FIRST LEVEL SCREENING – *WEEG 2015*

APPLICANT NAME: Ephraim Irrigation Company	CONTROL NUMBER: 22
APPLICANT LOCATION: Ephraim, UT	TASK AREA: A
PROJECT NAME: Cobble Pine Ld Ditch Piping & Ephraim Tunnel Improvements	BOR $: 1,600,000 Cost Share $: 2,337,500

	SCREENING FACTOR	COMPLETE	COMMENTS
1	Eligibility requirements		
	• Eligible applicant in a Reclamation state	X YES __NO	
	• 50% or more non-Federal cost share	X YES __NO	
	• Authorized funding amount ($1 Million total – no more than $500,000 a year)	X YES __NO	
	• Funding Group I or II	__I X II	
	• Length of project (9/30/17 – FG I or 9/30/18 – FG II)	X YES __NO	Pr. f end 5/15/2017
2	Proper format and length (75 pages)	__YES __NO	
3	Proposal content		
	• SF-424 (authorized signature)	X YES __NO	
	• SF-424B or SF-424D (authorized signature)	X YES __NO	
	• Title page	X YES __NO	
	• Table of contents	X YES __NO	
	TECHNICAL PROPOSAL/EVALUATION CRITERIA (No More Than 50 Pages)		
	• Executive summary	X YES __NO	
	• Background data	X YES __NO	
	• Technical Project description	X YES __NO	
	• Evaluation Criteria	X YES __NO	
	• Project Benefits/Performance Measures	X YES __NO	
	• Potential Environmental Impact Desc.	X YES __NO	
	• Required Permits/Approvals, if applicable	X YES __NO	
	• Letters of Project Support	X YES __NO	
	• Official Resolution (Required 30 Days After)	X YES __NO	
	PROJECT BUDGET		
	• Funding Plan	X YES __NO	
	• Letters of Funding Commitment	X YES __NO	→ DWR loan – Mar-May 2015
	• Budget Proposal	X YES __NO	
	• Budget Narrative	X YES __NO	
	• SF-424A or SF-424C	X YES __NO	

1st Level Screening Comments (Screening Committee Member):

Summary Comments (Grants Officer):

Applicant is eligible for consideration during the Second Level Evaluation phase X **Yes** ____ **No**

Grants Officer 1/24/15 **Date**

WaterSMART

Water and Energy Efficiency Grants for FY 2015

Response to FOA No. R15AS00002

Funding Group II

Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Ephraim, Utah

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January 23, 2015

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TECHNICAL PROPOSAL & EVALUATION CRITERIA

1. Executive Summary

The executive summary should include:

- *The date, applicant name, city, county, and state.*
- *A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA (see Section III.B, "Eligible Projects" in the FOA).*
- *State the length of time and estimated completion date for the project.*
- *Whether or not the project is located on a Federal facility.*

Estimated Start Date:	June 1, 2015
Estimated End Date:	May 15, 2017
Applicant's Name:	Ephraim Irrigation Company Ephraim City
Project Location:	Ephraim, Sanpete County, Utah
Project Title:	Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Project Summary:

The Ephraim Irrigation Company is working with Ephraim City to pipe the Gobblefield Ditch and upgrade the Bureau of Reclamation owned Ephraim Tunnel. The Gobblefield Ditch, an open canal that carries a large portion of the water from the tunnel, loses a significant amount of water due to seepage. This reduces the available agricultural water to the Ephraim Irrigation Company shareholders during the late summer season.

The Ephraim Tunnel is a Federal facility that was built by the Bureau of Reclamation from 1935 to 1937. The tunnel is a major water conveyance facility for both the Ephraim Irrigation Company as well as Ephraim City. Ephraim City owns springs on the east side of the mountain ridge. The water from the springs is conveyed through the Ephraim Tunnel in a 10-inch HDPE pipe. Canals on the eastern slope of the mountain capture runoff that is conveyed through the tunnel to Ephraim Irrigation Company shareholders. Approximately 65% of Ephraim City's culinary water is conveyed through the tunnel. It is estimated that roughly 50% of Ephraim Irrigation Company's total water supply comes through the Ephraim Tunnel. All of the water passing through the tunnel passes through four separate hydro generating power plants owned by Ephraim City, before flowing into the downstream drinking water and irrigation water systems.

The tunnel was constructed by the Bureau of Reclamation almost 80 years ago. An engineering investigation in 2012 concluded that the tunnel no longer conveys the flow that the tunnel was designed to be able to convey. Furthermore, the tunnel lies in a region that experiences earthquakes from time to time. In its current state, the tunnel is likely to sustain significant

damage up to and including structural failure/collapse from even small earthquakes in the immediate area. It is critical to upgrade the tunnel to both improve the flow capacity of the tunnel as well as to ensure delivery of water and minimize any possible damage from potential earthquakes.

It is proposed to upgrade the tunnel by inserting a new 54-inch diameter HDPE pipeline, encased in a cellular concrete, to increase the efficiency and flow capacity as well as to stabilize the tunnel. The existing culinary pipeline in the tunnel will be better secured and protected. A second culinary pipeline may be installed to provide redundancy for the culinary water supply since uninterrupted service is critical for Ephraim City. Upgrading and improving the tunnel will ensure that irrigation water is conveyed to the water users of the Ephraim Irrigation Company and secure uninterrupted service of culinary drinking water to the residents of Ephraim City.

In summary, this project will:

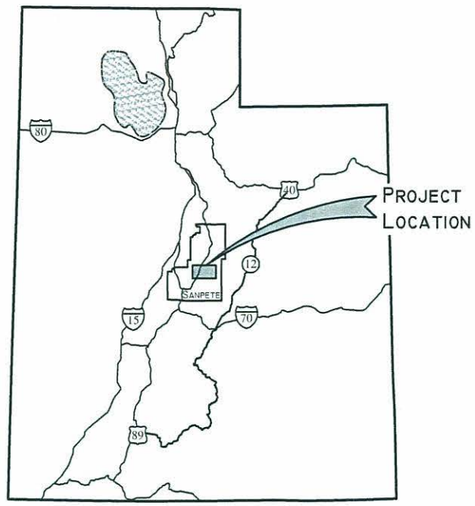
- Conserve water and preserve a total of about 6,500 acre-feet of water deliveries per year,
- Improve water management,
- Improve the reliability of culinary and irrigation water delivery,
- Decrease shortages, thus mitigating drought impacts,
- Conserve energy,
- Support shareholders in their efforts to convert from flood irrigation to sprinkler irrigation,
- Improve the usefulness and increase output of existing hydropower facilities,
- Increase water deliveries to environmental sensitive areas,
- Limit the pumping of culinary and irrigation wells, and
- Have a significant positive impact in the local economy.

2. Background Data

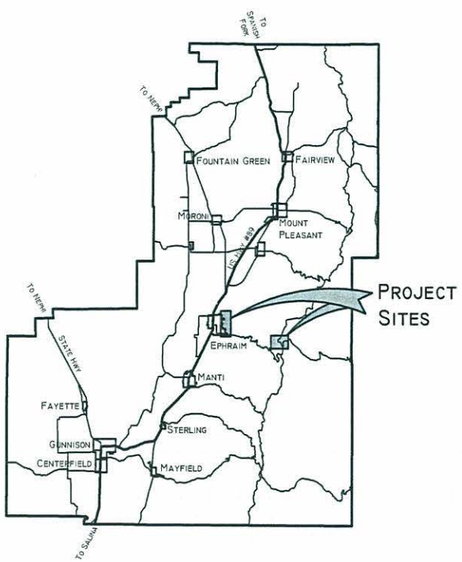
Location

Provide a map of the area showing the geographic location (include the State, county, and direction from nearest town).

This project is located in Ephraim, Sanpete County, Utah (see Figure 1).



State of Utah



Sanpete County

FRANSON CIVIL ENGINEERS

Ephraim City - Ephraim Irrigation Company

Gobblefield Ditch Piping and Ephraim Tunnel Rehabilitation

DATE: January 21, 2014

SCALE:

Piping & Tunnel Loc Map.dwg
H:\CLIENT\-South Utah Area\Sanpete Co\Ephraim Tunnel\Drawings

LAYOUT: Layout1

Figure 1

Project Location Map

Applicant's Water Supply

As applicable, describe the source of water supply, the water rights involved, current water uses (i.e., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water supply. If water is primarily used for irrigation, describe major crops and total acres served.

The Ephraim Irrigation Company provides irrigation water for shareholders in an area of approximately 16 square miles around Ephraim City. Cottonwood Creek, which flows down Ephraim Canyon from the east, is the main source of water, and has been used for crop cultivation since the 1850's. However, the available water is often limited and inconsistent, and farmers in the area have always sought ways to improve the supply. In the 1930's, the Ephraim Tunnel was built to convey water from the Colorado River basin to Cottonwood Creek. In more recent years, many of the original canals and ditches have been replaced with pipelines in an ongoing process for more efficient use of the limited water supply.

Nearly 6,500 full time residents and students at Snow College receive a significant portion of their drinking water through the Ephraim Tunnel. The culinary water conveyed through the tunnel is used for domestic, municipal, and limited industrial purposes, as well as hydropower. Irrigation water delivered through the Ephraim Tunnel and Gobblefield Ditch is used to irrigate primarily alfalfa fields and some grass hay, and is also used to generate hydropower. The irrigation water is also used to irrigate pastures for sheep and cattle. The Ephraim Irrigation Company has approximately 63 shareholders with about 43 of the shareholders owning shares in the Gobblefield Ditch.

Ephraim City has seen steady growth in population even through the recent recession. The demand for culinary water will grow as the population in Ephraim grows. Current agricultural water supplies are significantly less than needed for optimal crop production. Projects like this will continue to conserve water and bring the water supply closer to agricultural water demand. However, no amount of water conservation will solve the late season water shortages since there is extremely limited water storage available.

Water Source

Cottonwood Creek begins in the Wasatch Plateau and flows in a westerly direction down Ephraim Canyon and enters the valley southeast of Ephraim City. Along its length there are many small canyons and springs, but the Left Fork and New Canyon are its main tributaries. The Ephraim Irrigation Company (EIC) manages all the water in Cottonwood Creek. The EIC uses splitting structures in the canyon to divert water to the various shareholders in the areas in, and surrounding, Ephraim City. The majority of EIC's system has already been converted to pressurized irrigation. The last major ditch that has not converted to sprinkler irrigation is the Gobblefield Ditch. The Gobblefield Ditch provides water to lands immediately north of Ephraim City. Approximately 23% of the flow in Cottonwood Creek is diverted into the Gobblefield Ditch.

The shareholders on the Gobblefield Ditch have built ponds and pipelines on their land to better manage the limited water. Approximately 75% of shareholders in the Gobblefield Ditch are currently irrigating with sprinklers. It is anticipated that the piping of the Gobblefield Ditch will

facilitate the conversion of the remaining flood irrigated land to sprinkler. The lands not under sprinkler irrigation are mostly the lands close to the ditch where gravity-generated pressure is not sufficient to run sprinklers. The new pipeline will provide pressure that will reduce or eliminate the need to pump.

When the pioneers first settled in Ephraim in the late 1840's, there was sufficient water to irrigate the few cultivated acres of land. However, as the population in the area increased, more water was required to support the growth. Bringing water from the massive snow banks that collect annually on the eastern slopes seemed to be the only solution to the problem. In the late 1800's, a group of citizens started digging a tunnel through the Horseshoe Mountain at a higher elevation than that of the current Ephraim Tunnel. The tunnel was driven into the mountain several hundred feet before work discontinued due to lack of funds and an overabundance of local opposition.

In 1916, the Ephraim Construction Company, led by Harry Lund, found a new tunnel site. It was a bit lower in elevation than the original location, and work began to tunnel through the mountain. This attempt also failed because of community opposition. Those that opposed the tunnel thought that there was insufficient water available on the other side of the divide to justify the expense of construction.

In the following years, drought further suppressed the water supply, and interest in building the project picked back up. In 1931, an attempt was made to borrow money for the tunnel project from bankers in Salt Lake City. Negotiations with the banks fell through, so the project was taken to the Federal level. Investigations were conducted in the following years and after the nationwide drought in 1934, the Bureau of Reclamation (Reclamation) provided funds for these types of projects through the National Industrial Recovery Act of 1933. Construction of the Ephraim Tunnel began in September 1935 and was completed in November 1936. In 1938, the Civilian Conservation Corp added some additional concrete and timber linings to stabilize the tunnel.

The Ephraim Tunnel is owned by Reclamation and was designed to carry 95 cubic feet per second (cfs). The tunnel was originally dug in a horseshoe shape and excavated to a height of 6.5 feet. Internally, combined sections' equaling 1,600 lineal feet (LF) is supported by 6x6 timbers, with overhead wood lagging soaked in creosote to preserve the lumber. There is a 600-foot section with concrete lining, which is approximately 5.5 feet in diameter. However, most of the tunnel was never supported. The unsupported section of the tunnel is equivalent to 4,700 LF.

Water from the snow pack is collected on the eastern slopes of the southern range of the Wasatch Mountains, east of Skyline Drive in the Colorado Basin. Water from the snowmelt is collected and fed to the tunnel inlet, or to Cottonwood Creek, via feeder ditches. The water exits the tunnel on the west facing slope and flows into the left fork of Cottonwood Creek, down Ephraim Canyon approximately eight miles west to Ephraim City where water is delivered through pipelines and open ditches to each shareholder. The Ephraim Irrigation Company supplies water for farmers and residents in the vicinity of Ephraim City in Sanpete County.

Since the late 1930's, routine maintenance has been performed cleaning out foreign material and debris that has found its way into the tunnel. Over time, some of the wooden supports have been

overloaded by roof collapse. As a result, the wooden lagging has failed and roof fall has added rubble to the sediment accumulation. As the water flows through the tunnel each irrigation season, water penetrates the cracks between the rocks and the walls are showing the effects of erosion.

In March of 1982, Ephraim City signed an agreement (50-year lease) with Reclamation that allowed Ephraim City to install a 10-inch HDPE pipeline through the tunnel. The 10-inch pipeline currently supplies Ephraim City up to 65% of the culinary drinking water needed for the population depending on the time of year. The water flowing through the 10-inch pipeline originates from three spring collection areas: Riddlers Ridge Spring, Twin Spring, and Sawmill Spring. All three springs are piped to the Ephraim Tunnel inlet and merge into one main transmission line. Water in the 10-inch pipe travels through the tunnel and exits the concrete-lined outlet, then travels west down Ephraim Canyon to Ephraim City's storage facilities.

Water Rights – Ephraim Irrigation Company

The irrigation company has 19 distinct water rights that are prioritized by year as shown in Table 1. The direct flow rights are measured in cfs, and the specific volume rights are measured in acre-feet (AF). Of the 17 direct flow water rights, ten are from Cottonwood Creek and seven are transmountain. These rights total 492.5095 cfs; however, this amount may only be available occasionally and only during the peak flow periods of late spring. Furthermore, the peak flow period for transmountain water typically occurs later in the season than the peak flow in Cottonwood Creek. Even with the transmountain water from the tunnel, the flow in Cottonwood Creek decreases dramatically in the late summer season, and well water is often used as a supplement to the surface water.

EIC owns all of the water rights and shareholders are apportioned water based on the number of shares they own. One share of water is typically equal to 1 acre-foot, but this amount varies with fluctuations in supply. All shares have equal claim to water and when the available water is insufficient, each shareholder receives a proportionate amount. There are currently 4,094.5 shares.

Table 1: Ephraim Irrigation Company Water Rights

Flow (cfs or AF)	Priority Date	Water Right Number	Change Number	Source
Western Drainage Direct Flow Water Rights (cfs)				
0.015	1854	65-2286		Creek to San Pitch River
1.77	1854	65-2452	a15687	Ephraim Cottonwood Creek
5	1854	65-3383		Ephraim Cottonwood Creek
20	1854	65-2504	a16547	Ephraim Cottonwood Creek
196.1845	1854	65-3382	a28763	Ephraim Cottonwood Creek
0.04	1880	65-3385		Ephraim Cottonwood Creek
100	1932	93-833		Springs and Streams
2.5	1937	93-835	a12704	Ephraim Cottonwood Creek
8	1937	93-834		Springs and Streams
15	1977	65-1918		Underground Water Well
348.5095	**Total Western Drainage Direct Flows (cfs)**			
Transmountain Direct Flow Water Rights (cfs)				
3	1886	93-293		Headwaters of Becks Creek
9	1894	93-291		Bear Creek (John August Ditch)
1	1900	93-292		Headwaters of Becks Creek
6	1914	93-925		Seely Creek
20	1928	93-962		Bear Creek (DP Madsen Ditch)
5	1941	93-836		Seely Creek
100	1979	93-1200		Seely Creek
144	**Total Transmountain Direct Flows (cfs)**			
Specific Volume Water Rights (acre-feet)				
25.8	1854	65-3384		Ephraim Canyon
2.5	1984	65-2303	a13332	Underground Water Well
28.3	**Total acre-feet**			

Water Rights – Ephraim City

Riddlers Ridge Spring, Sawmill Spring, and the Twin Springs collection areas are located near the Ephraim Tunnel inlet. In 1982, Ephraim City installed a 10-inch HDPE culinary waterline through the Ephraim Tunnel to convey the water collected at these three spring collection areas to Ephraim City. The water rights associated with the springs that flow through the tunnel represent 65% of the city's spring water rights. Table 2 shows the water rights owned by Ephraim City that are conveyed through the 10-inch HDPE waterline. Ephraim City owns a total 3.82 cfs of municipal water rights. Water rights totaling 2.5 cfs (1,800 acre-feet per year) is conveyed through the Ephraim Tunnel.

Table 2: Ephraim City's Transbasin Water Rights

Combined Flow (cfs)	Priority Date	Water Right No.	Change No.	Source
	1999	93-3403	a23754	Riddlers Ridge
	1999	93-3403		Sawmill Spring
	1999	93-3403		Twin Springs
2.5	**Combined Total (cfs)**			

Water Usage

There are two main water measuring devices within the irrigation distribution system. The first device is located at the tunnel entrance and has been in use since 1960. The second is a staff gauge that was installed in 2004 on the diversion structure at the mouth of Ephraim Canyon.

The staff gauge that was installed in 2004 measures the total flow in Cottonwood Creek before the water enters any of the irrigation systems. The Lower San Pitch Water Commissioner, or his assistant, reads the gauge no less than every other day, and the average flow is computed. Even though the EIC manages all the water in Cottonwood Creek, and at times the entire flow is used for irrigation, there is no way to correlate the flow measurements with the actual water used for irrigation. Measurements from 2004 to 2008 show an average flow of 17,505 acre-feet per year. Most of this water comes in late May and early June. During this period of high flow, shareholders have sufficient water but most of the high flow ends up in the San Pitch River since there is extremely limited storage and the crops cannot utilize additional water.

Flows peak during the beginning of June and there are significant decreases by the middle of July. Flow measurements at the tunnel entrance show a dramatic variability in the flow. In 1979, almost 7,000 acre-feet traveled through the tunnel, while in 1985 the amount dropped to only 560 acre-feet. The average flow through the tunnel in 48 years is 3,330 acre-feet per year.

At the mouth of Ephraim Canyon there is a large structure that diverts the water into the canals that convey water to four large regulating ponds. Water is conveyed from each of these ponds in a pressurized pipeline, either directly to fields, or to the numerous small ponds that are located throughout the service area.

The Gobblefield Ditch conveys water to many ponds located north of Ephraim City. The Gobblefield Ditch carries 22.5% of the water that comes down from Cottonwood Creek. Portions of the ditch are lined with concrete; however, the concrete has deteriorated and large cracks result in large seepage losses. On an average year, water does not make it to the end of the ditch during the late season, and it is estimated that 42% of the water is lost through the over 17,000 foot long ditch.

Describe Water Delivery System

In addition, describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (i.e., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.

The irrigation distribution system includes several structures and components to bring the water from its source in the mountains to the fields and pastures in the valley. The mountain components consist of approximately 11 miles of canals and ditches, the Ephraim Tunnel, John August Lake, and the entire length of Cottonwood Creek and its tributaries.

At the mouth of Ephraim Canyon there is a large structure that diverts the water into the canals that convey water to four large regulating ponds – the Cane Valley Pond, the Hansen Ditch Pond, the North Field Pond, and the 15/16 Ditch Pond. Water is conveyed from each of these ponds in a pressurized pipeline, either directly to fields, or to the numerous small ponds that are located throughout the service area.

Water in the Gobblefield Ditch is diverted directly from Cottonwood Creek. Water from the ditch is then diverted onto the fields or into some privately-owned regulating ponds. Approximately 22.5% of the water in Cottonwood Creek is diverted into the Gobblefield Ditch. There are approximately 43 Gobblefield Ditch shareholders.

Ephraim City has a population of approximately 6,300 with a total of 1,468 connections as of 2012. The city's usage was 1,270 acre-feet of water in 2012. The Ephraim Municipal Water Department operates the culinary water facilities for the city, including the 10-inch HDPE pipeline installed through the Ephraim Tunnel.

Renewable Energy or Energy Efficiency

If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.

Both culinary and surface water through the tunnel affect each of Ephraim City's four hydropower plants further downstream. The total hydropower generation output from these four hydro-plants averages 511,328 kilowatt hours (kwh) per month. Per year, this equates to an average combined total output of 6,135,938 kwh per year. While this power does not completely satisfy the power needs of the city, it represents a significant amount of their annually consumed power.

Although not all of the water that produces hydropower comes through the tunnel, it is still a significant amount. Based on the impact the water coming through the tunnel has on hydropower generation for the city, we thought it applicable to include it in this application. The loss of the Ephraim Tunnel would negatively impact the hydropower generation as well as the water supply.

Neither the design flow capacity (95 cfs) nor the current capacity (40 to 80 cfs depending on the debris level in the tunnel) allow the tunnel to convey all of EIC's water rights. By improving the hydraulic efficiency of the tunnel, the tunnel flow capacity will increase to about 120 cfs. When

water is available, a greater flow will be delivered through the tunnel. The additional flow will increase the amount of hydropower that can be generated by the Ephraim City hydro-plants.

Approximately 75% of the land served by the Gobblefield Ditch is sprinkler irrigated. The current system of private ponds and pipelines provides sufficient pressure for sprinkler irrigation. It is anticipated that by piping the Gobblefield Ditch there will be pressures of 30 to 50 psi generated. Some of this pressure will facilitate the conversion of the remaining 25% of lands currently flood irrigated. With approximately 75% of lands not needing additional pressure, there is potential for generating hydropower at a few of the turnouts. The feasibility of generating hydropower on the Gobblefield Pipeline will be evaluated during design. With Ephraim City's knowledge and experience with hydropower facilities, it makes sense to evaluate the potential.

Prior Work with Reclamation

Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the projects(s).

EIC's major project working with Reclamation was the construction of the tunnel. The tunnel's construction was funded by Reclamation. In 1979, forty-two years after the construction of the tunnel was completed, the irrigation company made the final payment of the original contract of $193,000.

In 2009, Reclamation provided a matching grant to assist the EIC to prepare a Water Conservation Plan. The conservation plan was produced by the Utah Association of Conservation Districts and there were four recommendations to conserve water. The plan identified the improvement of the Ephraim Tunnel as the top priority. Piping open canals, specifically the Gobblefield Ditch, was the second highest priority. The EIC Water Conservation Plan is shown in Appendix I.

Reclamation inspects the tunnel and associated canals periodically. For many years the inspection reports have strongly recommended that improvements to the tunnel be made to increase the tunnel stability and capacity.

3. Technical Project Description

The technical project description should describe the work in detail, including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.

The Gobblefield Ditch is an open canal that carries irrigation water and also provides flood control during high runoff events. The purpose of this project is to install pipe along the Gobblefield Ditch to deliver irrigation water. The irrigation pipe will vary in diameter from 12 inches to 27 inches (see Appendix G). The pipe will have a capacity of up to 20 cfs, which is enough to provide for the irrigation needs north of Ephraim City. Seven turnouts will be installed along the pipeline to deliver water to small regulating ponds. The Gobblefield Ditch will remain in place and likely be improved so it can continue to route flood water away from Ephraim City.

Additional flood control improvements will be made as part of a separate project so the ditch can carry 60% of the 100-year flood, which is approximately 450 cfs. This will provide irrigation shareholders with a more reliable source of water and conserve water, which becomes very critical in the late summer season. The flood control aspect of the Gobblefield Ditch will also be preserved.

In September 2012, the Ephraim Tunnel was explored by Franson Civil Engineers and representatives from Reclamation, EIC, and Ephraim City. The tunnel's condition between the inlet and outlet varies from minimal deterioration and rubble accumulation to a significant amount of accumulation on the tunnel floor (average depth of 18 inches), heavy deterioration of the roof support structure where lagging is loaded and buckling, and failure of unstable rock layers at the bottom of the walls. Most of the failure is occurring where no supports are present. The original wood supports and wood lagging in multiple areas of the tunnel are overloaded and beginning to fail. A tunnel profile can be seen in Appendix H.

The inlet structure consists of a concrete structure with rock and mortar headwalls. The structure is in relatively good condition. Minor deterioration was noted on the rock and mortar headwall structures that flank each side of the tunnel entrance. The existing landscape is steep and sloping issues exist above and on each side of the inlet.

The original outlet was extended a few years ago due to slope instability. Three 5-foot sections of concrete box culvert were fabricated and installed by a local contractor to extend the outlet to help stabilize the area around the outlet. In addition to the outlet being very steep, it is difficult to access. There is currently no improved roadway to get to the outlet. At this time, it is recommended that you hike in to access the tunnel outlet.

EIC conducts an annual site visit where someone on the board walks through and inspects the Ephraim Tunnel. Mike Larson, the current EIC President, expressed concern of the overall condition of the tunnel, noting that the tunnel has deteriorated at an alarming rate since his previous visit. This past year, the tunnel has encountered more collapse than has been reported in previous years. In the late fall of 2014, Mike Larson and other shareholders entered the tunnel inlet and outlet to compare the condition to previous visits. There is still rapid deterioration of the walls happening exposing more of the roofline (widening, bridging). The debris continues to build on the floor of the tunnel further restricting water flow. It was noted that the walls had a very soft wet texture to them and several more sections have pitted and eroded.

In 1982, Ephraim City signed an agreement with Reclamation to "install a culinary waterline within the Ephraim Tunnel" for a period of 50 years. The 10-inch waterline was installed a couple of years later. The DR 21 10-inch HDPE pipe has an average inside dimension of 9.665 inches and an average outside diameter of 10.75 inches. When the pipe was originally installed, it was periodically strapped to the tunnel wall. The straps were bolted to the existing 6x6 timbers, within the concrete-lined sections, and into the rock walls of the tunnel. A few of the anchors connecting the straps to the wall have failed; however, the pipe remains in the same general location as it was when installed. The HDPE pipe did not appear to restrict flow other than the areas where roof failure has occurred and the rubble has built up around the pipe.

A Reconnaissance Report for the tunnel was completed in April 2013. The report identifies several alternatives and options to improve the tunnel's current condition and flow capacity. To prevent the interruption of water delivery, the improvements can only take place between August and late November. The remote and high elevation location prevents work from taking place in the winter due to snow accumulation. Access roads are not maintained during the winter. The scope of the tunnel improvements, and the limited time available for the work, require the project to be divided into two or three phases (years). During the first phase, the sediment and rubble that has accumulated in the tunnel's floor would be removed or redistributed to restore the flow capacity to approximately the design flow capacity of 95 cfs. In addition, locations where heavy deterioration has occurred will be stabilized in preparation for future improvements. Proper support will be installed at locations where support is needed to shore up previous roof cave-ins. The original wood supports and wood lagging in areas of the tunnel that are failing will also be replaced as necessary. The cleanup and stabilization of the tunnel is expected to occur in the fall of 2015 with final improvements (construction) occurring in the fall of 2016 and possible 2017.

Final improvement of the tunnel will include placement of a 54-inch diameter or larger steel reinforced HDPE pipe. Once the pipe has been placed, the space between the pipe and the existing tunnel will be backfilled with cellular concrete. The need to improve the tunnel over two or three years will be dependent on whether improvements can occur from both the inlet and outlet. As mentioned above, access to the tunnel outlet is very difficult and construction from the outlet would require considerable work to re-establish an existing but deteriorated access road. It is possible that all improvements could occur in 2015 if work could proceed from both ends. It is unlikely that there would be enough time if construction was only conducted from the inlet side. Initial discussions with the Forest Service indicate that use of the outlet to make improvements will be possible. However, it is still unlikely that all of the improvements can be made in one year.

Improving the Ephraim Tunnel will enhance the tunnel's dependability, increase the flow capacity, and protect Ephraim City's 10-inch HDPE culinary waterline. These improvements will ensure that irrigation water is conveyed to the EIC water users and secure uninterrupted service of culinary drinking water to the residents of Ephraim City.

4. Evaluation Criteria

Evaluation Criterion A: Water Conservation

Up to 28 points may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration to projects that are expected to result in significant water savings.

Subcriterion No. A.1 – Quantifiable Water Savings

Up to 24 points may be allocated based on the quantifiable water savings expected as a result of the project.

Describe the amount of water saved. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting*

calculations. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal (please note, the following is not an exclusive list of eligible project types. If your proposed project does not align with any of the projects listed below, please be sure to provide support for the estimated project benefits, including all supporting calculations and assumptions made).

This project is expected to directly conserve approximately 1,360 acre-feet of water per year. The average flow in the Gobblefield Ditch is 3,230 acre-feet per year from measurements taken since 2004. An average of 42% of the water is lost through seepage and evaporation. Appendix G shows the Gobblefield Ditch and divides the ditch into Sections A through H. Each section has different properties with some being natural channel, and others being concrete-lined or unlined sections. A seepage rate was estimated for each section and water losses computed based on the estimated seepage rates. The seepage rates, flows at each section, and detailed water loss calculations for the Gobblefield Ditch are shown in Appendix B.

In addition, this project will preserve an average of 3,330 acre-feet per year of irrigation water and 1,810 acre-feet per year of Ephraim City culinary water usage by eliminating the potential of a complete tunnel failure. Failure of the Ephraim Tunnel would have a dramatic negative impact on the city's water supply, hydropower generation capability, and cause significant negative impacts to the agricultural sector. The 3,330 acre-feet per year of irrigation water is an average of the past 48 years from measurements taken at the tunnel inlet. The 1,810 acre-feet per year is based on 65% of the total water rights owned by Ephraim City. In summary, improving the tunnel would preserve, on average, 5,140 acre-feet of water per year. The improved hydraulic performance will increase the volume of water delivered through the tunnel.

Therefore, the total direct water conservation and preservation is 6,500 acre-feet per year (1,360 acre-feet from Gobblefield Ditch and 5,140 acre-feet from Ephraim Tunnel).

In addition, all applicants should be sure to address the following:

- *What is the applicant's average annual acre-feet of water supply?*

  EIC's average water supply is approximately 17,500 acre-feet per year. However, some of this water is flood water that ultimately cannot be used by shareholders since there is no significant storage available and crops cannot take any more water.

- *Where is that water currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*

  Water lost in Gobblefield Ditch is currently seeping into the ground or evaporating.

- *Where will the conserved water go?*

  Water conserved will first be used by the irrigation company to reduce current water shortages. In periods where supply exceeds demand, the conserved water will stay in the creek and eventually reach the San Pitch River and Gunnison Reservoir.

Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

(1) **Canal Lining/Piping:** Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:

(a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

The water savings will be equal to the amount of water that is currently lost through seepage and evaporation. The calculations and assumptions are shown in Appendix B.

(b) How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.

Portions of the Gobblefield Ditch are unlined, others sections are lined with concrete that has cracked and deteriorated. The end section of the ditch is unlined and the soil in the area is very sandy. Because of the different soil types and linings, the ditch was divided into different sections and seepage rates were estimated for each section. The combined seepage for the entire system is 42%. Detailed seepage rates for each section and water loss calculations are shown in Appendix B.

Ephraim City and EIC placed weirs during the summer of 2013 to quantify the losses in the ditch. Unfortunately, as soon as the weir was installed, someone would remove it. By the time they determined who was removing the weirs, there was little time left in the irrigation season. One measurement was made in August, see Appendix B. The measurements were taken at Station B and Station C where the ditch is not lined, see Figure 2.

The measurement indicated that in this section about 24% of the water was being lost. Actual loss was likely greater since the weir at Station B did not have a good seal, allowing water to flow under the weir. The person making the measurements estimated actually loss at 40 to 45%. For the purposes of this application, the 24% loss in this section of the ditch was used. Using this measurement as a basis, the losses in the other sections were estimated. The losses in other unlined sections were extrapolated based on the length of the section and losses in the measured sections. Sections AB, BC, FG, and GH are unlined. The end of the ditch, Sections FG and GH, are in an area referred to as the Sand Ridge. As expected, losses are high in this area. During low flow conditions it is common for no water to reach the end of the ditch (100% loss). Sections CD, DE, and EF are concrete lined. The concrete lining in these ditch sections have deteriorated such that loses are significant. The irrigation company is removing sections of the concrete liner every year as pieces fall into the ditch, restricting the flow capacity. These sections were lined because they had high seepage losses. While still better than the unlined sections, these sections still have significant losses. Section DE is of similar length as Section BC. This section was assumed to have a 10% loss with the other concrete-lined sections having a proportional rate of loss for the section length.

N

Legend

- 15-Inch Pipe
- 18-Inch Pipe
- 21-Inch Pipe
- 24-Inch Pipe
- 27-Inch Pipe

FRANSON CIVIL ENGINEERS

Ephraim City / Ephraim Irrigation Company

Gobblefield Ditch Piping and Ephraim Tunnel Rehabilitation

DATE: January 22, 2014

SCALE: 1" = 1200'

Pipeline.dwg
H:\CLIENT\1-South Utah Area\Sanpete Co\Ephraim Tunnel\Drawings

LAYOUT: Pipeline Plan

Figure 2
Reconnaissance Level Pipeline Location Map

The Gobblefield Ditch is operated with splitting structures that constantly divert a percentage of the flow at each turnout. The water losses were estimated based on the average monthly flow for a particular section of ditch and the water loss percentage. See Appendix B for the actual calculation. The water diverted into the Gobblefield Ditch was estimated to be a maximum of 20 cfs in May and June, even though a greater flow of water is available. Flows above 20 cfs were assumed to be flood water that would not be used for irrigation. Seepage of flood water was not included in the water loss calculations.

(c) What are the expected post-project seepage/leakage losses and how were these estimates determined? (e.g., can data specific to the type of material being used in the project be provided?)

The Gobblefield Ditch will be piped using watertight PVC pipe. With good construction practices, the post project seepage/leakage losses will be near zero.

(d) What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Piping the Gobblefield Ditch is expected to conserve 1,360 acre-feet of water per year. The pipeline is expected to replace approximately 3.5 miles of ditch. Therefore, the average annual reduction is roughly 390 acre-feet per mile.

(e) How will actual canal loss seepage reductions be verified?

The ditch will be piped and seepage losses will be near zero. There will also be flow measurements at the head of the pipeline and at the turnouts; to equitably split the water in the pipeline the total flow will need to be known. During the 2015 irrigation season, additional flow measurements will be taken throughout the season to better define the water losses. This information will also be used during the design process. Measurement will be made of the flow diverted into the Gobblefield Pipeline. This will be compared to the flow measurements collected since 2004 to determine if additional water is being left in the creek. It is anticipated that the conserved water will alleviate water shortages, but there is the potential for water to stay in the creek when the water is not needed. Currently, the water is diverted whether it is needed or not. For example, water is diverted during rain storms. With sprinkler irrigation, if water is not being used it will stay in the creek.

(f) Include a detailed description of the materials being used.

The Gobblefield Ditch will be piped using PVC pipe. The pipe size will vary from 27 to 15 inches in diameter. Head gates and valves will be used at turnouts to control water delivery at the turnouts. A concrete structure will be constructed to divert water into the new pipeline and screen debris out of the water. The estimated lengths for the various pipe sizes can be seen in the cost estimate. Detailed design will occur during the summer of 2015.

Subcriterion No. A.2 – Percentage of Total Supply

Up to 4 additional points may be allocated based on the percentage of the applicant's total average water supply (i.e., including all facilities managed by the applicant) that will be conserved directly as a result of the project.

Provide the percentage of total water supply conserved: *State the applicant's total average annual water supply in acre-feet. Please use the following formula:*

$$\frac{\text{Estimated Amount of Water Conserved}}{\text{Average Annual Water Supply}} = \frac{1{,}360}{3{,}230} = 42\%$$

The estimated water conserved by piping the Gobblefield Ditch is 1,360 acre-feet. The average total water supply for the Gobblefield Ditch is 3,230 acre-feet.

Evaluation Criterion B: Energy-Water Nexus

Up to 16 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency.

For projects that include construction or installation of renewable energy components, please respond to Subcriterion No. B.1— Implementing Renewable Energy Projects Related to Water Management and Delivery. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion No. B.2— Increasing Energy Efficiency in Water Management. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both. However, an applicant may receive no more than 16 points total under both Subcriteria No. B.1 and B.2.

Subcriterion No. B.1 – Implementing Renewable Energy Projects Related to Water Management and Delivery

Up to 16 points may be awarded for projects that include construction or installation of renewable energy components (e.g., hydroelectric units, solar-electric facilities, wind energy systems, or facilities that otherwise enable the use of renewable energy). Projects such as small-scale solar resulting in minimal energy savings or production will be considered under Subcriterion No. B.2 below.

Describe the amount of energy capacity. *For projects that implement renewable energy systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

Both culinary and surface water through the tunnel affect each of Ephraim City's four hydropower plants further downstream. A summary of the city's hydro-plants can be found in the table below. The total hydropower generation output from these four hydro-plants averages 511,328 kwh per month. This equates to an average combined total output of 6,135,938 kwh per year. While this power does not completely satisfy the power needs of the city, it still represents a significant amount of their annually consumed power.

Table 3: Ephraim City Hydro-Plants

Generator	Total Output (kwh)	Monthly Average (kwh)	Average Yearly Output (kwh)
Generator #2 – Big Hydro: Culinary	5,033,000	279,611	3,355,333
Generator #1 – Big Hydro: Dirty Wheel	3,256,000	180,889	2,170,667
Old Hydro	334,500	18,583	223,000
Madsen Flat	580,407	32,245	386,938

Although not all of the water that produces hydropower comes through the tunnel, it is still a significant amount. Based on the impact the water coming through the tunnel has on hydropower generation for the city, we thought it applicable to include it in this application. Failure of the tunnel would significantly impact the amount of hydropower produced by Ephraim City. The improved flow capacity of the tunnel will potentially increase the water available for hydropower generation during the higher flow months of April, May, and June when the condition of the tunnel has been limiting the flow conveyed through the tunnel.

Approximately 75% of the land served by the Gobblefield Ditch is sprinkler irrigated. The current system of private ponds and pipelines provides sufficient pressure for sprinkler irrigation. It is anticipated that by piping the Gobblefield Ditch there will be pressures of 30 to 50 psi generated. Some of this pressure will be needed to facilitate the conversion of the remaining 25% of lands currently flood irrigated to sprinkler irrigation. With approximately 75% of lands not needing additional pressure, there is potential for generating hydropower at a few of the turnouts. The feasibility of generating hydropower on the Gobblefield Pipeline will be evaluated during design. With Ephraim City's knowledge and experience with hydropower facilities, it makes sense to evaluate the potential on the Gobblefield Pipeline.

Describe the amount of energy generated. *For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

The potential for generating power from Gobblefield Ditch will be evaluated during the design phase. But, it is not anticipated that piping the Gobblefield Ditch will provide a good source for hydropower generation. No new hydropower plants will be developed as part of the Ephraim Tunnel improvements; however, improving the tunnel will preserve the four hydropower plants currently in operation and will increase the water supply to Generator #1 which is fed primarily through the surface water coming through the tunnel.

Describe any other benefits of the renewable energy project. *Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:*

- *Expected environmental benefits of the renewable energy system*
- *Any expected reduction in the use of energy currently supplied through a Reclamation project*
- *Anticipated beneficiaries, other than the applicant, of the renewable energy system*
- *Expected water needs of the renewable energy system*

There are several energy benefits from piping the Gobblefield Ditch and improving the Ephraim Tunnel. Piping the Gobblefield Ditch will encourage shareholders to make improvements on their farms to convert from flood irrigation to sprinkler systems. Currently 25% of the

shareholders in Ephraim Irrigation Company flood irrigate. Improving the tunnel will help ensure the long term viability of the conveyance of water through the tunnel. If the tunnel was to fail, the flows in the Gobblefield Ditch would dramatically decrease and the existing wells would have to pump water continually to make up for the lost water previously provided by the ditch. Additionally failure of the tunnel would cause current hydropower development to significantly decrease.

Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management

If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to 4 points may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.

***Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project** (e.g., reduced pumping).*

- *Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

  The project will keep the existing hydropower plants in operation by eliminating the potential of tunnel failure. Improved water supply for hydropower generation will also be realized.

- *Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?*

  Piping the Gobblefield Ditch and improvements to the Ephraim Tunnel will prevent increased pumping of both agricultural and culinary wells. During periods of water shortage, some shareholders use wells to augment limited supply. Eliminating seepage and evaporation losses will improve the late season water supply and reduce the need to pump wells. There are currently five wells that can supplement some of the Gobblefield shareholders. Four are electric and one is driven by a diesel engine. The annual cost in electricity is estimated to be $10,000.00 and the annual cost of diesel is estimated at $7,000.00. Then there is the cost of maintenance and eventual repair and replacement.

  For the culinary water, all of Ephraim's drinking water is currently 100% gravity fed from springs. There is a backup well that can supplement up to 1,000 gpm in times of drought and emergency. Losing the tunnel would cut off 65% of the available of water supply, and the city would be forced to take steps to pump water from wells nearly continuously to supplement the reduced water supply. It is also anticipated that relying more on pumping from wells would increase the drawdown of the aquifer, and thus the required energy and cost of pumping continue to increase over time.

- *Please indicate whether your energy savings estimates originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.*

The location of energy savings will occur at the wells that will be used less.

- *Does the calculation include the energy required to treat the water?*

  No energy will be required to treat the water.

- *Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations. Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).*

  Piping the Gobblefield Ditch will eliminate the need to burn the unlined sections of the ditch yearly. In addition, periodically driving the ditch during the irrigation season will be significantly reduced. The reduction in diesel fuel used to operate the pump in the well will also result in less carbon emissions.

Evaluation Criterion C: Benefits to Endangered Species

Up to 12 points may be awarded for projects that will benefit federally-recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened species or endangered species, or addressing designated critical habitat.

Projects that benefit federally-recognized candidate species and federally-listed threatened or endangered species or designated critical habitat will receive additional consideration under this criterion. Please see www.fws.gov/endangered /index.html for a complete listing of federally-recognized candidate species and federally-listed threatened or endangered species in your area.

For projects that will directly benefit federally-recognized candidate species, please include the following elements:

- *What is the relationship of the species to water supply?*
- *What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

For projects that will directly accelerate the recovery of threatened or endangered species or address designated critical habitats, please include the following elements:

(1) How is *the* species adversely affected by a Reclamation project?
(2) Is the species subject to a recovery plan or conservation plan under the Endangered Species Act?
(3) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?

On the website listed above, there are four federally recognized endangered species in Sanpete County, Utah; the Humpback Chub, Colorado Pikeminnow, Bonytail Chub, and the Razerback Sucker. These species are normally associated with the Colorado River Basin.

According to the Utah State Water Plan - Sevier River Basin, the Least Chub is listed as an endangered species. The Least Chub is only found in the Bonneville Basin, particularly in the Salt Lake, Utah Lake, and Sevier Lake drainage areas. The project area drains to Sevier Lake. The Spotted Frog is listed as a federal-candidate species. The Spotted Frog population exists near riparian areas in the San Pitch drainage basin. Cottonwood Creek drains to the San Pitch River.

On an average year, the irrigation company will use the water conserved. However, during wet years, the increase tunnel capacity and fewer losses in the system will result in more water flowing to the San Pitch River. This would directly increase water in Sevier Lake, which is usually dry, and improve the habitat for the Least Chub. In addition, the Spotted Frog population would benefit from increases in water supply in the San Pitch River as additional water would improve riparian areas surrounding the river.

Evaluation Criterion D: Water Marketing

Up to 12 points may be awarded for projects that propose developing a new water market. Note: Water marketing does not include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses.

Briefly describe any water marketing elements included in the proposed project. *Include the following elements:*

- *Estimated amount of water to be marketed.*
- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility.*
- *Number of users, types of water use, etc. In the water market.*
- *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws).*
- *Estimated duration of the water market.*

State laws prohibit the sale or lease of water rights that are designated for a specific plot of land, unless the land itself is sold and taken out of production. As such, the water conserved will not be available to sell outside of the EIC's service area. The water conserved will be used to reduce current shortages experienced by the irrigation company and to reduce the damages resulting from drought. The conserved water could also be leased within the EIC's service area.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability

Up to 14 points may be awarded for projects expected to contribute to a more sustainable water supply. This criterion is intended to provide an opportunity for the applicant to explain 1) how the project relates to a completed WaterSMART Basin Study; 2) how the project could expedite future on-farm improvements; 3) how the project will build resiliency to drought; and/or 4) how the project will provide other benefits to water supply sustainability within the basin. An applicant may receive the maximum 14 points under this criterion based on discussion of one or more of the numbered sections below.

Subcriterion E.1 – Addressing Adaptation Strategies in a WaterSMART Basin Study

Up to 14 points may be awarded for projects that address an adaptation strategy identified in a completed WaterSMART Basin Study.

Proposals that provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed Basin Study (i.e., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes) may receive maximum points under this criterion. Applicants should provide as much detail as possible about the

relationship of the proposed project to the adaptation strategy identified in the Basin Study, including, but not limited to, the following:

- *Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project, and how the proposed WaterSMART Grant project would help implement the adaptation strategy.*
- *Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.*
- *Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.)*
- *Describe whether the project will result in further collaboration among Basin Study partners.*

Through the WaterSMART Basin Study Program, Reclamation is working with State and local partners, as well as other stakeholders, to comprehensively evaluate the ability to meeting future water demands within a river basin. The Basin Studies allow Reclamation and its partners to evaluate potential impacts of climate change to water resources within a particular river basin, and to identify adaptation strategies to address those impacts. For more information on Basin Studies, please visit: http://www.usbr.gov/WaterSMART/bsp/

This project does not fall within one of the areas that have a completed WaterSMART Basin Study. However, the Water Resources Master Plan for Sanpete County identifies that water shortages in the agricultural sectors are as high as 30% on normal years and 50% on dry years. Water shortages in the county have long been known to farmers and water providers. Several projects have been implemented that develop or conserve water in the past. The Sanpete Water Conservancy District is continually engaged in assisting water providers to plan and develop water conservation projects, but financial limitations are an obstacle to many agricultural water providers. The Sanpete County Water Resources Master Plan identifies the Ephraim Tunnel Rehabilitation Project as one of the top five priorities in the county.

Subcriterion E.2 – Expediting Future On-Farm Irrigation Improvements

Up to 14 points may be awarded for projects that describe in detail how they will directly expedite future on-farm irrigation improvements, including future on-farm improvements that may be eligible for NRCS funding.

If the proposed projects will help expedite future on-farm improvements please address the following:

- *Include a detailed listing of the fields and acreage that may be improved in the future.*
- *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*
- *Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.*
- *Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*
- *Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*

- *Describe the extent to which this project complements an existing or newly awarded NRCS funded project.*

Note: On-farm water conservation improvements that complement the water delivery improvement projects selected through this FOA may be considered for NRCS funding and technical assistance in FY 2015 to the extent such assistance is available. For more information, including application deadlines and a description of available funding, please contact your local NRCS office or visit <www.nrcs.usda.gov>for further contact information in your area.

This project will directly contribute to on-farm conservation improvements by promoting conversion from flood irrigation to sprinkler irrigation. Eleven shareholders are currently working with NRCS on making on farm improvements in anticipation of this project being built, approximately three quarters of the flood irrigated acreage. It is anticipated that the remaining shareholders that currently flood irrigate will make the conversion from flood to sprinkler irrigation in the future.

Subcriterion E.3 – Building Drought Resiliency

Up to 14 points may be awarded for projects that will build long-term drought resilience in an area affected by drought.

If the proposed project will make water available to alleviate water supply shortages resulting from drought, please address the following:

- *Explain in detail the existing or recent drought conditions in the project area. Describe the severity and duration of drought conditions in the project area. Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.*

  The last three years have been classified as moderate to severe drought in Sanpete County, Utah by the National Drought Mitigation Center. EIC's water rights are all for surface water that is greatly influenced by the snowpack. EIC has very limited storage capacity and is dependent on the flow in the creek. The very limited EIC storage does not have any carry over storage. A poor snowpack immediately reduces the flow in the creeks that EIC depends on. Drought conditions impact EIC immediately. Prolonged periods of drought, like the last three years, reduce the base flow in the creeks creating additional hardship. The lack of flow in the Cottonwood creek creates shortages that result in significant pumping of supplemental irrigation wells owned by individual shareholders. Even with the supplemental pumping the required water for irrigation is far short. The recent drought has reduced the flow from the Ephraim City springs, which increases the need for the city to pump its wells.

- *Describe the impacts that are occurring now or are expected to occur as a result of drought conditions. Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought. For example, will the proposed project prevent the loss of permanent crops and/or minimize economic losses from drought conditions? Will the project improve the reliability of water supplies for people, agriculture, and/or the environment during times of drought? Please note that all proposed projects must meet the project eligibility requirements described in Section III.B. of this FOA. In accordance with those requirements, project proposals requesting compensation for economic losses resulting from drought, and proposals for the purchase of water are <u>not</u> eligible for funding under this program.*

Please see Section III.B. of this FOA for a detailed description of the types of projects eligible for funding.

Drought reduces the time in which a sufficient water supply is available and further reduces the amount of late season water that is available. During drought, soil moisture starts low and does not recover because of the limited irrigation water that is available. The seepage losses are most damaging in the late season when there is not enough water to maintain a crop, even without the seepage losses. Eliminating seepage losses will reduce the impacts of drought. Currently, the primary crop is alfalfa or grass hay because some economic benefit can be realized even if water is only available for a first and second cutting. The improved water supply will not only increase the production during the first two cuttings, but it makes a third cutting a possibility when it is not usually possible during drought conditions. The improved water supply will also allow the farmers to plant more financially beneficial crops that need a consistent water supply for a longer period of time to reach maturity. The susceptibility of the area to drought prevents the planting of permanent crops, such as orchards. The project will improve drought resiliency, but not to the point that permanent crops can be considered without wells. The proposed project will allow the limited supplies during a drought to stretch further.

Subcriterion E.4 – Other Water Supply Sustainability Benefits

Up to 10 Points may be awarded for projects that include other benefits to water supply sustainability.

Projects may receive up to 10 points under this sub-criterion by thoroughly explaining additional project benefits, not already described above. Please provide sufficient explanation of the additional expected project benefits and their significance. Additional project benefits may include, but are not limited to, the following:

- *Will the project make water available to address a specific concern? For example:*
  - *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*
  - *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.*
  - *Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*
- *Will the project make additional water available for Indian tribes?*
- *Will the project make water available for rural or economically disadvantaged communities?*

The Water Resources Master Plan for Sanpete County identifies that water shortages in the agricultural sectors are as high as 30% on normal years and 50% on dry years. Water shortages are experienced regularly by the EIC shareholders and these water shortages have a detrimental economic impact to the water users. The increased capacity of the tunnel will improve the water supply to all shareholders as well as the city hydroelectric generators. This project will further improve the water supply for shareholders in the Gobblefield Ditch. The project will also preserve a significant portion of the culinary and irrigation water supply, thus reducing the need to pump from the aquifers.

As mentioned above, the water supply is greatly impacted by the snowpack. Climate change is expected to change more of the snow to rain. This will reduce the size of the snowpack and shorten the period of time when there is high flow in the creek. Thus, the overall water supply will likely be reduced by climate change, which makes the more efficient use of water supplies even more critical. Ephraim City is in a rural area that depends on agriculture for much of its economic activity. This project will preserve and improve the water supply as climate change potentially reduces the water supply. Transition from snow to more rain caused by climate change will also increase the threat of flooding. Allowing the Gobblefield Ditch to be used for flood water will provide additional protection for Ephraim City from flooding.

Ephraim City is growing as is the student population of Snow College, which is located in Ephraim. As growth occurs, it is critical that current water supplies are preserved and that the water is better managed. This project will improve the agricultural water supply. Groundwater resources are currently over-allocated in the Sanpete Valley. A new well requires conversion of a surface water right. Ephraim City has a culinary water well, but it has high levels of arsenic and can only be used if it can be blended with better quality water. The preservation of culinary water supply conveyed through the tunnel is critical to the anticipated growth of Ephraim City.

- *Does the project promote and encourage collaboration among parties?*
    - *Is there widespread support for the project?*
    - *What is the significance of the collaboration/support?*
    - *Will the project help to prevent a water-related crisis or conflict?*
    - *Is there frequently tension or litigation over water in the basin?*
    - *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

  There is widespread support for the project. The Sanpete Water Conservancy District supports the project and has provided funding for a portion of the cost to prepare this WaterSMART application. This project is included in the Sanpete County Water Resources Master Plan. EIC and Ephraim City are working together on this project, and are evenly splitting the costs associated with the tunnel improvements. The pressure and improved water supply are expected to promote the conversion from flood irrigation to sprinkler irrigation for the 25% of land not currently under sprinkler irrigation. Thus, allowing for more efficient use of water. Letters of support can be found in Appendix J.

- *Will the project increase awareness of water and/or energy conservation and efficiency efforts?*
    - *Will the project serve as an example of water and/or energy conservation and efficiency within a community?*
    - *Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?*
    - *Does the project integrate water and energy components?*

  As this project is completed, it will allow the Sanpete Water Conservancy District to focus its efforts and resources on other projects identified in the Sanpete County Water Resources Master Plan. The project will continue to demonstrate that investment in facilities to conserve water is financially feasible.

  The project integrates water and energy components in that it preserves and conserves water and the current and increased generation of hydropower.

Evaluation Criterion F: Implementation and Results

Up to 10 points may be awarded for the following:

Subcriterion No. F.1 – Project Planning

Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study)? Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place.

Provide the following information regarding project planning:

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Basin Study, drought contingency plan, or other planning efforts done to determine the priority of this project in relation to other potential projects.

EIC and Ephraim City have Water Conservation Plans. This project is also consistent with the Sanpete Water Conservancy District's Water Management and Conservation Plan. As mentioned above, this project is also included in the Sanpete County Water Resources Master Plan. A copy of the above mentioned documents can be provided electronically upon request. Due to the large size of the documents, hard copies of the documents have not been included with this application. The title pages of the documents can be seen in Appendix I.

(2) Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).

The Utah State Water Plan for the Sevier River Basin emphasizes water conservation and efficient management of developed water supplies as key strategies in providing for the present and future water needs in the state. In addition, this project helps to accomplish the goals set in the Sanpete Water Conservancy District Water Management and Conservation Plan and the Sanpete County Water Resources Master Plan. The project also accomplishes the goals identified in the EIC Water Conservation Plan. The goals identified in each of these documents is to conserve water, develop new water sources, and preserve existing water sources. This project conserves water and preserves existing water sources. This project is specifically identified in many of the documents identified above. Completing these projects will achieve goals identified in these planning documents.

Subcriterion No. F.2 – Readiness to Proceed

Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

(Please note, under no circumstances may an applicant begin any ground-disturbing activities—including grading, clearing, and other preliminary activities—on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).

A preliminary design has been prepared by Franson Civil Engineers to be used in the funding acquisition portion of the project. Preliminary pipe size, pipe lengths, estimated costs, and water savings calculations have been prepared related to the feasibility of piping the Gobblefield Ditch. A reconnaissance report has been prepared for the Ephraim Tunnel. The reconnaissance report assesses the current condition of the tunnel and identifies alternatives for improving the tunnel and their associated costs. Due to the difficulty and time consuming nature of obtaining an amended special use permit from the Forest Service, the permitting efforts have already begun and include some additional design work and preparation of maps.

The proposed schedule can be seen in Appendix F. Ephraim City and EIC are committed to this project as evidenced by the resources already committed to the project. The loss of water from a failure of the tunnel would be devastating to both the city and the irrigation company. Culinary water lost due to failure of the tunnel would require the city to drill and pump new wells to replace the water. Arsenic levels in the groundwater in the area may also result in treatment costs. The loss of hydropower generation would also be a huge burden for the city. The irrigation company would not be able to replace the water lost due to a tunnel failure. Efforts have already been made to start the permitting process. The Forest Service has agreed to prepare the cultural resources evaluation needed for NEPA compliance. Discussions have been initiated with Reclamation personnel in the Provo Area Office related to environmental compliance. Applications are pending for the funding needed to complete the project.

Please explain any permits that will be required, along with the process for obtaining such permits. Identify and describe any engineering or design work performed specifically in support of the proposed project.

Assuming award of a grant, NEPA compliance will be required, including a cultural clearance. Disturbance of riparian or wetland areas will not be necessary so a Section 404 permit will not be needed. However, a stream alteration permit will need to be obtained from the State of Utah. The tunnel is located on Forest Service land. The irrigation company and the city have a special use permit that allows use and routine maintenance of the tunnel and collection canals/pipelines. Early discussions with the Forest Service and efforts to find construction methods with the smallest environmental impacts have allowed the Forest Service to indicate that an amendment to the current special use permit will likely not be needed.

Subcriterion No. F.3 – Performance Measures

Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1 "FY2015 WaterSMART Water and Energy Efficiency Grants: Performance Measures."

Note: All WaterSMART Grant applicants are required to propose a "performance measure" (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all

assistance agreements with WaterSMART Grant recipients describing the performance measure, and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If information regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

The success of the tunnel improvement effort will be evident by the continued and increased delivery of water through the tunnel. The USGS monitoring station at the tunnel inlet will continue to measure the flow through the tunnel. This can be compared to historic measurements to assess the performance. However, the more recent flow data through the tunnel is likely inaccurate. The flow through the tunnel is measured based on the flow depth at the tunnel inlet. Roof and wall failures near the inlet to the tunnel have created blockages that create pools of water behind them and reduce the hydraulic capacity of the tunnel. The flow monitoring station could measure a flow depth of 2 feet and report a significant flow, when in reality, most of the flow depth measured is the result of a blockage, not actual flow of water. Actual deliveries through the tunnel will need to be compared to older data, when blockages were less likely to be present, to accurately assess the performance of the tunnel.

The Ephraim City SCADA system will continue to monitor water deliveries and hydropower generation. Flow meters will be installed at the head of the pipeline and at the turnouts to quantify water usage. Water in Cottonwood Creek will continue to be measured as will diversion to other areas of the irrigation system. The water remaining in the channel will be able to be quantified. To better quantify the water savings resulting from the pipeline, additional water measurement in the Gobblefield Ditch will be occurring during the 2015 irrigation season if a grant is obtained. These measurements will be compared to the data collected by the flow meters to quantify the improved water supply.

Subcriterion No. F.4: Reasonableness of Costs

Points may be awarded based on the reasonableness of the cost for the benefits gained.

Please include information related to the total project cost, annual acre-feet conserved, energy capacity, or other project benefits and the expected life of the improvement(s).

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.). Failure to provide this information may result in a reduced score for this section.

The calculation yields a cost of $7.98 for every acre-foot per year of water conserved and better managed. The Gobblefield pipeline is expected to have a 50 year improvement life. Projects involving PVC pipe typically have an expected life of 50 years for planning purposes. However, if the pipe is installed properly and the system is maintained, the system should last more than 50 years. All ferrous fittings will be greased and tape wrapped to decrease corrosion. The tunnel improvements are expected to last more than 50 years. The existing tunnel has delivered water for over 70 years with little or no maintenance. The tunnel should last another 70 years after improvement. However, a typical piping project that utilizes HDPE pipe is typically expected to last 50 years. For calculations, a 50 year life expectancy should be assumed.

Evaluation Criterion G: Additional Non-Federal Funding

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided.

$$\frac{\text{Non-Federal Funding}}{\text{Total Project Cost}} = \frac{\$2{,}337{,}500}{\$3{,}337{,}500} = \mathbf{70\%}$$

Evaluation Criterion H: Connection to Reclamation Project Activities

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

(1) How is the proposed project connected to Reclamation project activities?
(2) Does the applicant receive Reclamation project water?
(3) Is the project on Reclamation project lands or involving Reclamation facilities?
(4) Is the project in the same basin as a Reclamation project or activity?
(5) Will the proposed work contribute water to a basin where a Reclamation project is located?
(6) Will the project help Reclamation meet trust responsibilities to Tribes?

As mentioned previously, the Ephraim Tunnel was constructed by Reclamation and is still owned by Reclamation. Reclamation participates in the periodic inspection of the tunnel. Reclamation inspectors have been recommending improvement of the tunnel since deterioration of the tunnel started to noticeably accelerate.

The Central Utah Project initially called for water to be delivered to the Sevier River Basin, including Sanpete County. However, shortly after the Central Utah Project Completion Act was enacted, Millard and Sevier Counties withdrew from the Central Utah Water Conservancy District. As a result, delivery of Central Utah Project water to Sanpete County was eliminated. The Central Utah Water Conservancy District worked with Reclamation to develop the Central Utah Project. The Section 206 Program was created to fund projects that conserve and develop water in Sanpete County in recognition that Sanpete County was not going to receive any actual water from the Central Utah Project. The funding for the Section 206 Program has been exhausted and a replacement program has not been created.

The Gooseberry Narrows Project has been proposed and evaluated as a possible solution to decrease water shortages in Sanpete County. Reclamation worked with Sanpete County to develop the Gooseberry Narrows Project. Unfortunately, over 70 years of effort has not seen the completion of this project. The Gooseberry Narrows Project would have increased the water supply in the San Pitch drainage basin. Thus, benefiting the Ephraim Irrigation Company and Ephraim City.

The proposed projects will increase the water supply for the shareholders, and decrease the impact caused by water delivery to Sanpete County being eliminated from the Central Utah Project and the failure to implement the Gooseberry Narrows Project.

PERFORMANCE MEASURES

All WaterSMART Grant applicants are required to propose a method (or "performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

1. Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. Additional information about environmental compliance is provided in Section IV.D.4. "Project Budget," under the discussion of "Environmental and Regulatory Compliance Costs," and in Section VIII.B., "Overview of Environmental and Cultural Resources Compliance Requirements."

Note: Applicants proposing a Funding Group II project must address the environmental and cultural resources compliance questions for their entire project, not just the first one-year phase.

If you have any questions, please contact your regional or area Reclamation office (see <http://www.usbr.gov/main/regions.html>) with questions regarding ESA compliance issues. You may also contact Mr. Josh German at 303-445-2839 or jgerman@usbr.gov, for further information.

Note, If mitigation is required to lessen environmental impacts, the applicant may, at Reclamation's discretion, be required to report on progress and completion of these commitments. Reclamation will coordinate with the applicant to establish reporting requirements and intervals accordingly.

Under no circumstances may an applicant begin any ground-disturbing activities (including grading, clearing, and other preliminary activities) on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed. This pertains to all components of the proposed project, including those that are part of the applicant's non-Federal cost share. Reclamation will provide a successful applicant with information once environmental compliance is complete. An applicant that proceeds before environmental compliance is complete may risk forfeiting Reclamation funding under this FOA.

(1) Will the project impact the surrounding environment (i.e. soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

There will be minimal, short-term impacts associated with installing the Gobblefield Pipeline. All land surface disturbances would be confined to the proposed pipe alignment area and small staging areas adjacent to the pipeline. The pipeline alignment will follow the existing ditch. Existing roads run parallel to the ditch, so construction access will not require disturbance of undisturbed lands. Contract documents will outline the responsibility of the contractor relative to dust control, air and water pollution during construction activities. All construction will occur in previously disturbed areas. Impacts resulting from the construction of the pipeline will be temporary.

Improvement of the tunnel will require the reestablishment and/or improvement of the current and historic access to the tunnel inlet and outlet. Staging and storage areas will be needed at or near the tunnel inlet and outlet. It is hoped that access to the tunnel outlet can be minimized due to the greater difficulty and larger disturbance required to access the outlet. However, the need to access the outlet cannot be eliminated at this time. The inlet area has better current access and the area surrounding the inlet has been disturbed by the feeder canals and routine maintenance and operation of the tunnel. Permanent disturbances will be limited to existing disturbed areas. After construction, the inlet and outlet areas will not appear significantly different. The significant changes will be occurring underground. EIC and Ephraim City have started working with the Forest Service on permitting. Concepts have advanced to the point that the Forest Service does not think that an amendment to the existing special use permit will be necessary. Staging and storage areas and construction methods have been identified that will only have minor impacts beyond the significantly disturbed areas that already exist at the tunnel inlet and outlet. The tunnel headwall is original and was stamped "U.S.R. 1937." Preliminary discussions with the Forest Service Archaeologist has identified the headwall as a historic feature that should be preserved. Design of the tunnel improvements will include preservation of this feature.

Best Management Practices will be instituted to control erosion and sediment transport to adjacent water bodies. The disturbed areas will be restored to pre-construction conditions so that the impact of the construction will be temporary.

(2) Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

According to the U.S. Fish and Wildlife Endangered Species Report for Utah, various plants and animals were listed as endangered or threatened in Sanpete County. These sensitive plants and animals are not present in the areas to be disturbed. The proposed project is not expected to have a negative effect on plants or animals listed.

(3) Are there wetlands or other surface water inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.

There will not be any construction within wetland areas. There are no anticipated impacts to wetlands or surface water that falls under CWA jurisdiction as "waters of the United States."

(4) When was the water delivery system constructed?

The tunnel was completed in 1937. The headwall on the tunnel inlet is stamped "U.S.R. 1937." The Gobblefield Ditch was likely constructed at least partially before 1900, with concrete lining of sections occurring in the 1950's or 60's.

(5) Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and

describe the nature and timing of any extensive alterations or modifications to those features completed previously.

Construction of the tunnel was completed in 1937. The inlet headwall will not need to be replaced, but the walls leading up to the headwall will likely need to be replaced. The tunnel shoring that has not failed will be left in place. The feeder canals have required constant maintenance due to damage by heavy snow loads. No historic features remain outside the tunnel due to the need for constant maintenance of the facilities. The existing splitting structures at the turnouts may need to be removed when the pipeline is installed. The existing concrete ditch that is still functional will be left in place to function as a channel for flood water.

(6) *Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

The tunnel itself may qualify for listing on the National Register of Historic Places due to its age. However, the tunnel itself is not unique in that it is similar to many other trans-basin diversion tunnels in Sanpete County. The headwall mentioned above will need to be protected during construction and preserved. Due to a relatively short life span, and need for frequent maintenance and replacement of structures located on natural channels and in ditches, there are not expected to be any historic features associated with the Gobblefield Ditch piping portion of the project.

(7) *Are there any known archeological sites in the proposed project area?*

There are no known archeologicalsites in the project areas.

(8) *Will the project have a disproportionately high and adverse effect on low income or minority populations?*

The project will not adversely affect low income or minority populations. No homes or businesses will be impacted by the project.

(9) *Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

The project will not affect tribal lands.

(10) *Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

The project will not contribute to the spread of noxious weeds.

2. Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To complete a renewable energy project within the time frame required of this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying. To discuss questions related to projects that propose renewable energy development, please contact Mr. Josh German at 303-445-2839 or jgerman@usbr.gov.

Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see Section III.H1. Reclamation may also require additional reviews and approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 CFR 429, and that the development will not impact or impair project operations or efficiency.

If hydropower development is feasible on the Gobblefield Pipeline, it would be subject to an exemption from FERC licensing requirements based on recently enacted laws. However, an exemption would need to be applied for with FERC. The ownership of the tunnel will remain with Reclamation. As owner of the tunnel, Reclamation will need to approve the design of the improvements. Reclamation will also take the lead in NEPA compliance as the owner of the tunnel. Due to limitations in Reclamation staff, it is anticipated that the project proponents will consult with Reclamation on the NEPA compliance. Cultural clearance is being done by the Forest Service. The coordination process with Reclamation has already been initiated.

3. Official Resolution

Include an official resolution adopted by the applicant's board of directors or governing body, or for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of WaterSMART Grant financial assistance, verifying:

- *The identity of the official with legal authority to enter into agreement*
- *The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted*
- *The capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan*

An official resolution meeting set forth above is mandatory. *If the applicant is unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted up to 30 days after the application deadline.*

The signed Official Resolution is shown in Appendix A.

4. Project Budget

Funding Plan and Letters of Commitment

Describe how the non-Reclamation share of project costs will be obtained. Reclamation will use this information in making a determination of financial capability.

Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a mandatory requirement. Letters of commitment shall identify the following elements:

(1) The amount of funding commitment
(2) The date the funds will be available to the applicant
(3) Any time constraints on the availability of funds
(4) Any other contingencies associated with the funding commitment

Commitment letters from third party funding sources should be submitted with your project application. If commitment letters are not available at the time of the application submission, please provide a timeline for submission of all commitment letters. Cost share funding from sources outside the applicant's organization (e.g., loans or state grants), should be secured and available to the applicant prior to award.

Reclamation will not make funds available for a WaterSMART Grants project until the recipient has secured non-Federal cost-share. Reclamation will execute a financial assistance agreement once non-Federal funding has been secured or Reclamation determines that there is sufficient evidence and likelihood that non-Federal funds will be available to the applicant subsequent to executing the agreement.

Note: Applicants proposing a Funding Group II project are not required to have non-Federal cost share funding secured for the entire project at the time of award. Funding Group II applicants must demonstrate sufficient evidence that non-Federal cost-share for the first year of the project will be available by the start of that phase and must describe a plan and schedule for securing non-Federal funding for subsequent years of the project.

A loan will be acquired from the Utah Division of Water Resources. The application has been submitted. The project will go before the Utah Board of Water Resources for approval in March 2015. The loan from the Utah Division of Water Resources will be for the entire project. The funding is not being obtained on a phase basis. A letter regarding the funding from the Utah Division of Water Resources can be found in Appendix J.

The funding plan must include all project costs, as follows:

(1) How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).

The total project cost is $3,337,500. The EIC has applied for a loan from the Utah Division of Water Resources for $2,337,500. The loan will be paid back with assessments to the water users. Water users include shareholders in the Ephraim Irrigation Company and residents of Ephraim City. EIC Shareholders will make the loan payment through increased assessments. All shareholders will pay for the tunnel improvements since all shareholders benefit from the tunnel. The shareholders with shares in the Gobblefield Ditch will pay for the piping of the ditch since that aspect of the project benefits them

only. Ephraim City provides its own water and operates its own power company. Because the tunnel affects both culinary water delivery and power generation, all water and power users in Ephraim City will pay for the tunnel rehabilitation through increased water and power rates. If the $1,000,000 grant requested by this application is not approved, it is unlikely that the Gobblefield Ditch piping will occur. The improvement of the tunnel is critical and will likely occur without the grant, but the quality and longevity of the improvements will likely be scaled back due to limited funds. In any case, the financial impact of the project, with or without Federal assistance will be significant and will displace other needed projects that are meant to limit water and energy vulnerability, such and a well for redundancy and improvement of the existing facilities.

(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:

(a) What project expenses have been incurred

Incurred project expenses include the engineering costs associated with preliminary design and funding procurement. Work included:

- Preparation of a reconnaissance level design and cost estimate for piping the Gobblefield Ditch;
- Tunnel inspection;
- Preparation of a reconnaissance report identifying the current status of the tunnel and identifying alternatives to address the tunnel's deteriorating condition, including estimating the costs associated with the alternatives;
- Preparation of funding applications, including this WaterSMART application, and the loan application for the Utah Division of Water Resources;
- Work with the Forest Service on cultural clearance and possible special use permit amendment application; and
- Begin coordination with Reclamation on permitting and tunnel improvements.

(b) How they benefitted the project

These costs provided Ephraim City and EIC information from which to make informed decisions. The information gathered allowed work to begin on funding acquisition and to begin the permitting process. By starting the permitting process early, delays can be avoided.

(c) The amount of the expense

The total amount of the expenses is $35,000. This include $16,000 for the Tunnel Reconnaissance work and report, $1,500 for preliminary analysis of the feasibility of piping the Gobblefield Ditch, $5,500 for permitting assistance, and $12,000 for efforts related to securing funding. Funding assistance includes preparation of WaterSMART grant applications and coordination with Utah Division of Water Resources on the loan. Additional funds will be spent as efforts continue on funding acquisition and permitting the project.

(d) The date of cost incurrence

Cost was incurred between October 2012 and January 2015.

(3) *Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.*

The total of $2,337,500 will be provided by the Utah Division of Water Resources. A letter from the Utah Division of Water Resources can be found in Appendix J. The loan application is scheduled to be approved at the Utah Division of Water Resources Board Meeting in March, 2015. Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.

As a Reclamation facility, the tunnel has been put on a list prepared by Reclamation personnel of facilities that need improvement. Facilities on this list may be allowed access to a long term, 0% interest loan. Funds for improvement of these facilities have not been appropriated by Congress. It is not known whether this funding option will be made available to EIC. At this time, no application has been made.

(4) *Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.*

Ephraim City is exploring the feasibility of requesting funds from the US Army Corps of Engineers 595 Program, but no formal application has been made. No other grants or loans are being sought at this time. All funding is anticipated to come from the loan from the Utah Division of Water Resources and a WaterSMART grant. If grant funds are not secured from Reclamation, the piping of the Gobblefield Ditch will likely not occur. Improvement of the Ephraim Tunnel is critical and will likely proceed in some form. Although it is unlikely that the project sponsors can afford the project as currently envisioned. A temporary stabilization will likely occur until additional grant funds can be obtained.

Please include the following chart to summarize your non-Federal and other Federal funding sources. Denote in-kind contributions with an asterisk (*). Please ensure that the total Federal funding (Reclamation and all other Federal sources) does not exceed 50 percent of the total estimated project cost.

Table 4: Summary of non-Federal and Federal funding sources

Funding Sources	Funding Amount
Non-Federal Entities	
1. Utah Board of Water Resources	$2,337,500
Non-Federal Subtotal	$2,337,000
Other Federal Entities	
1. N/A	
Other Federal Subtotal	$0
Requested Reclamation Funding	$1,000,000
Total Project Funding	**$3,337,500**

For applicants submitting a proposal under Funding Group II, please include the following chart to summarize your Federal funding request by year.

Table 5: Funding Group II Funding request

	Funding Group II Request		
	Year 1 (FY 2016)	Year 2 (FY 2017)	Year 3 (FY 2018)
Funding Requested	$600,000	$400,000	$0

The Gobblefield Pipeline and first phase of the tunnel improvements are planned for the fall/winter of 2015/2016 (FY 2016). The tunnel improvements will be completed during the fall of 2016 (FY 2017).

Budget Proposal

The project budget shall include detailed information on the categories listed below and must clearly identify all project costs. Unit costs shall be provided for all budget items including the cost of work to be provided by contractors. Additionally, applicants shall include a narrative description of the items included in the project budget, including the value of in-kind contributions of goods and services provided to complete the project. It is strongly advised that applicants use the budget proposal format shown or a similar format that provides this information. If selected for award, successful applicants must submit detailed supporting documentation for all budgeted costs.

Table 6: Funding Sources

Funding Sources	Percent of Total Project cost	Total Cost by Source
Recipient funding	70%	$2,337,500
Reclamation funding	30%	$1,000,000
Other Federal funding	0%	$0
Totals	**100%**	**$3,337,500**

Table 7: Probable Cost Estimate

Budget Item Description	Computation		Quantity Type	Total Cost
	$/Unit	Quantity		
Legal Services	$200/hr	50	Hours	$10,000
Environmental Services	See Appendix E			$50,000
Engineering Services	See Appendix C			$250,000
Construction Management	See Appendix C			$130,000
Construction Contract	See Appendix D			$2,887,500
Reclamation Reporting	$100/hr	100	Hours	$10,000
Total Project Costs				**$3,337,500**

Budget Narrative

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The types of information to describe in the narrative include, but are not limited, to those listed in the following subsections.

Ephraim Irrigation Company and Ephraim City employees will not earn a salary, wages, fringe benefits or reimbursements from funding obtained to implement this project. All contributions by these two entities will be volunteered or funded by the city's or company's general fund.

All funding secured from Reclamation and the Board of Water Resources will be used to pay contractual agreements for implementing the project, including the construction contract, materials, and fees for legal, engineering, and environmental services. Efforts made to date have been funded from the general funds of the irrigation company and city.

Salaries and Wages

Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. The labor rates should identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task.

Clearly identify any proposed salary increases and the effective date.

Generally, salaries of administrative and/or clerical personnel will be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they should be included in this section; however, a justification should be included in the budget narrative.

Ephraim Irrigation Company and Ephraim City employees will not earn a salary, wages, fringe benefits or reimbursements from funding obtained to implement this project. All contributions by these two entities will be volunteered or funded by the respective company's general fund. The program manager and other key personnel are identified below.

Mike Larson, Program Manager/Irrigation Company President
Bryan Kimball, Assistant Program Manager, Ephraim City Engineer
Layne Jensen, Design Engineer, Franson Civil Engineers
Brant Hanson, Ephraim City Manager
Chad Parry, Ephraim City Public Works Director

Fringe Benefits

Indicate rates/amounts, what costs are included in this category, and the basis of the rate computations. Indicate whether these rates are used for application purposes only or whether they are fixed or provisional rates for billing purposes. Federally approved rate agreements are acceptable for compliance with this item.

EIC and Ephraim City employees will not earn a salary, wages, fringe benefits or reimbursements from funding obtained to implement this project. All contributions by these two entities will be volunteered or funded by the respective company's general fund.

Travel

Include purpose of trip, destination, number of persons traveling, length of stay, and all travel costs including airfare (basis for rate used), per diem, lodging, and miscellaneous travel expenses. For local travel, include mileage and rate of compensation.

Significant travel is not anticipated as being needed for this project. Local travel needs will be covered by the general funds of the irrigation company and city.

Equipment

Itemize costs of all equipment having a value of over $5,000 and include information as to the need for this equipment, as well as how the equipment was priced if being purchased for the agreement. If equipment is being rented, specify the number of hours and the hourly rate. Local rental rates are only accepted for equipment actually being rented or leased for the project. If equipment currently owned by the applicant is proposed for use under the proposed project, and the cost to use that equipment is being included in the budget as in-kind cost share, provide the rates and hours for each piece of equipment owned and budgeted. These should be ownership rates developed by the recipient for each piece of equipment. If these rates are not available, the U.S. Army Corp of Engineer's recommended equipment rates for the region are acceptable. Blue book, Federal Emergency Management Agency (FEMA), and other data bases should not be used.

Not applicable.

Materials and Supplies

Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research, or construction. Identify how these costs were estimated (i.e., quotes, past experience, engineering estimates or other methodology).

Not applicable.

Contractual

Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. If a subrecipient, consultant, or contractor is proposed and approved at time of award, no other approvals will be required. Any changes or additions will require a request for approval. Identify how the budgeted costs for subrecipients, consultants, or contractors were determined to be fair and reasonable.

All funding obtained for the project will be used to pay consultants and construction contractors and subcontractors. These include legal services, engineering services, environmental services, and construction services. Detailed tasks to be completed, rates, and materials for each task is outlined in the Appendices as follows:

1) Appendix C – Engineering Services

2) Appendix D – Construction Services
3) Appendix E – Environmental Services

The costs shown in the appendices were prepared by a professional engineering firm. Cost for construction services were estimated using bid abstracts from similar projects. However, the tunnel improvement is a very unique project with items that cannot be compared to items found in project bid abstracts. Engineering judgment based on experience is the basis for some of the estimates. A narrative for the unit costs in the construction services cost estimate is included in the appendix. The engineering services estimate is broken down into various tasks and employee type to provide a more detailed estimate.

Environmental and Regulatory Compliance Costs

Applicants must include a line item in their budget to cover environmental compliance costs. "Environmental compliance costs" refer to costs incurred by Reclamation or the recipient in complying with environmental regulations applicable to a WaterSMART Grant, including costs associated with any required documentation of environmental compliance, analyses, permits, or approvals. Applicable Federal environmental laws could include NEPA, ESA, NHPA, and the CWA, and other regulations depending on the project. Such costs may include, but are not limited to:

- *The cost incurred by Reclamation to determine the level of environmental compliance required for the project*
- *The cost incurred by Reclamation, the recipient, or a consultant to prepare any necessary environmental compliance documents or reports*
- *The cost incurred by Reclamation to review any environmental compliance documents prepared by a consultant*
- *The cost incurred by the recipient in acquiring any required approvals or permits, or in implementing any required mitigation measures*

The amount of the line item should be based on the actual expected environmental compliance costs for the project. However, the minimum amount budgeted for environmental compliance should be equal to at least 1-2 percent of the total project costs. If the amount budgeted is less than 1-2 percent of the total project costs, you must include a compelling explanation of why less than 1-2 percent was budgeted.

How environmental compliance activities will be performed (e.g., by Reclamation, the applicant, or a consultant) and how the environmental compliance funds will be spent, will be determined pursuant to subsequent agreement between Reclamation and the applicant. If any portion of the funds budgeted for environmental compliance is not required for compliance activities, such funds may be reallocated to the project, if appropriate.

The applicant is planning to conduct the environmental compliance with the assistance of contractors and in consultation with Reclamation. The budgeted environmental costs are shown in Appendix E. Specific tasks and employees performing those tasks are included in the appendix.

Reporting

Recipients are required to report on the status of their project on a regular basis. Failure to comply with reporting requirements may result in the recipient being removed from consideration for funding under future funding opportunities. Include a line item for reporting costs (including final project and evaluation costs). Please see Section VI. E. 2 "Program Performance Reports". for information on types and frequency of reports required.

A total of $10,000 was budgeted for coordination with Reclamation. This amount would include the costs to create a final construction report and finalize repayment agreements, semi-annual construction reports, annual project performance report, and to coordinate requests for reimbursement. This work will be performed by the project sponsors with assistance from the consulting engineering firm selected to design the system.

Other

Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and what it will be used for. No profit or fee will be allowed.

Not applicable.

Indirect Costs

Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable OMB circular cost principles (see Section III.E., "Cost Sharing Requirement") for the recipient's organization. It is not acceptable to simply incorporate indirect rates within other direct cost line items.

If the recipient has separate rates for recovery of labor overhead and general and administrative costs, each rate shall be shown. The applicant should propose rates for evaluation purposes, which will be used as fixed or ceiling rates in any resulting award. Include a copy of any federally approved indirect cost rate agreement. If a federally approved indirect rate agreement is not available, provide supporting documentation for the rate. This can include a recent recommendation by a qualified certified public accountant (CPA) along with support for the rate calculation.

If you do not have a federally approved indirect cost rate agreement, or if unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate. Information on "Preparing and Submitting Indirect Cost Proposals" is available from Interior, the National Business Center, and Indirect Cost Services, at www.doi.gov/ibc/services/Indirect_Cost_Services/index.cfm.

Not applicable.

Total Costs

Indicate total amount of project costs, including the Federal and non-Federal cost-share amounts.

The estimated total project cost is $3,337,500. The Federal contribution would be $1,000,000 from the grant with the balance of $2,337,500 coming from a loan from the Utah Division of Water Resources.

Budget Form

In addition to the above-described budget information, the applicant must complete an SF-424A, Budget Information—Nonconstruction Programs, or an SF-424C, Budget Information—Construction Programs. These forms are available at <http://apply07.grants.gov/apply/FormLinks?family=15>.

Forms SF-424C and SF-424D are enclosed with the application for federal assistance SF-424.

Appendix A

Signed Official Resolution

OFFICIAL RESOLUTION
OF THE
EPHRAIM IRRIGATION COMPANY

RESOLUTION NO. 2015 - 1

WHEREAS, the United States Department of the Interior, Bureau of Reclamation has announced the *WaterSMART Water and Energy Efficiency Grants* in order to prevent water supply crises and ease conflict in the western United States, and has requested proposals from eligible entities to be included in the WaterSMART Program, and

WHEREAS, the Ephraim Irrigation Company has need for funding to improve and update a tunnel and pipe an existing canal to conserve water and provide its shareholders with a more reliable source of water.

NOW, THEREFORE, BE IT RESOLVED that the Ephraim Irrigation Company Board of Directors agrees and authorizes that

1. The Ephraim Irrigation Company has reviewed and supports the proposal submitted;

2. The applicant is capable of providing the amount of funding specified in the funding plan; and

3. If selected for a WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: 1/20/2015

Mike D. Larson

Mike Larson
President, Ephraim Irrigation Company

ATTEST:

Bryan Kimball 1/20/15

Signature

Bryan Kimball

Printed Name

Appendix B
Water Savings Calculations

Ephraim Irrigation Company

Gobblefield Ditch Water Savings Calculations

					Estimated Water Losses in Acre-Feet per Month[5]													
					A-B		B-C		C-D		D-E		E-F		F-G		G-H	
Month	Average Flow (cfs)[1]	Gobblefield Ditch (23%)[2]	Pipeline Flows (Cap. 20 cfs)[3]	Total AF/Month[4]	1.000	10%	0.226	24%	0.158	5%	0.079	10%	0.203	1%	0.000	30%	0.147	5%
Apr	13.6	3.1	3.1	93.1	93.1	9.3	64.8	15.6	41.5	2.1	36.3	3.6	26.0	0.3	25.8	7.7	15.4	0.8
May	89.5	20.6	20.0	1229.8	1229.8	123.0	856.6	205.6	548.2	27.4	479.6	48.0	344.0	3.4	340.6	102.2	203.4	10.2
Jun	128.5	29.6	20.0	1190.1	1190.1	119.0	829.0	199.0	530.5	26.5	464.2	46.4	332.9	3.3	329.6	98.9	196.8	9.8
Jul	30.4	7.0	7.0	429.9	429.9	43.0	299.5	71.9	191.6	9.6	167.7	16.8	120.3	1.2	119.1	35.7	71.1	3.6
Aug	13.0	3.0	3.0	183.8	183.8	18.4	128.1	30.7	82.0	4.1	71.7	7.2	51.4	0.5	50.9	15.3	30.4	1.5
Sep	5.3	1.2	1.2	72.5	72.5	7.3	50.5	12.1	32.3	1.6	28.3	2.8	20.3	0.2	20.1	6.0	12.0	0.6
Oct	4.5	1.0	1.0	30.8	30.8	3.1	21.5	5.1	13.7	0.7	12.0	1.2	8.6	0.1	8.5	2.6	5.1	0.3
Total				3230.00		323.0		540.0		72.0		126.0		9.0		268.4		26.7

Total Supply	3,230.0 AF/Year
Total Loss	1,365.1 AF/Year
Average Percent Loss	42.3%

Factor for Turnout Diversions (Based on Water Rights)

Estimated percentage losses to seepage

[1] *Average flows in Cottonwood Creek based on measurements by the River Commissioners between 2006-2012.*

[2] *Average flows into Gobblefield Ditch. Based on 23% of the flows in Cottonwood Creek as per Ephraim Irrigation Company's Water Right (Turnout A)*

[3] *Average flows available post project. The pipeline will have a maximum capacity of 20 cfs.*

[4] *Conversion into acre-feet per month (April 15 to October 15).*

[5] *Estimated losses for each section of ditch. For example, the turnout at Section B diverts 22.6% of available flows; and the flow losses due to seepage at Section B-C is 24%.*

Turnout Legend

A	*Gooblefield Ditch Diversion (8400 gpm; 18.72 cfs)*
B	*Old Channel Turnout*
C	*Little Field Turnout*
D	*Old Field Turnout*
E	*Sand Ridge Turnout*
F	*No Turnout at this Location (transition from Concrete to Unlined Channel)*
G	*Grave Yard Turnout*
H	*Kesco & Haag Turnout*

Flow Diverted at Turnouts			
Turnout	Turnout (GPM)	Flow on Ditch	Factors
A	0	8400	1.000
B	1900	6500	0.226
C	1030	5470	0.158
D	433	5037	0.079
E	1022	4015	0.203
F	0	4015	0.000
G	591	3424	0.147
H - Kesco	1853	1571	0.541
H - Hagg	1571	0	

NOTE: The irrigation company needs 8,400 gpm (18.72 cfs) to irrigate their fields from the Gobblefield Ditch. On average, this flow is only available in May and June.

Appendix C

Probable Cost for Engineering Services

(Engineering Design and Construction Management)

Ephraim Irrigation Company and Ephraim City

Probable Cost Opinion for Engineering Services

Gobblefield Ditch Piping & Ephraim Tunnel Improvements

(Rate Table Attached)

Task Description	Hours By Personnel Category								Total Hours	Total Labor Charges	Other Direct Costs	Total Fee
	1	2	3	4	6	7	14	15				
	Principal	Project Manager	Senior Engineer	Staff Engineer	Engineer I	Designer	Office Assistant	Clerk				
Phase 1 - Project Management & Coordination												
Task 1. General Project Management Tasks	5	40					10		55	$6,990	$0	$6,990
Task 2. Client Coordination Meetings		18	10	10					38	$4,760	$700	$5,460
Task 3. Environmental Coordination		8		10			10		28	$2,750	$400	$3,150
Task 4. Preliminary Analysis		10	18	10			10		48	$5,190	$150	$5,340
Task 5. Permit Acquisitions		10	18	20		40	10		98	$10,070	$4,000	$14,070
Task 6. Loan Closing & Legal Coordination		10					10		20	$1,990	$3,000	$4,990
SUBTOTAL	**5**	**96**	**46**	**50**	**0**	**40**	**50**	**0**	**287**	**$31,750**	**$8,250**	**$40,000**
Phase 2 - Engineering Design												
Task 1. Design Team Management	4	60	20	8		10			102	$13,232	$78	$13,310
Task 2. Construction Drawings Draft (Tunnel Phase 1)		20	40		20	170			250	$25,700	$200	$25,900
Task 3. Construction Drawings Final (Tunnel Phase 1)	4	16	40		20	170			250	$25,780	$200	$25,980
Task 4. Construction Specifications (Tunnel Phase 1)	4	16	40		20		20		100	$10,640	$150	$10,790
Task 5. Bid & Award Coordination (Tunnel Phase 1)		20	40		20				80	$9,380	$200	$9,580
Task 6. Construction Drawings Draft (Tunnel Phase 2)		20	40		20	170			250	$25,700	$200	$25,900
Task 7. Construction Drawings Final (Tunnel Phase 2)	4	16	40		20	170			250	$25,780	$200	$25,980
Task 8. Construction Specifications (Tunnel Phase 2)	4	16	40		20		20		100	$10,640	$200	$10,840
Task 9. Bid & Award Coordination (Tunnel Phase 2)		20	40		20				80	$9,380	$200	$9,580
Task 10. Construction Drawings Draft (Gobblefield Ditch)		20		20	20	100			160	$16,260	$200	$16,460
Task 11. Construction Drawings Final (Gobblefield Ditch)	4	16		40	20	100			180	$18,420	$200	$18,620
Task 12. Construction Specifications (Gobblefield Ditch)	4	16		40	20		20		100	$10,000	$200	$10,200
Task 13. Bid & Award Coordination (Gobblefield Ditch)		20		20	20				60	$6,660	$200	$6,860
SUBTOTAL	**28**	**276**	**340**	**128**	**240**	**890**	**60**	**0**	**1,962**	**$207,572**	**$2,428**	**$210,000**
Phase 3 - Construction Management												
Task 1. Construction Team Management	5	20							25	$3,600	$0	$3,600
Task 2. On-Site Observation For Tunnel (Phase 1)		70	20	220					310	$35,080	$1,200	$36,280
Task 3. On-Site Observation for Tunnel (Phase 2)		70	20	280					370	$41,320	$1,200	$42,520
Task 4. On-Site Observation Gobblefield Ditch Piping		36	20	200					256	$28,240	$0	$28,240
Task 5. Record Drawings/Project Closeout		10	16	80		80			186	$19,320	$40	$19,360
SUBTOTAL	**5**	**206**	**76**	**780**	**0**	**80**	**0**	**0**	**1,147**	**$127,560**	**$2,440**	**$130,000**
Project Totals	**38**	**578**	**462**	**958**	**240**	**1010**	**110**	**0**	**3,396**	**$366,882**	**$13,118**	**$380,000**

FRANSON CIVIL ENGINEERS
FEE SCHEDULE – 2015

This Fee Schedule applies to services rendered during the current year. A new Schedule will be issued at the beginning of each year. These fees include overhead and profit.

Personnel

Classification	2015
Principal	$160
Senior Manager	$140
Senior Engineer	$120
Senior Field Manager	$116
Staff Engineer	$104
Senior Designer	$96
Engineer I	$89
Reports Writer/Editor	$88
Designer	$87
Engineering Assistant	$83
Engineering Intern	$72
Office Assistant	$59
Clerk	$53

Expenses

Expenses incurred for the project will be invoiced at direct cost. Standard rates for selected common direct expenses are as follows:

	2015
Mileage (IRS mileage rate + $0.10)	$0.68/mile
Copy/Print – 8.5x11	$0.04/page
Copies – 11x17	$0.08/page
Color Copy/Print	$0.25/page
Oversize copies/prints	$1.00/sq. ft.

Appendix D

Probable Cost for Construction Services

Ephraim Irrigation Company and Ephraim City
Gobblefield Ditch Piping

Bid Item	Item Description	Quantity	Unit	Unit Price	Total Item Price
1.0	**Mobilization**				
1.1	Mobilization	1	EA	$70,000	$50,000
1.2	Surveying	1	EA	$5,000	$4,000
2.0	**Inlet Structure**				
2.1	Inlet Structure	1	EA	$35,000	$35,000
3.0	**Pipe**				
3.1	Furnish and install 27-inch PVC PIP Pipe rated for 80 psi	1,100	LF	$43	$47,000
3.2	Furnish and install 24-inch PVC PIP Pipe DR 51 rated for 80 psi	4,560	LF	$35	$159,600
3.3	Furnish and install 21-inch PVC PIP Pipe DR 51 rated for 80 psi	6,500	LF	$31	$201,500
3.4	Furnish and install 18-inch PVC PIP Pipe DR 51 rated for 80 psi	5,400	LF	$26	$140,400
3.5	Furnish and install 15-inch PVC PIP Pipe	700	LF	$22	$15,400
4.0	**Turnout Assemblies**				
4.1	Furnish and Install turnouts	7	EA	$9,500	$66,500
5.0	**Large Meter Assemblies**				
5.1	Furnish and install large meter vault	1	EA	$14,000	$14,600
6.0	**Air-vac Assemblies**				
6.1	Furnish and install air-vac assembly	9	EA	$4,000	$36,000
7.0	**Control Valves**				
7.1	Valves	7	EA	$5,000	$35,000
				Sub-Total	**$805,000**
				Engineering Design	$70,000
				Construction Management	$40,000
				Environmental & Permiting	$15,000
				Admin and Legal	$10,000
				Total Project Cost	**$940,000**

Budget Narrative – Gobblefield

All unit costs above were estimated based on actual construction bids from a project recently completed. Engineering judgment was used when comparable items were not available or costs needed to be adjusted for inflation and different conditions. Inflation is also accounted for in the unit costs. Variances from bid costs are identified in the narrative below. Very limited design work has been done on this project. Only preliminary design work has been done to identify the pipe sizes needed and the lengths, since this has the greatest impact on the cost. The unit costs for the pipe are the most accurate for the same reason. Other unit costs are more of an average to represent a range of sizes since specific sizes and numbers have not yet been identified. The bid abstracts referenced include:

- North Summit Pressurized Irrigation Project, Wanship, West Hoytsville, and Hoytsville Pipelines; October 2014
- West Lewiston Pressurized Irrigation Project; May 2012
- Moroni Pipeline Project, Phase I; January 2013. This project is located in the same county and is a very similar project. It provides the best cost information.

The bid abstracts are available for review upon request. More detail is provided below:

Item 1.1 – The mobilization is about 6% of the total construction costs. The percentage was calculated based on the Wanship Pipeline bid abstract. The number was rounded to the nearest $10,000.

Item 1.2 – There is not expected to be significant surveying needs beyond preparing record drawings. A survey crew, including equipment, will cost approximately $150/hour. The cost represents three days of surveying effort, with rounding to the nearest $1,000.

Item 2.1 – No design work has been done on the inlet structure. The Moroni Pipeline Project included a desilting structure that also served as a pipe inlet. The average bid for the desilting structure was $60,000. The inlet structure will not have the complex geometry and sluicing equipment that the desilting structure has and it will also be a little smaller. With this as a reference, a cost of $35,000 was estimated.

Items 3.1 to 3.5 – Furnish and install costs in the Moroni Pipeline Project were used as reference for these costs since Ephraim and Moroni are very close and the installation conditions are similar. The average furnish and install cost of the lowest four bids was used. Approximately $3/ft was added to the cost for inflation. Note that between the time of the Moroni Pipeline Project and now, PVC prices have actually decreased, but the bidding environment is not as favorable. Values were rounded to the nearest dollar.

Item 4.1 – The turnout assemblies for this project will be very similar to the turnouts for the Moroni Pipeline Project, with the exception that a precast concrete box will not be needed. The bids for the turnouts ranged from $9,000 to $14,000, depending on the size of the pipe being connected to and the size of the turnout. With the concrete box and associated items being removed, an average cost with inflation was estimated to be $9,500/turnout.

Item 5.1 – The average bid for a 24-inch meter vault in the Moroni Pipeline Project was just under $13,000. This cost was increased to $14,000 to reflect inflation and a less competitive bidding environment.

Item 6.1 – The cost for the air/vac assemblies are based on a combination of the Wanship Pipeline and the Moroni Pipeline Project. Air/vac assemblies were about $2,500 for the Moroni Project and $4,500 for the Wanship Pipeline. The Wanship Pipeline is more recent, but the Moroni bids are more representative of bidding conditions in Sanpete County. A cost of $4,000 was estimated based on this information.

Item 7.1 – Butterfly valves will range from 15 inches to 27 inches in size. The cost of these valves will range from $1,200 to $3,000 based on material quotes for the North Summit Pressurized Irrigation Project. Flange adapters for the valve range from $250 to $700. Two flange adapters are needed. Installation costs range between $100 and $500 based on the size of the valve according to the West Lewiston Project bid abstract. With most valves being larger and factoring increased costs due to inflation, an average cost of $5,000/valve was selected.

Ephraim Irrigation Company and Ephraim City
Ephraim Tunnel Improvements

Item	Bid Item Description	Bid Quantity	Unit	Unit Price	Bid Item Price
1	**Site Preparation**				**$164,700.00**
1.01	Mobilization	1	LS	$150,000.00	$150,000.00
1.02	Surveying	1	LS	$4,000.00	$4,000.00
1.03	Clear, grub, strip, and improve access road - inlet	1	LS	$1,500.00	$1,500.00
1.04	Clear, grub, strip, and improve access road - outlet	1	LS	$8,000.00	$8,000.00
1.05	Water management and control as needed to construct project	1	LS	$1,200.00	$1,200.00
2	**Inlet Improvements**				**$22,130.00**
2.01	Establish and maintain site access	1	LS	$1,000.00	$1,000.00
2.02	Re-slope hillside around tunnel inlet/wing walls	1	LS	$5,000.00	$5,000.00
2.03	Remove deteriorated concrete/CMU at headwall structure - New head walls and apron	1	LS	$10,500.00	$10,500.00
2.04	Furnish and install wall drains and runoff basin	1	LS	$3,130.00	$3,130.00
2.05	Final site grading	1	LS	$2,000.00	$2,000.00
2.06	Revegetation	1	LS	$500.00	$500.00
3	**Outlet Improvements**				**$31,500.00**
3.01	Establish and maintain site access	1	LS	$7,500.00	$7,500.00
3.02	Install slope stabilization	1	LS	$10,000.00	$10,000.00
3.03	Furnish and install grate	1	LS	$2,500.00	$2,500.00
3.04	Final site grading	1	LS	$8,500.00	$8,500.00
3.05	Revegetation	1	LS	$3,000.00	$3,000.00
4	**Tunnel Improvements**				
	Sta 0+00 to 0+75 (Tunnel Inlet - Concrete Lined) (75-Feet)				**$9,940.00**
4.01	Remove rubble, debris, and sediment	10	CY	$150.00	$1,500.00
4.02	Secure 10-inch HDPE (Strap every 50-feet)	3	EA	$80.00	$240.00
4.03	Recess 10-inch HDPE into wall	75	LF	$50.00	$3,750.00
4.04	Furnish and install 54-inch steel reinforced polyethylene pipe	10	LF	$145.00	$1,450.00
4.05	Furnish and install cellular concrete/grout transition	1	LS	$3,000.00	$3,000.00
	Sta 0+75 to 4+50 (Unsupported Section) (375-feet)				**$121,515.00**
4.06	Remove rubble, debris, and sediment	180	CY	$150.00	$27,000.00
4.07	Secure 10-inch HDPE (Strap every 50-feet)	8	EA	$80.00	$640.00
4.08	Furnish and install 54-inch steel reinforced polyethylene pipe	375	LF	$145.00	$54,375.00
4.09	Furnish and install cellular concrete	400	CY	$95.00	$38,000.00
4.10	Furnish and install 1-foot thick concrete cap	1	LS	$1,500.00	$1,500.00
	Sta 4+50 to 16+85 (Wood Set Section) (1,235-feet)				**$354,150.00**
4.11	Remove rubble, debris, and sediment	150	CY	$150.00	$22,500.00
4.12	Secure 10-inch HDPE (Strap every 50-feet)	25	LF	$80.00	$2,000.00
4.13	Furnish and install 54-inch steel reinforced polyethylene pipe	1235	LF	$145.00	$179,075.00
4.14	Furnish and install cellular concrete	1585	CY	$95.00	$150,575.00
	Sta 16+85 to 22+60 (Unsupported Section) (575-feet)				**$154,285.00**
4.15	Redistribute rubble, debris, and sediment	15	CY	$75.00	$1,125.00
4.16	Secure 10-inch HDPE (Strap every 50-feet)	47	LF	$80.00	$3,760.00

Item	Bid Item Description	Bid Quantity	Unit	Unit Price	Bid Item Price
4.17	Furnish and install 54-inch steel reinforced polyethylene pipe	575	LF	$145.00	$83,375.00
4.18	Furnish and install cellular concrete	695	CY	$95.00	$66,025.00
	Sta 22+60 to 26+09 (Wood Set Section) (349-feet)				**$88,765.00**
4.19	Redestribute rubble, debris, and sediment	20	CY	$75.00	$1,500.00
4.20	Secure 10-inch HDPE (Strap every 50-feet)	7	LF	$80.00	$560.00
4.21	Furnish and install 54-inch steel reinforced polyethylene pipe	349	LF	$145.00	$50,605.00
4.22	Furnish and install cellular concrete	380	CY	$95.00	$36,100.00
	Sta 26+09 to 32+27 (Concrete Liner) (618-feet)				**$46,190.00**
4.24	Redestribute rubble, debris, and sediment	10	CY	$75.00	$750.00
4.25	Secure 10-inch HDPE (Strap every 50-feet)	13	LF	$80.00	$1,040.00
4.26	Recess 10-inch HDPE into wall	618	LF	$50.00	$30,900.00
4.27	Furnish and install 54-inch steel reinforced polyethylene pipe	40	LF	$150.00	$6,000.00
4.28	Furnish and install cellular concrete/grout transitions	1	LS	$7,500.00	$7,500.00
	Sta 32+27 to 69+85 (Unsupported Section) (3,758-feet)				**$1,069,010.00**
4.29	Redestribute rubble, debris, and sediment	600	CY	$75.00	$45,000.00
4.3	Secure 10-inch HDPE (Strap every 50-feet)	75	LF	$80.00	$6,000.00
4.31	Furnish and install 54-inch steel reinforced polyethylene pipe	3758	LF	$145.00	$544,910.00
4.32	Furnish and install cellular concrete	4980	CY	$95.00	$473,100.00
	Sta 69+85 to 71+14 (Concrete Liner) (129-feet)				**$13,565.00**
4.33	Redestribute rubble, debris, and sediment	25	CY	$75.00	$1,875.00
4.34	Recess 10-inch HDPE into wall	129	LF	$50.00	$6,450.00
4.35	Transition from 54-inch steel reinforced polyethylene pipe to existing concrete liner	2	EA	$2,500.00	$5,000.00
4.36	Secure 10-inch HDPE (Strap every 50-feet)	3	LF	$80.00	$240.00
	Sta 71+14 to 71+33 (Box Culvert) (19-feet)				**$6,750.00**
4.37	Remove rubble, debris, and sediment	10	CY	$150.00	$1,500.00
4.38	Secure 10-inch HDPE (Strap every 50-feet)	1	LF	$80.00	$80.00
4.39	Grout tunnel where culinary water line exits concrete liner	1	LS	$1,500.00	$1,500.00
4.40	Furnish and install 1-foot thick concrete cap	1	LS	$3,670.00	$3,670.00
				Sub Total	**$2,082,500.00**
				Engineering Design	**$180,000.00**
				Construction Management	**$90,000.00**
				Environmetal & Permitting	**$35,000.00**
				Admin Reporting and Legal	**$10,000.00**
				Total	**$2,397,500.00**

Budget Narrative – Ephraim Tunnel

The improvement of the Ephraim Tunnel is a very unique project with few bid abstracts that can be used for reference. The Fairview Tunnel Rehabilitation Project was completed in the same county about three years ago. The Fairview Tunnel Rehabilitation Project costs will be used as a reference. As an indication of the uniqueness of this type of project, only one firm bid on the rehabilitation of the Fairview Tunnel, although it was advertised throughout the western United States. Although the Fairview Tunnel Rehabilitation Project will provide good reference material, there is enough variability that significant adjustments will need to be made. The Fairview Tunnel was in worse shape and required far more stabilization to allow safe work conditions. A far greater volume of material needed to be removed from the tunnel before a pipe could be installed. The rock that the Fairview Tunnel was constructed in had weathered to a clay, which was very difficult to excavate. Debris in the Ephraim Tunnel is a blocky limestone that will be much easier to handle. Since there is far less debris in the Ephraim Tunnel, much of the debris will just need to be moved around to make space for the pipe.

Item 1.01 – The mobilization is about 7% of the total construction costs. A typical mobilization is 5%. Since this is a unique project, in a remote location, an additional 2% was added to the mobilization. The number was rounded up to the nearest $10,000.

Item 1.02 – There is not expected to be significant surveying needs beyond preparing record drawings. A survey crew, including equipment, will cost approximately $150/hour. The cost represents three days of surveying effort, with rounding to the nearest $1,000.

Items 1.03, 1.04, 2.01, and 3.01 – These items relate to preparing the access. The road to the inlet will require some grading. The outlet access is currently not usable and will require far more work to reestablish. Similar work for the Fairview Tunnel ranged from $795 to $3,616. Both the access to the inlet and outlet are longer for the Ephraim Tunnel. Based on a loose extrapolation of length, the cost was roughly doubled to $1,500 for the inlet and $8,000 for the outlet. An additional $1,000 was put into the estimate for maintenance of the inlet road during construction since that is where the majority of activity will be located. An additional $7,500 was put into the estimate to maintain access to the outlet during construction since it is a longer access road and will be more difficult to maintain.

Items 1.05 – Minimal water management is expected. The cost in the Fairview bid was increased slightly to reflect inflation ($1,115 to $1.200).

Items 2.02 and 3.12 – This item compared to the temporary slope stabilization in the Fairview bid. The cost was increased slightly for the inlet for inflation ($4,679 to $5,000). The outlet has steeper and longer slopes, so the stabilization costs for the outlet were essentially doubled.

Item 2.03 – The Fairview bid has an item for repair and reinforcement of wing walls. The scope of the work is similar, but access for concrete is greater. The estimated cost was increased from $8,726 to $10,500 to reflect inflation and higher concrete costs due to greater distance and more difficult site access.

Item 2.04 – Drainage is expected to be significantly easier for the Ephraim Tunnel than it was for the Fairview Tunnel. Based on this observation, the cost was reduced from $4,170 to $2,500.

Items 2.05 and 3.04 – Final site grading was increased from $1,205 to $2,000 because slightly more grading will be necessary for the inlet. The outlet will require far more work to stabilize the road and prevent future access. Slightly more effort will be needed to reclaim the road than to reopen it.

Items 2.06 and 3.05 – The revegetation cost was increased slightly from $492 to $500 for the inlet. Vegetation costs for the outlet include reseeding the access road.

Items 3.03 – The grate for the Fairview Tunnel was slightly larger, so the cost was reduced slightly from $2,610 to $2,500.

Items 4.01, 4.06, 4.11, and 4.35 – The Fairview Tunnel was bid using a cost for each linear foot of the tunnel that would be cleaned out. The cost varied based on the amount and difficulty of removing the material. The unit costs also included shoring so that work could be done safely. The linear foot cost ranged from $13/ft to $198/ft. The worst areas were paid on a cubic yard basis ($275/CY). The cleaning needed of the Ephraim Tunnel is not nearly as difficult as it was for the Fairview Tunnel since the Ephraim Tunnel is in better shape and the material is not a clay/rock mixture that is very difficult to work with (as it was in the Fairview Tunnel). Recognizing that the cleaning in the Ephraim Tunnel is more like the lower cost cleaning of the Fairview Tunnel, a cost of $150/CY was estimated.

Items 4.02, 4.07, 4.12, 4.16, 4.20. 4.25, 4.30, 4.36, and 4.38 – The existing 10-inch HDPE pipe will need to be secured in the tunnel in preparation for installing the 54-inch pipe. There is no comparable item for this in the Fairview Tunnel Project. In most areas, there are already straps securing the pipe. Some of these need to be repaired or replaced. Most will just need a little labor to move rocks or move the pipe to the side. The estimate of $80/50ft is an estimate based on engineering judgment.

Items 4.03, 4.26, and 4.34 – In areas where the tunnel is concrete lined, there is not sufficient room for the 10-inch pipe and 54-inch pipe. In these areas, the concrete must be cut to make room for the pipe. A 9-inch deep concrete cut at $8/ft was assumed. The cost to cut concrete was obtained from the Means Heavy Construction Cost Catalog. Due to the difficult conditions in the tunnel, the cost estimate in Means was increased. To create enough space for the pipe, three cuts were assumed to be needed. This converts to $24/ft for cutting. $15/ft was added to break out and remove the concrete/rock. Another $11/ft was added to move the pipe out of way during cutting and then to provide bedding for the pipe and secure it.

Items 4.04, 4.08, 4.13, 4.17, 4.21, 4.26, and 4.31 – The installation of a 54-inch ADS pipe in the Fairview Tunnel cost $135/foot. This cost for the Ephraim Tunnel was increased by $10/ft to account for inflation and the difficulties associated with installation in a longer tunnel.

Items 4.05 and 4.40 – This is basically preparing some formwork to grout around the pipe to make an efficient hydraulic transition from the concrete-lined section of the tunnel to the HDPE pipe.

Cast-in-place concrete in this situation is expected to be about $500/CY based on cast-in-place concrete costs for work on a dam in a similar remote area. About 6 CY of concrete should be needed to make the transition at the inlet and a similar amount at the outlet. Another $670 was added at the outlet due to a more difficult access.

Items 4.09, 4.14, 4.18, 4.22, 4.28, and 4.32 – A contractor that specializes in placement of cellular concrete, MixOnSite, estimated cellular concrete would cost between $65 and $75/CY. The higher cost was assumed and another $20/CY was added for mobilization of the specialized equipment, pipes for transporting the cellular concrete, testing, securing the 54-inch pipe so it would not float during placement, and ports in the 54-inch pipe for installation of the cellular concrete.

Items 4.15, 4.19, 4.24, 4.29, and 4.33 – Areas of the tunnel with little debris will only require the debris to be moved out of the center of the tunnel to the sides so that the pipe can be installed. These areas were estimated to require half the effort as the areas that required removal of the material. Thus, the cost to redistribute the debris was estimated to be $75/CY.

Appendix E

Probable Cost for Environmental Services

(Environmental and Cultural Resources Compliance)

Ephraim Irrigation Company

Probable Cost Estimate for Environmental Services (Gobblefield Ditch)

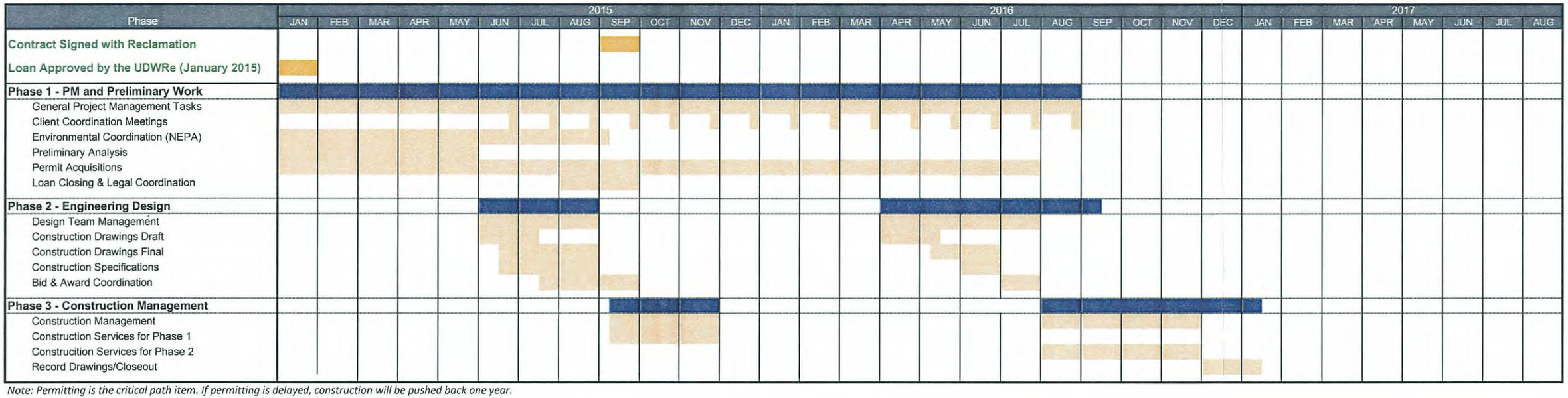
ITEM DESCRIPTION	HOURS	UNIT COST	TOTAL COST
Fieldwork - Archaeological Inventory			
Project Manager	40	$70.00	$2,800
Staff Archaeologist	40	$60.00	$2,400
		Subtotal	**$5,200**
Stream Alteration Permit			
Senior Manager	20	$136.00	$2,700
Staff Engineer	10	$101.00	$1,000
Senior Designer	10	$93.00	$900
		Subtotal	**$4,600**
Coordination with Reclamation on NEPA Compliance			
Senior Manager	10	$136.00	$1,400
Senior Designer	8	$93.00	$700
		Subtotal	**$2,100**
Report Production, Site Forms & Maps			
Principal Investigator	20	$70.00	$1,400
Staff Archaeologist	15	$60.00	$900
		Subtotal	**$2,300**
Direct Costs			
SHPO - Division of State History File Search	1	$270.00	$270
Mileage	300	$0.60	$180
Field Equipment	5	$70.00	$350
		Subtotal	**$800**
		Total	**$15,000**

Probable Cost Estimate for Environmental Services (Ephraim Tunnel)

ITEM DESCRIPTION	HOURS	UNIT COST	TOTAL COST
Fieldwork - Archaeological Inventory (see note below)			
Project Manager	10	$70.00	$700
Staff Archaeologist	10	$60.00	$600
		Subtotal	**$1,300**
Amended Special User Permit			
Senior Manager	30	$136.00	$4,100
Staff Engineer	80	$101.00	$8,100
Senior Designer	40	$93.00	$3,700
		Subtotal	**$15,900**
Stream Alteration Permit			
Senior Manager	15	$136.00	$2,000
Staff Engineer	9	$101.00	$900
Senior Designer	8	$93.00	$700
		Subtotal	**$3,600**
Coordination with Reclamation on NEPA Compliance			
Senior Manager	60	$136.00	$8,200
Senior Designer	20	$93.00	$1,900
		Subtotal	**$10,100**
Report Production, Site Forms & Maps			
Principal Investigator	20	$70.00	$1,400
Staff Archaeologist	25	$60.00	$1,500
		Subtotal	**$2,900**
Direct Costs			
SHPO - Division of State History File Search	1	$260.00	$260
Mileage	400	$0.60	$240
Field Equipment	10	$70.00	$700
		Subtotal	**$1,200**
		Total	**$35,000**

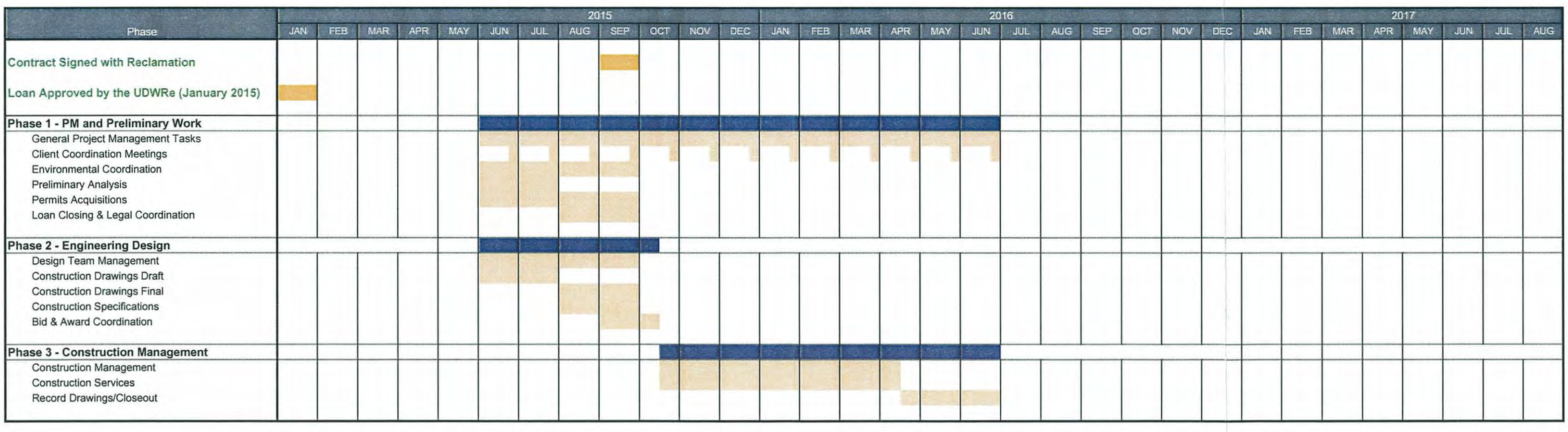
Appendix F
Proposed Schedule

Ephraim Tunnel Improvements



Note: Permitting is the critical path item. If permitting is delayed, construction will be pushed back one year.

Gobblefield Ditch Piping



Appendix G
Gobblefield Pipeline System

N

Legend

- 15-Inch Pipe
- 18-Inch Pipe
- 21-Inch Pipe
- 24-Inch Pipe
- 27-Inch Pipe

FRANSON CIVIL ENGINEERS

Ephraim City / Ephraim Irrigation Company

Gobblefield Ditch Piping and Ephraim Tunnel Rehabilitation

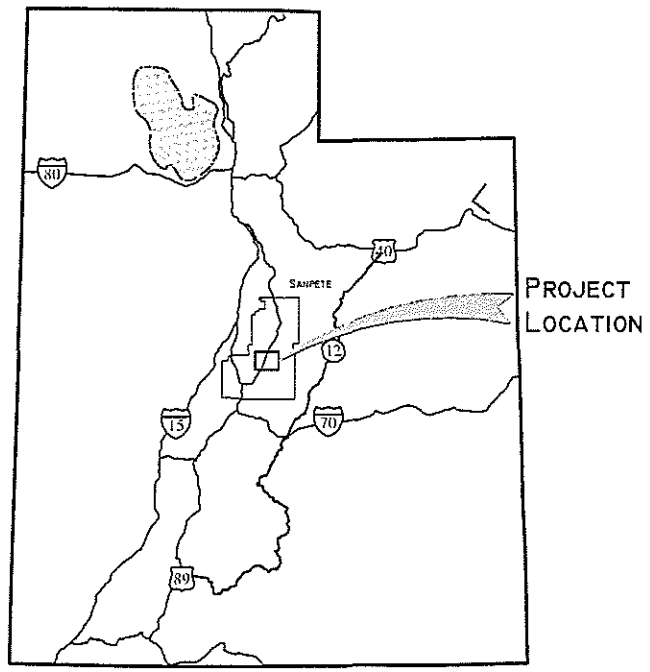
DATE:	January 22, 2014
SCALE:	1" = 1200'
Pipeline.dwg H:\CLIENT\1-South Utah Area\Sanpete Co\Ephraim Tunnel\Drawings	
LAYOUT: Pipeline Plan	

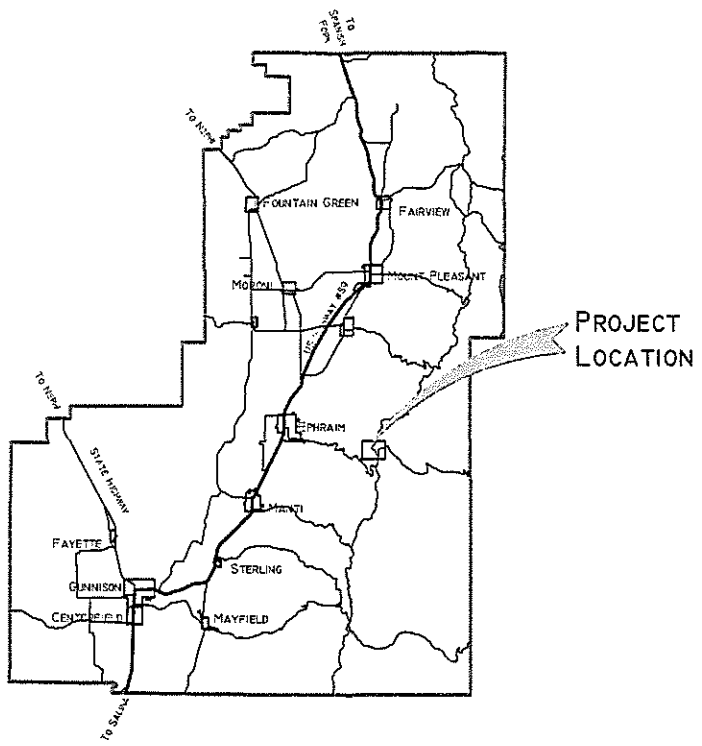
Figure 2

Reconnaissance Level Pipeline Location Map

Appendix H

Ephraim Tunnel Location Map and Profile





FRANSON
CIVIL ENGINEERS

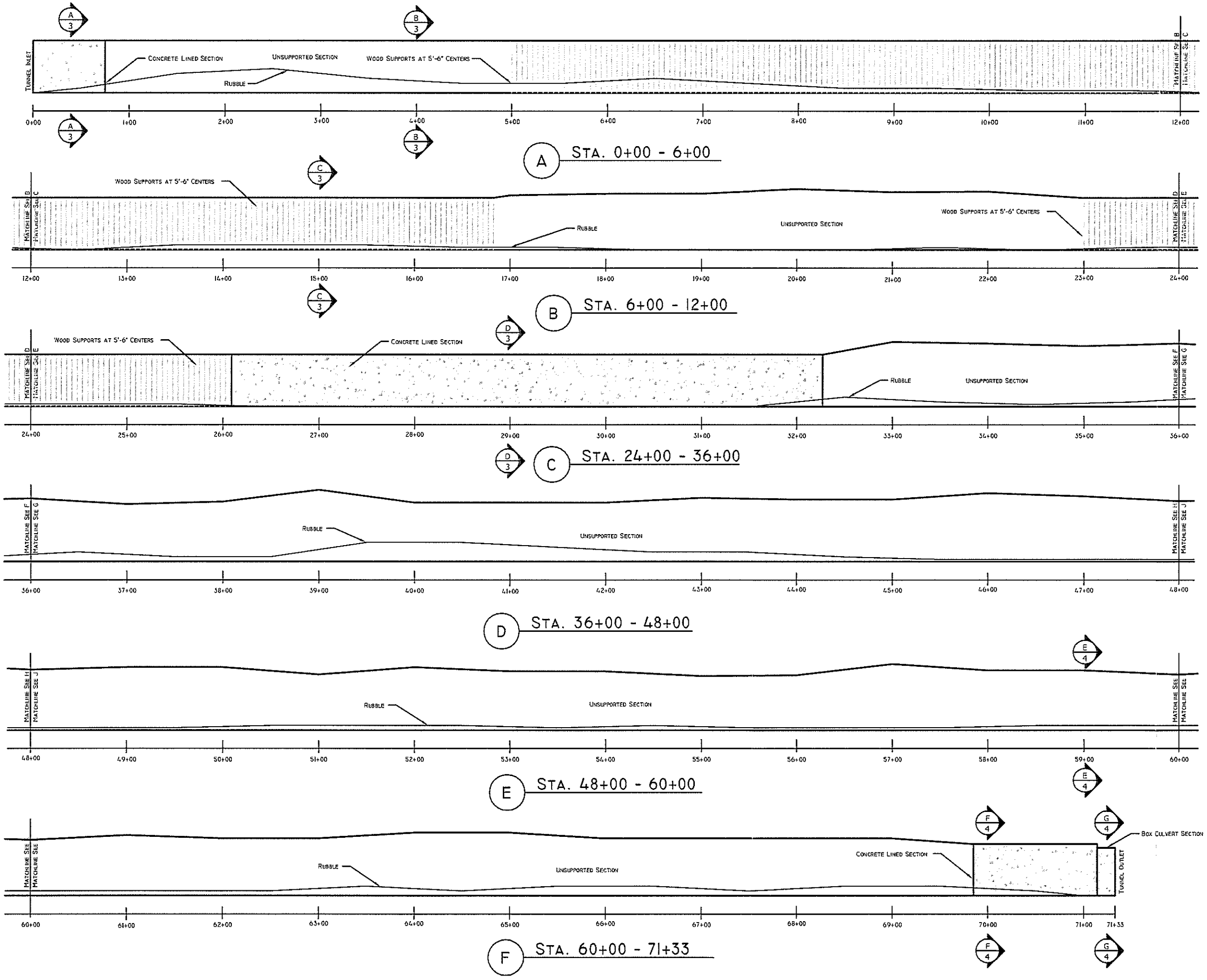
Ephraim City - Ephraim Irrigation Company

Ephraim Tunnel Rehabilitation

DATE:	February 22, 2013
SCALE:	
Location MApdwg H:\CLIENTS\-South Utah Area\Sanpete Co\Ephraim Tunnel\Drawings	
LAYOUT: Layout1	

Figure 1

Project Location Map



Unsupported Section

Concrete Lined Section

Wood Supports at 5'-6" centers

0 25' 50' 100'
Horizontal Scale

0 2.5' 5' 10'
Vertical Scale

FRANSON CIVIL ENGINEERS

Ephraim City - Ephraim Irrigation Company
Ephraim Tunnel Rehabilitation

DATE: April 24, 2013
SCALE:
Tunnel Sections.dwg
HACLIENTN-South Utah Area\Sanpete Co\Ephraim Tunnel\Drawings
LAYOUT: Profile-1

Figure 2
Tunnel Profile

Appendix I

Cover Page of Applicable Documents

(Electronic Copies Available Upon Request)

Ephraim Irrigation Company Water Conservation Plan

Sanpete Water Conservancy District Water Management & Conservation Plan

Sanpete County Water Resources Master Plan

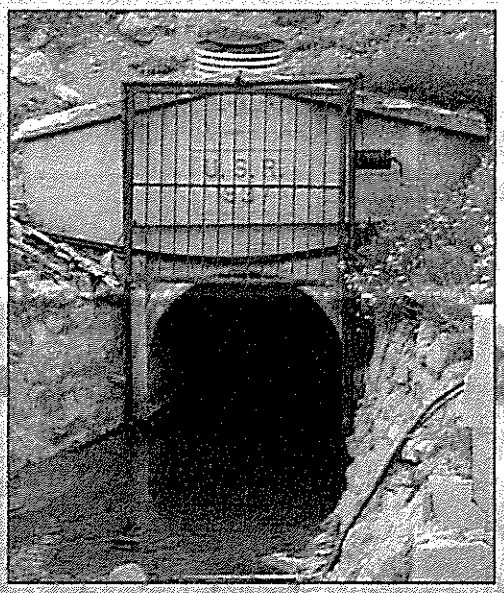
Ephraim Tunnel Reconnaissance Report

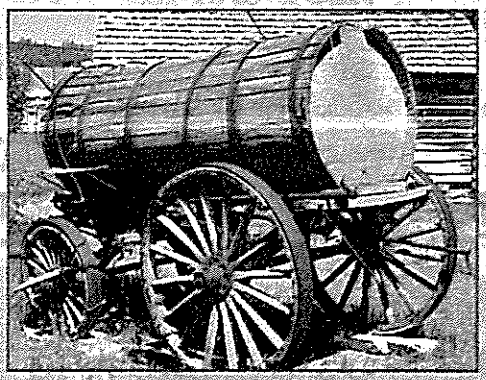
Ephraim City Water Utility and Conservation Plan Update

Water Conservation Plan

Ephraim Irrigation Company

October 2009





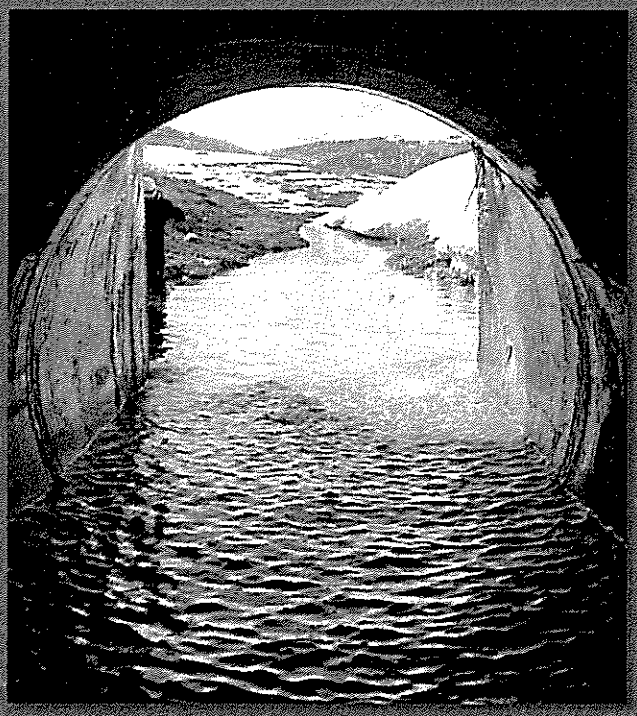
WATER MANAGEMENT & CONSERVATION PLAN

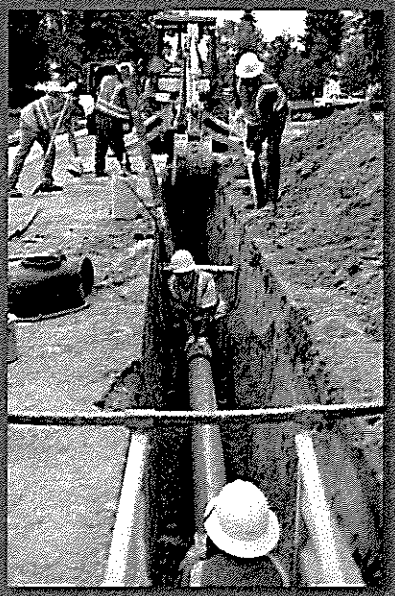
SANPETE WATER CONSERVANCY DISTRICT

September 2011

FRANSON
CIVIL ENGINEERS

Sanpete County
Water Resources Master Plan





Prepared for:

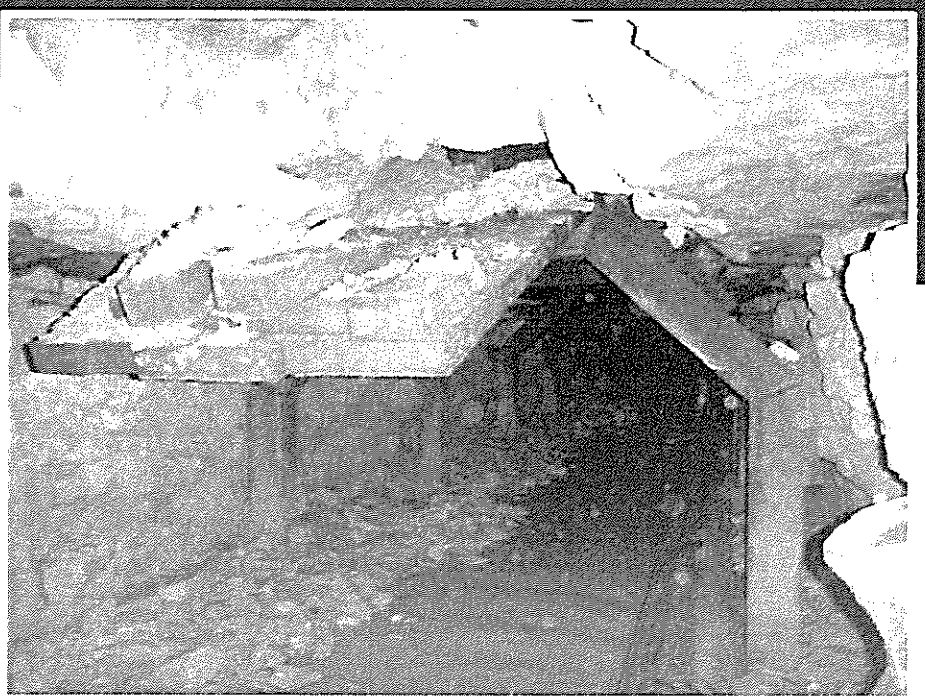
Sanpete Water Conservancy District

Prepared by:

FRANSON
CIVIL ENGINEERS

December 2012

Ephraim Tunnel Reconnaissance Report



Prepared for

Ephraim City and Ephraim Irrigation Company

Prepared by

FRANSON
CIVIL ENGINEERS

April 2013

Ephraim City Water Utility and Conservation Plan Update

November 2010

A conservation report, updating the previous water utility conservation report of Ephraim City, in compliance with the Utah Water Conservation Plan Act (73-10-32, UCA). This report was updated and compiled by City Engineer and Planner Bryan Kimball, and Public Works Director Chad Parry.

Appendix J
Letters of Support

COUNCIL MEMBERS
Tyler Alder
Margie Anderson
Alma Lund
Terry Lund
John Scott

MANAGER
Brant Hanson

PLANNER/ENGINEER
Bryan Kimball

RECORDER
Leigh Ann Warnock

EPHRAIM CITY CORPORATION

Richard Squire, MAYOR

5 South Main, Ephraim, Utah 84627

Ephraim
RICH IN HERITAGE. INVESTED IN THE FUTURE.

TREASURER
Leah Romero

BILLING CLERK
Candice Maudsley

FINANCE DIRECTOR
Steve Widmer

POLICE CHIEF
Ron Rasmussen

POWER DIRECTOR
Cory Daniels

PUBLIC WORKS DIRECTOR
Chad Parry

January 14, 2015

Bureau of Reclamation

WaterSMART Grant

To Whom It May Concern,

Ephraim City, in conjunction with the Ephraim Irrigation Company (providing a separate resolution), has need for funding to complete improvement of a tunnel and pipe an existing canal to conserve water and provide its shareholders with a more reliable source of water. Ephraim City has reviewed and supports the proposal submitted and is capable of providing the amount of funding specified in the funding plan. Should we be awarded a WaterSMART Grant, Ephraim City commits to work with Reclamation to meet established deadlines for entering into a cooperative agreement.

EPHRAIM CITY

Mayor Richard Squire

GARY R. HERBERT
Governor

Spencer J. Cox
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Water Resources

Eric L. Millis
Division Director

January 16, 2015

Mr. Michael Larson, President
Ephraim Irrigation Company
358 East 300 South
Ephraim, Utah 84627

RE: Projects E352/E361 – Ephraim Irrigation Company (Gobblefield Ditch/Ephraim Tunnel) Division of Water Resources funding letter for WaterSMART grant application

Mr. Larson:

We have been asked to provide this letter regarding available state funding for the Ephraim Irrigation Company's Gobblefield Ditch Piping and Ephraim Tunnel Improvement/Upgrade. We understand this letter is to be submitted with the company's WaterSMART grant application package to the Bureau of Reclamation.

We acknowledge receipt of the company's application to the Board of Water Resources (Board) for financial assistance for this project. The purpose of the project is to construct a pressurized irrigation system by installing about three and a half miles of transmission pipeline through the company's system. The project also includes the improvement and upgrade of the Ephraim Tunnel.

We understand that Ephraim Irrigation Company is applying for a $1,000,000 WaterSMART grant. We anticipate that the Board will provide $2,400,000 through a loan from the Board of Water Resources. It is understood that funding will be needed between May 2015 and May 2017.

The application has been approved by the local Board member for the area. We have meet with the company and are now preparing a Feasibility Report to present to the Board for their Authorization. It is anticipated that the report will be presented at the March 2015 board meeting. Any board action on the feasibility report will be subject to availability of funds, but at this time we do not anticipate a shortage of funds.

We look forward to continue working with you in the development of this project. Please contact me if you have any questions at 801-538-7266.

Thank you,

Marisa D. Egbert, P.E.
Project Manager

UTAH DNR WATER RESOURCES

1594 West North Temple, Suite 310, PO Box 146201, Salt Lake City, UT 84114-6201
telephone (801) 538-7230 • facsimile (801) 538-7279 • TTY (801) 538-7458 • *www.water.utah.gov*

USDA

United States Department of Agriculture

Natural Resources
Conservation Service

Ephraim Field Office

5 South Main
Suite 203
Ephraim, UT 84627

Voice: 435-283-8004
Fax: 435-283-8005

January 16, 2015

Mr. Mike Larsen
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

NRCS supports projects that conserve water such as the efforts of the Ephraim Irrigation Company to pipe the Gobblefield Ditch and improve the Ephraim tunnel. This project falls in step with local resource concerns documented in the local watershed plan for the San Pitch River in Sanpete County. NRCS looks forward to working with producers of the Ephraim Irrigation Company as they apply for programs and request assistance on resource concerns related to this project.

Sincerely,

Brian R. Miller
District Conservationist, NRCS, Sanpete County

An Equal Opportunity Provider and Employer

USDA

FSA
FARM SERVICE AGENCY

United States Department of Agriculture

Farm and Foreign Agricultural Services

Utah Farm Service Agency

Sanpete County Farm Service Agency

5 South Main
Suite #201
Ephraim, UT 84627

(435) 283-8002
Fax: (435) 283-8005

January 20, 2015

Mr Mike Larsen
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear: Mr Larsen:

Farm Service Agency Supports projects that conserve water such as the efforts of the Ephraim Irrigation Company to pipe the Gobblefield Ditch and improve the Ephraim Tunnel. This project will greatly benefit the producers in the Ephraim area. This project falls in step with the local resource concerns documented in the local watershed plan for the San Pitch River in Sanpete County. FSA looks forward to working with producers of the Ephraim Irrigation Company as they request assistance on resource concerns related to this project.

Sincerely,

Val Anderson
by Nadine Peterson acting CED
J Val Anderson
Sanpete County Executive Director

np

USDA is an Equal Opportunity Employer/Lender

State of Utah

GARY R. HERBERT.
Governor

SPENCER J. COX
Lieutenant Governor

Department of Agriculture and Food

LUANN ADAMS
Commissioner

SCOTT ERICSON
Deputy Commissioner

ROBERT HOUGAARD
Director, Plant Industry and Conservation

January 16, 2015

Mr. Mike Larsen
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

I write this letter to show the support of the Utah Conservation Commission regarding the efforts of the Ephraim Irrigation Company pursuing funding through the USBR's WaterSMART grant program. Both conserving water and providing reliable water delivery to the agricultural users in the State of Utah is one of our utmost priorities. The Sanpete Conservation District has also identified the improvement of water quality, quantity and irrigation efficiency as their highest priority for resource improvement.

The conversion of the canal to pipe, along with the improvements to the Ephraim Tunnel, all components of the Gobblefield Ditch Piping and Ephraim Tunnel Improvements project, will greatly benefit Sanpete County by increasing water conservation and ensuring a reliable source of water.

Sincerely,

LuAnn Adam
Commissioner,
Utah Department of Agriculture and Food
Chair,
Utah Conservation Commission

350 North Redwood Rd. P.O. Box 146500, Salt Lake City, UT 84114-6500
Telephone (801) 538-7100 • facsimile (801) 538-7126 • www.ag.utah.gov

Sanpete County Courthouse
160 North Main
Manti, Utah

Commissioners: Claudia Jarrett (Chair), Scott Bartholomew, Steve Frischknecht

Auditor: Ilene B. Roth
Assessor: Kenneth Bench
Attorney: Brody L. Keisel
Clerk: Sandy Neill
Recorder: Reed D. Hatch
Sheriff: Brian Nielson
Treasurer: Earl D. Clark

January 20, 2015

Mr. Mike Larsen, President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

Sanpete County fully understands the necessity of delivering water to our communities to keep them vibrant and viable as well as providing needed culinary and irrigation water to our residents. The Gobblefield Ditch Piping and Ephraim Tunnel Improvement Project will greatly benefit Sanpete County by conserving water and ensuring a reliable source of water to Ephraim.

We, therefore, fully support the efforts of the Ephraim Irrigation Company as they seek funding through the USBR's WaterSMART grant program. We are aware that this project is a high priority for our Sanpete Conservation District. This project has also been identified as priority in the Sanpitch River Watershed Management Plan (Sanpitch River Stewardship Group) and the new Sanpete County Coordinated Resource Management Plan (CRMP) now underway.

We applaud your efforts in seeking this important WaterSMART grant for the Ephraim Irrigation Company.

Sincerely,

Claudia Jarrett | Steve Frischknecht | Scott Bartholomew

SANPETE WATER CONSERVANCY DISTRICT

90 West Union Street
Manti, Utah 84642

BOARD MEMBERS
Edwin Sunderland, Chairman
David Cox
Kenneth Bench
Ken Palmer
Chad Olson
Richard Dyreng
Joe Frishchnecht

January 16, 2015

Mr. Mike Larsen,
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, Utah 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

It is our Intent to fully support the efforts of the Ephraim Irrigation Company as they seek funding through the USBR's WaterSMART grant program. The converting of the canal to pipe, Along with the improvements to the Ephraim Tunnel, will greatly benefit Sanpete County by the conserving water and ensuring a reliable source of water.

Sincerely,

Ed Sunderland
Chairman

SANPETE COUNTY SOIL CONSERVATION DISTRICT

January 15, 2015

Mr. Mike Larson
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larson:

It is the intent of the Sanpete Conservation District to fully support the efforts of the Ephraim Irrigation Company as they seek funding through the USBR's WaterSMART grant program. The converting of the canal to pipe, along with the improvements to the Ephraim Tunnel, will greatly benefit Sanpete County by conserving water and ensuring a reliable source of water. This project falls into the Districts priorities as outlined in the Sanpete Conservation District's, Sanpete County Resource Assessment, San Pitch River Watershed Management Plan (San Pitch River Stewardship Group), and new Sanpete County Coordinated Resource Management Plan (CRMP) now underway. We will assist in any way possible.

Sincerely,

Scott Sunderland

Scott Sunderland
Sanpete Conservation District
Vice-Chairman

UACD
Utah Association of
Conservation Districts

40 West Cache Valley Blvd.
Building 8 Suite C
Logan, UT 84341
Phone: 435-374-4444
www.uacd.org

January 16, 2015

Mr. Mike Larsen
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

It is the intent of the Utah Association of Conservation Districts to fully support the efforts of the Ephraim Irrigation Company as they seek funding through the USBR's WaterSMART grant program. The Utah Association of Conservation Districts supports valuable conservation practices and we believe the converting of the canal to pipe, along with the improvements to the Ephraim Tunnel, will greatly benefit Sanpete County by conserving water and ensuring a reliable source of water. Further, this project falls into the Utah Conservation Commission's priorities as outlined in the Sanpete Conservation District's; Sanpete County Resource Assessment.

Sincerely,

Kristy Davis
Executive Director
Utah Association of Conservation Districts

cc: Bob Barry

SNOW COLLEGE

NATURAL RESOURCES DEPARTMENT

January 16, 2015

Mr. Mike Larsen
President
Ephraim Irrigation Company
358 East 300 South
Ephraim, UT 84627

Re: Gobblefield Ditch Piping and Ephraim Tunnel Improvements

Dear Mr. Larsen:

It is our intent to fully support the efforts of the Ephraim Irrigation Company as they seek funding through the USBR's WaterSMART grant program. Snow College is a large end user of the water as well as the electricity generated from the Ephraim City hydroelectric plants. This water and electricity is crucial for the continued success of the college and our students. Also, as the chairperson for the Coordinated Resource Management Plan, I have sent out surveys asking what the public's top concerns are relating to our natural resources. I have received close to 100 surveys and the overwhelming majority of people say that agricultural water quantity is their top concern. These much needed improvements will greatly benefit Sanpete County by conserving water and ensuring a reliable source of water for our future.

Sincerely,

Chad Dewey
Director of Natural Resources
Snow College

150 College Avenue • Ephraim, Utah 84627 • 435.283.7932 • www.snow.edu