Seepage and Conveyance Technical Feedback Group

March 23, 2011

11704 W. Henry Miller Ave.
Dos Palos, CA
Agenda

• Introductions and Technical Feedback Group (TFG) Purpose
• Review updated Charter
• Action Item Review and Update
• 2011 Interim Flows
• Seepage Management Plan Comments
• Seepage Project Locations
• Seepage Project Challenges
• Information & Data Exchange
• Next Steps
TECHNICAL FEEDBACK GROUP
PURPOSE AND CHARTER
Technical Feedback Group Purpose

• Provide a constructive forum to improve the information exchange, knowledge, and understanding
  – Among agencies, water districts, landowners, and Settling Parties
  – Regarding Interim and Restoration flows, conveyance, and seepage issues

• Development of prioritized list of seepage avoidance projects
TFG Objectives

• Convey Interim and Restoration Flows while avoiding seepage impacts
• Identify locations for projects with potential for seepage impacts
• Identify potential projects that would avoid seepage impacts
• Set evaluation criteria for projects
• Develop a common understanding of the process, procedures and expectations for projects
Process & Decision-making

• Monthly Meetings
  • Focused on Seepage Project Handbook and identifying projects to avoid seepage impacts

• Additional topics and meetings identified and considered as we proceed
  • Update Charter in September 2011

• Reclamation and its partner agencies retain decision authority for Program implementation
<table>
<thead>
<tr>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
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</thead>
<tbody>
<tr>
<td>SMP</td>
<td>Projects Intro</td>
<td>Site Evaluation</td>
<td>Plan Formulation</td>
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<tr>
<td>Monitoring</td>
<td>Introduction</td>
<td>Data Collection</td>
<td>Project Types</td>
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<td>Thresholds</td>
<td>Background</td>
<td>Investigations</td>
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<td>Operations</td>
<td>Purpose</td>
<td>Groundwater</td>
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<td>Coordination</td>
<td>Potential Projects</td>
<td>Soil Salinity</td>
<td>Selection Criteria</td>
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<td>Conductivity</td>
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<td>Water Quality</td>
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<td>June</td>
<td>July</td>
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<td><strong>Design Data</strong></td>
<td><strong>Design &amp; Environmental Compliance</strong></td>
<td><strong>Construction</strong></td>
<td><strong>Financial Assistance</strong></td>
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<td>Groundwater</td>
<td>Deliverables</td>
<td>Farming Operations</td>
<td>Landowner Agreement</td>
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<td>Soil Salinity</td>
<td>Cost Estimating</td>
<td>Operations</td>
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<td>Infrastructure</td>
<td>Specifications</td>
<td>Conservation</td>
<td>SF 424</td>
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<td>Irrigation</td>
<td>ESA</td>
<td>Strategy</td>
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<tr>
<td>Crops</td>
<td>Section 106</td>
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**Discussion Topics**

- June: Design Data - Groundwater, Soil Salinity, Infrastructure, Irrigation, Crops
- July: Design & Environmental Compliance - Deliverables, Cost Estimating, Specifications, ESA, Section 106
- August: Construction - Farming Operations, Conservation Strategy
- Sept: Financial Assistance - Landowner Agreement, SF 424
Milestones for Handbook Preparation

Feb
- 2/18 Draft SMP
- 3/11 Projects Purpose

Mar
- 3/18 Projects Purpose
- 3/25 2011 SMP
- 3/11

Apr
- 4/14 Site Evaluation
- 4/14
- 5/12 Plan Formulation
- 5/12

May
- 5/12
- 6/3 Data Collection
- 6/3

Symbols:
- ● Draft SMP
- ▲ Projects Purpose
- ● Site Evaluation
- ▲ Plan Formulation
- ● TFG Meeting
- ▲ Agency Deliverable
- ▲ Stakeholder Comments
Milestones for Handbook Preparation

June
- 6/3 Design Data Collection

July
- 7/1 Design & Environmental Compliance
- 7/1 Design Data Collection

Aug
- 8/5 Construction
- 8/5 Design & Environmental Compliance
- 9/2 Financial Assistance

Sept
- 9/30 Financial Assistance
- 9/2 TFG Meeting
- 9/2 Agency Deliverable
- 9/2 Stakeholder Comments
Review and Update

ACTION-ITEMS
## Recently Closed Action Items

- Added MW-10 74/5 as a priority well
- Completed a site visit in Reach 3; two new wells will be added
- Added data and flow rate to profile graphs
- Stephen Lee activated the voicemail for his cell phone.
- Looked at alternate well siting options near Sack Dam
- Updated CCID well elevations and incorporated them into the SMP and Well Atlas
- Email notification will be sent to water districts and landowners when the final SMP is available
## Open Action Items

<table>
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<tr>
<th>Open Action Items</th>
<th>ID’ed</th>
<th>Due</th>
<th>Assigned to:</th>
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<tbody>
<tr>
<td>1. Develop operating plan to incorporate impact of soil temperature on thresholds</td>
<td>12/17/10</td>
<td>TBD</td>
<td>Green</td>
<td>Need revised due date from Sarge</td>
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<td>2. Provide the raw data/report from hand auger field work on the capillary fringe.</td>
<td>1/14/11</td>
<td>Late March</td>
<td>Burnett</td>
<td>Contractor back under contract. Anticipate meeting deadline.</td>
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<td>3. Work Plan for additional tensiometer work to develop more data on capillary fringe.</td>
<td>1/14/11</td>
<td>February 2011</td>
<td>Lee &amp; Green</td>
<td>Need updated due date from Sarge.</td>
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<td>4. Provide Monty and Chris with the excel files that the graphs are based on</td>
<td>2/10/11</td>
<td>3/10/11</td>
<td>Harrison</td>
<td>Pending</td>
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<td>5. Add river mile station to river profile to link wells to locations</td>
<td>2/10/11</td>
<td>3/10/11</td>
<td>Harrison</td>
<td>Pending</td>
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<td>6. Explore partnering on the cultural resources survey to expand the scope to go out beyond the levee to collect information that would help evaluate projects</td>
<td>2/10/11</td>
<td>3/10/11</td>
<td>Forsythe &amp; White</td>
<td>Discussions underway with DWR.</td>
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<td>7. Identify the Reclamation budget category for seepage avoidance projects and how much is budgeted</td>
<td>2/22/11</td>
<td>3/15/11</td>
<td>Mooney, Forsyte</td>
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Current Status

FRIANT

Flow (cfs)

1/1/2011
1/5/2011
1/9/2011
1/13/2011
1/17/2011
1/21/2011
1/25/2011
1/29/2011
2/2/2011
2/6/2011
2/10/2011
2/14/2011
2/18/2011
2/22/2011
3/2/2011
3/6/2011
3/10/2011
3/14/2011
3/18/2011
3/22/2011
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<th>Recommended Friant Dam Release Necessary to Achieve Gravelly Ford Target Flows (cfs)</th>
<th>Exhibit B Riparian Release (cfs)</th>
<th>Gravelly Ford Flow Target (cfs)</th>
<th>Gravelly Ford Flow Allocation (cfs)</th>
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Real-time Management for Temperature

Predicted Daily Average Water Temperatures at Management Target Locations for March 14 Interim Flow Check-in

- Predicted P<0.05 Temperature at end of Reach 1A
- Predicted P<0.05 Temperature at end of Reach 1A
- Spawning and Egg Incubation (<1°C) at end of Reach 1A
- Predicted P<0.05 Temperature at Slaggs Bridge
- Predicted P<0.05 Temperature at Slaggs Bridge
- Juvenile Smoltification (<12°C) at Slaggs Bridge (middle of Reach 1B)
- Predicted P<0.05 Temperature at end of Reach 2B
- Predicted P<0.05 Temperature at end of Reach 2B
- Juvenile & Adult Migration (<20°C) at end of Reach 2B
- Juvenile & Adult Migration (3-day ave <15°C) at end of Reach 2B
- Governing Release, actual releases or RA Recommendations (cfs)

Friant Capped Allocation (TAF): 404.2
Friant Flow Release Used & Rec’d (TAF): 395.995
Balance: 8.349 TAF
FLOOD OPERATIONS
Flood Operations & SJRRP

• SJRRP and Flood Flows Overlap
  – SJRRP – Reclamation
  – Flood – Army Corps

• Trade-offs
  – High Magnitude – Short Duration
  – Lower Magnitude – Long Duration

• SJRRP Provides some Operational Flexibility
Frequency – Friant Release
Comparison to Restoration Flows

- 1998
- 2005
- 2010
- Restoration

Flow (cfs)
Comments on the Draft SMP

• Site Visit Process
• Response Time & Process
• Priority Wells
• Hand Auguring
• Historic Groundwater Levels
• Landowner Claims
Historical Groundwater Method

Wells having long-term groundwater levels:

– Using spring measurements from 1983-2009, removed the highest 31% of values, and set threshold at highest remaining value

– 31% represents the number of wet years during that period

This method removes the influence of high water levels during very wet years
Historical Groundwater Method

191, GS elevation 108.8

GW ELEVATION, in feet

CCID 191

Spring WLs

Threshold (99.7 ft)
SMP Revisions

• Living Document
• Continue to be revised as additional information gathered
• Peer review panel
SEEPAGE PROJECT LOCATIONS
Elements of the Seepage Project Handbook

- Introduction ➔ Today
- Site Evaluation
- Plan Formulation
- Data Collection
- Design
- Environmental Compliance
- Construction
- Financial Assistance
Development of Risk Locations

• Sources
  – Landowner Identified Parcels
  – USGS Historical Groundwater Maps
  – Elevation Analysis
    • Model
    • Survey

• Seepage Risk Depends on Flow
  – ~1500 cfs Interim Flows
  – ~4500 cfs Restoration Flows
Locations of Identified Risks

Legend

- Soil Salinity Sites
- SJRRP Wells
- CCID Well
- Obanion Ranch - CCID
- San Juan Ranch - NFF
- Sierra Ave - CCID
- Flow Gage
- Stage Recorder

Canals

Landowner ID Parcels Updated 20110321
SCTF Identified Seepage Parcels
RMC Identified Impacted Parcels

Reach 2B
Historical Groundwater

Preliminary, Interpolated Depth to Water, Fall 1988 (Dry Normal Precipitation Year)

Explanation
- Water-level well
- SJRRP reach

Depth-to-water intervals
- 0 - 10 ft
- 10 - 20 ft
- 20 - 35 ft
- 35 - 50 ft
- 50 - 75 ft
- 75 - 100 ft
- 100 - 150 ft
- 150 - 200 ft
- 200 - 300 ft
Elevation Analysis – Reach 2A

• 2008 LiDAR Elevations
• Hydraulic model results at 1500 cfs local flow
• Hydraulic model results at 4500 cfs local flow
Elevation Analysis – Reach 2A

4500 cfs
Assumes no groundwater gradient
Elevation Analysis – Reach 3

- Reach 3 Terrain Model - combination of 2009 bathymetry and 2008 LiDAR
- Hydraulic model results at 1500 cfs local flow
- Hydraulic model results at 4500 cfs local flow
- January 2011 surveyed water surface elevation at approximately 1880 cfs local flow
Elevation Analysis – Reach 3

1880 cfs
Assumes no groundwater gradient
Elevation Analysis – Reach 4A

- 2008 LiDAR Elevations
- Hydraulic model results at 1500 cfs local flow
- Hydraulic model results at 4500 cfs local flow
Elevation Analysis – Reach 4A

1500 cfs
Assumes no groundwater gradient
SEEPAGE PROJECT BRAINSTORMING
Seepage Avoidance Approach

• Hold flows below level of impacts
• Implement project to allow increased flows
Considerations

- Design/Feasibility
- Suitability to Site Conditions
- Landowner Acceptability
- Cost
- Environmental Compliance
- Project Agreement
- Federal Contracting Process
Project Types Discussion

• Real Estate Actions
  – Easements
  – Acquisition

• Physical Projects
  – Tile drains
  – Slurry walls
  – Drainage ditches
  – Shallow well pumping
  – Conveyance improvements

• What other types do you see?
Projects Next Steps

• Next Steps for Projects
  – Identify evaluation process for different project types
  – Determine how to select a project type
  – Begin working through challenges
SEEPAGE PROJECT
CHALLENGES

Ali Forsythe
Discussion of Challenges

- Ownership
- Operations and Maintenance
- Water Discharge
- Water Rights
- Long-term Monitoring
- Cost-share
- Terms of an Agreement
Discussion of Challenges

• Ownership
  – Who owns the facilities?
  – Landowner or Federal government or other?

• Operations and Maintenance
  – Who operates and maintains the facility?
  – Who is responsible if it's not operated and maintained?

• Water Discharge
  – Where does the facility discharge to?
  – Discharges to the river may require a waste discharge permit – who holds the permit and ensures compliance with the conditions?
  – Who “owns” the discharge water?
  – What are the impacts to future fishery and water quality if discharged to the river?
Discussion of Challenges

• Water Rights
  – Who’s water is it?
  – How do we not induce further seepage from the river or local distribution canals?

• Long-term Monitoring
  – What long-term monitoring if any, is needed?
  – Who will do this and what access is needed?

• Cost-share
  – What are the existing drainage challenges?
  – Is the project also resolving a challenge that is not a result of the Restoration Program?

• Terms of an Agreement
  – Agreements with individual landowners would be needed to address these challenges and outline roles and responsibilities.
  – Would also need to address hold harmless provisions.
INFORMATION & DATA EXCHANGE
NEXT STEPS AND FOLLOW-THROUGH
Next Steps

• Landowner Comments on Project Locations sent to Reclamation – April 14

• Reclamation to provide Draft Site Evaluation to Landowners – April 14

• Set Next Meeting Dates:
  – April TBD
  – May TBD
  – June 21
Action Items and Review

- Update Action Items
  - Revised Actions
  - New Actions
• Projects to reduce or avoid seepage impacts
  – Disposal of tile drain water
Contact

• Technical Feedback Group – David Mooney
  – 916-978-5458
  – dmmooney@usbr.gov

• Seepage Concerns – Seepage Hotline
  – 916-978-4398
  – interimflows@restoresjr.net
BACKUP SLIDES
Iterative Approach to Increase Flows while Avoiding Impacts

- Establish Field Threshold
- Estimate Acceptable Flows
- Estimate Friant Releases
- Find Limit of Flows without Impacts
- Evaluate Projects to Avoid Impacts
- Identify Potential Increases
- Monitor Response
Agricultural Practices Method

- Well Top of Casing
- Well Ground Surface
- Field Ground Surface (lowest point within 750 feet)
- Ground Surface Adjustment
- Root Zone
- Groundwater Depth below ground surface at well and Well Threshold
- Irrigation Buffer
- Groundwater Table and Field Threshold
- Capillary Rise

Note: Not to scale
Historical Groundwater Method A

CCID 191, GS elevation 110.9

Spring threshold of 101.9 ft calculated as the 75th percentile of spring WLs prior to SJRRP flows

Fall threshold of 99.9 ft calculated as the 75th percentile of Fall WLs prior to SJRRP flows
Historical Groundwater Method B

MW-10-93, GS elevation 105.4

Spring threshold of 100.8 ft calculated as the 75th percentile of Spring WLS from nearby CCID well 184 prior to SJRRP flows

Fall threshold of 99.9 ft calculated as the 75th percentile of Fall WLS from nearby CCID well 184 prior to SJRRP flows
Historical Groundwater Method C

MW-09-85B, GS elevation 120.6
Drainage Direction Method

San Juan Ranch, Reach 4A

- 27-Apr
- 12-May
- 28-May
- 14-Jun
- 19-Jul
- 2-Aug
- 26-Aug
- 15-Sep
- 13-Oct
- 30-Nov

Elevation (NGVD 1988 feet)

Distance from SJR Centerline (feet)

Terrain-LiDAR
GS Survey
Process & Roles

• Projects Process Definition
  – Expectations
  – Procedures
  – Timeline

• Major Federal Requirements
  – Project/Site Evaluation
  – Permitting & Compliance
    • Environmental review (NEPA)
    • Endangered species (ESA)
    • Cultural resources (SHPO)
    • Water quality (Clean Water Act)