

RECLAMATION

Managing Water in the West

Upper High Creek Canal Enclosure and Hydropower Development Draft Environmental Assessment

PRO-EA-15-003

Upper Colorado Region
Provo Area Office
Provo, Utah



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

June 2015

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Upper Colorado Region
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Chapter 1. Purpose and Need

1.1 Introduction

This Environmental Assessment (EA) was prepared to examine the potential environmental impacts of the Upper High Creek Canal Enclosure and Hydropower Development Project, proposed by the Richmond Irrigation Company in Cache County, Utah. If approved, 8.3 miles of the Upper High Creek Canal would be modified, and two small hydropower plants would be installed with a combined capacity of 300 kilowatts.

The purposes of the project are:

- Modify the Upper High Creek Canal.
- Conserve approximately 4,800 acre-feet (AF) of water annually.
- Produce a significant amount of hydropower.
- Increase water delivery to the Bear River Migratory Bird Refuge.
- Integrate water conservation and clean energy production.

1.2 Background

The Richmond Irrigation Company is a nonprofit mutual irrigation company that provides irrigation water to 6,152 acres of agricultural land, and a secondary water system for Richmond City in Cache County, Utah. The Upper High Creek Canal is one of the primary conveyance canals owned by the irrigation company. It is unknown exactly when the canal was constructed, but the associated water rights have a priority date of 1860. The canal was likely constructed shortly thereafter. Diverting water from High Creek, the canal has a capacity of 40 cubic feet per second (cfs).

Approximately 9,600 AF of water is diverted annually from High Creek. There is no storage reservoir associated with the system. The Richmond Irrigation Company also owns and operates two wells, with a combined capacity of 4 cfs, to supplement water needs during the late irrigation season. From the canal, there are six piped laterals that distribute water to shareholders.

Water records from the irrigation company indicate that the canal loses nearly 50 percent or 4,800 AF, of the diverted water through seepage and evaporation. The significant water losses have a negative impact on Richmond Irrigation Company shareholders, Richmond City, and the general local economy.

1.3 Need for Action

This EA evaluates the potential effects of the Proposed Action in order to determine whether it would cause significant impacts to the human or natural environment, as defined by the National Environmental Policy Act (NEPA). If the EA shows no significant impacts associated with implementation of the proposed project, then a Finding of No Significant Impact (FONSI) will be issued by the Bureau of Reclamation. Otherwise, an Environmental Impact Statement will be necessary prior to implementation of the Proposed Action. NEPA applies to this project due to its WaterSMART Grant from Reclamation.

1.4 Project Area/Action Area

The project area is located approximately 13 miles north of Logan City, in Cache County, Utah, near Richmond City just south of the Utah/Idaho border, as shown on the project area map (Figure 1). It is in the Cache Valley subdivision of the Middle Rocky Mountains Region (PEC, 2015). Elevations range from 4,660 feet above sea level at the southern end of the project area, to 5,015 feet above sea level at the northern end.

The Upper High Creek Canal, shown in Figure 1, is located on private property. Richmond Irrigation Company has a prescriptive easement to operate the canal. The area has been somewhat impacted by farming and residential development. The canal begins at the inlet structure located on High Creek, at the mouth of High Creek Canyon northwest of Richmond. Waters not diverted enter the Cub River northeast of Richmond. The canal flows southward towards Richmond along the east bench; it cuts through the southeastern edge of town and crosses State Road 91, south of town. The total length of the existing Upper High Creek Canal is approximately 8.3 miles.

1.5 Scoping and Public Involvement

A public meeting was held on August 23, 2014, at the Richmond City Hall, to discuss the proposed project. Notices were sent to individual shareholders on June 28, 2014, and posted on the bulletin board at the Richmond City post office, the Richmond City office, and the Richmond Irrigation Company web page on June 29, 2014. Approximately 150 stockholders were in attendance. A vote was taken with approximately 90 percent in favor of the proposed project. The meeting minutes are included in Appendix A.

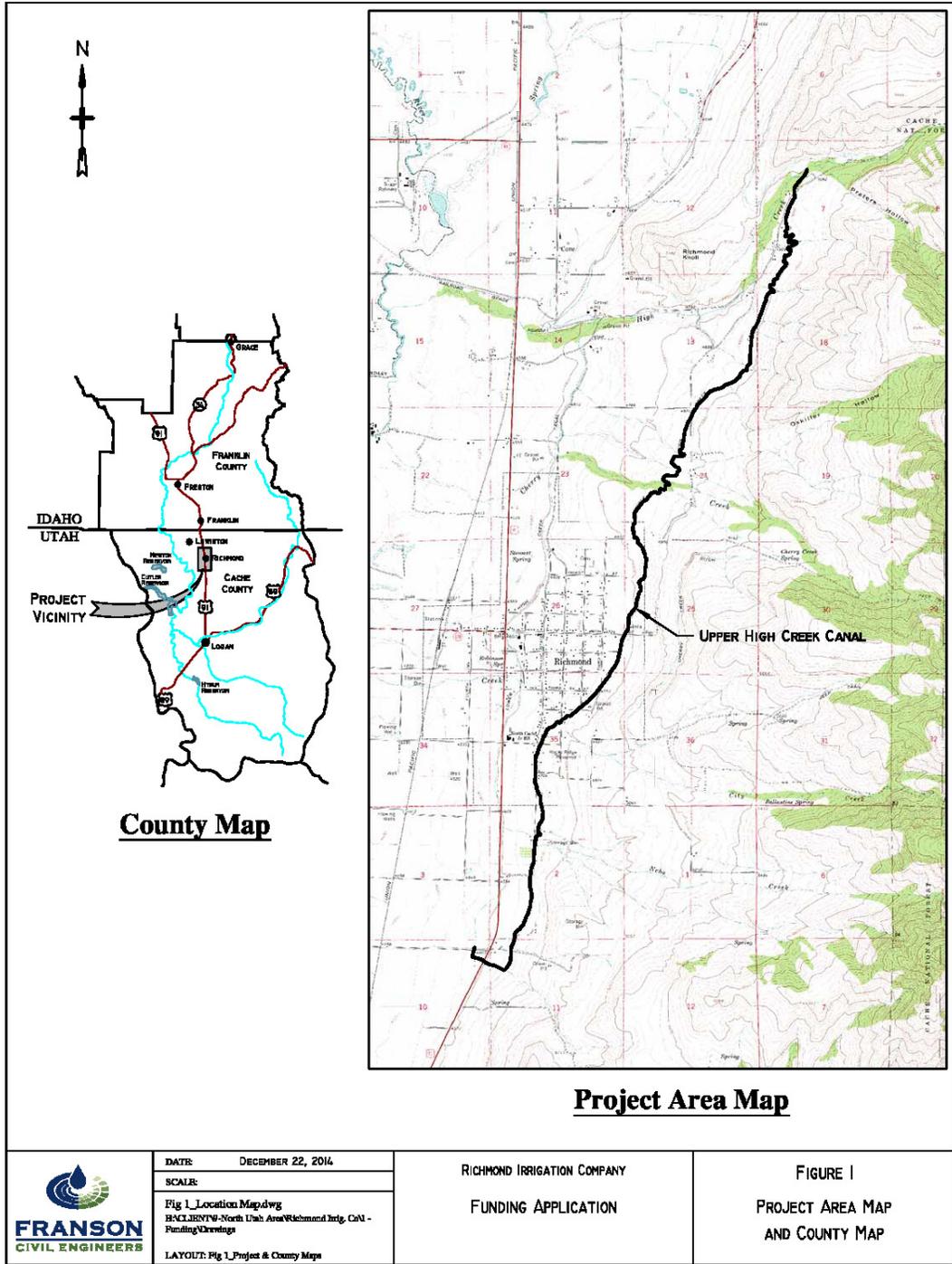


Figure 1: Project Area Map

Chapter 2: Alternatives

2.1 No Action Alternative

Under the No Action Alternative, the Richmond Irrigation Company's conveyance facilities would remain an open canal. It would continue to lose nearly 50 percent of the water diverted from High Creek through seepage and evaporation. This negative impact on Richmond Irrigation Company shareholders, Richmond City, and local economics would continue

2.2 Proposed Action Alternative (Preferred)

The preferred alternative would install approximately 7.0 miles of pipeline to replace conveyance of Richmond Irrigation Company's irrigation water in the Upper High Creek Canal. The pipeline would consist of 15-inch to 36-inch pipe. It would deviate from the existing alignment in three locations as shown on Figure 2. These locations would follow existing roadways or go through private property. The purpose for this is to straighten the pipeline where the canal meanders. The pipeline would replace the canal, with exceptions where the pipe needs to remain open for stormwater control. Richmond Irrigation Company would sign agreements with Cache County and Richmond City for the future operation of the canal as a stormwater facility.

An estimated 4,800 AF of water would be conserved. With good construction practices, the losses due to seepage and evaporation would be near zero. Of this, a maximum of 2,000 AF would be used by the Richmond Irrigation Company to reduce historical water shortages. High Creek is historically dry during the summer months due to diversions into the canal and other downstream diversions. The remaining 2,800 AF would stay in High Creek and eventually flow into the Bear River system.

A diversion structure, isolation valves, flow measurements, and possibly Supervisory Control and Data Acquisition for automation, would be used to improve water management and efficiency. Additionally, the Proposed Action Alternative would construct two hydropower facilities as shown on Figure 2. Due to the increased pressures in the system, the energy needs to be reduced. To accomplish this, two hydropower facilities would be constructed along the pipeline alignment which would have a combined capacity of 300 kilowatts. This could result in nearly 1,600,000 kilowatt-hours of energy generated.

The pipeline would be pressurized from the inlet to the Richmond hydropower unit, which could be easily connected to the local power grid. The pipeline will remain pressurized. The Coleville hydropower unit would eliminate all the pressure, and this pipeline/open canal would flow freely back into High Creek.

In addition, the Proposed Action Alternative would reduce the amount of power required to pump from two existing wells. On average years, Richmond Irrigation Company begins pumping from the wells at the beginning of July. It is anticipated that the project would delay the need of pumping for 20 days during average conditions.

Construction work would be completed during the non-irrigation season. Access to the farmlands and agricultural areas would be maintained. The Richmond Irrigation Company's board members would work with the affected property owners to address their concerns, to the extent possible.

It is anticipated that the pipe used would be HDPE and/or PVC, which has an industry accepted life expectancy of 50 years. Corrosion resistant fittings would be used to increase life expectancy of all fittings and appurtenances.

This project would be completed in two phases. The first phase would consist of enclosing the canal and installing meters at the proposed hydropower facility locations. Flow records would be recorded for an entire irrigation season. Once reliable flow records were obtained, phase two of the project (hydroelectric units) would be constructed and installed.

Figure 2: Proposed Action Alternative Map

Chapter 3: Affected Environment and Environmental Consequences

3.1 Introduction

The proposed pipe alignment would follow the existing canal corridor with a few exceptions. At several locations; as identified on Figure 2, the proposed alignment would follow existing roadways or go through private property. Where the pipe is installed in the canal corridor, it would be installed adjacent to the canal, leaving the existing canal open to collect stormwater/runoff.

There would be minimal, short-term impacts associated with installing the pipe and hydropower facilities. All land surface disturbances would be confined to existing access roads, the proposed pipe alignment area, and small staging areas adjacent to the pipeline. Richmond Irrigation Company would be responsible during construction for dust control, air and water pollution. Minimal environmental disturbance is anticipated and all work would be performed in previously disturbed areas (canal right-of-way, roadways, and farmland).

This chapter will discuss the direct, indirect, and cumulative effects on physical, biological, and socioeconomic resources within the project area. The following resources are reviewed:

- Hydrology
- Water Quality
- Air Quality/Noise
- Cultural Resources
- Vegetation and Noxious Weeds
- Wildlife Resources
- Threatened and Endangered Species
- Visual Resources
- Socioeconomics
- Flood Control

3.2 Resources Eliminated from Analysis

Table 1 shows the resources that have been eliminated from further analysis. Impacts to these resources were considered, but not analyzed in detail, because they were determined to not be affected directly, indirectly, or cumulatively by the No Action or Proposed Action Alternatives.

Table 1
Environmental Effects

Resource	Rationale for Elimination from Further Analysis
Public Health	Public Health would not be affected by implementing either the No Action or Proposed Action Alternatives.
Wilderness Areas and Wild and Scenic Rivers	There are no designated Wilderness Areas or Wild and Scenic Rivers within the project area; Wilderness Areas and Wild and Scenic Rivers would not be affected by implementing the No Action or Proposed Action Alternatives.
Prime and Unique Farmland	There is Prime and Unique Farmland within the project area. But, there would be no conversion of farmland to non-agricultural use, as defined by the Farmland Protection Policy Act (USC 4201-4209), by implementing the No Action or Proposed Action Alternatives.
Indian Trust Assets	There are no Indian Trust Assets related to the project area.
Paleontological Resources	Consultation with the State Paleontologist indicates there is only a low probability of the presence of significant paleontological resources in the project area.
Aquatic Resources	The Upper High Creek Canal is not a fishery and is dewatered annually during the non-irrigation season (October through April). Periodic operation and maintenance activities also cause dewatering to occur. Additionally, High Creek and Cub River would be positively impacted under the Proposed Action due to the change in operation, leaving supplementary water in the system.
Wetlands	The U. S. Fish and Wildlife Service (USFWS) National Wetlands Inventory indicates there are no wetland areas within the proposed pipeline alignment. There are no anticipated impacts to wetlands or surface water that falls under Clean Water Act (CWA) jurisdiction as “waters of the United States” under the Proposed Action Alternative.
Environmental Justice	No Environmental Justice population has been identified that would disproportionately bear impacts of the Proposed Action Alternative. It would not result in the denial of, reduction in, or substantial delay in the receipt of the benefits of any Federal programs, policies, or activities.

3.3 Hydrology

The High Creek System drains into the Cub River, which drains into the Bear River and terminates at the Great Salt Lake. Prior to entering the Great Salt Lake, diversions are made to a migratory bird refuge operated by the USFWS.

Historically, the refuge has had some difficulty in diverting the necessary water supply to maintain a healthy ecosystem, sometimes resulting in outbreaks and disease. By leaving 2,800 AF in the Bear River system, additional supplies may be available to those species that rely on the bird refuge. There are two species of birds that are listed as Federally recognized candidate species; the Yellow-billed Cuckoo, and the Greater sage-grouse. These will be addressed in Section 3.9.

The conserved water would reduce current shortages for other water users.

3.3.1 No Action Alternative

Under the No Action Alternative, there would be no direct or indirect effect on the hydrology of High Creek streamflows, as there would be no change in the existing management of the water resource.

3.3.2 Proposed Action Alternative

Hydrologic impacts due to the Proposed Action Alternative would be positive as described above. The additional water supply left in High Creek would flow to the Cub River and ultimately reach the Great Salt Lake, benefiting the migratory birds. Improved water supply would benefit the farmlands crop production.

The canal currently collects stormwater/runoff from the hillside and conveys it away from Richmond City. Under the Proposed Action, the pipeline would be installed adjacent to the canal leaving much of the canal open to continue to collect stormwater/runoff.

3.4 Water Quality

Each stream, reservoir, and canal in Utah is classified according to its beneficial uses. The required standards for water quality parameters are determined by the classifications used. According to the Standards of Quality for Waters of the State, Environmental Quality (R317-2-13), Utah Administrative Code (UAC), High Creek is classified as:

- Class 2B -- Protected for infrequent primary contact recreation. Also, protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

- Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
- Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

The Utah Department of Environmental Quality was contacted regarding any water quality concerns for High Creek. It has high water quality with no water quality issues. Water not diverted flows to the Cub River and then Bear River, which has an existing Total Maximum Daily Load (TMDL). The targets for Cub River and Bear River in Utah are 0.05 mg/L Total Phosphorus (TP) and 90 mg/L Total Suspended Solids (TSS).

Currently, the Upper High Creek Canal collects stormwater runoff from the adjacent hillside. This can cause sediment from bank erosion to enter the canal affecting water quality. The canal may also inadvertently intercept agricultural and urban runoff, which can contain fertilizers, pesticides, sediment, automobile related pollutants (lead, copper, zinc, oil, grease, and rust), and de-icing chemicals (salt and salt solutions).

3.4.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the current conditions or additional effects to water quality. Herbicides, nutrients, and sediments would continue to remain in the water in the same ratios as current conditions. Since no construction would occur, there would be no temporary construction-related water quality impacts. However, the canal would continue to function as at present with potential for adverse impacts through localized erosion and deposition of fine sediments into surface waters.

3.4.2 Proposed Action Alternative

Under the Proposed Action Alternative, water quality impacts during construction would be minimal, as there is no water in the canal during the non-irrigation season. Piping the canal would improve water quality in the system, because water would be conveyed in a closed pipe not allowing exposure to the water from bank erosion and agricultural and urban runoff. There are no foreseen long term negative impacts to water quality in High Creek, or the irrigation system.

There is a potential temporary increase in turbidity due to sediment entering High Creek during construction, creating direct and indirect effects on the water quality. The contractor would prepare a Stormwater Pollution Prevention Plan (SWPPP), and get the necessary stormwater permits. Erosion control measures would be specified to protect High Creek's water quality. The project would require disturbed land to be graded to provide proper drainage, to blend with the natural contours, and to be revegetated with native plants.

3.5 Air Quality/Noise

The Clean Air Act, amended in 1990, requires EPA to set National Ambient Air Quality Standards (NAAQS) for airborne pollutants considered damaging to public health and the environment. Six criteria pollutants addressed in the NAAQS are: carbon monoxide, particulate matter, ozone, nitrogen dioxide, lead, and sulfur dioxide. Particulate matter is broken into two categories: particulate matter with a diameter of 10 micrometers or less (PM₁₀) and particulate matter with a diameter of 2.5 micrometers or less (PM_{2.5}).

Air Quality conditions within the state are designated with respect to the NAAQS as attainment, maintenance, nonattainment, or unclassifiable. Attainment designation refer to areas that do not exceed the NAAQS, while areas that do exceed the standards are designated as nonattainment. A maintenance area is an area that was previously designated as a nonattainment area, of which the state or local government has a developed plan to reduce the pollutant in violation to obtain attainment status.

Richmond City is located within a PM_{2.5} nonattainment area. It is in an attainment area for all other pollutants including carbon monoxide, ozone, nitrogen dioxide, lead, and sulfur dioxide.

3.5.1 No Action Alternative

The No Action Alternative would have no impact on the existing air quality or noise conditions.

3.5.2 Proposed Action Alternative

Long term air quality improvement from reduced emissions from power generation would be realized with implementation of the Proposed Action Alternative. Temporary reduction of air quality in the areas of construction may occur due to increased fugitive dust and particles (PM₁₀). PM₁₀ emissions from construction activities during the construction period and are usually short-term.

3.6 Cultural Resources

The number of previous documented historic sites in Cache County is low. This makes development of a meaningful discussion of the area's cultural resource base speculative. Consequently, it is possible to discuss the cultural resources of the region in only the most general terms.

The general culture historical sequence seen all over the West should apply here as well. The earliest occupants of the region can be assigned to the Paleoindian period between, conservatively, about 13,000 to 10,000 years ago. Evidence of this occupation is never abundant and is nearly always regarded as historically significant. Even marginal sites are recommended as eligible for inclusion in the National Register of Historic Places (NRHP).

The Paleoindian period is succeeded by a change in prehistoric technologies and lifestyles, at least in part the result of significant climatic change at the end of the last major glaciation. The people who left traces of their cultures during this period, broadly called the Archaic, dealt with climatic swings that significantly affected the resources on which they were dependent. Nonetheless, the population increased and so does the evidence of their presence in the region so that by the end of the period, sometime in the neighborhood of 500 A.D., there is abundant evidence of their existence.

After about 500 A.D., a new lifestyle appears which, at the very least, supplements their reliance on wild plants and animals. In many areas there is considerable evidence of the presence of stable villages made up of clusters of semi-subterranean homes, and the production of agricultural products such as corn in the Uintah Basin, the San Rafael Swell and other portions of Utah east of the Wasatch range. To the west, the role of domesticates was reduced in favor of wetland resources including fish, root crops of various sorts, and upland game. In the Cache County area and neighboring locales, there is no reported evidence of permanent villages but at least some Fremont goods arrived in the area as the result of trade or other inter-tribal actions.

When the Fremont period actually ends is the subject of some dispute, but all indications are that there was yet another significant change in lifeways. It is highly likely that people, known by some as the Numa, moved into various parts of Utah and southern Idaho, including what was to become Cache County. These people were well established in the region by the time that the Dominguez-Escalante expedition arrived in Utah Valley in 1776.

There is no clear record of Euroamerican presence in what was to become Cache County until 1824 when trappers entered the area. Following this first entry, there were only sporadic visits by trappers and explorers until 1855. Unfortunately these ephemeral visits seldom left remains that can be detected today. It is very unlikely that much, if anything, would be found from this period in the area's history.

Permanent Euroamerican settlement did not reach the Cache Valley until 1856, with the establishment of Maughan's Fort. With the establishment of a permanent settlement, more settlers arrived rapidly expanding the valley's Euroamerican population and development of irrigated farming and sheep ranching. Evidence of the settlement of the valley and its development as an important agricultural area, is widespread in the area and was detected in the Upper High Creek Project area.

A cultural resource survey was done for the project area by Project Engineering Consultants (PEC). The routine literature search demonstrated that there had been no cultural inventories previously conducted within 0.5 miles of the Area of

Potential Effect (APE). Consequently, there are no previously recorded sites in or near the APE.

A selective, reconnaissance-level historical architectural survey was conducted by PEC. The selectivity was introduced by excluding those portions of the Upper High Creek Canal, where it would not be considered a contributing factor to the architectural properties significance. Most of the canal's length lies in agricultural land where architecture is absent.

The survey located three historic properties where the Upper High Creek Canal could be a contributing factor to the property's significance (Table 2).

Table 2
Historic Structures

Address	Site Type	Description	NR Status
8479 N. State Route 91	Farmstead	House and 6 outbuildings	Not eligible
533 S. State Street	Farmstead	House and 6 outbuildings	Listed
985 S. State Street	Small Farmstead	House and 3 outbuildings	Not Eligible

The question of the Upper High Creek Canal serving as a contributing element to the site's significance, only need be considered for the 533 South State Street complex, also known as the James and Amy Burnham Farmstead. This site's presence on the National Register of Historic Places is not in any way related to the canal, that is considered a non-contributing element.

The subsequent pedestrian field inventory (PEC 2015) resulted in the observation of three more archaeological sites, consisting of two historic canals and one historic-period farm staging area. Fifteen isolated occurrences were also identified.

The report (PEC 2015) states that only sites 42CA193, the Lower High Creek Canal, and 42CA194 on the Upper High Creek Canal, are recommended to be eligible for the National Register of Historic Places (NRHP). Site 42CA197, the farm staging area, is recommended not eligible under any criterion.

The Upper High Creek Canal is the project area. It was noted that the Upper High Creek Canal represents some of the earliest irrigation in Richmond, and therefore is significant in local history due to its contribution to the settlement and growth of the city. "It is not associated with a significant historic figure, does not represent a style or solve a particular engineering challenge, and does not have the potential to yield additional information through further investigation."

3.6.1 No Action Alternative

Under the No Action Alternative, a continuation of existing management and land use practices would occur. It would include on-going maintenance and repair of existing facilities. There would be no changes to the current conditions.

3.6.2 Proposed Action Alternative

Upon completion of the pipeline, portions of the Upper High Creek Canal would remain open to accommodate storm run-off issues or residents' aesthetic concerns. Other sections would be filled. As of this writing, it is not possible to address the effect of this action on the resource. A determination of effect and appropriate actions will be described in the final EA.

Under the Proposed Action Alternative, construction activities have the potential to discover previous, unknown, cultural resources and Native American artifacts. In the event of a discovery, construction activity in the vicinity would be suspended. A treatment plan would be developed, and coordination with Utah State Historic Preservation Office (SHPO) would occur immediately.

3.7 Vegetation and Noxious Weeds

Dominant vegetation in the project area includes: agricultural vegetation, bunch grasses, sagebrush, native and introduced forbs, scrub oak, and a few maple trees. There are riparian trees and vegetation along the canal such as willows (*Salix* spp.) and cottonwoods (*Populus* spp.), as well as dense orchard grass (*Dactylis glomerata*). Soils have been substantially disturbed through historic agricultural use and some residential development. This has caused some annuals and thistles to invade those sites. Elevation at the project area ranges from 5,015 feet to about 4,660 feet. As stated in Section 3.2, there are no wetland areas present along the pipeline alignment. The following photos are representative of the existing vegetation.



Photo 3-1



Photo 3.2



Photo 3.3

Noxious weeds are plants that typically invade from other countries, leaving their natural controls and competitors behind (insects, diseases, grazers, and climate). They have adapted to grow and proliferate in human-disturbed areas.

The following is a list of weeds declared noxious by the state of Utah:

Bermudagrass	Musk Thistle
Canada Thistle	Perennial Pepperweed (Tall Whitetop)
Diffuse Knapweed	Purple Loosestrife
Dyer's Woad	Russian Knapweed
Field Bindweed (Morning Glory)	Scotch Thistle
Hoary Cress	Spotted Knapweed
Johnsongrass	Squarrose Knapweed
Leafy Spurge	Yellow Starthistle
Medusahead	

The Cache County Resource Assessment (2011) indicates that the noxious weeds near the project area include: Dyer's Woad, Russian Knapweed, and Scotch Thistle.

3.7.1 No Action Alternative

Under the No Action Alternative, a continuation of existing management and land use practices would occur. It would include on-going maintenance and repair of existing facilities. There would be no changes to the current conditions.

3.7.2 Proposed Action Alternative

Under the Proposed Action Alternative, disturbances to all vegetation types would be expected to be temporary and minimal. All construction activities would occur in areas that have been previously disturbed by the development of existing facilities, farming practices, and roadways.

3.8 Wildlife Resources

The habitats in this area and the adjacent Wasatch-Cache National Forest, are home to approximately 300 vertebrate species including: fish, small mammals, raptors, water birds, and upland game birds, with a variety of other migratory birds, reptiles, amphibians, and occasional big game. The Utah Department of Wildlife Resources (UDWR) mapped habitats based on four value criteria; crucial (provides for “sensitive” biological and/or behavioral requisites necessary to sustain the existence and/or perpetuation), high (provides for “intensive” use), substantial (provides for “frequent” use), and limited (provides for only “occasional” use). This mapping assists in habitat management for state and Federal wildlife biologists, but there are no Federal or State regulations that afford these habitats any legal protection.

The following section profiles species that have identified habitats found in and adjacent to the project area: Habitat for species listed as State “sensitive” that have the potential to occur within the project area and/or adjacent lands (see Section 3.8.7). Habitat for species listed as Federally endangered, threatened or candidate does not occur within the project area and/or adjacent lands (see Section 3.9).

3.8.1 Fish

The Upper High Creek Canal is not a fishery and is dewatered annually during the non-irrigation season (October through April). Periodic operation and maintenance activities also cause dewatering to occur. There are no fish that exist in the canal.

Upper High Creek is not a major fishery in the area. Brook trout and Brown trout have been caught in the creek. Low flows and dry conditions in the summer limit habitat for fish.

3.8.2 Small Mammals

Within the project area, the following small mammals are common: badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), meadow vole (*Microtus pennsylvanicus*), deer mouse (*Peromyscus maniculatus*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), northern raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). These small mammals can use the upland habitat, as well as the agricultural properties and the lands in between to live and locate prey.

3.8.3 Raptors

Nearby cottonwood trees provide nesting habitat for raptors, such as the bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), and the Swainson's hawk (*Buteo swainsoni*). A large portion of the raptors diet may include the many small mammals that live in the open grasslands and agricultural lands within the project area.

3.8.4 Upland Game Birds

Upland game bird species that are likely to occur on or near the area include: chukar (*Alectoris chukar*), the Hungarian partridge (*Perdix perdix*), and blue grouse (*Dendragapus obscurus*). The project area is classified as substantial value for the chukar. They prefer steep rocky slopes with low shrub cover. While there is suitable vegetative cover for chukar, there are not rocky slope and outcroppings in the project area. The project area is classified as crucial for the Hungarian partridge. They prefer grassland or mixed sage and grass adjacent to cultivated lands in high mountain valleys. There is suitable habitat for the partridge in the project area. Lands within the project area are classified as high for the blue grouse. Habitats are likely used by blue grouse during the summer when they use lower elevations with brushy, shrub, or open habitats.

The project area also encompasses habitat within the known distribution of two state listed sensitive species, the sharp-tailed grouse (*Tympanuchus phasianellus*) and Greater sage-grouse (*Centrocercus urophasianus*). They will be addressed in the sensitive species section below (3.8.7).

3.8.5 Migratory and Other Birds

The habitat in the project area supports a high quantity and diverse type of migratory birds. The following birds were identified on the USFWS trust resource list for breeding: American bittern (*Botaurus lentiginosus*), Brewer's sparrow (*Spizella breweri*), burrowing owl (*Athene cunicularia*), Calliope hummingbird (*Stellula calliope*), eared grebe (*Podiceps nigricollis*), fox sparrow (*Passerella iliaca*), Lewis's woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), olive-sided flycatcher (*Contopus cooperi*), sage thrasher (*Oreoscoptes montanus*), and Williamson's sapsucker (*Sphyrapicus thyroideus*). Another group of birds that are in the project area year round include: Cassin's finch (*Carpodacus cassinii*), loggerhead shrike (I), and pinyon jay (*Gymnorhinus cyanocephalus*).

3.8.6 Big Game

The project area and adjacent lands are classified as crucial winter habitat for mule deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*). South and west-facing slopes at lower elevations are important wintering areas. The project area is generally on west, north-west facing slopes and may or may not be preferred wintering areas for mule deer. During the winter, elk are usually found in lower to mid-elevation habitats with mountain shrub and sagebrush vegetation. During summer, most mule deer habitat is located at higher elevations generally found in

the Wasatch-Cache National Forest (Bernales, Hersey, and Shannon, 2013). Although deer may feed at night in adjacent agricultural fields, the town limits of Richmond to the west and deer-proof fenced agricultural lands nearby limit their use of the area as winter habitat.

Moose (*Alces alces*) have some spring/fall habitat on the north end of the existing canal. They generally live in higher elevation habitats dominated by shrubs and young deciduous trees (UDWR 2008). Because of the presence of shrubby vegetation, the project area may provide some marginally suitable foraging habitat.

3.8.7 State Sensitive Species

The State Sensitive Species list contains species that are considered “Wildlife Species of Concern,” which means there are threats to their populations. These species are identified for conservation actions that would preclude the need for their listing under the Endangered Species Act (ESA). There is no statutory protection from the Federal or state government.

The following species were identified from an information request from the Department of Natural Resources (DNR), Utah Natural Heritage Program. The results are based on data existing in the UDWR central database on January 5, 2015. There are recent records of occurrence within a two-mile radius for Lyrate mountainsnail and sharp-tailed grouse, and historical records of occurrence for Deseret mountainsnail. Additional species included on the Utah Sensitive Species list are the western toad (*Bufo boreas*), short-eared owl, long-billed curlew (*Numenius americanus*), and bald eagle. Additionally, within a ½-mile radius, there are recent records of occurrence for red-tailed hawk (*Buteo jamaicensis*) nests.

3.8.8 No Action Alternative

The No Action Alternative represents a continuation of existing management and land use practices. There would be no impacts to wildlife within the project area.

3.8.9 Proposed Action Alternative

Under the Proposed Action Alternative, there would be no major long-term negative effects to wildlife. Construction activities would occur in or adjacent to areas that were previously disturbed by agricultural development, homes, and roadways. Construction would be in the late fall through early spring. Wildlife disturbance would be localized, temporary and minimal due to the lineal and fast moving nature of the construction activities. Revegetation at that elevation and location, in spring and early summer would likely occur fairly rapidly, which would minimize the disruption of habitat use by wildlife.

Seasonal migrations of wildlife may be affected by project construction. This would be temporary and wildlife would be able to use adjacent lands during this time. Temporary effects would be minimized by restricting construction activities to avoid sensitive breeding or nesting seasons.

There would be no displacement or harassment of migratory birds and raptors because the construction season would occur during the late fall, winter, and early spring, after and prior to times when birds are actively breeding in the area. The project would ensure compliance with the Migratory Bird Treaty Act. In the event that construction activities occurred in the late spring/early summer or any time active breeding, nesting, or pre-fledging behavioral activities were happening, Richmond Irrigation Company would adhere to the USFWS Utah Raptor Guidelines (Romin and Muck 2002), placing appropriate buffers on nests until fledging activities concluded. If nests of migratory birds were located during the construction process, a Reclamation biologist would be consulted and an appropriate buffer would be put in place. Any birds still in the project area during construction would be able to use similar roost sites or other habitats in the immediate project vicinity, if cottonwood trees and/or willows were removed during construction.

Effects to fish, small mammals, reptiles, and big game would be minimal. If the species were present during construction, minor disturbance may occur. However, most of the area has already been disturbed and is continually treated during maintenance activities (burned, mowed, or treated with herbicides). Additionally, the Proposed Action would remove the open canal as a free water source. This would cause any wildlife habituated to that water to have to seek a new source. Aquatic resources would be positively impacted because of the additional water to remain in High Creek.

Temporary changes in habitat for sensitive species would be negligible. No effect to the behavior of the listed species is expected and therefore, would not cause a trend toward Federal listing under the Endangered Species Act of 1973.

Overall, the direct and indirect effects to wildlife resources would be minimal. In addition the long and short-term impacts to the habitat, water sources, and behavior would be minor.

3.9 Threatened and Endangered Species

Federal agencies are required under the ESA, 16 USC 1531, to ensure that any action Federally authorized, funded, or carried out, does not jeopardize the continued existence of threatened or endangered species, or modify their critical habitat.

The DNR and USFWS were contacted regarding any threatened or endangered species within the project area. The UDWR does not have records of occurrence for any ESA species within the project area. Additionally, there are no critical habitats designated by USFWS for Federally-listed ESA species, or national wildlife refuges within or near the project area. There are four Federally protected ESA species listed as occurring or having potential habitat in Cache

County. However, they do not occur in the project area. Table 3 lists them, along with habitat requirements and potential impact determination.

Table 3
ESA Listed Species Potentially Found in Cache County

Species (common and scientific name)	Status	Habitat Description	Suitable Habitat in Project Area	Project Impact Determination
Birds				
Greater sage-grouse (<i>Centrocercus urophasianus</i>)	Candidate	Sagebrush dominated habitats on plains, foothills, and mountain valleys	No	No effect
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	Riparian areas with dense willows combined with mature cottonwoods. Also known to use wooded parks, cemeteries, tree islands, Great Basin Shrub-steppe, and high elevation willow thickets	No	No effect
Flowering Plants				
Ute ladies'-tresses (<i>Spiranthes dihyvalis</i>)	Threatened	Undisturbed riparian areas and wetland habitats; only in moist to very wet meadows near springs, lakes, relict meanders, and perennial streams	No	Not suitable habitat and no hydrologic connection to a known population ; No effect
Mammals				
Canada lynx (<i>Lynx canadensis</i>)	Threatened	Isolated spruce, fir, and lodgepole pine forests, typically in areas with high prey populations, especially snowshoe hare	No	Habitat requirements for species not present in project or action area; No effect

U.S. Fish & Wildlife Service (2014, December 11)

Although Ute ladies'-tresses (ULT) have been identified in Mendon, Utah, a site visit of the known ULT site was conducted on April 28, 2015, and compared with the project area, especially along the existing canal. No suitable habitat or hydrologic connection were identified or present that would support the habitat for ULTs. Reclamation's determination is that there is no effect to ULT.

3.9.1 No Action Alternative

Under the No Action Alternative, there would be no direct or indirect threats to listed species or their critical habitat because there would be no construction-related activities in those areas. It would be a continuation of existing

management and land use practices. There would be no changes to the current conditions. There would be no impacts to Threatened and Endangered species within the project area.

3.9.2 Proposed Action Alternative

Under the Proposed Action Alternative, based on the absence of the species or their habitats, there would be no effect to Threatened and Endangered Species.

3.10 Visual Resources

The natural and constructed features contribute to the visual resources within the project area, including: mountain views, agricultural fields, and vegetation along the canal corridor. Viewers, including local residents, workers, and recreationists, have a perception of the existing physical characteristics. This section assesses the extent to which the project would change the perceived visual character and quality of the environment where the project is located.

3.10.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the existing visual resources.

3.10.2 Proposed Action Alternative

Under the Proposed Action Alternative, it is not anticipated that there would be direct or indirect impacts to the visual resources along the mountain range due to construction of the project. Much of the canal would be left open for stormwater collection.

Additionally, there would be no impact from constructing a pipeline adjacent to the canal to the overall visual character for the close-range to mid-range to long-range viewers. Much of the canal would remain open.

3.11 Socioeconomics

The population of Richmond City was 2,470 at the 2010 census; it had increased to 2,514 in 2012. The median resident age was 29.4 years in 2012. The estimated median household income in 2012 was \$49,816, which is 13 percent lower than the state's median of \$57,049. Richmond exhibits limited overall racial diversity, with 95.2 percent of residents classified as white in 2010 and the next largest race being Hispanic at 4.7 percent.

3.11.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the socioeconomics of the community.

3.11.2 Proposed Action Alternative

There would be an increase in crop production to shareholders in the Richmond Irrigation Company, providing an economic benefit due to the implementation of the Proposed Action Alternative. There would also be a temporary increase in jobs created, including construction workers and local suppliers of construction materials.

Lands would change from flood irrigation to sprinkler irrigation. Positive economic benefits would result from the Proposed Action Alternative. There would be no changes to the land uses adjacent to the Upper High Creek Canal, thereby creating no effect to the socioeconomics of the community. The project would not adversely affect low income or minority populations.

Piping the canal would result in reduced maintenance and operation costs. The water master would not need to drive the canal alignment as frequently for safety and other inspection needs. In addition, there would not be a need for burning the canal to eliminate encroaching vegetation. All these activities would reduce carbon emissions.

The average annual power cost for pumping the wells between July and October is \$33,000. Eliminating the need for pumping during most of the month of July would conserve nearly \$10,000 per year in energy costs, which would be equal to approximately 2,750,000 kilowatt-hours of energy. The amount of power savings associated with reduced pumping would vary from year to year based on the amount of water in High Creek that would be available for diversion by the irrigation company.

3.12 Flood Control

The Upper High Creek Canal has served inadvertently as a flood control facility, collecting stormwater and irrigation runoff. Richmond City has come to rely on this benefit.

3.12.1 No Action Alternative

Under the No Action Alternative, there would be no changes and the canal would continue to collect stormwater.

3.12.2 Proposed Action Alternative

Much of the Upper High Creek Canal would remain open to collect stormwater and runoff, under the Proposed Action Alternative. Richmond Irrigation Company has started to work and negotiate with Richmond City officials on a legal agreement for collection and maintenance of the stormwater facility.

Chapter 4 Environmental Commitments

The following environmental commitments would be implemented as an integral part of the Proposed Action.

1. **Additional Analyses** – If the Proposed Action were to change significantly from that described in the EA, because of additional or new information, or if other construction areas are required outside the areas analyzed in this EA, additional environmental analysis including cultural and paleontological analyses would be undertaken if necessary.
2. **Construction Restrictions** – Construction and staging activities would be confined to previously disturbed areas, to the extent practicable.
3. **Public Access** – Activity areas would be closed to public access during construction. Richmond Irrigation Company would coordinate with contractor’s personnel, as necessary, to ensure public safety.
4. **Invasive Species** – Appropriate steps would be taken to prevent the spread of, and to otherwise control undesirable plants and animals within areas affected by construction activities. Equipment used for the project would be inspected for reproductive and vegetative parts, foreign soil, mud or other debris that may cause the spread of weeds, invasive species and other pests. Such material would be removed before moving vehicles and equipment. Upon the completion of work, decontamination would be performed within the work area before the vehicle and/or equipment are removed from the project site.

The Richmond Irrigation Company would make periodic inspections following vegetation of disturbed areas to locate and control populations of noxious weeds, if present. All seed used for restoration would be certified “noxious weed free” before use. If needed, the County Weed Control Department could be contacted to provide services to control the spread of noxious weeds.

5. **Vegetation** – Design and treatment activities would ensure that vegetation would be protected with no long term adverse effects. Staging areas would be in previously disturbed areas to the extent possible.
6. **Raptor Guidelines** – Richmond Irrigation Company would adhere to the Romin and Muck (2002) Utah, raptor guidelines by placing seasonal and spatial “no construction” buffers, along with daily timing restrictions around all active raptor nests or winter roosting bald eagles. If unknown nests are located during construction, the same guidelines would be implemented.
7. **Cultural Resources** - Any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, he/she must provide immediate telephone notification of the discovery to Reclamation’s Provo Area Office archaeologist. Work would stop until the proper authorities are able to assess the situation onsite. This action would promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The Utah SHPO and interested Native American Tribal representatives would be promptly notified. Consultation would begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).
8. **Air Quality** - Best Management Practices (BMP) would be followed to mitigate for temporary impact on air quality due to construction related activities. These may include the application of dust suppressants and watering to control fugitive dust; minimizing the extent of disturbed surface; during times of high wind, restricting earthwork activities; and limiting the use of, and speeds on, unimproved road surfaces.

Chapter 5 Consultation and Coordination

The following agencies were consulted during the development of this EA.

**Table 4
Consultation List for EA Preparation**

Name	Purpose & Authorities for Consultation or Coordination	Contacts and Conclusions
Cache County Development Service	County planning	Christopher Harrild, Senior Planner, 435-755-1640 chris.harrild@cachecounty.org
Richmond City	Stormwater control	Mike Hall, Mayor 435-258-3713
U.S. Fish and Wildlife Service	Consultation under Section 7 of the Endangered Species Act (16 USC 1531)	The USFWS was coordinated with for possible endangered species issues. Melissa Burns was contacted on December 11, 2014. 801-975-3330 x123
Utah Division of Wildlife Resources	Consult with UDWR as the agency with expertise on wildlife and ESA; searched database for wildlife and ESA species	Contacted Adam Brewerton at 801-510-2034 and Sarah Lindsey: sarahlindsey@utah.gov on December 18, 2014 Data request response letter received on January 5, 2015
Utah Department of Natural Resources	Verify wildlife information	Bill James 801-538-4752 February 17, 2015 Confirmed contact with Sarah Lindsey
Utah Division of Water Quality (UDWQ)	Consult with UDWQ as agency with jurisdiction and expertise on water quality	Mike Allred 801-536-4331 mdallred@utah.gov No foreseen issues
Utah Geological Survey (UGS)	Consult with USG concerning the paleontological sensitivity of the project area.	Martha Hayden 801-537-3311 Asst. to the State Paleontologist

Chapter 6 Preparers

The following are contributors to the EA:

Name	Agency	Position Title	Contribution
Ms. Linda Andra	Reclamation	Secretary	Visual Identity, Editing
Mr. Rick Baxter	Reclamation	Fish and Wildlife Biologist	ESA Compliance, Wildlife Resources
Mr. Scott Blake	Reclamation	Recreation Specialist	Recreation, Visual Resources
Mr. Peter Crookston	Reclamation	Environmental Protection Specialist	Environmental Assessment Coordinator, NEPA Oversight
Mr. Jeff Hearty	Reclamation	Economist	Economics
Mr. Calvin Jennings	Reclamation	Archaeologist	Cultural Resource, Paleontological Resource, Indian Trust Assets
Mr. Ryan Luke	Reclamation	Chief, Operations, Emergency Management Group	Water Resources, System Operations
Mr. Justin Record	Reclamation	Civil Engineer	Water Rights
Ms. Beth Reinhart	Reclamation	Chief, Environmental Group	Project Oversight
Ms. Monique Robbins	Franson Civil Engineers Inc.	Senior Engineer	Project Manager
Mr. Kerry Schwartz	Reclamation	Manager, Water and Environmental	Project Oversight
Mr. David Snyder	Reclamation	Fish and Wildlife Biologist	CWA Compliance, Wetlands

Chapter 7 References

Cache County. (2011, September). Cache County Resource Assessment. <http://www.uacd.org/pdfs/RA/3-21%20Cache%20County%202010%20resource%20assessment.pdf>

Cache County. (2003, March). Cache County Weed Control Policy. <https://www.cachecounty.org/assets/departement/weed/PDFs/POLICY.pdf>

CUWCD. (2014, April). Wasatch County Water Efficiency Project Operation, Maintenance, and Replacement Environmental Assessment. http://www.cuwcd.com/environmental/WCWEP_EA_FONSI.pdf

Idaho Department of Environmental Quality. (2006, March). Final Bear River/Malad River Subbasin Assessment and Total Maximum Daily Load Plan. http://www.epa.gov/waters/tmdl/docs/Bear%20River%20TMDL_04172006.pdf

PEC. (2015, February). An Archaeological Resource Investigation for the Upper High Creek Canal Project. Utah Antiquities Project No. U-14-ZP-1355p

U.S. Forest Service. (2007, September). DeWitt Pipeline Rehabilitation/Replacement Project Environmental Assessment. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsem_035064.pdf

U.S. Fish & Wildlife Service. (2014, December 11). *IPaC – Information, Planning, and Conservation System*. Retrieved from U.S. Fish & Wildlife Service: http://ecos.fws.gov/tess_public/reports/species-by-current-range-county?fips=49005

Abbreviations and Acronyms

APWA	American Public Works Association
BMP	Best Management Practices
cfs	Cubic feet per second
CWA	Clean Water Act
DNR	Department of Natural Resources
EA	Environmental Assessment
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
HDPE	High-density polyethylene
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PEC	Project Engineering Consultants
PVC	Polyvinyl chloride
RECLAMATION	Bureau of Reclamation
SCADA	Supervisory Control and Data Acquisition
SHPO	Utah State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total maximum daily load
TP	Total phosphorus
TSS	Total suspended solids
UAC	Utah Administrative Code
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
USFWS	U.S. Fish and Wildlife Service

Appendix A
Scoping Meeting Minutes