Marysville Ring Levee
Project History and Status

May 2021
Project Location

- Protects approximately 12,700 residents and critical infrastructure (State Highways 20 and 70, major railways)
- Rideout Memorial Hospital
Historical Background

• Marysville had a history of flooding, since the early Gold Rush days, that worsened with impacts from hydraulic mining

• Great floods in the 1860’s resulted in the State legislature forming the Marysville Levee Commission by special act March 6, 1876

• The Levee Commission constructed the “Ring Levee” around Marysville

• The U.S. Government eventually passed the Jackson Act in 1917

• Locally constructed levees were improved to federal standards through the 1950’s as part of the Sacramento River Flood Control Project (SRFCP)

• Project was completed and turned over to the State (Central Valley Flood Protection Board, formerly The Reclamation Board) in 1953
Project Background – “Risk to Life”

- A levee breach in the City results in rapid flooding
- The “risk to life” in Marysville is extremely high:
  - Escape routes become impassable within 1-2 hours
  - Entire City would be inundated within 24 hours
  - Water temperatures below 50 degrees

<table>
<thead>
<tr>
<th>Marysville Gage Temperature Readings (1997 Flood Event)¹</th>
<th>US Coast Guard Cold Water Survival (Temperature of 40 - 50 degrees F)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.2 - 50.7 Degrees Fahrenheit</td>
<td>30 to 60 min.</td>
</tr>
<tr>
<td></td>
<td>1 to 3 hrs.</td>
</tr>
</tbody>
</table>

¹ California Data Exchange Center
Marysville Levee Construction History

- Raised in Stages from 1862-1907
- Fill 1908
- Dredge Tailings
- Earth Fill 1942
- Concrete wall/Earth Fill 1928
- Cobble/Fill 1956
- Raised in Stages from 1862-1907

- 60-ft Sheet Pile Wall @ mile 0.28-0.45
- 60-ft x 8-in Cutoff Wall Near mile 0.45

After 1942 Construction
Earth Fill 1956
1955 Flood

- Near failures in Marysville
- Residents evacuated to Yuba City where a failure at Shanghai Bend resulted in 35 deaths
- New higher floodplain was adopted establishing 5 feet of freeboard over the 1955 water surface (substantially higher than the Olivehurst and Yuba City Levees)
- Improvements were completed in 1962
- MRL Performed well until 1986
1986 Flood

- February 1986, torrential rain drenched northern California
- Widespread damage across the Sacramento Valley, resulting in the Corps of Engineers performing a System Evaluation Study
- The Yuba River levee breached causing flooding to communities in Linda, Olivehurst and Arboga
- The MRL experienced several boils and areas of seepage
Post 1986: U.S. Army Corps of Engineers Work

As a result of the 1986 Event, the U.S. Army Corps of Engineers (USACE) begins two projects:

• **System Evaluation Study and Repairs**
  - Re-evaluation of entire SRFCP to determine if repairs required to meet original project design
  - Project determined portions of MRL required slurry walls
  - Repairs were completed in 1998

• **Yuba River Basin, California Project**
  - Yuba Water requested a Reconnaissance study to determine if a higher level of protection would be justified for Yuba River Basin (RD 784 and MRL)
  - Feasibility study completed in 1998. Congress subsequently authorized improving RD 784 levees to a 200-year level of protection and Marysville to a 300-year level
  - Project authorization in the Water Resources Development Act of 1999 (P.L. 106-53) and re-authorized in 2007 (Public Law 110–114)
  - Yuba Water covered the entire local share of the Feasibility Study
1997 Flood

- New Year’s flood of 1997 occurred while Corps repairs underway and Congress considering approval of needed levee system improvements
- Warm rains on top of significant snow accumulations from cold December storms resulted in significant flows in the Yuba and Feather Rivers, among others
- A levee breach in Arboga resulted in significant flooding to communities of Arboga and Olivehurst
- This flood highlighted the risk associated with seepage in the Central Valley
Post 1997: Flood Risk Reduction Efforts

• After the 1997 Flood the Yuba Water undertook several key flood risk reduction initiatives for the residents of Yuba County:

  • In 2000, Yuba Water became the non-Federal sponsor for the Yuba River Basin California General Re-evaluation Report to re-affirm the 1998 Feasibility study findings after the levee breach

  • In 2002, Yuba Water completed the Yuba-Feather Supplemental Flood Control Project Study to evaluate improvements to provide additional risk reduction to Yuba County

  • Yuba Water partnered with the County, TRLIA, and State to implement advance repairs to RD 784 levees that would be eligible for credit towards future repairs in Marysville once the Corps completed its General Re-evaluation Report
The Marysville Ring Levee Project (MRL)

- As the Corps’ GRR progressed it became apparent that the MRL portion would not require significant design changes resulting from new underseepage criteria

- In 2008, Yuba Water successfully advocated that the MRL be a “separable element” so construction could advance while the GRR continued

- In July 2010, the Corps completed an Engineering Documentation Report, and a 3-Party Project Partnership was signed

- In 2010, the Corps initiated construction of Phase 1
MRL Project Background

- Estimated Total Project Cost: $115 million

- Project Partnership Agreement (PPA) – Marysville Ring Levee:
  - USACE, CVFPB, and Marysville Levee District (MLD)
  - 65% Federal / 35% Non-Federal Cost Share
  - NFS are responsible for costs associated with Lands, Easements, Rights-of-way, Relocations, and Disposal Areas (LERRDS) as well as a minimum 5% cash

- Local Project Partnership Agreement:
  - CVFPB & MLD
  - 70% State / 30% Local Split of Non-Federal Share
Yuba Water Flood Risk Reduction Funding

• Yuba Water was the local sponsor for the Yuba Basin Feasibility Study, took the lead with Yuba County and MLC support to manage the study and provide 100% of the local share of approximately $10 million

• Yuba Water’s effort secured $70 million (of the available $90 million) in the Prop 13 Costa Machado Water Act of 2000 for Yuba-Feather levee improvements

• Prop 13 and future Prop 1E/84 funded the majority of the $450 million TRLIA work on the RD 784 portion of the Yuba Basin Project, which then became the local share credit for the Marysville levee improvements

• Yuba Water and Yuba County funded $46 million for the local share of the Feather and Yuba River levee work in RD 784, including the Feather River Setback levee
  • The Feather River setback levee reduced water surface elevations from 0.9 – 1.6 feet on the Feather, Yuba, and Jack Slough levees around Marysville
Credit for Advance Work - RD 784

- All work completed in RD 784 with state and local funding was preliminarily approved for credit towards future work
- Due to Delays with the GRR, Yuba Water advocated to move forward with approval of a small portion of the potentially eligible credit sufficient to construct the MRL
- Corps completed Post Authorization Change and Integral Determination Reports necessary to support making this credit available
- Amendment 1 to the PPA was executed March 17, 2017
  - Allows up to $42,827,000 in credit for the NFS (State and Marysville)
  - Will cover all project costs except LERRDs and minimum 5% cash
  - This credit will cover approximately 90% of the $12 million local share of the MRL Project
MRL Funding

Federal (65% Share)

- FY 19 President’s budget recommendation to Congress included $35.5 million
- Bipartisan Budget Act of 2018 (Supplemental) funding included $13.5 million
- Additional funding currently being sought through Supplemental and/or Workplan funds

Non-Federal (35% Share)

- 5% Minimum Cash Contribution ($5.75 million paid in 2012)
- $42.827 million in credit available from RD 784 work ($34.5 million estimated need)
- State has adequate funding budgeted through 2022
- (MLD) funding comes from a 2009 Assessment District that includes ~$150,000 per year for improvements. Yuba Water is providing grants and a Line of Credit (~$3 million to date) to help cover Marysville’s share
MRL Design and Construction Status

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 Cut-off Wall Construction (Completed 2014)</td>
<td></td>
</tr>
<tr>
<td>Phase 2A North Cut-off Wall Construction (Completed 2018)</td>
<td></td>
</tr>
<tr>
<td>Phase 2A South Cut-off Wall Construction (Completed 2019)</td>
<td></td>
</tr>
<tr>
<td>Phase 2B Cut-off Wall Construction (2022-2024)</td>
<td></td>
</tr>
<tr>
<td>Phase 2C Cut-off Wall Construction (Completed 2020)</td>
<td></td>
</tr>
<tr>
<td>Phase 3 Cut-off Wall Construction (2020-2022)</td>
<td></td>
</tr>
<tr>
<td>Phase 4A Landslide Berm (Completed 2017)</td>
<td></td>
</tr>
<tr>
<td>Phase 4B Relief Well</td>
<td></td>
</tr>
<tr>
<td>Phase 4B RW &amp; Finger Levee (2023-2024)</td>
<td></td>
</tr>
<tr>
<td>Phase 4C Cut-off Wall Construction (2023-2024)</td>
<td></td>
</tr>
</tbody>
</table>

- **Construction Year**
  - Phase 2A North = 2018
  - Phase 2A South = 2019
  - Phase 2C = 2020
  - Phase 2B = 2022/23
  - Phase 3 = 2020 – 2022
  - Phase 4B and Gaps = 2023/24

- **Segment**
  - Segment A (353+00 to 394+47)
  - Segment B (328+00 to 353+00)
  - Segment C (297+00 to 328+00)
  - Segment D1 (~248+50 to 268+00)
  - Segment D2 (266+00 to 297+00)
  - Segment E (394+10 to 3+00)

- **Additional Features**
  - Phase 4B Cut-off Wall
  - Phase 4C Cut-off Wall
  - Phase 4D Cut-off Wall
  - Phase 4E Cut-off Wall
  - Phase 4F Cut-off Wall
  - Phase 4G Cut-off Wall
  - Segment 1 (247+50 to 264+00)
  - Segment 2 (264+00 to 287+00)
  - Segment 3 (287+00 to 314+00)
  - Segment 4 (314+00 to 353+00)
  - Segment 5 (353+00 to 394+47)

- **Locations**
  - Yuba City
  - Folsom
  - Sacramento
  - San Francisco
  - Los Angeles
Completed Phases

- Phase 1 (Cutoff Wall) – 2014
- Phase 4A (Seepage Berm) – 2017
- Phase 2A North (Cutoff Wall) – 2018
- Phase 2A South (Cutoff Wall) – 2019
- Phase 2C (Cutoff Wall) - 2020
Phase 3 (2020 – 2022)

- Segment A – 2020
  - Delayed due to significant mine tailings

- Segments A, B, & C - 2021/22
  - Underway with path forward to deal with mine tailings, 17th Street Pump Station, and landowner concerns (access)
Phase 2B (2022)

Segment D1
- Between Simpson Lane and UPRR
- Significant PG&E conflicts to be relocated in 2021
- Cutoff Wall

Segment D2
- Between UPRR and Hwy 70
- Historic Tunnels, remove old sand plant
- Levee realignment and cutoff wall
Phase 4B (2023)

- Relief Wells/Cutoff Wall
  - Area between levees along Hwy 70 towards Oroville
  - Originally relief wells, now considering cutoff wall
  - Caltrans widening will relocate east levee
Phase 4C Gap Closures (2023/24)

- UPRR Bridge between Phases 2AS and 2C – Jet Grout
- 5th Street Bridge – likely no work necessary
- Hwy 70 Bridge between Phases 2C and 2B – Jet Grout
- West & North Cutoff Walls
  - Areas previously believed to meet criteria
  - Being re-evaluated and may require additional cutoff walls
## MRL Project Challenges

### UPRR Negotiations
- Phase 4A: Negotiated February 2013-July 2016
- Phase 2A South: Negotiated October 2016-July 2017
- Phase 2C: Negotiated 2017 – 2019
- Phase 2B: Negotiated 2018 – 2019

### Schedule
- Schedule being constrained to execute available federal funding
- Need to acquire real estate and complete significant utility relocations (142 PG&E Poles in Phases 2B and 3)
- Need to complete supplemental environmental documents including tribal coordination
- Re-evaluation of areas previously believed to meet criteria

### Right of Way Challenges Between USACE and UPRR

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule</td>
<td>Schedule being constrained to execute available federal funding</td>
</tr>
<tr>
<td></td>
<td>Need to acquire real estate and complete significant utility relocations (142 PG&amp;E Poles in Phases 2B and 3)</td>
</tr>
<tr>
<td></td>
<td>Need to complete supplemental environmental documents including tribal coordination</td>
</tr>
<tr>
<td></td>
<td>Re-evaluation of areas previously believed to meet criteria</td>
</tr>
</tbody>
</table>
FEMA Mapping in Marysville

- FEMA remapping requires homeowners with federally backed mortgages to buy insurance and imposes strict building requirements for new construction or improvements to existing structures
  - New construction or improvements to existing structures would be required to elevate above the base flood elevation or flood proof the structure according to FEMA standards
  - Insurance rates are increased to the new “actuarial” rates which would likely be in excess of $3,000 per home in Marysville
- Marysville accepted a Provisionally Accredited Levee (PAL) agreement on June 12, 2008 which allowed 2 years to evaluate and certify levees to the base flood (100-year)
- In January 2011 the City received a letter notifying them that accreditation information had not been received and the remapping process would be initiated
- FEMA has not begun the remapping process for Marysville
State of California Legislation

• In 2007, the California Legislature passed six interrelated bills to:
  • Reduce the risk of flooding
  • Reduce the consequences when flooding does occur

• SB5 contains the provisions most relevant to the *Urban Level of Flood Protection Criteria (ULOP)*
  • Requires cities and counties within the Sacramento-San Joaquin Valley to make findings related to an urban level of flood protection before:
    • entering a development agreement for property located within flood hazard zone;
    • approving a discretionary permit or other discretionary entitlement, or a ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or
    • approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone

• Several amendments: ABs 1165 (2009), 1965 (2012); SBs 1070 (2010), 1278 (2012)
ULOP Requirements and Criteria

• General plans must be amended by no later than July 2, 2015, and
• Zoning ordinances must be amended within 12 months after completion of the general plans amendments, or by July 2, 2016
• Criteria were published in November 2013 that present a minimum set of criteria that DWR deems reasonable and necessary for supporting a ULOP finding
• ULOP Findings:
  1. Flood management facilities provide 200-year level of protection
  2. The city or county has imposed conditions on a development action that are sufficient to provide 200-year level of protection;
  3. The local flood management agency is making adequate progress on construction/improvement of flood facilities to provide 200-year level of protection by 2025; or
  4. For property in areas without a finding of 200-year protection, the property meets the 200-year level of protection
City of Marysville Activities to Address ULOP

• With Yuba Water’s funding support, the City completed the following activities:
  
  • An Engineer’s Report documenting the data and analyses supporting a 200-year level of protection, and other information relied on to support supporting the findings (Completed $58,000)
  
  • A report by an independent panel of experts on the review of the engineer’s report (Completed $15,000)
  
  • A response by the engineer to the review by the independent panel of experts (Completed)
  
  • A report prepared by the local flood management agency demonstrating adequate progress (Completed – funded with ER)

*All City efforts were funded by a $73,000 grant from Yuba Water
Next Steps

• Make Adequate Progress Findings (Completed 2018)

• Initiate effort to perform a gap analysis for levee certification ($200,000 grant from Yuba Water – report is underway and should be completed Summer 2021)

• Once Corps improvements are completed:
  • FEMA 100-year Accreditation ($150,000 +, depending on data gaps and whether additional structural actions are required)
  • ULOP 200-year Certification ($500,000 +, depending on data gaps and whether additional structural actions are required)
Questions

Presented by: Thomas Engler, P.E., CFM
Principal
MBK Engineers
engler@mbkengineering.com