SAN JOAQUIN RIVER RESTORATION PROGRAM

Seepage and Conveyance Technical Feedback Group

February 10, 2011
11704 W. Henry Miller Ave.
Dos Palos, CA

Agenda

- Introductions
- Purpose and Charter
- Action Item Review and Update
- Recent High Flows
- Operating Criteria and Triggers
- Information and Data Exchange
- Seepage Avoidance Projects
- Next Steps

2

Review and Context

TECHNICAL FEEDBACK GROUP PURPOSE AND CHARTER

3

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

4

Objectives

- Develop an improved Seepage Monitoring & Management Plan before implementing spring Interim Flows (March 2011)
- Identify and evaluate actions to avoid seepage impacts
- Clarify future claims process

5

Core Topics

- Data & Information Consolidation
- Monitoring Plan
- Impact Thresholds
- Impact Avoidance Actions
- Process for Potential Future Claims

6

Related Topics

- Temporary Access
- Claims for Impacts Last Year
- Draft Program EIS/EIR
- Reach 4B Flow & Routing Issues
- RA Flow Recommendations
- Flood Management & Levee Improvements
- Funding and Implementation Timing

7

Process & Decision-making

- 3 to 5 meetings through February
  - Focused on SMMP
- Additional topics and meetings identified and considered as we proceed
  - Update Charter in March 2011
- Reclamation and its partner agencies retain decision authority for Program implementation

8

Seepage Monitoring & Management Plan

- Purpose: describe the approach to conveying flows while reducing or avoiding adverse seepage impacts
- Uses for the SMMP include:
  - Disclosure of approaches
  - Guidance for actions
  - Forum for input
- The Technical Feedback Group provides a way to solicit input.

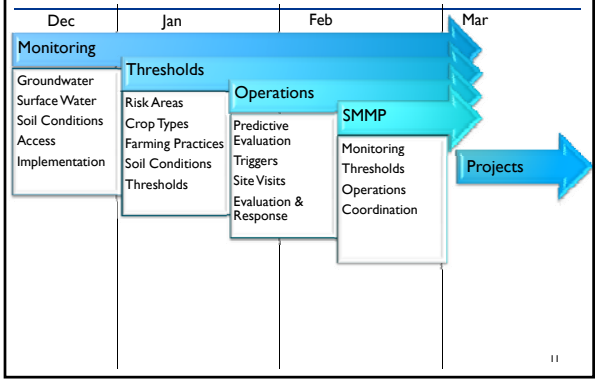
9

Elements of the SMMP

- Seepage Impacts
- Locations of Known Risks
- Operations Conceptual Model
- Monitoring Program
- Thresholds and Triggers
- Site Visit and Response
- Site Evaluation and Projects

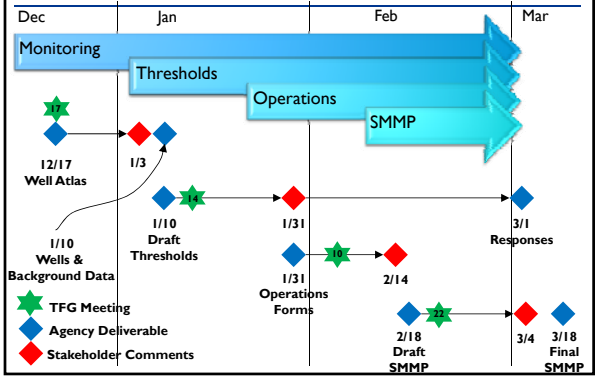
10

Discussion Topics



11

Milestones

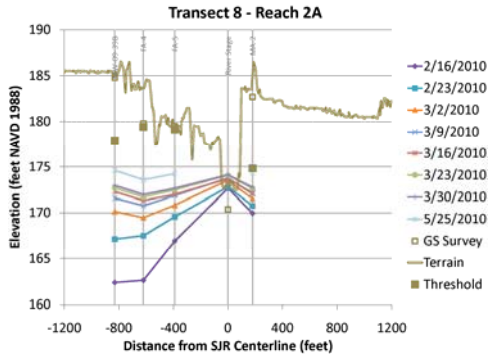


Follow-Up on Comments

ACTION-ITEM REVIEW AND UPDATE

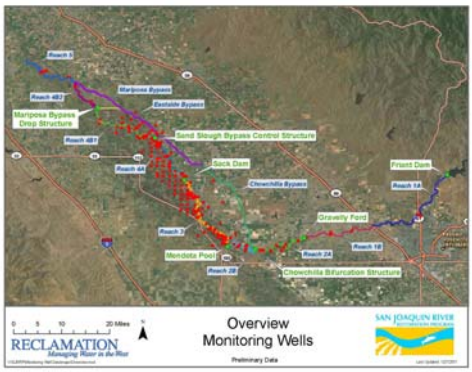
13

Action Item #2 Cross Sections



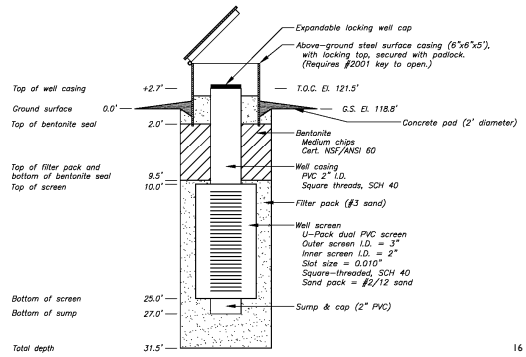
14

Action Items #5-7 Updated Well Atlas



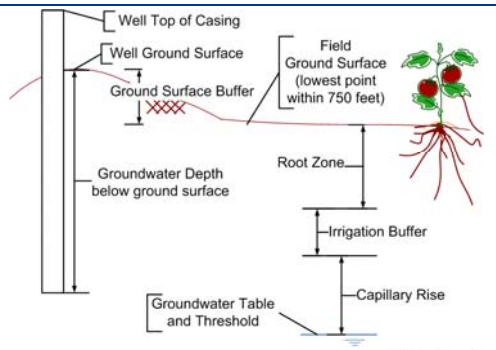
15

Action Item #5 Survey Data



16

Threshold Components in well atlas



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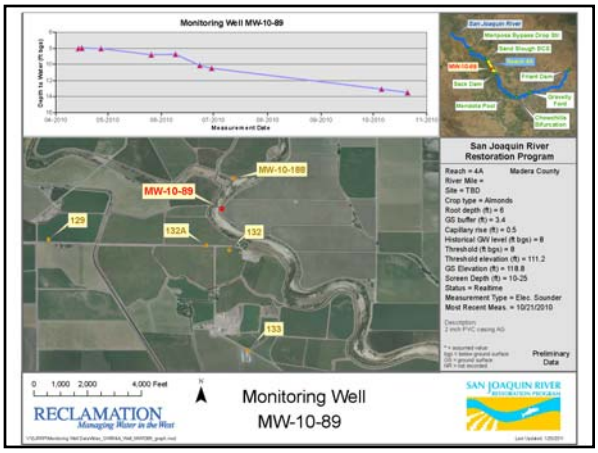


Action Item #7 Well Screen Depth

Reach = 4A Madera County
River Mile =
Site = TBD
Crop type = Almonds
Root depth (ft) = 6
GS buffer (ft) = 3.4
Capillary rise (ft) = 0.5
Historical GW level (ft bgs) = 8
Threshold (ft bgs) = 8
Threshold elevation (ft) = 111.2
GS Elevation (ft) = 118.8
Screen Depth (ft) = 10-25
Status = Realtime
Measurement Type = Elec. Sounder
Most Recent Meas. = 10/21/2010

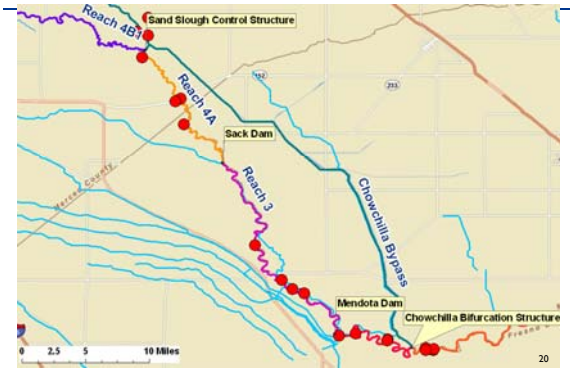
Description:
2 inch PVC casing AG

* = assumed value
bgs = below ground surface
GS = ground surface

Preliminary Data

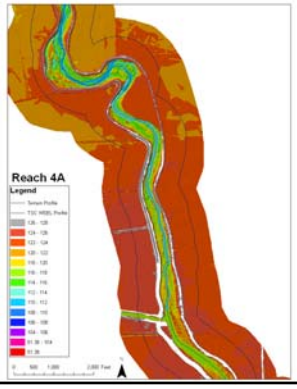
19

Action Item #8 Priority Wells



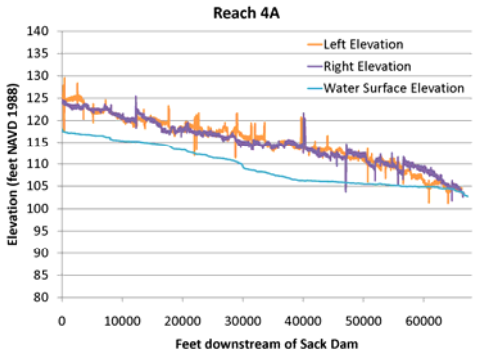
20

Action Item #9 Profiles



21

Action Item #9 Profiles



22

Monitoring Wrap-up

RECENT HIGH FLOWS

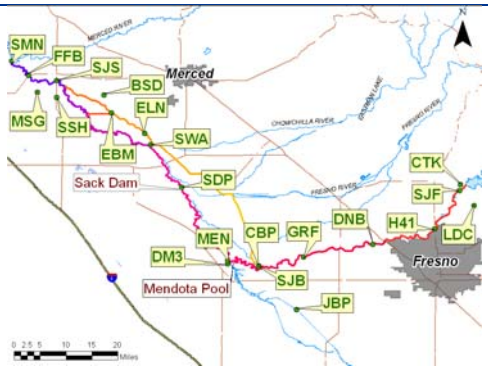
23

Data Collected during High Flows

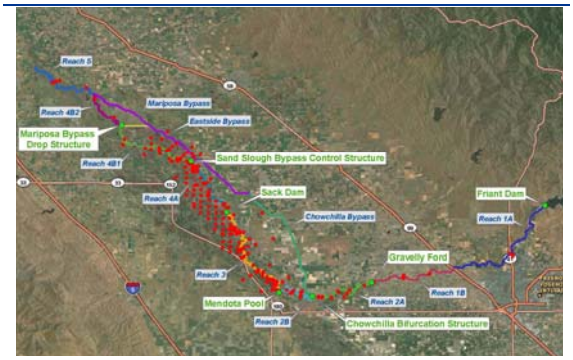
- Flow Data
  - Real-time Stream gages
  - Water Surface Profile and Bathymetry
- Groundwater Data
  - Real-time
  - Hourly Data Logged for future collection
  - Measurements

24

Stream Gage Network



SJRRP Monitoring Well Network



Groundwater Monitoring Frequency

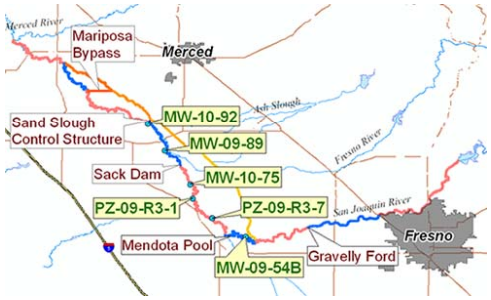
- Real-time
- Weekly soundings in key wells
- Hourly water level recorders
- Monthly soundings

Real-time Groundwater Monitoring

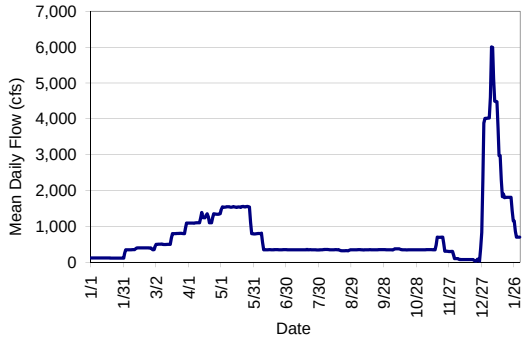
Figure G3.
Photo of a Real-Time Monitoring Well Installed By the SJRRP

- Five sites in Reaches 2-4
- Hourly depth to groundwater, temperature, and EC
- Available online at www.restoresjr.net and http://cdec.water.ca.gov
- Support water management decisions

SJRRP Real Time Wells

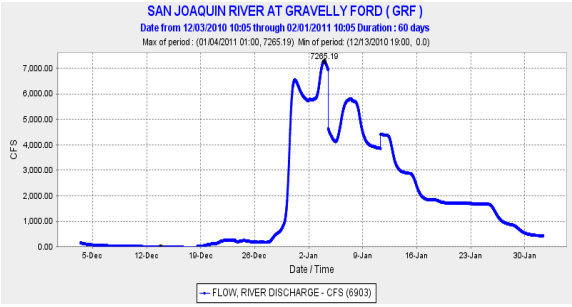


SJR Release at Friant Dam

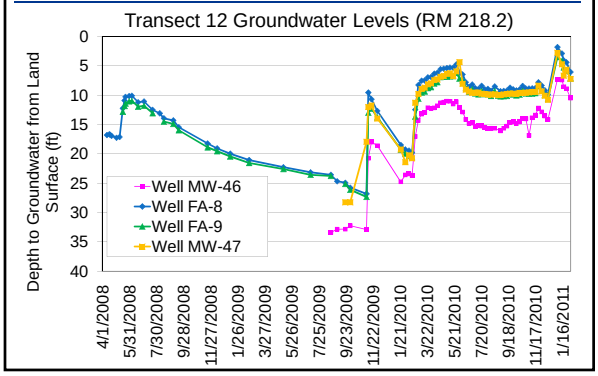


2011San Joaquin River Flood Flows

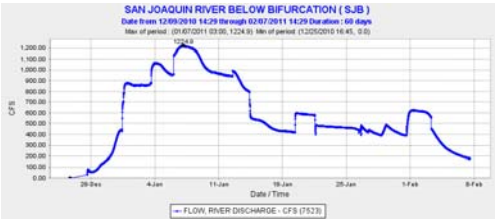
Gravelly Ford - 2011 Flood Flows



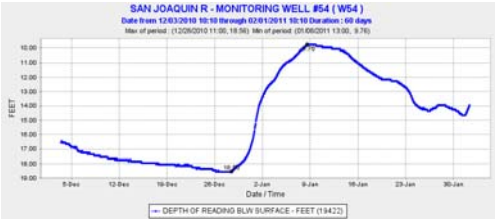
Reach 2 – 2011 Flood Flows



SJR below Bifurcation – 2011 Flood Flows

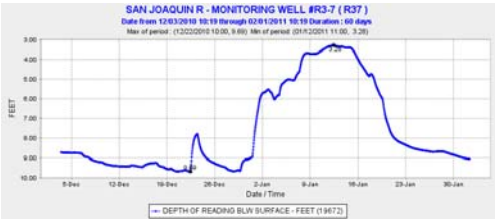


Monitor Well MW-54 - 2011 Flood Flows



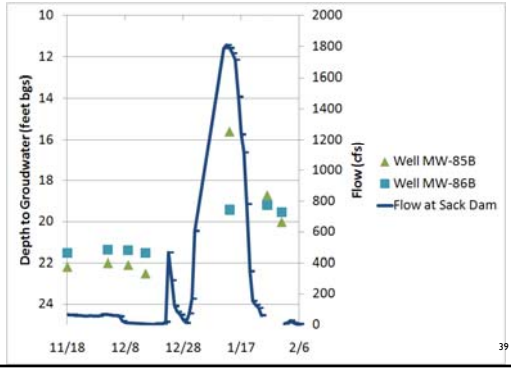
SJR near Mendota – 2011 Flood Flows

Monitor Well R3-7 – 2011 Flood Flows



SJR below Sack Dam - 2011 Flood Flows

Hwy 152 – 2011 Flood Flows

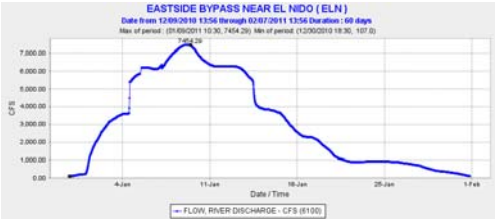


39

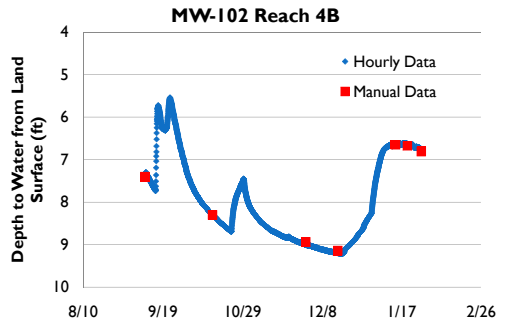
MW-89 – 2011 Flood Flows

MW-92 – 2011 Flood Flows

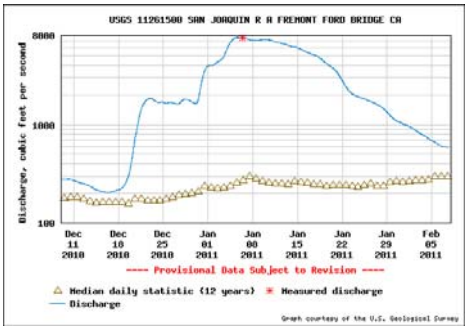
Eastside Bypass near El Nido – 2011 Flood Flows



MW-102 – 2011 Flood Flows



SJR at Fremont Ford – 2011 Flood Flows



Presentation on Operations and Forms

OPERATING CRITERIA AND TRIGGERS

45

Operating Criteria & Triggers

- Interim Flows Purpose: Release flows to gather information prior to full Restoration Flows
- Daily Operations
  - RA Recommendations
  - Coordination with CCID, LSJLD, SLDMWA
  - Channel Capacity
  - Avoid Seepage Impacts
  - Expected tributary inflow

46

Operating Criteria and Triggers

- Challenges
  - The relationship of flow rates to impacts is not clear
  - We will need flow releases to learn the relationship
- Strategy
  - Incremental Approach
  - Measure Responses
  - Anticipate and Identify Limitations

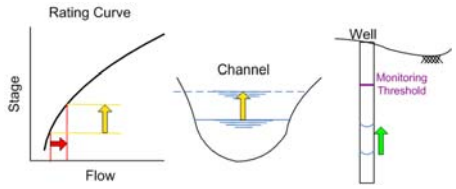
47

Seepage Operation Components

- Monitoring Data
- Triggers
  - Flow Bench Evaluations
  - Daily Flow Evaluations
  - Seepage Hotline Call
- Site Visit
- Response

48

Operations



- Thresholds identify potential problems so that Reclamation can establish operating criteria to manage flows

49

Presentation on Evaluations

FLOW BENCH AND DAILY FLOW EVALUATIONS

50

Flow Bench Evaluations

- Purpose: Avoid material adverse seepage impacts
- Reclamation performs Flow Bench Evaluations prior to increasing flows

51

Flow Bench Evaluations

- Flow Bench Evaluations include:
  1) Conveyance Capacity
  2) Groundwater Telemetry
  3) Groundwater Manual Measurements
  4) Flow Stability
  5) Groundwater Projections
  6) Mendota Pool Operations
  7) Feedback
     a) Landowners (Seepage Hotline)
     b) Operators: LSJLD, CCID and SLCC

52

Flow Bench Evaluations

1) Conveyance Capacity

Purpose: Avoid levee instability

– Would this flow surpass the DWR rated conveyance capacity of the channel?
  - Reach 1A, 1B & 2A: 8,000 cfs
  - Reach 2B: 1,300 cfs
  - Reach 3: 1,300 cfs

– If yes, reduce flow increase

53

Flow Bench Evaluations

2) *Groundwater Telemetry*

Purpose: Avoid seepage impacts

- Are current real-time groundwater levels above thresholds?
- If yes, this triggers a site visit (if not already conducted) to measure groundwater levels under the adjacent field.
- May reduce flow increase

54

Flow Bench Evaluations

3) Groundwater Manual Measurements

Purpose: Avoid seepage impacts

- Are current measured groundwater levels above thresholds?
- If yes, this triggers a site visit (if not already conducted) to measure groundwater levels under the adjacent field.
- May reduce flow increase

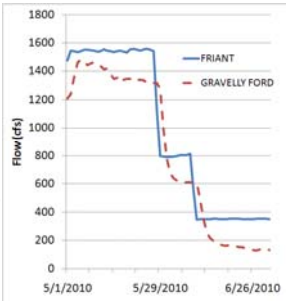
55

Flow Bench Evaluations

4) Flow Stability

Purpose: Account for travel time and potential changes that may not have materialized since the prior change in releases

- Have flows stabilized?
- If no, may delay the planned flow increase until flows have stabilized.



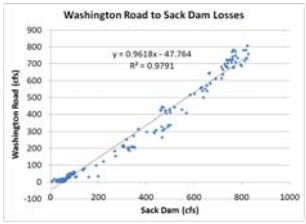
56

Flow Bench Evaluations

5) Groundwater Projections

Purpose: Avoid seepage impacts

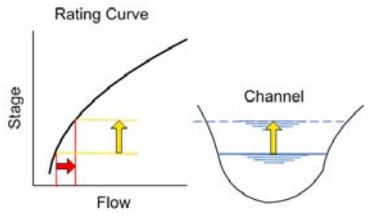
a) Determine local flow in each reach from proposed Friant increase



57

Flow Bench Evaluations

5) b) Determine increase in river stage from proposed local flow increase

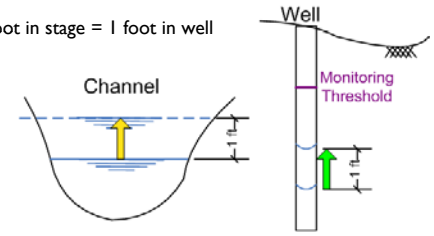


58

Flow Bench Evaluations

5) c) Determine increase in groundwater level

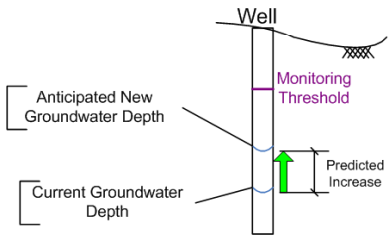
1 foot in stage = 1 foot in well



59

Flow Bench Evaluations

5) d) Determine predicted groundwater level



60

Flow Bench Evaluations

6) *Mendota Pool Operations*

Purpose: Avoid infeasible operations

- Is the proposed flow increase greater than exchangeable demand at Mendota Pool?
- Are there possible water quality effects?
- Do O'Neill operations require a reduction in the proposed flow increase?
- If yes, may reduce proposed flow increase.

61

Flow Bench Evaluations

7) Feedback

Purpose: Avoid infeasible operations, levee instability, and potential seepage impacts

a) Have there been calls on the Seepage Hotline?

- If yes, include short description of site visit and decision made.
- May reduce proposed flow increase if operational criteria has been established.

62

Flow Bench Evaluations

7) b) Have concerns been raised by LSJLD, CCID, or SLCC?

- If yes, include short description of concern and decision.
- May reduce proposed flow increase.

63

Daily Flow Evaluations

- Reclamation performs daily evaluations when flows exceed 475 cfs
- Daily Flow Evaluations Include
  - Conveyance Capacity
  - Groundwater Telemetry
  - Mendota Pool Operations
  - Landowner Feedback (Seepage Hotline)

64

Flow Bench & Daily Flow Evaluations

- Reclamation documents evaluations at: www.restoresjr.net/flows/FlowScheduling/flow_scheduling.html

65

Landowner Feedback

SEEPAGE HOTLINE PROCESS

66

Seepage Hotline Process

- Hotline Intake: A landowner calls the seepage hotline or sends an email:
  - 916-978-4398
  - interimflows@restoresjr.net
- Site Visit: Reclamation views the problem and meets with the landowner
- Response: Reclamation identifies a course of action

67

Seepage Hotline Process

- Hotline Intake
  - Location
  - Access
  - Distance from the River
  - Proximity to Levee Toe
  - Description of Seepage
  - Potential Impact
  - Relationship to Interim Flows
  - Immediacy of Impact

68

Seepage Hotline Process

- Site Visit
  - Description of Seepage
  - Type of Impact
  - Interim Flow Relationship
  - Operations Recommendation
  - Follow-Up Recommendation
  - Photo Log

69

Seepage Hotline Process

- Site Visits Data Collection
  - Landowner Input
  - River Stage
  - Soil Texture
  - Hand Auger Holes
  - Drive point Installation
  - Infrastructure
  - Crop Health

70

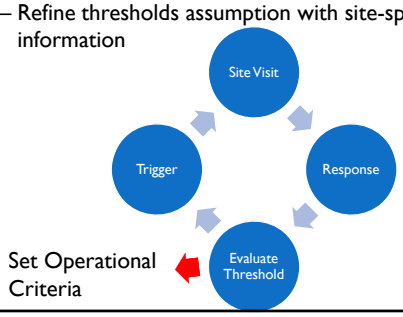
Seepage Hotline Process

- Adjust Monitoring
- Establish New Thresholds
- Set Operations Criteria
- Reduce Flows

71

Operations Methods

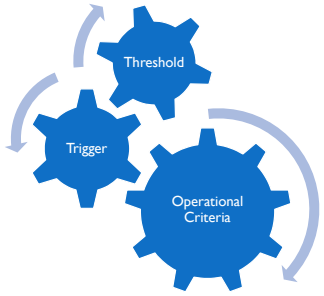
- The approach to establish operational criteria
  - Refine thresholds assumption with site-specific information



72

Operational Criteria

- 99.7 feet river stage elevation in Reach 4A



73

Operations Conclusions

- Potential Areas for Feedback
  - Is our operations approach clear?
  - Are the forms thorough and complete?
  - Are the purpose and activities of a site visit clear?
  - Are the steps in our iterative approach for creating operating criteria reasonable and complete?
- Next Steps
  - Written Comments by Feb. 14

74

Discussion on Thresholds

INFORMATION AND DATA EXCHANGE

75

Information & Data Requested

- At prior meetings we discussed
  - Areas of risk
  - Monitoring well network
  - Recent high flows

76

Information & Data Needs Discussion

- Is there more information available for:
  - Locations of poorly drained soils?
  - Cropping patterns and irrigation practices?
  - Location of existing tile drains?
  - Additional monitoring locations?
    - Program wells
    - District wells
    - Private wells

77

SEEPAGE AVOIDANCE PROJECTS

78

Seepage Avoidance Approach

- Hold flows below level of impacts
- Implement project to allow increased flows

79

Project Types

- Real Estate Actions
  - Easements
  - Acquisition
- Physical Projects
  - Tile drains
  - Slurry walls
  - Drainage ditches
  - Shallow well pumping
  - Conveyance improvements

80

Considerations

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

81

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)

82

Projects Next Steps

- Initial Feedback
  - Is the general direction and process reasonable?
  - Are there major missing pieces?
- Next Steps for Projects
  - Define list of potential projects – March / April

83

NEXT STEPS AND FOLLOW-THROUGH

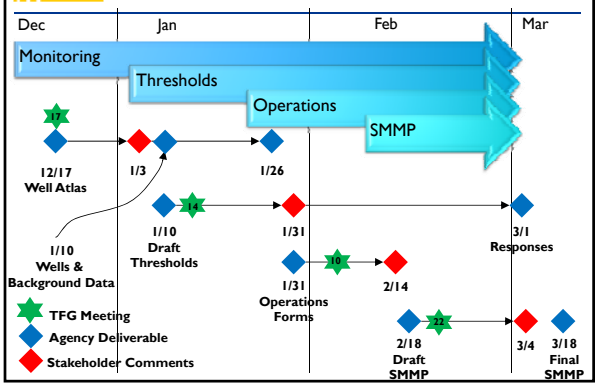
84

Next Steps

- Operating Criteria and Triggers
  - Draft Seepage Management Forms available for comment
  - Incorporate stakeholder comments
  - Post 2011 Seepage Management Forms
- Integrate sections into the 2011 SMMP
- Identify potential projects to avoid impacts

85

Milestones & Meetings



Action Items and Review

- Update Action Items
  - Revised Actions
  - New Actions

87

Topics Parking Lot

- Conversion of row crops to permanent crops and impact on thresholds
- Timing of flows and relationship to severity of seepage impacts
- Data & Information Exchange
  - Soil conditions
  - Irrigation practices
  - Tile drains
- Disposal of tile drain water

88

Topics Parking Lot (Cont.)

- Reach 4B high flow issues
- RA Interim Flow Recommendations
- Claims process
- Revisit Charter
- Projects to reduce or avoid seepage impacts
- Vegetation management in and along the river
- Policing in the river channel
- River crossings

89

Contact

- Technical Feedback Group – David Mooney
  - 916-978-5458
  - dmmooney@usbr.gov
- Seepage Concerns – Seepage Hotline
  - 916-978-4398
  - interimflows@restoresjr.net

90