Water Management
Technical Feedback Meeting

August 20, 2010
Fresno, CA

Agenda Overview

• Comments on Meeting Notes
• MC/FKC Capacity Restoration / Reverse Flow Feasibility Studies
• Restoration Flow Guidelines
• Interim Flow Release Summary
• Recapture/Recirculation
• Next Meeting Date
• Public Comment
Comments on Meeting Notes

Friant-Kern & Madera Canals
Capacity Restoration Project
&
Friant-Kern Canal Reverse Flow
Pump-Back Facilities Project
Since Last Meeting

- Bi-Weekly Coordination Meetings
- Technical Meetings w/Authorities
- Completed “Full-Fix” Designs for Projects
- Completed Operations Modeling for Projects
- Completed Preliminary Benefits Modeling for CapRest
- Developed “Optimization” Model for CapRest
- Completed Cost Estimate for Reverse Pump

Friant-Kern & Madera Canals Capacity Restoration Project
Outline

- Operations Results
- FKC & MC Designs
- Next Steps

Operations

Screen #1: Basin Wetness

Screen #2: Conveyance Capacity

Screen #3: Delivery Capacity
**Conveyance Capacity**

- Exceeding Current & Restored Capacity
- Deliverable within Restored Capacity
- Deliverable within Current Capacity
- Contract Deliveries

*1995 Diversions/Supplies – Used for illustrative purposes only.

**Delivery Capacity (Demand)**

- **Scenario 1: Anticipated Demand**

- **Scenario 2: Plus Part-III Opportunities**
  - Taken from Friant Survey of Opportunities for SJRRP
    - 810 cfs in direct recharge facilities
    - 1,705 cfs in in-lieu projects

- **Scenario 3: No Basin Wetness Screen**
Results

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Annual Increase (acre-feet)</td>
<td>6,000</td>
<td>6,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Maximum Annual Increase (acre-feet)</td>
<td>56,000</td>
<td>65,000</td>
<td>113,000</td>
</tr>
<tr>
<td>Delivery of RWA credits</td>
<td>3-8%</td>
<td>3-8%</td>
<td>5-12%</td>
</tr>
</tbody>
</table>

FKC & MC Designs

- Section 10201 of P.L. 111-11 authorizes the Secretary to conduct a feasibility study on the:

  “Restoration of the capacity of the Friant-Kern Canal and Madera Canal to such capacity as previously designed and constructed by the Bureau of Reclamation.”
### FKC – Maximum Capacity

<table>
<thead>
<tr>
<th>Friant-Kern Canal</th>
<th>HEC-RAS Current Maximum Capacity (cfs)</th>
<th>Designed Maximum Capacity (cfs) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>Mileposts</td>
</tr>
<tr>
<td>Friant Dam</td>
<td>Kings River Check</td>
<td>0 to 28.52</td>
</tr>
<tr>
<td>Kings River Check</td>
<td>Kaweah River Check</td>
<td>28.52 to 71.29</td>
</tr>
<tr>
<td>Kaweah River Check</td>
<td>Tule River Check</td>
<td>71.37 to 95.67</td>
</tr>
<tr>
<td>Tule River Check</td>
<td>White River Check</td>
<td>95.80 to 112.90</td>
</tr>
<tr>
<td>White River Check</td>
<td>Poso Creek Check</td>
<td>112.96 to 130.05</td>
</tr>
<tr>
<td>Poso Creek Check</td>
<td>Kern River Check</td>
<td>130.12 to 151.60</td>
</tr>
</tbody>
</table>

* Based on Reclamation’s original design drawings, dated Dec. 1937 to Mar. 1950.

### MC – Maximum Capacity

<table>
<thead>
<tr>
<th>Madera Canal</th>
<th>HEC-RAS - Current Simulated Maximum Canal Capacity (cfs)</th>
<th>1985 Maximum Capacity (cfs) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>Mileposts</td>
</tr>
<tr>
<td>Friant Dam</td>
<td>Turnout and Check</td>
<td>0.0 to 6.1</td>
</tr>
<tr>
<td>Turnout and Check</td>
<td>Concrete Drop Structure</td>
<td>6.1 to 19.31</td>
</tr>
<tr>
<td>Concrete Drop Structure</td>
<td>Dry Creek Siphon</td>
<td>21.4 to 24.1</td>
</tr>
<tr>
<td>Dry Creek Siphon</td>
<td>End of Canal</td>
<td>24.1 to 35.69</td>
</tr>
</tbody>
</table>

* Based on maximum capacity from 1985 work statement.
Results

<table>
<thead>
<tr>
<th>Deficient Mileage</th>
<th>FKC</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>119</td>
<td>18</td>
</tr>
</tbody>
</table>

- Normalized “n-values”
- Applies current Reclamation standards

Next Steps

- Working w/Authorities to reformulate Feasibility Study
- Developed “Optimization” Model
  - Water Benefit
  - Construction Cost
  - Value of Water ($100 to $200)
Friant-Kern Canal Reverse Flow Pump-Back Facilities Project

Outline

• Operations Results
• Feasibility Cost Estimate
• Next Steps
Operations

Delta Pumping before Restoration

\[ \text{Delta Pumping after Restoration} \]

\[ \text{Difference in Delta Pumping} \]

Note: Values shown for contract year 1932.

Delivery Priority

1. Class 1 & 2
2. Store in San Luis Reservoir
3. Increased Deliveries
4. “Surplus”
Delivery Priority

• Deliveries are made in this order:
  1. CA to Arvin Edison Water Storage District (AEWSD)
  2. CVC to AEWSD
  3. CVC to SWID
  4. CVC to South San Joaquin Municipal Utility District (SSJMU)
  5. CVC to SSJMU and Delano-Earlimart ID (DEID)

<table>
<thead>
<tr>
<th></th>
<th>Existing (cfs)</th>
<th>Legislated (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVC to FKC (Kern check)</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Shafter-Wasco (1st pump-back)</td>
<td>80</td>
<td>500</td>
</tr>
<tr>
<td>Poso Creek (2nd pump-back)</td>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td>Reservoir Check (3rd pump-back)</td>
<td>0</td>
<td>300</td>
</tr>
</tbody>
</table>

Key:
CVC = Cross Valley Canal
cfs = cubic feet per second
FKC = Friant-Kern Canal
### Pump-Back Results

<table>
<thead>
<tr>
<th></th>
<th>w/ Existing Facilities (TAF)</th>
<th>w/ Legislated Facilities (TAF)</th>
<th>Difference (TAF)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Average Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available</td>
<td>58.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friant Dam Supply Offset</td>
<td>36.0</td>
<td>42.0</td>
<td><strong>6.0</strong></td>
</tr>
<tr>
<td>Class 1</td>
<td>11.5</td>
<td>14.1</td>
<td><strong>2.6</strong></td>
</tr>
<tr>
<td>Class 2</td>
<td>24.5</td>
<td>27.9</td>
<td><strong>3.4</strong></td>
</tr>
<tr>
<td>Increased Deliveries</td>
<td>11.6</td>
<td>10.2</td>
<td><strong>-1.4</strong></td>
</tr>
<tr>
<td>Surplus Water</td>
<td>10.7</td>
<td>6.2</td>
<td><strong>-4.5</strong></td>
</tr>
</tbody>
</table>

*Note: Period of Record: March 1922 – February 2002.

### Reverse Pump Project

- Section 10201 of P.L. 111-11 authorizes the Secretary to conduct a feasibility study on the:

  “Reverse flow pump-back facilities on the Friant-Kern Canal, with reverse-flow capacity of approximately 500 cubic feet per second at the Poso and Shafter Check Structures and approximately 300 cubic feet per second at the Woollomes Check Structure.”
Reverse Pump Project

- Section 10203 of P.L. 111-11 states:

  “… in an amount not to exceed $17,000,000, provided that the Secretary first determines that such expenditure will not conflict with or delay his implementation of actions required by part I of this subtitle.”

Feasibility Cost Estimate

<table>
<thead>
<tr>
<th>Shafter</th>
<th>Poso Creek</th>
<th>Woollomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20 Million</td>
<td>$18.5 million</td>
<td>$13 million</td>
</tr>
</tbody>
</table>

- Size of Pumps
- Number of Pumps (6)
- 3 years for construction
Shafter Utilization*

*Based on current operational assumptions

Poso Creek Utilization*

*Based on current operational assumptions
Woollomes Utilization*

Lake Woollomes Check

Pump Capacity - 300 cfs

*Based on current operational assumptions

Next Steps

• Working w/Authorities to reformulate Feasibility Study
  – Delivery priority
  – Pump size & configuration
Restoration Flow Guidelines

RFG: Recent and Planned Coordination

- July 20th  Discussion of Restoration Flow Guidelines
- Aug 5th    Small group discussion of RWA Methods
- Aug 31st   Draft 2 of Restoration Flow Guidelines
RWA Proposal

- Consistent understanding of model inputs
- Consistent understanding of model outputs
- Continuing review of treatment of storage

Gravelly Ford Flow Targets

- Reclamation will estimate adjusted releases by comparing average flow rates and dividing by the number of days remaining in the time period.
- Reclamation will increase releases from Friant Dam if:
  - 1. Average flow rates are less than 10% of target flow rates;
  - 2. Changes in Friant Dam releases would exceed 25 cfs.
- Reclamation will decrease releases from Friant Dam if:
  - 1. Mean daily releases from Friant Dam would remain greater than or equal to 350 cfs.
  - 2. Average flow rates are more than 10% above target average flow rates;
  - 3. Changes in Friant Dam releases would exceed 25 cfs.
- Reclamation will resume the planned release schedule from Friant Dam when average mean daily flow rates equal target average flow rates.
Recapture / Recirculation

Recapture Volume

- Recapture = San Mateo - 5% - Sack Dam
- Additional adjustment for estimated vs. actual Sack Dam flows
- Total recapture is 42,551 af
- EA’s completed
- Agreements signed
Next Meeting

Agenda for Next Meeting

- Date & Time:
  - October 8, 2010
- Tentative Agenda:
  - MC/FKC Feasibility Studies
  - Restoration Flow Guidelines
Public Comment