RECLAMATION

Managing Water in the West

High Mountain Lakes Stabilization
Deer Lake
Construction Report

Uinta Basin Replacement Project

U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah

November 2010

High Lakes Stabilization
Deer Lake
Construction Report

Uinta Basin Replacement Project

prepared by

Provo Area Office
Upper Colorado Region

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Introduction

The Uinta Basin Replacement Project (UBRP Project) was authorized by Section 203 of the Central Utah Project Completion Act [CUPCA; Titles II through VI of P.L. 102-575]. A component of the UBRP Project is that 13 high mountain lakes formerly used to store water would be stabilized at No-Hazard levels and the water rights transferred downstream for storage in the enlarged Big Sand Wash Reservoir, another feature of the UBRP Project. The stabilization of the thirteen reservoirs is mitigation for the UBRP Project.

Stabilization of the thirteen high mountain lakes at No-Hazard levels will provide constant lake water levels year-round. Nine of these lakes (Bluebell, Drift, Five Point, Superior, Water Lily, Farmers, East Timothy, White Miller, and Deer) are located in the upper Yellowstone River watershed and four (Brown Duck, Island, Kidney and Clements) are in the Brown Duck Basin portion of upper Lake Fork watershed.

The work accomplished in the Swift Creek Drainage portion of the upper Yellowstone River watershed in 2006 was to stabilize Water Lily Lake, plug the Farmers Lake Tunnel, and remove the outlet structure at White Miller Lake. Clements Lake, in the Brown Duck Basin, was stabilized in 2007. The work accomplished in the Brown Duck Basin in 2008 was the stabilization of Island Lake and Brown Duck Lake. In 2009, Kidney Lake in the Brown Duck Basin was stabilized, and four lakes in the Garfield Basin were stabilized (Superior, Five Point, Bluebell, and Drift).

This report includes work completed during 2010 where the Bureau of Reclamation (Reclamation) crew worked to stabilize Deer Lake. Contract record drawings showing location maps and applicable details for Deer Lake are included in the Appendices. For complete details on design analysis and methodology of the process used to stabilize this lake, please refer to the High Lake Stabilization Technical Memorandum for Swift Creek Drainage Deer Lake and East Timothy Lake dated January 2010 by the Bureau of Reclamation, Upper Colorado Region, Provo Area Office. The Technical Memorandum was reviewed and approved by the State of Utah, U.S. Department of the Interior, U.S. Forest Service, and Utah Reclamation Mitigation and Conservation Commission. East Timothy Lake was also stabilized during 2010 by the Duchesne County Water Conservancy District (DCWCD). Details of the East Timothy Lake work are found in the East Timothy Lake Construction Report.

Construction Oversight

Project management was provided by the Utah Reclamation Mitigation and Conservation Commission. Construction oversight throughout the project was accomplished by multiple entities. The Bureau of Reclamation designed and then constructed the stabilization of Deer Lake with assistance by the Utah Conservation Corps (UCC). The U.S. Forest Service and Utah Department of Natural Resources' Division of Water Rights were responsible for inspecting the

project. Other entities including U.S. Department of the Interior CUPCA Office, U.S. Fish and Wildlife Service, Duchesne County Water Conservancy District (DCWCD), Central Utah Water Conservancy District, and Moon Lake Water Users Association were involved in completing the project. Outfitter (riding and pack train) services were provided by Flying J Outfitters, a contractor, and the U.S. Forest Service (pack train only).

UCC Crew

Construction work during the summer of 2010 consisted of preparation of the site by the Utah Conservation Corps (UCC) prior to mobilization at the site by the Reclamation Force Account Crew. The UCC is an organization administered through Utah State University. Their mission is to improve the quality of public lands and the communities surrounding them through partnership projects, service, and education. UCC crews were arranged and managed by the U.S. Forest Service.

Helicopter Fly in

Equipment and materials were brought to the staging area adjacent to Mill Park for loading by the helicopter contractor. The contractor was responsible for loading all equipment and materials to the helicopter. All material was safely flown to the work site at Deer Lake.

Figure 1: Columbia Helicopter flying equipment from Mill Park to Deer Lake.

Figure 2: Helicopter used to transport equipment to worksite.

Deer Lake Construction

Deer Lake is located on an unnamed tributary of Swift Creek. Deer Lake is downstream of Farmers Lake and White Miller Lake, both of which were stabilized in 2006. It had a surface area of about 21 acres and held approximately 110 acre-feet of water. The embankment consisted mostly of sand and clay with stone riprap facing. The dam was 17 feet high with a 15-foot hydraulic height. The dam had a 24-inch diameter low-level outlet pipe located at the maximum section.

As part of this project, the outlet works gate and pipe were completely removed and a stabilized outlet channel was constructed according to the design prepared by Reclamation engineers. Formal survey work was performed at Deer Lake and the contract record drawings are included in Appendix B of this document. The spillway elevation of the former reservoir was 10,226 feet. The stabilized outlet channel was set at elevation 10,218 to restore Deer Lake to close to the original natural lake level.

Construction on Deer Lake was performed by the Reclamation Force Account crew with some assistance by the UCC crews. The Kings Peak Wildland Fire Module of the Duchesne Ranger District also assisted the project by removing hazard trees from the work and camp sites. The following summaries are based on crew records from their daily logs, copies of which are included in Appendix A of this report. Copies of letter accepting the completed project are included in Appendix D.

Although many people were involved in the work effort to stabilize Deer Lake Dam, the majority of the field work was completed by Thad McDonald, Bob Hopkins, Jason Muir, Gary Cunningham, Rick Sweat, and Duane “Red” Taylor, all of the Bureau of Reclamation’s Provo Area Office.

Gary Cunningham, Thad McDonald, and Jason Muir (l to r).

Equipment Used at Deer Lake

2 – Caterpillar 305C Trackhoes
2 – Caterpillar 277B Skidsteer Loaders
1 – Honda Generator
1 – Trash Pump
1 – RT 82-SC Walk-Behind Compactor
Miscellaneous Hand Tools - shovels, sledgehammers, pry bars, cross cut saws, axes
Diesel and Gasoline Fuel Containers

Construction Activities at Deer Lake

July 6-July 11

Activities at Deer Lake began on Tuesday, July 6th, 2010. Reclamation's crew rode in and set up camp. The equipment and supplies were flown in to Deer Lake by helicopter the week before. Duane Taylor surveyed and staked the breach construction, and the crew started removing riprap on the upstream side of the dam and excavating the breach. Valton Mortenson, Forest Service engineer, visited the site on July 9th and expressed concern with the proposed alignment of the outlet channel. Discussions were held with Reclamation engineers Scott Winterton and Bart Leeflang, which resulted in the alignment being adjusted at the bottom of the breach to better match the existing stream.

Figure 3: Reclamation crew led by Rick Sweat riding up to Deer Lake.

Figure 4: Deer Lake dam and head gate before removal.

Figure 5: Reclamation crew using mini-excavators to remove riprap and cut breach through dam.

Figure 6: Crew continued cutting through Deer Lake dam – looking upstream.

July 12-July 15

Work continued at Deer Lake with the Reclamation crew working on the breach excavation. The crew stockpiled dirt and rocks to be used for the breach riprap. One skidsteer broke down on July 13th and was left idle for the rest of the shift. The crew completed excavating the breach and removed the concrete headwall from the existing outlet pipe. There were not enough days left in the crew's work shift to begin and complete the next step in the sequence of stabilizing the dam, which was to install a coffer dam around the old outlet pipe, remove the pipe, and re-pack the trench. So it was decided that it would be best to perform those actions during the next work shift. The Reclamation crew cleaned up the work site and rode out with Alesha from Flying J Outfitters on July 15th.

Figure 7: Crew excavating down to outlet pipe.

Figure 8: View of existing outlet pipe w/ breach cut through the dam.

Figure 9: Crew using mini-excavator to cut through dam.

July 20-July 25

Work continued at Deer Lake with Reclamation's crew arriving on July 20th. The crew continued work on the breach by digging down to the pipe. A temporary coffer dam was put in upstream to stop the water and the crew removed the outlet pipe. The pipe was corroded; it came out in pieces. After the pipe was removed, the crew started backfilling and built up the area to the designed elevation for the breach. The crew used the RT 82-SC Walk-Behind Compactor to compact the backfill material. The Forest Service inspection crew accompanied by Valton Mortenson and Brian Paul (Forest Service) and Mark Holden (Mitigation Commission) arrived on July 21st. They were impressed with the progress of the project.

The Reclamation crew placed riprap on the slopes and at the bottom of the breach and mixed in fines as they placed the rock sills at the design elevations and locations. One skidsteer was still broken so the crew did the work with 2 mini-excavators and one skidsteer. Valton asked the crew to put in a horse crossing at the head of the breach and the crew was able to accomplish that. On July 24th, one of the mini-excavators quit working; it had some electrical problems, so the crew was left with 2 pieces of equipment to finish up the work. The crew finished placing riprap throughout the entire breach and completed washing in fines at the bottom of the breach.

Figure 10: Looking downstream through the completed breach before riprap and rock sills were placed.

Figure 11: Reclamation crew placing riprap in breach.

Figure 12: Looking upstream at the breach.

July 26-July 28 With the breach work completed the crew started packing up all their equipment and supplies to prepare for fly-out. They also worked on raking out the equipment tracks and did some contouring around the breach to make it look natural. The outlet pipe was smashed up and the head gate was cut up into smaller pieces so it could be packed away for fly-out. The crew finished packing and loading and tied down the decks. The Reclamation crew rode out with Flying J Outfitters on July 28th.

Figure 13: Crew washing fines into channel.

Figure 14: Looking upstream at the completed breach at Deer Lake.

Aug. 18-Aug. 20

The inspection crew arrived onsite for final inspection on Aug. 18th. The inspection crew consisted of the following: Mark Holden (Mitigation Commission), Valton Mortenson and Brian Paul (U.S. Forest Service), Kirk Beecher (CUWCD), Bob Leake and Brad Weber (Utah Division of Water Rights), and Scott Winterton and Will Spitzenberg (Reclamation). Everyone was impressed with the work and everything was passed off except some minor touch ups that were needed on the horse trail crossing the breach. Rick Sweat (Reclamation) worked on fixing the horse trail the following morning while Duane Taylor did the as-built survey work. Valton Mortenson approved the horse trail work and the project was given final approval on Aug. 19th, 2010.

Table 1. Quantities of materials involved in stabilization of Deer Lake Dam. Total Bulk Amount of Material Handled = 2,820 CY

Breach Channel Width (1)	Breach Channel Elevation (feet, msl)	Breach Channel Excavation Volume (CY)	Existing Outlet Grout Backfill Volume (CY)	Gabion Basket Volume (CY)	Riprap Removed From Dam Volume (CY)	Inlet/Outlet Channel Fill Volume (CY)	Riprap Placed in Breach Volume (CY)	Stilling Pool Sill Riprap Volume (CY)	Filter Material Volume (CY)
15' min	10,218.00	2,040	0	0	200	0	560	15	5

(1) 2.5:1 sideslopes, both sides, finished width

Appendix A – Crew Daily Logs

Bureau of Reclamation Crew

Start Date	Work Area/Description
7/06/2010	We met George and Alesha [Flying J Outfitters] at the Swift Creek trail head at 9am. After packing and weighing everything, we made our way to Deer Lake at 1pm. Upon arrival we unloaded our gear and started to set up camp. Rick Sweat & Duane Taylor was here to help and Duane is going to do the survey staking tomorrow.
7/07/2010	Today we finished setting up camp. While we did that Duane Taylor set up his survey equipment and set the grades for the project. The breach is not very big but I'm a little concerned where I'm going to put all the spoils. All the equipment looks to be in good shape, although one track hoe does have pretty worn tracks. Everyone is set up with their own tents and everything looks good. We will start with the breach tomorrow.
7/08/2010	Today we started into the dam. We removed most of the upstream side riprap. We can't remove the downstream side all at once. We will just move it to the side as we go down. Rick Sweat & Duane Taylor rode out today. Not a lot of rock to this dam so far. I believe it will not take long to get down to the pipe.
7/09/2010	Today we just continued with the excavation of the dam. Not much to report except that there is no rock in the center of the breach. Valton Mortenson, the Forest Service Engineer paid us a visit. Some things were a little off with the plans, but Valton made a call to Scott Winterton and Bart Leeflang and got it all sorted out. We needed to move the downstream side of the breach to match the existing stream bed. I think it will look better that way and Valton agreed.
7/10/2010	Continue with breach excavation. Still not much rock. Center looks like a crushed type soil. Almost like a road base. Most of the outlet works have been removed and set aside to be cut up so we can fly it out. We dug out the trench leading to the outlet pipe in hopes that it will bring the level of the lake down. That way we will have some extra time to do the work after we coffer it off. It has rained every day so I don't know how long we will have after we coffer the dam.
7/11/2010	Today we didn't do too much, just a little work cleaning up the slopes and stock piling riprap. Took kind of an easy day, being Sunday and all. These guys have been working very hard and need a little break.
7/12/2010	Continue breach excavation today. During work Gary blew a hydraulic hose on the krypto-claw attachment for the excavator. It's not really that big of a deal though. We just put the spare bucket on. The breach is really starting to take shape. Within a few days we should be ready to riprap. Sweat & I have decided that it would be smarter to wait till the start of the next shift to coffer the dam outlet. We don't want the lake to come up too fast and flood the project. With all the rain we have had it's hard to tell how fast the lake would fill up.
7/13/2010	Today was kind of a slow day. While we were stockpiling some dirt, one of the skidsteers broke. The bearings on the front axle came apart. Bob Hopkins and I tried to get the bad bearings out, but couldn't. I called Sweat to order new ones and to get some kind of a maintenance book on the VIS system. We are pretty lucky though. I've heard Randy (Crozier) up at East Timothy has had a lot more problems. We will be fine; most of the breach is done and even if we can't finish the repairs we can complete the job with 1 skidsteer on time.

7/14/2010 Last working day of the shift. The breach is coming so well. I can't believe how there is almost no rock in the center of the dam. It has made our job so much easier. Today we just exposed the pipe and took out the concrete headwall. The plan showed 3 of them but there was just one at the head of the pipe. Dirt is staged at the outlet so first thing coming back we can shut off the water and pull the pipe. We have riprap ready to go back in and slopes are mostly done. Not too bad for the first shift. Rest of the day was spent on cleaning up and packing for the ride out.

7/15/2010 Alesha arrived early because she rode in last night. After weighing and packing all our stuff we rode out.

7/20/2010 Today was ride in day. I was late getting to the trail because I had to stop at the Forest Service office to get a permit from Brian Paul. Well when I arrived he had not got it yet. So it took about an hour for him to get it. The ride in was pretty good but we arrived in camp too late to do anything on the dam. We have a busy day shift ahead. I guess some very high ups are coming in tomorrow for an inspection. I think they will be impressed.

7/21/2010 Well we got an early start today because I want to have as much done as we can before the big shots get here. The coffer dam didn't take but 15 minutes to put in, and in about half an hour the pipe was out. It was so bad that it came out in pieces. That's great though it saves me work not having to cut it up. So with the pipe gone we finished digging the downstream side using the material to build up and compact the top of the breach. At 11:30am the Forest Service group showed up. As they ate lunch I gave them a safety briefing. We went over the construction what we were doing at the moment, and what we were going to do to finish. It went well. Valton, JR, and Brian said they were impressed.

7/22/2010 Today we finished with the breach excavation. Everything is compacted and ready for riprap. As we rip-rapped the floor we started at the downstream side digging out the rock sills as we went. We tied the downstream side into the existing stream bed the best we could. I think it looks pretty good. As I did that Gary Cunningham placed riprap on the slopes. Jason Muir and Bob Hopkins were trading off on the skidsteer as the other one is still broken. They would bring it in with mixed soils so it would be easier for us to wash in fines when we are done. By the end of the day more than half the breach was done.

7/23/2010 We continued doing riprap today. The Forest Service group rode out today and stopped by to see what we have completed. I think they were impressed by how much we had done. Almost all of the breach was done except for the last of 5 rock sills and the apron at the upstream side. Valton and I talked about a horse crossing and some other items. My guys deserve a pat on the back. They have done a great job and made us look good. After they left we wrapped up the bottom of the breach, shot it in with the laser and made sure it was the correct elevation.

7/24/2010 Work on riprap continues. Floor is complete and finished the slopes. The track-hoe I was running had some sort of electrical problem and died in the middle of the breach. We tried jumping the battery but nothing worked so it's dead right in the middle of everything. I called Sweat and we just worked around it. Now we have two pieces of equipment down. We tried to unhook the hydraulics and drag it out with the skidsteer but that didn't work either. I'll call Sweat again tomorrow.

7/25/2010 Well, Randy rode out today. He stopped to see if he could help out with the hoe. We put the jumper cables on and it started. I don't know what he did that we didn't

but we were able to move it before it died again. We were able to move it out of way and finished all the riprap. We moved in some dirt and started to wash it in.

7/26/2010 Seven days in to the shift and the lake has only risen about 3 inches. Had I known it wasn't going to fill fast I would've coffered off sooner. All is well, the breach is done. The guys started packing up camp while I raked out our tracks and did some contouring. I used up most of the dirt in the breach. I smashed up the pipe with the hoe and Bob Hopkins used the chop saw to cut up the head gate. Tomorrow we will strap it all to the top of the decks for fly out.

7/27/2010 All we did today was pack up camp. We packed everything but the tents we were sleeping in. All the decks are loaded and strapped down. Most of the metal from the head gate was packed into the feed boxes that were flown in for Alesha. Tomorrow we will finish packing and ride out for the last time.

7/28/2010 After we all woke up we packed away our tents, cots and personal gear. Gary used the hoe to finish raking out our tracks. Everything is packed. Alesha rode in this morning. We loaded up and rode out, and of course it rained all the way. But that's ok, the job is done and we are heading home. All in all it was a good job and I think it all went very well. The breach looks good and the guys did a wonderful job. All that is left to do is fly-out, and the UCC crews can tidy up the area. (Not that we left it a mess). Final inspection is I believe Aug. 18th. I believe it will pass no problems.

Utah Conservation Corp Crews – High Lakes Stabilization Weekly Report

Week **Leader Tom Ogilvie**

6-9-10 to 6-15-10 We setup our camp on a ridge line and had to move it when the weather got bad. We met up with the High Lakes Coordinator after set-up and he showed us how to use the USFS radios and gave us emergency contact info. Met Bureau of Reclamation at Mill Park helicopter staging area where we ran security for millions of dollars worth of equipment. We helped other crews package equipment and supplies. We experienced bad weather for 3 days including heavy winds, snow, sleet rain and hail.

Week **Leader Mercer Owens**

6-14-10 to 6-21-10 We met up with the other crew at Mill Park on the first day and set-up camp. We spent the week running security on thousands of dollars worth of machinery. We played hearts to pass the time.

Week **Leader Tom Ogilvie**

6-21-10 to 6-29-10 We arrived at Mill Park and ran security. We took part in the safety briefing by the USFS and Columbia helicopters. We worked as traffic control during the helicopter lift operation. Crews onsite during the helicopter operation included the Duchesne County Water Conservancy District, US Forest Service, Reclamation and the Columbia Helicopter crew. We hiked up to the East Timothy lake and met the US Forest Service Archeologist, the packers and their animals, the USFS explosives crew and set-up our summer camp. We worked with the USFS trail crew and archeologist to establish trail reroutes.

Week **Leader Mercer Owens**

6-28-10 to 7-6-10 We hiked up to East Timothy Dam today, and met up with crew leader Ogilvie and we worked with the Duchesne County Water Conservancy District crew. We sifted sand and sorted boulders, all of which were removed from the dam.

Deer Lake Construction Report

Week	Leader Tom Ogilvie
7-5-10 to 7-13-10	We hiked up to East Timothy Dam today, and met up with crew leader Owens, and we worked with the Duchesne County Water Conservancy District crew. We sifted sand and sorted boulders, all of which were removed from the dam. We worked with Reclamation at Deer Lake. We spent days on 3 miles of trail reroute.

Week	Leader Mercer Owens
7-12-10 to 7-20-10	We hiked up to East Timothy Dam today and met up with crew leader Ogilvie, and we worked with the Duchesne County Water Conservancy District crew. We worked with concrete and helped create gabion walls in the dam. We spent days on 3.5 miles of trail reroute.

Week	Leader Tom Ogilvie
7-19-10 to 7-27-10	We hiked up to East Timothy Dam today and met up with crew leader Owens. We spent a week on re-routing a tough section of trail to East Timothy. The new reroute now goes around a few trouble spots, mud holes, in a nearby meadow.

Week	Leader Mercer Owens
7-26-10 to 8-2-10	We hiked up to East Timothy Dam today and met up with crew leader Ogilvie, and we worked with the Duchesne County Water Conservancy District crew and Reclamation. We cleaned up the Deer Lake worksite, and rocked a ½ mile of the new trail reroutes created by Ogilvie's crew. We were invited to the USFS High Lakes Coordinator's office where he taught us about what it's like to work with the Government, how to apply to Government jobs and the best route to take to land a Government job.

Week	Leader Tom Ogilvie
8-2-10 to 8-10-10	We worked with the DCWCD crew mixing concrete. We did a lot more trail work and are very proud of the quality of our work. We worked on 3 miles of trail. We did some hiking to some great areas.

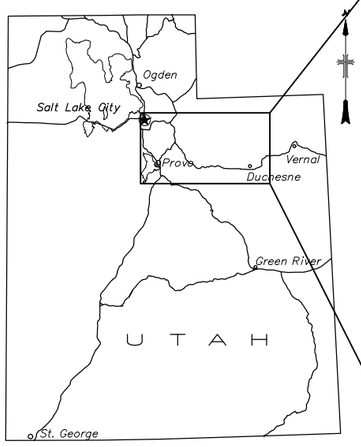
Week	Leader Mercer Owens
8-9-10 to 8-13-10	We hiked up to East Timothy Dam today and worked with the Duchesne County Water Conservancy District crew rehabbing the work site area.

Week	Leader Luke Leclair-Marzolf
8-30-10 to 9-6-10	We hiked up to East Timothy Dam today, hiked up the Swift Creek trail to perform trail maintenance, and performed trail work on about ½ mile of trail. Also, climbed King's Peak and South King's Peak.

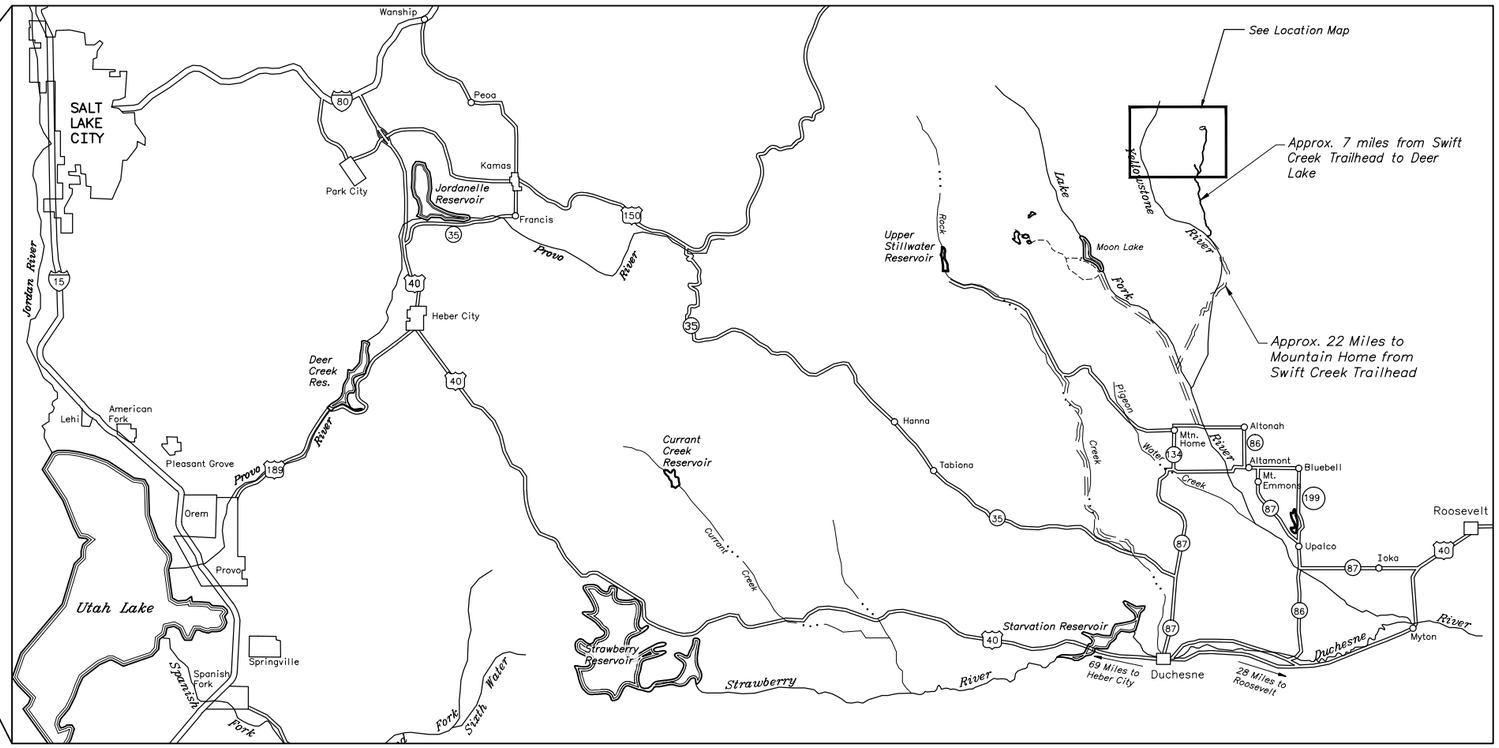
Week	Leader Sara Davis
9-6-10 to 9-13-10	We hiked into the Brown Duck Basin and cleared fallen trees of the trail leading to Kidney Lake (including Brown Duck and Island Lakes), cleared channels, checked for beaver dam removed unburned drift wood from burn piles, and hiked up to Clements Lake in East Basin and did the same. Did work on 13 miles of trail!

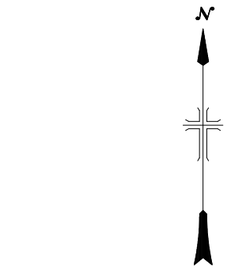
Week	Leader Luke Leclair-Marzolf
9-12-10 to 9-14-10	Hiked up the Swift Creek trail to perform trail maintenance.

Appendix B – Contract Record Drawings



KEY MAP





VICINITY MAP

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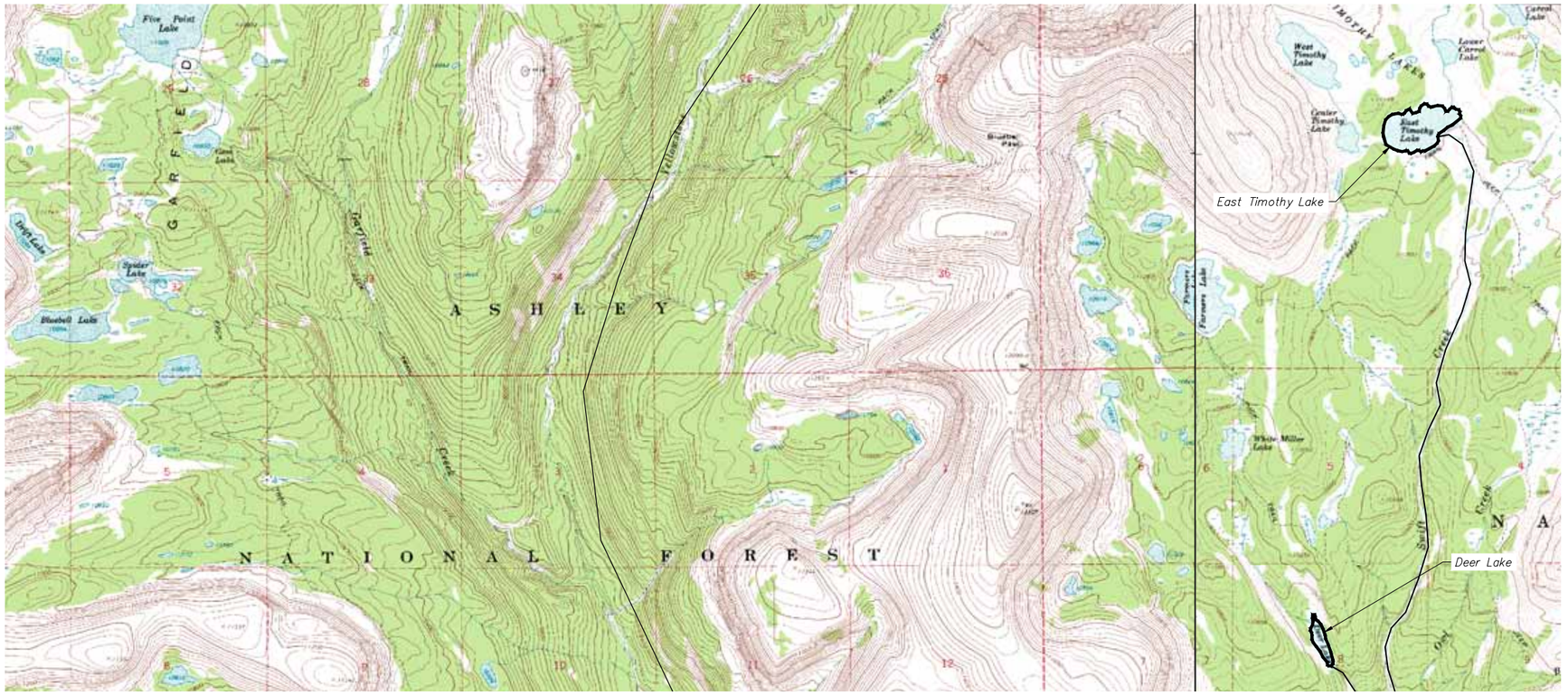
SCALE OF MILES



LOCATION MAP

NOT TO SCALE

Page no.	Drawing no.	Title
1	0A58-418-99	Key Map, Vicinity Map, Location Map and Drawing List
2	0A58-418-100	Deer Lake Plan and Profile
3	0A58-418-101	Deer Lake Sections, Detail and Tables
4	0A58-418-102	East Timothy Lake Overall Plan
5	0A58-418-103	East Timothy Lake Breach Plan and Profile
6	0A58-418-104	East Timothy Lake Breach Sections, Detail and Tables
7	0A58-418-105	East Timothy Lake Existing Outlet Profile

RECLAMATION
Managing Water in the West

REV NO		
1	2010-10-06 Will Spitzenberg	ASBUILT DRAWINGS

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PROVO AREA OFFICE
PROVO, UTAH

SWIFT CREEK BASIN LAKES
EAST TIMOTHY AND DEER LAKES
VICINITY AND LOCATION MAPS - CONTRACT RECORD

DESIGNED _/s/ Michael Draper_ CHECKED_/s/ Scott Winterton, P.E._
DRAWN _/s/ Michael Draper_ TECH. APPR. _/s/ Cary Southworth, P.E._
APPROVED /s/ Joseph Bullough, P.E. PEER REVIEWER

PROVO, UTAH SHEET 1 OF 1 2010-02-11

0A58-418-99

DATE AND TIME PLOTTED
DECEMBER 16, 2010 15:27
PLOTTED BY
WSPITZENBERG

CAD SYSTEM
AutoCAD RM 18.1s
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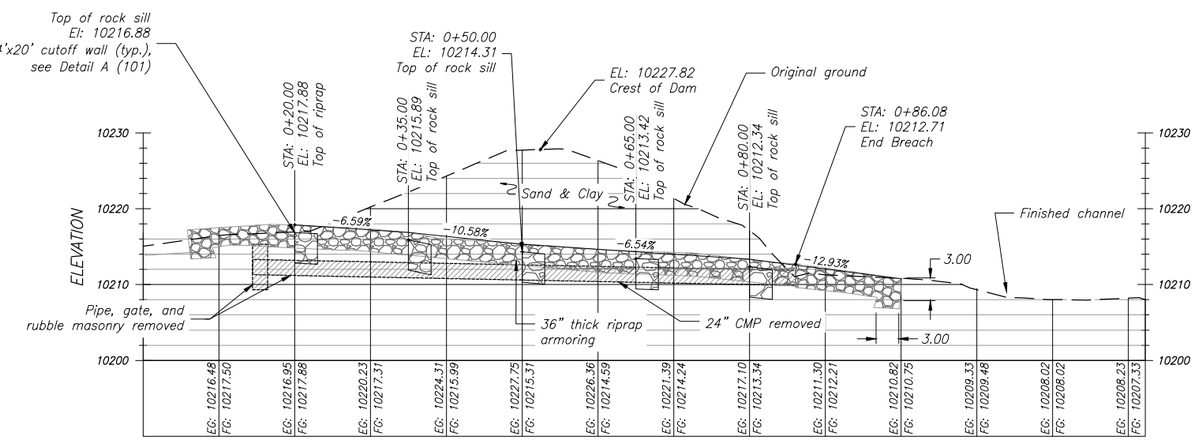
RECLAMATION
Managing Water in the West

PLAN



PROFILE

NOTES

1. Contour interval is 1 foot.
2. Centerline alignment varied along breach to create resting pools. During construction, breach centerline was rotated to avoid disturbing undisturbed soil.
3. Top of riprap El. 10,218. Cut vol. = 2,040 c.y.
4. Sand filter material mixed into riprap for 5 feet every 15 feet through breach.
5. Grid factor = 0.99949466
6. Rock sills are 24"–36" riprap intermixed with smaller rock to lock riprap together.
7. Backfill compacted to the extent possible based on tools allowed to be used. Backfill material is a matrix of 6"–12" rock mixed with fine soil.

REV. NO		
1	2010-10-06 Will Spitzenberg	ASBUILT DRAWINGS

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PROVO AREA OFFICE
PROVO, UTAH

SWIFT CREEK BASIN LAKES
DAM STABILIZATION

DEER LAKE
PLAN AND PROFILE – CONTRACT RECORD

DESIGNED /s/ Will Spitzenberg, P.E. CHECKED /s/ Scott Winterton, P.E.
DRAWN /s/ Will Spitzenberg, P.E. TECH. APPR. /s/ Cary Southworth, P.E.
APPROVED /s/ Joseph Bullough, P.E.
PEER REVIEWER

PROVO, UTAH — SHEET 1 OF 1 — 2010-02-11 — 0A58-418-100

DATE AND TIME PLOTTED
NOVEMBER 11, 2010 12:33
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RECLAMATION
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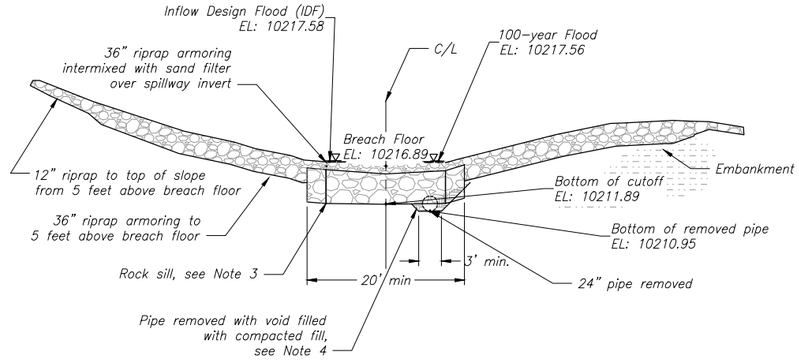
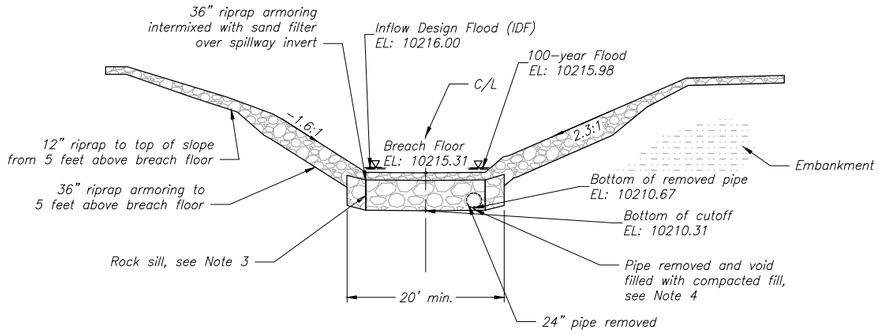
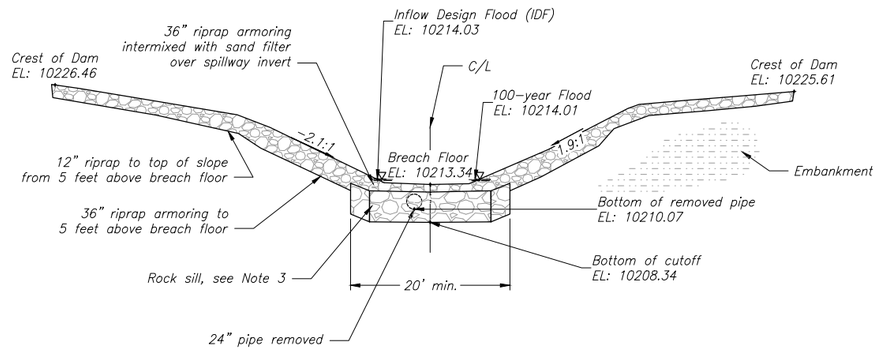


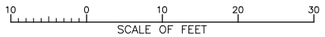
BREACH CHANNEL SECTION AT STA. 0+35

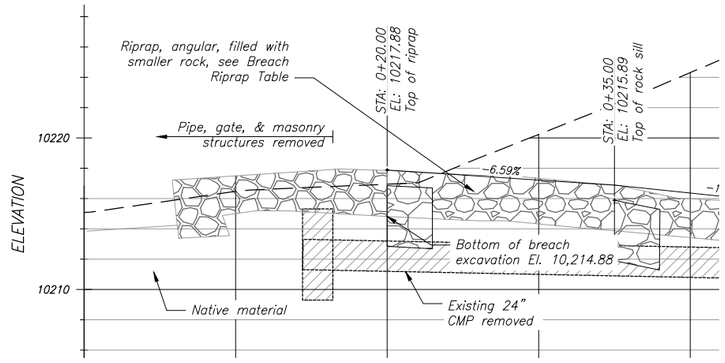


BREACH CHANNEL SECTION AT STA. 0+50

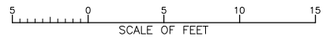


BREACH CHANNEL SECTION AT STA. 0+80





DETAIL A



ROCK SILL ELEVATIONS					
STATION	BREACH FLOOR	TOP OF ROCK SILL	BOTTOM OF ROCK SILL	100 YEAR FLOOD ELEVATION	IDF ELEVATION
0+20	10,217.88	10,216.88	10,212.88	10,218.55	10,218.57
0+35	10,216.89	10,215.89	10,211.89	10,217.56	10,217.58
0+50	10,215.31	10,214.31	10,210.31	10,215.98	10,216.00
0+65	10,214.42	10,213.42	10,209.42	10,215.09	10,215.11
0+80	10,213.34	10,212.34	10,208.34	10,214.01	10,214.03

BREACH RIPRAP				
D MIN.	D15	D50	D MAX.	THICKNESS MIN.
9"	12"	18"	27"	36"

NOTES

1. Flood elevations through the breach represent elevations as if the abandoned spillway does not operate.
2. Riprap placed through breach in layers to maintain correct gradations.
3. Rock sills are 24"–36"ø riprap intermixed with smaller rock to lock riprap together.
4. Backfill compacted to the extent possible based on tools allowed to be used. Backfill material is a matrix of 6"–12" rock mixed with fine soil.

REV NO		
1	2010-10-06 Will Spitzenberg	ASBUILT DRAWINGS

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PROVO AREA OFFICE
PROVO, UTAH

SWIFT CREEK BASIN LAKES
DAM STABILIZATION

DEER LAKE
SECTIONS, DETAIL AND TABLES – CONTRACT RECORD

DESIGNED /s/ Will Spitzenberg, P.E. CHECKED /s/ Scott Winterton, P.E.
DRAWN /s/ Will Spitzenberg, P.E. TECH. APPR. /s/ Cary Southworth, P.E.
APPROVED /s/ Joseph Bullough, P.E.
PEER REVIEWER

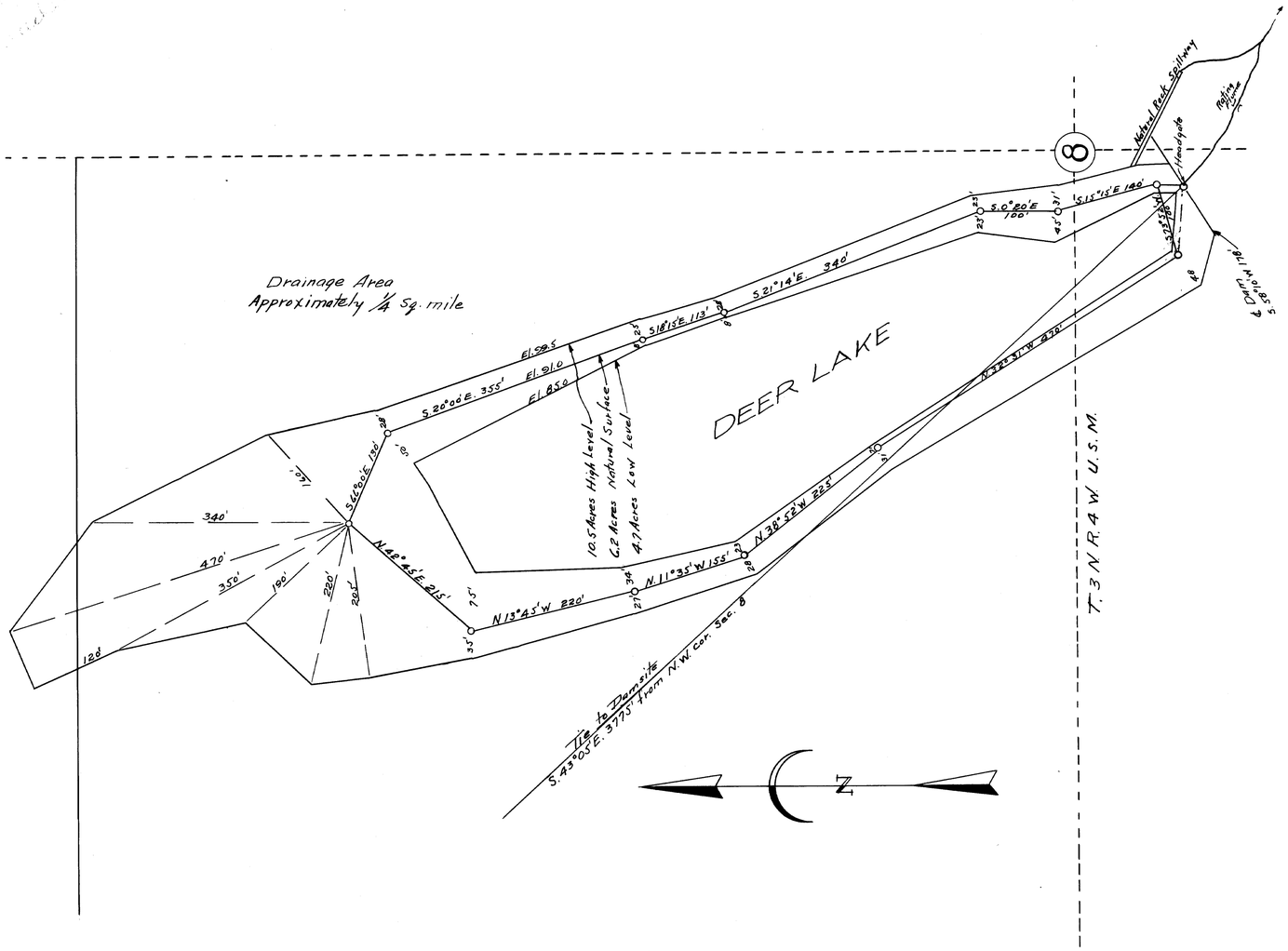
PROVO, UT SHEET 1 OF 1 2010-02-11

OA58-418-101

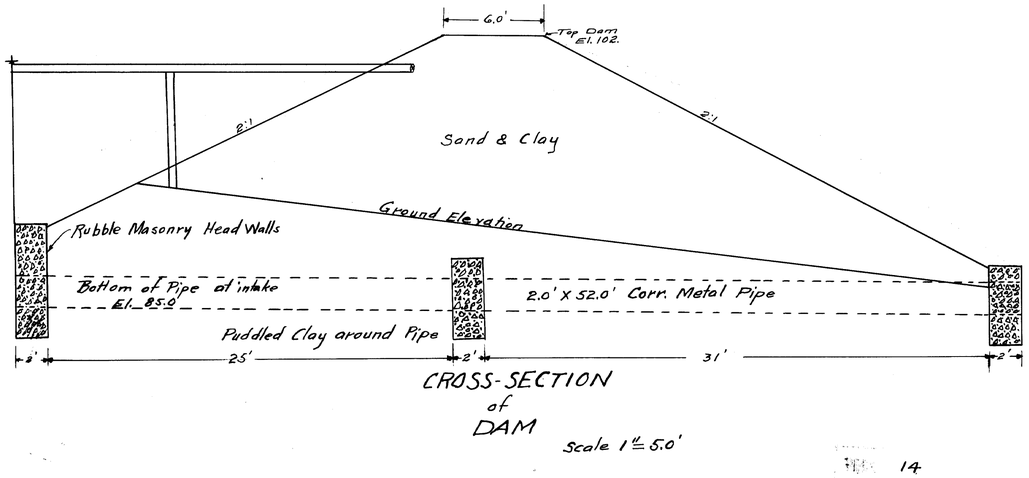
DATE AND TIME PLOTTED
NOVEMBER 10, 2010 12:34
PLOTTED BY
WSPITZENBERG

CAD SYSTEM
AutoCAD RM 18.1s
CAD FILENAME
E:\STTIMOTHY-ASBUILT.DWG

Appendix C – Historical Drawings

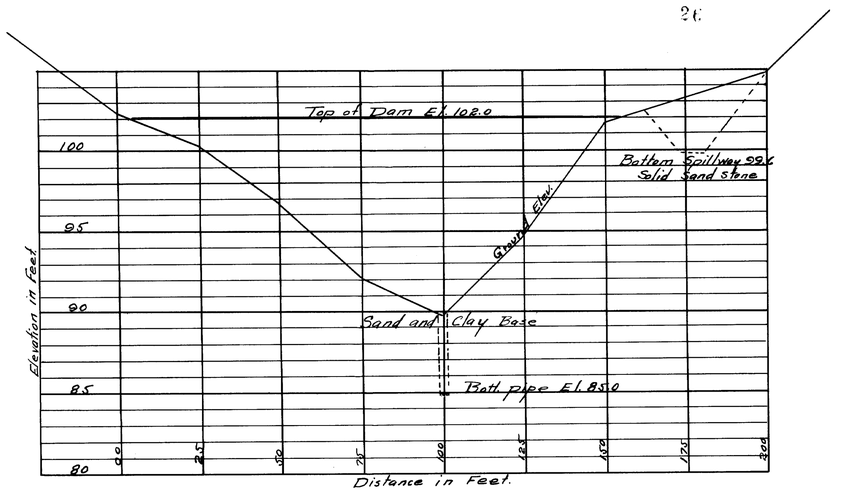


MAP
Scale 1 in = 100 ft.



CROSS-SECTION
of
DAM
Scale 1" = 5.0'

14
2
4



PROFILE
of
DAM

ENGINEER'S CERTIFICATE

C.J. Preece being first duly sworn certifies that he was employed to prepare the plans and specifications for the dam proposed to be constructed in connection with the appropriation of water under application 9628; that these plans consisting of ~~one~~ two sheets indicate the information to be submitted for approval of said plans and the survey of the site was made by him on the 14th day of Aug. 1928.

C. J. Preece

Subscribed and sworn to before me this 21 day of July 1929

Walter Twining
Notary Public.
Duchesne Ut

comm. expires Mar 5, 1930

OWNER'S CERTIFICATE

W. E. Wayne Jr. for Farmers Irrigation Company, being first duly sworn, certifies that he employed C. J. Preece of Duchesne, Utah, to prepare the accompanying plans of dam to be constructed in connection with the appropriation of water under application 9628 and that he hereby accepts these plans.

W. E. Wayne Jr.

Subscribed and sworn to before me this 26 day of July 1929

Walter Twining
Duchesne Ut. Notary Public.
Comm. expires Mar 5 1930

MAP, DRAWINGS AND PROFILE
OF
DEER LAKE RESERVOIR
IN
DUCHESNE COUNTY
BY
FARMERS IRRIGATION COMPANY
Application 9628

Feb. 1929 Scales as shown

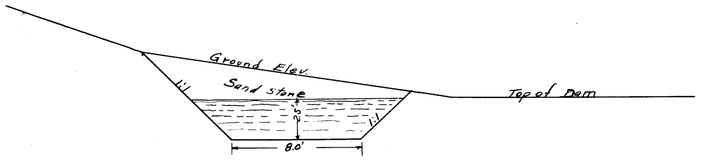
72

Received Feb. 6, 1929
Returned April 13, 1929
Approved Jan. 2, 1931
Geo. M. Bacon
State Engineer

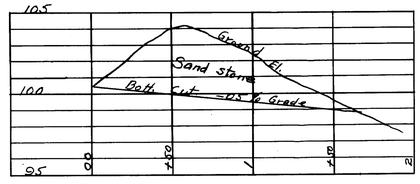
Deer Lake
P-72

H. 1896

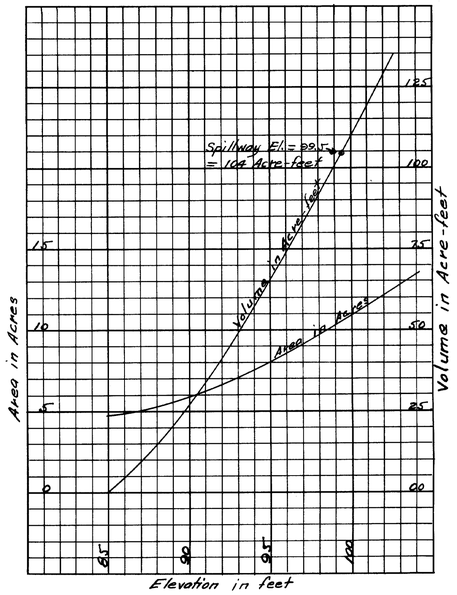
UT87
Hist/Public
1930



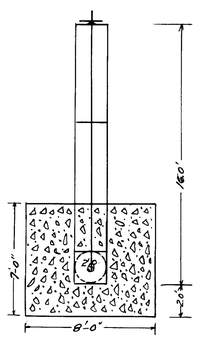
CROSS-SECTION
OF
SPILLWAY
Scale 1"=5'



PROFILE
OF
SPILLWAY



CAPACITY CURVE



Burnham Gate
With
Rubble Masonry
Head Wall

DEER LAKE
Application
9628

73

Deer Lake P-73

H-280
UT37
Duchesne

HAER
UTAH
7-MOHO.V
1-D-

HISTORIC AMERICAN ENGINEERING RECORD

High Mountain Dams in Upalco Unit, Deer Lake Dam

HAER No. UT-42-D

Location:	5.8 miles north of Swift Creek Campground, Ashley National Forest Mountain Home vicinity, Duchesne County, Utah UTM: 12.553860.4502350 Quad: Mount Emmons
Date of Construction:	c. 1925
Builder/Designer:	Farmers Irrigation Company
Present Owner:	Moon Lake Water Users Association, Roosevelt, Utah 84066
Original Use:	Dam
Present Use:	Dam
Significance:	Deer Lake is one of several natural high mountain lakes in the Swift Creek and Yellowstone River drainages dammed by the Farmers Irrigation Company in the 1920s and 1930s to store water for irrigation. The dam is a representative example of small-scale earth-fill construction in the Upalco Unit of the Central Utah Project.
Inventoried by:	Clayton Fraser and James Jurale Fraserdesign Loveland, Colorado October 19, 1985

HISTORICAL INFORMATION

On June 25, 1925, the National Forest Service issued a special use permit to the Farmers Irrigation Company for "constructing and maintaining a dam and storing water for irrigation purposes" on Deer Lake in the Swift Creek drainage. A small--approximately 8 acres--but relatively deep lake, Deer Lake was limited in littoral area because of its narrow confines between two ridges. The lake receives flows from both White Miller and Farmers lakes--two other Farmers Irrigation Company reservoirs--and now acts as a regulating reservoir. The 140-foot-long, 18-foot-high dam is an earth-fill structure, with stone riprap on both the sloped upstream and downstream faces. It is drained by a 30-inch diameter gated steel pipe outlet, with a small timber weir for an overflow spillway. It is proposed that the dam be altered somewhat to return the lake to its natural level.

ARCHITECTURAL INFORMATION

Dam length:	140 feet
Dam height:	18 feet
Dam width:	7 feet
Construct:	Earth fill dam with stone riprap facing
Lake size:	11.0 acres; 249 acre-feet maximum capacity; 14 vertical foot maximum drawdown
Outlet:	Gated pipe; timber weir spillway

BIOGRAPHICAL INFORMATION

"Preliminary Engineering Report: Stabilization of High Mountain Lakes, Upalco Unit," National Forest Service Report, 1968, n.p.

William F. Gentleman, "Report on the Lakes and Reservoir of the Headwaters of the Uintah, Whiterocks and Lakefork Rivers, Uintah Project, Utah; February 1932," page 20.

Deer Lake Reservoir File #5154, Roosevelt District Ranger Office, Ashley National Forest, Roosevelt, Utah.

Field inspection by Clayton Fraser and Robert Righter, July 24, 1985.

For additional information, see Irrigation Canals in the Uinta Basin, HAER No. UT-30.


HAER NO. UT-42-D-3
KODAK SAFETY FILM 6043
8


HAER NO. UT-42-D-5
KODAK SAFETY FILM 6043

Appendix D – Letters of Approval

USDA United States Department of Agriculture | Forest Service | Ashley National Forest | Supervisor's Office
355 North Vernal Avenue
Vernal, UT 84078

File Code: 2320
Date: September 16, 2010

Mark Holden
CUP Mitigation Commission
230 South 500 East
Suite 230
Salt Lake City, UT 84102-2045

Dear Mr. Holden,

In the summer of 2010, Deer and East Timothy lakes in the Swift Creek Basin were stabilized as planned. A breach was cut through each dam for passage of the maximum inflow design flood. The slopes were laid back on a 2.5:1 slope and the breaches were rip-rapped. Grouted gabion structures were installed on the bottom of the breach, as grade control at East Timothy. The outlet pipe was filled with grout at East Timothy. Several rock seals were installed for grade control at Deer. The outlet pipe was removed at Deer. The dams and spillways were cleared of woody debris and will be left in place as a monument to the men who built those years ago.

The State of Utah has downgraded the dams to a "No Hazard" inactive structure on their inventory and they are no longer going to regularly inspect the dams. The work performed has eliminated the risk to property below the dams and the Forest Service agrees with the state's "No Hazard" rating.

The Forest Service appreciates the work of the Mitigation Commission, State of Utah, Moon Lake Water Users, Duchesne County Water Conservancy District, Bureau of Reclamation, and the Central Utah Water Conservancy District on the High Lake Stabilization Project. This work has successfully completed the field work for the High Lakes Stabilization Project.

If you have any questions, please contact Valton Mortenson, Civil Engineer, at (435) 781-5147.

Sincerely,

KEVIN B. ELLIOTT
Forest Supervisor

cc: Bob Leake
Scott Winterton
Kirk Beecher
Randy Crozier
Rick Sweat
Everett Taylor
Brian Paul

MITIGATION COMMISSION
OFFICIAL FILE COPY
CLASSIFICATION
PROJECT
FOLDER CONTROL
SEP 2 2 2010

CODE	INITIALS
MC 02	

MITIGATION COMMISSION
OFFICIAL FILE COPY
CLASSIFICATION
PROJECT
FOLDER CONTROL
SEP 14 2010
CODE INITIALS
MC02
MC01

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Water Rights
KENT L. JONES
State Engineer/Division Director

September 8, 2010

Utah Reclamation Mitigation & Conservation Commission
230 South 500 East, Suite 230
Salt Lake City, UT 84102

Attention: Mark Holden, Project Manager

Re: East Timothy – UT00099, Deer Lake – UT00087

Final inspections of East Timothy and Deer Lake dams were conducted on Thursday, August 19, 2010, with the following in attendance:

Name	*Representing*
Randy Crozier	Duchesne County Water Conservancy Dist.
Valton Mortensen, Brian Paul	USFS, Ashley National Forest
Mark Holden	Utah Reclamation Mitigation & Conservation Commission
Bob Leake, Brad Weber	Division of Water Rights, Vernal Office
Everett Taylor (Visited 8/12/2010)	Division of Water Rights, Dam Safety
Kirk Beecher	Central Utah Water Conservancy District
Rick Sweat, Red Taylor, Scott Winterton, Will Spitzenberg,	US Bureau of Reclamation

This letter will serve as official notice of our acceptance of the project, pursuant to Section 73-5a-304 of the Utah Code Annotated 1953, as amended, contingent upon the completion of the following items:

1. Within 60 Days of the project's completion the State Engineer must be supplied with a final set of "As Constructed" drawings. These drawings should be marked as "Record Drawings" or other designation indicating the final status of these documents. The drawings can be submitted electronically in either a .pdf or .tif format. Alternatively, these drawings may be submitted on a mylar medium.

Based on our final inspection and acceptance of the project, the referenced dams are considered to be stabilized and will be reclassified on the State Dam Inventory as inactive dams.

UTAH DNR WATER RIGHTS

1594 West North Temple, Suite 220, PO Box 146300, Salt Lake City, UT 84114-6300
telephone (801) 538-7240 • facsimile (801) 538-7467 • TTY (801) 538-7458 • www.waterrights.utah.gov

I have included a copy of our inspection report with this letter for your information. As always, if you have any questions or would like to discuss any of the aforementioned items in further detail, please contact me at (801) 538-7376 or Everett Taylor at (801) 538-7372.

Sincerely,

David K. Marble, P.E.
Assistant State Engineer

DKM/ewt/jm

Enclosures

DIVISION OF WATER RIGHTS - DAM SAFETY SECTION
DAM INSPECTION REPORT – 2010

Dam Name/Number:	**Deer Lake, UT00087**		
Date:	8/19/2010	Hazard:	Inactive
Storage Level:	~10217'	Dam Type:	Earthen
Spillway Flow:	0 cfs	Purpose of Inspection:	Final
Outlet Flow:	0 cfs	Weather:	Partly Cloudy

Representatives at the Inspection:

Name	*Representing*
Randy Crozier	Duchesne County Water Conservancy Dist.
Valton Mortensen, Brian Paul	USFS, Ashley National Forest
Mark Holden	Utah Reclamation Mitigation & Conservation Commission
Bob Leake, Brad Weber	Division of Water Rights, Vernal Office
Everett Taylor (Visited 8/12/2010)	Division of Water Rights, Dam Safety
Kirk Beecher	Central Utah Water Conservancy District
Rick Sweat, Red Taylor, Scott Winterton, Will Spitzenberg,	US Bureau of Reclamation

Comments:
1. This inspection was performed to finalize the project after the dam was breached, restoring the lake to the natural lake level and reducing the dam to "No Hazard" status.

Necessary Maintenance and Repair:
1. None. Punchlist items were discussed on August 12, 2010, and included: 1. Remove driftwood from the spillway; 2. Move the burn pile away from the reservoir so USFS can burn it later this fall. All items of work have been completed.

Embankment:	
Crest:	Good.
US Slope:	Good.
DS Slope:	Good

Abutments/Foundation:	
L Abutment:	Good.
R Abutment:	Good.
US Toe:	Good.
DS Toe:	Good.

Reservoir Basin:	
Shore Stability:	Good.
Reservoir Bottom:	Natural Lake is inundating the basin.

Spillway:	
Freeboard:	0.5 – 1' below breach.
Intake:	Good.
Concrete Structures:	Not Applicable.
Outfall/Stilling Basin:	Good.

Outlet:	
Conduit:	Not Applicable.
Intake:	Not Applicable.
Channel/Stilling Basin:	Not Applicable.
Controls/Venting:	Not Applicable.

Instrumentation:	
Monuments:	Not Applicable.
Staff Gage:	Not Applicable.
Piezometers:	Not Applicable.
Drains:	Not Applicable