

Walla Walla County Conservation District

Gardena Farms Irrigation District #13

South Lateral Pipeline Project

Project Implementation Report

WA Dept of Ecology Contract #0900213

BPA Project 2007-396-00, Contract 42762



CONTACT INFORMATION:

Walla Walla County Conservation District
325 N. 13th Avenue
Walla Walla, WA 99362

Website: www.wwccd.net
Email: rick.jones@my180.net

Phone: 509-522-6340 Ext. 3
FAX: 509-525-2811

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Final Report

Gardena Farms Irrigation District
Piping – South Lateral Phase
South Lateral Pipeline Construction

BPA Project 2007-396-00, Contract 42762
&
WA-DOE Water Infrastructure Grant GO900213

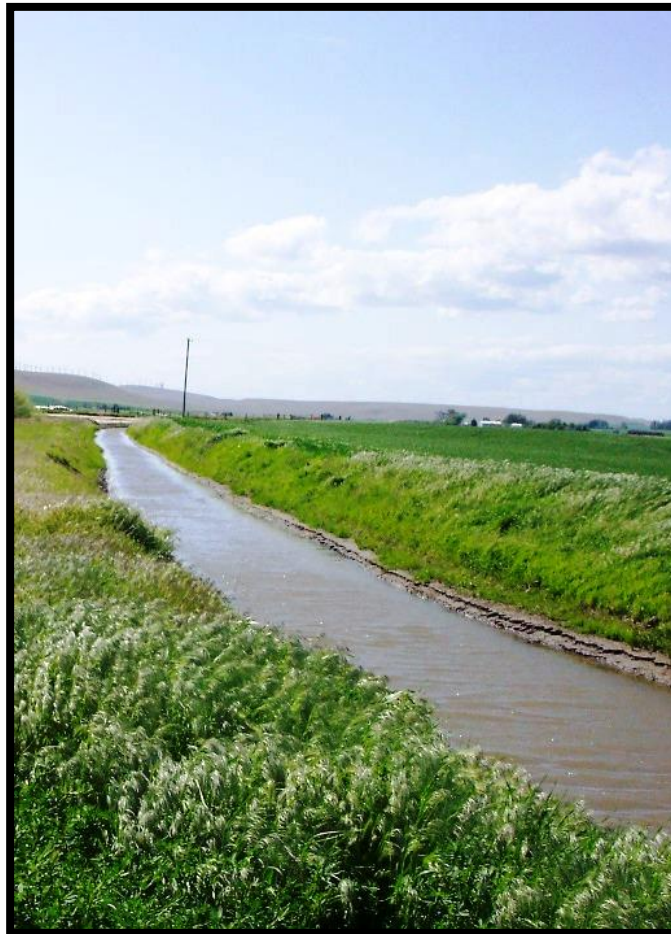
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Project Overview and Historical Perspective

Gardena Farms Irrigation District #13 (GFID) is one of the oldest such organizations in Washington with construction of the original canal started in 1892. It started as the Walla Walla Irrigation Company and was a privately owned organization. Diverting water from the Walla Walla River at river mile 36.9 to serve approximately 7,000 acres of cropland within its district, GFID was officially incorporated in 1928. The GFID water right with a priority date of 1892 is the largest and one of the most senior water rights in the Walla Walla Basin (WA).

In its early history, much of the first engineering was performed by local farmer and engineer E. C. Burlingame – the diversion dam and canal system bear his name to this day. Today, the GFID canal system is still impressive. The Upper Burlingame Canal and Lower Gardena Canal combine to form the main canal which is 11.55 miles of unlined earthen canal. This portion of the system includes the Pine Creek inverted siphon (that crosses the Pine Creek Valley and goes under Pine Creek) which is an additional 1.44 miles of piped conveyance. After a short run in the Lower Canal, the canal split into the North and South Laterals, 7.3 and 5.5 miles in length respectively.



*The South Lateral of the Gardena Farms Irrigation District
prior to pipeline construction.*

MAINTENANCE ISSUES

For a number of years, managers and irrigators of the GFID have envisioned some needed upgrades to their open canal delivery system. The need for improvement was evident. According to irrigation water delivery efficiency studies conducted by Economic & Engineering Services (EES) in 2004, fully 1/3 of the diverted water was lost to seepage. The study identified piping the delivery system as one of the alternatives available.

Recurring maintenance needs on the canal and laterals included:

- Annual re-shaping of the canal where needed (reinforce weakened sections of the canal, remove collected bottom debris, etc.)
- Control of weeds growing along and within the canal
- Removal of wind blown weeds that accumulate in the canal
- Maintenance of deteriorating water control structures



Weed control and removal of weed debris posed a significant maintenance problem.



Maintenance of deteriorating grade control and intake structures are also part of the annual maintenance costs for GFID#13

The costs associated with the above maintenance and operation of the system was fully 25% of the total annual operating costs. This did not include staff wages and benefits nor any capital costs.

This need for action was finally pushed to the forefront in 2000 when the Interim Settlement Agreement with the U. S. Fish & Wildlife Service (USFWS) called for increased flows in the Walla Walla River to improve conditions for fish that are listed and provided protection under the Endangered Species Act. The Settlement Agreement, in effect, served notice to all water users that the federal regulatory agencies were prepared to take further action but were willing to finance infrastructure upgrades that would save water and increase instream flows. The WWCCD has been instrumental in the implementation of projects to improve and upgrade private irrigation systems with funding from state and federal agencies.

TARGET SPECIES

The target species for the Walla Walla River from which GFID water is diverted are Mid-Columbia Basin Steelhead and Bull Trout which are listed as “Threatened” under the Endangered Species Act as well as reintroduced Spring Chinook salmon. Steelhead are the primary target species with adult summer steelhead migrating upstream from September through March and juvenile steelhead out-migrating between March and July. There are increasing numbers of Spring Chinook also found in the Walla Walla River; most of the spawning adults are thought to be recruits from hatchery production from other river systems. In 2000, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) started planting pre-spawning adult Spring Chinook in the Walla Walla Basin. Spring Chinook adult migration occurs between mid-April and end of June. Bull Trout are not generally found in the lower reaches of the basin during the warmer months, however, adfluvial populations migrate downstream and forage in the river below the GFID diversion when temperatures permit. Reductions in irrigation withdrawals associated with

water savings resulting from this project will help maintain stream flows critical to the recovery of these important fish stocks.

SCOPE OF THE SOUTH LATERAL PIPING PROJECT

The scope of the South Lateral piping project was to install pipelines to replace 5.5 miles of open canal conveyance as well as laterals, upgrade pump stations to make them compatible with a new piped conveyance system, and install an automated water use reporting system.

The first phase of piping was completed by GFID #13 in 2006-07 when 2.01 miles (10,591 ft) of mainline and lateral pipeline was installed and 7 pump stations were modified. In 2009 the GFID Board of Directors requested that the Walla Walla County Conservation District (WWCCD) assume responsibility for grants they had received from BPA and the WA Dept of Ecology and complete the South Lateral piping project. WWCCD's first task was to complete the plans and specifications for the project. This required the WWCCD design team to review and verify engineering that had been done by IRZ Consulting, LLC. on a mainline design and then develop designs for the remaining 14 pump stations in the South Lateral service area. WWCCD engineering staff also designed a state-of-the-art radio telemetry based system for automatically reporting water use for all 21 individual pump stations so that GFID could remotely monitor water use and manage delivery demands throughout the entire South Lateral system from the office.

TIE-IN WITH U. S. ARMY CORPS OF ENGINEER'S (USACE) OVER-ARCHING PLAN (WATER EXCHANGE PROJECT) TO BE CONSTRUCTED IN 2018

In a related effort also triggered by the threat of federal regulatory actions the Corps of Engineers (Corps) with support and encouragement from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is working on a feasibility study to define concepts available for a Columbia River water exchange project whereby water would be pumped from the Columbia River to serve irrigators in the Walla Walla Basin. In early 2009, the Corps completed a conceptual design for a pipeline that would convey water from the Columbia River near the mouth of the Walla Walla River to connections that would feed water to the three largest irrigation districts on the Walla Walla River in Oregon and Washington. In return, irrigators would agree to not divert their water right and leave flow in the Walla Walla River during periods when flows are critical to fish. Construction of the proposed exchange project is due to begin in 2018.

Gov. Gregoire has expressed full support of the Columbia River exchange and has committed \$40M to the project. This project has been proposed by the CTUIR as the key to final settlement of water rights granted to the CTUIR by way of their treaty which dates back to 1855. If not resolved the potential exists for the CTUIR to seek resolution through the judicial system which could have dire consequences for the agricultural economy of the Walla Walla Basin. The WWCCD design team is designing the GFID pipeline to operate as a gravity system to convey water diverted at their existing diversion works or to convey Columbia River water received from the Corps pipeline project. If the GFID is to cooperate on the Corps / CTUIR project it is essential that the entire Gardena conveyance system is piped by 2018 which is the proposed start date for construction of the exchange project.

THE ROAD TO IMPLEMENTATION

In late 2009, the WWCCD finalized contract negotiations with Bonneville Power Administration (BPA) for implementing the remaining piping of the South Lateral project. BPA funding had been secured earlier by GFID #13 and was transferred to the WWCCD. Mainline designs had been developed in early 2009 by IRZ Consulting. The WWCCD design team developed plans and specifications for the on-farm laterals and pump stations in close cooperation with the GFID board and water users. The new piped conveyance system was designed for a maximum capacity of 27 cfs or 12,150 gpm.

Premier Excavation was selected as a result of WWCCD's competitive bidding process and began project installation of the second phase in mid-December of 2009.



Pipe staged for installation as excavator operator prepares the trench

The second phase constructed by the WWCCD project completed the conversion of the remaining 4.25 miles of main canal and multiple on-farm laterals to a piped conveyance system by installing 30,785 ft of pressured piped delivery system. The WWCCD phase also included the installation of 14 new/redesigned pump stations.

So what has been accomplished by the combined efforts of GFID and the WWCCD? The South Lateral canal and open ditch laterals were converted to a buried pipeline system including approximately 41,400 feet of buried pipe. Twenty one pump stations were redesigned and upgraded including bringing the electrical systems up to OR/WA code, and equipping them with electronic flow meters that automatically report real time water usage via radio telemetry to the GFID managers. The water saved by the new system amounts to 3.99 cfs which will be transferred to the Dept of Ecology's Trust program. The new system will efficiently deliver irrigation water to 2,203 acres.

Just laying the above project numbers does not do justice to the true magnitude of the South Lateral piping project. The number of feet of piping is only a part of what was accomplished. Pumping stations needed to be modified – and in some cases redesigned and relocated. Power had to be improved and/or rerouted. Roads had to be crossed. Wiring for automated control of valves had to be routed and connected to allow management of flows via the planned telemetry system.



Example of a pumping station prior to modification



A new pumping station complete with concrete pad and new power service panel

Each pumping station built required a concrete pump pad. Each elbow and “T” in the piping required a concrete thrust block.



Each road crossing (there were four) required a sleeve capped by concrete. Paved crossings had an additional asphalt cap as well. Some of the old canal service roads were no longer needed and removed.



Power panels for operating the various pumping plants were found in conditions ranging from satisfactory to “too dangerous to be around”. An important part of the project was to upgrade electrical service panels.



With the South Lateral piping project due to wrap up at the end of November 2010, it was important to conduct final pressure testing. This was accomplished in early October. Water was introduced into the pipeline from wells to 72 pounds per square inch (psi) pressure and held the pressure held for a period of 75 minutes. This exceeded the project requirements of 70 psi for 70 minutes. Following the pressure test, the system was operated for 12 days with the pipeline flowing at capacity with an operating pressure of 40 psi. During this period, no leaks were noted.

Another important aspect of the wrap-up process was finish work. The pipeline alignment in most places coincided with the old canal. Therefore, the trenching was done in the bottom of the canal and pipe laid in much the same alignment. After covering the pipeline, the old canal and many secondary delivery ditches were obliterated. Additionally, in piping the delivery system, the need for about 6,600 ft. of canal was eliminated and most of this obsolete canal was filled in with soil. Not only did stakeholders gain back some acreage previously needed for canal right-of-way and access roads, they eliminated a formidable weed problem along and in the canal and in adjacent fields.



The GFID South Lateral Piping Project was finalized according to schedule on November 30, 2010 with a final cost of approximately \$1,742,789. Bonneville Power Administration's Fish and Wildlife Program provided 73% (\$1,276,000) of the funding all of which was under contract with the WWCCD. WA Dept of Ecology's Water Resources Program provided 27% (\$466,790) of the funding which was originally under contract with GFID but was, at the request of the GFID Board of Directors, subsequently transferred to WWCCD.

The following businesses and their employees contributed to the construction of this project:

- Randy Grudzinski Excavating – contracted by GFID
- Premier Excavation – contracted by WWCCD as primary contractor
 - Dunning Irrigation -- subcontractor for pipe, fittings, & pump station construction
 - Current Electric – electrical subcontractor in WA
 - Shelco Electric – electrical subcontractor in OR