

RECLAMATION

Managing Water in the West

TR-2009-04

Travel to the Newlands Project; Fallon, Nevada

Dates of Travel: October 26-30, 2009



**U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Hydraulic Investigations and Laboratory Services Group
Denver, Colorado**

BUREAU OF RECLAMATION
TECHNICAL SERVICE CENTER
DENVER, COLORADO

TRAVEL REPORT

Code: 86-68460

Date: October 30, 2009

To: Bob Einhellig
Manager, Hydraulic Investigations & Laboratory Services

From: Tracy Vermeyen, Hydraulic Engineer

Subject: Travel to Fallon, Nevada to participate in a water measurement review of a random sample of structures at the Newlands Project.

1. Travel Period: October 26-30, 2009

2. Places or offices visited: Reclamation's Fallon Field Office and the Truckee-Carson Irrigation District (TCID) Office and field sites.

3. Purpose of trip: To be an independent Reclamation observer during the field review of water measurement structures on the Newlands Project.

4. Synopsis of Trip: On the afternoon of Monday, October 26, 2009, I traveled from Denver, CO to Reno, NV where I rented a car and drove to Fallon, NV. I arrived in Fallon at 4:30 p.m.

On Tuesday, October 27, 2009, I met with Dave Overvold, project manager, Walt Winder, O&M foreman, Dave Watkins, hydrographer, and Mike Adams, computer specialist from TCID. I also met with Dr. Charles Burt (Director, ITRC) and Dr. John Replogle (Hydraulic Engineer, ARS-collaborator) at 8:00 a.m. for a kickoff meeting at the TCID offices. TCID provided operational records for the 30 sites that were to be reviewed. TCID provided rating tables, Sutron data recorder records, and WinFlume files for their sites with ramp flumes. TCID personnel led the tour of the sites visited. At each site we measured as-built dimensions of the water measurement structure, surveyed the control section and staff gage zero, and noted concerns and recommendations to improve the performance of each structure. Table 1 contains a list of the sites surveyed. We visited 12 sites on or near the L-canals and finished around 4:00pm. That afternoon, John, Charles and I combined our notes, measurements and photographs at the hotel from 4:30 to 6:30 pm.

Table 1. Flow measurement sites reviewed on Tuesday, October 27, 2009.

TCID MEAS. DEVICE	Type	Year installed
A2-C6A	RectRamp	2006
A9	RectRamp	2006
E1-C10	Weir	2006
L1-6 Headworks	TrapRamp	2000
L1-8-C2	RectRamp	2003
L1-C17	RectRamp	2004
L1-T20 (aka -T19)	TrapRamp	2002
L4-1-T2	Propeller	2000
L4-3-T4	RectRamp	2003
L4-C4	RectRamp	2007
V4-T6	RectRamp	2006
V5	RectRamp	2007

Wednesday, October 28, 2009 – I met with TCID staff at their headquarters at 8:00am. John, Charles, and I stopped in the Reclamation office to check in with Jim Lively (LO-910). Jim mentioned his concern about TCID's flumes being out of level or tilted. We told Jim we were surveying the sills to document their condition. Dave Watkins, and Mike Adams led the tour of the sites along or near the S canal. Table 2 contains a list of the sites visited. The S-17 headworks site was added and the Paiute North Drain weir was surveyed instead of Paiute South Drain because the South Drain structure is not normally used for flow metering. We visited 11 sites and finished around 3:30 p.m. John, Charles and I combined our notes, measurements and photographs at the hotel from 4 to 6 p.m.

Table 2. Flow measurement sites reviewed on Wednesday, October 28, 2009.

TCID MEAS. DEVICE	Type	Year installed
A21-C6	Weir	2000
Harmon Spill	RectRamp	2000
L10 Headworks	TrapFlume	2000
Paiute North Drain	Weir	?
S Headworks	RectRamp	2007
S17 Head/BOR	Weir	2004
S17-C6 Ramp	RectRamp	2000
S3	RectRamp	2007
S4	RectRamp	2002
S6	RectRamp	2007
S8	RectRamp	2007

Thursday, October 29, 2009 – I met with TCID staff at their headquarters at 8:00 a.m. Jeff Rieker (LO-900) joined us for a short update on our progress. TCID staff Dave Watkins, Dave Overvold, and Walt Winder led the tour of the sites visited. Table 3 contains a list of the sites visited on or near the T canals. We visited 8 sites and finished around 3:30pm. John, Charles and I combined our notes, measurements and photographs at the hotel from 4 to 6 pm.

Table 3. Flow measurement sites reviewed on Thursday, October 29, 2009.

TCID MEAS. DEVICE	Type	Year installed
N-T20 (N-T19)/BOR	TrapRamp	2000
T16 Head	Weir	2001
T16 Terminus	RectRamp	2003
TC1 Head/BOR	Weir	2002
TC10 Head/BOR	Parshall Flume	2002
TC6 Head/BOR	Weir	2004
TC-T13	Weir	2005
V-T1	RectRamp	2001

Friday, October 30, 2009 – Charles, John and I met at 8:00 a.m. and began writing our report. We worked until about 12:00pm. John Replogle and I left Fallon at 12:15pm for the Reno airport. I traveled back to Denver and arrived at 6:00pm.

Conclusions - More than 30 flow measurement structures were surveyed on the Newlands Project. These sites were a random sample of the 94 flow measurement sites targeted for review. The sites were a mix of TCID and BOR operated and maintained flow measurement structures. In general, I found the TCID structures to be well constructed and maintained. We found some minor discrepancies in as-built dimensions, but these did not significantly affect the WinFlume-generated discharge rating tables. In fact, an offset in staff gage and flume sill elevations were by far the biggest source of discharge measurement error. The typical site was equipped with a Sutron data recorder (reading every 5 minutes), a discharge rating table and a notebook for recording periodic staff gage readings. Most stilling wells contained float and pulley water level meters with shaft encoders that are powered by 12-volt batteries and solar panels. TCID has adopted the ramp flume (long-throated flume) as their preferred measurement structure and they have built many rectangular and trapezoidal flumes (66 of 94 sites). The quality of flume construction was very good. Second to ramp flumes, contracted-rectangular weirs were the most common flow measurement structures reviewed (8). Most of the weirs surveyed were older structures and most were non-standard. The reasons for a non-standard classification include: high approach velocities, weir blades mounted on the downstream side of the bulkheads, low P heights, and unlevel weir blades.

Of the sites visited that were operated and maintained by Reclamation's Fallon Office (5 or 6 of the 30+ sites), most structures were rectangular weirs that were non-standard for

the same reasons TCID's weirs were deemed non-standard. In general, I found Reclamation's water measurement structures to be in poor condition and lacking the required maintenance to assure accurate flow measurements. For example, the TC1 structure is a 14-ft-long weir with a non-standard orifice (a sluice opening with the door removed) that did not have an orifice plate or a downstream level sensor to determine the differential head across the orifice. Furthermore, there were pieces of riprap blocking the orifice. In this condition, the TC1 structure will not produce useable discharge data. I was not able to look at Reclamation's data loggers, but they were all solar powered and most were equipped with GOES satellite transmitters. The only Reclamation ramp flume we reviewed was the S17-C6 rectangular ramp and it was in similar condition to the TCID ramp flumes we surveyed.

Client Feedback – TCID staff were very appreciative of our visit.

CC Jeff Rieker, LO-900 (via email)

Peer Reviewed by: Tom Gill (86-68460)

Travel Report: Newlands Project (TCID)

Travelers: Tracy Vermeyen

Date: October 30, 2009

Traveler: Tracy Vermeyen, 86-68460

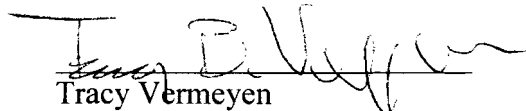
SIGNATURES AND SURNAMES FOR:

Travel to: Fallon, Nevada

Date or Dates of Travel: October 26-30, 2009

Names and Codes of Traveler's: Tracy Vermeyen, 86-68460

Travelers: Tracy Vermeyen



Tracy Vermeyen

Hydraulic Investigations and Laboratory Services Group

11/9/09

Date

Peer Review by:



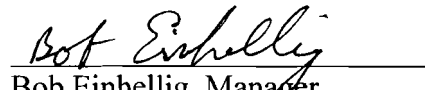
Tom Gill

Hydraulic Investigations and Laboratory Services Group

11/13/09

Date

Noted and Dated by:



Bob Einhellig, Manager

Hydraulic Investigations and Laboratory Services Group

11/16/09

Date