

LMA: **NA0010 U23 Lower San Joaquin Levee District**

Waterway: **RB San Joaquin River**

Site ID: **NA0010U23RM224.27**

Status: **Repaired Site**

| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
|------------------|--------------------|---------------|-------------|-----------------|
| 36.802116 | -120.173847 | 224.27 | 9.15 | |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 555 |
| Scarp Height (ft): | 14 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 12 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 10.00 |

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 12 |
| Crown Type: | Gravel |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/24/2012 |
| Comments: | |

07/24/2012: Site has been repaired with riprap rocks and broken concrete blocks, but loose material and cracking are visible at the top of the repaired site. The site needs close monitoring for performance evaluation.

08/16/2011: This site is immediately downstream of the riparian protection section. Dense vegetation growing on the toe and slope of the bank seems to indicate the most part of the erosion occurred prior to last winter. The closest spot is 12 feet away from the levee toe.



Looking downstream at the repaired site



Looking downstream standing at the middle of the erosion site. Note the cracking and loosen material



Close look at the repaired site.



Looking downstream.



LMA: **NA0010 U23 Lower San Joaquin Levee District**

Waterway: **RB San Joaquin River**

Site ID: **NA0010U23RM224.33**

Status: **Repaired Site**

| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
|------------------|--------------------|---------------|-------------|-----------------|
| 36.802898 | -120.173278 | 224.33 | 9.23 | |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 280 |
| Scarp Height (ft): | 16 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 1.90 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|--|
| Length (ft): | 0 | x2 | 0 |
| Scarp Height (ft): | 0 | x3 | 0 |
| Location of Erosion: | 0 | x1 | 0 |
| WS Berm Width (ft): | 0 | x1 | 0 |
| WS Vegetation: | 0 | x2 | 0 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 0 | x3 | 0 |
| WS Soil Type: | 0 | x4 | 0 |
| Site Relative to Bend: | 0 | x1 | 0 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | Total Score (out of 91): |
| | | | 0 |
| | | | Normalized Score (out of 100%): |
| | | | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 12 |
| Crown Type: | Gravel |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/24/2012 |
| Comments: | |

07/24/2012: The site has been repaired with clay material, riprap rocks, and broken concrete blocks, but the loose material and large crackings at the repaired site are visible. Need monitoring for the performance during the coming high flow events.

08/16/2011: The erosion is cutting into the levee. The site is located at the outside of a river bend, and the erosions were caused by river flows during the last flooding season. The ground was covered by dense grasses. Animal burrow holes are visible.



Looking upstream at the repaired site.



A close view at the repaired site at the corner of the river bend. Note the losen material and cracking



Looking downat the cracking at the repaired site



Looking upstream

LMA: **NA0011 U01 Madera County FCWCA**
 Waterway: **RB Ash Slough**
 Site ID: **NA0011U01RM2.57**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.055596 | -120.412647 | 2.57 | 1.15 | M |

I. Site Feature *WS - Waterside

Length (ft): **460**
 Scarp Height (ft): **3**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Sand (SP, SM and mixtures)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **8.90**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 50 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 55 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 4 | x4 16 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site and with visible roots and leaning**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/24/2012**
 Comments:

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.



Close-in view at the erosion site



View from the riverbed



Tree roots exposed



Looking upstream standing on the riverbed



LMA: **NA0011 U01 Madera County FCWCA**
 Waterway: **RB Ash Slough**
 Site ID: **NA0011U01RM3.8**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.06857 | -120.39862 | 3.80 | 2.38 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 100 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 10 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Sand (SP, SM and mixtures) |
| Site Relative to Bend: | Immediately Downstream of Bend |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 47 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 4 | x1 4 | |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): 52 |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 4 | x4 16 | |
| Site Relative to Bend: | 2 | x1 2 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/24/2012 |
| Comments: | |

07/31/2012: Site was visited on 07/26/2012. No significant changes observed
 08/09/2011: Site was inspected. No visible change was observed from the previous condition. There have been no reports from the district that this site was corrected.
 11/30/2010: Site was not inspected this year due to time constraints. There have been no reports from the district that this site was corrected. Continue monitor 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 CLRO CES Evaluation 2008 Report; it was previously rated "M".
 8/26/2008: Undulating waterside slope surface; vehicular damage along the waterside slope possibly caused by farming equipment; levee crown is composed of sandy material; there is a collection of concrete rubble on the waterside crown hinge; vehicular damage extends from levee toe to crown surface.
 9/6/2007: Farmer degraded levee on waterward slope and crown.



Close look at the site



New dirt added to the levee



Notice the trash on the site



Vegetation on the levee



LMA: **NA0013 U03 Merced Streams Group**
 Waterway: **RB Owens Creek Diversion**
 Site ID: **NA0013U03RM1**
 Status: **Existing Site**

| | | | | |
|----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.2708 | -120.28418 | 1.00 | 1 | M |

I. Site Feature *WS - Waterside

Length (ft): **10**
 Scarp Height (ft): **7**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft):
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **11.60**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 53 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 58 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/31/2012**
 Comments:

07/31/2012: Site was visited on 07/26/2012. No significant changes observed. Dense vegetation presents at the site.
 08/16/2011: No visible change. 100 percent vegetation coverage with star thistles. Minor cracking visible on the waterside slope.
 11/30/2010: Site was not inspected this year due to time constraint. There have been no reports from the district that this site was corrected. Continue to monitor during flood events.
 2009: Site is recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; it was previously rated "U".
 8/26/2008: Terracetting erosion; frequent livestock traversing the slopes has caused deformation of the waterside levee slope.
 9/11/2007: GPS extended from opposite bank using Google Earth.



A close look at the site, which is covered by thick vegetation



Site covered with dense vegetation.



Wooden posts and fence on site



Dense vegetation



LMA: **NA0013 U03 Merced Streams Group**
 Waterway: **RB Owens Creek Diversion**
 Site ID: **NA0013U03RM1.25**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.27263 | -120.28039 | 1.25 | 1.25 | M |

I. Site Feature *WS - Waterside

Length (ft): **10**
 Scarp Height (ft): **3**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **2**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **3.80**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 46 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 51 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 2 | x1 2 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/24/2012**
 Comments:

07/31/2012: Site was visited on 07/24/2012. No significant changes observed. Dried grass covered the site. Dense vegetation.
 08/16/2011: No visible change. 100 percent vegetation coverage with star thistles. Minor cracking visible on the waterside slope. Burrow holes visible.
 11/30/2010: Site was not inspected this year due to time constraint. There have been no reports from the district that the site was repaired. Continue to monitor during flood events.
 2009: Bank erosion scour that is immediately downstream of Mission Avenue bridge; noticeable terracetting damage from livestock traversing the slope; site is recommended as local maintenance issue, per CLRO Evaluation 2008 Report; site was previously rated "M".
 8/26/2008: Terracetting damage from livestock; there is now a pocket erosion developing on the levee toe; site is 100 feet downstream of Mission Avenue bridge.



The site is covered with dense thistles.



No significant change visible from the levee top



The site is covered with dense thistles.



Minor cracking observed last year at the levee shoulder not visible because of the dried grass



LMA: **NA0013 U04 Merced Streams Group**
 Waterway: **LB Owens Creek Diversion**
 Site ID: **NA0013U04RM0.21**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.272283 | -120.280869 | 0.21 | 0.21 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 700 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 20 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 44 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 2 | x1 2 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 48 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/24/2012 |
| Comments: | |

07/31/2012: No significant changes observed
 08/16/2011: No significant change was visible. Minor cracking on the waterside levee slope was spotted. 100 percent vegetation coverage with star thistles.
 11/30/2010: Site was not inspected this year due to time constraints. There have been no reports from the district that the site has been corrected.
 2009: Site recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; previously rated "U".
 9/10/2007: GPS extended from opposite bank using Google Earth; signs of vehicular damage on levee.



The site is covered with dense star thistles. No significant changes visible



The site is covered with dense star thistles



The site is covered with dense star thistles



Minor cracking visible on the site



LMA: **NA0013 U04 Merced Streams Group**
 Waterway: **LB Owens Creek Diversion**
 Site ID: **NA0013U04RM0.42**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.27063 | -120.28397 | 0.42 | 0.42 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|-----------------------------|
| Length (ft): | 50 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | No Ground Coverage |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 26.50 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 44 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 48 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/24/2012 |
| Comments: | |

07/24/2012: No significant changes observed.
 08/16/2011: No visible significant changes. 100 percent vegetation coverage with star thistles. Minor cracking visible on the waterside slope.
 11/30/2010: Site was not inspected this year due to time constraints. There have been no reports from the district that the site has been corrected.
 2009: Site is recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; terracing damage from livestock traversing; there is a wooden platform installed on site; landside is on high ground; site was previously rated "M".
 9/10/2007: GPS extended from opposite bank using Google Earth; GPS on file is correct.



Direct look at the site



The site is covered with thick vegetation



Direct look at the site



The site is covered with thick vegetation



LMA: **NA0017 U15 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **RB Mormon Slough**
 Site ID: **NA0017U15RM0.86**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.045818 | -121.023955 | 0.86 | 0.86 | U |

I. Site Feature *WS - Waterside

Length (ft): **4800**
 Scarp Height (ft): **12**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **11**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 59 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 3 | x1 3 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 65 |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site and with visible roots**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Site has been revisited. No significant changes observed on erosion site
 09/02/2011: No significant changes observed on site.
 11/02/2010: No significant changes observed on site. 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 changes in condition; site was previously rated "U".
 2007: Visited site 02/06/2007; possible critical site.



Looking upstream



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



Close view of erosion site. Note the sloughing soil at the shoulder.



Closer look at the site. Sliding soil at upper slope.



LMA: **NA0017 U15 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **RB Mormon Slough**
 Site ID: **NA0017U15RM1.58**
 Status: **Repaired Site**

| | | | | |
|-----------------|------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.04017 | -121.0338 | 1.58 | 1.58 | |

I. Site Feature *WS - Waterside

Length (ft): **350**
 Scarp Height (ft): **5**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **15.10**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|--------|-----------------|---|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Site was visited. No new erosion has been found. Dense vegetation developed at the repaired site.
 09/02/2011: Site was repaired in 2011 summer by the district. Needs to monitor during the next flood season for performance. The site was previously rated "U".
 11/02/2010: No significant changes observed on site. Bank erosion extends approximately 100 feet downstream and 250 feet upstream of the drop structure.
 8/12/2009: No major change observed; erosion is upstream and downstream of drop structure; bank erosion is associated with high velocities; it is recommended for annual assessment and monitoring of critical erosion site per CLRO CES Evaluation 2008 Report; it was previously rated "U".
 2007: Visited site 02/06/2007.



Looking at the repaired site. Dense vegetation covered the repaired slope.



Close look of the repaired site



Looking downstream to the drop structure.



Close view of the repaired site.



LMA: **NA0017 U15 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **RB Mormon Slough**
 Site ID: **NA0017U15RM3.14**
 Status: **Repaired Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.026257 | -121.054829 | 3.14 | 3.14 | |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 30 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 15 |
| WS Vegetation: | No Ground Coverage |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 16 |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | Concrete Lining |
| Bank Protection Location: | Slope |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Site is visited and no new erosion discovered.
 09/02/2011: Site was fixed in April 2011 by the district. Suggest continue to monitor performance during flooding. The site was previously rated "M".
 11/02/2010: No significant changes observed on site. Upon further inspection, it appears that a slab of aging concrete lining on the bank slope has slipped, possibly due to a weakend subsoil layer. Fissure cracks have developed and now extend outward from where the initial slip occurred. Erosion of the subsoil layer could further weaken the bank and intrude into the levee prism. It could also affect the stability of the pump structure.
 8/12/2009: Downward creep of the soil that was possibly caused during pipe installation; erosion is between 2 to 3 feet cut into the bank; vertical pump inlet is located adjacent to erosion; District personnel Jay Howdigi and Jim Caruso were present during the site visit.



Looking down at the repaired site.



Looking down at the repaired site.



Looking down at the repaired site.



Looking at the levee shoulder



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM6.47**
 Status: **Repaired Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.986959 | -121.087544 | 6.47 | 6.47 | |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 30 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | No Ground Coverage |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2:1 |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | |
| WS Vegetation: | 0 | x2 | 0 | Normalized Score (out of 100%): |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 16 |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Site is visited and no new erosion activity found at the repaired site, but new pocket erosion has developed at the toe downstream of the bridge.
 09/02/2011: The site has been repaired by the district. The site was previously rated "M".
 11/02/2010: No significant changes observed on site. Bridge scour has created a pocket erosion, exposing a portion of the underlying concrete padding.
 8/11/2009: Site is adjacent to abutment on Milton Road Bridge; pocket erosion has developed and will continue to expose the bridge foundation; this erosion appears to be critical as it may affect the bridge foundation.



Looking at the site from right bank, immediately upstream of the bridge



Looking at the site from right bank, upstream of the bridge



Close view of the fixed site from upstream of the Milton Bridge.



The new developed erosion immediately downstream of the bridge. Viewed from the right bank.



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM11.81**
 Status: **New Site**

| | | | | |
|-----------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.99772 | -121.077807 | 11.81 | 5.54 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 250 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 4 | x2 8 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 62 |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: The site is located at the oppsite river bank of E. Tobacco Road.



Looking downstream at the site



Closer view of the site



Closer view of erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM12.95**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|--------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.964735 | -121.142503 | 12.95 | 10.17 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 100 |
| Scarp Height (ft): | 12 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 62 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Dense vegetation on site



Front view of erosion



Front view of erosion



Closer view of erosion



Close look at the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM13.53**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.96719 | -121.13308 | 13.53 | 9.59 | M |

I. Site Feature *WS - Waterside

Length (ft): **120**
 Scarp Height (ft): **15**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **10**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|------------------------------------|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 4 | x1 4 | 53 |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | 58 |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Erosion is on berm. The berm width is estimated.



Looking downstream at the erosion



front view of erosion



Front view of erosion



Front of view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM13.72**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.966922 | -121.129533 | 13.72 | 9.4 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 80 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 | 4 |
| Scarp Height (ft): | 5 | x3 | 15 |
| Location of Erosion: | 5 | x1 | 5 |
| WS Berm Width (ft): | 5 | x1 | 5 |
| WS Vegetation: | 1 | x2 | 2 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 4 | x3 | 12 |
| WS Soil Type: | 3 | x4 | 12 |
| Site Relative to Bend: | 1 | x1 | 1 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | Total Score (out of 91): 56 |
| | | | Normalized Score (out of 100%): 62 |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Erosion is covered with dense vegetation.



Looking downstream at the erosion



Close view of erosion



Another close view of erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM13.86**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.966615 | -121.127328 | 13.86 | 8.99 | U |

I. Site Feature *WS - Waterside

Length (ft): **12**
 Scarp Height (ft): **8**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 62 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Pocket erosion at the levee toe and slope. The erosion is covered with dense vegetation.



Front view of erosion



Front view of erosion



Closer view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM14.48**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.969213 | -121.116574 | 14.48 | 8.63 | M |

I. Site Feature *WS - Waterside

Length (ft): **200**
 Scarp Height (ft): **5**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **25**
 WS Vegetation: **Ground surrounding site fully covere**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1:1 or less**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 42 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 1 | x1 1 | |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): 46 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Erosion occurred on a berm of approximately 25 ft wide. Site is covered with dense vegetation.



Front view of erosion



Front view of erosion



Front view of erosion



Closer view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM16.27**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.983279 | -121.090843 | 16.27 | 6.81 | U |

I. Site Feature *WS - Waterside

Length (ft): **1000**
 Scarp Height (ft): **25**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1:1 or less**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|--------|-----------------|---------------------------------|
| Length (ft): | 5 | x2 | 10 |
| Scarp Height (ft): | 5 | x3 | 15 |
| Location of Erosion: | 5 | x1 | 5 |
| WS Berm Width (ft): | 5 | x1 | 5 |
| WS Vegetation: | 2 | x2 | 4 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 4 | x3 | 12 |
| WS Soil Type: | 3 | x4 | 12 |
| Site Relative to Bend: | 1 | x1 | 1 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | Total Score (out of 91): |
| | | | 64 |
| | | | Normalized Score (out of 100%): |
| | | | 70 |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Discontinuous scarp or pocket erosions occurred along a long stretch of the river, with a highest height larger than 25 ft at certain points.



Looking at the most downstream erosion at the site.



Closer view of the erosion



Front view of the erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM17.99**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.00373 | -121.07308 | 17.99 | 5.03 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 12 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 53 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 58 |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

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.



Front view of erosion



Close look at the erosion



A close look at the upper levee slope above the pocket erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM18.69**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.012792 | -121.068073 | 18.69 | 4.33 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 110 |
| Scarp Height (ft): | 20 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 60 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 66 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: A irrigation pipe presents at the site, but not likely has caused the erosion.



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



Front view of erosion.



Closer look at erosion



Closer look at erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM19.18**
 Status: **New Site**

| | | | | |
|----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.0181 | -121.06517 | 19.18 | 3.9 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 100 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 5 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1.5:1 |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 48 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 53 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 3 | x3 9 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: River-induced erosion occurred on the berm, while the runoff-induced erosion on the levee slope. Site is covered with vegetation



Close look at the erosion. Note the erosion at the levee slope as well as berm.



A closer look at the erosion



Front view of erosion at berm



Another closer look at the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM19.23**
 Status: **New Site**

| | | | | |
|----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.0186 | -121.06439 | 19.23 | 3.84 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 50 |
| Scarp Height (ft): | 12 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 53 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 58 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Erosion is covered with grass and shrubs.



Front view of erosion



Front view of erosion



A closer look at the erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM19.28**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.01929 | -121.06381 | 19.28 | 3.78 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 60 |
| Scarp Height (ft): | 8 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 55 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 60 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Tow large-size pocket erosions. Site is covered with dense vegetation.



Looking upstream



Front view of erosion



front view of erosion



A closer look at the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM20**
 Status: **New Site**

| | | | | |
|-----------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.02667 | -121.053031 | 20.00 | 3.03 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 300 |
| Scarp Height (ft): | 20 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 4 | x2 8 | Total Score (out of 91): 59 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 65 |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Site Comprised of series of pocket and scarp erosions. Some of erosions are covered by grass or shrubs.



Front view of the erosion.



Front view of erosion



Looking downstream



Close view of the scarp erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM20.62**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.032202 | -121.045226 | 20.62 | 2.37 | U |

I. Site Feature *WS - Waterside

Length (ft): **50**
 Scarp Height (ft): **7**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1:1 or less**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 62 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: The erosion was firstly reported in 2012 spring levee inspection report. Fresh soil exposed at the site as a result of possible effort for levee slope enhancement.



Front view of the site.



Close view of erosion. Note the vegetation at the site



Front view of erosion



Close look at the site.



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM20.71**
 Status: **New Site**

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.033072 | -121.04497 | 20.71 | 2.31 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 40 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 59 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Site is covered with dense vegetation.



Front view of the erosion.



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



Closer view of the erosion



front of the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM21.05**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.03715 | -121.04058 | 21.05 | 1.94 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 100 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 5 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 | 4 |
| Scarp Height (ft): | 5 | x3 | 15 |
| Location of Erosion: | 5 | x1 | 5 |
| WS Berm Width (ft): | 5 | x1 | 5 |
| WS Vegetation: | 1 | x2 | 2 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 4 | x3 | 12 |
| WS Soil Type: | 3 | x4 | 12 |
| Site Relative to Bend: | 1 | x1 | 1 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | Total Score (out of 91): 56 |
| | | | Normalized Score (out of 100%): 62 |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Berm width is estimated as 5 ft.



Looking downstream at the erosion site



Looking downstream at the erosion



Front view of the erosion



Front view of the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM21.94**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.037906 | -121.038949 | 21.94 | 1.77 | M |

I. Site Feature *WS - Waterside

Length (ft): **40**
 Scarp Height (ft): **6**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **5**
 WS Vegetation: **Ground surrounding site fully covere**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|------------------------------------|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 5 | x1 5 | 45 |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 3 | x3 9 | 49 |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/22/2012**
 Comments:

08/22/2012: Site is covered by dense vegetation. Berm width is estimated as 5 ft.



Close view of the erosion



Looking downstream at the erosion



Front view of the erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM21.95**
 Status: **New Site**

| | | | | |
|-----------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.03808 | -121.038676 | 21.95 | 1.75 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 30 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): 57 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Erosion is covered by dense vegetation.



Front view of erosion site



Close view of erosion



close view of erosion. Note the dense vegetation at the site



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM22.01**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.03911 | -121.03784 | 22.01 | 1.74 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 50 |
| Scarp Height (ft): | 8 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 57 |
| WS Vegetation: | 0 | x2 0 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: Site is covered with dense vegetation. A scarp erosion is adjacent to a pocket erosion at the downstream.



Front view of erosion site. A pocket erosion is at the downstream



Front view of the pocket erosion



Front of pocket erosion



Close view of the scarp erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM22.15**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.03994 | -121.03543 | 22.15 | 1.59 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 25 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 10 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 42 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 4 | x1 4 | |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): 46 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: The berm is estimated at 10 ft. Dense vegetation on site



Front view of erosion.



Close look at the erosion



Front view of erosion



Front view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM22.58**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.04126 | -121.02773 | 22.58 | 1.13 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------------|
| Length (ft): | 20 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 15.90 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 50 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 55 |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|------------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Slope |
| Survey Date: | 8/22/2012 |
| Comments: | |

08/22/2012: 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.



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



Front view of eroision. Note the irrigation pipe at the erosion site



Front view of erosion and broken concrete protection at levee slope



Closer view of erosion



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM22.74**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.04308 | -121.02628 | 22.74 | 0.98 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 100 |
| Scarp Height (ft): | 12 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 1:1 or less |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 62 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 4 | x3 12 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

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.. There is a drainage pipe at the site, which might have caused the problem at one pocket erosion.



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



Looking downstream



Looking downstream



Front view of the site



LMA: **NA0017 U16 San Joaquin County Flood Control and Water Conservation Distri**
 Waterway: **LB Mormon Slough**
 Site ID: **NA0017U16RM23.35**
 Status: **New Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 38.048159 | -121.016427 | 23.35 | 0.3 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 1800 |
| Scarp Height (ft): | 20 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | Near vertical |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 67 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 74 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/22/2012 |
| Comments: | |

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.



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



Looking downstream standing on the right side river bank.



Looking downstream from right side of the river



close view of the erosion



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.822306 | -121.375304 | 31.40 | 0 | U |

I. Site Feature *WS - Waterside

Length (ft): **6**
 Scarp Height (ft): **6**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **2.50**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 61 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 67 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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 erosion



Close view of erosion



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.90253 | -121.32569 | 44.32 | 1.08 | U |

I. Site Feature *WS - Waterside

Length (ft): **15**
 Scarp Height (ft): **10**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|-----------|---|
| Length (ft): | 1 | x2 | 2 | Total Score (out of 91): 61 |
| Scarp Height (ft): | 4 | x3 | 12 | |
| Location of Erosion: | 5 | x1 | 5 | |
| WS Berm Width (ft): | 5 | x1 | 5 | |
| WS Vegetation: | 2 | x2 | 4 | Normalized Score (out of 100%): 67 |
| WS Burrow Hole Activity: | 5 | x1 | 5 | |
| WS Levee Slope (H:V): | 5 | x3 | 15 | |
| WS Soil Type: | 3 | x4 | 12 | |
| Site Relative to Bend: | 1 | x1 | 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The erosion is nearly verticle, 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 erosion site. Note the concrete blocks and vegetation.



Close view of erosion. Animal holes are visible



Close view of erosion



Close view of erosion



LMA: **RD0017 U02 Mossdale**
 Waterway: **RB San Joaquin River**
 Site ID: **RD0017U02RM45.97**
 Status: **New Site**

| | | | | |
|-----------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.88032 | -121.333266 | 45.97 | 5.43 | M |

I. Site Feature *WS - Waterside

Length (ft): **4**
 Scarp Height (ft): **3**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 48 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 53 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: 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



LMA: **RD0017 U02 Mossdale**
 Waterway: **RB San Joaquin River**
 Site ID: **RD0017U02RM46.73**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.87056 | -121.32912 | 46.73 | 3.46 | U |

I. Site Feature *WS - Waterside

Length (ft): **5**
 Scarp Height (ft): **8**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 59 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The erosion is immediately upstream of riprap protection section. The possible cause of the erosion is the rainfall runoff washout.



Front view of the site. Note the riprap protection next to the site.



Close view of the site



LMA: **RD0404 U01 Boggs**
 Waterway: **RB San Joaquin River**
 Site ID: **RD0404U01RM40.86**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.93948 | -121.34273 | 40.86 | 0.23 | U |

I. Site Feature *WS - Waterside

Length (ft): **250**
 Scarp Height (ft): **5**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **2.10**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 4 | x2 8 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 59 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. The erosion has developed in size, and more pocket erosions found.
 8/23/2011: Pockets erosions observed by last survey seem have progressed during the last food 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.



Downstream view of Site. Progressing pocket erosion visible.



Front view of the site



Front view of the site



Downstream view of the site



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.93919 | -121.33828 | 41.11 | 0.48 | U |

I. Site Feature *WS - Waterside

Length (ft): **18**
 Scarp Height (ft): **8**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 58 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 64 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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



Downstream view of the site.



A closer look at the site. Note the protected bank downstream and upstream of the erosion



Front view of the site



Front view of the site



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

| | | | | |
|------------------|------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.939133 | -121.3361 | 41.22 | 0.61 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 80 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | No Ground Coverage |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 60 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 66 |
| WS Vegetation: | 3 | x2 6 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | Gravel |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Slope |
| Survey Date: | 8/7/2012 |
| Comments: | |

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.



Front view of the erosion. Note the slumping erosion at upper slope.



Close view of erosion



Front view of erosion. Note the broken concrete blocks at the slope.



Front view of the erosion.



LMA: **RD0404 U01 Boggs**
 Waterway: **RB San Joaquin River**
 Site ID: **RD0404U01RM41.23**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.93881 | -121.33617 | 41.23 | 0.62 | U |

I. Site Feature *WS - Waterside

Length (ft): **20**
 Scarp Height (ft): **15**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 58 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 64 |
| WS Vegetation: | 3 | x2 6 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The rootball of a fallen tree removed material from the levee. Immediately action needed to remove the fallen tree trunk and repair the damage.



Upstream view of the site



close view of the site



Closer view of the site



LMA: **RD0404 U02 Boggs**
 Waterway: **RB French Camp Slough**
 Site ID: **RD0404U02RM1.56**
 Status: **Repaired Site**

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.91844 | -121.29704 | 1.56 | 1.45 | |

I. Site Feature *WS - Waterside

Length (ft): **1350**
 Scarp Height (ft): **6**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **8.90**

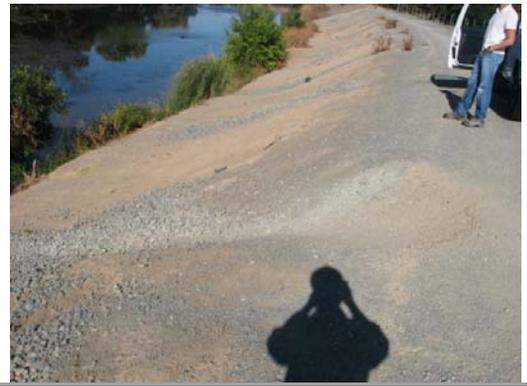
II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/26/2012**
 Comments:

07/26/2012: No new erosion has been observed.
 09/02/2011: Site has been repaired with added soil and crashed rock. No new erosion activities found on site.
 11/30/2010: Site was not inspected this year due to time constraints. There has been no reports from the district that the site was corrected. Continue to monitor during flood events.
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.
 2009: Erosion appears to be maintenance-related, and not caused by riverflow; recommend annual assessment and monitoring of erosion site, per Critical Erosion Sites Evaluation 2008 Report; previously rated "U".
 9/12/2006: Headward erosion along the levee bank; erosion has created "notches" estimated to be about 12 feet in height; erosion appears to be maintenance related; DWR Inspector for the area says the erosion has been present for years.



Looking downstream of the repaired site.



Looking downstream



Close look at the repaired site.



Looking upstream from levee top



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.93887 | -121.34046 | 40.99 | 0.4 | U |

I. Site Feature *WS - Waterside

Length (ft): **20**
 Scarp Height (ft): **4**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 55 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | Normalized Score (out of 100%): 60 |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

8/7/2012: 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 erosion site. Note the vegetation at the levee toe and lower slope



Front view of the site



LMA: **RD0524 U01 Middle Roberts Island**
 Waterway: **LB San Joaquin River**
 Site ID: **RD0524U01RM41.15**
 Status: **Repaired Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.938895 | -121.337602 | 41.15 | 0.56 | |

I. Site Feature *WS - Waterside

Length (ft): **360**
 Scarp Height (ft): **6**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **6.30**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Broken Concrete**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. The site seems to have been repaired.
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes observed on site. Some emergent vegetation at the lower and middle slope. Existing revetment is no longer adequately protecting the oversteepened slope. Some of the broken concrete used as revetment has slid, dragging levee materials away from the slope and creating notches.
 09/29/2009: Erosion site extends from RM 41.11 to 41.18; existing revetment is no longer adequately protecting the oversteepened slope.
 2008: Existing concrete slabs were placed as temporary fix; some of the slabs have started to slide, dragging levee materials away from the slope and creating notches; note that a sewage treatment plant is located on the landside of the levee.



Direct view of the site.



Direct view of the site.



Direct view of the site.



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.936821 | -121.334582 | 41.39 | 0.77 | U |

I. Site Feature *WS - Waterside

Length (ft): **35**
 Scarp Height (ft): **8**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 55 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 60 |
| WS Levee Slope (H:V): | 3 | x3 9 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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 interferes the view of erosion.



Upstream view of the erosion site. Note the railroad bridge.



Front view of the erosion site. Vegetation visible



Front view of erosion



Front view of erosion



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.935576 | -121.333202 | 41.50 | 0.91 | M |

I. Site Feature *WS - Waterside

Length (ft): **15**
 Scarp Height (ft): **5**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **6.62**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 57 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 3 | x3 9 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Broken Concrete**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**

Comments:
 08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: The erosion site is immediately donstream of the riprap protection.



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



A close view of the erosion



Front view of the site



Front view of the site



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.93541 | -121.33156 | 41.58 | 1 | U |

I. Site Feature *WS - Waterside

Length (ft): **19**
 Scarp Height (ft): **12**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 58 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 64 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The erosion was discovered during the boat survey.



Front view of erosion



Front view of erosion



Front view of erosion



Front view of erosion



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.935326 | -121.331537 | 41.59 | 1 | |

I. Site Feature *WS - Waterside

Length (ft): **55**
 Scarp Height (ft): **10**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **6.62**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

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.



Close view of site. New minor erosion developed at the levee slope erosion.



Close view of the erosion. The protection has been loosened and washed away.



Front view of the site



Front view of the erosion. New erosion has developed immediately upstream of the repaired site,



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

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.933347 | -121.32911 | 41.79 | 1.2 | U |

I. Site Feature *WS - Waterside

Length (ft): **400**
 Scarp Height (ft): **5**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 67 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 74 |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 3 | x3 9 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **12**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **River Rock**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. No significant changes observed
 08/23/2011: No significant changes observed on site.
 9/07/2010: No significant changes observed on site. Some emergent vegetation 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.



Direct view of the site.



Direct view of the site.



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

| | | | | |
|------------------|------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.931858 | -121.3283 | 41.92 | 1.3 | U |

I. Site Feature *WS - Waterside

Length (ft): **160**
 Scarp Height (ft): **12**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 63 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 69 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site was first reported in 2012 spring levee inspection report.



close 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 Island**
 Waterway: **LB San Joaquin River**
 Site ID: **RD0524U01RM42.03**
 Status: **New Site**

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.930575 | -121.32809 | 42.03 | 1.39 | U |

I. Site Feature *WS - Waterside

Length (ft): **6**
 Scarp Height (ft): **6**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 62 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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.



Upstream view of the erosion



Close view of the erosion



Close view of the erosion



Downstream view of the erosion



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.92777 | -121.32787 | 42.20 | 1.61 | U |

I. Site Feature *WS - Waterside

Length (ft): **300**
 Scarp Height (ft): **4**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of Bend < 90 deg**
 Radius of Curvature(Rc/W): **2.20**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 4 | x2 8 | Total Score (out of 91): 60 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 66 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 5 | x1 5 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site and with visible roots and leaning**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: : The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site. Trees concerned still in place.
 09/07/2010: No significant changes 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.



Large trees along the levee toe. There is minimal slope protection. The erosion near tree visible.



Front view of erosion



Fallen tree near the site



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

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.920992 | -121.32137 | 42.79 | 2.19 | M |

I. Site Feature *WS - Waterside

Length (ft): **6**
 Scarp Height (ft): **4**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 53 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 58 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site was first reported in 2012 spring levee inspection report.



Close view of the pocket erosion



Close view of the pocket erosion



Downstream view of erosion.



front view of erosion



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

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.919885 | -121.31971 | 42.93 | 2.32 | U |

I. Site Feature *WS - Waterside

Length (ft): **12**
 Scarp Height (ft): **6**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 70 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 77 |
| WS Vegetation: | 3 | x2 6 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site was first reported in 2012 spring levee inspection report. The site is located at the inside corner of a river bend.



Close look of the site.



Front view of the site



Front view fo the site. Note the soil type



closer view of the erosion



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.91665 | -121.32198 | 43.23 | 2.65 | M |

I. Site Feature *WS - Waterside

Length (ft): **10**
 Scarp Height (ft): **5**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 50 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 55 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site was first reported in 2012 spring levee inspection report.



Upstream view of erosion



Close view of erosion



closer view of erosion



Front view of erosion



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.91301 | -121.32449 | 43.52 | 2.96 | M |

I. Site Feature *WS - Waterside

Length (ft): **5**
 Scarp Height (ft): **5**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 57 |
| WS Vegetation: | 3 | x2 6 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site was first reported in 2012 spring levee inspection report.



Front view of erosion



Close view of erosion



Close view of erosion



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.908544 | -121.324894 | 43.83 | 3.27 | |

I. Site Feature *WS - Waterside

Length (ft): **400**
 Scarp Height (ft): **5**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**

Comments:
 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.



A closer view of the erosion



Closer view of the erosion



LMA: **RD0524 U01 Middle Roberts Island**
 Waterway: **RB San Joaquin River**
 Site ID: **RD0524U01RM44.13**
 Status: **New Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.90463 | -121.32361 | 44.13 | 3.56 | U |

I. Site Feature *WS - Waterside

Length (ft): **150**
 Scarp Height (ft): **6**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **2.35**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 65 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 71 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The levee toe has been cut off along a 150ft long river stretch. The erosion is located just upstream of a river bend.



Front view of erosion



Front view of erosion



Front view of erosion



Front view of erosion



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.89223 | -121.32793 | 45.07 | 4.53 | U |

I. Site Feature *WS - Waterside

Length (ft): **51**
 Scarp Height (ft): **15**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 62 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 68 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type:
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: Erosion is located at the inside of a river bend. Site is covered with broken concrete blocks and other debris.



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



Front view of the site.



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.889809 | -121.329342 | 45.27 | 4.71 | M |

I. Site Feature *WS - Waterside

Length (ft): **12**
 Scarp Height (ft): **6**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 57 |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

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 erosion site



Front view of the erosion.



Front view of the site.



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



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.87788 | -121.33255 | 46.12 | 5.65 | M |

I. Site Feature *WS - Waterside

Length (ft): **30**
 Scarp Height (ft): **3**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **5.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 46 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 51 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 1 | x1 1 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: : The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes 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 changes 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 th revetment is sliding, causing deformation on the levee slope; site is upstream of Howards Road Bridge.



Sloughing rip rap just below the Howard Bridge abutment.



Sloughing rip rap adjacent to Howard Bridge.



Front view of sloughing rip rap.



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.87437 | -121.33285 | 46.39 | 5.86 | U |

I. Site Feature *WS - Waterside

Length (ft): **15**
 Scarp Height (ft): **4**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 55 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 5 | x1 5 | Normalized Score (out of 100%): 60 |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The erosion is near a water-intake structure. Pipe leakage likely caused the erosion.



Front view of the site



Closer look of the erosion and the pipe



Closer look of the erosion and the pipe



Closer look of the erosion and the pipe



LMA: **RD0544 U01 Upper Roberts Island**
 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 *WS - Waterside

Length (ft): **200**
 Scarp Height (ft): **4**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of Bend < 90 deg**
 Radius of Curvature(Rc/W): **3.10**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site and with visible roots**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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 visible immediately upstream of the site
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes 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. Rotten tree roots and minor erosion visible immediately upstream of the site



View of the tree root



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.850534 | -121.322285 | 48.81 | 2.01 | U |

I. Site Feature *WS - Waterside

Length (ft): **10**
 Scarp Height (ft): **5**
 Location of Erosion: **Toe & Slope**
 WS Berm Width (ft): **10**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 4 | x1 4 | Normalized Score (out of 100%): 59 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type:
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: Erosion is right at the inside of a river bend. Dense vegetation visible at the site.



Front view of erosion



Front view of erosion



Front view of erosion



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.840697 | -121.318252 | 49.67 | 2.94 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 15 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 5 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 60 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 66 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | Gravel |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/7/2012 |
| Comments: | |

08/07/2012: Erosion is immediately upstream of a river bend. Dense vegetaion is visible at the erosion site.



Front view of the erosion. The pumping machine unlikely the cause of the erosion.



Front view of the site. Note the dense vegetation and rocks immediately upstream of the erosion



Upstream of the site is protected by rocks and broken concrete



Close view of the site



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.81776 | -121.35085 | 32.91 | 2.66 | U |

I. Site Feature *WS - Waterside

Length (ft): **100**
 Scarp Height (ft): **6**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V):
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|-----------|---|
| Length (ft): | 2 | x2 | 4 | Total Score (out of 91): 56 |
| Scarp Height (ft): | 4 | x3 | 12 | |
| Location of Erosion: | 5 | x1 | 5 | |
| WS Berm Width (ft): | 5 | x1 | 5 | Normalized Score (out of 100%): 62 |
| WS Vegetation: | 1 | x2 | 2 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 5 | x3 | 15 | |
| WS Soil Type: | 3 | x4 | 12 | |
| Site Relative to Bend: | 1 | x1 | 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

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 rocks, but the rocks have been washed away.



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



Front view of pocket erosion



close look at the erosion



Front view of pocket erosions



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

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.821763 | -121.347275 | 33.21 | 2.34 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------------|
| Length (ft): | 10 |
| Scarp Height (ft): | 8 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 0.63 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 64 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 70 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 5 | x3 15 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 8/7/2012 |
| Comments: | |

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 a fallen tree near the site



Front view of site



| | |
|-----------|----------------------------|
| LMA: | RD2031 U01 Elliot |
| Waterway: | LB Stanislaus River |
| Site ID: | RD2031U01RM0.48 |
| Status: | Existing Site |

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.70474 | -121.15914 | 0.48 | 0.48 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------------|
| Length (ft): | 150 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 10 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Clay (CL, CH, SC, GC) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 5.90 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 43 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 4 | x1 4 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 47 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 3 | x4 12 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|---|
| Crown Width (ft): | 16 |
| Crown Type: | Earthen |
| Tree Hazard: | Trees on site and with visible roots and leaning |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Slope |
| Survey Date: | 7/18/2012 |
| Comments: | |

07/18/2012: No significant changes observed.
 08/18/2011: No significant changes observed on site. Debris that blocks the irrigation outlet visible.
 10/19/2010: No significant changes 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 downstream of the site. The irrigation outlet operating. Debris at the outlet visible



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



Downstream view of the site.



LMA: **RD2031 U02 Elliot**
 Waterway: **RB San Joaquin River**
 Site ID: **RD2031U02RM78.7**
 Status: **Not Rated**

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.631716 | -121.18937 | 78.70 | 4.35 | |

I. Site Feature *WS - Waterside

Length (ft): **200**
 Scarp Height (ft): **10**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **100**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/18/2012**
 Comments:

07/18/2012: No significant change observed on the site.
 08/18/2011: No significant changes observed on the site. Dead trees and animal activities 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.



From the berm looking downstream.



Close look at the erosion



Close look at the erosion



Close look at the erosion



LMA: **RD2058 U01 Pescadero**
 Waterway: **LB Paradise Cut**
 Site ID: **RD2058U01RM1.78**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.803769 | -121.386341 | 1.78 | 2.15 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|-----------------------------|
| Length (ft): | 20 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | Upper 1/2 Slope |
| WS Berm Width (ft): | 25 |
| WS Vegetation: | No Ground Coverage |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 | 2 |
| Scarp Height (ft): | 2 | x3 | 6 |
| Location of Erosion: | 5 | x1 | 5 |
| WS Berm Width (ft): | 1 | x1 | 1 |
| WS Vegetation: | 3 | x2 | 6 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 1 | x3 | 3 |
| WS Soil Type: | 5 | x4 | 20 |
| Site Relative to Bend: | 1 | x1 | 1 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | Total Score (out of 91): 44 |
| | | | Normalized Score (out of 100%): 48 |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 24 |
| Crown Type: | Gravel |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Berm |
| Survey Date: | 7/26/2012 |
| Comments: | |

07/31/2012: Site was visited on 07/26/2012. No significant change observed. A new vertical pipe was installed and concrete blocks left on the site. Dense vegetation around the site. No signs of new leaks or spill from the siphon breaker.

09/02/2011: Site was not visited due to the time limit.

09/22/2010: No significant changes observed. Vegetation downstream, upstream and on the lower slope of the site have been recently sprayed. These areas were also fenced off during the site visit, making it difficult for us to examine the condition of the lower slope. Possible leak or spill from the siphon breaker is creating notches along the slope and developing into a headward erosion. If the problem continues, it will erode the slope and fully expose the pipe to outside elements.

07/23/2009: A possible leak or spill from a siphon breaker is eroding the slope and developing into a headward erosion; a portion of the buried pipe is exposed; the lower slope seems to be lined with chunks of concrete debris or other rock material.



Close look at the site. Note the concrete blocks and vegetation.



Direct view of siphon breaker.



Direct view of siphon breaker. Recently placed vertical pipe



A close look at the site. Note the concrete debris.



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

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.78981 | -121.35249 | 3.97 | 4.51 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 200 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 10 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 5.20 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 44 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 4 | x1 4 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 48 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|---|
| Crown Width (ft): | 15 |
| Crown Type: | Gravel |
| Tree Hazard: | Trees on site and with visible roots |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 7/26/2012 |
| Comments: | |

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 changes observed. Minor pocket erosions are lined at the lower bank. Two large Oak and Willow trees are on midslope 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 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 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 at a pocket erosion site. Vegetation has developed and covered the erosion.



Direct view at the erosion near a tree



Direct view at the erosion near a tree



Direct view at the erosion near a tree



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

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.80408 | -121.31406 | 54.14 | 0.91 | M |

I. Site Feature *WS - Waterside

Length (ft): **15**
 Scarp Height (ft): **4**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **2.10**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 46 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): 51 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Broken Concrete**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site. 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 changes 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 erosion site



Front view of the rip rap



Downstream view of the erosion site and riprap revetment



Front view of the site



LMA: **RD2062 U02 Stewart**
 Waterway: **RB Paradise Cut**
 Site ID: **RD2062U02RM1.94**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.805422 | -121.383173 | 1.94 | 3.48 | M |

I. Site Feature *WS - Waterside

Length (ft): **500**
 Scarp Height (ft): **1**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **30**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 46 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 1 | x1 1 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 51 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/26/2012**
 Comments:

07/31/2012: Site was visited on 07/26/2012. No significant change observed.
 09/02/2011: No significant changes observed on site from the previous visit.
 09/22/2010: No significant changes observed on site. The foot-high near-vertical scarp still exists on levee toe. There is little to no vegetation on the slope.
 03/09/2010: As discussed with Michael Moncrief of MBK, site will be addressed this year.
 07/27/2009: 1 to 2 feet of near-vertical scarp on levee toe; damage was most likely caused by farming equipment during clearing or tilling operation; this is a maintenance-related issue.



Upstream view of site. Note the vertical scarp at the toe.



Direct view of site.



Downstream view of site.



A close view of site.



LMA: **RD2062 U02 Stewart**
 Waterway: **RB Paradise Cut**
 Site ID: **RD2062U02RM2.14**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.804604 | -121.379454 | 2.14 | 3.27 | M |

I. Site Feature *WS - Waterside

Length (ft): **50**
 Scarp Height (ft): **2**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **30**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 38 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 1 | x1 1 | |
| WS Vegetation: | 3 | x2 6 | Normalized Score (out of 100%): 42 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/26/2012**
 Comments:

07/26/2012: Site was visited on 07/26/2012. No significant changes observed.
 09/02/2011: : No significant changes observed on site from last visit.
 09/22/2010: No significant changes observed on site. The fencing located on the berm was removed. Levee slope and berm area 10 feet from the levee toe are bare of any vegetation. The 1- to 2 feet of near-vertical scarp on the levee toe is unchanged.
 03/09/2010: As discussed with Michael Moncrief of MBK Engineer, the district will address the site this year.
 7/27/2009: 1 to 2 feet of near-vertical scarp on the levee toe; damage was most likely caused by agricultural equipment during clearing or tilling operation; this is a maintenance-related issue.



Downstream view of scarp caused by a maintenance equipment.



Close view of scarp.



downstream view of site.



Upstream view of site.



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM29.93**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.809673 | -121.390321 | 29.93 | 0.02 | U |

I. Site Feature *WS - Waterside

Length (ft): **450**
 Scarp Height (ft): **4**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 60 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 66 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

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 erosion



Front view of the erosion



Upstream view of the erosion



Front view of the erosion. Note the dense vegetation.



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM30.02**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.810052 | -121.388847 | 30.02 | 0.1 | M |

I. Site Feature *WS - Waterside

Length (ft): **40**
 Scarp Height (ft): **3**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 47 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 52 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

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.



close view of the site



Close view of the site



Front view of the site. Note the vegetation



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM30.1**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.810468 | -121.387492 | 30.10 | 0.18 | M |

I. Site Feature *WS - Waterside

Length (ft): **20**
 Scarp Height (ft): **4**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 57 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **No trees on site**
 Bank Protection Type:
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

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. The erosion is vertical



Front view of the erosion



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM30.19**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.810609 | -121.385879 | 30.19 | 0.27 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 475 |
| Scarp Height (ft): | 4 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 2:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Straight Reach |
| Radius of Curvature(Rc/W): | 0.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 5 | x2 10 | Total Score (out of 91): 63 |
| Scarp Height (ft): | 3 | x3 9 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 69 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | Size Riprap |
| Bank Protection Location: | Toe |
| Survey Date: | 8/7/2012 |
| Comments: | |

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site. Dense vegetation visible along the water line.
 09/07/2010: No significant changes 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 site, per CLRO CES Evaluation 2008 Report; previously rated "M".
 11/05/2008: Top of vertical scarp has rip rap that appears to be sliding; rodent holes; existing toe rip rap.



Front view of the 5-ft vertical scarp .



Another view of the same 5-ft scarp.



Front view of the site with dense vegetation.



Front view of the site with dense vegetation



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM30.27**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.811281 | -121.384461 | 30.27 | 0.35 | M |

I. Site Feature *WS - Waterside

Length (ft): **16**
 Scarp Height (ft): **4**
 Location of Erosion: **Levee Toe**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Immediately Downstream of Bend**
 Radius of Curvature(Rc/W): **2.59**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 51 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 56 |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 2 | x1 2 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site**
 Bank Protection Type:
 Bank Protection Location: **Toe**
 Survey Date: **8/7/2012**
 Comments:

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.



Upstream view of the erosion.



Close view of the site



Front view of the erosion.



Front view of the site



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM30.43**
 Status: **Existing Site**

| | | | | |
|-----------------|------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.81307 | -121.3831 | 30.43 | 0.56 | U |

I. Site Feature *WS - Waterside

Length (ft): **30**
 Scarp Height (ft): **4**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **1.90**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 55 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 5 | x1 5 | Normalized Score (out of 100%): 60 |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 4 | x1 4 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Broken Concrete**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes 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: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.81929 | -121.37888 | 31.12 | 1.2 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 30 |
| Scarp Height (ft): | 2 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Outside of Bend < 90 deg |
| Radius of Curvature(Rc/W): | 1.80 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 47 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 52 |
| WS Vegetation: | 0 | x2 0 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 5 | x1 5 | |
| Radius of Curvature(Rc/W): | 4 | x1 4 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Toe |
| Survey Date: | 8/7/2012 |
| Comments: | |

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes 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. Existing scalloped erosion is immediately downstream of rip rap section.



close view of the site



Front view of the site. Note the lateral crack along the middle slope



Front view of the site just above existing rip rap.



LMA: **RD2062 U03 Stewart**
 Waterway: **LB Old River**
 Site ID: **RD2062U03RM31.28**
 Status: **Existing Site**

| | | | | |
|-----------------|------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.82138 | -121.3769 | 31.28 | 1.42 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------|
| Length (ft): | 30 |
| Scarp Height (ft): | 2 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 2.70 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 43 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 47 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

| | |
|---------------------------|---|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | Trees on site and with visible roots and leaning |
| Bank Protection Type: | Broken Concrete |
| Bank Protection Location: | Slope |
| Survey Date: | 8/7/2012 |
| Comments: | |

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site.
 09/07/2010: No significant changes 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.



Close view of the site where a small to medium sized Oak tree is located.



A closer look of the site near the oak 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: **RD2063 U01 Crows Landing**
 Waterway: **RB San Joaquin River**
 Site ID: **RD2063U01RM103.49**
 Status: **Repaired Site**

| | | | | |
|------------------|--------------------|---------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.442305 | -121.022727 | 103.49 | 3.16 | |

I. Site Feature *WS - Waterside

Length (ft): **1000**
 Scarp Height (ft): **25**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **32**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Sand (SP, SM and mixtures)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **3.93**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/24/2012**
 Comments:

07/24/2012: Learned from the district that the upstream erosion has been repaired by placing broken concrete blocks. Visual inspection at the repaired site found no new erosion development. No significant change observed on the site at the downstream section of the repaired erosion site.

10/14/2011. This site was reported on Jan. 18, 2011. The first 100' of erosion appears to be a previous cut with fresh activity. At station 2+00 the district president indicated that 60 - 80' of material eroded. The remainder berm width is at least 32 ft from the levee toe. As the levee is not at risk at this time, the site is not rated, but needs to be closely monitored for possible erosion failure during the upcoming flooding season.



Looking downstream at the erosion



Direct view of the erosion



Closer view of the erosion



Looking downstream at the erosion



LMA: **RD2075 U01 McMullin**
 Waterway: **RB San Joaquin River**
 Site ID: **RD2075U01RM64.34**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.727933 | -121.274491 | 64.34 | 5.34 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|-----------------------------------|
| Length (ft): | 75 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | Toe & Slope |
| WS Berm Width (ft): | 10 |
| WS Vegetation: | 1/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2:1 |
| WS Soil Type: | Sand (SP, SM and mixtures) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 5.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 52 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 4 | x1 4 | Normalized Score (out of 100%): 57 |
| WS Vegetation: | 2 | x2 4 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 4 | x4 16 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 1 | x1 1 | |

III. Misc

| | |
|---------------------------|---|
| Crown Width (ft): | 26 |
| Crown Type: | Paved |
| Tree Hazard: | Trees on site and with visible roots and leaning |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 9/13/2012 |
| Comments: | |

09/13/2012: No significant changes observed on site.
 08/18/2011: No significant changes observed on site. 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 changes observed on site. 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 of the site .



Looking up to the levee crown at the added material.



Looking upstream of the erosion site



Direct look at the levee slope.



LMA: **RD2085 U01 Kasson**
 Waterway: **LB San Joaquin River**
 Site ID: **RD2085U01RM66.5**
 Status: **Existing Site**

| | | | | |
|------------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.703094 | 121.274894 | 66.50 | 2.25 | U |

I. Site Feature *WS - Waterside

Length (ft): **85**
 Scarp Height (ft): **15**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **17**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 2 | x1 2 | Normalized Score (out of 100%): 59 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 0 | x3 0 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

Crown Width (ft): **13**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **12/4/2012**
 Comments:

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 present at the site. Animal burrow holes are visible, and possibly can cause seepage.
 09/22/2010: No significant changes 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.



Looking downstream



Looking upstream



Direct view at the erosion



View from levee top



LMA: **RD2085 U01 Kasson**
 Waterway: **LB San Joaquin River**
 Site ID: **RD2085U01RM67.7**
 Status: **Not Rated**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.688545 | -121.276298 | 67.70 | 3.64 | |

I. Site Feature *WS - Waterside

Length (ft): **670**
 Scarp Height (ft): **17**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **42**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **3:1 or greater**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Outside of Bend < 90 deg**
 Radius of Curvature(Rc/W): **1.04**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|------------------------------------|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | |
| WS Vegetation: | 0 | x2 | 0 | Normalized Score (out of 100%): |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft): **15**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **12/4/2012**
 Comments:

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.



Looking downstream. At the downstream end the erosion occurring at a spur levee.



Looking downstream at the erosion at the spur levee



Direct view of the erosion



Looking downstream standing at the water edge



LMA: **RD2089 U01 Stark**
 Waterway: **RB Old River**
 Site ID: **RD2089U01RM29.61**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.80978 | -121.39623 | 29.61 | 0.66 | U |

I. Site Feature *WS - Waterside

Length (ft): **20**
 Scarp Height (ft): **5**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Outside of bend > 90 deg**
 Radius of Curvature(Rc/W): **2.20**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 57 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 63 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 3 | x1 3 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/7/2012**
 Comments:

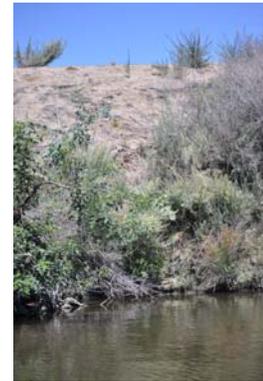
08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: The 5-foot vertical scarp shows no significant change from the last year inspection. No new erosion activities observed. Dense white willow trees on site.
 09/07/2010: It was difficult to view the erosion 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,LM0.60; 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 invisible because of the dense vegetation



LMA: **RD2089 U01 Stark**
 Waterway: **RB Old River**
 Site ID: **RD2089U01RM29.8**
 Status: **Existing Site**

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.809394 | -121.392791 | 29.80 | 0.45 | M |

I. Site Feature *WS - Waterside

Length (ft): **4**
 Scarp Height (ft): **2**
 Location of Erosion: **Upper 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Inside of Bend**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 48 |
| Scarp Height (ft): | 1 | x3 3 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | Normalized Score (out of 100%): 53 |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 5 | x1 5 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

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 certain impact on the levee.



Front view of the site.



Front view of the site



Front view of the site



Front view of the site



LMA: **RD2089 U01 Stark**
 Waterway: **RB Old River**
 Site ID: **RD2089U01RM29.95**
 Status: **Repaired Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.81005 | -121.39026 | 29.95 | 0.3 | |

I. Site Feature *WS - Waterside

Length (ft): **50**
 Scarp Height (ft): **7**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **2/3 of ground covered**
 WS Burrow Hole Activity: **Signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **No trees on site**
 Bank Protection Type: **Size Riprap**
 Bank Protection Location: **Slope**
 Survey Date: **8/7/2012**
 Comments:

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes observed on site.
 09/07/2010: Site appears to have been repaired by placing shot rock along the entire slope as revetment. Seasonal grasses growing over the placed revetment. Emergent vegetation at the lower slope that could possibly be covering the vertical scarp that was previously observed. It is recommended that another inspection be conducted to verify status of site. It was previously rated "U".
 08/06/2010: Recommended as local maintenance issue, per CLRO.
 09/28/2009: Rock revetment placed on the upper slope; however, vertical scarp still exists; site is recommended for annual assessment and monitoring of erosion site, per CLRO CES Evaluation 2008 Report; Site # is the same as RM29.95, LM0.22; previously rated "M".
 11/05/2008: Pocket erosion with vertical scarp; loss of rip rap; mild vegetation growth since previous survey.
 10/20/2006: Site visited on 10/20/2006.



Front view of the site.



Front view of the site.



Front view of the site. Note the vegetation at the site



LMA: **RD2089 U02 Stark**
 Waterway: **RB Old River**
 Site ID: **RD2089U02RM28.35**
 Status: **Existing Site**

| | | | | |
|-----------------|------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.80996 | -121.4132 | 28.35 | 0.42 | U |

I. Site Feature *WS - Waterside

| | |
|----------------------------|---|
| Length (ft): | 60 |
| Scarp Height (ft): | 6 |
| Location of Erosion: | Lower 1/2 Slope |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | Ground surrounding site fully covere |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 2.5:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Inside of Bend |
| Radius of Curvature(Rc/W): | 7.00 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 2 | x2 4 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 59 |
| WS Vegetation: | 0 | x2 0 | |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 1 | x3 3 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 0 | x1 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|---|
| Crown Width (ft): | |
| Crown Type: | |
| Tree Hazard: | Trees on site and with visible roots |
| Bank Protection Type: | Size Riprap |
| Bank Protection Location: | Slope |
| Survey Date: | 8/7/2012 |
| Comments: | |

08/07/2012: The site has been visited by boat survey. No significant change observed
 08/23/2011: No significant changes 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.



Close view of the site



Close look of the site



A closer look of the site



LMA: **RD2092 U01 Dos Rios**
 Waterway: **RB San Joaquin River**
 Site ID: **RD2092U01RM84.6**
 Status: **Repaired Site**

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.58713 | -121.16283 | 84.60 | 1.62 | |

I. Site Feature *WS - Waterside

Length (ft): **750**
 Scarp Height (ft): **2**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **1000**
 WS Vegetation: **No Ground Coverage**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2.5:1**
 WS Soil Type: **Clay (CL, CH, SC, GC)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | | |
|----------------------------|----------|-----------------|----------|---|
| Length (ft): | 0 | x2 | 0 | Total Score (out of 91): 0 |
| Scarp Height (ft): | 0 | x3 | 0 | |
| Location of Erosion: | 0 | x1 | 0 | |
| WS Berm Width (ft): | 0 | x1 | 0 | Normalized Score (out of 100%): |
| WS Vegetation: | 0 | x2 | 0 | |
| WS Burrow Hole Activity: | 0 | x1 | 0 | |
| WS Levee Slope (H:V): | 0 | x3 | 0 | |
| WS Soil Type: | 0 | x4 | 0 | |
| Site Relative to Bend: | 0 | x1 | 0 | |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 | |

III. Misc

Crown Width (ft):
 Crown Type:
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **8/18/2011**
 Comments:

09/26/2012: Site was not surveyed this year due to time constraints. There have been no reports from the levee inspectors or district that this site has new erosion.
 08/18/2011: This site was repaired. No new erosion visible.
 11/30/2010: Site was not surveyed this year due to time constraints. There have been no reports from the district that this site was corrected.
 08/05/2010: Recommended for annual assessment and monitoring during flood events, per CLRO.
 08/25/2009: No major change since last visit; sloughing of the lower slope that's created a terraced effect; damage could be caused by wave action during an extended flooding; site is recommended as local maintenance issue, per CLRO CES Evaluation 2008 Report; previously rated "M".
 08/09/2007: Not as serious - use lower rating.



Upstream view of the site looking from the levee crown.



Upstream view of the site



Downstream view of the site.



Close-in view of the repaired site.



LMA: **RD2095 U01 Paradise Cut**
 Waterway: **LB Paradise Cut**
 Site ID: **RD2095U01RM6.74**
 Status: **Existing Site**

| | | | | |
|-----------------|-----------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.76363 | -121.319 | 6.74 | 0.73 | M |

I. Site Feature *WS - Waterside

Length (ft): **50**
 Scarp Height (ft): **8**
 Location of Erosion: **On berm**
 WS Berm Width (ft): **10**
 WS Vegetation: **1/3 of ground covered**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 50 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 4 | x1 4 | |
| WS Vegetation: | 2 | x2 4 | Normalized Score (out of 100%): 55 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **24**
 Crown Type: **Gravel**
 Tree Hazard: **No trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/18/2012**
 Comments:

07/18/2012: No significant changes observed on site.
 09/02/2011: No significant changes observed on site.
 09/22/2010: No significant changes observed on site. 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 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 RxR crossing, possibly caused by eddy effects.
 03/13/2007: Site visited on 03/13/2007.



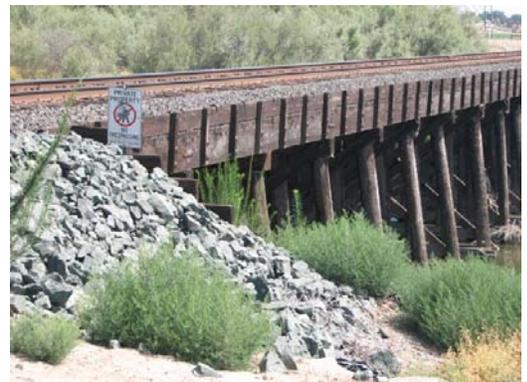
Direct view of the erosion at the downstream of RR bridge.



looking up at the erosion from the lower levee slope



Closer view of the erosion



Upstream side of RR bridge



LMA: **RD2095 U01 Paradise Cut**
 Waterway: **LB Paradise Cut**
 Site ID: **RD2095U01RM6.88**
 Status: **Existing Site**

| | | | | |
|-----------------|-------------------|-------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.76196 | -121.31814 | 6.88 | 0.86 | U |

I. Site Feature *WS - Waterside

Length (ft): **25**
 Scarp Height (ft): **7**
 Location of Erosion: **Lower 1/2 Slope**
 WS Berm Width (ft): **0**
 WS Vegetation: **Ground surrounding site fully covere**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **1.5:1**
 WS Soil Type: **Silt (ML)**
 Site Relative to Bend: **Straight Reach**
 Radius of Curvature(Rc/W): **0.00**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 1 | x2 2 | Total Score (out of 91): 54 |
| Scarp Height (ft): | 4 | x3 12 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | |
| WS Vegetation: | 0 | x2 0 | Normalized Score (out of 100%): 59 |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 3 | x3 9 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 1 | x1 1 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **Broken Concrete**
 Bank Protection Location: **Slope**
 Survey Date: **7/18/2012**
 Comments:

07/18/2012: No significant changes observed.
 09/02/2011: No significant changes observed.
 09/22/2010: No significant changes observed. Sloughing of the existing rip rap possibly due to a combination of steep slope and undesirable flood conditions.
 08/06/2010: Recommended as local maintenance issue, per CLRO.
 07/29/2009: No major change observed since last visit; near-vertical slope that has rip rap sloughing; site is recommended as a local maintenance issue, per CLRO CES Evaluation 2008 Report; Site # is the same as RM6.90, LMO.86; previously rated "U".
 07/22/2008: Previous erosion site that is partially protected with concrete rubble; erosion scarp is adjacent to the sloughing rip rap.
 03/13/2007: Site visited on 03/13/2007.



Direct view of the site



Direct view of the site



Direct view of the site



| | |
|-----------|--------------------------------|
| LMA: | RD2095 U02 Paradise Cut |
| Waterway: | LB San Joaquin River |
| Site ID: | RD2095U02RM60.62 |
| Status: | Existing Site |

| | | | | |
|------------------|--------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.740196 | -121.297662 | 60.62 | 1.78 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------------|
| Length (ft): | 150 |
| Scarp Height (ft): | 10 |
| Location of Erosion: | On berm |
| WS Berm Width (ft): | 25 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | Signs of activity |
| WS Levee Slope (H:V): | 3:1 or greater |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 5.70 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|------------------------------------|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): |
| Scarp Height (ft): | 5 | x3 15 | |
| Location of Erosion: | 1 | x1 1 | |
| WS Berm Width (ft): | 1 | x1 1 | 53 |
| WS Vegetation: | 1 | x2 2 | Normalized Score (out of 100%): |
| WS Burrow Hole Activity: | 5 | x1 5 | |
| WS Levee Slope (H:V): | 0 | x3 0 | 58 |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|-------------------------|
| Crown Width (ft): | 60 |
| Crown Type: | Gravel |
| Tree Hazard: | No trees on site |
| Bank Protection Type: | None |
| Bank Protection Location: | None |
| Survey Date: | 9/13/2012 |
| Comments: | |

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 navigatable waterway.
 08/23/2011: No significant changes observed on the site.
 9/22/2010: No significant changes observed on site. 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



Looking upstream of the site. Note dense vegetation on the berm.



Looking downstream of the site.



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 |

| | | | | |
|-----------------|-------------------|--------------|-------------|-----------------|
| Latitude: | Longitude: | River Mile: | Levee Mile: | Overall Rating: |
| 37.73888 | -121.29826 | 60.69 | 1.87 | M |

I. Site Feature *WS - Waterside

| | |
|----------------------------|------------------------------------|
| Length (ft): | 200 |
| Scarp Height (ft): | 5 |
| Location of Erosion: | Levee Toe |
| WS Berm Width (ft): | 0 |
| WS Vegetation: | 2/3 of ground covered |
| WS Burrow Hole Activity: | No signs of activity |
| WS Levee Slope (H:V): | 2:1 |
| WS Soil Type: | Silt (ML) |
| Site Relative to Bend: | Outside of bend > 90 deg |
| Radius of Curvature(Rc/W): | 5.70 |

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|----------|-----------------|---|
| Length (ft): | 3 | x2 6 | Total Score (out of 91): 53 |
| Scarp Height (ft): | 2 | x3 6 | |
| Location of Erosion: | 5 | x1 5 | |
| WS Berm Width (ft): | 5 | x1 5 | Normalized Score (out of 100%): 58 |
| WS Vegetation: | 1 | x2 2 | |
| WS Burrow Hole Activity: | 0 | x1 0 | |
| WS Levee Slope (H:V): | 2 | x3 6 | |
| WS Soil Type: | 5 | x4 20 | |
| Site Relative to Bend: | 3 | x1 3 | |
| Radius of Curvature(Rc/W): | 0 | x1 0 | |

III. Misc

| | |
|---------------------------|----------------------|
| Crown Width (ft): | 60 |
| Crown Type: | Gravel |
| Tree Hazard: | Trees on site |
| Bank Protection Type: | Size Riprap |
| Bank Protection Location: | Slope |
| Survey Date: | 9/13/2012 |
| Comments: | |

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 navigatable 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. 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 levee profile if left untreated.

10/20/2006: Just upstream of where berm starts to widen.



View from levee slope. The dense vegetation on the site block the view of the erosion



Front view of the erosion.



Direct view of the erosion.



A closer look at the site



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 *WS - Waterside

Length (ft): **500**
 Scarp Height (ft): **17**
 Location of Erosion: **Toe & Beyond**
 WS Berm Width (ft): **0**
 WS Vegetation: **Ground surrounding site fully covere**
 WS Burrow Hole Activity: **No signs of activity**
 WS Levee Slope (H:V): **2:1**
 WS Soil Type: **Sand (SP, SM and mixtures)**
 Site Relative to Bend: **Immediately Downstream of Bend**
 Radius of Curvature(Rc/W): **7.90**

II. Criteria

| | Score: | Weighted Score: | |
|----------------------------|--------|-----------------|-----------|
| Length (ft): | 5 | x2 | 10 |
| Scarp Height (ft): | 5 | x3 | 15 |
| Location of Erosion: | 5 | x1 | 5 |
| WS Berm Width (ft): | 5 | x1 | 5 |
| WS Vegetation: | 0 | x2 | 0 |
| WS Burrow Hole Activity: | 0 | x1 | 0 |
| WS Levee Slope (H:V): | 2 | x3 | 6 |
| WS Soil Type: | 4 | x4 | 16 |
| Site Relative to Bend: | 2 | x1 | 2 |
| Radius of Curvature(Rc/W): | 0 | x1 | 0 |
| | | | 59 |
| | | | 65 |

III. Misc

Crown Width (ft): **16**
 Crown Type: **Earthen**
 Tree Hazard: **Trees on site**
 Bank Protection Type: **None**
 Bank Protection Location: **None**
 Survey Date: **7/18/2012**
 Comments:

07/18/2012: Erosion has further developed toward levee crown. Vegetation has been removed.
 08/18/2011: 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 on the site. Trees visible.
 10/19/2010: No significant changes observed on site. Remaining levee berm topsoil is of silty sand mixture. 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 material.



Looking downstream from levee top. The tree at the water edge is the visible starting point of the erosion.



A close look at the erosion.



Looking downstream at the scour site. It seems the erosion has further developed upward to the levee top since the last survey



Looking downstream at the scour site. The fresh scoring is visible.

