High Lakes Stabilization
Construction Report

Uinta Basin Replacement Project

Garfield Basin
Five Point Lake, Bluebell Lake, Drift Lake, Superior Lake
High Lakes Stabilization Construction Report

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Garfield Basin
Five Point Lake, Bluebell Lake, Drift Lake, Superior Lake

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 rights 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 enlargement of Big Sand Wash Reservoir.

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.

This report includes work completed during 2009 to stabilize Five Point, Bluebell, Drift, and Superior lakes in the Garfield Basin. Contract record drawings showing location maps and applicable details for each of the lakes are included in the Appendices. For complete details on design analysis and methodology of the process used to stabilize these lakes, please refer to the High Lake Stabilization Technical Memorandum for Garfield Basin dated January 2009 by the Bureau of Reclamation, Upper Colorado Region, Provo Area Office.

Garfield Basin Construction

Construction Oversight

Construction oversight throughout the project was accomplished by multiple entities. The U.S. Forest Service, Department of the Interior, Utah Reclamation Mitigation and Conservation Commission, Utah Department of Natural Resources, U.S. Fish and Wildlife Service, Duchesne County Water Conservancy District, Central Utah Water Conservancy District, Utah Division of Water Rights, Moon Lake Water Users Association, and the Bureau of Reclamation (Reclamation) were involved in ensuring a successful project was accomplished.
It should be noted that all of the construction work on these four Garfield Basin Lakes (Five Point, Bluebell, Drift, and Superior) was done by the Duchesne County Water Conservancy District (DCWCD). The DCWCD crews set their base camp near Five Point Lake and started work on Five Point, Bluebell, and Drift concurrently. The DCWCD crews worked on Superior Lake after Bluebell and Drift Lakes were completed.

**Helicopter Fly in**

Equipment and materials were brought to the staging area at 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 sites at each lake.

![Columbia Helicopter used to transport equipment to worksite.](image1)

**Figure 1:** Columbia Helicopter used to transport equipment to worksite.

![Helicopter picking up supplies to drop off at Five Point Lake.](image2)

**Figure 2:** Helicopter picking up supplies to drop off at Five Point Lake.
Equipment

5 – Caterpillar 305C Trackhoes
3 – Caterpillar 287B Skid Steer Loaders
4 – Honda Generators; 4 – Trash Pumps
4 – Concrete Mixers; 1 – Grout Plant – Chem Grout - Self Contained
Miscellaneous Hand Tools - shovels, sledgehammers, pry bars, cross cut saws, axes, pedestal
gate stand, sawz-all, pipe wrenches, diesel and gasoline fuel containers generator, arc welder, air
compressor and power tools for equipment repair & assembly, 1 roll of fuel containment pond
liner & 2 rolls of visqueen w/ nylon tarp cover (30' x 40') w/nylon reinforcement & 10  planks
(4x4x12), hoses, fittings & nozzles (for trash pump, for flushing outlet pipe and serving as a
gROUT plant back-up)

Figure 3: Equipment used at Garfield Basin.

Figure 4: Reclamation and DCWCD crew at Mill Park preparing equipment and supplies for fly in.
Five Point Lake Construction

Five Point Lake is located near the top of Garfield Creek. It had a surface area of about 87 acres at the existing spillway and held approximately 627 acre-feet of water. The dam was a homogeneous earthfill embankment with stone riprap facing. The dam was 15 feet high and has a 24-inch diameter low-level outlet pipe (62 feet long) located at the maximum section. There was a concrete-walled vertical shaft located on top of the dam; it extended from the top of the dam, down through the dam to the outlet pipe.

The outlet headworks was removed and the existing 24-inch pipe was grouted shut. A breach was constructed to restore the outlet flows from Five Point Lake to its natural drainage. A summary of the work completed is given herein and a copy of the crew’s daily log is included in Appendix A.

June 18-June 20 Activities at Five Point Lake began on Thursday, June 18th, 2009. The Duchesne County Water Conservancy District (DCWCD) crew hiked in and set up camp and put up containment cover for the fuel tanks. Equipment and supplies were flown in successfully by the Helitech crew.

![Figure 5: Crew clearing snow from spillway at Five Point.](image)

June 21-June 27 The DCWCD crew continued work on Five Point on Monday, June 22nd by removing riprap from the upstream and downstream faces of the dam and collecting rocks for the gabion baskets. The crew also started excavation of the breach and removed the headgate and upper portion of the concrete wet well.
June 29-July 4 Survey staking indicated differences in elevations from the design. Randy Crozier, DCWCD General Manager and construction foreman, contacted Valton Mortenson regarding the break in elevation compared to the design drawings at Five Point Lake. The actual elevation as surveyed and staked in the field for the bed of the existing outlet channel was ~ 0.8 feet lower than was shown on the design drawing. To make up for this drop, Randy proposed to lower the elevation of the middle and lower gabions by 0.8 feet. This would preserve the slope between the middle and lower gabions, but would increase the slope between the upper and middle gabions. Valton contacted Cary Southworth and Scott Winterton at USBR to discuss this
Garfield Basin Construction Report

proposal. Scott analyzed the change in slope due to the proposed drop in elevation of the middle and lower gabions, and determined the slope would still be less than 5%. This would stay within the design criteria we had established as a target to ensure fish passage. Also, the riprap sizing for the entire outlet channel was calculated based on the highest slope (between the middle and lower gabions) on the initial design. This slope is staying the same. They concluded that the riprap sizes identified in the design would be adequate to protect the outlet channel if the revisions were made. Scott Winterton discussed this with Everett Taylor, Utah Division of Water Rights, on June 30, 2009, and Everett concurred with the proposed design change.

Valton Mortenson visited the site July 1-3 for an inspection. During the inspection, Valton reviewed the elevation markings and verified that the elevation marked on the upstream stakes and the downstream stakes did not tie out; there was a 3 foot elevation bust. He assumed this occurred because the downstream portion of the dam was staked while covered by a snow drift. The breach channel had been shifted to the right hand side by 3.5 feet to help lengthen the channel. The downstream gabion was shown on the drawing to be in the existing outlet channel. It was impossible to install it in this location due to the amount of water, so it was installed at Sta 1+10. The downstream portion of the gabion is at Sta 1+10 and the upstream portion at Sta 1+07. This gabion was installed after placing a temporary coffer dam at the inlet. The elevation of the top of gabion is 10,991. The gabion was installed in several lifts by placing a layer of gabion rock and then a layer of cement and having hand crew with muck boots mix everything together to fill all the voids. They used 67 bags of 47 pound cement. This type of cement placement eliminates voids but it uses more cement. Figuring a 6-bag mix, the crew made 5.5 cubic yards of cement for the gabion. The estimates were to use approximately 4 cubic yards of cement for the gabion. The middle gabion was moved upstream to Sta 0+60. This was done so that it could be set in the breach of the dam section and not near the outlet pipe headwall. At Sta 0+70 where the gabion was called for, the removal of the outlet pipe headwall would have removed all of the soil on the left hand side of the gabion. The gabion was placed at elevation 10,993.73. The gabion was installed just like the downstream gabion. The upstream gabion was lowered to elevation 10,996. This provides a 4.5 percent slope for the breach channel. The elevation of 10,996 also fits the old lake level better as this elevation corresponds with the top of the rock ring of the pre-dam lake. The Crew set top of control gabion at 10,996.0 as approved, with top of riprap at 10,997.0. Valton Mortenson arranged a conference call among the parties to discuss the in-field adjustments that had been made. This discussion occurred and the changes were approved.

NOTE: The as-built survey was conducted after the project was complete. The survey data indicates the stabilized elevation is 10,998.0 feet, where the design designated an elevation of 10,997.0 feet. Based on the WMS SMPDBK model for Five Point Lake established by Reclamation engineers, the maximum breach flow was designed to be 450 cfs with the anticipated maximum depth in the channel downstream of the dam equal to 3.9 feet. By increasing the breach elevation to 10,998.0 feet, as currently constructed, the maximum breach flow would be 566 cfs with the corresponding maximum depth downstream of the dam equal to 4.3 feet. The anticipated increase in flood depth between design and construction is 0.4 feet. According to the digital elevation model (DEM) utilized in the WMS SMPDBK analysis, the increase in breach flow would not appear to result in significant additional environmental impact. It is important to note DEM’s available for remote areas such as this have limited resolution making it difficult to clearly delineate small mountain streams. The maximum depth section
appears to be a small length of the stream in a narrower reach of the channel. The majority of the output file from the SMPDBK analysis indicates the maximum depths are 2-3 feet. In wide, flat, meadow areas, the difference in flow depths for 450 cfs to 566 cfs would be less than 0.4 feet and Reclamation’s opinion is the anticipated additional impact would be negligible. The Utah State Division of Water Rights concurs with this assessment, and Five Point Lake Dam is regarded as a “No Hazard” dam and will be removed from the State’s active inventory.

Figure 8: Crew using trackhoe to remove outlet works at Five Point.

Figure 9: Removing inlet structure at Five Point.
Figure 10: Installation of the middle cutoff wall at Five Point.

Figure 11: Grouting operation with DCWCD hand crew for cutoff walls.
July 6-July 11 Work continued at Five Point; the crew moved old equipment to the flight deck and removed wire from the old spillway. All old equipment was photographed, and inventoried for later disposition according to the Memorandum of Agreement for cultural and historic resources. The crew also continued gathering riprap. The Forest Service arrived on July 10th and set up a safety hut for the crew.
July 12-July 18  
Work continued at Five Point Lake. The DCWCD crew installed temporary and permanent coffer dams, and removed the inlet structure using a hydraulic stinger attachment. The crew also removed the concrete box culvert on the upstream end. They finished removing the downstream headwall and grouted the outlet pipe and old wet-well. The grouting required 420 bags (47 lbs each) of Type I Cement powder, mixed with water and Super-P. The crew started cleaning up and broke down the grout plant. They also removed wire from old spillway, and continued to riprap the channel.

Figure 14: Inlet structure being removed using a stinger attachment.

Figure 15: Installing gabion basket at outlet pipe prior to grouting.
July 19-July 25

The DCWCD crew continued to riprap the channel until it was all completed and worked on naturalizing the old lake shore basin and washed fines into the new outlet channel.
July 26-Aug. 1

Activities continued at Five Point with Dex Winterton coming in to relieve Randy Crozier on Sunday, July 26th. The DCWCD crew finished up their work and started clean-up and packaging materials and equipment for fly out. They also did some dress up and rehabilitation work in the areas where the riprap was removed. Old equipment that was onsite was repackaged and bundled for fly out. The crew left one Fresno scraper and a roller on the dam for historical purposes.
Aug. 2-Aug. 8  

Final Inspection was conducted on Aug. 6th, 2009 for Five Point with the following people present: Bob Leake and Brad Weber (Utah Division of Water Rights), Valton Mortenson and Brian Paul (U.S. Forest Service), Scott Winterton (U.S. Bureau of Reclamation), and Hailey Crozier and Dex Winterton (DCWCD). The inspection crew found the Five Point Lake work to be satisfactory. They asked the crew to remove the stakes and flags as well as turn over painted rocks so the public doesn’t notice any paint on the rocks. The hand crew worked on re-packaging and arranging the tool house for fly out.
Bluebell Lake is also located near the top of Garfield Creek. Bluebell Lake Dam was constructed in 1930 by Farmers Irrigation Company to improve late season water storage in the High Uintas. It had a surface area of about 48 acres at the existing spillway and held
approximately 235 acre-feet of water. The dam was a homogeneous earthfill embankment with stone riprap facing. The dam was 8 feet high and had 24-inch diameter low-level outlet pipe (22 feet long) located at the maximum section. The outlet pipe was slip-lined with a smaller diameter High Density Poly Ethylene (HDPE) pipe in the late 1980s. The void between the 24-inch diameter pipe and the inner HDPE pipe was filled with grout.

The outlet headworks and the existing 24-inch pipe was removed. A breach was constructed along the original outlet alignment to restore the outlet flows from Bluebell Lake to its natural drainage. A summary of the work completed is given herein and a copy of the crew’s daily log is included in Appendix A.

**June 21-June 27**  
Construction activities at Bluebell Lake began on Tuesday, June 23rd, 2009. The DCWCD crew hiked from base camp near Five Point every day to work on Bluebell. The DCWCD crew removed the headgate and excavated main embankment to the top of pipe and removed section of old CMP pipe using a combination of hand tools and mechanized equipment. The crew moved pipe pieces into a pile ready for fly out.

![DCWCD crew removing headgate.](image)
June 29-July 4  The DCWCD crew resumed work at Bluebell on Monday by placing an earthen coffer dam and removing the outlet pipe and head structure. The breach grade was rebuilt using rock sills. The crew continued constructing the main channel and placing riprap in the channel.
Figure 26: Hand crew assisting with breaking up concrete structure with sledge hammers which was proven ineffective, so they used the stinger attachment to get the job done. Bluebell Lake.

July 6-July 11

The crew continued working on Bluebell on July 6th with the placing of riprap and washing fines in the channel. They also loaded scrap metal, headgate, and outlet pipe on deck ready for fly out. The hand crew piled all slash to be burned and loaded the tool house on the containment deck and packaged deck for fly out.

Figure 27: Looking upstream to the finished channel w/ riprap in place.
July 12-July 17  
On July 15th, Valton Mortenson and Randy Crozier inspected the completed work.

Aug. 2-Aug. 8  
The final inspection for Bluebell Lake was conducted on August 5th with the following people present: Bob Leake and Brad Weber (Utah Division of Water Rights), Valton Mortenson and Brian Paul (U.S. Forest Service), Scott Winterton (U.S. Bureau of Reclamation), and Hailey Crozier and Dex Winterton (DCWCD). The inspection crew found the work at Bluebell Lake to be satisfactory with some minor items the crew needed to take care of before hiking out.

The crew needed to remove a sand bag, one piece of concrete, wooden stakes and flagging before fly out. The crew also needed to rake out some trackhoe ruts in the meadow.

Final work was completed on Aug. 7th when crew members rehabilitated the meadow and cleaned up micro litter.

Drift Lake Construction

Drift Lake is also located near the top of Garfield Creek. It had a surface area of about 31 acres at the existing spillway and held approximately 158 acre-feet of water. The dam was a homogeneous earthfill embankment with stone riprap facing. The dam was 12 feet high and had a 24-inch diameter low-level outlet pipe (44 feet long) located at the maximum section. The outlet pipe was slip-lined with a smaller diameter HDPE pipe in the late 1980s. The void between the 24-inch diameter pipe and the inner HDPE pipe was filled with grout.

The outlet headworks was removed and the existing 24-inch pipe was also removed. A breach was constructed to restore the outlet flows from Drift Lake to its natural drainage. A summary of the work completed is given herein and a copy of the crew’s daily log is included in Appendix A of this report.

June 21-June 27  
Construction activities at Drift Lake began on Tuesday, June 23rd, 2009. The DCWCD crew hiked in from base camp and worked on removing the headgate. The crew put containment covers over fuel tanks and worked on removing the snow drift from below the dam. Two trackhoes were used to remove rocks and excavate the breach.
June 29-July 4  Work at Drift continued after a Sunday off. The crew verified grades and finished constructing main channel and placing riprap. Valton Mortenson rode in on July 1st and the crew discussed grades to make sure it worked with existing conditions.
July 6-July 11

The crew continued work at Drift on July 6th by cutting the final grade and putting in a permanent coffer dam. Crew also removed outlet pipe using stinger attachment on trackhoe. The hand crew continued placing riprap and washed fines into the channel. They also piled all slash to be burned and loaded old equipment on deck and packaged for fly out.
Figure 31: Crew cutting final grade.

Figure 32: Temporary coffer dam put in place to control water flow.
July 13-July 18  Valton Mortenson and Randy Crozier inspected the work on July 15th and discussed additional work to be done at Drift. The crew worked on finishing the outlet channel, placing riprap and shaping the entrance side slopes with two trackhoes.

Figure 33: Crew used trackhoe to remove the outlet pipe.

Figure 34: Rock sills placed in channel.
Work continued at Drift Lake with the DCWCD crew placing riprap at the channel and slopes using two trackhoes. Other crew members moved supplies to the south side of the cut in the dam.

Activities at Drift continued on July 27th. The crew finished sealing up channel seepage and did some clean-up and dressed-up channel. The
hand crew packaged for fly out and cleaned up area by cutting and gathering angle irons and scrap metals. Other crew members worked on gathering drift wood and other organic materials to place in burn pile.

Figure 37: Looking upstream on the completed breach channel at Drift Lake.

**Aug. 2-Aug. 8**

The final inspection for Drift Lake was conducted on August 5\textsuperscript{th} with the following people present: Bob Leake and Brad Weber (Utah Division of Water Rights), Valton Mortenson and Brian Paul (U.S. Forest Service), Scott Winterton (U.S. Bureau of Reclamation), and Hailey Crozier and Dex Winterton (DCWCD). The inspection team found the work at Drift Lake to be satisfactory. The crew did final cleanup by turning over painted rocks and cleaning up the micro litter.
Superior Lake Construction

Superior Lake is located near the top of Garfield Creek. It had a surface area of about 38 acres at the existing spillway and held approximately 320 acre-feet of water. The dam was a homogeneous earthfill embankment with stone riprap facing. The dam was 15 feet high and has a 20-inch diameter low-level outlet pipe (38 feet long) located at the maximum section.

The existing outlet channel from Superior Lake is diverted from its natural channel about 0.2 miles downstream of Superior Lake Dam, and a small canal conveys the water into Five Point Lake. As part of the stabilization project, the channel was rehabilitated to restore the outlet flows from Superior Lake to its natural drainage.

**June 21-June 27**  
Construction activities at Superior Lake began on Sunday, June 21st, 2009. The DCWCD crews put in a temporary diversion and backup dam in the old canal.

**June 29-July 4**  
The DCWCD hand crew replaced the temporary cutoff dam and began removing gabions from the old spillway.

**July 6-July 11**  
Work on Superior Lake continued on Tuesday, July 7th with the DCWCD hand crew continuing to remove gabions and membrane from the old spillway.
Construction continued on Superior Lake on Wednesday, July 15th. Valton Mortenson and Randy Crozier discussed and verified the location for the stream reconnects.

Activities at Superior Lake resumed on July 20th. The hand crew collected rocks for gabion cutoff walls using wheelbarrows. The crew completed three stream reconnects on the way to Superior and moved 1 trackhoe, 1 skid steer, grout plant, hydraulic hammer, and a 30 inch bucket from Five Point to Superior Lake. The crew worked on removing riprap and wired the headgate open and cut the stem. The hand crew removed the old gate operator and cut off additional stem length on the outlet works. The other crew members laid out upstream gabion location and determined old lake elevation and grades as per the plans.
Figure 41: Outlet channel prior to construction.

Figure 39: Crew cutting through dam at Superior Lake.
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Figure 40: Completed breach prior to placing gabion cutoff walls and riprap.

**July 26-Aug 1** Construction continued at Superior Lake with Randy Crozier riding in on Sunday to replace Dex Winterton as supervisor. The crew started cutting through the dam with the trackhoe and skid steer, while other crew members screened filter sand. The gabion cutoff wall was placed and the crew verified location with Valton Mortenson and Randy Crozier. The crew set up the safety shower and continued removing material from the cut. The hand crew constructed three 3x3x9 feet gabion baskets for the cutoff walls. They also piled driftwood and organic material at the burn pile. A temporary coffer dam was constructed to slow the flow of water.
Figure 41: Placing of cutoff wall at top of breach.

Figure 42: Grouting operation for the gabion cutoff walls.
Aug. 3-Aug. 8

Work continued at Superior Lake on Monday, August 3rd. The crew placed a permanent coffer dam and removed the headgate and about 10 feet of the outlet pipe on the upstream end.

The crew installed a 3x3x3 gabion on the upstream side of the outlet pipe and a 3x3x6 foot gabion at the downstream side of the outlet pipe to assure a solid connection to the outlet pipe. The outlet pipe grouting
operation started on August 5th and the crew quickly learned that the outlet pipe had several holes in it which required extra cement bags to fill. Bob Leake and Brad Weber rode to Five Point to carry 40 leftover bags of cement back to Superior Lake using their pack horses, enabling the crew to fill the Superior outlet pipe. The calculated volume of cement needed to grout the outlet pipe was 140 bags, when all was completed the crew used 189 bags of cement (47 pounds each) to fully grout the outlet pipe. Filter sand and gravel was installed at the downstream side of the lower outlet gabion to bedrock.

The crew placed the middle and upstream gabion walls on Tuesday. They did not encounter bedrock at these locations. The crew used 68 bags of 47 pound cement for the upstream gabion and also for the middle gabion.

The inspection team stopped by on August 5th and determined that the upstream gabion wall was too narrow on one side. The inspection team directed the DCWCD crew to chip out a 9 foot section of the gabion on the right hand side and extend the flat portion to the specified length of 15 feet. The crew removed 9 feet of the front gabion on the west side as directed and re-installed it.

Figure 45: Hand crew cutting off a portion of the outlet pipe prior to grouting.
Figure 46: Removing the upstream portion of the outlet pipe.

Figure 50: Grouting operation underway for plugging the outlet pipe.
Figure 47: Crew sealed outlet pipe by placing 3’x3’x3’ gabion basket filled with rock and grout on the upstream side of the outlet pipe.

Figure 48: Sand filter in place at plugged outlet.

Aug. 10-Aug. 15  Construction resumed at Superior Lake after a Sunday off. Dex Winterton rode out and Randy Crozier came in to supervise the work. The hand crew washed fines into the channel while other crew members continued to riprap the channel. Some crew members started breaking down camp and packed materials and supplies for fly out.
Final inspection of Superior Lake was completed on Aug. 13th with the following people present: Valton Mortenson (U.S. Forest Service), Bob Leake and Brad Weber (Utah Division of Water Rights), and Randy Crozier (DCWCD). The inspection team noted with appreciation the good work done by the DCWCD crew. There were a few items that the team wanted done and all the items were completed that same day. The stream reconnection between Superior Lake and Five Point was completed to the satisfaction of the inspection crew and the Forest Hydrologist, Mark Muir.

Figure 49: New breach at Superior Lake after work was completed.

With all four dams stabilized, the DCWCD crew finished breaking down main camp, packaged everything ready for fly out and rode out on August 16th, 2009.

The Duchesne County Water Conservancy District crew stabilized Five Point, Bluebell, Drift, and Superior in eight weeks.
Appendix A – Crew Daily Logs
### Duchesne County Water Conservancy District Crew Daily Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Work Area/Description</th>
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<tbody>
<tr>
<td>6/17/2009</td>
<td>Flew all supplies and equipment to kidney</td>
</tr>
<tr>
<td>6/18/2009</td>
<td>Flew all supplies and equipment to Garfield basin lakes</td>
</tr>
<tr>
<td>6/19/2009</td>
<td>DCWCD crew rode in and set a partial camp</td>
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</tbody>
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| 6/20/2009  | Safety meeting  
Crew continued setting camp  
Five Point Lake  
- put containment cover over fuel tanks  
*snowed and rained all day |
| 6/21/2009  | Safety meeting  
Superior Lake  
- Put in a temporary diversion dam in old canal  
*snowed all day |
| 6/22/2009  | Safety meeting  
Five Point Lake  
- stripped riprap from up and downstream faces  
- 2 trackhoes  
- collected 25 yards of gabion rock  
- constructed gabion baskets  
Superior and Drift Lakes  
- Put containment covers over fuel tanks  
Finished setting camp |
| 6/23/2009  | Safety Meeting  
Five Point Lake  
- started main excavation of cut  
- 1/3rd of the yardage removed  
- 2 skids and 2 trackhoes  
- stock piled material  
Bluebell Lake  
- removed head gate  
- built containment basin  
- put up latrine  
- excavated main embankment to top of pipe and removed a portion of old cmp top pipe sections  
- 1 trackhoe  
Drift Lake  
- removed head gate |
| 6/24/2009  | Safety Meeting  
Five Point Lake  
- built sand screen and screened about 4 yards of sand  
- excavated 200 yards material from cut  
- *1 trackhoe 2 skids  
- removed headgate and upper portion of concrete wet well  
Drift Lake  
- dug out snowdrift below dam (180 yards)  
- 2 trackhoes  
- started pulling riprap (60 yards) |
| 6/25/2009  | Safety Meeting |
Five Point
- sorted 3 yards of filter sand
- continued main embankment cut (200 yards)
- resolved elevation differences with Valton
Drift Lake
- continued to remove rock
- 2 trackhoes
Bluebell Lake
- handcrew moved pipe pieces for fly out
Superior Lake
- put in a back-up dam in old canal

6/26/2009 Safety Meeting
Five Point
- busted concrete structure with stinger
- 2 trackhoes 4 handcrew
- “rain day”
- gathered wood at camp
- moved latrines

6/27/2009 Safety Meeting
Five Point
- continued removing material and shooting grades of cut
- 2 trackhoes 2 skids
- removed headgate from center of dam
- cut steel rebar from concrete for disposal
- gathered more riprap
- moved old equipment to the dam
Drift Lake
- continued to remove rock in cut of dam
- 2 trackhoes 2 hand crew

6/28/2009 Sunday Off

6/29/2009 Safety Meeting
Drift Lake
- verified grades and continued to excavate
- 2 trackhoes 2 hand crew
Bluebell
- placed earthen coffer dam
- removed outlet pipe and head structure, used hydraulic hammer, steel and hdpe
- started re-building grade with rock seals
- Hand crew assisted with excavation and reconstruction
- 1 track hoe 7 hand crew

6/30/2009 Safety Meeting
Bluebell Lake
- finished constructing main channel and riprap
- 1 trackhoe 2 handcrew
Drift Lake
- continued excavation
- 2 trackhoes 2 handcrew
- hydraulic hose broke on trackhoe
Five Point Lake
- removed rebar from old spillway crest
- started removing wire from existing spillway
- constructed road to cement mixer
- 1 skid 4 handcrew
Superior
- re-placed temporary cutoff dam – handcrew

7/1/2009 Safety Meeting
Five Point Lake
- Cut final grade
- 2 trackhoes 2 skids
Superior
- started to remove gabions in old spillway (8 hand crew)
- *Valton came in

7/2/2009 Safety Meeting
Five Point
- poured downstream gabion
  - 67 bags cement
  - 2 skids, generator, mixer, all crew
- put in temporary cofferdam upstream
Bluebell and Drift Lakes
- talked about final grades

7/3/2009 Safety Meeting
Five Point
- dug and poured center gabion
  - 2 skids, generator, mixer, all crew
  - 65 bags concrete
Drift Lake
- fixed broken line on track hoe
Five Point Lake
- welded shank and fixed bucket
- set top elevation to 10996 at top of gabion (Valton approved)

7/4/2009 Safety Meeting
- dug and poured upstream gabion
  - 2 skids, generator, mixer, all crew
- started collecting riprap from old lake bed area
  - 1 trackhoe

7/5/2009 Sunday Off
7/6/2009 Safety Meeting
Bluebell Lake
- finished placing riprap in channel
- washed fines into channel – hand crew and 3” pump
- piled all slash to burn
- Loaded scrap metal, headgate, and outlet pipe on deck
- Loaded tool house on containment deck and packaged deck to fly
- Dismantled toilet and filled hole
Drift Lake
- continued cutting final grade
  - 2 trackhoes
Five Points
- continued gathering riprap
  - 2 trackhoes
Drift Lake
- continued cutting final grade
  - 2 trackhoes
- put in permanent coffer dam
- removed outlet pipe
  - used stinger on trackhoe to remove concrete structure
- started placing rock seals in channel
Superior Lake
- continued removing gabions from old spillway – hand crew

7/8/2009 Safety Meeting
Five Point Lake
- continued gathering riprap
  - 2 trackhoes
Superior Lake
- continued removing gabions from old (hand crew)
Drift Lake
- continued placing riprap and fines in channel (2 trackhoes)
- began cutting outlet pipe into smaller pieces for fly-out

7/9/2009 Safety Meeting
Five Point Lake
- continued gathering riprap (2 trackhoes)
Superior Lake
- continued removing gabions from old spillway (hand crew)

7/10/2009 Safety Meeting
Five Point Lake
- continued gathering riprap (2 trackhoes)
- forest service set up safety hut
Drift Lake
- continued to riprap and place fines in channel (2 trackhoes)
Superior
- Continued removing gabions and membrane from old spillway (hand crew)

7/11/2009 Safety Meeting
Five Point Lake
- continued gathering riprap (2 trackhoes)
- mechanic work on trackhoes (kryto claws)
Drift Lake
- washed fines into channel bed (hand crew)
- turned over painted rocks

7/12/2009 Sunday Off

7/13/2009 Safety Meeting
Five Point Lake
- put in temporary and permanent coffer dams
- removed inlet structure
  - used hydraulic stinger on trackhoe
- repaired equipment (kryto claw)
- poured inlet gabion – hand crew and 2 skidsteers
- set up safety shower and eye wash station
- dug out downstream headwall – 1 trackhoe
- removed 4 ft of pipe downstream end
Garfield Basin Construction Report

- removed 10 feet of concrete box culvert upstream end
  *Dex and 3 crew members rode out

7/14/2009  Safety Meeting
Five Point Lake
- finished breaking out downstream headwall- used (hydraulic hammer and trackhoe)
- constructed the lower rock ring cutoff
- rippapped part of dike and rehabilitated (2 trackhoes 2 skids)
- re-graded lower sections of channel
- filled part of the old outlet channel upstream
- poured gabion on the end of downstream pipe (hand crew)
- put in sand and gravel filter downstream
- set up grout pland and 4 inch pump
- 2 inch pump quit running – mechanic on no luck
- Removed and cut rebar and steel from downstream headwall and upstream concrete and old wet well
  *Valton came in and reviewed site with Randy

7/15/2009  Extensive Safety Meeting
Five Point Lake
- grouted outlet pipe and old wet-well
  - 416 bags of concrete and 1 skid
- disposed of cut rebar from concrete into grout
- filled part of existing channel downstream
- placed select fill in front of upstream gabion
- ripprapped lake side of gabion (2 trackhoes 2 skids)
Superior Lake
- Valton and Randy discussed and verified location for stream reconnects
Drift Lake
- Valton and Randy discussed additional work to be completed
Bluebell Lake
- Valton and Randy looked over the work done

7/16/2009  Safety Meeting
Five Point
- cleaned up and broke down grout plant (hand crew)
- removed wire from spillway
- packaged up trash
- worked on filling and building old inlet and outlet channels rippapped (2 trackhoes 2 skids)
- set up drinking water facility and pump at spring (other spring closer to camp went dry)
Drift Lake
- finished outlet channel
- rippapped and shaped entrance side slopes (2 trackhoes)
  - track came off on trackhoe and was put back on

7/17/2009  Safety Meeting
Five Point Lake
- filled in the rest of downstream embankment
- began to ripprap channel (2 trackhoes 2 skids)
- some clean up
- Loaded historic equipment and scrap metal onto flight deck
- Filled in old wet well and finished grade up the east slope
- handcrew took forms and sand screen to superior
*Randy and Julie rode out

**7/18/2009 Safety Meeting**
Five Point
- riprapped southeast face and channel (2 trackhoes 2 skids)
- started doing re-hab on the lake shore with pump and hand crew
- cleaned up around lake

**7/19/2009 Sunday Off (Randy and Julie rode in)**

**7/20/2009 Safety Meeting**
Five Point
- continued to riprap channel, slopes and berms (2 trackhoes 2 skids)
- put in silt fence along shore line
- Hand crew assisted equipment to naturalize lake shore where it was used as a borrow area to collect riprap
Drift
- continued to place riprap at drift (2 trackhoes)

**7/21/2009 Safety Meeting**
Five Point Lake
- continued to riprap channel and slopes (2 trackhoes 2 skids)
- continued naturalizing old lake shore basin
- washed fines into the new outlet channel
Drift
- continued to riprap the channel and slopes
- moved supplies to south side of cut in dam

**7/22/2009 Safety Meeting**
Five Point Lake
- continued to riprap channel (2 trackhoes 2 skids)
- built dirt berm on upstream east side of channel
- hand placed riprap in channel
Superior Lake
- hand crew collected gabion rock (used wheelbarrows)

**7/23/2009 Safety Meeting**
Five Point Lake
- continued to riprap channel (2 trackhoes 2 skids)
- gathered more riprap
- hand crew washed fines into channel
Superior Lake
- hand crew continued gathering gabion rock

**7/24/2009 Safety Meeting**
Five Point
- continued to riprap the channel (2 trackhoes 2 skids)
- continued re-hab at old lake basin with 4" pump
Superior
- Completed three stream reconnects on the way to Superior (1 trackhoe, 3 hours)
- Moved 1 trackhoe 1 skid, grout plant, hydraulic hammer, and 30 inch bucket to Superior Lake– left 9:30a.m., used trail
- started removing riprap
- wired headgate open and cut stem and hand crew removed old operator

**7/25/2009 Safety Meeting**
Five Point Lake
- rehabilitated with 1 trackhoe and 1 skid
- finished riprap
- continued washing fines into channel
- hand crew used rock bars to seal channel bottom
- continued rehabilitating the area with 4” pump

Superior
- continued removing riprap
- cutoff additional stem on outlet works
- dug back to large seepage collar on upstream end of pipe (12 feet back 3 feet thick)
- laid out upstream gabion location
- Determined old lake elevation and grades as per plan

7/26/2009  Sunday Off (Randy road out and Dex came in)
7/27/2009  Safety Meeting
Five Point Lake
- did some dress up and rehabilitation with trackhoe
Superior Lake
- began making cut through the dam (1 trackhoe 1 skid)
- screened 4 yards of filter sand – hand crew
- verified front gabion

Drift Lake
- finished sealing up the channel seepage
- did some clean-up and dressed up the channel (2 trackhoes)

7/28/2009  Safety Meeting
Drift Lake
- Hand crew packaged for fly-out and cleaned up the area
- gathered and cut angle iron and scrap metal
Superior
- continued rough cut through dam and slopes
- continued screening filter sand and gravel
- moved gabion and verified with Valton and Randy

7/29/2009  Safety Meeting
Five Point Lake
- more clean-up and packaging
- took down safety shower and fs safety cabana
Superior Lake
- set up safety shower
- continued removing material from cut (1 trackhoe, 1 skid)
- screened 5 yards of sand
- compressed wire from old gabions and membrane from old spillway for fly-out
- gathered drift wood and other organic material and placed in burn pile
- hand crew constructed 3-3x3x9 gabion baskets
- hand crew cut more wood and moved outhouses

7/30/2009  Safety Meeting
Superior Lake
- dug out and poured upstream gabion (1 trackhoe 1 skid, mixer, 3” pump; 64 bags of concrete)
- filtered water for safety shower

7/31/2009  Safety Meeting
Superior Lake
- continued removing material from cut (1 trackhoe 1 skid)
- put in temporary coffer dam
- Removed rocks from around downstream outlet works
- Gathered more gabion rock (1 skid)
- Used demolition saw to cut steel stem and pipe on upstream headworks

8/1/2009 Safety Meeting
Superior Lake
- finished removing material from cut in dam (1 trackhoe 1 skid)
  - final grade in bottom and slopes
- packaged old wire and membrane to fly
- gathered driftwood and put in burn pile
- screened 2 more yards of sand
- found and put wheelbarrow on trash deck to fly
Five Point Lake
- re-packaged old equipment
  - left one fresno for historical purposes

8/2/2009 Sunday off
8/3/2009 Superior Lake
- Put in permanent coffer dam (1 trackhoe 1 skid)
- excavated out the front headgate
- cut and removed pipe upstream to old concrete headwall in dam
- poured downstream gabion of outlet pipe (22 bags of concrete)
  - made a custom fit gabion that filled channel crossways from rock to rock
- poured upstream gabion on outlet pipe
  -1-3’x3’x3’ gabion basket
  -11 bags of concrete

8/4/2009 Safety Meeting
Superior Lake
- dug and poured middle gabion in channel (1 trackhoe 1 skid, mixer, 3” pump; 64 bags concrete used)
  - hit ledge rock at 2’ 3”

8/5/2009 Safety Meeting
Superior Lake
- grouted pipe (189 bags concrete)
  -40 bags concrete packed on horses from
- tightened tracks on skidsteer

Final Inspection for bluebell and drift (Bob, Brad, Valton, Russel, Dex)

8/6/2009 Safety Meeting
Five Point Lake
- Final Inspection for Five Point conducted today by (Bob, Brad, Valton, Hailey, Dex)
Superior Lake
- Tore out 9 feet of front gabion on west side (because it was too narrow) and re-poured
  - needed a 15’ bottom
  - 16 bags concrete
  - 1-3’x3’x9’ gabion basket
- Put in sand and gravel filter downstream of lower outlet gabion rock to rock and encased filter with excess gravel material

8/7/2009 Safety Meeting
Five Point Lake
- Hand crew re-packaged and arranged tool house for fly out

Drift Lake
- turned over painted rocks
- cleaned up micro litter

Bluebell Lake
- rehabbed the meadow (trackhoe tracks)
- cleaned up micro litter

Superior Lake
- cleaned up and did packaging
- filled in upstream and downstream of grouted pipe with dirt and rock and compacted (1 trackhoe, 1 skid)
- riprapped downstream berm
- shot and graded bottom of channel to middle gabion
- began to riprap channel, starting at ledge rock on downstream toe

*started running 2 shifts - daylight to dark

8/8/2009 Safety Meeting
Five Point Lake
- did more packaging

Superior Lake
- riprapped the bottom of channel up to the front lakeside gabion
- placed riprap on the east and west side slopes
- cut more firewood

*continued running 2 shifts - daylight to dark

8/9/2009 Sunday off – Dex rode out and Randy rode in

8/10/2009 Safety Meeting
Superior Lake
- Hand crew washed fines into channel and used rock bars
- continued to riprap channel
- Did reconnect in the bottom of the channel to original channel
- hand crew continued packaging to fly

8/11/2009 Safety Meeting
Superior Lake
- Shaped the old spillway, sloped sides and floor and rip rapped (1 trackhoe, 1 skid)
- Did re-hab on east side of channel
- continued packaging
- started breaking down camp

*took final pictures of all lakes

8/12/2009 Safety Meeting - main crew rode out
Superior Lake
- re-hab on west side of channel
- shaped leftover dirt mound and rehabed
- continued breaking down camp

8/13/2009 Safety Meeting
Superior Lake
- Conducted Final Inspection (Valton, Bob, Brand, Randy)

8/14/2009 Safety Meeting
- continued breaking camp

8/15/2009 Safety Meeting
- DCWCD crew finished breaking camp and rode out
Appendix B – As-Built Drawings
Appendix C – Historical Drawings
MAP PROFILE & DRAWINGS
OF
FIVE POINT LAKE RESERVOIR
IN MOHAWK COUNTY
PREPARING TO APPLICATION NO. 5032
BY
THE FARMER'S IRRIGATION COMPANY

Sheet No. 5
Sheet of 2 sheets

FILE NO. 5306
H-11438
H. Utah