# ACCOMPLISHING THE IMPOSSIBLE: OVERCOMING OBSTACLES OF A COMBINED IRRIGATION PROJECT

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## ABSTRACT

During the past five years of record-breaking drought, the impossible was done when the unlikeliest group collaborated in western Uintah County, Utah. Individuals from the Uintah Water Conservancy District, the Ouray Park Irrigation Company, the Uintah River Irrigation Company, and the Ute and Ouray Indian Tribes, represented by the Bureau of Indian Affairs, agreed to implement an irrigation project that would combine seven irrigation canals into a single pressurized delivery system. These individual groups had many obstacles and historical mistrust to overcome before construction even could begin on the West Side Combined Canal Salinity Project (WSCCSP).

The first obstacle was to acquire sufficient funding to design and construct the five divisions of the WSCCSP. Another obstacle faced was coordinating and improving the ecological and environmental issues by increasing instream flows and tightening salinity control in order to be eligible to receive the needed Federal funding for the project. There was also the sensitive subject, especially in times of drought, of juggling the water rights of the project participants. The project areas' water rights include Native American water rights and non-Tribal water rights. Some participants have storage rights while others have only direct flow rights. Probably the most difficult obstacle was socio-economic. The historical mistrust between the entities needed to be resolved and the project participants have cooperated to share resources rather than compete for a less than adequate water supply.

These obstacles, having been overcome, have resulted in very apparent project benefits. With three of the five project divisions complete, water has been conserved, water deliveries have been maximized, crops yields have increased, and the usable water supply has been increased through better efficiency and management.

## INTRODUCTION

The West Side Combined Canal Salinity Project (WSCCSP) is a large irrigation project located near Gusher in Uintah County, Utah. It consists of replacing

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seven irrigation canals with one pressurized irrigation delivery system. The seven canals are owned and operated by two irrigation companies and the Ute and Ouray Indian Tribes. Before conception of the WSCCSP, each canal was operated separately by its respective owner. As the water source for all of the canals is the Uinta River, the irrigation companies and Tribes often competed for water. In order for the WSCCSP to be successful, the irrigation companies and Tribes would have to work together to overcome many obstacles. The four major obstacles included obtaining project funding, satisfying environmental and ecological requirements, juggling water rights, and easing historical mistrust.

## PRE-PROJECT CONDITIONS

### Project Participants

In April 1998, the Uintah River Irrigation Company (URIC) applied for funding from the Colorado River Salinity Control Program to replace a portion of the Moffat Canal with a pressurized pipeline. URIC sought assistance from the Uintah Water Conservancy District (UWCD) to formulate a project plan. During the plan formulation process, the Ouray Park Irrigation Company (OPIC) and the Ute and Ouray Indian Tribes, represented by the Bureau of Indian Affairs (BIA), were invited to the planning meetings because of the proximity of their canals and irrigated lands to the Moffat Canal. The Moffat and Ouray Park Canals parallel each other for the entire length of Moffat Canal. The purpose of the planning meetings was to study the possibility of combining all the canals into a single distribution system. Each participating entity chose a representative to serve on a project steering committee.

### Project Need

As all of the project participants divert water out of the Uintah River, water rights play a key role in determining who gets water when. Many of the rights are for direct flow. Therefore, in dryer years those with a lower priority, i.e. URIC, may only receive water during high flow. Since the canals are not lined, much of the water is lost to seepage. Delivering water through pipe would save water lost to seepage, and therefore, would increase the water supply of those with lower priority rights.

Also, many of the landowners have chosen to flood irrigate rather than pump water from the canals into sprinklers. A pipeline distribution system that is pressurized by gravity would allow landowners to convert to sprinklers without having to pay pumping costs. Due to the variability of the volume and timing of water availability, landowners expect that sprinkler irrigation will increase overall irrigation efficiency.

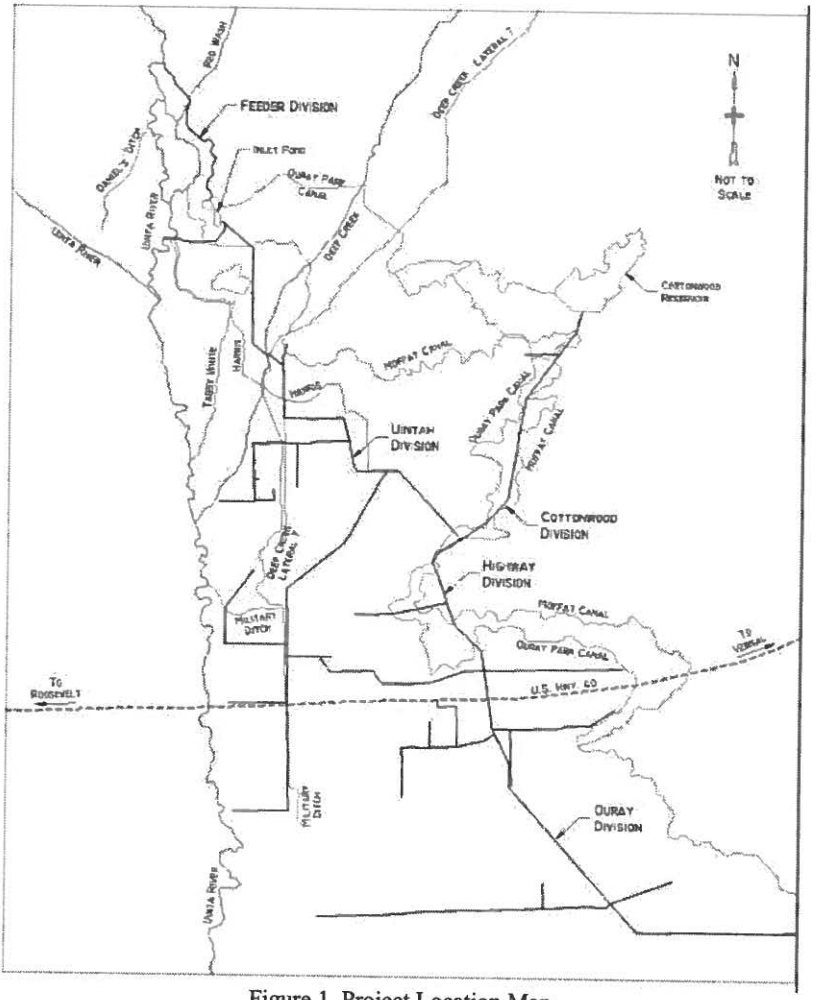


Figure 1. Project Location Map

**Design Concept**

Service area: The seven canals to be replaced and the acreage served by each are summarized in Table 1.

Table 1. Participating Canals

| Canal | Governing Organization | Length of Canal to be Replaced (miles) | Area Served (acres) |
|---|---|---|---|
| Ouray Park Canal | OPIC | 15.3 | 9,553 |
| Moffat Canal | URIC | 16.4 | 2,044 |
| Daniels Ditch | BIA | 1.0 | 151 |
| Tabby White Canal | BIA | 2.5 | 196 |
| Harris Ditch | BIA | 5.9 | 425 |
| Military Ditch | BIA | 2.6 | 852 |
| Deep Creek – Lateral 7 | BIA | 2.7 | 763 |
| Total | | 46.4 | 13,984 |

Project Facilities: To facilitate funding, design, and construction, the WSCCSP was separated into five divisions, namely Feeder, Uintah, Highway, Cottonwood, and Ouray, as shown in Figure 1.

- The Feeder Division consists of a combined diversion structure, a measurement flume, and approximately 1.5 miles of lined canal.
- The main trunk line of the Uintah Division consists of 23,900 feet of steel and PVC pipe ranging from 42-inch to 24-inch. The laterals consist of 47,000 feet of PVC pipe ranging from 21-inch to 4-inch.
- The Highway Division consists of 12,250 feet of 48-inch diameter HDPE pipe and 62,200 feet of PVC pipe ranging from 24-inch to 2-inch.
- The Cottonwood Division consists of 12,600 feet of 48-inch HDPE pipe and 2,700 feet of 12-inch PVC pipe.
- The Ouray Division consists of 16,000 feet of 48-inch HDPE pipe and 4,375 feet of 18- and 21-inch PVC pipe.

In total, the project includes over 12 miles of main trunk line and 22 miles of laterals.

## DESCRIPTION OF MAJOR OBSTACLES

**Funding**

The first major obstacle that the project participants had to overcome was acquiring enough funding to design and construct the WSCCSP. When the WSCCSP was reformulated to include all of the project participants, UWCD applied for funding for the WSCCSP from two main sources, the Colorado River Basin Salinity Control Program and the Water Conservation Credit Program of the Central Utah Water Conservancy District (CUWCD).

The Colorado River Basin Salinity Control Program managed by USBR provides funding to projects that reduce the salt loading in the Colorado River by implementing irrigation improvements. The Water Conservation Credit Program managed by CUWCD provides funding to projects that conserve water by implementing more efficient delivery and application of irrigation water.

It was planned that combined money from the two sources would cover the cost of the entire project. However, only the application for money from the Salinity Control Program was successful. The steering committee was faced with the decision to either put the project on hold until enough funding was secured for the entire project or to try to begin design and construction on two of the five project divisions.

**NEPA/Cultural Resources**

As a result of receiving Federal funding from the Salinity Program, the WSCCSP participants faced the second major obstacle, NEPA compliance. Fortunately, due to a previous Environmental Impact Statement on the Uintah Basin Salinity Project by the Natural Resources Conservation Service (NRCS), a complete Environmental Assessment was not necessary. Instead, a Site Specific Environmental Evaluation Checklist would fulfill the NEPA requirement. The checklist, however, contained two hurdles, biological mitigation and cultural resources work.

Biological mitigation: Though abandoning canals has the benefit of reducing water loss and salinity in the Colorado River, a major disadvantage is the loss of wetlands and riparian habitat. NEPA requires mitigation for all loss of habitat. UWCD hired a consultant to assess the biological effects of the WSCCSP and to prepare a mitigation plan. In order for the mitigation plan to be implemented, each of the project participants would have to contribute land or water for habitat.

Cultural resources: The NEPA checklist was signed with the understanding that cultural resource surveys would be completed as the project was implemented. Since the surveys are based on the pipeline alignment and not all of the divisions were designed concurrently, many surveys were necessary. Compounding the issue, different archeologists were employed for each division's survey. Much of the Uintah Division was located on Tribal land. The Tribe requires surveyors to apply for a special permit before investigations can begin. A delay in getting the necessary permit caused a delay in completing the cultural resources inventory in time for construction to begin. Also, as archeological sites were found, some alignment changes were necessary to avoid those sites. This added time and cost to the process as the new alignment also needed to be surveyed.

## Water Rights

Under pre-project conditions each of the seven canals had a separate diversion out of the Uintah River. When the project participants diverted water out of the river depended on their water rights. As the Feeder Division of the project included replacing the seven separate diversions with one combined diversion dam, it was imperative to understand the who, how much, and when of the water rights. Even though the project participants were agreeing to combine their water physically, they insisted that the water rights would remain intact and unchanged. It was not easy to juggle the water rights as they differed in priority date, some allowed for storage while others were only for direct flow, and some were for Tribal water. Once all of the pertinent rights were located, applications were filed to change the point of diversion for each to the location of the combined diversion dam.

## Mistrust of Project Participants

Throughout history, neighbors have fought over limited water supply. The participants of the WSCCSP are no different. With separate diversions and canals, there was less chance of conflict since each entity diverted water according to their respective rights. With the combined diversion and pipeline project, however, water would be commingled. The project participants would be forced to work together to ensure water was distributed appropriately.

# HOW EACH OBSTACLE WAS OVERCOME

## Funding

As a result of the original application to the Salinity Program, UWCD entered into a contract with the U.S. Bureau of Reclamation (USBR) for $6.85 million. As this amount did not cover the cost of the entire project (roughly $15 million), UWCD decided to proceed with the Feeder and Uintah Divisions. USBR agreed to provide UWCD with about half of the $6.85 million, which could be justified by the actual salt reduction realized by the first two divisions.

In the fall of 2002, UWCD was ready to proceed with the Highway Division. After several months of negotiations, an agreement was made between UWCD, USBR, and NRCS. NRCS would fund, design, and construct the Highway laterals. UWCD would proceed with design and construction of the Highway main pipeline, which USBR would fund with the remaining half of the $6.85 million contract. The agreement and resulting actions would allow for the delivery of water to the lands served by the Highway laterals. Water delivery to those lands had been on the NRCS priority list for several years.

Now, in 2004, UWCD is requesting additional funding from the Salinity Program to complete the final two divisions of the WSCCSP. With completion of the

Cottonwood and Ouray Divisions, the remaining salinity control benefits anticipated for the project can be accomplished.

**NEPA/Cultural Resources**

Biological mitigation: As part of the NEPA compliance process, a mitigation plan for loss of wetlands and riparian habitat was prepared and concurred with by the USBR and the U.S. Fish and Wildlife Service (USFWS). The mitigation plan was formulated to provide increased instream flows. By combining the seven diversions, 15 cfs of water that was diverted upstream remains in the Uintah River for an additional 4.5 miles. Also, flows in the nearby Red Wash that were diverted by URIC now have no way into the pipeline. These flows, which range between 4 and 7 cfs, flow into the Uintah River below the combined diversion.

Abandonment of the canals could potentially result in loss of habitat along their banks. In order to sustain some of the best habitat of trees and shrubs, sections of the two major canals would be blocked off to catch natural inflow from adjacent drainages. Also, to mitigate the potential loss of habitat, some local ponds that were used for irrigation water storage were designated to become wildlife habitat. Project participants were asked to share in the responsibility of providing water to keep the mitigation ponds full. Some participants, however, felt that requiring each participant to supply a certain amount of water was asking too much. The steering committee agreed that the participants who would not supply water for mitigation could provide land for wildlife habitat.

Cultural resources: The first cultural resources inventory completed was for the Feeder Division, which involved a new diversion structure at the Uintah River and lining a portion of the Ouray Park Canal. Since the project area was previously disturbed, the cultural resources survey was fairly straightforward resulting in few archeological sites.

Cultural resources work became a true obstacle when work began on the Uintah Division. When the decision to proceed with the Uintah Division was made, there was just four short months to complete design and award a construction contract. Cultural resources work began immediately, but it was not soon enough. Since a large portion of the Uintah Division was located on Tribal land, the archeologist needed a special permit to conduct the necessary surveys and site inventories. It took several weeks for the Tribe to award the permit. The permit was awarded with the condition that a Tribal archeologist be present for all surveys and construction done on Tribal land. As the archeologist conducted the survey, several sites were found that resulted in a change of pipeline alignment. The cultural resources work on the Uintah Division was an iterative process as new alignments were designed and surveyed. By the time the permit was given, the surveys completed, and the inventory report was written, the construction contract had been awarded, but concurrence from the State Historical Preservation Office

(SHPO) was still pending. Due to the approach of winter, it was imperative that the contractor begin work. Special permission was requested from SHPO to begin construction on previously disturbed ground. Fortunately, the request was granted, with the stipulation that an archeologist be present.

Since NRCS took the lead on the design and construction of the Highway Division laterals, it was negotiated that the NRCS archeologist would complete the cultural resources survey for the entire Highway Division. SHPO concurrence was received without any problems.

**Water Rights**

Memorandum of Understanding: A Memorandum of Understanding (MOU) among the Uintah River Irrigation Company, the Ouray Park Irrigation Company, the Bureau of Indian Affairs, and the Uintah Water Conservancy District was signed on September 28, 2000. The MOU is intended to be the framework to allow the WSCCSP to move forward through planning, design, construction, and operation for the benefit of water users in western Uintah County. One of the main issues resolved in the MOU is the management of the various water rights involved in the project. The MOU explicitly states that the implementation of the WSCCSP will not change any ownership, priority date, or place of use for the water rights. Only the point of diversion and means of conveyance shall change.

Storage agreement: Because of the mitigation plan, however, pre-project water use did have to change. As stated earlier, water from Red Wash that was used by URIC would instead be used for instream flows. Also, URIC would cease use of their storage ponds. These changes would effect the timing of when URIC would have water available to them. Therefore, URIC entered into a storage agreement on May 16, 2000 with OPIC to define the use of Cottonwood Reservoir under project conditions. The storage agreement would allow URIC to use 600 acre-feet of Cottonwood Reservoir's 6,000 acre-foot capacity, and URIC would reimburse OPIC with its direct flow rights.

**Mistrust of Project Participants**

Project participants were hesitant to trust each other before the conception of the WSCCSP, let alone when the water would be commingled. Therefore, members of the steering committee have entered into several agreements that make the WSCCSP possible. Each agreement went through the draft and review process to ensure each participant's interests were protected.

Memorandum of Understanding: As stated above, the MOU was vital in outlining how the participants would work together to not only implement the project, but also operate and maintain the completed system. The MOU also defined water measurement, which would ensure water rights were respected.

Storage agreement: The storage agreement is evidence that the project participants were able to compromise. By sharing facilities, the irrigation companies were able to simultaneously optimize their water supplies, honor mitigation agreements, and allow the project to move forward.

Carriage agreements: As a supplement to the MOU, a Carriage Agreement (CA) between the Uintah River Irrigation Company and the Bureau of Indian Affairs (BIA) has been developed to define the use of the Uintah Division to carry water for both entities.

O&M Manual: An Operation and Maintenance Manual was developed for the interim use of the WSCCSP completed divisions. The BIA and URIC operate the Uintah and Highway Divisions, respectively. Training was provided to BIA and URIC personnel who operate and maintain the system. The Operation and Maintenance Manual will be updated and refined over time as the remainder of the system is installed.

SCADA system: A remote telemetry system, known as Supervisory Control and Data Acquisition (SCADA), is to be installed throughout the combined system. As each lateral has been equipped with a metering device, project participants will be able to monitor that water use is representative of the water rights. USBR has already partially installed the telemetry system on the Uintah Division. The telemetry system on the Highway Division should be operational by the 2005 irrigation season. This accessibility to accurate measurement of inflow and outflow is a key feature in the success of the WSCCSP.

## POST-PROJECT CONDITIONS

### Current Project Status

As of the summer of 2004, three of the five project divisions are complete. The Feeder Division including the combined diversion and the canal lining was completed in August 2001. The Uintah Division was designed and constructed between May 2001 and June 2003. In April 2004, construction of the Highway Division was completed.

UWCD is presently negotiating with USBR for additional funding from the Salinity Program to design and construct the Cottonwood and Ouray Divisions.

The success of the WSCCSP is shown in Figure 2, as lands once served by the Moffat Canal and Tribal canals are receiving water from the pipeline. Had the project not been implemented, these lands would not have received enough water to irrigate in these past few dry years.

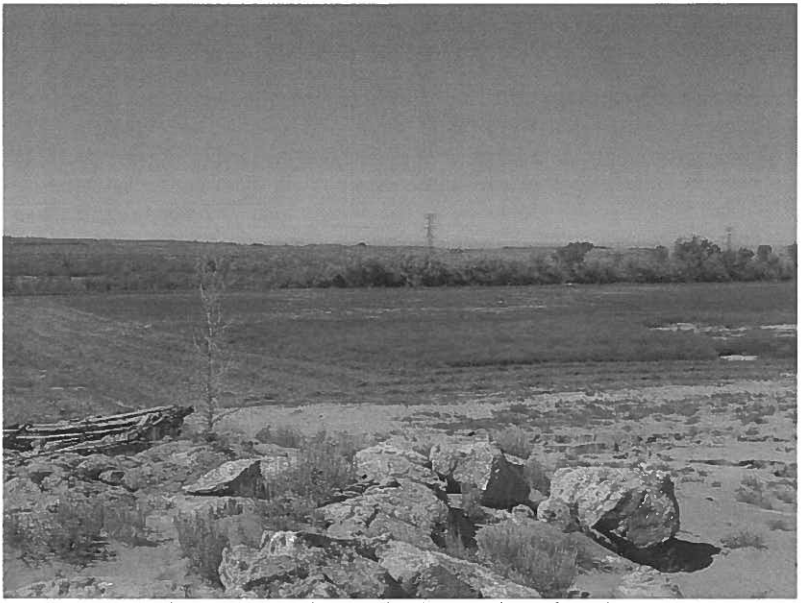

Figure 2. Land that received water through project.

## CONCLUSION

By working together the project participants were able to overcome several obstacles of implementing a combined irrigation project. By recognizing the obstacles early, the participants were able to find solutions before the obstacles became impediments. The steering committee was patient as applications for funding were approved, rejected, and modified. Each participant compromised and contributed something to the mitigation plan for environmental compliance. The water rights of each participant were respected. Most importantly, the historical mistrust was managed by developing agreements that outlined each participant's responsibility toward construction and project operation. In the end all participants realized that they needed each other and the project in order to maximize their individual water supplies.

The future operation of the project depends on building on the newfound relationships of trust and cooperation. The system has been designed and is operated based on new technology and different measurement techniques. Reverting to old ways of doing business is no longer possible if the project is to maximize improved operation and water availability benefits. There will still be adjustments and growing pains in fully implementing the project.