

RECLAMATION

Managing Water in the West

Meeting Summary

Canal/Asset Management Meeting

Denver, Colorado
May 14, 2008



MISSION STATEMENTS

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Contents

Introduction	1
General Session	1
Overview.....	1
Truckee Canal Incident Perspectives.....	2
Stormwater Runoff/Urbanized Canals.....	3
Assessments of Canals Through Urbanized Areas.....	4
Aging Infrastructure /Asset Management.....	8
Folsom Dam Modifications.....	9
Reclamation’s Technical Service Center.....	11
Open Comment Period and Summary Discussion.....	14
Laboratory Tour and Closeout	14

Introduction

On May 14, 2008, the Bureau of Reclamation held a special meeting with transferred works operating entities and key Reclamation staff primarily to discuss issues related to the operation, maintenance, and safety of canals located in urbanized areas. The meeting also briefly addressed issues related to asset management and aging infrastructure. It additionally afforded the opportunity for meeting attendees to tour Reclamation research laboratories and better understand Reclamation's capabilities, accomplishments, partnerships, and ongoing activities in this area.

General Session

Overview

Robert Johnson, Commissioner, and Kris Polly, Deputy Commissioner for External and Intergovernmental Affairs, gave opening remarks.

Deputy Commissioner Polly thanked those in attendance for making time to come to Denver to discuss canals that have become "urbanized." He described "urbanized canals" as canals designed to deliver water through rural areas that now have subdivisions built around them increasing the severity of consequences resulting from a canal failure. He expressed his hope that Reclamation and its operating entities collectively will develop a way to identify and address this problem in a manner that is practical, affordable and effective. He also reminded attendees that the meeting was a forum for information and idea sharing and not a forum for final decision making.

Commissioner Johnson welcomed those in attendance and expressed appreciation for their participation. He stated this type of outreach, communication, and information-sharing is the key focus of Reclamation's Managing for Excellence action plan currently being implemented.

He indicated that approximately two-thirds of Reclamation's physical assets have been transferred to our operating partners for operation, maintenance, and replacement; making those partners the stewards of most of Reclamation's canals and distribution systems. He noted the recent Truckee Canal breach as an example of compounded consequences when the inundation area is an urbanized town or development that has grown up near the canal. He mentioned that Reclamation has developed a new facility review tool – a canal safety checklist – and test driven it with one operating partner in each region. He explained that later in the agenda, a panel of both operating entities and Reclamation field staff would discuss the use of the checklist in the special reviews that

took place last month. He emphasized the need for input from our partners as to the usefulness of this checklist and advice as to what Reclamation should be doing to assist our operating partners in the area of canal safety and integrity, particularly in urbanized areas that could be adversely affected by a breach or overtopping of the canal.

Commissioner Johnson said urban vulnerability to canal breaches is not the only issue with canal operations and integrity. Another topic for discussion is a perspective on stormwater runoff and how that affects the operation and water quality of irrigation delivery and drainage.

Truckee Canal Incident Perspectives

Presenter: Ernie Schank, President, Truckee-Carson Irrigation District.

Note: To view his Powerpoint presentation, please go to www.usbr.gov/canalsafety.

Mr. Schank started his presentation by saying the last thing you want to have happen is a canal breach. He provided the audience with a detailed description of Newlands Project and the canal. He said the Truckee-Carson Irrigation District has been responsible for operations and maintenance of a portion or the entire canal for 90 years. During that time there have been 5 breaches.

On January 5, 2008, a 911 call was received reporting water in the streets of Fernley, Nevada. Within 20 minutes of that call, water delivery into the canal was shut off and being diverted into the river. Mr. Schank provided an in-depth description, including numerous pictures of the canal breach and the measures taken to repair the breach. He also discussed the long-term options and fixes, along with the current outlook.

Water was returned to the canal on March 21, 2008, with flows of 150 cfs and increased to 250 cfs on May 9, 2008. The flows are anticipated to go to 350 cfs in mid-May.

In his comments regarding urbanization, he said the Truckee Canal is a life line to the cities of Fernley and Fallon. Without the canal, Fernley would not exist and Fallon would only be about one-third the size. The canal was built for agricultural water deliveries and no one took into consideration housing development below its banks. The soil compaction standards in 1905 were not the same as they are today.

Some other items of concern he presented included:

- Rodent control
- Off-road damage to canal banks
- Pumping installations
- Garbage
- Swimming
- Vandalism of structures and controls

He also provided a list of potential fixes, however some are cost prohibitive. They were:

- Impermeable barrier
- Lining
- Pipe
- New or additional spill structures
- Double canal bank width
- More check structures
- More automation (SCADA)
- Changing OCAP to allow earlier diversion
- Expand and maintain flood channels
- Allow local governments to hook storm drainage into drain system
- Reclamation and Irrigation District work more closely with local planners
- Improve emergency planning and exercises
- Designate “man made or agriculture” flood plain so insurance and is required
- Organize citizen watch with “many eyes”
- Education and public relations

Mr. Schank said the key to preserving canal infrastructure is Reclamation, irrigation districts, and local governments working in partnership.

Stormwater Runoff/Urbanized Canals

Presenters:

Norm Semanko, Executive Director, Idaho Water Users Association

Paul Cherrington, Manager – Water Engineering and Transmission, Salt River Project

Note: To view their Powerpoint presentations, please go to www.usbr.gov/canalsafety.

Mr. Semanko provided his comments specific to canals issues in his area and provided pictures as examples of the problems.

He talked of housing developments along the canals. Some are built on the banks; others are built below the canal posing potential safety concerns. Encroachments and maintenance access have become a very big problem. In some areas, maintenance is impossible due to development of sidewalks, landscape, roads, and structures.

Idaho law requires working with the impacted irrigation district when developing near a canal, but this is not adhered to according to Mr. Semanko. He said the planning and zoning people and city councils need to realize they can't just issue permits. It is important to have the opportunity to work with these local jurisdictions to understand the reasons for the easements and the potential consequences of a breach or overtopping. He stated Reclamation needs to step up and partner with the irrigation districts to deal with local jurisdictions.

Mr. Semanko also stressed the hazards and concerns of stormwater discharges into the canals. When a canal is running at capacity and stormwater is discharged into it, flooding will occur. Stormwater discharge is another issue he believes needs to be addressed with the local jurisdictions.

Mr. Cherrington shared his comments on the Salt River Project (SRP) canals. The SRP is one of the first five Reclamation projects and is now one of Reclamation's most urbanized canal projects.

As with other canals, there were many breaches in the early years but no breaches or overtopping have occurred in over 30 years. Mr. Cherrington explained some of the changes that were put in place to address the issue of breaching and overtopping.

- Canals have been lined (SRP has been placing concrete lining in the canals at a rate of approximately 2 miles per year and is now about 98 percent complete.)
- Spillways have been constructed at historic washes
- Emergency spillways have been built
- Flood control projects have been completed (the flood control district has been very helpful and SRP sits on their board)
- SRP removes storm drains if they are put in the canal without proper authorization. (If authorized, locality provides outlets with the same or more volume.)
- Aquatic vegetation is controlled with fish
- Gopher walls built (any holes are filled and compacted)
- Utility boring/jacking designs are reviewed and inspected by SRP

Ongoing miscellaneous issues:

- Vandalism (local enforcement)
- Swimming in the canals (signage and local enforcement)
- Fallen trees (constant removal)
- Vehicles in the canal - up to 10 a week (installing gates)
- Vagrant encampments (working with local authorities)
- Chemical dumps or spills (24-hour Hazmat team)
- Fishing (removing aquatic vegetation control measures)

Mr. Cherrington said waterfront (canal) property is a draw for real estate developers. These developed properties sell for millions. Therefore, developers work with SRP to address any roadblocks to development. He also said the canal easement has been turned into the Sun Circle Trail which is part of the National Trail System

Assessments of Canals through Urbanized Areas

Moderator: Karl Wirkus, Deputy Commissioner, Operations

Note: To view his Powerpoint presentation, please go to www.usbr.gov/canalsafety.

Deputy Commissioner Wirkus opened the session by describing the current Review of Operation and Maintenance (RO&M) Program. He said the reviews of representative portions and structures of canal systems are generally done every 3 to 6 years. They include collaboration with operating entities on O&M condition, deficiencies, and a formal report with recommendations. The urbanization of canals has been known and Reclamation has sponsored workshops on urbanization issues previously. In the late 1990s, a preliminary inventory of urbanized canal reaches were identified based on knowledge of staff, past RO&M examinations and special site visits. The inventory included location, capacity, estimated population at risk, etc. With this information, the inventory prioritization began. It was based primarily on location, size, and the extent of hazard and was not based on “condition”. The intent was that this prioritization would be used to direct increased attention of the reviewers during RO&M examinations. A draft preliminary examination checklist was also developed.

At this point, Deputy Commissioner Wirkus referred to the January 2008 incident on the Truckee Canal presented earlier by Mr. Schank. After the breach, the regions updated their preliminary inventory of canal reaches and, this time, using condition assessments, attempted to further prioritize the canal reaches. The new preliminary list now includes 108 reaches from the inventory that should receive further attention. The draft review checklist was also revised and updated.

The next step Reclamation has recently undertaken was the special canal reviews. He said that, in collaboration with operating entities, a representative canal reach through an urbanized area in each region was selected for a special review (pilot program). In order to foster consistency, the draft checklist was used in conducting the special reviews. The intent of these special reviews was to gain input from the operating entities for future activities. He reminded the audience that a draft checklist and copies of the completed checklists were in their folders. He then introduced the panel which included representatives from each of Reclamation’s regions and their operating entities involved in these special reviews.

PANELISTS:

Pacific Northwest Region: New York Canal
Steve Jarsky, Pacific Northwest Regional Office.
Paul Deveau, Boise Board of Control

Great Plains Region: Helena Valley Canal
Jerry Stallman, Great Plains Regional Office
Jim Foster, Helena Valley Irrigation District

Upper Colorado Region: Strawberry Highline Canal
Don Wintch, Upper Colorado Regional Office
Dan Ellsworth, Strawberry High Line Canal Company

Lower Colorado Region: Reach 12, Central Arizona Project

Randy Chandler, Phoenix Area Office
John Newman, Central Arizona Water Conservancy District

Mid-Pacific Region: V and S Canals, Newlands Project

Harvey Edwards, Lahontan Basin Area Office
Ernie Schank, Truckee- Carson Irrigation District

The panel provided powerpoint presentations on each of the five canal reaches reviewed with the draft checklist. They described the history of the project associated with the canal; the outcomes of the special review; and specific concerns noted as a result of the review.

Note: To avoid duplication, comments and concerns discussed in this session are included in the summary discussion section below.

For additional information specific to the checklist projects, please see each Region's power point at www.usbr.gov/canalsafety.

Aging Infrastructure/Asset Management

Presenter: Ken Maxey, Manager – Maintenance Services Office

Excerpts from Mr. Maxey's presentation are listed below. For his complete presentation, please go to www.usbr.gov/canalsafety.

Managing Construction and Infrastructure in the 21st Century Bureau of Reclamation

- “. . . the number of facilities currently owned by Reclamation appears to be relatively stable, requiring an effective management strategy and a focus on operations, maintenance, repair, and modernization rather than development.”
- “Today, Operation and Maintenance (O&M) is the primary technical workload of Reclamation and is likely to remain so because of the aging infrastructure and the need for rehabilitation and modernization of facilities.”
- “Reclamation is in a new era. This new era is marked by two new tasks: (1) the operation, maintenance, and rehabilitation of existing structures and systems and (2) the creation and nurturing of brokered agreements among a variety of players affected by the management of water resources.”

Reclamation's Infrastructure

- 348 Dams/Reservoirs
- 58 Hydropower generation sites with 14,800 MW capacity
- 8,116 miles of Canals
- 24,674 miles of Water Distribution Laterals

- 13,095 miles of Drains

Characteristics

- The age of Reclamation’s infrastructure ranges from over 100 years old to facilities that are still under construction
- Two-thirds of the facilities have been transferred to operating partners for OM&R
- Estimated Replacement Cost of Reclamation’s infrastructure = \$92 billion

Aging Infrastructure

- Age can degrade an asset or system functionality or reliability
- Degradation of infrastructure performance or condition can be expressed as a degree of risk
- The complexity of the asset (e.g., the infrastructure “system”) significantly increases the risk associated with system failure

Major Rehabilitation and Repair Estimates (Preliminary – January 2008)

Reserved Works	190	\$1,632,527,748
Transferred Works	302	\$972,965,997
Safety of Dams	3	\$469,244,450
F&WL funded by Reclamation		\$54,748,000
Total	494*	\$3,129,486,195

Asset Management Strategy

- Strategy #1 – Complete the Asset Inventory and Financial Records Verification Project
- Strategy #2 – Continue to rely on the Review/ Examination Program for High- and Significant- Hazard Dams to assess the dam safety and condition of high- and significant hazard dams.
- Strategy #3 – Continue to rely on the Power Review of Operations and Maintenance Program (PRO&M) to assess the operational and maintenance condition of generation assets.
- Strategy #4 – Continue to rely on the Associated Review of Operations and Maintenance (RO&M) Program to assess the operational and maintenance condition of water diversion and delivery assets.
- Strategy #5a – Continue to pursue off-budget financing for the remainder of the Power O&M/Capital investment program.
- Strategy #6 - Establish a Loan Guarantee Program.
- Strategy #7 - Complete HydroAMP power train component guides and deploy throughout Reclamation generation sites.
- Strategy #8 – Finish the deployment of MAXIMO Version 6.2 (the CARMA Project) throughout Reclamation generation sites and a limited number of water sites.

- Strategy #9 – Develop and expand water technology solutions, focusing on “Hot Spots” of water conflict in the West (e.g., Water 2025, water conservation programs, desalination).
- Strategy #10 – Further refine a 5- to 10-year overall O&M investment strategy and schedule for Reclamation.
- Strategy #11 – Expand collaborative efforts with Army Corps of Engineers, Tennessee Valley Authority and other Federal/non-Federal utilities on asset management strategies and practices.
- Strategy #12 – Develop and/or compile common performance metrics for water and power assets, and link them to budget resource decision making processes using data from existing examination and review programs, MAXIMO, and HydroAMP.
- Strategy #13 - Using quantifiable performance and process measures, develop an annual report for Reclamation management and Budget Review Committee on asset performance, risks, and recommendations. Also, possible use as a public report.
- Strategy #14 – Integrate M4E action item findings/results into overall strategy.

Folsom Dam Modifications

Presenters:

Mike Finnegan, Area Manager, Central California Area Office

Dr. Christine Altendorf, Deputy Commander, Sacramento District, Corp of Engineers

Note: To view their Powerpoint presentation, please go to www.usbr.gov/canalsafety.

The presenters emphasized partnership and collaboration between Reclamation and the Corps of Engineers in combining efforts on this major effort. The highlights are listed below.

Joint Federal Project --Folsom Dam and Reservoir

Common Objectives

- Design and construct a Joint Federal Project for Folsom Dam that expedites action by Reclamation and USACE to:
 - Provide 200-year or better flood protection
 - Address the dam safety hydrologic risk (pass Probable Maximum Flood)
- Complete other Dam Safety (DS) improvements
- Complete other Flood Damage Reduction (FDR) improvements

Other Improvements

- Dam Safety
 - Seismic Stability Modifications
 - Seepage Control Modifications
- Flood Damage Reduction
 - Raise embankments 3.5’

→ Modification or replacement of emergency spillway gates

Partnership

- Agencies
 - Reclamation
 - Corps of Engineers
 - California Department of Water Resources/
Reclamation Board
 - Sacramento Area Flood Control Agency (SAFCA)

- Department Leadership
 - Interior
 - Department of the Army
- Congressional Delegation

Current Status

- Corps of Engineers
 - Completed 35% Design in April
 - Control Structure (Utah State)
 - Chute (St. Anthony Falls)
 - Stilling Basin (BOR)
 - Approach Channel
- Independent Tech Review being conducted
- Majority of model work complete
- Constant coordination between BOR and COE

Overview of Reclamation's Technical Services Center

Presenter: Mike Gabaldon, Director, Technical Resources

Note: To view his Powerpoint presentation, please go to www.usbr.gov/canalsafety.

Mr. Gabaldon provided an outline of the Technical Services Center.

TSC Profile

- Unique expertise developed through 100 years of design, construction, operation and maintenance of water and power infrastructure

- Reclamation's in-house provider for specialized technical services to support
 - Design and construction activities
 - Operation and maintenance programs
 - Natural resources aspects of Reclamation's operations
 - Research and new technology development
 - Technical manuals, standards, and guidelines development

Laboratory Facilities and Capabilities

- 54,000 square-foot floor space
- 240,000-gallon storage reservoir
- Automated flow delivery and measurement systems

Laboratory History

- Reclamation began using hydraulic models in 1930 in Fort Collins and Montrose, CO
- Unprecedented scale of Hoover, Shasta, and Grand Coulee Dams made the hydraulic lab necessary to evaluate new design aspects
- Reclamation obtained Lab Facility in 1946
- Consolidated hydraulic labs in one location
- Allowed for expansion of applied research
- Largest indoor hydraulic lab in the world

River and Geomorphology Studies

River Restoration

River Resources Management

Fluvial Hydraulics & Geomorphology

River and Geomorphology Studies

-- Project Examples

- Upper Gila River Fluvial Geomorphology Study – New Mexico
- Little Colorado River Sedimentation Study – Arizona
- Trinity River Restoration and Adaptive Management Plan – California
- Rio Grande Environmental Studies: Cochiti Reach – New Mexico
- Klamath Project Environmental Studies - Oregon

Hydraulic Investigations

Water Measurement

-- Water Measurement - Developments

- WinFlume computer program for calibration and design of long-throated flumes and broad-crested weirs
- Improved calibration methods for canal radial gate check structures, facilitate accurate flow measurement, and improved canal operations
- Low-cost flow meters and data recorders for on farm open-channel applications

Fisheries Engineering

Fish ladders for western sucker and minnow species

Fish locks for swim- challenged species

New Technologies – Water Purification, Desalination

Technology Transfer Workshops

New Technologies

Water Purification, Desalination

Technology Transfer Workshops

- Modern Methods for Canal Operation and Control (twice per year)

- Water Measurement (once per year)
- Specialized workshops as requested (in Denver or on-the-road)

Inventions

- Powerplant Efficiency Optimization Computer Program
- Directional Harmonic Overcurrent Relay Device
- Sonic Tomography
- Flow Deflectors
- Non-destructive Concrete Void Detection
- RO Membrane Technology

Open Comment Period and Summery Discussion

Karl Wirkus facilitated an open forum for continued comments and discussion from the earlier panel discussion. All other comments were also welcomed.

Main Themes (and comments):

1) Encroachment issues are a big problem for our irrigation districts throughout Reclamation. Stormwater runoff is also included in this topic. Reclamation's support and participation in addressing these issues is absolutely necessary. Districts need assistance from Reclamation in working with local jurisdictions to understand the need for easements and the consequences of breaches or overtopping.

- Lack of enforcement for canal easements
- Lack of authority to enforce canal easements
- Reclamation response to easement issues not always effective or responsive
- New subdivisions
- Limited understanding of easement needs by local entities
- Encroachment becomes an issue when local development maps are not shared with irrigation districts
- Enforcement assistance from Reclamation is very important
- Congress needs to give power to say "no" for easement encroachments
- Educate developers not to create canal safety issues
- Need consistent approach to easement issues
- Someone needs to say "No, you are not going to do that!"
- Subdivisions built over drains leaving no place for water to drain causing floods
- Stormwater discharge is a physical capacity issue. Need local entities to understand canal operations and capacities.

2) Reclamation canal RO&M examinations could be improved to provide more technical assistance. It would also be good to have regular interaction with Reclamation employees as part of a working team.

- Canal RO&M examinations need to provide more technical support
- Districts don't need adult supervision as much as help and guidance
- Like the idea more frequent intervals
- Involve local Reclamation employees to work more with districts
- Would like feedback, not just a checklist or report
- Need to be consistent, ongoing, and solution-oriented
- Concern that Reclamation is losing institutional knowledge. Need to have new employees working with experienced employees to share the knowledge. Pilot program in Oregon working with district staff has proved helpful for all.

3) Lack of funding makes keeping up with OM&R difficult.

- Water 2025 challenge grant money should be available for more than just water conservation; should be available for canal safety issues, too.
- There could be a number of seepage problems identified but, in many cases, no funding available to make needed repairs. Limited funds to correct a well-documented problem.
- Urban development greatly increases maintenance issues/costs for the districts. Districts need support from Reclamation in working with locals to educate them and seek funding from them for urbanization impacts.
- Rising O&M costs "chase out" farmers and developers "pick off" land owners.
- It all comes down to money.
- Concern with documenting hazards and deficiencies with no money to fix
- Concerned with how/why rehabilitation is the sole responsibility of water users when it is still a Federal asset. Reclamation considers the waters users responsible for rehabilitation/replacement but there is no mechanism available to finance such work in a reasonable term/time period.
- It takes an event like the Truckee breach to get any attention from Congress
- If the St. Marys Canal or Minidoka Dam spillway failed, the Federal government would come up with the money to fix it, wouldn't it?
- Farmers need help. They just can't do anymore to cover all rehabilitation/replacement costs. We need to get that message to Congress

4) There needs to be Loan Guarantee Program and/or the R&B (Rehabilitation and Betterment) Program needs to be revitalized and funded

- Loan Guarantee Program will help some but the smaller districts can't pay back the loan, no matter what the terms are. (The resources are not available to pay.) The program doesn't fit all situations
- Currently, there is no funding appropriated for the in R&B Program
- Need to work together before going to OMB about reinitiating the R&B Program
- OMB allowed customers to advocate for the Loan Guarantee Program and then emasculated it, making it not useful
- Some districts have resources and can address needed rehabilitation (such as the Salt River Project); some districts (in the middle) can pay if given reasonable

loan/funding terms and conditions; and other districts cannot repay no matter what loan program/conditions are available.

- A revitalized R&B Program, combined with the Loan Guarantee Program, would work well

5) One size doesn't fit all

- Don't implement an overarching policy to fix the problem while creating a larger problem for some projects.

6) Concerns with support and timeliness of Federal legal assistance

- Need better response and support from Solicitor/DOJ
- Reclamation should be more involved in litigation issues

After a lengthy, productive, and informative comment session, Commissioner Johnson provided summary comments.

Commissioner Johnson thanked everyone for their participation and candidness. He thought the sharing of ideas was very helpful to all. He agreed that one size doesn't fit all and recognized the differences in the range of our customers and their issues. He committed to putting out a summary of the meeting and as additional approaches to implement ideas are available, he will get those out also. He said that Reclamation will continue to keep in touch and gauge the need for another meeting. He thought it would be helpful to piggy back on other association meetings along the way to keep customers updated.

He also committed to:

- Review the Challenge Grant Program to see if "Water for America" criteria could include and give priority to public safety issues at Reclamation facilities
- Continue efforts with OMB on the Loan Guarantee Program. He recently met with OMB and got agreement to reinstate development of the implementing rule. Reclamation will continue to work with OMB on the rule and try to get it in place. He will also continue to pursue the funding issue.
- Take a look at Reclamation's RO&M Program and reassess review of canals through urbanized areas. He will work toward putting more funding towards technical assistance for our customers and ensure it remains nonreimbursable. He is committed to being a partner, not an adult supervisor.
- Support relations with local communities regarding encroachment/trespass issues. Look at our regulations and be more helpful and aggressive in enforcement issues. He believes there are opportunities for partnerships there. Together, we need to educate communities/developers and get them to pay costs for urbanization impacts.
- Willing to have discussions with the Justice Department and Solicitor's Office to address the enforcement of encroachment issues. He requested attendees with specific examples provide evidence of these types of problems, which would help him to address these concerns.

Laboratory Tour and Closing Comments

Meeting attendees were provided a tour of Reclamation's research laboratories. The tour included:

- Robles Diversion Dam Model
- Canal Automation Model
- Folsom Dam Modification Model
- Fish Stress Test – Tracy Facility
- Coatings Lab – Zebra/Quagga Mussels
- Materials Lab – Pipe Robot, membrane lining, concrete, corrosion, and 5-million pound test machine

Deputy Commissioner Polly concluded the laboratory tour and meeting by thanking everyone for coming and expressed his appreciation for the sharing of ideas and information.

Meeting Information

For access to meeting documents and Powerpoint presentations, please go to www.usbr.gov/canalsafety.