	<b>0</b>	Bank Slope Veg.:	<b>0</b> x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4	<b>0</b>	Bank Slope (H:V):	<b>0</b> x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2	<b>0</b>	Bank Condition:	<b>0</b> x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2	<b>0</b>	Tree Hazard:	<b>0</b> x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1	<b>0</b>	Radius of Curvature:	<b>0</b> x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2	<b>0</b>	Geomorphologic:	<b>0</b> x3 <b>0</b>

**Total Score (out of 265): 0**      **Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>9/3/2015</b>

**Comments:**

09/03/2015: The ersion site has been repaired, and vegetation has been removed. Minor erosion is still visible at the lower bank slope near the discharge structure.  
 7/31/2014: Soil has been added near the site and more vegetation is visible.  
 7/16/2013: The site was reported in the 2013 Spring Levee Inspection Reports. The erosion was caused by the water from the discharge line crossing the levee. Above the erosion a concrete discharge structure is present at the levee toe. The site is covered with dense vegetation.



Looking at the repaired erosion site.



The erosion site has been repaired and vegetation has been removed.



The erosion site has been repaired but a minor erosion at the lower bank slope is still visible.



Close view of the minor erosion at the lower bank slope.



LMA: **NA0017 U15 San Joaquin Count** Waterway: **RB Mormon Slough**  
 Site ID: **NA0017U15RM13.87** Status: **Existing Site**

Latitude: **37.96806** Longitude: **-121.123299** River\_Mile: **13.87** Levee\_Mile: **8.94** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>90</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>45</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>2.0:1</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>2</b>	x4 <b>8</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 107**      **Normalized Score (out of 100%): 40**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: Both ends of the erosion site are protected by riprap.



View of the site from the left river bank.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U15 San Joaquin Count** Waterway: **RB Mormon Slough**  
 Site ID: **NA0017U15RM14.49** Status: **Existing Site**

Latitude: **37.969711** Longitude: **-121.116739** River\_Mile: **14.49** Levee\_Mile: **8.43** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>8</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Good, covers bottom 1/2</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>Medium to Dense</b>
Levee Slope (H:V):	<b>2.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>1</b>	x4 <b>4</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>1</b>	x3 <b>3</b>
Levee Slope (H:V):	<b>1</b>	x4 <b>4</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>5</b>	x2 <b>10</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 133**      **Normalized Score (out of 100%): 50**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>15</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Runoff</b>
Erosion Indicator:	<b>Caving</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed. More vegetation is observed at the site.  
 8/20/2014: No significant change observed.  
 09/12/2013: The erosion has been caused by runoff.



Looking down at the erosion from the levee crest.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U15 San Joaquin Count** Waterway: **RB Mormon Slough**  
 Site ID: **NA0017U15RM22.91** Status: **Existing Site**

Latitude: **38.045818** Longitude: **-121.023955** River\_Mile: **22.91** Levee\_Mile: **0.86** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>4800</b>	WS Berm Width (ft):	<b>10</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>Dense</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Frequent &gt;1/2 Slope</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	5	x3 15	WS Berm Width (ft):	4	x3 12
Crest Width (ft):	3	x4 12	WS Burrow Activity:	5	x2 10
Levee Soil Type:	2	x4 8	Bank Soil Type:	2	x4 8
Levee Revetment:	5	x4 20	Bank Revetment:	5	x4 20
Levee Slope Veg.:	0	x3 0	Bank Slope Veg.:	0	x3 0
Levee Slope (H:V):	2	x4 8	Bank Slope (H:V):	5	x4 20
Levee Slope Condition:	0	x2 0	Bank Condition:	0	x2 0
Location of Erosion:	1	x2 2	Tree Hazard:	0	x2 0
Site Relative to Bend:	1	x1 1	Radius of Curvature:	0	x1 0
Max Tidal (ft):	0	x2 0	Geomorphologic:	0	x3 0

**Total Score (out of 265): 136**      **Normalized Score (out of 100%): 51**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change has been observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Site has been revisited. No significant change observed.  
 09/02/2011: No significant change observed on site.  
 11/02/2010: No significant change observed. The mile-long erosion continues to degrade the bank. There are a few trees along the mile-long stretch on the lower bank slope that are affected by the scarp. WS Levee Slope was changed to 2:1. As a result, normalized score increased from 62 to 65.  
 08/05/2010: Recommended for waterside repair, per CLRO; "water velocity is a major factor for accelerating bank slope erosion."  
 8/12/2009: Near-vertical bank erosion; degrading channel is incising the banks; recommend annual assessment and monitoring of critical erosion site, per CLRO CES Evaluation 2008 Report; district is monitoring site for change in condition; site was previously rated "U".  
 2007: Visited site 02/06/2007; possible critical site.



Downstream view of the site.



Close view of the erosion. Note the dense vegetation and tree on site.



Close view of the erosion site. Small trees grow at the lower slope of the bank.



Looking down at the site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM12.95** Status: **Existing Site**

Latitude: **37.964735** Longitude: **-121.142503** River\_Mile: **12.95** Levee\_Mile: **10.17** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 152**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Dense vegetation on site. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Upstream view of the site from the right river bank.



Close view of the erosion.



Closer view of the erosion.



Front view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM13.53** Status: **Existing Site**

Latitude: **37.966772** Longitude: **-121.133071** River\_Mile: **13.53** Levee\_Mile: **9.59** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>120</b>	WS Berm Width (ft):	<b>6</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>Dense</b>
Levee Slope (H:V):	<b>2.5:1</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>1</b>	x4 <b>4</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 105**      **Normalized Score (out of 100%): 40**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>15</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion is on berm. The berm width is estimated. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Upstream view of the erosion.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM13.72** Status: **Existing Site**

Latitude: **37.966922** Longitude: **-121.129533** River\_Mile: **13.72** Levee\_Mile: **9.4** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>80</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 155**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion is covered with dense vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Upstream view of the erosion.



Close view of the erosion.



Close view of the erosion.



Front view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM13.85** Status: **Existing Site**

Latitude: **37.966661** Longitude: **-121.127864** River\_Mile: **13.85** Levee\_Mile: **9.07** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>25</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>4</b>	x2 <b>8</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>5</b>	x2 <b>10</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 168**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>20</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: The erosion might have been caused by river flow combined with runoff. Dense vegetation is presents at the site. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the site from the right river bank.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM13.86** Status: **Existing Site**

Latitude: **37.966615** Longitude: **-121.127328** River\_Mile: **13.86** Levee\_Mile: **8.99** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 152**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Pocket erosion at the levee toe and slope. The erosion is covered with dense vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion.



Close view of the erosion.



Closer view of the erosion.



Closer view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM14.48** Status: **Existing Site**

Latitude: **37.969213** Longitude: **-121.116574** River\_Mile: **14.48** Levee\_Mile: **8.63** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>200</b>	WS Berm Width (ft):	<b>25</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>1</b>	x3 <b>3</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 119**      **Normalized Score (out of 100%): 45**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion occurred on a berm of approximately 25 ft. wide. Site is covered with dense vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the site from the right river bank.



Front view of the erosion.



Close view of the erosion.



Closer view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM15.57** Status: **Existing Site**

Latitude: **37.978194** Longitude: **-121.101696** River\_Mile: **15.57** Levee\_Mile: **7.38** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>300</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 175**      **Normalized Score (out of 100%): 66**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed. Note the site ID changed from NA0017U16RM10.82 to NA0017U16RM15.57 to reflect the correct river mile.  
 09/12/2013: The site is located at immediately downstream of a levee segment protected by broken concrete. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the site from the right river bank.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM16.27** Status: **Existing Site**

Latitude: **37.983279** Longitude: **-121.090843** River\_Mile: **16.27** Levee\_Mile: **6.81** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>1000</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>3</b>	x3 <b>9</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 180 Normalized Score (out of 100%): 68**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>25</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: Site has been surveyed and the erosion has worsened since last year.  
 08/22/2012: Discontinuous scarp or pocket erosions occurred along a long stretch of the river, with an erosion height greater than 25 ft. at certain points. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Downstream view of the site from the right river bank.



Closer view of the erosion.



Front view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM17.11** Status: **Existing Site**

Latitude: **37.993525** Longitude: **-121.081679** River\_Mile: **17.11** Levee\_Mile: **5.71** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>60</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>45</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Medium</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>2.0:1</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Scattered &gt;1/2 Slope</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>2</b>	x3 <b>6</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>2</b>	x4 <b>8</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>2</b>	x2 <b>4</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 98**      **Normalized Score (out of 100%): 37**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Slide</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: The erosion is near a tree and probably has been made worse by the unstable bank slope.



View of the site from the right river bank.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM17.27** Status: **Existing Site**

Latitude: **37.995216** Longitude: **-121.080159** River\_Mile: **17.27** Levee\_Mile: **5.56** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>120</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>3</b>	x2 <b>6</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 164**      **Normalized Score (out of 100%): 62**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: The erosion seems to be caused by high river flow. Dense vegetation is present at the site. Signs of animal activities are visible. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View from the right river bank.



View from the right river bank.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM17.81** Status: **Existing Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**37.99772 -121.077807 17.81 5.54 M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>250</b>	WS Berm Width (ft):	<b>3</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>Medium</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>2</b>	x3 <b>6</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 138**      **Normalized Score (out of 100%): 52**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The site is located at the opposite river bank of E. Tobacco Road. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Upstream view of the site.



Front view of the site.



Closer view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM17.99** Status: **Existing Site**

Latitude: **38.003624** Longitude: **-121.072585** River\_Mile: **17.99** Levee\_Mile: **5.03** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>5</b>	x2 <b>10</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 187**      **Normalized Score (out of 100%): 71**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: Site has been surveyed and the pocket erosion has developed toward levee crest.  
 08/22/2012: A pocket erosion at the levee toe and on lower slope. The levee surface at the upper slope also shows signs of erosion due to poor maintenance. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View from right river bank.



Close view of the erosion.



A close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM18.69** Status: **Existing Site**

Latitude: **38.012792** Longitude: **-121.068073** River\_Mile: **18.69** Levee\_Mile: **4.33** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>110</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>3</b>	x2 <b>6</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 166**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>20</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: An irrigation pipe is present at the site, but probably did not cause the erosion. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the erosion site.



Front view of the erosion.



Closer view of the erosion.



Closer view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM19.18** Status: **Existing Site**

Latitude: **38.017715** Longitude: **-121.065011** River\_Mile: **19.18** Levee\_Mile: **3.9** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>6</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>2:1</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>2</b>	x4 <b>8</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 135**      **Normalized Score (out of 100%): 51**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: River-induced erosion occurred on the berm, while the runoff-induced erosion occurred on the levee slope. Site is covered with vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the site from right river bank.



Closer view of the erosion.



Front view of the erosion at the berm.



Closer view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM19.23** Status: **Repaired Site**

Latitude: **38.018449** Longitude: **-121.06412** River\_Mile: **19.23** Levee\_Mile: **3.84** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>50</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: This site was repaired prior to this survey.  
 08/22/2012: The erosion is covered with grass and shrubs. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of repaired site.



Front view of repaired site.



A closer view of the repaired site.



Close view of the repaired site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM19.28** Status: **Repaired Site**

Latitude: **38.018902** Longitude: **-121.063658** River\_Mile: **19.28** Levee\_Mile: **3.78** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>Medium to Dense</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed. Slightly more vegetation is observed at the site.  
 8/20/2014: No significant change observed.  
 9/12/2013: This site has been repaired prior to this survey, but new erosion has developed immediately downstream of the site.  
 08/22/2012: Tow large-size pocket erosions. Site is covered with dense vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



View of the repaired site.



View of the repaired site.



Front view of the repaired erosion.



A closer view of the site. Note the pocket erosion immediately next to the repaired site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM19.29** Status: **Existing Site**

Latitude: **38.019642** Longitude: **-121.062917** River\_Mile: **19.29** Levee\_Mile: **3.61** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>25</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>45</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Medium</b>
Levee Slope (H:V):	<b>2.5:1</b>	Bank Slope (H:V):	<b>2.0:1</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Scattered &lt;1/2 Slope</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>2</b>	x3 <b>6</b>
Levee Slope (H:V):	<b>1</b>	x4 <b>4</b>	Bank Slope (H:V):	<b>2</b>	x4 <b>8</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 92**      **Normalized Score (out of 100%): 35**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: A pocket erosion was found near the water's edge.



View of the site from the right river bank.



Close view of the erosion.



Close view of the erosion. Note the dense vegetation.



View of the site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM20** Status: **Existing Site**

Latitude: **38.02667** Longitude: **-121.053031** River\_Mile: **20.00** Levee\_Mile: **3.03** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>300</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 178**      **Normalized Score (out of 100%): 67**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>20</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Site Comprised of series of pocket and scarp erosions. Some of erosions are covered by grass or shrubs. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion.



Front view of the erosion.



Close view of the erosion.



Close view of the scarp erosion. Note the small tree at the erosion site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM20.62** Status: **Existing Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**38.032202 -121.045226 20.62 2.37 U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>50</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>3</b>	x2 <b>6</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 169 Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>7</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change has been observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion was first reported in the 2012 spring levee inspection report. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the site.



Close view of the erosion. Note the vegetation at the site.



Close view of the erosion.



Close view of the site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM20.71** Status: **Existing Site**

Latitude: **38.033072** Longitude: **-121.04497** River\_Mile: **20.71** Levee\_Mile: **2.31** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>40</b>	WS Berm Width (ft):	<b>3</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 138**      **Normalized Score (out of 100%): 52**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Site is covered with dense vegetation. There is no levee structure on site.  
 The levee crest width and levee height were not measured or estimated in the field.



Front view of the site.



Front view of the erosion. Site is covered with vegetation and trees.



Closer view of the erosion.



Front view of the site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM21.05** Status: **Existing Site**

Latitude: **38.036549** Longitude: **-121.040302** River\_Mile: **21.05** Levee\_Mile: **1.94** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>5</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Scattered &gt;1/2 Slope</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>2</b>	x2 <b>4</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 134**      **Normalized Score (out of 100%): 51**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Berm width is estimated as 5 ft. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion



Close view of the erosion.



Front view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM21.94** Status: **Existing Site**

Latitude: **38.037906** Longitude: **-121.038949** River\_Mile: **21.94** Levee\_Mile: **1.77** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>40</b>	WS Berm Width (ft):	<b>3</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>Medium to Dense</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>1</b>	x3 <b>3</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 132**      **Normalized Score (out of 100%): 50**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed  
 9/12/2013: No significant change observed.  
 08/22/2012: Site is covered by dense vegetation. Berm width is estimated as 5 ft. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Looking at the erosion from right river bank.



Front view of the erosion.



Front view of the erosion.



Close view of the erosion. Note the dense vegetation.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM21.95** Status: **Existing Site**

Latitude: **38.03808** Longitude: **-121.038676** River\_Mile: **21.95** Levee\_Mile: **1.75** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>5</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>Medium</b>
Levee Slope (H:V):	<b>1.5:1</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Scattered &gt;1/2 Slope</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>2</b>	x3 <b>6</b>
Levee Slope (H:V):	<b>3</b>	x4 <b>12</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>2</b>	x2 <b>4</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 125**      **Normalized Score (out of 100%): 47**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion is covered by dense vegetation. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion site.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM22.01** Status: **Existing Site**

Latitude: **38.03911** Longitude: **-121.03784** River\_Mile: **22.01** Levee\_Mile: **1.74** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>50</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265):** **163** **Normalized Score (out of 100%):** **62**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: Site is covered with dense vegetation. A scarp erosion is adjacent to a pocket erosion at the downstream. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion site from the left river bank.



Front view of the pocket erosion.



Close view of the pocket erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM22.15** Status: **Existing Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**38.038751 -121.037347 22.15 1.59 M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>25</b>	WS Berm Width (ft):	<b>10</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 153 Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The berm is estimated at 10 ft. Dense vegetation on site. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM22.58** Status: **Existing Site**

Latitude: **38.040757** Longitude: **-121.027786** River\_Mile: **22.58** Levee\_Mile: **1.13** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clays and Gravels</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>15.9</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>1</b>	x4 <b>4</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 167**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Loose Soil</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 9/12/2013: No significant change observed.  
 08/22/2012: The erosion is at the outside corner of a river bend, and next to a tree at the levee toe. Irrigation structure presents at the site. There is no levee structure on site. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion. The erosion is next to a tree at the levee toe.



Front view of the erosion.



Front view of the erosion and broken concrete protection on the levee slope.



Closer view of the erosion.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM22.74** Status: **Existing Site**

Latitude: **38.042833** Longitude: **-121.025776** River\_Mile: **22.74** Levee\_Mile: **0.98** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor condition or n</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 157**      **Normalized Score (out of 100%): 59**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: No significant change observed.  
 8/20/2014: No significant change observed.  
 09/12/2013: No significant change observed.  
 08/22/2012: The erosion was surveyed and documented for monitoring purpose. There is no levee structure on the site, only high ground protecting the land behind. The levee crest width and levee height were not measured or estimated in the field.  
 There is a drainage pipe at the site, which might have caused the problem at one pocket erosion.



View of the site from right river bank.



Close view of the erosion.



Close view of the erosion. Note the drainage pipe at the site.



Close view of the site.



LMA: **NA0017 U16 San Joaquin Count** Waterway: **LB Mormon Slough**  
 Site ID: **NA0017U16RM23.35** Status: **Existing Site**

Latitude: **38.048159** Longitude: **-121.016427** River\_Mile: **23.35** Levee\_Mile: **0.3** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>1900</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>1:1 or less</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Entire slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>Migration erosion side</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>5</b>	x3 <b>15</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>4</b>	x4 <b>16</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>5</b>	x2 <b>10</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>3</b>	x3 <b>9</b>

**Total Score (out of 265): 200 Normalized Score (out of 100%): 75**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>25</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/12/2015</b>

**Comments:**

8/12/2015: The erosion progressed at the site. Newly collapsed material is observed at the bottom of the erosion.  
 8/20/2014: The erosion at the site has worsened. The erosion increased in both length and in height.  
 09/12/2013: Site has been visited and signs of new erosion are visible.  
 08/22/2012: The erosion was surveyed and documented for monitoring purpose. There is no levee structure on the site, only high ground protecting the land behind. The levee crest width and levee height were not measured or estimated in the field.



Front view of the erosion. Looking from the right side of the river.



Close view of the erosion. Signs of new erosion along the site.



Close view of the erosion.



Close view of the erosion.



LMA: **RD0001 U01 Union Island** Waterway: **RB Old River**  
 Site ID: **RD0001U01RM31.4** Status: **Existing Site**

Latitude: **37.822306** Longitude: **-121.375304** River\_Mile: **31.40** Levee\_Mile: **0** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>6</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>17</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>Frequent &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>2.5</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>3</b>	x2 <b>6</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>3</b>	x1 <b>3</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 152**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/20/2013: No significant change at this site.  
 08/07/2012: The erosion is at the confluence of Old River and one of its tributary.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.



Front view of the site. Note the large tree on site.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM44.32** Status: **Existing Site**

Latitude: **37.90253** Longitude: **-121.32569** River\_Mile: **44.32** Levee\_Mile: **1.08** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>

Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 170**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The erosion is nearly vertical, and has developed upward to halfway of the levee slope. The protecting concrete blocks have been washed away. Animal activities are visible.



Front view of the erosion site. Note the concrete blocks and vegetation.



Close view of the erosion.



Close view of the erosion.

Close view of the erosion.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM44.52** Status: **Repaired Site**

Latitude: **37.89951** Longitude: **-121.32603** River\_Mile: **44.52** Levee\_Mile: **1.28** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>10</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>29</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3	<b>0</b>	WS Berm Width (ft):	<b>0</b> x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4	<b>0</b>	WS Burrow Activity:	<b>0</b> x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4	<b>0</b>	Bank Soil Type:	<b>0</b> x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4	<b>0</b>	Bank Revetment:	<b>0</b> x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3	<b>0</b>	Bank Slope Veg.:	<b>0</b> x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4	<b>0</b>	Bank Slope (H:V):	<b>0</b> x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2	<b>0</b>	Bank Condition:	<b>0</b> x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2	<b>0</b>	Tree Hazard:	<b>0</b> x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1	<b>0</b>	Radius of Curvature:	<b>0</b> x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2	<b>0</b>	Geomorphologic:	<b>0</b> x3 <b>0</b>

**Total Score (out of 265): 0**      **Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: The erosion has been repaired. A minor erosion is still visible near the tree.  
 08/13/2013: A mid-size tree is present immediately upstream of the erosion, which could block the view of the site. Some debris is visible.



View from downstream.



Close view of the repaired erosion site.



Close view of the repaired erosion site. Note the tree near the site.

Close view of the repaired erosion site.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM45.94** Status: **Repaired Site**

Latitude: **37.88102** Longitude: **-121.33226** River\_Mile: **45.94** Levee\_Mile: **2.66** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>8</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1.5:1</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Frequent &gt;1/2 Slope</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees (0-2" di</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**      **Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Caving</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: Erosion has been repaired.  
 6/19/2014: The erosion was probably caused by the irrigation pipe found at the site.



View of the repaired erosion site from the survey boat.



Close view of the repaired erosion site.



Close view of the site.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM45.95** Status: **Existing Site**

Latitude: **37.88071** Longitude: **-121.3322** River\_Mile: **45.95** Levee\_Mile: **2.72** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>120</b>	WS Berm Width (ft):	<b>10</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1.5:1</b>

Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Frequent &lt;1/2 Slope</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>3</b>	x4 <b>12</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 117**      **Normalized Score (out of 100%): 44**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: Levee has been cut at the mid slope and a temporary step has been made for unknow purpose. More erosion has been found at the site.  
 6/19/2014: The erosion is in the river bank which has an estimated 10-ft wide berm.



Front view of the erosion site. Note the new cut at the middle levee slope.



Front view of the erosion.



Front view of the erosion.

Close view of the erosion.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM46.03** Status: **Repaired Site**

Latitude: **37.879293** Longitude: **-121.332518** River\_Mile: **46.03** Levee\_Mile: **2.78** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>50</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>4.4</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0 Normalized Score (out of 100%):**

**III. Misc**

Crown Type: **Gravel** Scarp Height (ft): **15**  
 Bank Protection Type: **None** Cause of Erosion: **River Induced**  
 Erosion Indicator: **Scarp** Survey Date: **6/24/2015**

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: The erosion has been repaired.  
 08/13/2013: Found during boat survey. There is vegetation at the site.



Front view of the repaired site.



Close view of the repaired site.



Close view of the repaired site.

Close view of the repaired site.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM46.1** Status: **Existing Site**

Latitude: **37.87866** Longitude: **-121.3324** River\_Mile: **46.10** Levee\_Mile: **2.81** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>10</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Poor, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>3</b>	x4 <b>12</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 133**      **Normalized Score (out of 100%): 50**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Slide</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: A pocket erosion was found during the boat survey.



Front view of the erosion.



Front view of the erosion.



Close view of the erosion. The slope protection is poor.

Close view of the erosion.



LMA: **RD0017 U02 Mossdale** Waterway: **RB San Joaquin River**  
 Site ID: **RD0017U02RM46.89** Status: **Existing Site**

Latitude: **37.8685** Longitude: **-121.32767** River\_Mile: **46.89** Levee\_Mile: **3.62** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>5</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 151**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: The erosion is near a large tree and probably has been caused by the irrigation pipe on the site.



Front view of the erosion. Note the tree and the irrigation pipe.



Close view of the erosion.



Close view of the erosion.

Close view of the erosion.



LMA: **RD0404 U01 Boggs**  
 Site ID: **RD0404U01RM40.86**

Waterway: **RB San Joaquin River**  
 Status: **Repaired Site**

Latitude: **37.93948** Longitude: **-121.34273** River\_Mile: **40.86** Levee\_Mile: **0.23** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>280</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>2.1</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: The erosion has been repaired.  
 6/19/2014: No significant change observed.  
 08/13/2013: The boat survey found the erosion has progressed significantly in size and in number of pocket erosions.  
 08/07/2012: The site has been visited by boat survey. The erosion has developed in size, and more pocket erosions were found.  
 8/23/2011: Pockets erosions observed by last survey seem to have progressed during the last flood season. Continuous monitoring of this site suggested  
 9/07/2010: No significant change observed on site. There is emergent vegetation at the water line. Several pocket erosions lined along the lower slope that stretches from RM 40.86 to RM 41.14.  
 9/30/2009: No major change observed; the site was combined with other existing sites are RM's 40.93, 40.98, and 41.14 as one site; several pocket erosion just above non-uniform toe rip rap; previously rated "U"; bare spots along the upper slope.  
 2008: Possibly caused by wave wash erosion; several pocket erosion along the lower slope; site is inside of a bend.  
 2006: Visited site 09/12/06.



Front view of the repaired site.



Front view of the repaired site.



Close view of the repaired site.



LMA: **RD0404 U01 Boggs**  
 Site ID: **RD0404U01RM40.98**

Waterway: **RB San Joaquin River**  
 Status: **Repaired Site**

Latitude: **37.939228** Longitude: **-121.340786** River\_Mile: **40.98** Levee\_Mile: **0.34** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: The erosion site has been repaired. Minor erosion is visible at the water edge.  
 06/19/2014: No significant change observed.  
 08/13/2013: The pocket erosion is located at immediately upstream of a small oak tree.



Front view of the repaired erosion site.



Front view of the of the repaired erosion site.



Front view of the repaired erosion site.



Close view of the repaired erosion site. Note the minor erosion at the water edge.



LMA: **RD0404 U01 Boggs** Waterway: **RB San Joaquin River**  
 Site ID: **RD0404U01RM41.11** Status: **Existing Site**

Latitude: **37.93919** Longitude: **-121.33828** River\_Mile: **41.11** Levee\_Mile: **0.48** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>18</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>17</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 170**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 8/7/2012: The erosion is next to a repaired site and approximately 400 feet downstream of a river bend. There are broken concretes at the upper levee slope, but not visible at the levee toe or lower slope. Likely the protection concrete blocks have been washed away.



Close view of the site.



A closer view of the site.



Front view of the site.



LMA: **RD0404 U01 Boggs** Waterway: **RB San Joaquin River**  
 Site ID: **RD0404U01RM41.22** Status: **Repaired Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**37.939133 -121.3361 41.22 0.61**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>80</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>13</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>



Front view of the repaired erosion site.



Close view of the repaired erosion site.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: The erosion has been repaired.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The site was first discovered by levee inspector in the spring inspection. Levee slope was protected with broken concrete blocks, but those blocks have been washed away during high flows.



LMA: **RD0404 U01 Boggs**  
 Site ID: **RD0404U01RM42.02**

Waterway: **RB San Joaquin River**  
 Status: **Existing Site**

Latitude: **37.93045** Longitude: **-121.32745** River\_Mile: **42.02** Levee\_Mile: **1.46** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Poor, covers bottom 1/</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>



Front view of the erosion.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>4</b>	x4 <b>16</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>



Close view of the erosion. Note the protection on the lower levee slope.

**Total Score (out of 265): 143**      **Normalized Score (out of 100%): 54**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: A series of scarp erosions have been found on the lower levee slope and at the levee toe.



Close view of the erosion. The upstream end of the site is protected by riprap revetment.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM40.85** Status: **Existing Site**

Latitude: **37.939085** Longitude: **-121.343917** River\_Mile: **40.85** Levee\_Mile: **0.18** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>3.8</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>2</b>	x1 <b>2</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 174**      **Normalized Score (out of 100%): 66**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: The erosion was discovered during 2013 spring levee inspection. Inspector comment: Erosion is located along the lower level of water-ward slope.



Close view of the erosion.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM40.99** Status: **Existing Site**

Latitude: **37.93887** Longitude: **-121.34046** River\_Mile: **40.99** Levee\_Mile: **0.4** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>11</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 170**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Slide</b>
Erosion Indicator:	<b>Caving</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 8/7/2012: The erosion is at the upper levee slope, and likely caused by slope slip. The lower levee slope is covered with dense vegetation.



Front view of the erosion site. Note the vegetation at the levee toe and on the lower slope.



Front view of the site.



Close view of the erosion.



Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.36** Status: **New Site**

Latitude: **37.937222** Longitude: **-121.335277** River\_Mile: **41.36** Levee\_Mile: **0.74** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>80</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Poor, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees (0-2" di</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>3</b>	x4 <b>12</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 144**      **Normalized Score (out of 100%): 54**

**III. Misc**

Crown Type: **Gravel**      Scarp Height (ft): **12**  
 Bank Protection Type: **None**      Cause of Erosion: **River Induced**  
 Erosion Indicator: **Undermining**      Survey Date: **6/24/2015**

**Comments:**

06/24/2015: The erosion site is immediately downstream of the RR bridge.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.39** Status: **Existing Site**

Latitude: **37.936821** Longitude: **-121.334582** River\_Mile: **41.39** Levee\_Mile: **0.77** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>35</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 172**      **Normalized Score (out of 100%): 65**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The site has been visited by boat survey. No significant change observed.  
 08/23/2011: The site is located immediately upstream of a Railroad bridge. Dense vegetation at the water line blocks the view of erosion.



Front view of the erosion site.



Front view of the erosion site. Vegetation is visible.



Front view of the erosion.



Front view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.44** Status: **Existing Site**

Latitude: **37.93593** Longitude: **-121.334133** River\_Mile: **41.44** Levee\_Mile: **0.83** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>25</b>	Burrow Activity:	<b>Obscured by vegetation</b>
Levee Soil Type:	<b>Silts and Clean Sands</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>4.1</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>1</b>	x4 <b>4</b>	WS Burrow Activity:	<b>3</b>	x2 <b>6</b>
Levee Soil Type:	<b>5</b>	x4 <b>20</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>1</b>	x1 <b>1</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

Total Score (out of 265): **187** Normalized Score (out of 100%): **71**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: No significant change observed.  
 08/13/2013: Site was discovered during boat survey. The dense vegetation blocks a clear view of the erosion. Size of erosion site was very roughly estimated.



Front view of the erosion. The tree and vegetation block the view of the site.



The erosion is invisible because of the dense vegetation.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.5** Status: **Existing Site**

Latitude: **37.935576** Longitude: **-121.333202** River\_Mile: **41.50** Levee\_Mile: **0.91** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>6.6</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 184**      **Normalized Score (out of 100%): 69**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: The erosion site is immediately downstream of the riprap protection.



Front view of the erosion. Note the riprap protection near the site.



A close view of the erosion.



A close view of the erosion.

A close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.58** Status: **Existing Site**

Latitude: **37.93541** Longitude: **-121.33156** River\_Mile: **41.58** Levee\_Mile: **1** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>19</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 180**      **Normalized Score (out of 100%): 68**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The erosion was discovered during the boat survey.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.59** Status: **Existing Site**

Latitude: **37.935078** Longitude: **-121.331134** River\_Mile: **41.59** Levee\_Mile: **1** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Poor, covers bottom 1/</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>6.6</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>4</b>	x4 <b>16</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 172**      **Normalized Score (out of 100%): 65**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The site has been visited by boat survey. Site has been repaired, but new erosion occurred at the levee slope and immediately upstream of the repaired site.  
 08/23/2011: The site is about 500 ft downstream of bridge. The levee toe seems to be protected, but the protection is being washed away.



Downstream view of the site.



Close view of the erosion.



Front view of the site.

Front view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.79** Status: **Existing Site**

Latitude: **37.933347** Longitude: **-121.32911** River\_Mile: **41.79** Levee\_Mile: **1.2** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>400</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 177 Normalized Score (out of 100%): 67**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change at this site.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site.  
 9/07/2010: No significant change observed on site. Vegetation is visible at the water line. There is an exposed pipe discharge partially hanging at the mid-slope, possibly still used for discharging irrigation/runoff water. There is minimal rip rap protection along the bank, and what's left of it is no longer adequately protecting the bank.  
 9/29/2009: Site consists of a 400-foot long eroding bank with minimal vegetation and protection; the existing rip rap has sloughed, rendering it useless; note that there is an exposed section of a pipe.  
 10/18/2006: There is extensive loss of rip rap on some sections; sewage disposal pond is on the landside of the levee; there is an exposed pipe outlet "hanging" from the upper slope.



Direct view of the site.



Direct view of the site.



Close view of the upstream side of the erosion.

Close view of the site. Note the tree near the erosion site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM41.92** Status: **Existing Site**

Latitude: **37.931858** Longitude: **-121.3283** River\_Mile: **41.92** Levee\_Mile: **1.3** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>160</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>10</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>4</b>	x4 <b>16</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 184**      **Normalized Score (out of 100%): 69**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: New signs of animal activity were found.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report.



Front view of the erosion.



Front view of the erosion.



Front view of the erosion.

Front view of the erosion. Note the drainage pipe on the site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.03** Status: **Existing Site**

Latitude: **37.930575** Longitude: **-121.32809** River\_Mile: **42.03** Levee\_Mile: **1.39** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>6</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 167**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report. The site is located about 750 ft downstream of SR 4 Bridge.



Front view of the erosion.



Front view of the erosion.



Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.09** Status: **Existing Site**

Latitude: **37.92965** Longitude: **-121.32811** River\_Mile: **42.09** Levee\_Mile: **1.46** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>4.6</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>4</b>	x2 <b>8</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>1</b>	x1 <b>1</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 181**      **Normalized Score (out of 100%): 68**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: The site is located approximately 400 ft. downstream SR 4 Bridge. Dense vegetation is visible at the toe.



Front view of the erosion site.



Close view of the erosion.



Close view of the erosion. Note the vegetation at the site.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.2** Status: **Existing Site**

Latitude: **37.92777** Longitude: **-121.32787** River\_Mile: **42.20** Levee\_Mile: **1.61** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>300</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Outside of Bend &lt; 90 deg</b>	Radius of Curvature:	<b>2.2</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>3</b>	x1 <b>3</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 170 Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: : The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site. Trees concerned still in place.  
 09/07/2010: No significant change observed on site. The concern here is the undermining of the levee toe where most of trees are. There are erosion pockets lined along the lower slope and at the base of the trees, exposing tree roots. There is minimal slope protection.  
 09/29/2009: The lower slope is lined with minor erosion pockets; some tree roots are exposed; there is visible undermining of the levee toe; site is immediately upstream of the Highway 4 Bridge; the bridge is possibly causing a scour to occur, eroding the bank.



Front view of the site where undermining has occurred.



Close view of the erosion.



Front view of the erosion. Dense vegetation is visible.



Close view of the erosion at the levee toe.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.79** Status: **Existing Site**

Latitude: **37.920992** Longitude: **-121.32137** River\_Mile: **42.79** Levee\_Mile: **2.19** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 163**      **Normalized Score (out of 100%): 62**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>7</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 7/22/2014: The erosion has increased in size.  
 08/13/2013: No significant change observed. Slightly more vegetation was visible.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report.



View from downstream.



Close view of the pocket erosion.



Close view of the pocket erosion. Note the vegetation at the site.

Front view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.84** Status: **Existing Site**

Latitude: **37.92065** Longitude: **-121.32037** River\_Mile: **42.84** Levee\_Mile: **2.26** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>150</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Silts and Clean Sands</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees (0-2" di</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>



View from upstream.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>5</b>	x4 <b>20</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>



Close view of the erosion.

**Total Score (out of 265): 189**      **Normalized Score (out of 100%): 71**

**III. Misc**

Crown Type: **Gravel**      Scarp Height (ft): **15**  
 Bank Protection Type: **None**      Cause of Erosion: **River Induced**  
 Erosion Indicator: **Undermining**      Survey Date: **6/24/2015**

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: An irrigation pipe is on site.



Close view of the erosion.

Close view of the erosion. Note the irrigation pipe.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM42.93** Status: **Repaired Site**

Latitude: **37.919885** Longitude: **-121.31971** River\_Mile: **42.93** Levee\_Mile: **2.32** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>11</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clays and Gravels</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Loose Soil</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The erosion was repaired.  
 08/13/2013: The length of erosion has progressed downstream, and the site length has increased from 12 ft in length last year to 100 feet in length this year.  
 08/07/2012: The site was first reported in the 2012 spring levee inspection report. The site is located at the inside corner of a river bend.



View from upstream.



Front view of the repaired site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM43.23** Status: **Repaired Site**

Latitude: **37.91665** Longitude: **-121.32198** River\_Mile: **43.23** Levee\_Mile: **2.65** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>10</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3	<b>0</b>	WS Berm Width (ft):	<b>0</b> x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4	<b>0</b>	WS Burrow Activity:	<b>0</b> x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4	<b>0</b>	Bank Soil Type:	<b>0</b> x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4	<b>0</b>	Bank Revetment:	<b>0</b> x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3	<b>0</b>	Bank Slope Veg.:	<b>0</b> x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4	<b>0</b>	Bank Slope (H:V):	<b>0</b> x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2	<b>0</b>	Bank Condition:	<b>0</b> x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2	<b>0</b>	Tree Hazard:	<b>0</b> x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1	<b>0</b>	Radius of Curvature:	<b>0</b> x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2	<b>0</b>	Geomorphologic:	<b>0</b> x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The erosion was repaired.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report.



Upstream view of the repaired site.



Close view of the repaired site.



Closer view of the repaired site.

Close view of the repaired site. Note the vegetation at the site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM43.52** Status: **Existing Site**

Latitude: **37.91301** Longitude: **-121.32449** River\_Mile: **43.52** Levee\_Mile: **2.96** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>5</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 170**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.

Close view of the erosion. Note the vegetation at the site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM43.83** Status: **Repaired Site**

Latitude: **37.908544** Longitude: **-121.324894** River\_Mile: **43.83** Levee\_Mile: **3.27** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>400</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: New erosion was found at the levee toe. Trees are present.  
 08/07/2012: The site has been repaired. Protecting riprap revetment has been placed at the levee shoulder and slope, but minor erosions are visible at the levee toe.  
 08/23/2011: Sloughing rip rap is visible on the site



Direct view of the site.



Front view of the site.



Closer view of the erosion.

Close view of the erosion. Note vegetation at site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM43.86** Status: **Existing Site**

Latitude: **37.90809** Longitude: **-121.32509** River\_Mile: **43.86** Levee\_Mile: **3.3** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 178**      **Normalized Score (out of 100%): 67**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: The levee toe seems to have been protected by river rocks and vegetation on site.



View from upstream of the erosion.



Front view of the erosion.



Close view of the erosion. Note river rocks and vegetation at the levee toe.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM44.13** Status: **Repaired Site**

Latitude: **37.90463** Longitude: **-121.32361** River\_Mile: **44.13** Levee\_Mile: **3.56** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft): **80** WS Berm Width (ft): **0**  
 Crest Width (ft): **18** Burrow Activity: **No signs of activity**  
 Levee Soil Type: **Clayey Sand** Bank Soil Type: **Silts and Clean Sands**  
 Levee Revetment: **Good, covers entire slo** Bank Revetment: **Very poor or none**  
 Levee Slope Veg.: **Slight** Bank Slope Veg.: **No vegetation**  
 Levee Slope (H:V): **3:1 or greater** Bank Slope (H:V): **1.5:1**

Levee Slope Condition: **No caving** Bank Condition: **Very deteriorated**  
 Location of Erosion: **Up to mid slope** Tree Hazard: **No or small trees**  
 Site Relative to Bend: **Outside of bend > 90 deg** Radius of Curvature: **2.4**  
 Max Tidal (ft): **3.0 to 4.0 ft.** Geomorphologic: **No migration**

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	0	x3 0	WS Berm Width (ft):	0	x3 0
Crest Width (ft):	0	x4 0	WS Burrow Activity:	0	x2 0
Levee Soil Type:	0	x4 0	Bank Soil Type:	0	x4 0
Levee Revetment:	0	x4 0	Bank Revetment:	0	x4 0
Levee Slope Veg.:	0	x3 0	Bank Slope Veg.:	0	x3 0
Levee Slope (H:V):	0	x4 0	Bank Slope (H:V):	0	x4 0
Levee Slope Condition:	0	x2 0	Bank Condition:	0	x2 0
Location of Erosion:	0	x2 0	Tree Hazard:	0	x2 0
Site Relative to Bend:	0	x1 0	Radius of Curvature:	0	x1 0
Max Tidal (ft):	0	x2 0	Geomorphologic:	0	x3 0

**Total Score (out of 265): 0**      **Normalized Score (out of 100%):**

**III. Misc**

Crown Type: **Gravel** Scarp Height (ft): **3**  
 Bank Protection Type: **None** Cause of Erosion: **River Induced**  
 Erosion Indicator: **Undermining** Survey Date: **6/24/2015**

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The previous erosion was repaired. New erosion was found below the repaired levee slope.  
 08/13/2013: No significant change observed.  
 08/07/2012: The levee toe has been cut off along a 150 ft. long river stretch. The erosion is located just upstream of a river bend.



View of the repaired site. Note the new erosion at the levee toe.



View of the repaired site.



View of the repaired site.

View of the repaired site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM45.07** Status: **Existing Site**

Latitude: **37.89223** Longitude: **-121.32793** River\_Mile: **45.07** Levee\_Mile: **4.53** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>51</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>17</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>5</b>	x3 <b>15</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 173**      **Normalized Score (out of 100%): 65**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>15</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Loose Soil</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The erosion is located at the inside of a river bend. Site is covered with broken concrete blocks and other debris.



Front view of the erosion site.



Close view of the site.



Front view of the site. Note the loosely placed concrete blocks.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM45.27** Status: **Repaired Site**

Latitude: **37.889809** Longitude: **-121.329342** River\_Mile: **45.27** Levee\_Mile: **4.71** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>12</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>17</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The erosion was repaired.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: Cracking erosion along the levee bank. Erosion appears to be caused by river flows.



Front view of the repaired site.



Front view of the repaired site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM45.97** Status: **Existing Site**

Latitude: **37.88032** Longitude: **-121.333266** River\_Mile: **45.97** Levee\_Mile: **5.43** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>4</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 169**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Caving</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: The erosion seems to be getting worse. More material sloughing visible.  
 08/07/2012: The erosion is underneath an irrigation pipe. The likely cause of the erosion is the pipe leakage.



Close view of the erosion and the pipe.



Front view of the site.



Front view of the site.

Front view of the site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM46.06** Status: **Existing Site**

Latitude: **37.87892** Longitude: **-121.33267** River\_Mile: **46.06** Levee\_Mile: **5.53** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>40</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>4.4</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>1</b>	x1 <b>1</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 151**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: Larger trees are at the levee shoulder, and an irrigation pump station is next to the erosion site.



Front view of the erosion.



Close view of the site.



Close view of the site. Note large trees at the levee shoulder.

Close view of the erosion.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM46.12** Status: **Repaired Site**

Latitude: **37.87788** Longitude: **-121.33255** River\_Mile: **46.12** Levee\_Mile: **5.65** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Poor, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>5.0</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0 Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Undermining</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The erosion was repaired.  
 08/13/2013: The boat survey found no significant change at this site, except slight animal activity was visible at the site.  
 08/07/2012: : The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site.  
 09/07/2010: No significant change observed on site. Erosion site is located beneath Howard Road Bridge. Majority of the existing rip rap has slipped, dragging away levee materials and exposing the underlying soft soil.  
 08/06/2010: Recommend for annual assessment and monitoring during flood events, per CLRO.  
 09/30/2009: No major change observed since the last visit; upper portion of existing revetment has slipped, exposing the degrading bank; note that site # is the same as RM46.30, LM5.69 found in the CLRO CES Evaluation 2008 Report; site was previously rated "M".  
 11/04/2008: Previously repaired using rock revetment; upper portion of the revetment is sliding, causing deformation on the levee slope; site is upstream of Howards Road Bridge.



Front view of the repaired site.



Front view of the repaired site.



Front view of the repaired site.



LMA: **RD0524 U01 Middle Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0524U01RM46.39** Status: **Existing Site**

Latitude: **37.87437** Longitude: **-121.33285** River\_Mile: **46.39** Levee\_Mile: **5.86** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>21</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>1</b>	x4 <b>4</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>3</b>	x2 <b>6</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 159**      **Normalized Score (out of 100%): 60**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The erosion is near a water-intake structure. Pipe leakage likely caused the erosion.



Front view of the site.



Close view of the erosion and the pipe.



Closer view of the erosion.

Closer view of the erosion and vegetation.



LMA: **RD0544 U01 Upper Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0544U01RM47.12** Status: **Repaired Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**37.86482 -121.3272 47.12 0.43**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>200</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Good, covers entire slop</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Outside of Bend &lt; 90 deg</b>	Radius of Curvature:	<b>3.1</b>
Max Tidal (ft):	<b>3.0 to 4.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0 Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>Riprap</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Undermining</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: Repaired site. No significant change observed.  
 08/13/2013: Repaired site. No new erosion found at the site.  
 08/07/2012: The site has been visited by boat survey. The site has been repaired with riprap protection. Rotten tree roots and minor erosion are visible immediately upstream of the site  
 08/23/2011: No significant change observed on site.  
 09/07/2010: No significant change observed on site. There are minor pockets of erosion lining the lower slope and undermining of the toe. There are annual grasses and emergent vegetation at the lower slope. Burrow holes were observed along the slope and persist throughout the 200-foot long site.  
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.  
 09/30/2009: No major change observed since last visit; despite dense vegetation, the bank continues to erode and slough; the levee toe is being undermined; note the tree on site; the site was previously rated "U".  
 10/21/2008: Undermining of the levee toe; rodent holes in several location; trees with roots partially exposed; sloughing on slope.



Upstream view of the repaired site.



Front view of the repaired site.



Front view of the site.



LMA: **RD0544 U01 Upper Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0544U01RM48.81** Status: **Repaired Site**

Latitude: **37.850534** Longitude: **-121.322285** River\_Mile: **48.81** Levee\_Mile: **2.01** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>10</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>14</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Frequent &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Toe &amp; Slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>2.0 to 3.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: The erosion was repaired.  
 08/13/2013: No significant change observed.  
 08/07/2012: The erosion is right at the inside of a river bend. Dense vegetation is visible at the site.



Front view of the site.



Close view of the site.



Front view of the erosion.

Front view of the erosion.



LMA: **RD0544 U01 Upper Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0544U01RM49.67** Status: **Existing Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**37.840697 -121.318252 49.67 2.94 U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>11</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>2.0 to 3.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>2</b>	x2 <b>4</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 166 Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013: Pump has been removed. A larger pocket erosion has been found at the erosion site.  
 08/07/2012: The erosion is immediately upstream of a river bend. Dense vegetation is visible at the erosion site.



Front view of the erosion.



Close view of the site.



Close view of the site.

Front view of the site



LMA: **RD0544 U01 Upper Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0544U01RM51.04** Status: **Existing Site**

Latitude: **37.825248** Longitude: **-121.313856** River\_Mile: **51.04** Levee\_Mile: **4.21** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>28</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>Dense</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Scattered &lt;1/2 Slope</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>2.0 to 3.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>1</b>	x3 <b>3</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>2</b>	x2 <b>4</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 113**      **Normalized Score (out of 100%): 43**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 06/19/2014: No significant change observed.  
 08/13/2013: The erosion has been caused by irrigation pipe.



Front view of the site.



Close view of the site.



Close view of the site.

Close view of the site.



LMA: **RD0544 U01 Upper Roberts Isla** Waterway: **LB San Joaquin River**  
 Site ID: **RD0544U01RM51.09** Status: **Repaired Site**

Latitude: **37.82436** Longitude: **-121.31436** River\_Mile: **51.09** Levee\_Mile: **4.32** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>30</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>2.0 to 3.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0 Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: The erosion has been repaired.  
 6/19/2014: No significant change observed.  
 08/13/2013: This erosion has been caused by instability of the levee . Larger trees exist downstream of the erosion site.



Front view of the repaired site.



Front view of the repaired erosion site.



Close view of the repaired erosion site.

Close view of the repaired erosion site.



LMA: **RD0544 U02 Upper Roberts Isla** Waterway: **RB Old River**  
 Site ID: **RD0544U02RM32.91** Status: **Existing Site**

Latitude: **37.81776** Longitude: **-121.35085** River\_Mile: **32.91** Levee\_Mile: **2.66** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>100</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>Frequent &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>3</b>	x2 <b>6</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 154**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 10/11/2013: No significant change observed.  
 08/07/2012: Series of pocket erosion were discovered at the levee toe during the boat survey. The area is covered with vegetation and riprap, but the rip rap has been washed away.



Front view of pocket erosion. Note the vegetation and riprap at the site.



Close view of pocket erosion.



Close view of the erosion.



Close view of the site.



LMA: **RD0544 U02 Upper Roberts Isla** Waterway: **RB Old River**  
 Site ID: **RD0544U02RM33** Status: **New Site**

Latitude: **37.818861** Longitude: **-121.3504** River\_Mile: **33.00** Levee\_Mile: **2.57** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Silty Sand and Sandy Silt</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees (0-2" di</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>3</b>	x4 <b>12</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 164**      **Normalized Score (out of 100%): 62**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>12</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: The site was discovered during the boat survey. Irrigation pipe leakage caused the soil to sink at the upper levee shoulder. The lower part of the levee is protected by riprap rocks. The irrigation pump was operating at the site.



Front view of the erosion site.



Close view of the erosion.



Close view of the erosion. Vegetation around the site is visible.



Front view of the site. Note the operating irrigation pump.



LMA: **RD0544 U02 Upper Roberts Isla** Waterway: **LB Old River**  
 Site ID: **RD0544U02RM33.21** Status: **Existing Site**

Latitude: **37.821763** Longitude: **-121.347275** River\_Mile: **33.21** Levee\_Mile: **2.34** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>10</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>No caving</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>0.6</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 152**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:		Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Undermining</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/20/2013: No significant change observed.  
 08/07/2012: The site was first reported in 2012 spring levee inspection report. The data were estimated as the site is underneath a irrigation pump station and inaccessible by boat or land survey. It's possible the pump station played a role in the erosion.



Front view of the erosion site. View is partially blocked by the pump structure and vegetation.



Front view of the site.



Close view of the site.



Front view of the site.



LMA: **RD2031 U01 Elliot**  
 Site ID: **RD2031U01RM0.48**

Waterway: **LB Stanislaus River**  
 Status: **Existing Site**

Latitude: **37.70474** Longitude: **-121.15914** River\_Mile: **0.48** Levee\_Mile: **0.48** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>150</b>	WS Berm Width (ft):	<b>9</b>
Crest Width (ft):	<b>21</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Poor, covers entire slope</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Frequent &gt;1/2 Slope</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>5.9</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>1</b>	x4 <b>4</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>3</b>	x4 <b>12</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 111 Normalized Score (out of 100%): 42**

**III. Misc**

Crown Type: **Earthen** Scarp Height (ft): **5**  
 Bank Protection Type: **None** Cause of Erosion: **Poor Maintenance Practice**  
 Erosion Indicator: **Loose Soil** Survey Date: **8/28/2015**

**Comments:**

08/28/2015: No significant change observed.  
 07/31/2014: No significant change observed.  
 09/10/2013: No significant change observed.  
 07/18/2012: No significant change observed.  
 08/18/2011: No significant change observed on site. Debris that blocks the irrigation outlet is visible.  
 10/19/2010: No significant change observed on site. Sloughing of the bank is occurring adjacent to an irrigation outlet structure. There is moderate to heavy vegetation along the bank that is well established. Broken chunks and slabs of concrete are used as rip rap and line the outside of the irrigation outlet structure. However, much of the rip rap along the slope is sloughing and could possibly lead to future slope instability.  
 08/05/2010: Recommended as a local maintenance issue, per CLRO.  
 08/20/2009: No major change observed since last visit; 1 inch fissure cracks developing on the slope; rip rap is showing signs of sloughing; recommend as local maintenance issue; site was previously rated "U".  
 2008: No change from previous year; irrigation outlet located on site; rip rap placed on river bank.  
 09/06/2007: Near agricultural diversion; only 3' landside height differential.



Direct view of the site.



Looking down at the site.



View of the current condition of the bank slope just above the irrigation outlet.



View of the loose material at the bank top.



LMA: **RD2031 U02 Elliot**  
 Site ID: **RD2031U02RM78.7**

Waterway: **RB San Joaquin River**  
 Status: **Not Rated**

Latitude: **37.631716** Longitude: **-121.18937** River\_Mile: **78.70** Levee\_Mile: **4.35** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>200</b>	WS Berm Width (ft):	<b>90</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>No vegetation</b>	Bank Slope Veg.:	<b>Slight to Medium (40-20)</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>3.0</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/19/2015</b>

**Comments:**

08/19/2015: No significant change observed.  
 7/17/2014: The erosion has slightly expanded toward levee toe at two pocket locations.  
 09/10/2013: The site has been visited. The erosion has expanded toward levee crest at two pocket locations.  
 07/18/2012: No significant change observed on the site.  
 08/18/2011: No significant change observed on the site. Dead trees and animal activities are visible. The closest point of the erosion site to the levee toe is about 100 ft.  
 10/19/2010: There is active scouring occurring on the bank due to the nature of the flow and the lack of armor protection. There is also a fallen log immediately downstream of where the erosion has occurred and is protruding outward, possibly creating an eddy and scouring the bank. With the remaining 100-foot wide berm, the levee prism is not yet affected. However, the bank will continue to degrade, and eventually intrude into the levee prism if no protection is put in place. Erosion site is recommended for annual assessment and monitoring during flood events.



Looking downstream.



Looking upstream. Note the pocket erosion.



Close view of the pocket erosion.



Close view of the erosion.



LMA: **RD2058 U01 Pescadero** Waterway: **LB Paradise Cut**  
 Site ID: **RD2058U01RM3.97** Status: **Existing Site**

Latitude: **37.78981** Longitude: **-121.35249** River\_Mile: **3.97** Levee\_Mile: **4.51** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>200</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>2.5:1</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>5.2</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>1</b>	x4 <b>4</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 154**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/4/2015</b>

**Comments:**

08/04/2015: No significant change observed.  
 08/26/2014: No significant change observed.  
 08/28/2013: No significant change observed.  
 07/26/2012: The site has been visited, and no significant change has been observed.  
 09/02/2011: This site was not visited due to the time limit.  
 09/22/2010: No significant change observed. Minor pocket erosions are lined at the lower bank. Two large Oak and Willow trees are on mid-slope and bench. The remaining bench was re-measured and found to be approximately 10 feet. There was no indication of active erosion on site during the site visit.  
 08/05/2010: Recommended for annual assessment and monitoring of the site during flood events, per CLRO.  
 07/23/2009: No major change observed since last visit; site is a 200-ft. long near-vertical berm erosion; recommend annual assessment and monitoring of the erosion site, per CLRO CES Evaluation 2008 Report; Site # is the same site previously reported as RM4.0,LM4.51; previously rated "U".  
 09/10/2008: Two large trees (2-3' DBH) with partial roots exposed.  
 2007: Visited site 03/13/2007.



Direct view of a pocket erosion site.



Direct view of the erosion near a tree.



Direct view of the erosion near a tree.



Direct view of the erosion near a tree.



LMA: **RD2062 U01 Stewart** Waterway: **LB San Joaquin River**  
 Site ID: **RD2062U01RM54.14** Status: **Repaired Site**

Latitude: **37.80408** Longitude: **-121.31406** River\_Mile: **54.14** Levee\_Mile: **0.91** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>15</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Silty Sand and Sandy Silt</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Good, covers entire slo</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>2.1</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>0</b>	x3	<b>0</b>	WS Berm Width (ft):	<b>0</b> x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4	<b>0</b>	WS Burrow Activity:	<b>0</b> x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4	<b>0</b>	Bank Soil Type:	<b>0</b> x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4	<b>0</b>	Bank Revetment:	<b>0</b> x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3	<b>0</b>	Bank Slope Veg.:	<b>0</b> x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4	<b>0</b>	Bank Slope (H:V):	<b>0</b> x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2	<b>0</b>	Bank Condition:	<b>0</b> x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2	<b>0</b>	Tree Hazard:	<b>0</b> x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1	<b>0</b>	Radius of Curvature:	<b>0</b> x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2	<b>0</b>	Geomorphologic:	<b>0</b> x3 <b>0</b>

**Total Score (out of 265): 0**

**Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/24/2015</b>

**Comments:**

06/24/2015: No significant change observed.  
 6/19/2014: No significant change observed.  
 08/13/2013. This was repaired prior to the boat survey. No new erosion found at the site  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed at the site. There is vegetation on the slope. There is a bridge construction site just upstream of the erosion. The impact of the construction may need to be monitored.  
 09/07/2010: No significant change observed on site. Sloughing of the existing rip rap revetment on the lower slope has developed into an erosion pocket. There is moderate annual grass growth on the slope.  
 08/06/2010: Recommended as local maintenance issue, per CLRO.  
 03/09/2010: Per Michael Moncrief of MBK, site is scheduled for repair this year.  
 2009: Landside ground surface has been raised to the height of the levee crown; sloughing of the existing rip rap revetment on the lower slope that has created a pocket, exposing underlying soil; Site # is the same RM54.34,LM1.08; previously rated "M".  
 2006: Previously marked with stake.



Front view of the repaired site.



Front view of the rip rap.



Front view of the site.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM29.93**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.809673** Longitude: **-121.390321** River\_Mile: **29.93** Levee\_Mile: **0.02** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>450</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 167**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: Site is at the upstream of a drainage ditch.



Front view of the erosion.



Front view of the erosion.



Close view of the erosion.



Front view of the erosion. Note the dense vegetation.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM30.02**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.810052** Longitude: **-121.388847** River\_Mile: **30.02** Levee\_Mile: **0.1** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>40</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 166**      **Normalized Score (out of 100%): 63**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>3</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: Hard to view the erosion because of the dense vegetation and trees on site.  
 The site is under the bush, close to the tree.



Front view of the site.



Close view of the site.



Close view of the site. Note the vegetation.



View of the site from downstream.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM30.1**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.810468** Longitude: **-121.387492** River\_Mile: **30.10** Levee\_Mile: **0.18** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 153**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: The protection at the levee toe has been washed away.



Direct view of the site.



Front view of the erosion.



Close view of the erosion.



Close view of the erosion.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM30.19**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.810609** Longitude: **-121.385879** River\_Mile: **30.19** Levee\_Mile: **0.27** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>475</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>21</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Medium trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>1</b>	x4 <b>4</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>2</b>	x2 <b>4</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 163 Normalized Score (out of 100%): 62**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: A new pocket erosion at the upper levee slope has been found directly above a large tree. The erosion might have been caused by internal pipe leakage or surface runoff.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site. Dense vegetation is visible along the water line.  
 09/07/2010: No significant change observed on site. Much of the upper slope was recently cleared of vegetation by spraying. 4- to 6-foot vertical scarp and pocket erosions are lined along a span of 475 feet. In some sections, the vertical scarp encroaches into the levee prism. There is a lack of berm along this reach, exposing the levee slope to high flow velocities during normal and flood events.  
 08/06/2010: Recommended as local maintenance issue, per CLRO.  
 03/09/2010: As discussed with Michael Moncrief of MBK Engineers, the site will be 'addressed' later this year.  
 09/29/2009: No major change observed since last visit; pocket erosion and a vertical scarp forming; this site was combined with Site RM30.13 and 30.02 with a combined total erosion length of 475 feet; recommended as annual assessment and monitoring of the site, per CLRO CES Evaluation 2008 Report; previously rated "M".



View of the pocket erosion and the tree.



Close view of the pocket erosion.



Front view of the site with dense vegetation.



Front view of the existing erosion at the toe.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM30.27**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.811281** Longitude: **-121.384461** River\_Mile: **30.27** Levee\_Mile: **0.35** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>16</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>20</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Immediately Downstrea</b>	Radius of Curvature:	<b>2.6</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>2</b>	x1 <b>2</b>	Radius of Curvature:	<b>3</b>	x1 <b>3</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 155**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: The site is right at the downstream of a river bend.



Front view of the erosion.



Close view of the site.



Front view of the erosion.



Close view of the site. Note the piled concrete debris.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM30.43**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.81307** Longitude: **-121.3831** River\_Mile: **30.43** Levee\_Mile: **0.56** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>35</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>1.9</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>3</b>	x3 <b>9</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>4</b>	x1 <b>4</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 152**      **Normalized Score (out of 100%): 57**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>4</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed.  
 08/23/2011: No significant change observed on site.  
 09/07/2010: No significant change observed on site. Much of the placed rip rap revetment has slid. It is no longer adequately protecting the slope.  
 08/06/2010: Recommended as local maintenance issue, per CLRO Report.  
 03/09/2010: As discussed with Michael Moncrief of MBK, site will be 'addressed' this year.  
 09/29/2009: No major change observed since last visit; a section of the rip rap has slipped, exposing a levee section that has eroded; recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; Site # is the same as RM30.43, LMO.63; previously rated "U".  
 11/05/2008: Site is located inside of a bend; scarp looks to be into the levee prism; piles of concrete chunks placed on the slope, with some of them already starting to slide.



Close view of the site.



Front view of the site. Previously placed rip rap slipped, exposing the underlying soils and creating a pocket.



Front view of the site. Rip rap no longer adequately protecting levee slope.



Front view of the site.



LMA: **RD2062 U03 Stewart** Waterway: **LB Old River**  
 Site ID: **RD2062U03RM31.12** Status: **Existing Site**

Latitude: **37.81929** Longitude: **-121.37888** River\_Mile: **31.12** Levee\_Mile: **1.2** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of Bend &lt; 90 deg</b>	Radius of Curvature:	<b>1.8</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>4</b>	x1 <b>4</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 161**      **Normalized Score (out of 100%): 61**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>2</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Terracetting</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site.  
 09/07/2010: No significant change observed on site. Much of the seasonal grass along the slope was cleared. Site consists of an existing scalloped erosion approximately 30 feet long by 5 feet wide at its widest opening. The lateral crack is extended outwards along the middle slope. There is a 1 to 2 feet of differential settlement that could further develop into a shallow slide.  
 08/06/2010: Recommended as local maintenance issue, per CLRO.  
 03/09/2010: As discussed with Michael Moncrief of MBK Engineer, site will be 'addressed' this year.  
 09/28/2009: No major change observed; section of rip rap has slipped, creating a terraced effect; dense vegetation growth; recommended as a local maintenance issue, per CLRO CES Evaluation 2008 Report; Site # is the same as RM31.12,LM1.25; previously rated "U".  
 09/14/2006: 1-2' into prism.



Front view of the site.



Close view of the site.



Front view of the site. Note the crack along the middle of the slope.



Front view of the site.



LMA: **RD2062 U03 Stewart**  
 Site ID: **RD2062U03RM31.28**

Waterway: **LB Old River**  
 Status: **Existing Site**

Latitude: **37.82138** Longitude: **-121.3769** River\_Mile: **31.28** Levee\_Mile: **1.42** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>2.7</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>



Front view of the erosion site.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	1	x3	3	WS Berm Width (ft):	5 x3 15
Crest Width (ft):	2	x4	8	WS Burrow Activity:	0 x2 0
Levee Soil Type:	2	x4	8	Bank Soil Type:	5 x4 20
Levee Revetment:	5	x4	20	Bank Revetment:	5 x4 20
Levee Slope Veg.:	4	x3	12	Bank Slope Veg.:	5 x3 15
Levee Slope (H:V):	0	x4	0	Bank Slope (H:V):	5 x4 20
Levee Slope Condition:	2	x2	4	Bank Condition:	5 x2 10
Location of Erosion:	4	x2	8	Tree Hazard:	1 x2 2
Site Relative to Bend:	0	x1	0	Radius of Curvature:	3 x1 3
Max Tidal (ft):	1	x2	2	Geomorphologic:	0 x3 0



A closer view of the site.

**Total Score (out of 265): 170**      **Normalized Score (out of 100%): 64**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>2</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: No significant change observed on site.  
 09/07/2010: No significant change observed on site. There is a small- to medium sized Oak tree on the mid-slope just above rip rap. Some of the rip rap has collapsed, creating a pocket erosion just above the existing toe rip rap and upstream of the Oak tree.  
 08/06/2010: Recommended as local maintenance issue, per CLRO.  
 03/09/2010: As discussed with Michael Moncrief of MBK Engineer, site will be 'addressed' in 2010.  
 09/29/2009: No major change since last visit; sliding of the rip rap at the base of the lone tree; there is noticeable man-made trail and foot traffic extending from the crown to the toe; much of the broken concrete used as temporary rip rap has slid, exposing portion of the bare levee slope; recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; Site # is the same as RM31.3, LM1.45; previously rated "M".  
 11/05/2008: Portion of rip rap collapsing.  
 09/14/2006: Portion of rip rap along the slope has collapsed; exposed levee section is starting to erode, exposing roots from the nearby tree.



Front view of the site. Note existing broken concrete on the upper slope as well as on the lower slope and at the toe.



Front view of the site.



LMA: **RD2075 U01 McMullin** Waterway: **RB San Joaquin River**  
 Site ID: **RD2075U01RM64.34** Status: **Existing Site**

Latitude: **37.727933** Longitude: **-121.274491** River\_Mile: **64.34** Levee\_Mile: **5.34** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>75</b>	WS Berm Width (ft):	<b>10</b>
Crest Width (ft):	<b>26</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Scattered &lt;1/2 Slope</b>	Bank Condition:	<b>No caving</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>5.0</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>1</b>	x2 <b>2</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>1</b>	x1 <b>1</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 129 Normalized Score (out of 100%): 49**

**III. Misc**

Crown Type:	<b>Paved</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Cracking</b>	Survey Date:	<b>8/28/2015</b>

**Comments:**

08/28/2015: No significant change observed. Loose material is visible at the upper levee slope. The loose soil may have been caused by runoff.  
 08/18/2014: No significant change observed.  
 09/10/2013: No significant change observed.  
 09/13/2012: No significant change observed.  
 08/18/2011: No significant change observed. Some new material added to the water side levee slope, but the added material is loose and seems not helping the levee protection.  
 10/05/2010: No significant change observed. Levee slope has minimal vegetation and lacks rip rap protection. Sandy material found on the lower and middle slope is an undesirable material to have on a levee.  
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.  
 08/20/2009: No major change since last visit; site is located in an oxbow; slope surface consists of very sandy material; there is a tree on site leaning and with exposed tree roots; site is recommended as a local maintenance issue, per CLRO CES Evaluation 2008 Report; Eddy Cordoza from the district is aware of the site and is looking for recommendation; site is previously rated "U".  
 08/17/2007: Site is close to an irrigation pump inlet.



Looking upstream at the site.



View of the site.



Looking downstream at the erosion site.



Direct view of the levee slope. Note the loose soil possibly caused by runoff.



LMA: **RD2085 U01 Kasson** Waterway: **LB San Joaquin River**  
 Site ID: **RD2085U01RM66.5** Status: **Existing Site**

Latitude: **37.703094** Longitude: **121.274894** River\_Mile: **66.50** Levee\_Mile: **2.56** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>85</b>	WS Berm Width (ft):	<b>17</b>
Crest Width (ft):	<b>13</b>	Burrow Activity:	<b>Signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>Medium to Dense</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>Migration erosion side</b>



Close view of the erosion.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>2</b>	x3 <b>6</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>5</b>	x2 <b>10</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>1</b>	x3 <b>3</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>5</b>	x1 <b>5</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>3</b>	x3 <b>9</b>



Close view of the erosion.

**Total Score (out of 265): 136**      **Normalized Score (out of 100%): 51**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>15</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>9/10/2015</b>



Direct view of the erosion. Note dense vegetation at the site.

**Comments:**

09/10/2015: No significant change observed. Signs of animal activity are present.  
 09/10/2014: No significant change observed.  
 09/20/2013: No significant change in erosion observed. More vegetation at the site.  
 12/04/2012: The erosion has progressed remarkably toward levee, extended to the up- and downstream of the original pocket erosion. Trees and dense bush are present at the site. Animal burrow holes are visible, and possibly can cause seepage.  
 09/22/2010: No significant change observed. There is little visibility due to seasonal grass on the berm and slope.  
 08/18/2009: Site is located on berm; pocket erosion has developed; the site is covered in dense vegetation; there are several relief wells on the landside of the levee; site is Not Rated because berm width is greater than 30 feet; site should be monitored to keep track of erosion progress.

Close view of the erosion.



LMA: **RD2085 U01 Kasson** Waterway: **LB San Joaquin River**  
 Site ID: **RD2085U01RM67.7** Status: **Not Rated**

Latitude: **37.688545** Longitude: **-121.276298** River\_Mile: **67.70** Levee\_Mile: **3.64** Overall Rating:

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>670</b>	WS Berm Width (ft):	<b>42</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium</b>	Bank Slope Veg.:	<b>Slight</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of Bend &lt; 90 deg</b>	Radius of Curvature:	<b>1.0</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>Migration erosion side</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3 <b>0</b>	WS Berm Width (ft):	<b>0</b>	x3 <b>0</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>0</b>	x4 <b>0</b>	Bank Soil Type:	<b>0</b>	x4 <b>0</b>
Levee Revetment:	<b>0</b>	x4 <b>0</b>	Bank Revetment:	<b>0</b>	x4 <b>0</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>0</b>	x3 <b>0</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 0 Normalized Score (out of 100%):**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>17</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/19/2015</b>

**Comments:**

08/19/2015: No significant change observed.  
 7/17/2014: No significant change observed.  
 09/10/2013: No significant change observed.  
 12/04/2012: This site has been documented before, and a cost estimate to repair has been prepared dated 05/09/2010. The fresh cut shows the erosion is developing. The berm width is at least 42 feet. Sticks were placed at three locations along the river bank, with 3 sticks 5 feet apart at each location.



View of the downstream end of the erosion.



Close view of the erosion.



Direct view of the erosion.



Looking upstream.



LMA: **RD2089 U01 Stark**  
 Site ID: **RD2089U01RM29.04**

Waterway: **RB Old River**  
 Status: **Existing Site**

Latitude: **37.80558** Longitude: **-121.40301** River\_Mile: **29.04** Levee\_Mile: **1.22** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>30</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>12</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 155**      **Normalized Score (out of 100%): 58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>15</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: The erosion is around a tree at the levee toe. Dense vegetation is visible.



View of the erosion from the survey boat.



Close view of the site.



Close view of the site. Note the tree and the vegetation.



Front view of the erosion.



LMA: **RD2089 U01 Stark**  
 Site ID: **RD2089U01RM29.61**

Waterway: **RB Old River**  
 Status: **Existing Site**

Latitude: **37.80978** Longitude: **-121.39623** River\_Mile: **29.61** Levee\_Mile: **0.66** Overall Rating: **U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>20</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to lower slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>2.2</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>2</b>	x2 <b>4</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>3</b>	x1 <b>3</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 160 Normalized Score (out of 100%): 60**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>5</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: The 5-foot vertical scarp shows no significant change from the last year inspection. No new erosion activities observed. Dense white willow trees on site.  
 09/07/2010: It was difficult to view the erosion due to the thick Willow thickets and other vegetation at the water line. At the time of the inspection, there were no signs of repair on site. As noted during the last survey, there is a 5-foot vertical scarp along the lower slope that may be subjected to high flow velocities.  
 08/05/2010: Recommended for repair, per CLRO; "Erosion of this site may be subjective to rapid rates of erosion."  
 09/28/2009: No major change observed; 5-foot vertical scarp is immediately downstream of where berm has tapered; site is recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; Site # is the same as RM29.6, LMO.60; previously rated "U".  
 11/05/2008: No change observed; rodent holes on lower slope; wide levee crown.



Front view of the site. The scarp is visible on the slope.



Front view of the site. Note the very dense white willow thickets on site.



Front view of the site.



Front view of the site. Note the erosion is invisible because of the dense vegetation.



LMA: **RD2089 U01 Stark**  
 Site ID: **RD2089U01RM29.8**

Waterway: **RB Old River**  
 Status: **Existing Site**

Latitude: **37.809394** Longitude: **-121.392791** River\_Mile: **29.80** Levee\_Mile: **0.45** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>4</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Dense</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>

Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>0</b>	x3	<b>0</b>	WS Berm Width (ft):	<b>5</b> x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4	<b>12</b>	WS Burrow Activity:	<b>0</b> x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4	<b>8</b>	Bank Soil Type:	<b>5</b> x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4	<b>20</b>	Bank Revetment:	<b>5</b> x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3	<b>0</b>	Bank Slope Veg.:	<b>5</b> x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4	<b>0</b>	Bank Slope (H:V):	<b>5</b> x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2	<b>0</b>	Bank Condition:	<b>5</b> x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2	<b>8</b>	Tree Hazard:	<b>0</b> x2 <b>0</b>
Site Relative to Bend:	<b>0</b>	x1	<b>0</b>	Radius of Curvature:	<b>5</b> x1 <b>5</b>
Max Tidal (ft):	<b>1</b>	x2	<b>2</b>	Geomorphologic:	<b>0</b> x3 <b>0</b>

Total Score (out of 265): **155** Normalized Score (out of 100%): **58**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>2</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>Poor Maintenance Practice</b>
Erosion Indicator:	<b>Loose Soil</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed  
 08/23/2011: The site shows loose material around the pipe crossing. The operation of the pipe might have caused an impact on the levee.



Front view of the site. The irrigation pipe is functioning and leaking water at the site.



Front view of the site.



Close view of the site.



Close view of the site.



LMA: **RD2089 U01 Stark**  
 Site ID: **RD2089U01RM29.94**

Waterway: **RB Old River**  
 Status: **New Site**

Latitude: **37.809833** Longitude: **-121.390261** River\_Mile: **29.94** Levee\_Mile: **0.59** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>40</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>15</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>3:1 or greater</b>

Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>Large trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>3</b>	x4 <b>12</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>4</b>	x3 <b>12</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>0</b>	x4 <b>0</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>3</b>	x2 <b>6</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

Total Score (out of 265): **134** Normalized Score (out of 100%): **51**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: The erosion is below a large oak tree. Vegetation is visible around the eroiosn site.



Front view of the erosion site. Note the large tree above the erosion.



Close view of the erosion.



LMA: **RD2089 U02 Stark**  
 Site ID: **RD2089U02RM28.35**

Waterway: **RB Old River**  
 Status: **Existing Site**

Latitude: **37.80996** Longitude: **-121.4132** River\_Mile: **28.35** Levee\_Mile: **0.42** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>60</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>18</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Slight to Medium (40-2)</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to mid slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Inside of Bend</b>	Radius of Curvature:	<b>7.0</b>
Max Tidal (ft):	<b>1.0 to 2.0 ft.</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>3</b>	x2 <b>6</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>0</b>	x1 <b>0</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>1</b>	x2 <b>2</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 149**      **Normalized Score (out of 100%): 56**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>6</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>6/25/2015</b>

**Comments:**

06/25/2015: No significant change observed.  
 07/02/2014: No significant change observed.  
 08/13/2013: No significant change observed.  
 08/07/2012: The site has been visited by boat survey. No significant change observed.  
 08/23/2011: No significant change observed on site.  
 09/07/2010: Site consists of a jutting rip rap that has created an eddy, scouring the levee slope. Most sections of the toe and lower slope are lined with rip rap. However, the rip rap is sloughing on the mid slope and at the toe, exposing the underlying soils and tree roots. The remaining revetment is no longer adequately protecting the slope. There are 3 Sycamore trees at the toe with exposed tree roots.  
 08/05/2010: Recommended for repair, per CLRO.  
 09/28/2009: Pocket erosion on lower slope just above the toe rip rap; protruding rip rap upstream is creating an eddy, scouring the levee slope; Site # is the same as RM28.40,LM0.30; previously rated "U"; pictures will be made available during the next survey.  
 11/05/2008: Cut into levee profile; riprap slide; rodent holes; pictures do not match GPS and current condition.



View of the site from the survey boat.



View of the site from the survey boat.



View of the site from the survey boat.



View of the site from the survey boat.



LMA: **RD2095 U01 Paradise Cut** Waterway: **LB Paradise Cut**  
 Site ID: **RD2095U01RM6.74** Status: **Existing Site**

Latitude: **37.76363** Longitude: **-121.319** River\_Mile: **6.74** Levee\_Mile: **0.73** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>50</b>	WS Berm Width (ft):	<b>10</b>
Crest Width (ft):	<b>24</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>Scattered &gt;1/2 Slope</b>	Bank Condition:	<b>Frequent &lt;1/2 Slope</b>
Location of Erosion:	<b>Up to levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Straight Reach</b>	Radius of Curvature:	
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>1</b>	x3 <b>3</b>	WS Berm Width (ft):	<b>4</b>	x3 <b>12</b>
Crest Width (ft):	<b>1</b>	x4 <b>4</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>2</b>	x3 <b>6</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>2</b>	x2 <b>4</b>	Bank Condition:	<b>0</b>	x2 <b>0</b>
Location of Erosion:	<b>1</b>	x2 <b>2</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>1</b>	x1 <b>1</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 113**      **Normalized Score (out of 100%): 43**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>8</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Pocket</b>	Survey Date:	<b>8/4/2015</b>

**Comments:**

08/04/2015: No significant change observed.  
 08/26/2014: No significant change observed.  
 08/28/2013: No significant change observed.  
 07/18/2012: No significant change observed.  
 09/02/2011: No significant change observed.  
 09/22/2010: No significant change observed. There is now considerable vegetation at the water line and along the lower berm slope. However, the erosion on the lower berm slope is still present and has not been corrected.  
 08/06/2010: Recommended for local maintenance issue, per CLRO.  
 07/29/2009: No major change since last visit; noticeable vegetation growth; erosion is on berm, but if left untreated, it will eventually erode into levee prism; site is recommended for annual assessment and monitoring of the site, per CLRO CES 2008 Report; Site # is the same as RM6.80,LM0.73; previously rated "U".  
 07/22/2008: Downstream of WPRR near siphon pipe & pump; sandy levee; visited by Jeff Van Gilder and LRO in 2008 for repair assessment; scouring downstream of RR crossing, possibly caused by eddy effects.  
 03/13/2007: Site visited on 03/13/2007.



Direct view of the erosion upstream of Railroad bridge.



Looking down at the erosion downstream of the Railroad bridge.



Close view of the erosion downstream of the RR bridge.



Close view of the erosion.



LMA: **RD2095 U02 Paradise Cut** Waterway: **LB San Joaquin River**  
 Site ID: **RD2095U02RM60.62** Status: **Existing Site**

Latitude: **37.740196** Longitude: **-121.297662** River\_Mile: **60.62** Levee\_Mile: **1.78** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>150</b>	WS Berm Width (ft):	<b>25</b>
Crest Width (ft):	<b>60</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Clayey Sand</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense</b>	Bank Slope Veg.:	<b>Slight to Medium</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>1:1 or less</b>
Levee Slope Condition:	<b>No caving</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Below levee toe</b>	Tree Hazard:	<b>No or small trees</b>
Site Relative to Bend:	<b>Outside of bend &gt; 90 deg</b>	Radius of Curvature:	<b>5.7</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>No migration</b>

**II. Criteria**

	<u>Score:</u>	<u>Weighted Score:</u>		<u>Score:</u>	<u>Weighted Score:</u>
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>1</b>	x3 <b>3</b>
Crest Width (ft):	<b>0</b>	x4 <b>0</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>2</b>	x4 <b>8</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>1</b>	x3 <b>3</b>	Bank Slope Veg.:	<b>3</b>	x3 <b>9</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>4</b>	x4 <b>16</b>
Levee Slope Condition:	<b>0</b>	x2 <b>0</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>0</b>	x2 <b>0</b>	Tree Hazard:	<b>0</b>	x2 <b>0</b>
Site Relative to Bend:	<b>3</b>	x1 <b>3</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>0</b>	x3 <b>0</b>

**Total Score (out of 265): 106**      **Normalized Score (out of 100%): 40**

**III. Misc**

Crown Type:	<b>Gravel</b>	Scarp Height (ft):	<b>10</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/4/2015</b>

**Comments:**

08/04/2015: No significant change observed.  
 7/02/2014: No significant change observed.  
 08/28/2013: No significant change observed.  
 09/13/2012: The site has been visited by land survey. The vegetation on the site shows the erosion has not developed significantly from the last survey.  
 The site was not visited by boat survey due to the limitation of navigable waterway.  
 08/23/2011: No significant change observed.  
 9/22/2010: No significant change observed. There is moderate vegetation growth on the berm. Despite the erosion occurring on the berm, corrective action should be taken before the issue becomes severe.  
 9/29/2009: Site is immediately downstream of a section of existing rip rap; there is a 20-foot berm remaining; berm will continue to erode unless erosion is mitigated; Site# is the same as RM62.6, LM1.87; recommended for annual assessment, per CES Evaluation 2008 Report  
 2006: Visited 10/20/06



Close view of the site.



View of the erosion.



Close view of the site.



Close view of the site.



LMA: **RD2095 U02 Paradise Cut** Waterway: **LB San Joaquin River**  
 Site ID: **RD2095U02RM60.69** Status: **Existing Site**



View of the erosion from the survey boat. The dense vegetation on the site blocks the view of the erosion.

Latitude: **37.73888** Longitude: **-121.29826** River\_Mile: **60.69** Levee\_Mile: **1.87** Overall Rating: **M**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft): **200** WS Berm Width (ft): **0**  
 Crest Width (ft): **45** Burrow Activity: **No signs of activity**  
 Levee Soil Type: **Clayey Sand** Bank Soil Type: **Silts and Clean Sands**  
 Levee Revetment: **Good, covers entire slo** Bank Revetment: **Good, covers entire slop**  
 Levee Slope Veg.: **Medium to Dense** Bank Slope Veg.: **No vegetation**  
 Levee Slope (H:V): **3:1 or greater** Bank Slope (H:V): **1:1 or less**

Levee Slope Condition: **No caving** Bank Condition: **Very deteriorated**  
 Location of Erosion: **Up to levee toe** Tree Hazard: **Medium trees**  
 Site Relative to Bend: **Outside of bend > 90 deg** Radius of Curvature: **5.7**  
 Max Tidal (ft): **Less than 1.0 ft** Geomorphologic: **No migration**



The erosion is not visible from the levee top. The levee slope is protected by riprap rocks.

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	2	x3 6	WS Berm Width (ft):	5	x3 15
Crest Width (ft):	0	x4 0	WS Burrow Activity:	0	x2 0
Levee Soil Type:	2	x4 8	Bank Soil Type:	5	x4 20
Levee Revetment:	0	x4 0	Bank Revetment:	0	x4 0
Levee Slope Veg.:	1	x3 3	Bank Slope Veg.:	5	x3 15
Levee Slope (H:V):	0	x4 0	Bank Slope (H:V):	4	x4 16
Levee Slope Condition:	0	x2 0	Bank Condition:	5	x2 10
Location of Erosion:	1	x2 2	Tree Hazard:	2	x2 4
Site Relative to Bend:	3	x1 3	Radius of Curvature:	0	x1 0
Max Tidal (ft):	0	x2 0	Geomorphologic:	0	x3 0

**Total Score (out of 265): 102 Normalized Score (out of 100%): 38**

**III. Misc**

Crown Type: **Gravel** Scarp Height (ft): **5**  
 Bank Protection Type: **Riprap** Cause of Erosion: **River Induced**  
 Erosion Indicator: **Scarp** Survey Date: **8/4/2015**

**Comments:**

08/04/2015: No significant change observed.  
 7/02/2014: No significant change observed.  
 08/28/2013: No significant change observed. Dense vegetation blocks the visual inspection at the site.  
 09/13/2012: The site has been visited by land survey. The erosion is not visible from the levee slope because of dense vegetation at the site. Levee slope is protected by placed rocks. The site was not visited by boat survey due to the limitation of navigable waterway.  
 08/23/2011: Dense vegetation makes it difficult to view the possible erosion. No new development was observed on site.  
 09/23/2010: At the time of the inspection, the erosion site was difficult to view from the levee. The erosion is located on the bank toe, below the existing rip rap. There were no signs of repair on site, nor has the site been reported to be repaired by the district. Images taken from last year indicate that existing rip rap at the bank toe has sloughed exposing the underlying soils. Weakening of the toe could lead to future bank instability.  
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.  
 09/29/2009: No major change observed since last visit; sloughing of the rip rap above toe; erosion begins immediately downstream of existing rip rap revetment; roughly 15-foot berm remains; however, it will continue to erode and eventually intrude into the



LMA: **RD2101 U01 Blewett** Waterway: **LB San Joaquin River**  
 Site ID: **RD2101U01RM73.92** Status: **Existing Site**

Latitude: Longitude: River\_Mile: Levee\_Mile: Overall Rating:  
**37.650259 -121.228961 73.92 1.95 U**

**I. Site Feature** \*All Levee conditions are on waterside. Max Tidal is maximum tidal fluctuation.

Length (ft):	<b>500</b>	WS Berm Width (ft):	<b>0</b>
Crest Width (ft):	<b>16</b>	Burrow Activity:	<b>No signs of activity</b>
Levee Soil Type:	<b>Clayey Sand</b>	Bank Soil Type:	<b>Silts and Clean Sands</b>
Levee Revetment:	<b>Very poor or none</b>	Bank Revetment:	<b>Very poor or none</b>
Levee Slope Veg.:	<b>Medium to Dense (80-6</b>	Bank Slope Veg.:	<b>No vegetation</b>
Levee Slope (H:V):	<b>3:1 or greater</b>	Bank Slope (H:V):	<b>Near vertical</b>
Levee Slope Condition:	<b>Very deteriorated</b>	Bank Condition:	<b>Very deteriorated</b>
Location of Erosion:	<b>Up to upper slope</b>	Tree Hazard:	<b>Young trees</b>
Site Relative to Bend:	<b>Immediately Downstrea</b>	Radius of Curvature:	<b>7.9</b>
Max Tidal (ft):	<b>Less than 1.0 ft</b>	Geomorphologic:	<b>Migration both sides</b>

**II. Criteria**

	Score:	Weighted Score:		Score:	Weighted Score:
Length (ft):	<b>2</b>	x3 <b>6</b>	WS Berm Width (ft):	<b>5</b>	x3 <b>15</b>
Crest Width (ft):	<b>2</b>	x4 <b>8</b>	WS Burrow Activity:	<b>0</b>	x2 <b>0</b>
Levee Soil Type:	<b>2</b>	x4 <b>8</b>	Bank Soil Type:	<b>5</b>	x4 <b>20</b>
Levee Revetment:	<b>5</b>	x4 <b>20</b>	Bank Revetment:	<b>5</b>	x4 <b>20</b>
Levee Slope Veg.:	<b>0</b>	x3 <b>0</b>	Bank Slope Veg.:	<b>5</b>	x3 <b>15</b>
Levee Slope (H:V):	<b>0</b>	x4 <b>0</b>	Bank Slope (H:V):	<b>5</b>	x4 <b>20</b>
Levee Slope Condition:	<b>5</b>	x2 <b>10</b>	Bank Condition:	<b>5</b>	x2 <b>10</b>
Location of Erosion:	<b>4</b>	x2 <b>8</b>	Tree Hazard:	<b>1</b>	x2 <b>2</b>
Site Relative to Bend:	<b>2</b>	x1 <b>2</b>	Radius of Curvature:	<b>0</b>	x1 <b>0</b>
Max Tidal (ft):	<b>0</b>	x2 <b>0</b>	Geomorphologic:	<b>5</b>	x3 <b>15</b>

**Total Score (out of 265): 179 Normalized Score (out of 100%): 68**

**III. Misc**

Crown Type:	<b>Earthen</b>	Scarp Height (ft):	<b>17</b>
Bank Protection Type:	<b>None</b>	Cause of Erosion:	<b>River Induced</b>
Erosion Indicator:	<b>Scarp</b>	Survey Date:	<b>8/19/2015</b>

**Comments:**

08/19/2015: No significant change observed.  
 07/17/2014: No significant change observed.  
 09/20/2013: Site has been visited. There are signs of further erosion development along the levee slope and toe.  
 07/18/2012: The erosion has further developed toward levee crown. Vegetation has been removed.  
 08/18/2011: The erosion progressed significantly during the past flood season. The levee toe along the erosion site was washed away, and the erosion has cut the levee structure up to the point about 1/3 of the levee slope. The scarp height is approximately 17 feet. Very dense vegetation and trees are visible.  
 10/19/2010: No significant change observed on site. Remaining levee berm topsoil is of silty sand mixture. The erosion is near the downstream transition. An eddy has formed, and has scoured away a 100-foot section of the bank, possibly encroaching into the levee prism. Vegetation on site includes willows, oak, and cotton wood located from the bench to the toe. On the landside are rows of corn crop.  
 08/05/2010: Recommended for Repair, per CLRO.  
 2009: Site recommended as annual assessment and monitoring if critical erosion site, per CLRO CES Evaluation 2008 Report; an eddy has formed, eroding bank and intruding into the levee prism; Site # is the same as RM76.3, LM1.89; previously rated "U".  
 08/30/2007: Recommended for short list of immediate repair sites; silty sand levee



Upstream view of the erosion.



Downstream view of the erosion.



Close view of the erosion.



Close view of the erosion. Levee crest is approximately 8 feet above the erosion.

