Agenda

1. Reach 2B Project Background
2. Project Update
3. Technical Challenges
Reach 2B Project Background

Project Background
**Project Background**

### Existing Conditions

1. **Project Extents (Phase 1)**
   - Upstream Chowchilla Bifurcation Structure
   - D’stream Bypass Connection

2. **Ex. Structures**
   - Chowchilla Bifurcation
   - San Mateo Crossing
   - Mendota Dam
   - Water Supply Infrastructure

3. **Ex. Conditions**
   - Limited capacity (1,300 cfs – 2,500 cfs)
   - Primarily dry upstream
   - Pool backup to San Mateo Ave.
   - Shallow Groundwater

4. **Settlement Requirements**
   - Channel/Floodplain capacity of at least 4,500 cfs
   - Pool Bypass
   - Floodplain & related riparian habitat

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### Project Overview/Process

1. **Scoping**
2. **Alternatives Formulation**
3. **Environmental Impact Statement/Report**
4. **Detailed Design**
5. **Permitting**
6. **Land Acquisition**
7. **Construction Procurement**
8. **Construction**
Project Background
Alternatives Formulation

1. Final Scoping Report 2/28/10
3. Initial Options TM 4/2/10
4. Analytical Tools TM 10/15/10
5. 2010 Field Survey – Landowner Summaries 1/6/11
6. Final Field Survey Report 11/30/11
7. Project Description TM ongoing
Project Update

Summary of Alternatives

Bypass Alternatives

Floodplain Alternatives
Project Update
Summary of Floodplain Alternatives

Revegetation Approach:
1. Low End Option: Remove invasives
2. High End Option: Full revegetation & irrigation
### Project Update

**Summary of Bypass Alternatives**

1. **Bypass Channel**
   - Low flow channel
   - Bankfull channel
   - Drop structures

2. **Extension Levees**
   - FP-1
   - FP-5
   - Levee removal

3. **Bifurcation Structure**
   - Bypass control structure with fish ladder
   - Pool control structure with fish screen

4. **Major Infrastructure Relocations**
   - Columbia Canal extension and siphon
   - Road 10 1/2

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### Project Update

**Summary of Bypass Alternatives**

1. **Fresno Slough Dam**
2. **Bypass Canal (Short)**
   - Pool control structure with fish screen

3. **Extension Levees**
   - FP-1
   - FP-5
   - Levee removal

4. **Mendota Dam Fish Passage**
   - Fish ladder
   - Drop structures

5. **Major Infrastructure Relocations**
   - Columbia Canal extension and siphon
   - Main Canal & Helm Ditch
Project Update

Upcoming Milestones

• Working on the Project Description for the Project EIS/R (Final Alternatives)
  – Revisions based on agency comments, TAC feedback, and recent technical analyses
  – Technical Memorandum available late Summer 2012
• Initiated Project EIS/R
  – Environmental settings written
  – Impacts analyses start Summer 2012
  – Draft Public document available Spring 2013
  – Final EIS/R available early 2014
  – ROD summer 2014
• Preliminary design underway
• Anticipated Future Milestones:
  – Property Acquisition Process beginning summer 2014
  – Construction beginning early 2016

Technical Challenges
Technical Challenges

- Grade control and sediment continuity
  - Removal of Mendota Dam
  - Grade control in the bypass
- Fish passage
  - Frequency and duration
  - Fish rock ramp concept design
- Borrow area assessment and testing
- Other Misc. Challenges (not covered today)
  - Fresno Slough Dam backwater condition
  - Alternate water delivery canals
  - Infrastructure relocation

Technical Challenges

Grade Control - Removal of Mendota Dam

- Objective:
  - To remove existing structure and need for fish passage improvements at the structure
  - To allow channel adjustment and provide sediment to R3
- Concept Features:
  - Remove Mendota Dam
  - Potentially excavate Pool sediments
  - New fish ladder at San Mateo
Technical Challenges
Grade Control - Removal of Mendota Dam

• Benefits
  – Would eliminate need for a fish passage structure at former dam location
  – Potential seepage projects due to lowered water surface elevation
  – Proposed levees between Mendota Dam and San Mateo Ave could be lower

• Impacts:
  – Would require new fish ladder at San Mateo crossing
  – Would eliminate all floodplain (vegetation and fish habitat) downstream of San Mateo crossing
  – Would require significant excavation and associated cost
  – Potential WQ and channel stability issues, which may result in the need for extensive channel erosion protection (vegetated riprap)

** Similar benefits and impacts at Compact Bypass **

Technical Challenges
Fish Passage – Frequency and Duration

• Objective:
  – To understand the timing and duration of passage windows at the various proposed structures
  – To understand which species would be able to pass the proposed structures

• Proposed Structures:
  – Chowchilla Bifurcation Structure
  – Bypass Canal Bifurcation Structure
  – San Mateo Avenue crossing
  – Compact Bypass Bifurcation Structure
  – Mendota Dam
Technical Challenges
Fish Passage – Frequency and Duration

• Analyses incorporated:
  – Historic flow records for example wet, normal wet, normal dry, and dry years
  – Flow restrictions in R2B due to Kings River floods
  – Fish swimming abilities versus hydraulic depth and velocities at structures

Technical Challenges
Fish Ladder Modifications

• Objective
  – To understand the limitations of a vertical slot ladder to pass fish under all hydraulic conditions

• Concept:
  – Modify existing ladder design to pass adult and juvenile salmonids and, when possible, other native fish.
Technical Challenges
Fish Passage – Rock Ramp Concept

• Objective:
  – To develop a structure capable of passing sturgeon and other native fish as well as salmonids

• Concept features:
  – 2-stage channel to provide adequate depth for sturgeon and low velocities for juvenile salmon
  – Multiple gates to accommodate variable hydraulic head

• Benefits:
  – Provides passage for adult and juvenile salmonids, sturgeon, and other native fish
  – Capable of operating under a wide range of hydraulic headwater and tailwater conditions
  – No need for supplemental flow
  – Can operate during gate operations (also applies to vertical slot ladder)

• Impacts:
  – Extremely long passage structure (1,000+ feet)
  – Higher cost
Technical Challenges
Soil Borrow Material

- **Objective**
  - Identify opportunities for borrow within and outside the project area.

- **Concept**
  - The overall project will need about 1.7M CY of fill
  - The following opportunities were investigated:
    - Excavation from within the project (~1.6M CY)
    - Removal of portions of existing levees (<1M CY)
    - Grading of high ground within the floodplain to further enhance floodplain connectivity (~1.5M CY)
    - Deep borrow pits areas within the project area that could be backfilled with spoil (~2.4M CY)
    - Mendota Pool excavation (<0.5M CY if an option)
    - Borrow from outside sources (~1M+ CY)

Questions?
Objective:
- Hydraulic analyses of Fresno Slough Dam and effects on water surface elevations

Concept:
- Modify dam design so upstream effects are negligible
Technical Challenges
Mendota Pool – Water Delivery Canals

• Objective:
  – To include sufficient reasonable routes for canals in the environmental documentation

• Concept:
  – Include alternate routes suggested by landowners and others
  – Conduct prelim. feasibility assessment