Town of Palisade, Colorado

Draft Environmental Assessment for the Palisade Sewer Transfer Conveyance Line Project

Per USDA Rural Development Requirements

Prepared By:

J-U-B ENGINEERS, INC.

305 S. Main Street, Unit 6
Palisade, CO 81526

November 2021

Town of Palisade, Colorado

Draft Environmental Assessment for the Palisade Sewer Transfer Conveyance Line Project

Per USDA Rural Development Requirements

Prepared By:

J-U-B ENGINEERS, INC.

305 S. Main Street, Unit 6
Palisade, CO 81526

November 2021

Contents

List of Figures

List of Tables

Appendices

Common Acronyms and Abbreviations

AC	Acre
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AFT	Agricultural Forestry Transitional
AMSL	Above mean sea level
APE	Area of Potential Effect
BE	Biological Evaluation
BFE	Base Flood Elevation
BGEPA	Bald Eagle and Golden Eagle Protection Act
BMPs	Best Management Practices
CAA	Clean Air Act
CDHPE	Colorado Department of Public Health and Environment
CFR	Code Federal Regulations
CSD	Clifton Sanitation District
DPS	Distinct Population Segment
E.O.	Executive Order
EA	Environmental Assessment
EMF	Electromagnetic fields
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Federal Farmland Protection Policy Act
GRI	Grand River Institute
GVIC	Grand Valley Irrigation Company
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Consultation
J-U-B	J-U-B ENGINEERS, Inc.
LEP	Limited English Proficiency
LF	Linear Feet
MBTA	Migratory Bird Treaty Act
MDR	Medium Density Residential
MSA	Magnuson Stevens Act
NAAQS	National Ambient Air Quality Standards
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NPL	National Priorities List
NRHP	National Register of Historic Places
ROW	Right-of-way
SHPO	State Historic Preservation Officer
SPCC	Spill Prevention, Control and Countermeasure
TESC	Temporary Erosion and Sediment Control
THPO	Tribal Historic Preservation Officer
Town	Town of Palisade
USACE	United States Army Corps of Engineers
USDA RD	United States Department of Agriculture Rural Development

USFWS	United States Fish and Wildlife Service
WWTP	Wastewater Treatment Plant

1 Purpose and Need for Proposal

In 2009, the Colorado Department of Public Health and Environment (CDPHE) issued revised effluent limits to the Town of Palisade's (Town) wastewater treatment facility that were scheduled to go into effect in 2013. At that time, the Town investigated methods of increasing the quality of treatment utilizing their aerated lagoon wastewater treatment facility. The Town also investigated the possibility of transporting its wastewater southwest to Clifton Sanitation District (CSD). This would eliminate the requirement for the Town to construct and operate its own upgraded mechanical wastewater treatment facility needed to meet the requirements of the revised effluent standards issued by the CDPHE.

Based on the effluent data provided by the Town since 2013, the Town wastewater has exceeded its influent organic load capacity allowed per the current CDPHE permit. The purpose of this project is to construct a conveyance line from the Town to the CSD, utilizing a combination of gravity sewer and force main piping, which would help the Town meet the organic load capacity allowed by the current CDPHE discharge permit.

The Town of Palisade is seeking funding from the United States Department of Agriculture (USDA) Rural Development (RD) for the proposed project. USDA requires development of an Environmental Assessment (EA) for the distribution of Rural Development Loans and Grants. Anticipating that USDA RD funding may be used, this environmental report is structured in accordance with USDA EA requirements to determine impacts of the selected improvements and mitigation measures that may be necessary.

2 Proposed Alternatives

2.1 No Action Alternative

The Town of Palisade Wastewater Treatment Plant (WWTP) currently treats effluent for the Town and the surrounding area. Since 2013, the Town's wastewater effluent has exceeded the influent organic load capacity allowed by the current CDPHE permit. The Town is currently and has for some time been out of compliance with the current discharge permit. The No Action Alternative would maintain existing condition and would not provide improvements that would allow the Town to meet the permit conditions. The No Action Alternative would result in continued failed compliance of the CDPHE permit.

2.2 Preferred Alternative

In June 2020, the Town funded a Sewer Transfer Study that identified several alternatives for wastewater treatment that would meet CDHPE requirements for effluent. Several options were explored, including the construction of a new mechanical treatment plant, however this was deemed infeasible due to several issues such as the high cost of construction. Instead, the recommended option was a combination of gravity line and force main that discharges to a second gravity line. This combination conveyance line has been carried forward in this EA as the Preferred Alternative

The Preferred Alternative would consist of the following elements, which are illustrated in Figure 1:

- A new gravity line that would run from the south of the Town following the north side of the Grand Valley Irrigation Company (GVIC) canal alignment, then transferring to the existing roadway right-of-way near the intersection of 35 Road and F Road (approximately 3.03 miles).

- A lift station and short force main (approximately 0.57 miles) would be constructed along the route near this intersection of 35 Road and F Road to make up the elevation difference necessary to maintain adequate slope on the remaining gravity sections of the sewer line.
- Following the section of force main, an additional gravity line would be installed (approximately 1.58 miles). This section would follow the alignment of F Road to the intersection of 34 Road. The line would then turn south for approximately 0.25 miles before traveling west towards 33 ¾ Road and later following the GVIC alignment to the CSD connection.

Overall, the entirety of the new pipeline would stretch approximately 5.15 miles (27,200 LF).

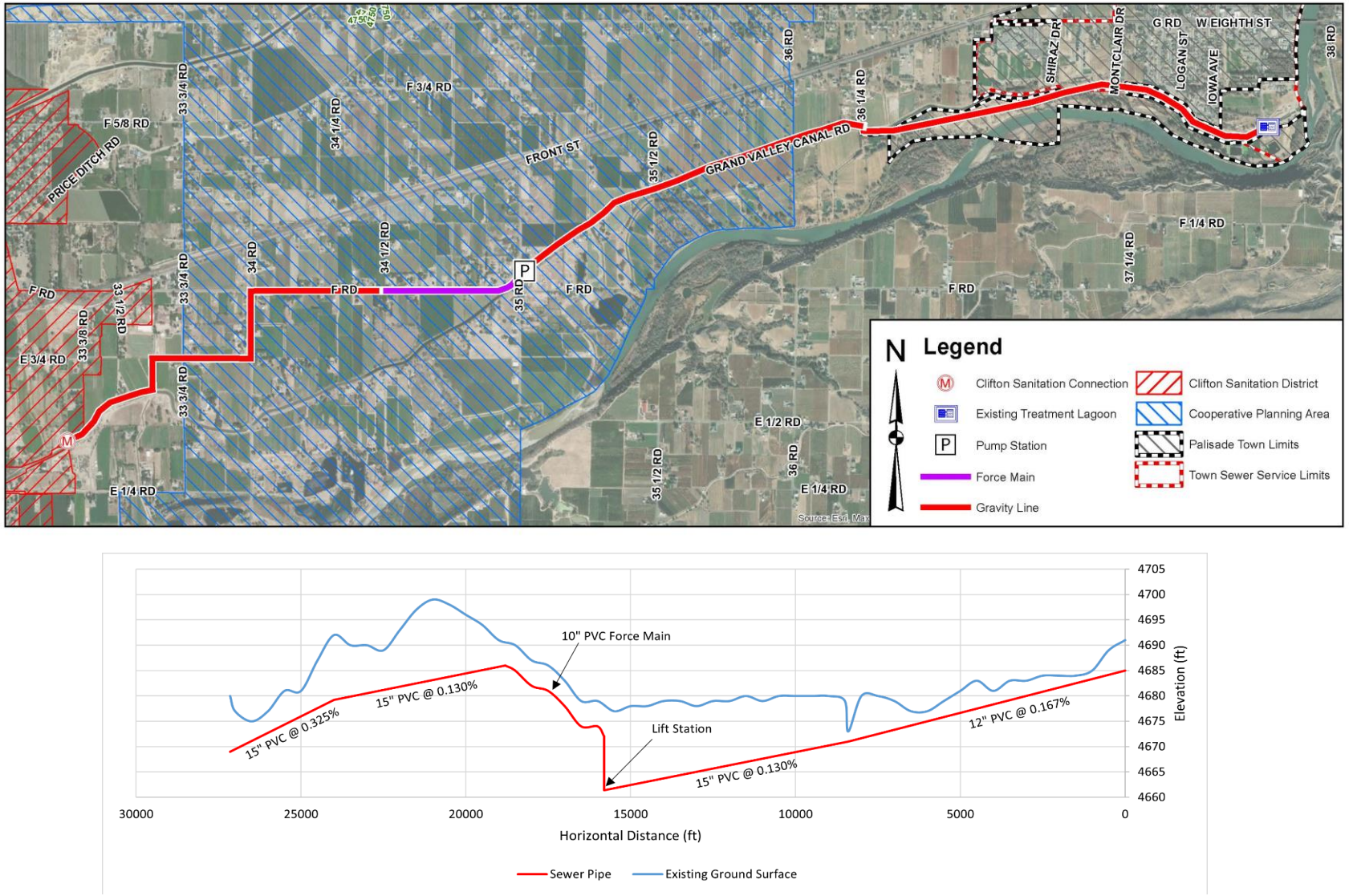


Figure 1. Preferred Alternative Area of Potential Effect (APE).

3 Environmental Resources

This section describes the geographical and environmental setting of the area that could be affected by the implementation of the Preferred Alternative and documents the current condition of each environmental resource being evaluated. Baseline data utilized to determine the affected environment was gathered by reviewing existing documentation and databases, consulting with various individuals and agencies, and conducting field investigations.

Figure 1 illustrates the Area of Potential Effect (APE). Overall, the APE consists of existing irrigation canal and roadway rights-of-way. The surrounding area is heavily disturbed by agricultural and residential development.

3.1 Land Use

3.1.1 Affected Environment

3.1.1.1 General Land Use

The Preferred Alternative alignment is partially located within the Town of Palisade limits, Mesa County, Colorado. A portion of the Preferred Alternative is also located in a Cooperative Planning Area maintained by Mesa County, the Town of Palisade, and the Town of Grand Junction. According to the Mesa County Zoning Map, the current zoning classification for County lands within the APE are "Agricultural Forestry Transitional (AFT)," which is intended to accommodate agricultural operations and very low-density single-family residential development. The Town of Palisade land within the Preferred Alternative APE also contains lands zoned as "Agricultural Forestry Transitional (AFT)" as well as a small segment of land zoned as "Medium Density Residential (MDR), which is established to maintain and protect residential areas of higher density, including a variety of small lot residential development options. The Town of Grand Junction land within the Preferred Alternative APE is also designated as "AFT."

Per Part 4 of the Cooperative Planning Agreement, established February 9, 1998, between Mesa County, the Town of Palisade, and the Town of Grand Junction all parties within the Cooperative Planning Area will not:

a.) extend any sanitary sewer line
b.) recommend amendment to any 201 sewer service are boundary without the mutual consent of all parties.

Due to the terms of Cooperative Planning Area agreement, the Town of Palisade is required to obtain approval from both Mesa County and the Town of Grand Junction prior to construction of the Preferred Alternative. On October 21, 2021, the Town of Palisade submitted a formal request for project approval to both the City of Grand Junction and Mesa County. The City of Grand Junction and Mesa County responses to the formal request are pending. The formal letter request and associated responses will be included under Appendix C-1

3.1.1.2 Important Farmland

The Federal Farmland Protection Policy Act (FPPA) [Subtitle I of Title XV, Sections 1539-1549 of the Agricultural and Food Act of 1981 (Public Law 97-98)] requires federal agencies to "minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to ensure that federal programs are administered in a manner that, to the extent practicable, will be compatible with state, unit of local government, and private programs and policies to protect farmland." Agencies are required to develop and review their policies and procedures to implement the FPPA. The FPPA does not authorize the federal government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

For the purpose of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland that is subject to FPPA requirements does not have to be currently in agricultural production; it can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

Generally, prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticide, and labor. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. It has favorable soil and climatic conditions and adequate moisture supply to produce economically sustainable yields of high-quality crops when treated and managed according to acceptable farming methods. Farmland of statewide or local importance is land other than prime or unique farmland that is determined and designated as such by local governments.

Table 3.1 and the USDA NRCS Farmland Classification Map included in Appendix B-2 describe the soils within the APE and the associated farmland classification. As described in Table 3.1, some of the mapped soils within the APE meet the criteria for "prime farmland if irrigated," and "prime farmland if irrigated and drained." However, the Preferred Alternative would be constructed within existing right-of-way, and would not result in the conversion of any farmland.

Table 3.1. List of Mapped Soils within the APE.

Soil Type	Farmland Rating	Percent of APE
Water	N/A	11.0%
Sagers silty clay loam, 0 to 2 percent slopes	Prime farmland if irrigated	22.7%
Green River silty clay loam, 0 to 2 percent slopes	Prime farmland if irrigated	7.1%
Bebeevar loam, 0 to 2 percent slopes	Prime farmland if irrigated and drained	20.8%
Green River clay loam, 0 to 2 percent slopes	Prime farmland if irrigated and drained	11.4%
Gyprockmesa cobbly clay loam, 5 to 12 percent slopes	Not prime farmland	0.3%
Sagrlite loam, 0 to 2 percent slopes	Prime farmland if irrigated	4.7%

Sagrlite loam, 2 to 5 percent slopes	Prime farmland if irrigated	3.3%
Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes	Not prime farmland	18.6%
Turley clay loam, 0 to 2 percent slopes	Prime farmland if irrigated	0.01%
Totals for APE		99.9%*

*Totals may not equal 100% due to rounding.

3.1.1.3 Formally Classified Land

A search of formally classified lands was conducted using the resources listed below. These search results determined that no formally classified lands existing within the APE.

- Colorado State Parks: https://cpw.state.co.us/placestogo/parks/Pages/parkMap.aspx
- National Parks, Historic Sites, and Monuments: https://www.nps.gov/state/co/index.htm
- Natural Landmarks: https://www.nps.gov/subjects/nnlandmarks/state.htm?State=CO
- Wilderness Areas: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3852601.html#
- U.S. Fish and Wildlife Service (USFWS) Wildlife Refuges: https://www.fws.gov/refuges/find-a-wildlife-refuge/
- Colorado Parks and Wildlife State Wildlife Areas: https://cpw.state.co.us/placestogo/parks/Pages/WildlifeAreaMap.aspx
- Wild and Scenic Rivers: https://www.rivers.gov/colorado.php
- Bureau of Land Management Administered Lands: https://www.blm.gov/colorado
- Native American Owned Lands and Leases: https://www.bia.gov/regional-offices/southwest

3.1.2 Environmental Impacts

3.1.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to general land uses, prime or important farmland, or formally classified lands. All existing land uses and zoning ordinances would remain in effect without any alterations. No existing land would be converted from agricultural use, and land use would remain compatible with existing land use plans and policies. The No Action Alternative is not anticipated to result in impacts to land use.

3.1.2.2 Preferred Alternative

The Preferred Alternative is not anticipated to result in any incompatibilities with existing land use controls and policies. The Preferred Alternative would be fully constructed within utility corridors and existing utility and roadway right-of-way (ROW) or easements. There would be no impacts to formally classified land as there are no formally classified lands within the APE.

The Preferred Alternative improvements are not anticipated to contribute to changes in land use associated with recreation, mining, or large industrial development. Therefore, the Preferred Alternative is not anticipated to significantly impact land use within the APE.

3.1.3 Mitigation

As there would be no changes to land use as a result of the Preferred Alternative, no mitigation is anticipated to be required.

3.2 Floodplains

3.2.1 Affected Environment

Executive Order (E.O.) 11988, *Floodplain Management*, and E.O. 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, require federal agencies to avoid actions, to the extent practicable, which would result in the construction or placement of facilities in floodplains and/or affect floodplain values. E.O. 11988 further defines floodplains as "lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year."

Congress established the National Flood Insurance Program (NFIP) in 1968. The NFIP is administered at a local level and is a voluntary mitigation program made available to state and local governments by the Federal Emergency Management Agency (FEMA). FEMA makes flood insurance, grants, and loans available in those communities that practice sound floodplain management. To better inform decision making, FEMA conducts hydrologic and hydraulic studies through the NFIP, and publishes flood insurance rate maps (FIRMs) that identify and delineate flood hazard risks for land use planning. FIRMs identify three main zones of flood hazard risk:

- Flood Zone A – corresponds to the 100-year floodplain that is determined by approximately methods. Detailed hydraulic analysis is not performed for such areas. No Base Flood Elevations (BFE) or depths are shown within this zone. Mandatory flood insurance purchase requirements may apply.
- Flood Zone B – corresponds to areas between the limits of the 100-year flood and the 500-year flood or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood.
- Flood Zone C – corresponds to areas of minimal flood potential (500-plus-year flood).

According to the FIRMs produced through the NFIP (Community Panel #08077C0855F and #08077C0835F, included as Appendix B-3), a Flood Zone A designation exists along the length of the Colorado River and portions of the Grand Valley Canal, portions of which are located within the Preferred Alternative APE.

3.2.2 Environmental Impacts

3.2.2.1 No Action Alternative

The No Action Alternative would not result in any changes to the existing area within the APE. As such, there would be no development to the Colorado River or Grand Valley Canal floodplains, and no floodplain development permit would be required.

3.2.2.2 Preferred Alternative

The Preferred Alternative would require excavation and construction within the mapped floodplain associated with the Colorado River and Grand Valley Canal. A floodplain development permit would be obtained from Mesa County prior to the commencement of any construction activities. Some sections of the preferred alternative may fall within areas of the 100-year flood plain as delineated in the Federal Emergency Management Agency Flood Insurance Rate Map. Design of these sections will include mitigation considerations to protect the sanitary sewer infrastructure from flood hazard. These measures may include waterproofing of concrete structures, mitigating buoyancy affects to the system, and waterproofing access points. These are standard design considerations when ground water or temporary surface water inundation may be anticipated.

During construction, installation of the new pipeline would consist of trenching near the canal, installing, and then burying a pipeline. The surrounding area would be restored to pre-project conditions after construction completion, thereby minimizing overall impacts to the floodplain. As the floodplain would be restored after construction completion, no significant impacts to floodplains are anticipated.

3.2.3 Mitigation

Prior to construction, a floodplain development permit would be obtained from Mesa County, documenting all project elements. As no significant impacts to the floodplain are anticipated to occur, no floodplain specific mitigation is anticipated to be required.

3.3 Wetlands

3.3.1 Affected Environment

Wetlands are complex ecosystems that contain a number of important functions, including flood control, ground water recharge, water filtration and purification, erosion control, wildlife habitat, recreation, and research and education.

A site visit was performed by J-U-B ENGINEERS, Inc. (J-U-B) in 2021 to evaluate potential wetland areas within the APE. A wetland assessment was generated following the site assessment to document the presence or absence of wetlands within the APE. A total of 25 wetlands totaling 13.95 acres, two ponds totaling 4.64 acres, one canal (Grand Valley Canal) totaling 19,576 linear feet (LF) (13.83 acres), one intermittent stream totaling 3,217 LF (0.78 acres), and 4,707 LF (1,49 acres) of ditches were identified within the APE. The documented wetland areas are described in more detail and mapped in the included wetland delineation report (see Appendix B-4). Table 3.2 identifies the Aquatic resources delineated within the APE.

Table 3.2. Delineated Aquatic Features in the APE.

Aquatic Resource Name	Aquatic Resource Classification		Aquatic Resource Size (AC)	Aquatic Resource Size (Linear Feet)
	Cowardin Code	Sample Point*		
Wetlands				
Wetland 1	PEM1E	SC01	0.37	
Wetland 2	PEM1F	RW03	0.30	
Wetland 3	PFO1E	RU02	0.88	
Wetland 4	PEM1E9i	SP04	1.77	

Aquatic Resource Name	Aquatic Resource Classification		Aquatic Resource Size (AC)	Aquatic Resource Size (Linear Feet)
	Cowardin Code	**Sample Point***		
Wetlands				
Wetland 5	PFO1E	RW20	1.38	
Wetland 6	FEM1F	SC03	0.17	
Wetland 7	PEM1F	RW02	0.09	
Wetland 8	PEM1F	-	0.17	
Wetland 9	PFO1E		1.00	
Wetland 10	PFO1E	RW02	0.9	
Wetland 11	FEM1F	RW02	1.15	
Wetland 12	PEM1E	RW20	0.21	
Wetland 13	PFO1E	RW20	0.12	
Wetland 14	PFO1E	RW21	0.12	
Wetland 15	PEM1E	RW21	0.12	
Wetland 16	PFO1E	RW21	0.14	
Wetland 17	PEM1F	SC01 and SC04	0.44	
Wetland 18	PFO1E	-	3.62	
Wetland 19	PEM1D	SP03	0.006	
Wetland 20	PEM1E	SP03 and SC05	0.08	
Wetland 21	PEM1F	SC08	0.05	
Wetland 22	PEM1F	SC09	0.27	
Wetland 23	PEM1F	SC10	0.39	
Wetland 24	PEM1E9i	RW04	0.016	
Wetland 25	PSS1E	SP01	0.19	
Total			**13.95**	
Linear Features				
Grand Valley Canal	N/A	SC01, SC04, SC05, SC07, and SC11	13.83	19,576
Intermittent Stream 1	R4SB7	RW21, and SC03	0.78	3,217
Ditch 1	N/A	SC08	0.05	73.2
Ditch 2	N/A	SC09	0.27	571.6
Ditch 3	N/A	SC10	0.39	845.6
Total			**15.32**	**24,283.44**
Pond Features				
Pond 1	L2UB3	RW01	3.20	
Pond 2	L2UB3	RW03	1.43	
Total			4.63	

*Per wetland delineation map (see Appendix B-4).

3.3.2 Environmental Impacts

3.3.2.1 No Action Alternative

Under the No Action Alternative, there would be no development or changes to the existing wetlands within the APE. Therefore, there would be no significant impacts to wetlands.

3.3.2.2 Preferred Alternative

Based on the findings of the Wetland Delineation, all of the documented wetlands except for those directly associated with the Grand Valley Cana (Wetlands 1, 17, 19, 20, and 21), or those associated with the three ditches (Wetlands 21, 22, and 23), have a direct connection to the Colorado River (a Water of the U.S.) and therefore fall under the jurisdiction of the Army Corps of Engineer (USACE).

However, construction of the Preferred Alternative is not anticipated to impact any of these jurisdictional wetlands. If any of these wetlands are impacted by the Preferred Alternative additional wetland mitigation would be required.

3.3.3 Mitigation

No mitigation is anticipated to be required as there would be no impacts to jurisdictional wetlands as a result of the Preferred Alternative. Additional mitigation would be required if it was determined at a later date that impacts to the documented jurisdiction wetlands would be required for construction.

3.4 Water Resources

3.4.1 Affected Environment

3.4.1.1 Surface Water

There is a wide variety of legislation that addresses the development of water quality standards and management thereof to protect surface water supplies. The APE is primarily located within the Watson Creek-Colorado River subwatershed (HUC #140100051502), with a small segment of the western extent of the project located within the Indian Wash-Colorado River subwatershed (HUC #140100051503). As described in the wetland delineation, the Grand Valley Canal makes up the primary surface water feature within the APE, and the Colorado River is the primary feature adjacent to the APE.

Approximately 19,576 linear feet of the Grand Valley Canal passes through the APE. The canal begins at a diversion structure on the Colorado River and meanders through the valley until it rejoins the River south of Loma, Colorado. Some stretches of the canal contain wet meadow wetlands, though the majority of the canal within the APE lacks hydrophytic vegetation and/or hydric soils.

3.4.1.2 Groundwater

According to the EPA's Sole Source Aquifer Database, there are no sole source aquifers in the vicinity of the APE. While water resources in the APE are primarily surface water features, there are a few groundwater wells in the vicinity of the APE. Well depth varies greatly, and the groundwater is likely influenced by the presence of the Colorado River. Figure 2 on page 12 illustrates the locations of various wells in the vicinity of the APE.

3.4.2 Environmental Impacts

3.4.2.1 No Action Alternative

The No Action Alternative would not alter any existing surface or groundwater resources within the APE. Surface water quality would likely continually degrade over time due to the Town's inability to meet the requirements of the current CDPHE permit.

3.4.2.2 Preferred Alternative

Implementation of the Preferred Alternative is anticipated to temporarily impact the Grand Valley Canal at the location where the proposed pipeline would cross the existing canal. Construction in this area would occur during the winter months, when the Canal is not actively being utilized for irrigation.

Any construction that would occur within or adjacent to surface waters would utilize Best Management Practices (BMPs) and conservation measures during construction to minimize impacts to surface waters. If these BMPs and conservation measures are followed, no negative impacts are anticipated to occur to water resources as a result of the Preferred Alternative. Overall, the Preferred Alternative is anticipated to result in a net betterment to water resources due to the improvements made that would allow the Town to meet the requirements of the current and future CDPHE permits.

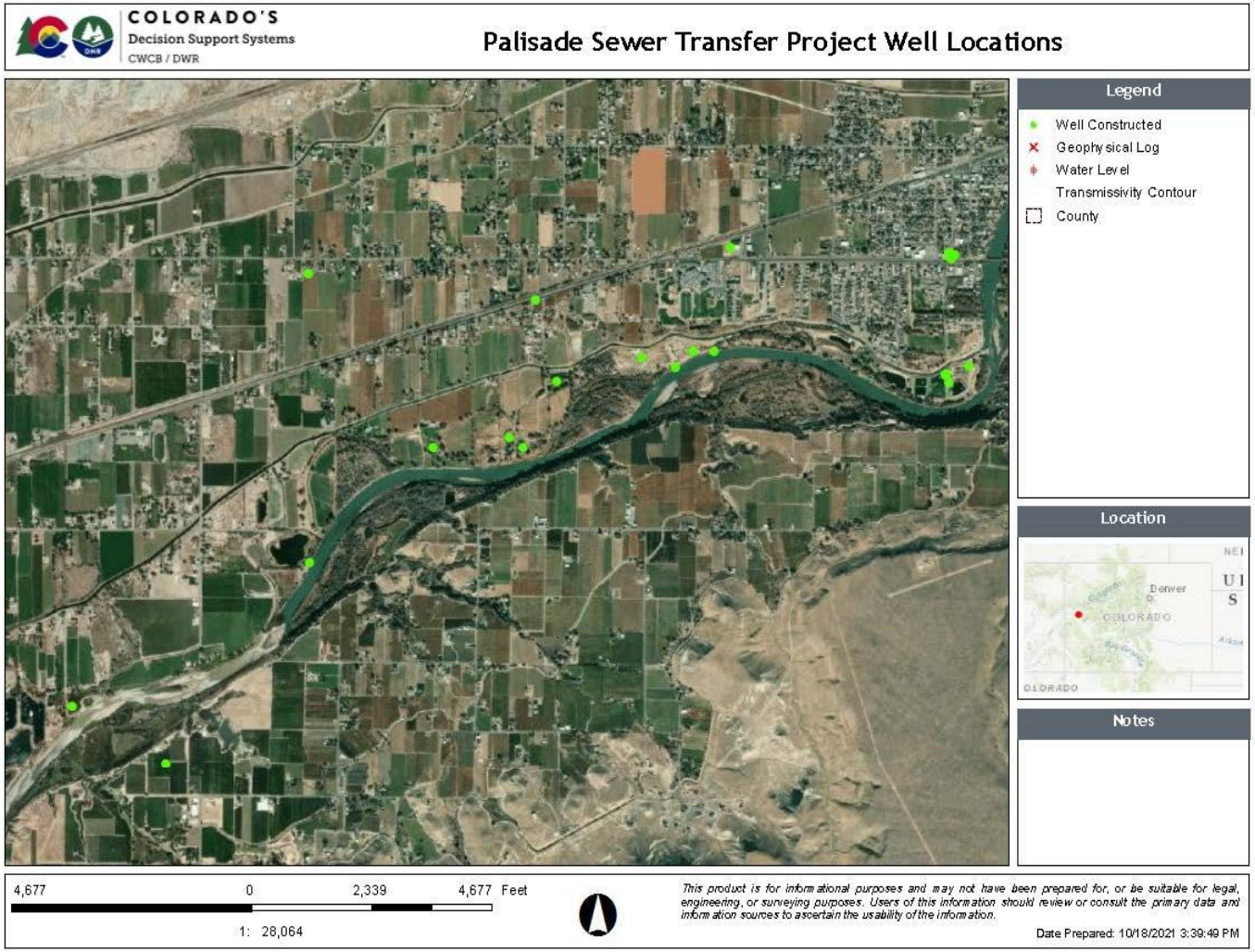


Figure 2. Wells located in the Vicinity of the APE.

3.4.3 Mitigation

As no significant impacts are anticipated to occur to water resources, no mitigation would be required. BMPs and conservation measures would be utilized to minimize short-term, construction related impacts that could occur as a result of the Preferred Alternative.

3.5 Coastal Resources

There are no coastal resources located within the APE

3.6 Biological Resources

3.6.1 Affected Environment

Federal agencies are required to follow guidelines set forth in the Endangered Species Act of 1974 (ESA) [16 U.S.C. 1531-1543], the Migratory Bird Treaty Act of 1918 (MBTA) [16 U.S.C. 703-712], the Bald Eagle and Gold Eagle Protection Act of 1940 (BGEPA), and the Magnuson=Stevens Act of 1976 (MSA) [16 U.S.C. 1801]. To document the existing habitat and species, including the potential presence of any listed species, a Biological Evaluation (BE) was completed by J-U-B ENGINEERS, Inc. in 2021 for the APE (see Appendix B-5).

3.6.1.1 General Fish, Wildlife, and Vegetation

The BE concluded that the general habitat conditions are representative of a highly disturbed agricultural environment, with land uses consisting of mixed commercial, agricultural, and residential uses. Soils have generally been tilled and cultivated, and common and noxious weeds are abundant. The following table describes dominant plant species observed within the APE.

Table 3.3. Dominant Vegetation within the APE.

Scientific Name	Common Name
Asclepias speciose	Showy milkweed
Asclepias suberticillata	Horsetail milkweed
Bassia scoparia	Ragweed
Disticlis spicata	Inland saltgrass
Echinochola crus-galli	Barnyard grass
Elaeagnus angustifolia	Russian olive
Equisetum hyemale	Rough horsetail
Ericameria nauseosa	Rabbitbrush
Lepidium draba	Whitetop
Leymus cinereus	Great Basin wild rye
Medicago sativa	Alfalfa
Melilotus officinalis	Yellow sweet clover
Panicum capillare occidentale	Witch grass
Persicaria maculosa	Ladies' thumb
Phalaris arundinacea	Reed canary grass
Pragmites sp.	Common reed
Populus fremontii	Femont cottonwood
Populus tremuloides	Quaking aspen

Scientific Name	Common Name
Salix exigua	Coyote Willow
Sarcobatus vermiculatus	Grease wood
Setaria helvola	Yellow foxtail
Tamarix ramosissima	Saltcedar
Typha sp.	Cattail

General species observed during the site visit include a variety of songbirds, black-billed magpie (*Pica husonia*), and mallard (*Anas platyrhynchos*).

3.6.1.2 ESA-Listed Threatened and Endangered Species

As described in the BE, the U.S. Fish and Wildlife Service (USFWS) information for Planning and Consultation (IPaC) Report identified six ESA-listed species as potentially occurring within the APE: yellow-billed cuckoo (*Coccyzus americanus*), bonytail chub (*Gila elegans*), humpback chub (*Gila cypha*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and the Colorado hookless cactus (*Sclerocactus glaucus*).

No special status species were observed during the site survey. The following information summarizes the potential impacts to the aforementioned ESA-listed species that may exist within the APE. A more detailed documentation of the species and impacts determination is documented in the BE (see Appendix B-5)

3.6.1.2.1 Yellow-Billed Cuckoo

Yellow-billed cuckoo (*Coccyzus americanus*) was listed as threatened by the USFWS on November 3, 2014. Yellow-billed cuckoos are considered a riparian obligate and are usually found in large tracts of cottonwood/willow habitat with dense sub-canopies (below 33 feet) and limited grazing disturbance (Wiggins 2005). Suitable breeding and nesting habitat for the species must be at least 300-feet-wide and a minimum of 12 contiguous acres (Colorado parks and Wildlife 2020).

In Western Colorado, the yellow-billed cuckoo depends primarily on old growth riparian woodlands of cottonwood with dense understories (Kingery 1998; Righter et al. 2004). Nesting sites are typically found along river valleys in deciduous riparian woodland patches with breeding often coinciding with the emergence of large numbers of caterpillars, cicadas, and other large insect fauna (Ehrlich et al. 1992). The species incubation/nestling period is the shortest of any known bird, as it one of the last neotropical migrants to arrive in North America, reaching its breeding areas in late May or early to mid-June. Although exact migration dates can vary, the yellow-billed cuckoo typically begins its return migration to South American in late August or early to mid-September (Bennet 2014).

In May of 2021, the USFWS updated the designation of 298,845 acres of critical habitat for the yellow-billed cuckoo western distinct population segment (DPS) in Arizona, California, Colorado, Idaho, New Mexico, Texas, Utah, and Wyoming (Federal Register 2021). Primary threats to the species include conversion of riparian habitat to agriculture and other uses, dam construction, stream channelization and stabilization, and livestock grazing (USFWS 2017). The USFWS IPaC Report also identified critical

habitat for the species in the vicinity of the APE. Critical habitat and the required 1/2-mile habitat buffer overlaps with the APE in Riverbend Park, on the east side of the APE, and on the south of the Grand Valley Irrigation Canal. The critical habitat area for yellow-billed cuckoo in this location encapsulates the Colorado River corridor from Grand Junction and east to the Town of Palisade (USFWS 2021a; USFWS 2021b).

3.6.1.2.2 Colorado River Fish: Bonytail Chub, Colorado Pikeminnow, Humpback Chub, and Razorback Sucker

Bonytail

In 1980, the USFWS listed the bonytail chub (*Gila elegans*) as an endangered species under the ESA. The species is a minnow native to the Colorado River system. They are opportunistic feeders; their prey includes insects, zooplankton, algae, and higher plant matter. Bonytail chub spawn in spring and summer over gravel substrate. Currently, man bonytail chub are raised in fish hatcheries and released into the wild when they are large enough to survive in their natural environment. Bonytail chub prefer stream habitat that consists of eddies, pools, and backwaters near swift currents in large rivers (USFWS 2021c).

Humpback Chub

The humpback chub (*Gila cypha*) is a minnow native to the upper Colorado River system including the Green, Yampa, White, and Little Colorado Rivers (USFWS 2014). The USFWS listed the fish as endangered under the ESA in 1967. The humpback chub originally thrived in the fast, deep, whitewater areas of the Colorado River and its major tributaries. Documented occurrences of the species are now confined to a few whitewater areas in the Colorado, Green, and White Rivers. The species spawn during the spring and summer in shallow, backwater areas with cobble substrate. Younger chub reside in shallower, turbid habitats until they are large enough to move into whitewater areas (USFWS 2021c).

Colorado Pikeminnow

The Colorado pikeminnow (*Ptychocheilus lucius*) is native to the Colorado River system. The species was listed under the ESA on March 11, 1967. Their current range is limited to the upper Colorado River system. The species is mainly piscivorous; younger pikeminnows also eat insects and other invertebrates. They spawn in the summer over gravel or smaller cobble substrate situated in riffle habitat. Adult Colorado pikeminnows prefer medium to large rivers while juveniles prefer slow-moving backwaters (USFWS 2021c). This species requires uninterrupted passage through waterways and is adapted to hydrologic cycles that are characterized by high levels of snowmelt runoff in the spring and lower, stable flows at other times of the year (USFWS 2021d). The USFWS IPaC reported the presence of designated critical habitat for the Colorado pikeminnow within the vicinity of the APE; however, the APE does not overlap with critical habitat for the pikeminnow, which is limited to the Colorado river.

Razorback Sucker

The razorback sucker (*Xyrauchen texanus*) was designated as endangered on May 2, 1990. This fish is native to the Colorado River system, with recent reports of the species only coming from the lower Colorado, lower Yampa, and Green Rivers (USFWS 2014). They spawn between February and June and prefer slow backwater habitats (USFWS 2021b). The near extinction of the species can be linked to flow regulation or alternations, habitat loss, and competition and predation by non-native fishes.

The USFWS IPaC reported the presence of designated critical habitat for the species within the vicinity of the APE. Corresponding to the location of critical habitat for the Colorado pikeminnow, the APE also does not overlap with critical habitat for the razorback sucker, which is limited to the Colorado River.

3.6.1.2.3 Colorado Hookless Cactus

The Colorado hookless cactus (*Sclerocactus glaucus*) was first designated as a threatened species under the ESA on October 11, 1979. The hookless cactus is a small barrel cactus that grows between a height of 4 to 18 centimeters. It grows in coarse soil with high cobble and gravel components, typically associated with river and stream terrace deposits, and usually consisting of Mancos shale with volcanic cobbles and pebbles on the surface. The cactus also grows on rocky substrates on mesa slopes. This species is found between approximately 4,400 and 6,200 feet above mean sea level (AMSL)

3.6.1.3 Migratory Bird Treaty Act

Table 3.4 documents the MBTA and BGEPA protected species identified in the IPaC report that have the potential to occur within the APE.

Table 3.4. MBTA and BGEPA Protected Species with the Potential to Occur in the APE.

Scientific Name	Common Name
Gymnorhinus cyanocephalus	Pinyon jay
Haliaeetus leucocephalus	Bald eagle
Leiothlypis virginiae	Virginia's warbler
Melanerpes lewis	Lewis's woodpecker
Coccothraustes vespertinus	Evening grosbeak

The pinyon jay inhabits pinyon-juniper woodlands, sagebrush, scrub oak, chaparral, and ponderosa pine forests (Cornell 2019a). The Lewis's woodpecker also breeds in open ponderosa pine forests, burned forests with high snag densities, and frequents pinyon-juniper woodlands and woodlands with cottonwood trees near streams (Cornell 2019b). Bald eagles require nesting sites high above the ground and canopy that are open and accessible. Bald eagles typically breed in forested areas adjacent to large bodies of water (USFWS 2011). The MBTA passerine species that may occur in the APE include Virginia's warbler, which breed in open pinyon-juniper and oak woodlands, and on slopes with shrubby ravines (Cornell 2019c); and evening grosbeak, which is found in pinyon-juniper forests and pine oak forests in the Rocky Mountains, where thy typically breed in mature and second-growth stands (Cornell 2019d).

3.6.2 Environmental Impacts

3.6.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the existing biological resources within the APE. There would be no impacts to threatened, endangered, or state-listed species as no development would occur within the APE.

3.6.2.2 Preferred Alternative

Based on the available information regarding the biological requirements and the status of ESA-listed species, the environmental baseline for the APE, and the potential effects of the Preferred Alternative, the Preferred Alternative is not anticipated to negatively impact any of the aforementioned listed species.

The proposed project does not include any actions that would directly or indirectly affect the Colorado River channel or its associated riparian fringe, and therefore would not impact any of the listed fish species. Work would be completed outside of nesting bird season, and therefore would not disturb any potential breeding or nesting yellow-billed cuckoo or other migratory bird species. If the Preferred Alternative cannot be constructed outside of the breeding and nesting season and would require the removal of midstory vegetation that could provide suitable habitat for birds, then the APE should be surveyed for any migratory bird or eagle nests prior to the removal of large vegetation. If a nest of an ESA-identified avian species is identified within the APE, USFWS would be notified immediately to discuss the appropriate course of action.

3.6.3 Mitigation

As there are no significant impacts anticipated for the Preferred Alternative, no mitigation would be required. The following Best Management Practices (BMPs) and conservation measures are standard requirements and would be utilized during implementation of the Preferred Alternative to minimize adverse impacts to biological resources and habitat that might support federally protected or state-sensitive species. These would include, but are not limited to, soil and erosion control devices, noxious weed prevention and control, and construction timing to avoid breeding and nesting season for migratory birds. Specific conservation measures to avoid and minimize impacts to avian species include:

- Construction would be timed to occur over the course of two winter construction seasons, from 2022/2023 through 2024/2025.
- Construction activities and any vegetation removal in Riverbend Park would be restricted until after the yellow-billed cuckoo breeding and nesting season which ends in late August/early September.
- Equipment would be cleaned prior to arrival at the site to avoid noxious weed dispersal within or near the APE.
- All necessary BMPs would be in place to control sediment and erosion, and to protect water quality during construction activities.

Additional construction BMPs shall include, but are not limited to, the following:

- All construction activities, equipment storage, and materials staging would be conducted with the APE and the designated staging areas.
- Temporary erosion and sediment control (TESC) devices would be incorporated in active construction areas to prevent sediment discharges to any surface waters in canals or other bodies of water. These devices must remain in place until the potential for sediment migration is no longer a risk.
- Any unnecessary removal of trees or shrubs would be avoided.

- Excavated sediment and debris shall be disposed of at a pre-approved area no less than 200 feet from any surface water feature.
- An approved native seed mix appropriate to the APE would be applied post construction to disturbed areas.
- If vegetation removal would occur during the breeding and nesting season for migratory birds in any part of the APE, a nesting survey would be required prior to the removal of trees and shrubs to identify any active nests in the APE, no earlier than seven days before construction.

Chemical pollution measures shall include, but are not limited to the following:

- An approved spill prevention, control, and countermeasure (SPCC) plan would be in place prior to any construction activities.
- All construction equipment shall be decontaminated with high pressure water prior to mobilization to the job site to remove all surface oil, grease, dirt, and plant matter. Proper decontamination is particularly critical to prevent the spread of noxious and/or non-native vegetation into agricultural fields.
- Machinery will be fueled or lubricated no less than 150 feet from live water. Machinery would be fueled over a surface that would facilitate spill remediation. Machinery shall be maintained in a petroleum leak-free condition to avoid and reduce potential for groundwater contamination.
- Major maintenance of equipment, such as changing fluids, overhaul, tune-ups, and similar types of regularly scheduled maintenance shall be performed at an approved off-site facility or staging area.
- Petroleum products and hazardous, toxic, and/or deleterious materials shall not be stored, disposed of, or accumulated adjacent to or in the immediate vicinity of live water.
- Portable toilets shall not be placed adjacent to canals, streams, lakes, wetlands, wells, or springs. They shall be located no less than 150 feet from these areas to prevent water contamination.

If the described BMPs and conservation measures are adhered to throughout the life of the Preferred Alternative, it is anticipated that the project would have effect on listed species.

3.7 Cultural Resources and Historic Properties

3.7.1 Affected Environment

A number of Federal Statutes and E.O.s guide the protection of historic and cultural resources. NEPA requires agencies to consider the effects of a planned Federal undertaking upon the cultural environment, including historical, archaeological, and paleontological resources. In addition to NEPA, planned actions must also comply with the National Historic Preservation Act (NHPA) [16 U.S.C. 470, as amended]. Section 106 of the NHPA and its implementing regulations require Federal agencies to consider the effects of their undertakings on historic properties. According to these regulations, a historic property is defined as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP)…” (36 C.F.R. 800.16); compliance with Section 106 requires consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), and/or the Tribal Historic

Preservation Officer (THPO) if there is the potential for adverse impacts to historic properties listed on or eligible for listing on the NRHP.

A cultural resource survey was completed for the APE by Grand River Institute (GRI) in July 2021, which documented four previously recorded cultural resource sites, and one newly documented NRHP-eligible site (see Appendix B-6). Of the documented resources, only two were determined to be located within the APE: a segment of the Grand Valley Canal, and the Palisade Migratory Camp.

Given the nature of the Preferred Alternative, it was determined that the segment of the Grand Valley Canal would not be impacted by any project activities. Subsurface monitoring was recommended, however, for any ground disturbance within the site boundary of the Palisade Migratory Camp. The USDA RD Cultural Resource specialist has concurred with the finding of the cultural resource survey. SHPO consultation is pending.

3.7.2 Environmental Impacts

3.7.2.1 No Action Alternative

Under the No Action Alternative, no changes to the APE would take place, and therefore there would be no significant impacts to cultural resources or historic properties.

3.7.2.2 Preferred Alternative

Of the sites documented in the cultural resource survey, only one site was determined to be located within the APE and in an area with the potential to be disturbed by the Preferred Alternative, the Palisade Migratory Camp. The survey recommended subsurface cultural monitoring during any ground disturbance activities within the cultural site boundary. The effects determination is pending SHPO consultation.

In the event that archaeological or historic materials are discovered during any construction activities, work in the immediate vicinity would stop, the area would be secured, and the THPOs for the Southern Ute Tribe, the Ute Mountain Tribe, and The Ute Indian Tribe of the Uinta and Ouray Reservation, and the Colorado SHPO would be contacted.

3.7.3 Mitigation

If construction activities uncover any materials, such as stone tools, shell, bone, fire-cracked rock, charcoal, pottery, glass, brick, metal, or human remains, work in the immediate vicinity would stop at once and the Colorado SHPO and THPOs for the Southern Ute Tribe, the Ute Mountain Tribe, and the Ute Indian Tribe of the Uinta and Ouray Reservation would be contacted.

3.8 Aesthetics

3.8.1 Affected Environment

Aesthetics, including visual resources and character, may be subjective because it includes personal aesthetic preferences. Aesthetic impacts can include contrasts between a specific area, its existing environment, and the general perception of the community concerning any changes. Existing impacts

are those associated with the Grand Valley Canal, roadway rights-of-way, agricultural fields, and existing Town sewer infrastructure.

It is anticipated that while the Preferred Alternative would result in short-term, construction-related aesthetic impacts, there would be no significant impacts to aesthetics. Construction would require excavation along existing utility and roadway ROW, however after installation of the new pipeline, the excavated areas would be returned to their existing conditions. After construction completion, the Preferred Alternative elements would be consistent with the existing aesthetics of the site and the surrounding area. There would be no change in building heights, and no new lighting or glare is anticipated.

3.8.2 Environmental Impacts

3.8.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the aesthetics of the APE and the surrounding area. Therefore, there would be no significant impacts to aesthetics as a result of the No Action Alternative.

3.8.2.2 Preferred Alternative

No major aesthetic changes are anticipated to occur as a result of the Preferred Alternative. While construction would result in temporary, short-term impacts to aesthetics, all disturbed areas would be restored to existing conditions after project completion. No new glare is anticipated, and no new lighting would be installed as a result of the Preferred Alternative.

3.8.3 Mitigation

As the Preferred Alternative is not anticipated to impact aesthetics, not mitigation is anticipated to be required.

3.9 Air Quality

3.9.1 Affected Environment

Potential air quality impacts can be short-term (construction-related) or long-term (facility emissions, increased traffic). Under the Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS) have been established for criteria pollutants, specifically ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead. Under the CAA, air quality conditions within all areas of a state are required to be designated with respect to the NAAQS as “attainment,” “nonattainment,” or “unclassifiable.” Areas that do not exceed the NAAQS are designated as attainment, while areas that exceed the standards are designated as nonattainment. Mesa County is currently in attainment for all criteria pollutants (EPA 2021).

There is the potential for short-term impacts associated with construction emissions and fugitive dust. These impacts would be anticipated to cease after construction completion and impacts to air quality are not anticipated to exceed state or federal limits.

3.9.2 Environmental Impacts

3.9.2.1 No Action Alternative

There would be no changes in air quality as a result of the No Action Alternative; therefore, there would be no significant impacts to air quality.

3.9.2.2 Preferred Alternative

Currently, Mesa County is in attainment for all criteria pollutants, and only short-term construction-related impacts to air quality are anticipated to result from the Preferred Alternative. These short-term impacts are not anticipated to exceed state or federal limits. All construction-related air quality impacts would cease after project completion.

3.9.3 Mitigation

The Contractor would be required to implement BMPs to monitor, prevent, and control generation of dust and other airborne particulate matter during construction activities. Water trucks would be utilized to minimize dust impacts during all earthwork/grading required during construction. Air emissions would be minimized through properly maintaining functional mufflers on equipment.

3.10 Socioeconomic Impacts and Environmental Justice

3.10.1 Affected Environment

The core of USDA RD's mission is to support sound development of rural communities and provide economic opportunities for rural residents. As this development has the potential to affect, either positively or negatively, the socioeconomic status of the surrounding area, it must be analyzed. Socioeconomics is often focused on population or income changes, or effects to local institutions like schools, health care, or housing. Additionally, community cohesion or growth, tax revenues, property values, displacement of people or land, transportation pattern changes, health and public safety changes, and public services and facilities development can all play a role in socioeconomic impacts.

The EPA's EJSCREEN database was referenced to determine the population data for individuals located within a 0.5-mile radius of the APE (see Appendix B-7). Table 3.5 below summarizes the 2010 Census data for the population located within a 0.5-mile radius of the APE. According to the 2010 Census data, approximately 14% of the population within the study area are considered a minority population. There are five documented households with limited English proficiency (LEP). The study area is not located on tribal reservation lands, however cultural consultation occurred with the Southern Ute Tribe, the Ute Mountain Tribe, and The Ute Indian Tribe of the Uinta and Ouray Reservation.

Table 3.5. Population by Race and Ethnicity

Race	Number of Persons	Percentage
White (not Hispanic or Latino)	2,341	86%
Hispanic or Latino (of any race)	284	10%
American Indian and Alaskan Native	20	1%
Black or African American	9	<1%
Non-Hispanic Asian	11	<1%

Race	Number of Persons	Percentage
Pacific Islander	6	<1%
Other Race	2	<1%
Two or More Races	38	1%
Total Population	**2,710**	

*Total may not equal 100% due to rounding; Source: *Environmental Protection Agency EJSCREEN Database*

The 2014-2018 American Community Survey (ACS) Summary Report indicates that 348 households are considered low-income, which amounts to approximately 29% of the households in the vicinity of the APE.

To begin the public involvement process and to allow interested parties, including any low income or minority populations, a chance to comment on potential sewer improvements, a Sewer Transfer Study was completed for the Town of Palisade by JUB in June 2020 that included the Preferred Alternative. This study was presented to the Town's Board of Trustees during a meeting on August 25, 2020, which included opportunity for public comment. No comments or questions were received at this meeting.

3.10.2 Environmental Impacts

3.10.2.1 No Action Alternative

Under the No Action Alternative, no immediate changes to the existing socioeconomics or environmental justice populations are anticipated to occur. Long-term negative impacts have the potential to arise from the continued use of aging wastewater treatment facilities, including failure to meet the requirements of the current CDPHE discharge permit. This has the potential to result in a decreased level of service and a decrease in water quality in the nearby Colorado River.

3.10.2.2 Preferred Alternative

The Preferred Alternative is not anticipated to result in disproportionately high or adverse impacts to socioeconomics, low-income, or minority populations due to the following:

- There are no known long-term adverse impacts anticipated to occur to environmental resources in the APE;
- The temporary impacts and long-term benefits of the Preferred Alternative are anticipated to be experienced equally among residents and employees in the APE; and,

The Preferred Alternative is not anticipated to increase traffic congestion, reduce or remove access to community facilities, or impact community cohesion in the APE. Temporary impacts to noise, air quality, floodplains, and water resources associated within construction are anticipated to occur, however these impacts would cease after project completion.

Permanent beneficial impacts to socioeconomics and environmental justice populations from the Preferred Alternative include enhanced community wastewater facilities and improved water quality.

3.10.3 Mitigation

As no adverse significant impacts to socioeconomics or environmental justice populations are anticipated, no mitigation would be required.

3.11 Noise

3.11.1 Affected Environment

The proximity of a project's construction activities and operations to other land uses can produce sounds that could create significant noise impacts for nearby sensitive sound receptors, such as schools, hospitals, or residences. Noise is generally defined as any loud, discordant, or disagreeable sound or sounds.

As discussed in Section 3.1, the current zoning classification for the APE is primarily "Agricultural Forestry Transitional," and the APE is located within existing utility and roadway ROW. The land surrounding the APE is primarily agricultural land interspersed with residences and is actively farmed throughout the growing season. Noise in the area is influenced by the presence of Interstate 70 and State Highway 6, both located north of the APE, and agricultural activities (i.e. noise associated with farm equipment and maintenance operations) in the surrounding fields. Noise during construction of the Preferred Alternative is likely to be slightly increased during construction activities, however noise levels are anticipated to drop to existing levels post-construction.

3.11.2 Environmental Impacts

3.11.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to existing noise conditions within the APE. Therefore, there would be no significant impacts to noise.

3.11.2.2 Preferred Alternative

Construction Associated with the Preferred Alternative is anticipated to cause short-term noise impacts within the APE. BMPs, such as regulating operations to daytime working hours and utilizing properly functioning equipment mufflers, would be implemented to minimize construction noise related impacts. After project completion, noise levels are anticipated to return to pre-project levels consistent with light vehicle traffic and agricultural activities. Overall, no significant noise-related impacts are anticipated to occur as a result of the Preferred Alternative.

3.11.3 Mitigation

No noise mitigation is anticipated to be required for the Preferred Alternative. BMPs would be implemented to minimize short-term construction impacts, and noise levels would return to pre-project levels post construction.

3.12 Transportation

3.12.1 Affected Environment

Transportation impacts include those impacts from transport of materials to a site, movement of equipment and vehicles onsite, and movement of equipment and vehicles away from a site, when associated with any project. Other transportation impacts that could arise from a project include

transportation of materials, including hazardous materials, to or from a site either during construction or operation of a facility. Construction detours and roadway changes can also result in traffic patterns or intensity changes and can alter the overall flow of transportation corridors nearby a project site or facilities.

As shown in Figure 1 on page 3, the Preferred Alternative would follow a number of existing roadway ROWs and the existing alignment of the Grand Valley Canal. Existing roadways and canal access would be utilized for construction equipment. Some minor short-term detours may be required during construction, but there would be no permanent roadway relocations or realignments.

3.12.2 Environmental Impacts

3.12.2.1 No Action Alternative

The No Action Alternative would not alter existing materials transportation methods, roadways, or transportation routes. Current transportation would continue; therefore, there would be no significant transportation impacts as a result of the No Action Alternative.

3.12.2.2 Preferred Alternative

There are a variety of roadways that provide access to the APE. The Preferred Alternative would not change existing roadways and is not anticipated to result in a permanent increase in vehicle traffic, change to materials transportation, or reduce the current roadway level of service. Existing facility access roads would be utilized for construction. Some minor detours may be required during construction adjacent to roadway ROW, however no permanent road closures or relocations are anticipated. Overall, the Preferred Alternative is not anticipated to result in significant impacts to transportation.

3.12.3 Mitigation

As the Preferred Alternative would have no effect on transportation within the APE, no mitigation is anticipated to be required. A traffic control plan would be developed prior to construction activities, and all local emergency services would be notified prior to the implementation of any temporary detours or road closures.

3.13 Human Health and Safety

3.13.1 Affected Environment

According to the USDA RD and as documented in 40 C.F.R. Part 1508.27, it is important to evaluate whether any proposal might result in adverse effects on public health and safety in the APE and the surrounding area. Currently, the APE contains existing roadway and utility ROWs, agricultural fields, and the existing Town WWTP facilities.

3.13.1.1 Electromagnetic Fields and Interference

Electromagnetic fields (EMFs) are associated with every electric device (e.g. power lines, electric wiring, electric equipment or cell and microwave towers). EMFs have the potential to cause interference to radio and television signals, as well as direct effects to humans in the immediate vicinity to power lines. While linkages between EMFs and human health are generally considered weak, specific built

environment elements (i.e. power lines, cell and microwave towers) in the APE should be documented. Currently, there are power and utility poles that follow the roadways in some segments of the APE and provide electrical utilities to the surrounding area. These power and utility poles would not be changed as part of the Preferred Alternative

3.13.1.2 Environmental Risk Management

Hazardous materials, substances, or wastes that could be released at, generated by, or are required for the operation of a facility have the potential to result in environmental or human health hazards. These hazards can also impact the real property value of a site or facility.

According to the EPA's Superfund National Priorities List (NPL) database, there are no superfund sites or priority cleanup sites on or near the APE that would impact property values or cause potential environmental or human health hazards.

The existing Palisade wastewater facilities are failing to meet effluent limits for its current CDPHE permit. This failure to meet the permit requirements is an existing potential public health concern that affects both the APE and the surrounding area, including communities downstream from the existing facilities.

3.13.2 Environmental Impacts

3.13.2.1 No Action Alternative

There would be no changes to existing conditions at the at the Town's wastewater facilities under the No Action Alternative. All power and utility lines would remain in place, and the existing treatment facilities would continue to operate without receiving the repairs and updates necessary to meet the current CDPHE permit requirements. Potential impacts due to discharge could result in negative impacts to water quality within and downstream of the APE.

3.13.2.2 Preferred Alternative

No negative impacts to human health and safety are anticipated to occur from electromagnetic fields; there would be no changes to the existing power and utility lines in place within the APE. Water quality within and downstream of the project area is anticipated to improve as a result of the Preferred Alternative. The proposed improvements would allow the Town to meet the current and anticipated permit requirements from CDPHE. Overall, net positive impacts are anticipated to occur to human health and safety as a result of the Preferred Alternative.

3.13.3 Mitigation

As the Preferred Alternative is not anticipated to negatively impact human health and safety, no mitigation is anticipated to be required.

3.14 Corridor Analysis

3.14.1 Affected Environment

Linear infrastructure, including electric transmission or distribution lines, telecommunication lines, or water and wastewater pipelines all have the potential to alter project elements or result in unanticipated impacts to a proposal. Issues that may arise, but are not typically encountered include:

- The APE can be more extensive than originally documented;
- Overhead lines can cause visual impacts to become more important;
- The availability of existing, acceptable utility corridors decrease while infrastructure needs increase;
- A potential need for a greater amount of land acquisition; and,
- A need to include a larger number of stakeholders in the siting and decision-making process.

The majority of the land within the APE is located within existing utility and canal ROWs, with the exception of a small segment located within an existing conservation easement (Mesa County Reception #2316215). Coordination is ongoing between the Town, the Land Conservancy, and the property owner to determine next steps regarding development on the property.

3.14.2 Environmental Impacts

3.14.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the existing electrical utilities, water and wastewater transmission lines, and telecommunications lines. No alterations or significant impacts to the existing utility or roadway corridors would occur.

3.14.2.2 Preferred Alternative

The Preferred Alternative is not anticipated to significantly impact the utility corridor within and surrounding the APE. New sewer lines would be constructed within existing utility corridors, utility, roadway, and canal ROW or easement, with a small segment constructed on lands currently held in a conservation agreement. All disturbed areas would be returned to existing conditions after project completion. Mitigation would likely be included as part of the Preferred Alternative to account for potential impacts to the conservation easement. Overall, no significant impacts to the corridor within the APE are anticipated.

3.14.3 Mitigation

There is no known mitigation required at this time. If any mitigation requirements stem from the final coordination on the construction of the Preferred Alternative in Cooperative Agreement Planning Area, this EA will be updated and any requirements will be included in final design and construction.

3.15 Environmental Impact Mitigation Summary

Table 3.6 summarizes the environmental impact mitigation measures identified for the Preferred Alternative.

Table 3.6. Environmental Impact Mitigation Summary

Affected Environmental Resource	Mitigation Measures
Water Resources	• Utilization of BMPs and conservation measures to avoid or reduce impacts to surface and groundwater during construction.
Biological Resources	• Implementation of BMPs and conservation measures to avoid or minimize impacts to species and habitat during construction. • Project specific mitigation measures as described in the BE would be implemented throughout the life of the project.
Cultural Resources	• Subsurface monitoring would be implemented during construction near the Palisade Migrant Camp historic site.
Air Quality	• Implementation of BMPs to minimize construction-related, short-term dust and exhaust impacts.
Noise	• Implementation of BMPs to minimize construction-related, short-term noise impacts.

3.16 Cumulative Effects

A cumulative effects assessment considers the impacts of a project in light of the effects of past, present and reasonably foreseeable future actions occurring in the area affected by the project. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. There are no known federally funded projects in or near the study area.

The Town's existing wastewater infrastructure contains limitations that have rendered the Town unable to meet current and future requirements of its CDPHE discharge permit. The Preferred Alternative would address these deficiencies while also allowing the Town to meet the current and future permit requirements.

4 Agency Correspondence

Agency correspondence for the development of the Preferred Alternative began during the development of this Environmental Assessment. Agency scoping letters were sent out on June 8, 2021 to interested agencies to notify them of the preparation of this EA. Only one response was received. A list of the contacted agencies, a copy of the scoping letter and the response letter can be found in Appendix C.

5 Public Notices

Public involvement is a vital component of the NEPA process. Public notice for the Preferred Alternative began with the development of the Sewer Transfer Study, which was completed by JUB for the Town in July 2020.

5.1 Public Participation

5.1.1 Public Notices

The draft EA will be published and made available for a 30-day public comment period. Notice of availability will be advertised in the Grand Junction Sentinel (paper of record) prior to the beginning of the comment period.

5.1.2 Public Meetings

The 2020 Sewer Transfer Study was presented to the Town's Board of Trustees during a meeting on August 25, 2020, which included opportunity for public comment. There were no questions or comments received from the public at that time.

6 References

Bennett, Jason and Douglas A. Keinath. 2014. “Species assessment for yellow-billed cuckoo (*Coccyzus americanus*) in Wyoming.” December 2003.

Colorado Parks and Wildlife. 2020. “Western Yellow-billed cuckoo.” https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/PrioritySpecies/Factsheet-and-Habitat-Scorecard_YellowBilledCuckoo.pdf.

Cornell. 2019a. “Pinyon Jay: Life History.” https://www.allaboutbirds.org/guide/Pinyon_Jay/lifehistory.

Cornell. 2019b. “Lewis’s Woodpecker: Life History.” https://www.allaboutbirds.org/guide/Lewiss_Woodpecker/lifehistory.

Cornell. 2019c. “Virginia’s Warbler: Life History.” https://www.allaboutbirds.org/guide/Virginias_Warbler/lifehistory.

Cornell. 2019d. “Evening Grosbeak: Life History.” https://www.allaboutbirds.org/guide/Evening_Grosbeak/lifehistory.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. *The Birder’s Handbook: A Field Guide to the Natural History of North American Birds*. Simon and Schuster, Inc. New York, New York.

Environmental Protection Agency (EPA). 2021. “American Community Survey 2014-2018.” EJSCREEN. EPA. https://ejscreen.epa.gov/mapper/.

EPA. 2021. “Nonattainment Areas for Criteria Pollutants (Green Book).” EPA. https://www.epa.gov/green-book.

EPA. 2021. “Superfund National Priorities List – Where You Live Map.” EPA. https://www.epa.gov/superfund/search-superfund-sites-where-you-live#map.

Federal Register, 86 FR 20798 (Federal Register). 2021. Department of the Interior, Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo. https://www.govinfo.gov/content/pkg/FR-2021-04-21/pdf/2021-07402.pdf.

Federal Register, 59 FR 13374. 1994. Department of the Interior, Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub and Bonytail Chub. https://www.fws.gov/carlsbad/SpeciesStatusList/CH/19940321_fCH_BOCH.pdf.

J-U-B ENGINEERS, Inc. 2020. *Town of Palisade Sewer Transfer Study*. Revised June 2020.

Kingery, H.E. 1998. *Colorado Breeding Bird Atlas*. Colorado Breeding Bird Atlas Partnership and Colorado Division of Wildlife.

Righter, R., R. Levad, C. Dexter, and K. Potter. 2004. *Birds of Western Colorado Plateau and Mesa County*. Grand Valley Audubon Society. 214 pp.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2021. "Web Soil Survey." NRCS. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

U.S. Fish and Wildlife Service (USFWS). 2021a. "Information for Planning and Consultation (IPaC) Report." USFWS. https://ecos.fws.gov/ipac/.

USFWS. 2021b. Yellow Billed Cuckoo Critical Habitat: Unit 55: CO-2 Colorado River 3 Mesa County, Colorado. https://www.fws.gov/sacramento/outreach/public_advisories/WesternYellow-BilledCuckoo/maps/CO/EA_YBCUunit55_CO_2.pdf.

USFWS. 2021c. Wyoming Ecological Services Office: Colorado River Fish. https://www.fws.gov/wyominges/Species?CORivFish.php.

USFWS. 2021d. Fish and Aquatic Conservation: Colorado pikeminnow. https://fws.gov/fisheries/freshwater-fish-of-america/colorado_pikeminnow.html.

USFWS. 2021e. Mountain Prairie Region Endangered Species: Plants. Colorado Hookless Cactus. https://www.fws.gov/mountain-prairie/es/coloradoHooklessCactus.php.

USFWS 2021f. Species Status Assessment Report for Colorado hookless cactus (*Sclerocactus glaucus* and *Sclerocactus dawsonii*). https://www.fws.gov/mountain-prairie/es/species/plants/ColoradoHooklessCactus/20210712_FWS_SCL_SSA_final_508.pdf.

USFWS. 2017. "Species Information: Yellow-billed Cuckoo (*Coccyzus americanus*). https://ecos.fws.gov/ecp/species/3911.

USFWS. 2014. "Razorback Sucker (*Xyrauchen texanus*) fact sheet." USFWS Nevada Fish and Wildlife Office. https://www.fws.gov/nevada/protected_species/fish/species/rzbk_sucker.html.

USFWS. 2011. "Bald Eagle (*Haliaeetus leucocephalus*)" https://www.fws.gov/arcata/es/birds/baldEagle/b_eagle.html.

Wiggins, D. 2005. "Yellow-billed cuckoo (*Coccyzus americanus*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. https://www.fs.fed.us/r2/projects/scp/assessments/yellowbilledcuckoo.pdf.

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

List of Appendices

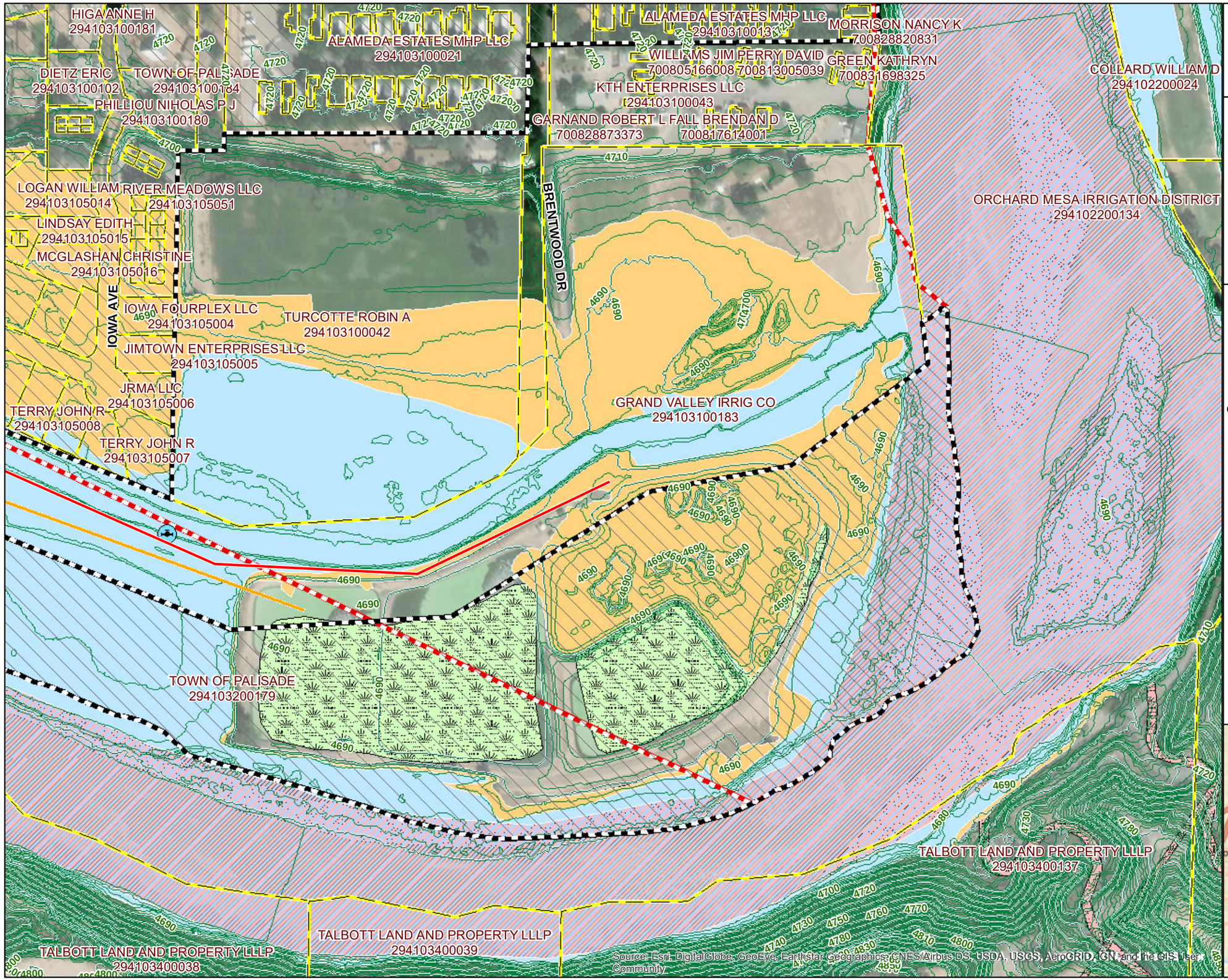
Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX A – Project Maps

Town of Palisade Sewer Transfer Study

Sheet 1 of 11



N

W E

S

0 100 200 400

Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Utilities

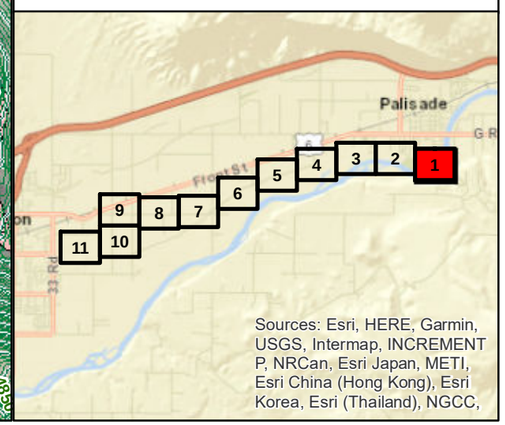
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Town of Palisade
Sewer Transfer Study

Sheet 2 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits

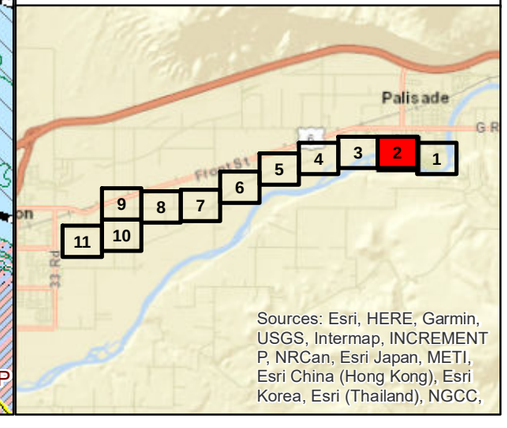
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CHRONOS PROPERTY LLC 294103212002
FAY RANDE 294103215026
VERSLUIS PETER M 294103210004
MILLER LEVI JOE 294103210011
BARBER DAVID L 294103208007
PFEIFFER KARL W 294103213003
CHRONOS PROPERTY LLC 294103220003
DAVIS TRUST 294103216027
ROBINSON ALAN SHAWN 294103210005
FALLER ROBERT L 294103208006
LATHAM ROBERT T 294103109007
VARNER GAIL A 294103208005
BOLLIG DANIEL E 294103215030
HORN CIRRUE H 294103200092
INMAN JERRY R 294103207006
CHRONOS PROPERTY LLC 294103200073
YOUNG RUTH S 294103215033
LUDLAM J&K FAMILY TRUST 294103206002
TINSLEY STEVE J 294103218006
DORN KARALYN E 294103208004
HANSEN CURT 294103108011
GOLEC WALTER 294103210007
FICKEN DEBBIE L 294103207004
CHRONOS PROPERTY LLC 294103220003
COWAN MARY L MAHEUX-RAE KAREN 294103217012
294103217011
LYONS ROY 294103108014
GRIFFIN RODNEY 294103213001
DUNCAN E STANLEY 294103210016
TOWN OF PALISADE 294103200182
PAISLEY RICHARD K JR 294103208001
GRAND VALLEY IRRIG CO 294103100183
TOWN OF PALISADE 294103219012
KELLER ROBERTA 294103207001
TOWN OF PALISADE 294103200181
TOWN OF PALISADE 294103105088
POPP WALTER E 294103105084
SELBY MICHELLE 294103105087
TOWN OF PALISADE 294103200180
CRIM RICK D 294103105027
434 PENDLETON LLC 294103105026
TOWN OF PALISADE 294103200180
431 PENDLETON LLC 294103105071
DEPARTMENT OF NATURAL RESOURCES 294103300176
TDJ LOST ANCHOR PROPERTY LP 294103400038
MONTCLAIR DR
ELBERTA AVE
VINEYARD AVE
CABERNET DR
LOGAN ST
LINCOLN CT
RODEO RD
RODEO RD
WILLIAM CT
PENDLETON ST

Town of Palisade
Sewer Transfer Study

Sheet 3 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

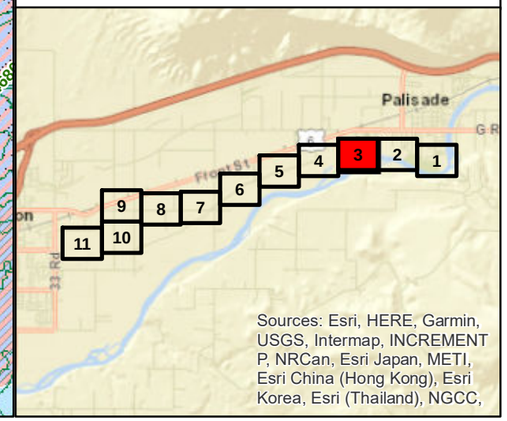
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



SHIELDS RONALD ANTHONY
294104109006

HAAS CARLA C
294104109007

KUNTZ DEREK
294104109008

METZLER DONALD R AND DIANA K LIVING TRUST
294104109009

BOLLINGER MARK
294104109010

SELLARS JON R
294104110002

JOHNSTON PHILIP P
294104110003

MCCALL DAVID C
294104110005

HAWKINS GREGG M
294104110007

MOFFETT BRIAN R
294104109012

SHIRAZ DR

RODEO RD

MESA COUNTY VALLEY SCHOOL DISTRICT NO 51
294104100170

MACPAC VENTURES LLC
294104104002

LICATA LOUIS GEORGE REVOC TRUST
294104105003

TOWN OF PALISADE
294103200180

TOWN OF PALISADE
294104100172

TOWN OF PALISADE
294104100171

DEPARTMENT OF NATURAL RESOURCES
294103300176

WEST COUNTRY LLC
294104300100

NOLAND MAX L
294104400075

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Town of Palisade
Sewer Transfer Study

Sheet 4 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

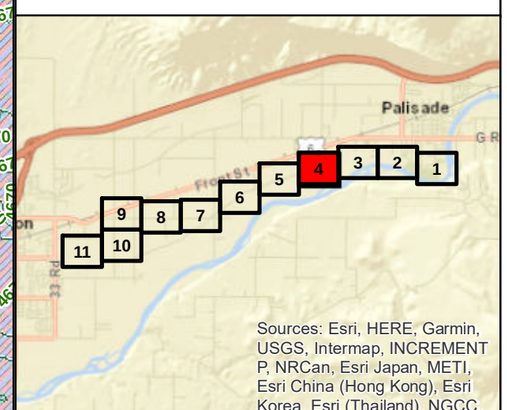
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine

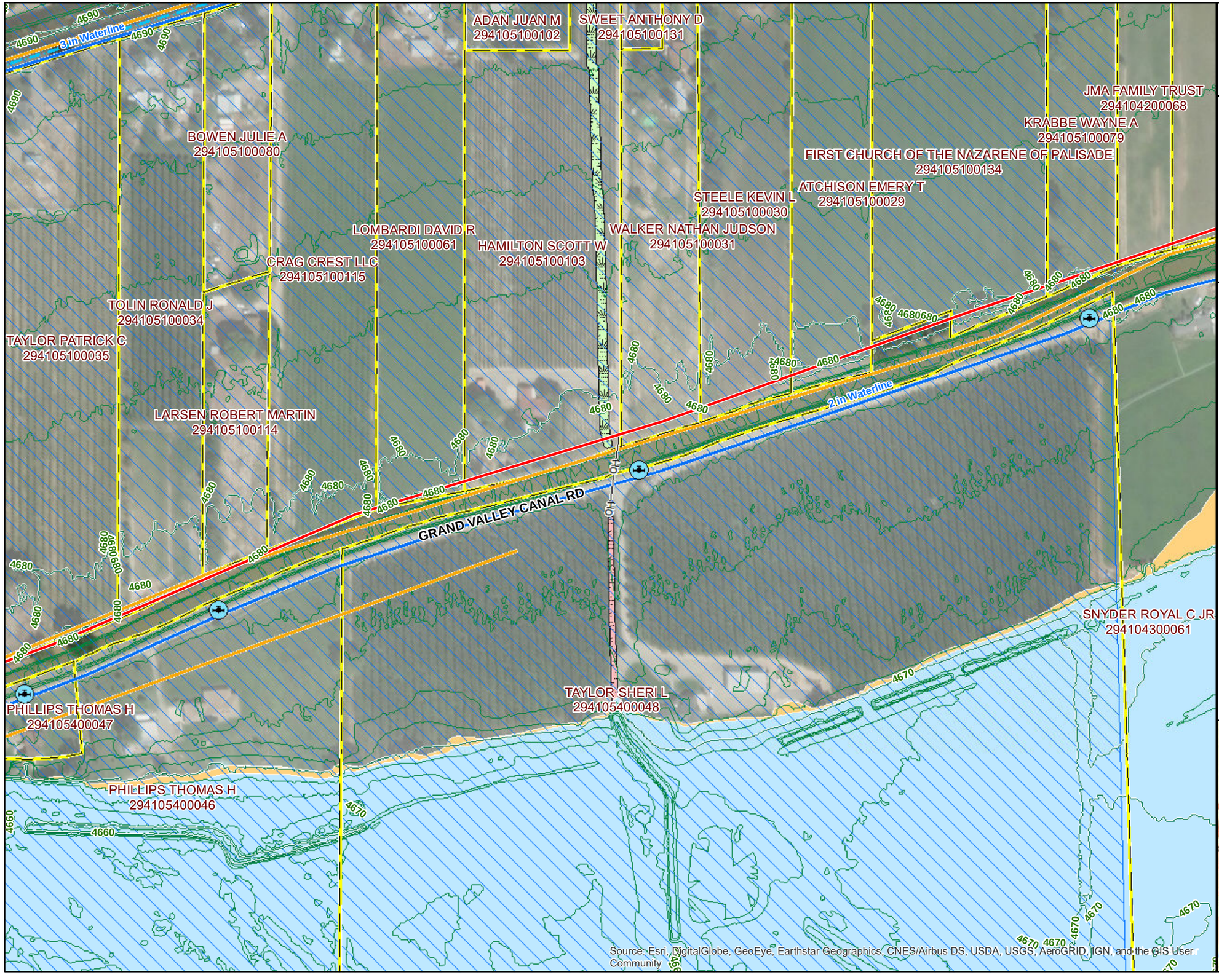


Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Town of Palisade
Sewer Transfer Study

Sheet 5 of 11



N
W E
S

0 100 200 400 Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Utilities

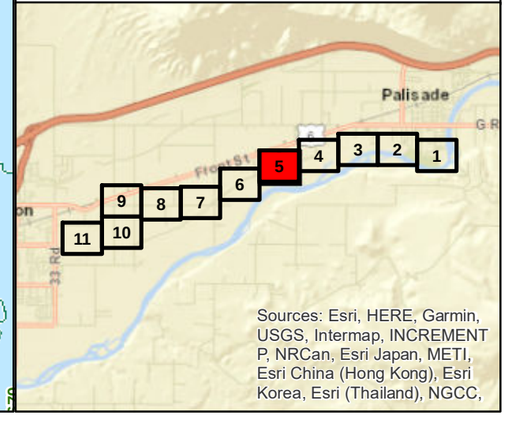
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Town of Palisade
Sewer Transfer Study

Sheet 6 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

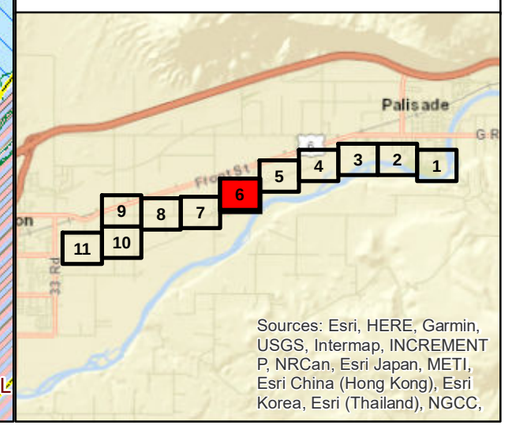
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

RICHARDS DARYL E
294105301001

KRAMER JULIE
294105300095

STARKS WALTER DAVID
294105300041

WARMING SOLVEIG
294105301002

SHAY PATRICK L
294105300042

STEVENS CARL
294105300111

WARR LESLIANN
294105300100

VANLANDINGHAM JOHN PERRY
294105300055

PALMER JAMES H EST
294105400086

PHILLIPS THOMAS H
294105400047

PHILLIPS THOMAS H
294105400046

MCCLAIN JOHN F
294105300124

MILLER DANNY L
294105300126

CRAWFORD HARVEY L
294105300049

THIBODEAU JOSHUA M
294105300090

MOSBY MICHAEL
294105300091

HOYT DARREL
294105300108

294108104001

GRAND VALLEY CANAL RD

35 1/2 RD

2in Waterline

OH

Town of Palisade
Sewer Transfer Study

Sheet 7 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

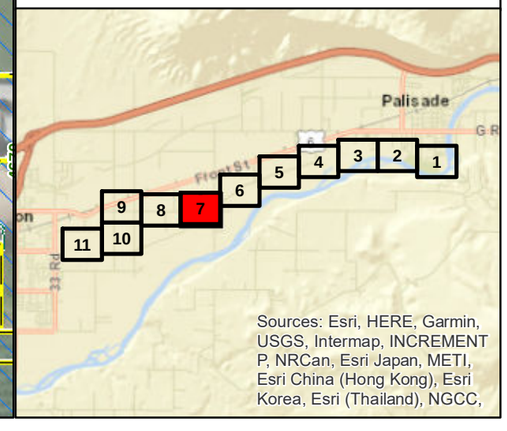
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Town of Palisade
Sewer Transfer Study

Sheet 8 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine

SASSON MARK
294106400063

ELDER N EUGENE MILLER MICHAEL EMERY
294106300165 294106300164

OWENS KEITH R AND OWENS CELESTE REVOC FAMILY TRUST
294106300145

JENSEN CHARLES H JR
294106400099

DIFFENDAFFER BLAINE E
294106300210

3411 FRONT STREET LLC
294106300057

WHITESIDE PETER D
294106300058

KAUFMAN LINDA P JONES BRUCE R
294106300114 294106300203

WENS DAVE
294106300113

TAYLOR TERESA M
294106300111

34 1/2 RD

BAKER BART K
294106300115

BOYDSTUN WILLIAM C
294106300144

ORIBELLO RONNIE
294106400181

ORIBELLO RONNIE
294106400182

GASKILL JASON
294106300209

F RD

3 in Waterline

KING KERRY C
294107200096

BELSHER DENNIS O
294107200157

COLE LIVING TRUST
294107200001

LANCASTER PAUL A
294107100066

KOCH DALE L
294107200002

WENS KARL DAVID
294107200118

SANKEY LELA MAY
294107200004

FITZGERALD DIANE S
294107200065

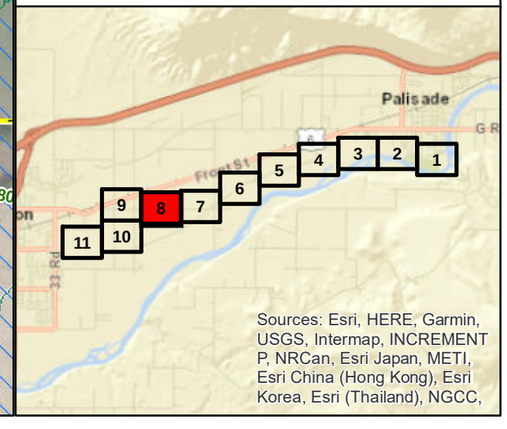
WHITTINGTON MICHAEL
294107200005

BELSHER DENNIS O
294107200158

BARKER BRIAN W
294107200014

FITZGERALD DIANE S
294107100063

HOUCK TREVA K
294107200119



Town of Palisade
Sewer Transfer Study

Sheet 9 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits

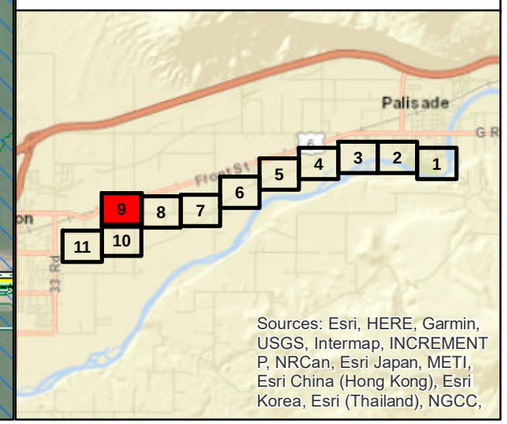
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



STORY BRIAN
294301400158

KRUKOW TROY R
294301400195

MYERS LYDIA
294301400196

KENT A B
294301400106

MARTINEZ JOHN EMANUEL
294106300055

O'BANION DAVID E
294301400061

EKX-LINN ANN M
294301400159

BORDEWYK DALE
294106300127

OWENS KEITH R AND OWENS CELESTE REVOC FAMILY TRUST
294106300145

HAYS HERBERT H
294301400108

GOFORTH KEVIN
294301400065

O'BANION DAVID E
294301400213

BOUNDS AUDIT L
294301400064

BOYDSTUN WILLIAM C
294106300144

DIAZ PROPERTIES LLC
294301400155

QUILLIN SALMANCA
294301400218

MURPHY DARLENE M
294301400201

STEIN ALLEN
294301400217

FROST RICHARD
294301400211

DAVIS WESLEY
294312100119

MORRISON ROBERT W TRUST SR
294312100006

MCELLEY EDWARD M
294312100201

FULLER SHERRI L
294312100064

SPENCE REILLY
294312100200

COLE LIVING TRUST
294107200001

MARTIN ALISA J
294312100117

KUCHYT TRENT J
294312100120

MORRISON ROBERT W TRUST SR
294312100004

BIBEAU MELISSA J
294312100094

MCKA BURDETTE W
294312100121

MARTIN ALISA J
294312100118

BROWNING MICHAEL I
294312100122

BROWNING MICHAEL I
294312100126

COOK JEFFREY W
294312100135

FROEDGE HEATHER
294312108006

THOMAS TERRY R
294312108001

BARKER BRIAN W
294107200014

FRONT ST

F RD

33 3/4 RD

34 RD

OH

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Town of Palisade
Sewer Transfer Study

Sheet 10 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine

BUSSELL TERESA L
294312100202

BROWNING MICHAEL I
294312100126

BENCY NICHOLAS J
294312100203

FROEDGE HEATHER
294312108006

Confidential Owner
294312108005

BOERNER CLINT W
294312108002

JENKINS SHANNON
294312108003

WALDEN GAVIN E
294312108004

BARKER BRIAN W
294107200014

MYERS PAULINE L
294107200015

CRUSE LLOYD H
294107200016

BELL JOHN E
294107200017

MOORE ALAN D
294312100136

MOORE ALAN D
294312100175

MCELLEY EDWARD D
294312100181

MCELLEY EDWARD D
294312100182

GABOSSI JOSEPH J
294312100127

RAWHIDE & LACE LLC
294312100197

HALL AARON R III
294312100196

LJNHAM PAUL W
294312409004

BLANKENSHIP JIM R
294312409003

DIFFENDAFFER LIVING TRUST
294312400038

CLIFTON WATER DISTRICT
294312400217

CLIFTON WATER DISTRICT
294312400216

GNOJEK TIMOTHY R
294312400139

VALVODA DAVID J
294107200042

STRONG WALTER H
294107200043

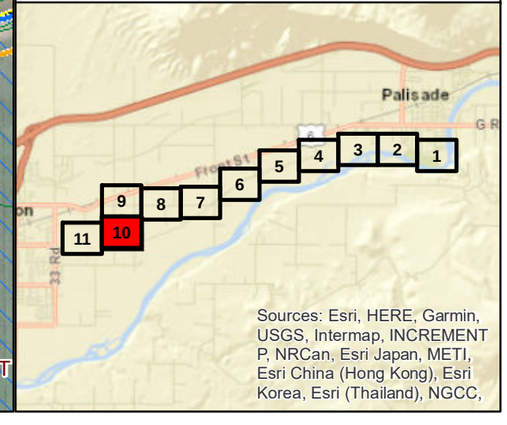
WARNER KENT C
294107300135

LAVETA V KAY REVOCABLE TRUST
294107300134

33 3/4 RD

34 RD

GRAND VALLEY CANAL RD



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC,

Town of Palisade
Sewer Transfer Study

Sheet 11 of 11

N
W E
S

0 100 200 400
Feet

1 inch = 200 feet

Legend

- Pump Station
- Force Main
- Gravity Line

Utilities

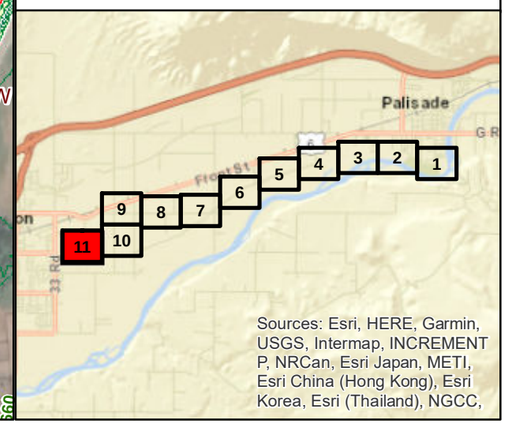
- OH Transmission Line
- Waterline
- Gas
- Tele
- Unknown Pipe
- Headgates
- CSD Manholes
- CSD Sewer Line
- Palisade Town Limits
- Parcel Limits
- Town Sewer Service Limits
- 10' Contours
- 2' Contours
- Cooperative Planning Area

Flood Zone

- No Base Flood Elev Known
- Zone AE
- Regulatory Floodway
- Levee Flood Risk
- 500-yr Flood Plain
- Clifton Sanitation District

Wetlands

- Emergent Wetland
- Forested/Shrub Wetland
- Freshwater Pond
- Riverine



Town of Palisade, Colorado

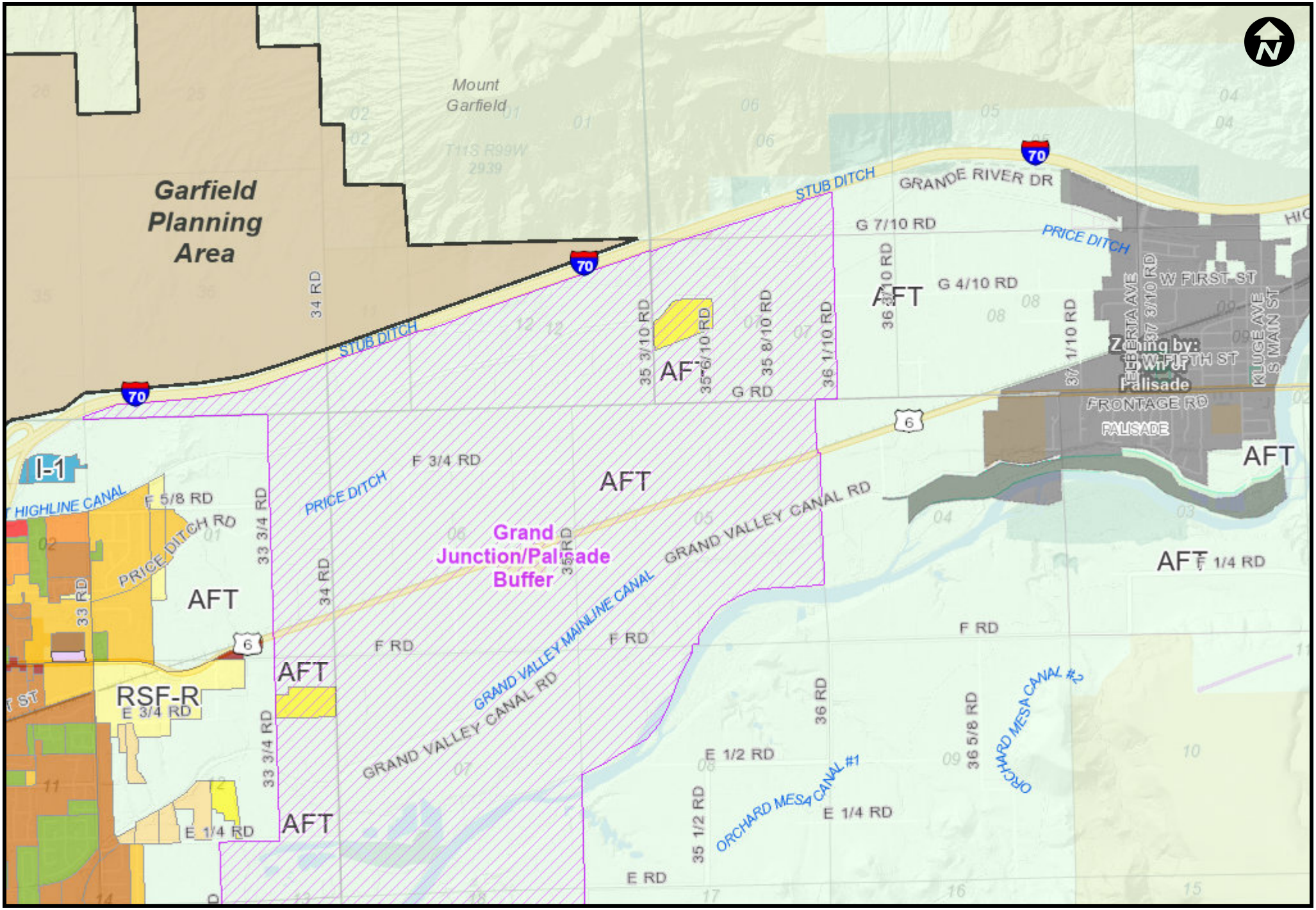
Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – Environmental Resource Maps and Reports

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 1 Zoning Map



Mesa County Map

0 0.25 0.5 1 mi
0 0.3 0.6 1.2 km

Print Date: November 2, 2021

Mesa County, Colorado
GIS/IT Department
gis.mesacounty.us

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 2 USDA NRCS Web Soil Survey Database Report

United States Department of Agriculture

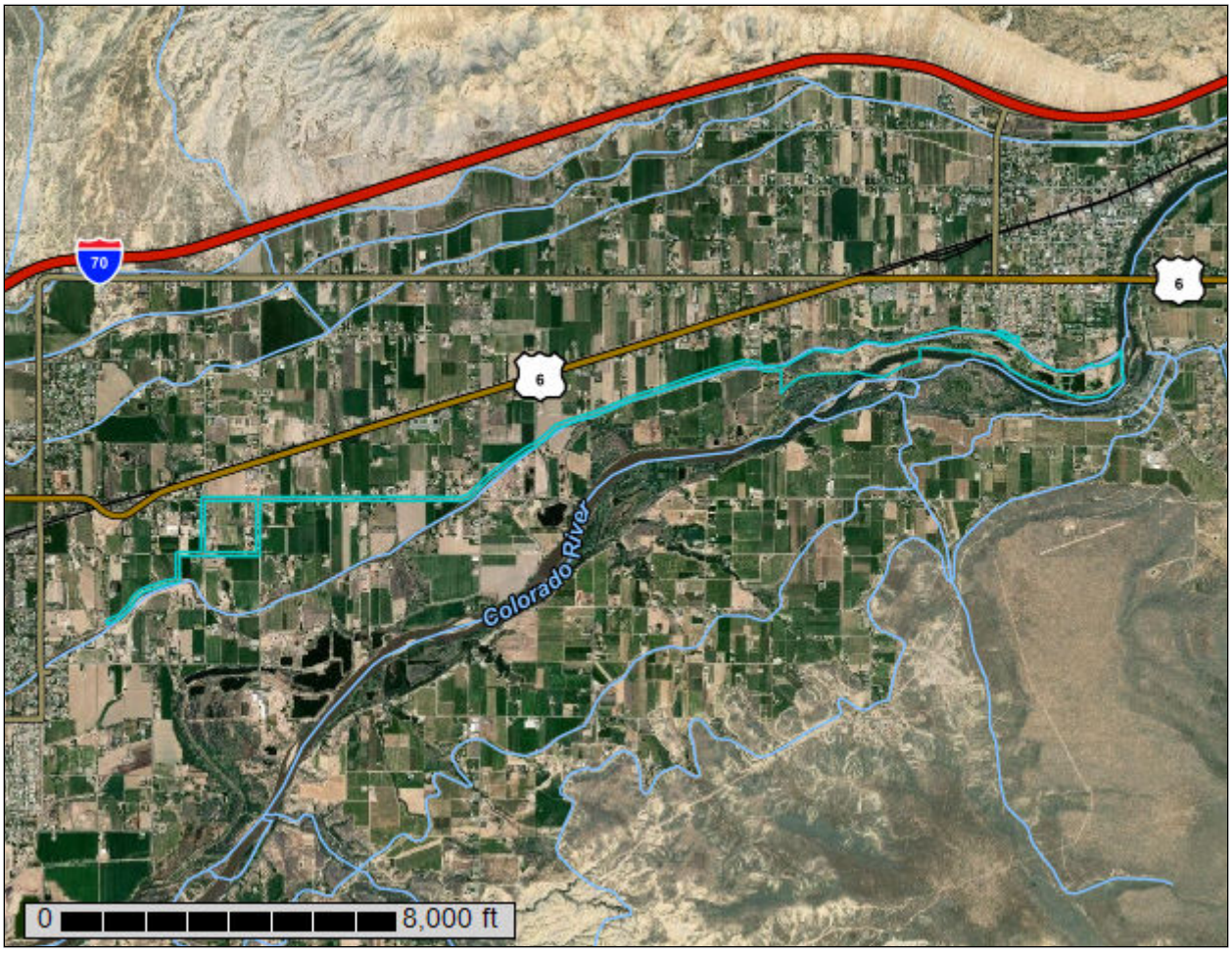
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mesa County Area, Colorado

Palisade Sewer EA



September 29, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

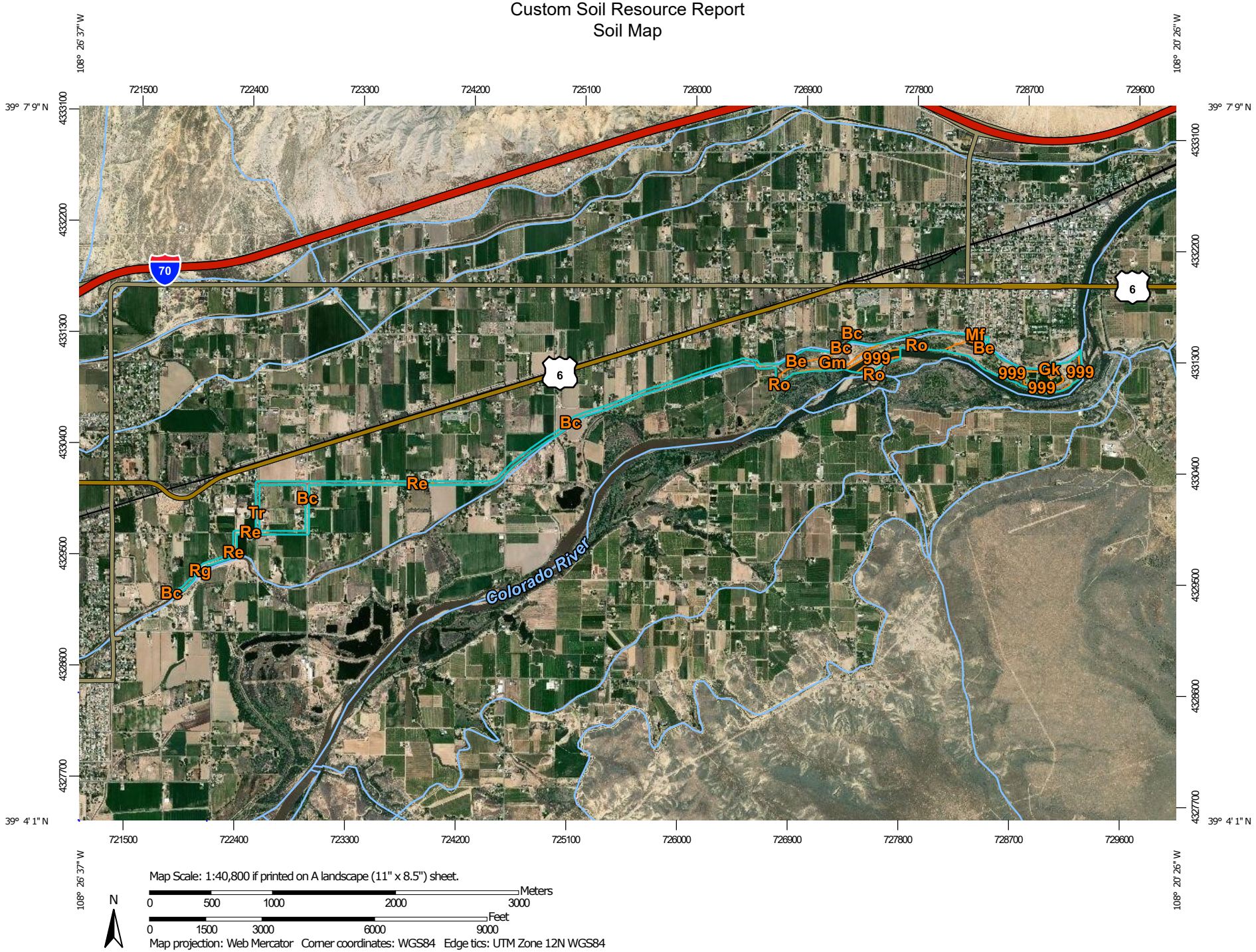
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 11, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2010—Aug 8, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
999	Water	17.6	11.0%
Bc	Sagers silty clay loam, 0 to 2 percent slopes	36.4	22.7%
Be	Green River silty clay loam, 0 to 2 percent slopes	11.3	7.1%
Gk	Bebeevar loam, 0 to 2 percent slopes	33.3	20.8%
Gm	Green River clay loam, 0 to 2 percent slopes	18.3	11.4%
Mf	Gyprockmesa cobbly clay loam, 5 to 12 percent slopes	0.4	0.3%
Re	Sagrlite loam, 0 to 2 percent slopes	7.6	4.7%
Rg	Sagrlite loam, 2 to 5 percent slopes	5.2	3.3%
Ro	Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes	29.8	18.6%
Tr	Turley clay loam, 0 to 2 percent slopes	0.1	0.0%
Totals for Area of Interest		**160.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties

and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mesa County Area, Colorado

999—Water

Map Unit Composition

Water: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: Unranked

Bc—Sagers silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k0bq
Elevation: 4,490 to 5,900 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Sagers and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagers

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Cretaceous source alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 12 inches: silty clay loam
C - 12 to 25 inches: silty clay loam
Cy - 25 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

Be—Green River silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k06r
Elevation: 4,430 to 4,820 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Green river and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Green River

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium over coarse-loamy alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 10 inches: silty clay loam
C1 - 10 to 16 inches: fine sandy loam
C2 - 16 to 24 inches: fine sandy loam
C3 - 24 to 32 inches: fine sandy loam
C4 - 32 to 44 inches: fine sandy loam
C5 - 44 to 52 inches: fine sandy loam
2C - 52 to 60 inches: very cobbly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: NoneVery rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY011UT - River Floodplain (Fremont Cottonwood)
Hydric soil rating: No

Gk—Bebeevar loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k0dc
Elevation: 4,430 to 4,820 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Bebeevar and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bebeevar

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium over sandy and gravelly alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 9 inches: loam
C1 - 9 to 14 inches: loam
C2 - 14 to 18 inches: fine sandy loam
2C - 18 to 32 inches: sand
3C - 32 to 59 inches: very cobbly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY012UT - Sandy Bottom (Fourwing salbush)
Hydric soil rating: No

Gm—Green River clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: k0dd
Elevation: 4,430 to 4,820 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition
Green river and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Green River

Setting
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium over coarse-loamy alluvium derived from sandstone and shale

Typical profile
Ap - 0 to 10 inches: clay loam
C1 - 10 to 16 inches: fine sandy loam
C2 - 16 to 24 inches: fine sandy loam
C3 - 24 to 32 inches: fine sandy loam
C4 - 32 to 44 inches: fine sandy loam
C5 - 44 to 52 inches: fine sandy loam
2C - 52 to 60 inches: very cobbly sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: NoneVery rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY011UT - River Floodplain (Fremont Cottonwood)
Hydric soil rating: No

Mf—Gyprockmesa cobbly clay loam, 5 to 12 percent slopes

Map Unit Setting

National map unit symbol: k0ct
Elevation: 4,490 to 4,890 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Gyprockmesa and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gyprockmesa

Setting

Landform: Strath terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy slope alluvium derived from shale over cobbly alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 5 inches: cobbly clay loam
Btk1 - 5 to 10 inches: clay loam
Btk2 - 10 to 15 inches: clay loam
Btk3 - 15 to 23 inches: cobbly clay loam
2Bky1 - 23 to 35 inches: very cobbly clay loam
2Bky2 - 35 to 44 inches: cobbly clay loam
2Bky3 - 44 to 70 inches: stony loam

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Gypsum, maximum content: 35 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

Re—Sagrlite loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k0d1
Elevation: 4,500 to 4,900 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Sagrlite and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagrlite

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Cretaceous slope alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 13 inches: loam
C - 13 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

Rg—Sagrlite loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: k0d3
Elevation: 4,500 to 4,900 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Sagrlite and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagrlite

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Cretaceous slope alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 13 inches: loam
C - 13 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

Ro—Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k0d4
Elevation: 4,430 to 4,820 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 135 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Bebeevar and similar soils: 45 percent
Green river and similar soils: 35 percent
Riverwash: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bebeevar

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium over sandy and gravelly alluvium derived from sandstone and shale

Typical profile

A - 0 to 9 inches: loam
C1 - 9 to 14 inches: loam
C2 - 14 to 18 inches: fine sandy loam
2C - 18 to 32 inches: sand
3C - 32 to 59 inches: very cobbly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 2.13 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY012UT - Sandy Bottom (Fourwing salbush)
Hydric soil rating: No

Description of Green River

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium over coarse-loamy alluvium derived from sandstone and shale

Typical profile

A - 0 to 10 inches: silty clay loam
C1 - 10 to 16 inches: fine sandy loam
C2 - 16 to 24 inches: fine sandy loam
C3 - 24 to 32 inches: fine sandy loam
C4 - 32 to 44 inches: fine sandy loam
C5 - 44 to 52 inches: fine sandy loam
2C - 52 to 60 inches: very cobbly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: C
Ecological site: R034BY011UT - River Floodplain (Fremont Cottonwood)
Hydric soil rating: No

Description of Riverwash

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Tr—Turley clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: k0d8
Elevation: 4,500 to 4,800 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Turley and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Turley

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Cretaceous slope alluvium derived from sandstone and shale

Typical profile
Ap - 0 to 10 inches: clay loam
C1 - 10 to 20 inches: fine sandy loam
C2 - 20 to 30 inches: clay loam
C3 - 30 to 60 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 5e
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 3 FEMA FIRMs

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from NAIP color infrared orthophotography produced with a one meter ground resolution from photography dated 2003 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

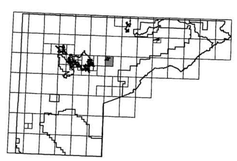
Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

Mesa County Vertical Datum Offset Table

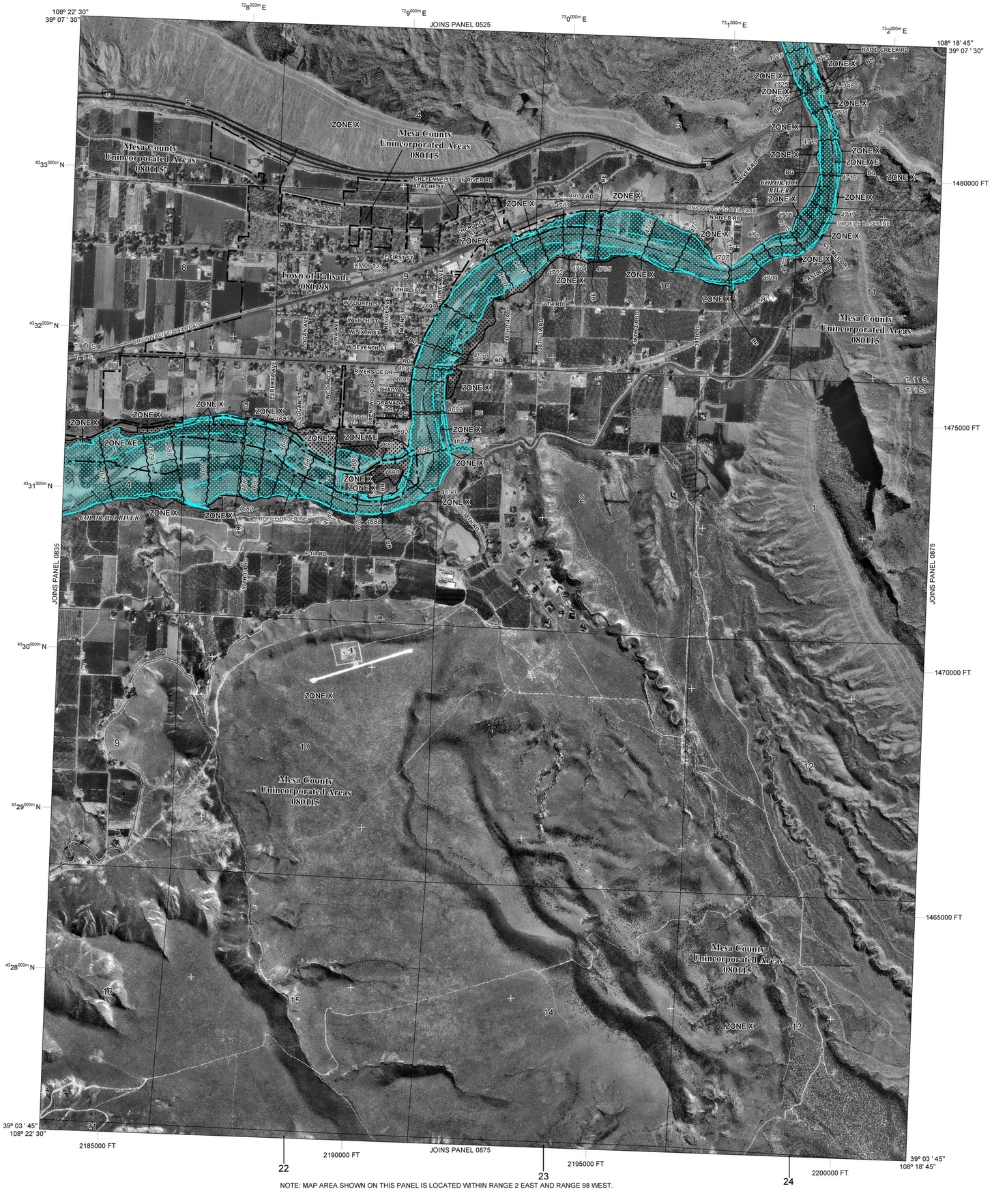
Flooding Source	Vertical Datum Offset (ft)	Flooding Source	Vertical Datum Offset (ft)
Colorado River	3.4		

Example: To convert Colorado River elevations to NAVD 88, 3.4 feet were added to the NGVD 29 elevations.



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard Information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4389000m N	1000-meter Universal Transverse Mercator grid values, zone 12
3100000 FT	5000-foot ticks: Colorado State Plane coordinate system, Central zone (FIPSZONE 0502), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 6, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0855F

FIRM

FLOOD INSURANCE RATE MAP
MESA COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 855 OF 1725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESA COUNTY	080115	0855	F
PALISADE, TOWN OF	080198	0855	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08077C0855F
EFFECTIVE DATE
JULY 6, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from NAIP color infrared orthophotography produced with a one meter ground resolution from photography dated 2003 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

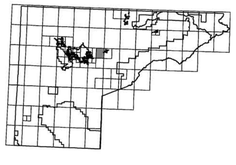
Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

Mesa County Vertical Datum Offset Table

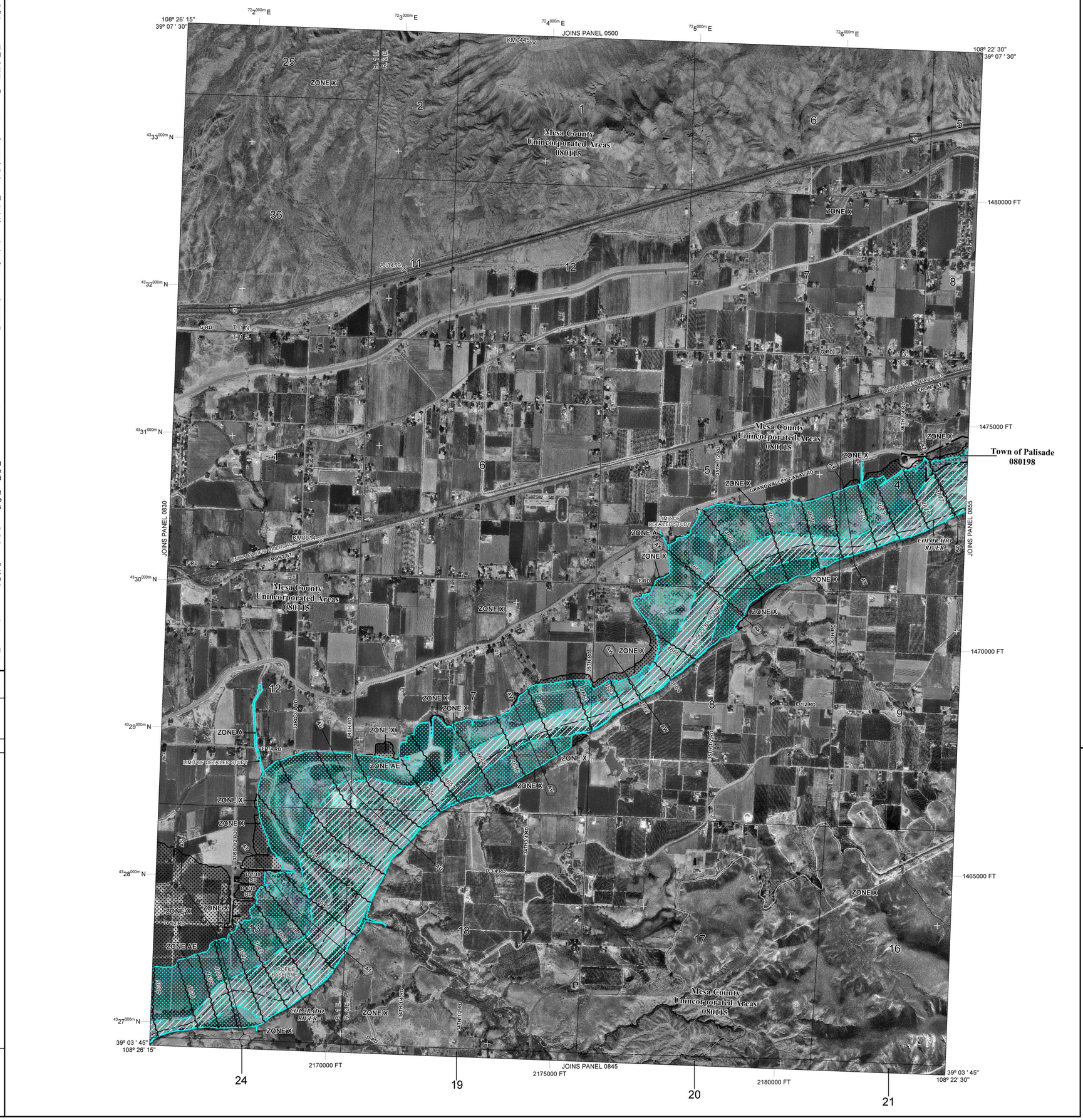
Flooding Source	Vertical Datum Offset (ft)	Flooding Source	Vertical Datum Offset (ft)
Colorado River	3.4		

Example: To convert Colorado River elevations to NAVD 88, 3.4 feet were added to the NGVD 29 elevations.



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard Information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
$^{43}_{88}{}^{000m}$ N — 1000-meter Universal Transverse Mercator grid values, zone 12
3100000 FT — 5000-foot ticks: Colorado State Plane coordinate system, Central zone (FIPSZONE 0502), Lambert Conformal Conic projection
DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
•M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 6, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0835F

FIRM

FLOOD INSURANCE RATE MAP
MESA COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 835 OF 1725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESA COUNTY	080115	0835	F
PALISADE, TOWN OF	080198	0835	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08077C0835F
EFFECTIVE DATE
JULY 6, 2010

Federal Emergency Management Agency

City of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 4 Wetland Delineation Report

Aquatic Resource Delineation for the

Town of Palisade Sewer Transfer Combination Conveyance Line Project

Mesa County, Colorado

Prepared for:

Town of Palisade, Colorado

Prepared by:

J·U·B ENGINEERS, INC.

October 2021

This page is intentionally left blank

Table of Contents

Tables

Chapter 1. Introduction

1.1 Introduction

J-U-B Engineers, Inc. (J-U-B) conducted a water resources assessment on August 31, 2021 for the proposed Palisade Sewer Transfer Combination Conveyance Line Improvement Project (Proposed Project) located in Mesa County, Colorado. The Proposed Project is located in portions of Sections 3, 4, 5, 6, 7, and 8, Township 1 South, Range 2 East, and Sections 1 and 12, Township 1 South, Range 1 East, Ute Meridian. The Proposed Project would occur within the mixed agricultural and residential areas along portions of the Colorado River on the west side of Grand Valley, between Interstate 70 and the Colorado River (See attached Topo Map). The objective of this assessment was to document the Waters of the U.S. (WOTUS), including wetlands located within the Proposed Project Survey Area (Survey Area).

1.2 Landscape Setting

The Proposed Project is located in the Town of Palisade. The Survey Area has elevations ranging from 4,673 to 4,698 above mean sea level (AMSL). Land uses in the surrounding area consist of mixed commercial, agricultural, and residential uses. The majority of the alignment follows the Grand Valley Canal with a small portion following the alignment of E ¾ Road and F Road. For representative photos of the Survey Area, refer to the attached Photo Inventory.

1.2.1 Climate

The region is considered a warm summer continental climate with an average high temperature of 67.2° F and an average low temperature of 40.8° F (CantyMedia, 2021). Extreme temperatures are not uncommon. The highest recorded temperature was 111° F, which occurred in July, and the coldest temperature was -23° F, which occurred in January.

The average annual precipitation for the region is 54.8 inches, much of which comes in the form of rain. There's an average of 61 days of precipitation per year, with most precipitation occurring in March, April, August, and September; the least occurring in June.

1.2.2 Vegetation

Vegetation within the Survey Area was typical for agricultural fields in the region, with wetland species occurring in low lying areas. Dominant species are identified in Table 1.1 below.

Table 1.1 –Dominant Vegetation Within the Survey Area

Stratum	Common Name	Scientific Name	Indicator Status
Trees	Fremont's cottonwood	*Populus fremontii*	NA
	Russian olive	*Elaeagnus angustifolia*	FAC
Shrubs	Big sagebrush	*Artemisia tridentata*	UPL
	Coyote willow	*Salix exigua*	FACW
	Greesewood	*Sarcobatus vermiculatus*	FACU
	Wood's rose	*Rosa woodsii*	FACU
Herbs	Baltic rush	*Juncus balticus*	FACW
	Cattail	*Typha latifolia*	OBL
	Common reed	*Phragmites australis*	FACW
	Common dandelion	*Taraxacum officinale*	FACU
	Field horsetail	*Equisetum arvense*	FAC

Stratum	Common Name	Scientific Name	Indicator Status
Herbs	Fuller's teasel	*Dipsacus fullonum*	FAC
	Great Basin Wildrye	*Leymus cinereus*	FAC
	Intermediate wheatgrass	*Thinopyrum intermedium*	UPL
	Inland saltgrass	*Distichilis spicata*	FAC
	Kentucky bluegrass	*Poa pratensis*	FAC
	Nebraska sedge	*Carex nebrascensis*	OBL
	Reed canarygrass	*Phalaris arundinacea*	FAC
	Smooth Brome	*Bromus inermis*	FACU
	Three-square	*Schoenoplectus americanus*	OBL
	Yarrow	*Achillea millefolium*	FACU

Obligate (OBL) *– Almost always occurs in wetlands.*
Facultative Wetland (FACW) *– Usually occurs in wetlands but may occur in non-wetlands.*
Facultative (FAC) *– Occurs in wetlands and non-wetlands equally.*
Facultative Upland (FACU*) – Usually occurs in non-wetlands but may occur in wetlands.*
Upland (UPL) *– Almost never occurs in wetlands.*

1.2.3 Soils

A review of Natural Resources Conservation Service's (NRCS) Web Soil Survey revealed that the Survey Area is comprised of nine soil map units. The five dominant soil map units are described in the following paragraphs. All soil map units are included in detail in the attached Soil Reports. The soil is classified as not hydric (see table 1.2 NRCS Soil Types Mapped within the Survey Area).

Sagers Silty Clay Loam

The Sagers Silty Clay Loam component makes up 22.7 percent of the map unit complex. This component can be found on terraces and valleys with slopes generally ranging from 0 to 2 percent. The parent material consists of Cretaceous source alluvium derived from sandstone and shale. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded or ponded. This soil has no seasonal zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Bebeevar Loam

The Bebeevar Loam component makes up 20.8 percent of the map unit complex. This component can be found on floodplains and valleys with slopes generally ranging from 0 to 2 percent. The parent material consists of alluvium over sandy and gravelly alluvium derived from sandstone and shale. The natural drainage class is moderately well-drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is rarely flooded and not ponded. This soil has a seasonal zone of water saturation at 36 inches during April, May, and June. Organic matter content in the surface horizon is about 1 percent. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. The soil has no saline horizon within 30 inches of the soil surface.

Bebeevar and Green River Soils and Riverwash

The Bebeevar and Green River Soils and Riverwash component makes up 18.6 percent of the map unit complex. This component can be found on floodplains and valleys with slopes generally ranging from 0 to 2 percent. The parent material consists of alluvium over sandy and gravelly alluvium derived from sandstone and shale. The natural drainage class is moderately well-drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded and is not ponded. This soil has a seasonal zone of water saturation at 36 inches during April, May, and June. Organic matter content in the surface horizon is about 1 percent. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. The soil has no saline horizon within 30 inches of the soil surface.

Green River Clay Loam

The Green River Clay Loam component makes up 11.4 percent of the map unit complex. This component can be found on floodplain steps and valleys with slopes generally ranging from 0 to 2 percent. The parent material consists of clayey alluvium over coarse-loamy alluvium derived from sandstone and shale. The natural drainage class is moderately well-drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is rarely flooded and not ponded. This soil has a seasonal zone of water saturation at 39 inches during April, May, and June. Organic matter content in the surface horizon is about 1 percent. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. The soil has a slightly saline horizon and a maximum sodium adsorption ratio of 3 within 30 inches of the soil surface.

Green River Silty Clay Loam

The Green River Silty Clay Loam component makes up 7.1 percent of the map unit complex. This component can be found floodplain steps and valley with slopes generally ranging from 0 to 2 percent. The parent material consists of clayey alluvium over coarse-loamy alluvium derived from sandstone and shale. The natural drainage class is moderately well-drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is rarely flooded and is not ponded. This soil has a seasonal zone of water saturation at 39 inches during April, May, and June. Organic matter content in the surface horizon is about 1 percent. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. The soil has a slightly saline horizon and a maximum sodium adsorption ratio of 3 within 30 inches of the soil surface.

Table 1.2 – NRCS Soil Types Mapped within the Survey Area

Soil Series Name	Hydric	% of Project Area
Water	No - 0% hydric	11.0%
Sagers silty clay loam, 0 to 2 percent slopes	No - 0% hydric	22.7%
Green River silty clay loam, 0 to 2 percent slopes	No - 0% hydric	7.1%
Bebeevar loam, 0 to 2 percent slopes	No - 0% hydric	20.8%
Green River clay loam, 0 to 2 percent slopes	No - 0% hydric	11.4%
Gyprockmesa cobbly clay loam, 5 to 12 percent slopes	No - 0% hydric	0.3%
Sagrilite loam, 0 to 2 percent slopes	No - 0% hydric	4.7%
Sagrilite loam, 2 to 5 percent slopes	No - 0% hydric	3.3%

Soil Series Name	Hydric	% of Project Area
Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes	No - 0% hydric	18.6%
Turley clay loam, 0 to 2 percent slopes	No - 0% hydric	0.0%
Total		**100%**

1.2.4 National Wetland Inventory (NWI)

The USFWS NWI suggests that large areas of riverine, freshwater emergent wetlands, and freshwater forested/shrub wetlands features may be found within the Survey Area (See Attached NWI Maps).

Chapter 2. Methods

2.1 Delineation Methodology for Wetlands

The wetland delineation was completed in accordance with the USACE 1987 Wetland Delineation Manual (USACE, 1987) and the 2008 Arid West Regional Supplement (USACE, 2008). All potential wetland areas were verified for wetland indicators as established in the above delineation manuals. The following procedures were implemented at each sample point to determine the presence of wetland indicators and the information was recorded on Arid West Regional Supplement Data Forms. Photographs were also taken to document each sample point.

2.1.1 Hydrophytic Vegetation

All plant species within a 5' radius were recorded for each sample point. The relative percent cover for each species was determined by estimating aerial cover. The indicator status of each species was determined using the Arid West National Wetland Plant List (USACE, 2018). Vegetation species comprising at least 20 percent of the total aerial cover in its stratum were considered dominant, following the guidelines of the USACE 50/20 rule. If more than 50 percent of the dominant plant species had an indicator status of obligate wetland species (OBL), facultative wetland species (FACW), or facultative species (FAC), the sample point met the hydrophytic vegetation parameter.

2.1.2 Hydric Soils

At each sample point, a soil pit was dug to a minimum depth of 18 inches to assess soil characteristics and water conditions. A profile of the soil pit was used to determine soil color, texture, and moisture at different depths within the soil profile. Colors of the soil profile and any redox features were identified by comparing a moistened sample to the Munsell® Soil Color Charts (Munsell®, 2009). Soil textures and moisture were determined by feeling the soil samples. If the soil characteristics met one of the primary hydric soil indicators, or two or more secondary hydric soil indicators, identified in the 2008 Arid West Regional Supplement (USACE, 2008) and the Field Indicators of Hydric Soils in the U.S. Version 7 manual (USDA, 2018), the sample point met the hydric soils parameter.

2.1.3 Wetland Hydrology

Each soil pit was also examined for the presence or absence of hydrologic indicators. These hydrologic indicators are described in the 2008 Arid West Regional Supplement (USACE, 2008). If it was determined that at least one primary hydrologic indicator, or two or more secondary hydrologic indicators, were present, the sample point met the hydrologic parameter.

2.1.4 Wetland Boundary Delineation Procedure

Sample points that met all three parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) were classified as occurring in a wetland. A second sample point, located in the adjacent upland, was then documented for the presence of the three indicators. If the point did not meet all three parameters, the point was classified as occurring in an upland. The next step was to define the wetland boundary occurring between a wetland sample point and the upland sample point. The boundary was based on information gathered from the two sample points and observable changes in elevation and plant communities. Survey data was downloaded into ArcMAP to produce a map that shows delineated wetland boundaries and sample point locations. The acreages for each wetland polygon were calculated in ArcMAP and included on the map. The Cowardin Classification (Cowardin, 1979) was used to designate the wetland type.

Chapter 3. Delineation Results

Twenty-five wetlands totaling 13.95 acres, two ponds totaling 4.64 acres, one canal (Grand Valley Canal) totaling 19,576 Linear Feet (LF) (13.83 acres), one intermittent stream totaling 3,217 LF (0.78 acres), and 4,707 LF (1.49 Acres) of ditches were identified within the Survey Area. No other wetlands or WOTUS were identified within the Survey Area (see Table 3 – Aquatic Resources).

Table 3 – Aquatic Resources

Aquatic Resource Name	Aquatic Resources Classification		Aquatic Resource Size (AC)	Aquatic Resource Size (linear feet)
	Cowardin	Sample Point		
Wetland Features				
Wetland 1	PEM1E	SC01	0.37	-
Wetland 2	PEM1F	RW03	0.30	-
Wetland 3	PFO1E	RU02	0.88	-
Wetland 4	PEM1E9i	SP04	1.77	-
Wetland 5	PFO1E	RW20	1.38	-
Wetland 6	PEM1F	SC03	0.17	-
Wetland 7	PEM1F	RW02	0.09	-
Wetland 8	PEM1F	-	0.17	-
Wetland 9	PFO1E	-	1.00	-
Wetland 10	PFO1E	RW02	0.9	-
Wetland 11	PEM1F	RW02	1.15	-
Wetland 12	PEM1E	RW20	0.21	-
Wetland 13	PFO1E	RW20	0.12	-
Wetland 14	PFO1E	RW21	0.12	-
Wetland 15	PEM1E	RW21	0.12	-
Wetland 16	PFO1E	RW21	0.14	-
Wetland 17	PEM1F	SC01 and SC04	0.44	-
Wetland 18	PFO1E	-	3.62	-
Wetland 19	PEM1E	SP03	0.006	-
Wetland 20	PEM1E	SP03 and SC05	0.08	-

Aquatic Resource Name	Aquatic Resources Classification		Aquatic Resource Size (AC)	Aquatic Resource Size (linear feet)
	Cowardin	Sample Point		
Wetland Features				
Wetland 21	PEM1F	SC08	0.05	-
Wetland 22	PEM1F	SC09	0.27	-
Wetland 23	PEM1F	SC10	0.39	-
Wetland 24	PEM1E9i	RW04	0.016	-
Wetland 25	PSS1E	SP01	0.19	-
Total			**13.95**	**-**
Linear Features				
Grand Valley Canal	NA	SC01, SC04, SC05, SC07, and SC11	13.83	19,576
Intermittent Stream 1	R4SB7	RW21, and SC03	0.78	3,217
Ditch 1	NA	SC08	0.05	73.2
Ditch 2	NA	SC09	0.27	571.6
Ditch 3	NA	SC10	0.39	845.64
Total			**15.32**	**24,283.44**
Pond Features				
Pond 1	L2UB3	RW01	3.20	-
Pond 2	L2UB3	RW03	1.43	-
Total			**4.63**	**-**
Grand Total			**33.9**	**24,283.44**

3.1 Aquatic Resources

Vegetation

Overall, Obligate (OBL), Facultative Wetland (FACW), and Facultative Neutral (FAC) classes represented the dominant vegetation in the wetlands. These species included: Baltic rush, cattails, inland saltgrass, three-square, Nebraska sedge, field horsetail, and reed canarygrass. Uplands were dominated by greasewood, intermediate wheatgrass, smooth brome, and yarrow.

Soils

All wetland test pits exhibited the presence of hydrogen sulfide (A4), with two pits (SP01 and SP04) also exhibiting a depleted matrix (F3). The upland soil pits did not exhibit any indicators of hydric soils.

Hydrology

Each of the wetlands exhibited hydrogen sulfide (C1), with soil pits (SP01 and SP04) also exhibiting evidence of oxidized rhizospheres along living root channels (C3). No evidence of hydrology was recorded within the uplands.

3.1.1 Wet Meadow Wetland – PEM1E *(Palustrine, Emergent, Persistent, Seasonally Flooded/ Saturated)*

A total of five wet meadow wetlands totaling 1.07 acres were delineated within the Survey Area (Wetlands 1, 12, 15, 19, and 20). In an average year, these wetlands experience persistently wet conditions and are seasonally flooded/saturated. Dominant vegetation included Nebraska sedge, Baltic rush, inland saltgrass, field horsetail, and reed canarygrass. Soils in these wetlands exhibited a hydrogen sulfide odor in the upper 12 inches of the soil surface, meeting the criteria for hydric soils. Hydrology for each of these wetlands was met through the presence of a hydrogen sulfide odor, water stained leaves, and/or surface soil cracks.

3.1.2 Alkaline Wet Meadow Wetland – PEM1E *(Palustrine, Emergent, Persistent, Seasonally Flooded/ Saturated, Mixosaline, Alkaline)*

A total of two alkaline wet meadow wetlands totaling 1.78 acres were delineated within the Survey Area (Wetlands 4 and 24). In an average year, these wetlands experience persistently wet conditions and are semi-permanently flooded. Dominant vegetation included inland saltgrass and three-square. Soils in these wetlands exhibited a hydrogen sulfide odor and a depleted matrix. A pH test revealed that the soils are slightly alkaline with a pH of 8. Hydrology for these wetlands was met through the presence of a hydrogen sulfide odor, oxidized rhizospheres along living root channels, surface soil cracks, and salt crust.

3.1.3 Emergent Marsh Wetland – PEM1F *(Palustrine, Emergent, Persistent, Semi-permanently Flooded)*

A total of nine emergent marsh wetlands totaling 2.74 acres were delineated within the Survey Area (Wetlands 2, 6, 7, 8, 11, 17, 21, 22, and 23). In an average year, these wetlands experience persistently wet conditions and are semi-permanently flooded. Dominant vegetation included cattails, three-square, and Nebraska sedge. No soil pits were dug in these wetlands as they each exhibited the presence of hydrogen sulfide when compressed by footsteps. Hydrology for each of these wetlands was met through the presence of surface water, saturation near the soil surface, and the presence of hydrogen sulfide.

3.1.4 Scrub-Shrub Wetland – PSS1E *(Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded/Saturated)*

One scrub-shrub wetland totaling 0.19 acres was delineated within the Survey Area (Wetland 25). In an average year, this wetland experiences persistently wet conditions and is seasonally flooded/saturated. Dominant vegetation included coyote willow, and reed canarygrass. Soils in this wetland exhibited a hydrogen sulfide odor and a depleted matrix. Hydrology was met through the presence of hydrogen sulfide, oxidized rhizospheres along living roots, saturation within 7 inches of the soil surface and a water table at 10 inches.

3.1.5 Forested Wetland – PFO1E *(Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated)*

A total of six forested wetlands totaling 8.17 acres were delineated within the Survey Area (Wetlands 3, 9, 10, 13, 14, and 18). In an average year, this wetland experiences persistently wet conditions and is seasonally flooded/saturated. Dominant vegetation included Fremont's cottonwood, and Russian olive. No soil pits were dug in these wetlands as the Proposed Project is not anticipated to impact these wetlands. Soils and hydrology were assumed based on landscape position, adjacent wetlands and surface water, and dominant vegetation.

3.1.6 Pond – L2UB3 *(Lacustrine, Littoral, Unconsolidated Bottom, Mud)*

A total of two freshwater ponds totaling 4.64 acres were delineated within the Survey Area (Ponds 1 and 2). These ponds appear to have a perennial supply of water and contain an unconsolidated mud bottom with wetland vegetation consisting of bulrush, cattails, and three-square around their perimeter.

3.1.7 Intermittent Stream – R4SB7 *(Riverine, Intermittent, Streambed, vegetated)*

One intermittent stream totaling 3,217 LF (0.78 acres) was delineated within the Survey Area. This is an intermittent stream that is inundated for much of the year and likely has a connection to the surrounding water table. The location of the OHWM was assessed based on the following indicators: change in average sediment texture, change in vegetation species, change in vegetation cover, and break in bank slope. Dominant vegetation within the OHWM consisted of cattails and bulrush. Though no connection to the Colorado River was identified at the time of survey, additional analysis of aerial photography suggests that the intermittent stream connects to the Colorado River through a culvert on its western (downstream) end.

3.1.8 Ditches

A total of three ditches 4,707 LF (1.49 Acres) were identified in the Survey Area. Each of the three ditches had surface water at the time of survey and dominant vegetation consisting of cattails. A records search through the USGS National Hydrography Dataset determined that none of the three ditches are named features. These ditches appear to be associated with irrigation north of the Survey Area. Three emergent marsh wetlands (Wetlands 21, 22, and 23) were identified in the ditches.

3.1.9 Grand Valley Canal

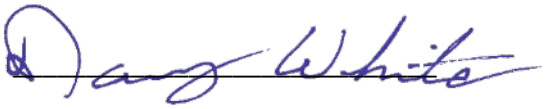
The Grand Valley Canal is the primary linear feature that spans much of the Survey Area. The canal begins at a diversion structure on the Colorado River and meanders through the valley until it rejoins the Colorado River just South of Loma, Colorado. Some stretches of the canal contain wet meadow wetlands (Wetland 1, 17, 19, and 20), though the majority of the canal within the Survey Area lacked hydrophytic vegetation and/or hydric soils, and therefore, did not satisfy all three wetland parameters.

Chapter 4. Conclusions

Based on the findings of this study, twenty-five wetlands totaling 13.95 acres, two ponds totaling 4.64 acres, one canal (Grand Valley Canal) totaling 19,576 Linear Feet (LF) (13.83 acres), one intermittent stream totaling 3,217 LF (0.78 acres), and 4,707 LF (1.49 Acres) of ditches were identified within the Survey Area. Given the current regulatory guidelines that exist at the writing of this report, all wetlands except those directly associated with Grand Valley Canal (Wetlands 1, 17, 19, 20, and 21), or those associated with the three ditches (Wetlands 21, 22, and 23) have a direct connection to the Colorado River (a WOTUS) and therefore, fall under the regulatory authority of the U.S. Army Corps of Engineers. It is our opinion that the wetlands associated with Grand Valley Canal and the three unnamed ditches are non-jurisdictional due to their use for irrigation, and because the wetlands associated with them would not be present without the irrigation water they carry. It should be noted that final authority with regards to wetland delineation and jurisdiction rests with the appropriate regulatory agency.

If you have any questions regarding this report, please contact me. I may be reached at dwhite@jub.com, or on my office phone at 385-333-2809.

Respectfully submitted by:



Date: October 11, 2021

Danny White, Wetland Scientist

J-U-B ENGINEERS, Inc.

Attachments

1. References
2. Water Resource Delineation Maps
3. Datasheets and Photo Inventory
4. NRCS Soils Map
5. NWI Map

References

CantyMedia. (2021, 9 29). Utah Climate Summary. Retrieved from weatherbase: www.weatherbase.com/weather/weather.php3?s=662650&cityname=Palisade-Colorado-United-States-of-America.

Cowardin, e. a. (1979). *Classification of Wetlands and Deepwater Habitats.* Washington E.C: U.S. Fish and Wildlife Service.

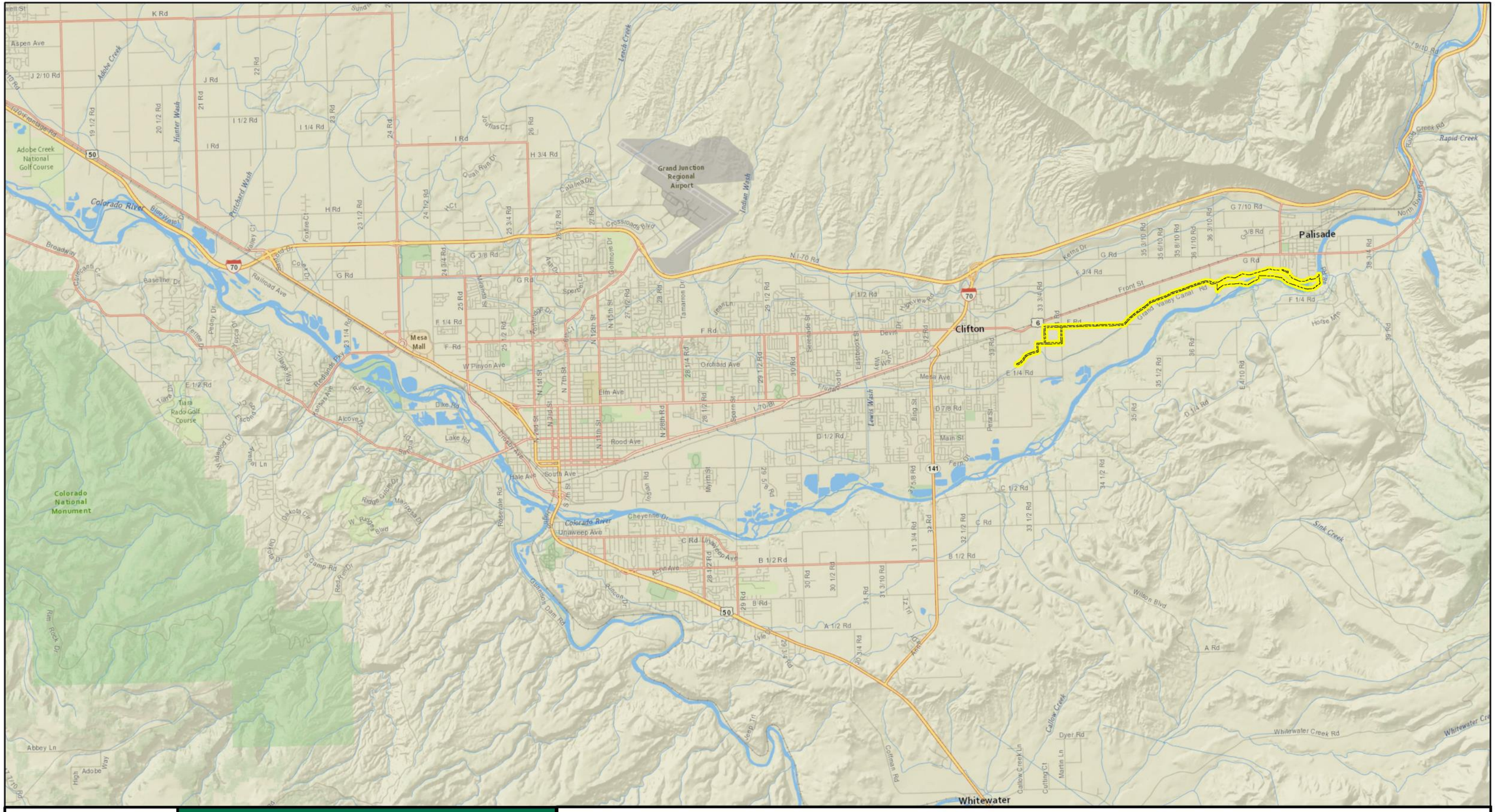
USACE. (1987). *Corps of Engineers Wetlands Delineation Manual.* Vicksburg, MS: Environmental Laboratory.

USACE. (September 2008). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2).* Vicksburg, MS: Environmental Laboratory.

USDA. (2018). *Field Indicators of Hydric Soils in the United States - A guide for identifying and delineating hydric soils (Version 8.2).* United States Department of Agriculture.

U.S. Natural Resource Conservation Service. (2021, September 29). *Web Soil Survey*. Retrieved from Soils Report: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

USGS. (2020, June 17). *National Hydrography*. Retrieved from United States Geological Survey: https://viewer.nationalmap.gov/advanced-viewer/



Vicinity Map

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on September 27, 2021

J·U·B ENGINEERS, INC.

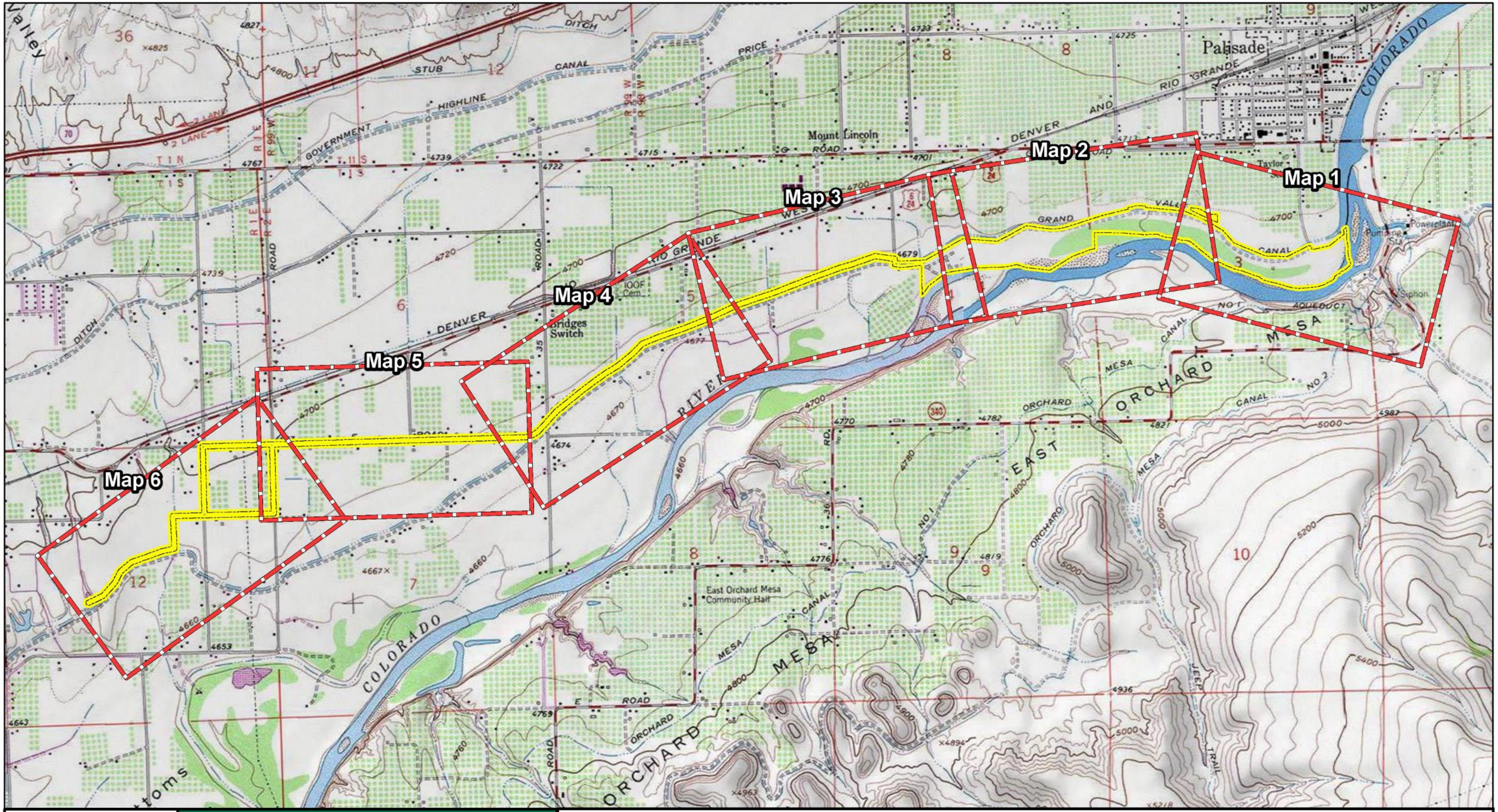
N

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

0 0.75 1.5 3 Miles

Legend

Survey Area



Topographic Map

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on September 27, 2021

J·U·B ENGINEERS, INC.

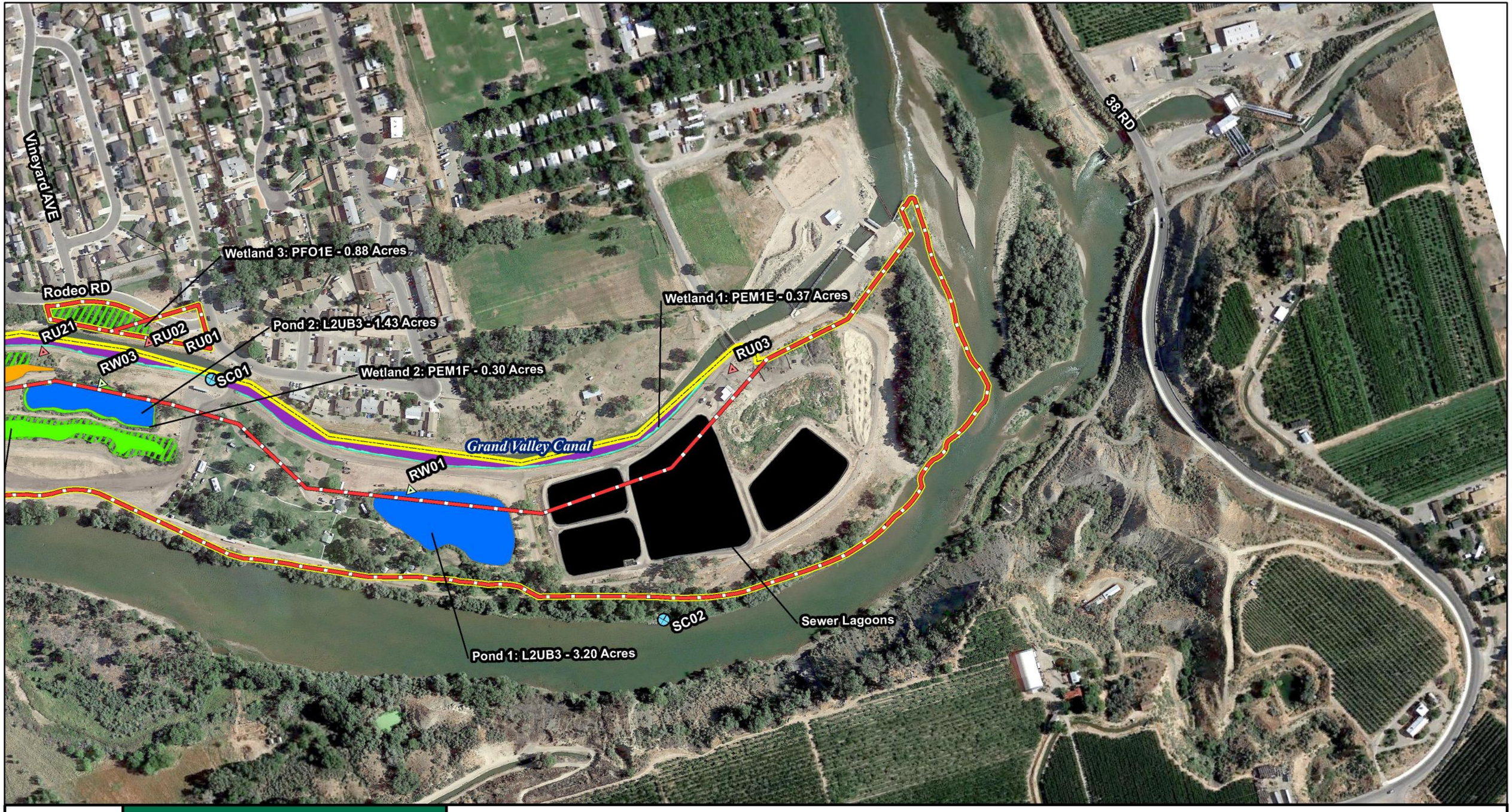
N

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

0 1,000 2,000 4,000 Feet

Legend

- Map Index
- Survey Area



J·U·B ENGINEERS, INC.

Aquatic Resource Delineation Map 1

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

N

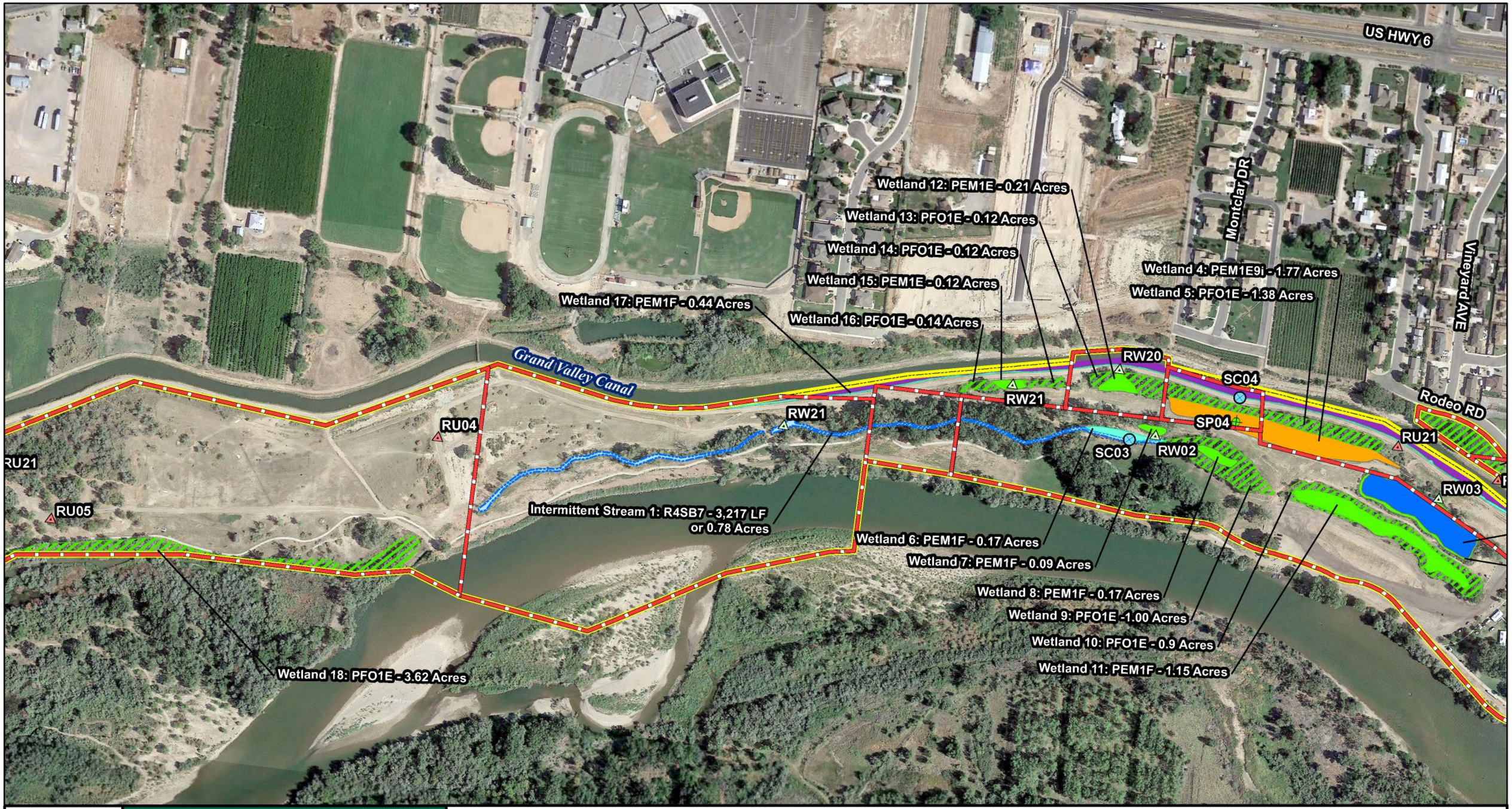
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon



J·U·B ENGINEERS, INC.

Aquatic Resource Delineation Map 2

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

N

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon

US HWY 6

36 1/4 RD

Wetland 19: PEM1E - 0.006 Acres

Grand Valley Canal

SP03

SC05

RU21

RU05

Wetland 20: PEM1E - 0.08 Acres

See Map 2
Wetland 18: PFO1E - 3.62 Acres

J·U·B ENGINEERS, INC.

Aquatic Resource Delineation Map 3

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

N

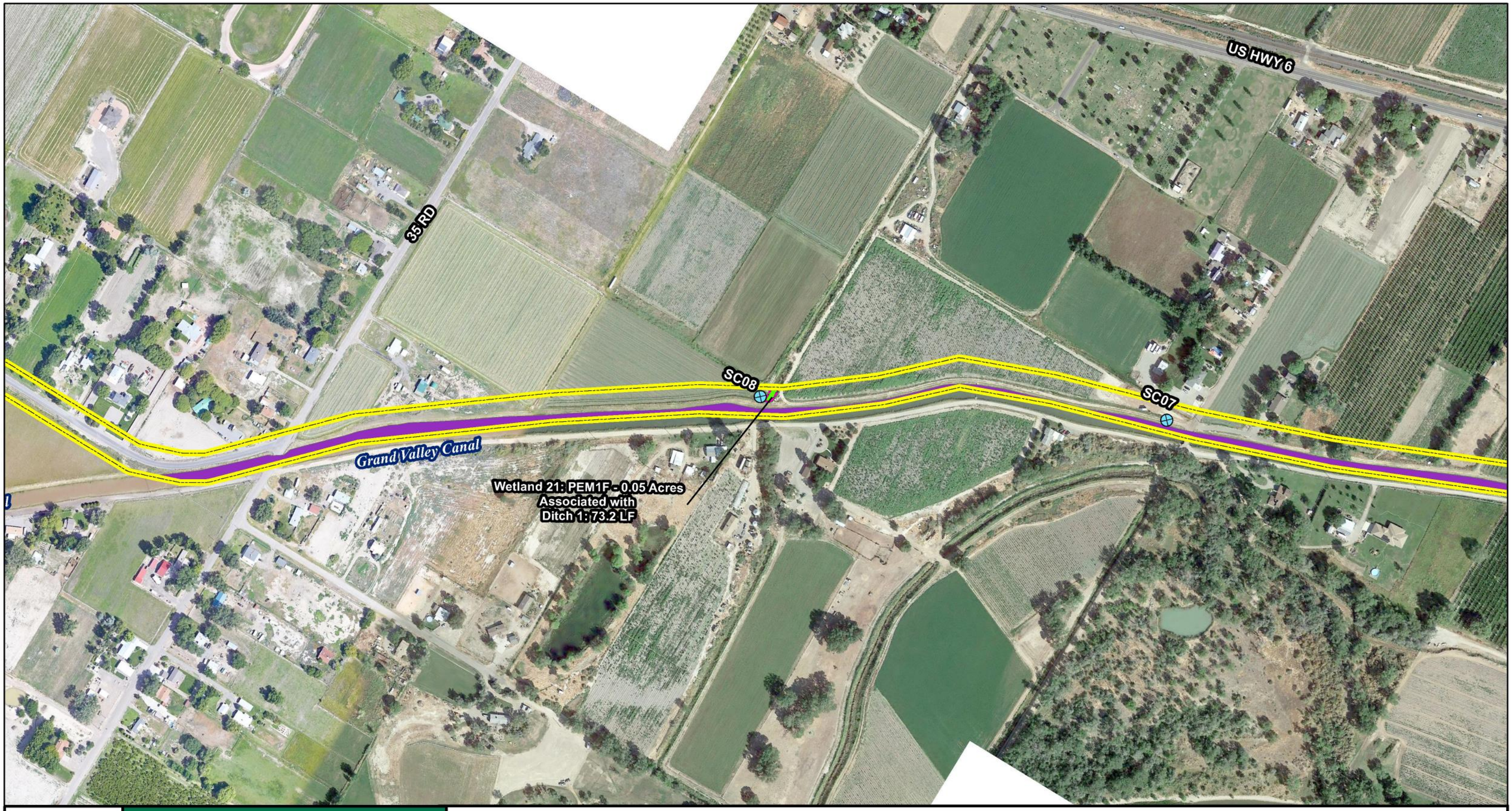
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon



J·U·B ENGINEERS, INC.

Aquatic Resource Delineation Map 4

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

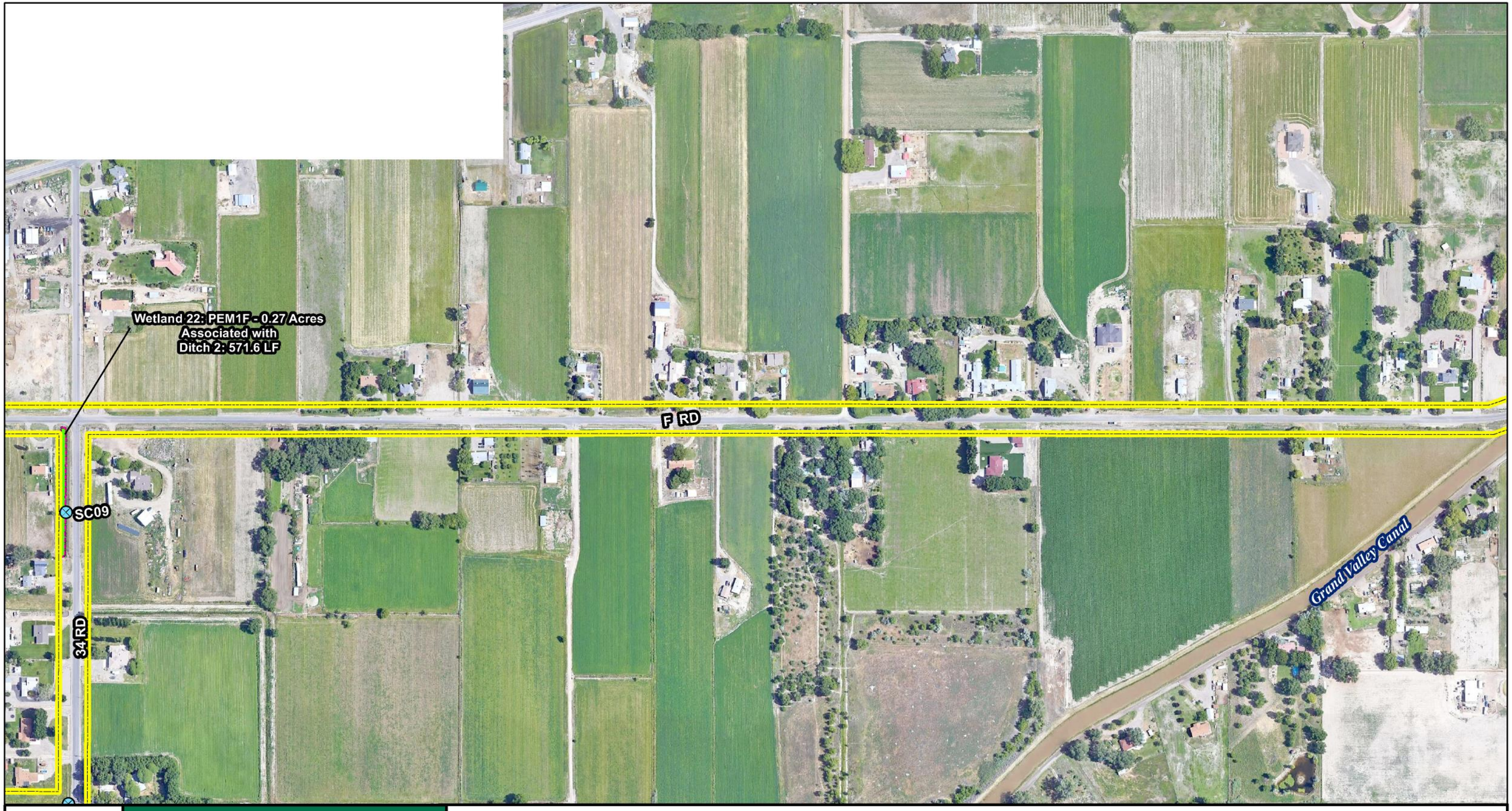
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon



J·U·B ENGINEERS, INC.

Aquatic Resource Delineation Map 5

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

N

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon

J-U-B ENGINEERS, INC.

Aquatic Resource Delineation Map 6

Delineation of Wetland and Other Waters of the U.S. - for the Town of Palisade Sewer Transfer Combination Conveyance Line

Created on October 11, 2021

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

1 inch = 400 feet on 11X17

0 200 400 800 Feet

Legend

- <all other values>
- Representative Upland
- Representative Wetland
- Stream Crossing
- Wetland Soil Pit
- Upland Soil Pit
- Staging
- Survey Area (265 Acres)
- Intermittent Stream (3,217 LF or 0.78 AC)
- Ditch (1.49 AC or 4,707 LF)
- Alkaline Wet Meadow - PEM1E9i (1.78 AC)
- Emergent Marsh - PEM1F (2.74 AC)
- Wet Meadow - PEM1E (1.07 AC)
- Pond - L2UB3 (4.64 AC)
- Forested Wetland - PFO1E (8.17 AC)
- Scrub Shrub Wetland - PSS1E (0.19 AC)
- Grand Valley Canal (13.83 AC or 19,576 LF)
- Sewer Lagoon

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sewer Transfer Combination Conveyance Line City/County: Palisade/Mesa County Sampling Date: 8/31/2021

Applicant/Owner: Town of Palisade State: CO Sampling Point: SP01

Investigator(s): D. White Section, Township, Range: S12 T1S R1E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Range and Irrigated Region Lat: 39.083758° Long: -108.434984° Datum: WGS 84

Soil Map Unit Name: Sagrlite loam, 2 to 5 percent slopes NWI classification: PSS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Salix exigua	75	Y	FACW
2.			
3.			
4.			
5.			
	75 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 4/1	96	10 YR 6/6	4	C	PL	Loam	
8-18	10 YR 6/1	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 7

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP01 Typical Site Conditions | Soils

SP01 Typical Site Conditions | East

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sewer Transfer Combination Conveyance Line City/County: Palisade/Mesa County Sampling Date: 8/31/2021

Applicant/Owner: Town of Palisade State: CO Sampling Point: SP02

Investigator(s): D. White Section, Township, Range: S12 T1S R1E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 2

Subregion (LRR): Western Range and Irrigated Region Lat: 39.083670° Long: -108.434814° Datum: WGS 84

Soil Map Unit Name: Sagrlite loam, 2 to 5 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. sarcobatus vermiculatus	5	Y	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Distichilis spicata	45	Y	FAC
2. Melilotus officinalis	5		FACU
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	55 (A)		175 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: SP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 3/1	100					SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP02 Typical Site Conditions | Solis

SP02 Typical Site Conditions | North

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sewer Transfer Combination Conveyance Line City/County: Palisade/Mesa County Sampling Date: 8/31/2021

Applicant/Owner: Town of Palisade State: CO Sampling Point: SP03

Investigator(s): D. White Section, Township, Range: S4 T1S R2E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Range and Irrigated Region Lat: 39.100310° Long: -108.379918° Datum: WGS 84

Soil Map Unit Name: Green River silty clay loam, 0 to 2 percent slopes NWI classification: PEM1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phragmites australis	15	Y	FACW
2. Distichilis spicata	15	Y	FAC
3. Leymus cinereus	15	Y	FAC
4. Equisetum arvense	30	Y	FAC
5.			
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 4-1	100					SaL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP03 Typical Site Conditions | Soil

SP03 Typical Site Conditions | West

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sewer Transfer Combination Conveyance Line City/County: Palisade/Mesa County Sampling Date: 8/31/2021

Applicant/Owner: Town of Palisade State: CO Sampling Point: SP04

Investigator(s): D. White Section, Township, Range: S3 T1S R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 2

Subregion (LRR): Western Range and Irrigated Region Lat: 39.102411° Long: -108.362238° Datum: WGS 84

Soil Map Unit Name: Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes NWI classification: PEM1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Distichilis spicata	40	Y	FAC
2. Schoenoplectus americanus	15	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1	75	10 YR 6/6	5	C	PL	SaL	
	10 YR 4/1	20						
6-12	10 YR 4/1	96	10 YR 6/6	4	C	PL	SaL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SP04 Typical Site Conditions | Soil

SP04 Typical Site Conditions | West

SC01 Typical Site Conditions | East

SC03 Typical Site Conditions | East

SC04 Typical Site Conditions | West

SC05 Typical Site Conditions | East

SC06 Typical Site Conditions | East

SC07 Typical Site Conditions | West

SC08 Typical Site Conditions | North

SC10 Typical Site Conditions | North

SC11 Typical Site Conditions | West

RW01 Typical Site Conditions | South

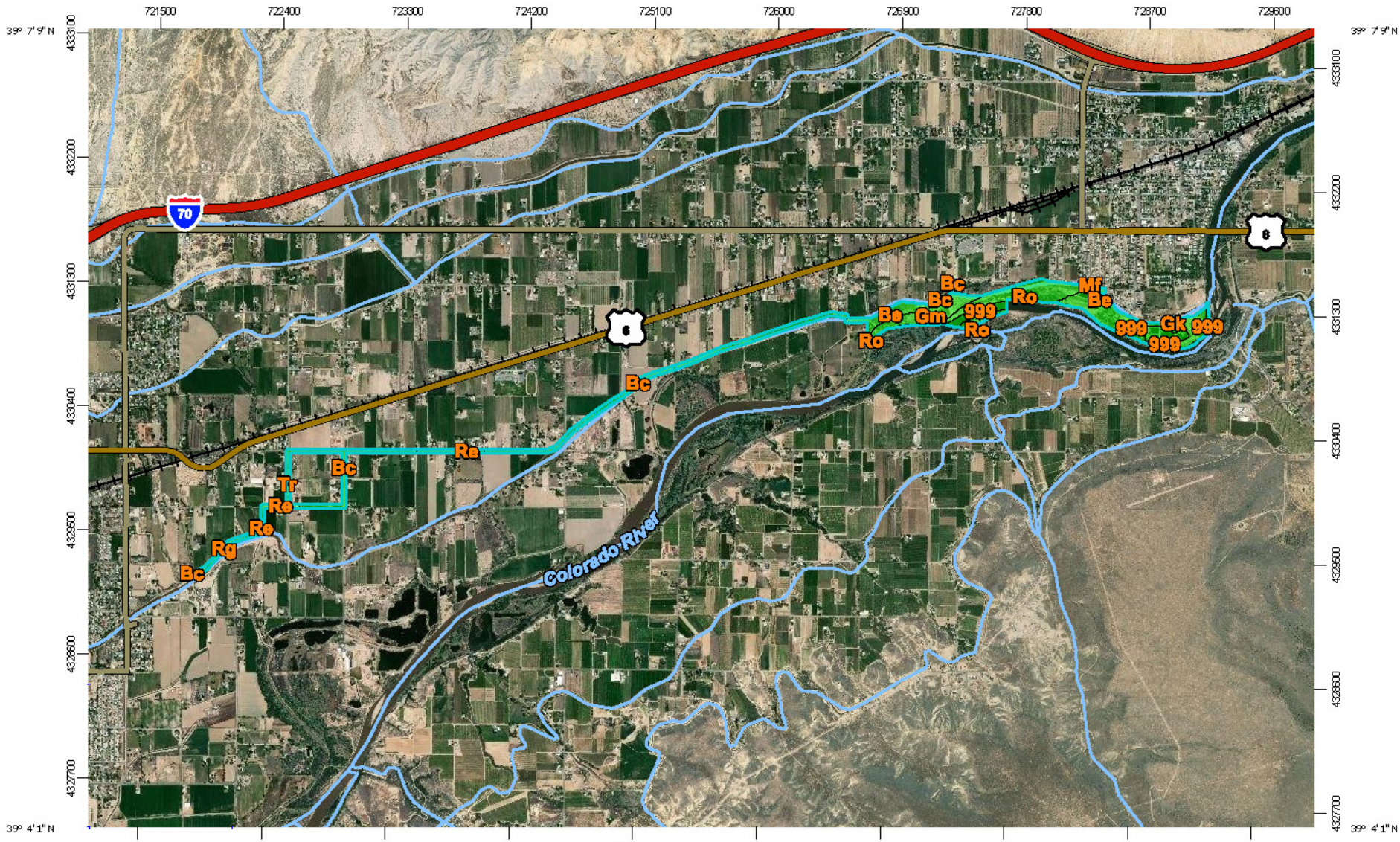
RW02 Typical Site Conditions | West

RW03 Typical Site Conditions | South

RW04 Typical Site Conditions | West

RW21 Typical Site Conditions | North

Hydric Rating by Map Unit—Mesa County Area, Colorado
(Palisade Sewer EA)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 11, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2010—Aug 8, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
999	Water	0	17.6	11.0%
Bc	Sagers silty clay loam, 0 to 2 percent slopes	0	36.4	22.7%
Be	Green River silty clay loam, 0 to 2 percent slopes	0	11.3	7.1%
Gk	Bebeevar loam, 0 to 2 percent slopes	0	33.3	20.8%
Gm	Green River clay loam, 0 to 2 percent slopes	0	18.3	11.4%
Mf	Gyprockmesa cobbly clay loam, 5 to 12 percent slopes	0	0.4	0.3%
Re	Sagrlite loam, 0 to 2 percent slopes	0	7.6	4.7%
Rg	Sagrlite loam, 2 to 5 percent slopes	0	5.2	3.3%
Ro	Bebeevar and Green River soils, and Riverwash, 0 to 2 percent slopes	0	29.8	18.6%
Tr	Turley clay loam, 0 to 2 percent slopes	0	0.1	0.0%
Totals for Area of Interest			**160.0**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

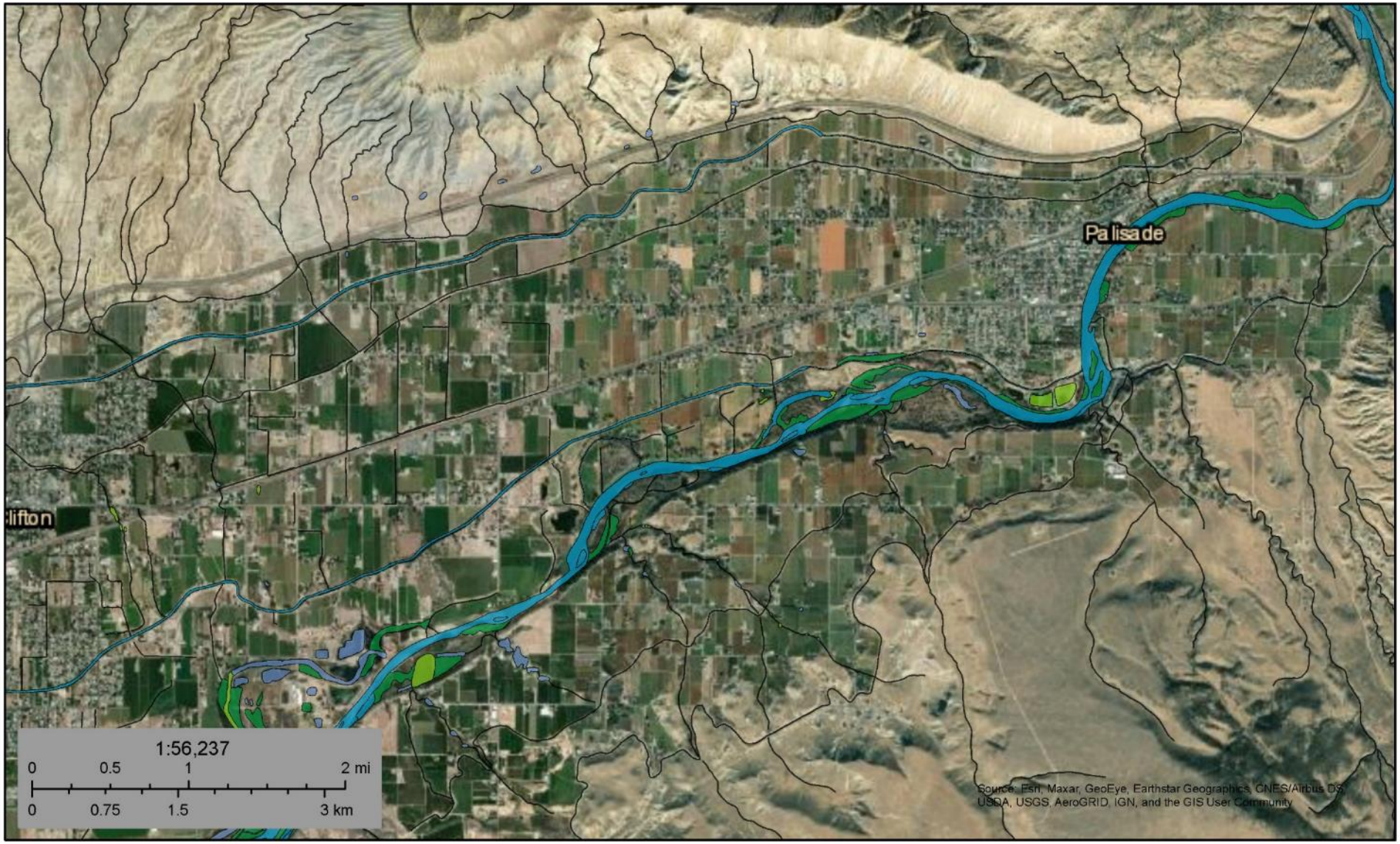
Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

U.S. Fish and Wildlife Service

National Wetlands Inventory

Palisade Sewer Project EA



September 29, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 5 Biological Evaluation

Biological Evaluation for the

Town of Palisade Sewer Transfer Combination Conveyance Line Project

Mesa County, Colorado

Prepared for:

Town of Palisade, Colorado

Prepared by:

J·U·B ENGINEERS, INC.

305 S. Main Street, Unit 6

Palisade, CO 81526

October 2021

Contents

Tables

Appendices

Introduction

The following Biological Evaluation (BE) has been prepared for the Sewer Transfer Combination Conveyance Line Project (Proposed Project) located in Mesa County, Colorado. This BE was prepared on behalf of the Town of Palisade and the Grand Valley Irrigation Company (GVIC) in support of a U.S. Department of Agriculture (USDA) Rural Development Environmental Assessment.

The purpose of this BE is to provide technical information and to review the Project's Action Area (Action Area) in sufficient detail to determine to what extent the Proposed Project may affect: federally threatened or endangered species or species proposed for listing; designated and proposed critical habitat; State Sensitive Species under Conservation Agreements; and essential fish habitat (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.). This BE is prepared in accordance with 50 CFR 402 and legal requirements found in Section 7 (a)(2) of the Endangered Species Act (ESA) (16 U.S.C. 1536(c)).

Proposed Project & Action Area

Proposed Project

The Sewer Transfer Combination Conveyance Line Project would create a new gravity line that would run south from the Town of Palisade following the north side of the GVIC Canal alignment, then transferring to the existing roadway right-of-way (ROW) near the intersection of 35 Road and F Road (approximately 3.03 miles). A lift station and short force main (approximately 0.57 miles) would be constructed along the route near this intersection of 35 Road and F Road to make up the elevation difference necessary to maintain adequate slope on the remaining gravity sections of the sewer line. Following the section of force main, an additional gravity line would be installed following the alignment of F Road to the intersection of 34 Road. The line would then turn south for approximately 0.25 miles before traveling west towards 33 ¾ Road and then returning to the GVIC alignment and finally to the Clifton Sanitation District (CSD) connection.

Action Area

The Proposed Project Action Area is located in Sections 3, 4, 5, 6, 7, and 8, Township 1 South, Range 2 East, and Sections 1 and 12, Township 1 South, Range 1 East, Ute Meridian. The Proposed Project would occur within the mixed agricultural and residential areas along portions of the Colorado River on the west side of Grand Valley, between Interstate 70 and the Colorado River, and within Town of Palisade limits, Mesa County, and a Cooperative Planning Area maintained by Mesa County, the Town of Palisade, and the Town of Clifton (See Appendix A).

Best Management Practices and Conservation Measures

The following Best Management Practices (BMPs) and conservation measures are standard requirements and would be required during implementation of the Proposed Project and are intended to minimize adverse effects to biological resources and habitat that may support federally protected or state sensitive species under conservation agreements. These measures are integral components of the Proposed Project and would ensure that project activities are completed with minimal impacts to biological resources. These would include, but are not limited to, soil and erosion control devices,

noxious weed prevention and control, and construction timing to avoid breeding and nesting season for migratory birds. Specific conservation measures to avoid and minimize impacts to yellow-billed cuckoo and other migratory birds include the following:

1. Construction would be timed to occur over the course of two winter construction seasons, from 2022/2023 through 2024/2025.
2. Construction activities and any vegetation removal in Riverbend Park will be restricted until after the YBCU breeding and nesting season which ends in late August/early September.
3. Equipment would be cleaned prior to arrival at the site to avoid noxious weed dispersal within or near the Action Area.
4. All necessary BMPs would be in place to control sediment and erosion, and to protect water quality during construction activities.

Additional construction BMPs shall include, but are not limited to, the following:

1. All construction activities, equipment storage, and materials staging would be conducted within the Action Areas and the designated Staging Areas.
2. Temporary erosion and sediment control (TESC) devices would be incorporated in active construction areas to prevent sediment discharges to any surface waters in canals or other bodies of water. These devices must remain in place until the potential for sediment migration is no longer a risk.
3. Any unnecessary removal of trees or shrubs will be avoided.
4. Excavated sediment and debris shall be disposed of at a pre-approved area no less than 200 feet from any surface water feature.
5. An approved native seed mix appropriate to the Action Areas would be applied post construction, where applicable, to areas where ground disturbance has occurred.
6. If vegetation removal would occur during the breeding and nesting season for migratory birds in any part of the Action Area, a nesting survey would be required prior to the removal of trees and shrubs to identify any active nests in the Action Area, no earlier than 7 days before construction activities commence.

Chemical pollution measures shall include, but are not limited to, the following:

1. An approved spill prevention, control, and countermeasure (SPCC) plan would be in place prior to any construction activities.
2. All construction equipment shall be decontaminated with high pressure water prior to mobilization to the job site to remove all surface oil, grease, dirt, and plant matter. Proper decontamination is particularly critical to prevent the spread of noxious and/or non-native vegetation into agricultural fields.
3. Machinery will be fueled or lubricated no less than 150 feet from live water. Machinery will be fueled over a surface that will facilitate spill remediation. Machinery shall be maintained in a petroleum leak-free condition to avoid and reduce potential for groundwater contamination.
4. Major maintenance of equipment such as changing fluids, overhaul, tune-ups, and similar types of regularly scheduled maintenance shall be performed at an approved off-site facility or staging area.
5. Petroleum products and hazardous, toxic, and/or deleterious materials shall not be stored, disposed of, or accumulated adjacent to or in the immediate vicinity of live water.

6. Portable toilets shall not be placed adjacent to canals, streams, lakes, wetlands, wells, or springs. They shall be located no less than 150 feet from these areas to prevent contamination of any water sources.

Existing Environmental Conditions

The Action Area has elevations ranging from 4,673 to 4,698 feet above mean sea level (AMSL). Land uses in the surrounding area consist of mixed commercial, agricultural, and residential uses. The majority of the alignment follows the Grand Valley Canal (GVIC Canal) with a small portion following the alignment of E ¾ Road and F Road. Conditions within the Action Area are representative of a highly disturbed agricultural area, where soil has been tilled and cultivated, and where common and noxious weeds are abundant. Sections of the Proposed Project align with paved roads, and the canal road of the GVIC Canal alignment. Proposed Staging Areas for the Project include areas within Riverbend Park, an area to the east of existing waste water treatment ponds that are adjacent to the park, and locations on the east and west end of the alignment that have been previously disturbed and used as gravel parking areas or stockpile areas. A section of the Colorado River runs parallel to the Action Area on the south side of the Project alignment, at the east end of the Action Area. However, the Proposed Project will not overlap with the River corridor and will not involve any actions along the river's riparian edge, nor within the channel. Riverbend Park is adjacent to the Colorado River channel for approximately 3 miles, and the GVIC Canal where the Proposed Project alignment will occur is on the north side of the park. Table 1 lists the dominant vegetative species that were observed during field surveys. See Appendix D for a photo inventory of representative photos of the Action Area.

Table 1 Dominant plant species observed within the Action Area

Scientific Name	Common Name
Asclepias speciosa	showy milkweed
Asclepias subverticillata	horsetail milkweed
Bassia scoparia	ragweed
Disticlis spicata	inland saltgrass
Echinochola crus-galli	barnyard grass
Elaeagnus angustifolia	Russian olive
Equisetum hyemale	rough horsetail
Ericameria nauseosa	rabbitbrush
Lepidium draba	whitetop
Leymus cinereus	Great Basin wild rye
Medicago sativa	alfalfa
Melilotus officinalis	yellow sweet clover
Panicum capillare occidentale	witch grass
Persicaria Maculosa	ladies' thumb
Phalaris arundinacea	reed canary grass
Phragmites sp.	common reed
Populus fremontii	Fremont cottonwood
Populus tremuloides	quaking aspen
Salix exigua	coyote willow

Sarcobatus vermiculatus	grease wood
Setaria helvola	yellow foxtail
Tamarix ramosissima	saltcedar
Typha sp.	cattail

Species Descriptions & Status

Agency Coordination & Species of Concern

As part of the inventory completed for the Proposed Project, a species list from the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system was generated for the Proposed Project on August 30, 2021 (see USFWS IPaC Report in Appendix C). Field survey of the Proposed Project Action Area was conducted by a biologist with J-U-B ENGINEERS, Inc. (J-U-B) on August 31, 2021.

The USFWS IPaC identified six species that are federally threatened or endangered under the Endangered Species Act (ESA), which have the potential to occur in the Action Area (Table 3). The report identified designated critical habitats within the Action Area for three species: Critical habitat for the yellow-billed cuckoo and critical habitat for the Colorado pikeminnow and razorback sucker. Multiple bird species protected under the Migratory Birds Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA) may occur in the Action Area. Species descriptions and determinations of the effects of the Proposed Project for each species are summarized below. Final determinations for all species evaluated are listed in Table 3.

Species Descriptions

Western Yellow-Billed Cuckoo & Critical Habitat

The western yellow-billed cuckoo (YBCU; *Coccyzus americanus*) was listed as threatened by the USFWS on November 3, 2014. Yellow-billed cuckoos are considered a riparian obligate and are usually found in large tracts of cottonwood/willow habitat with dense sub-canopies (below 33 feet) and limited grazing disturbance (Wiggins 2005). Suitable breeding and nesting habitat for the species must be at least 300-feet-wide and a minimum of 12 contiguous acres (Colorado Parks and Wildlife 2020).

On Colorado's Western Slope, the YBCU depends primarily on old growth riparian woodlands of cottonwood with dense understories (Kingery 1998; Righter et al. 2004). Nesting sites are typically found along river valleys in deciduous riparian woodland patches with breeding often coinciding with the emergence of large numbers of caterpillars, cicadas, and other large insect fauna (Ehrlich et al. 1992). The species' incubation/nestling period is the shortest of any known bird, as it is one of the last neotropical migrants to arrive in North America, reaching its breeding areas in late May or early-mid June. Although exact migration dates can vary, the YBCU typically begins its return migration to South America in late August or early-mid September (Bennett 2014).

In May of 2021, the USFWS updated the designation of 298,845 acres of critical habitat for the YBCU western distinct population segment (DPS) in Arizona, California, Colorado, Idaho, New Mexico, Texas, Utah and Wyoming (Federal Register 2021). Primary threats to the YBCU include conversion of riparian habitat to agriculture and other uses, dam construction, stream channelization and stabilization and livestock grazing (USFWS 2017). The USFWS IPaC Report identified critical habitat for the species in the vicinity of Action Area. Critical habitat and the required ½- mile habitat buffer for YBCU does overlap

with the Project footprint in Riverbend Park, on the east side of the Action Area, and on the south edge of the GIVC Canal. The critical habitat area for YBCU in this location encapsulates the Colorado River corridor from Grand Junction and east to the Town of Palisade (USFWS 2021a; USFWS 2021b).

Colorado River Fish: Bonytail, Colorado pikeminnow, humpback chub and razorback sucker

Bonytail

In 1980, the USFWS listed the bonytail chub (*Gila elegans*) as an endangered species under the ESA. Bonytail chub is a minnow that is native to the Colorado River system. The near extinction of the bonytail chub can be linked back to flow regulation or alteration, habitat loss, and competition and predation by exotic fishes. Bonytail chub are opportunistic feeders; their prey includes insects, zooplankton, algae, and higher plant matter. Bonytail chub spawn in spring and summer over gravel substrate. Currently, many bonytail chub are raised in fish hatcheries and released into the wild when they are large enough to survive in their natural environment. Bonytail chub prefer stream habitat that consists of eddies, pools, and backwaters near swift currents in large rivers (USFWS 2021c).

Humpback Chub

The humpback chub (*Gila cypha*) is a minnow that is native to the upper Colorado River system including the Green, Yampa, White, and Little Colorado Rivers (USFWS 2014). The USFWS listed the humpback chub as endangered under the ESA in 1967 (USFWS 1990). The humpback chub originally thrived in the fast, deep, white-water areas of the Colorado River and its major tributaries. Human-induced flow alteration, like dams and irrigation diversions, have eliminated habitat and migration routes for the species. Documented occurrences of the humpback chub in Utah are now confined to a few whitewater areas in the Colorado, Green, and White Rivers. The species spawn during the spring and summer in shallow, backwater areas with cobble substrate. Younger chub reside in shallower, turbid habitats until they are large enough to move into whitewater areas (USFWS 2021c).

Colorado Pikeminnow & Critical Habitat

The Colorado pikeminnow (*Ptychocheilus lucius*) is native to the Colorado River system of the western United States and Mexico. The Colorado pikeminnow was added to the list of endangered species on March 11, 1967. Their current range is limited to the upper Colorado River system. The near extinction of the Colorado pikeminnow can be linked to flow regulation or alterations (e.g., the installation of dams), habitat loss, and competition and predation by non-native fishes. Colorado pikeminnows are mainly piscivorous; younger pikeminnows also eat insects and other invertebrates. They spawn in the summer over gravel or smaller cobble substrate situated in riffle habitat. Adult Colorado pikeminnows prefer medium to large rivers and the juveniles prefer slow-moving backwaters (USFWS 2021c). This fish species requires uninterrupted passage through waterways. The pikeminnow also is adapted to hydrologic cycles that are characterized by high levels of snowmelt runoff in the spring and lower stable flows at other times of the year (USFWS 2021d). The USFWS IPaC reported the presence of designated critical habitat for the Colorado pikeminnow within the vicinity of the Action Area. However, the Action Area does not overlap with critical habitat for the pikeminnow, which is limited to the Colorado River, because it does not intrude or overlap with the Colorado River corridor or its tributaries.

Razorback Sucker & Critical Habitat

The razorback sucker (*Xyrauchen texanus*) was designated as endangered on May 2, 1990. This sucker fish is native to the Colorado River system. Recent reports of this species have only come from the lower Colorado, lower Yampa, and Green Rivers (USFWS 2014a). The near extinction of the razorback sucker can be linked to flow regulation or alterations (e.g., the installation of dams and irrigation diversions), habitat loss, and competition and predation by non-native fishes. They spawn between February and June. Adult razorback suckers prefer slow backwater habitats (USFWS 2021b).

The population decline of these four endangered fish species is due, in part, to habitat destruction (diversion and impoundment of rivers), as well as competition and predation from introduced fish species. In 1994, USFWS designated critical habitat for all four endangered species in the entire Colorado River Basin (Federal Register 1994). The USFWS IPaC reported the presence of designated critical habitat for the razorback sucker within the vicinity of the Action Area. Corresponding to the location of critical habitat for the Colorado pikeminnow, the Action Area also does not overlap with critical habitat for the razorback sucker which is limited to the Colorado River, because it does not intrude or overlap with the Colorado River corridor or its tributaries.

Colorado Hookless Cactus

The Colorado hookless cactus (*Sclerocactus glaucus*) was first designated as a threatened species under the ESA on October 11, 1979. The hookless cactus is a small barrel cactus that grows between a height of 4 to 18 centimeters. It grows in coarse soil with high cobble and gravel components, typically associated with river and stream terrace deposits, and usually consisting of Mancos shale with volcanic cobbles and pebbles on the surface. The cactus also grows on rocky substrates on mesa slopes. This species is found between approximately 4,400 and 6,200 feet AMSL and is endemic to western Colorado. (USFWS 2021f).

Migratory birds

A summary of the MBTA protected bird species that may occur in the Action Area is detailed below. Table 2 lists the MBTA and BGEPA species identified by the USFWS IPaC Report.

Table 2 MTBA protected bird species with the potential to occur within the Action Area

Scientific Name	Common Name
Gymnorhinus cyanocephalus	pinyon jay
*Haliaeetus leucocephalus**	bald eagle
Leiothlypis virginiae	Virgina's warbler
Melanerpes lewis	Lewis's woodpecker
Coccothraustes vespertinus	evening grosbeak

* These species are also protected under the BGEPA.

The pinyon jay inhabits pinyon-juniper woodlands, sagebrush, scrub oak, chaparral and ponderosa pine forests (Cornell 2019a). The Lewis's woodpecker also breeds in open ponderosa pine forests, burned forests with high snag densities, and frequents pinyon-juniper woodlands and woodlands with cottonwood trees near streams (Cornell 2019b). The bald eagle requires nesting sites high above the ground and canopy that are open and accessible. Bald eagles typically breed in forested areas adjacent to large bodies of water (USFWS 2011). The MBTA passerine species that may occur in the Action Area include Virginia's warbler, which breed in open pinyon-juniper and oak woodlands, and on slopes with shrubby ravines (Cornell 2019c); And the evening grosbeak, which can be found in pinyon-juniper forests

and pine oak forests in the Rocky Mountains, where they typically breed in mature and second-growth stands (Cornell 2019d).

Effects Analysis

Western Yellow-Billed Cuckoo & Critical Habitat

An incidental nesting and bird survey for raptors and migratory birds, including YBCU, was performed within the Action Area during field surveys. No protocol YBCU survey was completed as the site visit occurred at the end of the nesting season for the species. A habitat suitability assessment for YBCU within the Action Areas was performed. The habitat assessment included a ½-mile buffer around the Action Area and utilized available aerial imagery and local regional data for a desktop analysis. Because YBCU critical habitat overlaps with the east end of the Action Area, special focus was given to evaluating this this location.

The Colorado river segment on the south side of the primary staging area in Riverbend Park was highlighted prior to field surveys as a location to assess for YBCU habitat, and other migratory bird habitat because it fell within the designated critical habitat buffer for the YBCU, and contained riparian vegetation along the edges of the Colorado River, which borders the park on the south side. However, the riparian corridor that connects to the staging area along the river in this segment is less than 1/10 mile (528 ft) wide and is sparsely vegetated. The YBCU requires dense closed canopy that has a core area with a size of at least 11-12 acres (Colorado Parks and Wildlife 2020). The vegetation along the river and within Riverbend Park has an open canopy where sparse mature cottonwoods (*Populus fremontii*) grow, with a mostly absent midstory, and with low-growing reed canary grass (*Phalaris arundinacea*) and coyote willow (*Salix exigua*) along both the GVIC Canal and the Colorado River. The vegetation present does not constitute sufficient cover or structure to qualify for suitable YBCU habitat. Although the Action Area falls within the geographic area that has been modeled as Critical Habitat for YBCU, the landscape condition and lack of an established, appropriately-sized cottonwood gallery within the Action Area and within a ½-mile of the Action Area leads to the assessment that there is not suitable habitat for YBCU breeding, nesting and foraging within the Proposed Project alignment.

No habitat within the Colorado River channel or immediate riparian area will be disturbed or impacted by project actions. Construction for the Proposed Project is anticipated to be performed across two winter construction seasons from 2022/2023 through 2024/2025. Under this schedule, work would be completed outside of nesting bird season (April-August) and therefore no disturbance to any potentially breeding or nesting YBCU or other migratory bird species using this area or within the vicinity of the Action Area is anticipated. Given the lack of suitable habitat for the YBCU species, and the timing of construction to be outside the breeding and nesting season, the Proposed Project is expected to have no effect on yellow-billed cuckoo. With the lack of suitable YBCU habitat in the Action Area and within a ½-mile of the Action Area, the Proposed Project will have no effect to YBCU Critical Habitat.

Colorado River Fish: Bonytail, Colorado pikeminnow, humpback chub and razorback sucker & Critical Habitat for the Colorado pikeminnow and razorback sucker

The Proposed Project would not include actions within the Colorado River channel or immediate riparian area, which is adjacent to the east end of the Action Area, and runs parallel to part of the GVIC Canal,

with Riverbend Park separating the canal from the river corridor. No actions associated with the Proposed Project will negatively impact the flow quantity or water quality of the Colorado River.

The GVIC Canal is a maintained ditch that is dry outside the irrigation season, which runs from April through October. Portions of the canal are unlined while other portions are lined. The canal has a fish screen at its diversion point to prevent fish entrainment, and additionally the canal does not contain suitable habitat that would sustain fish given the short, controlled water regime; furthermore, the canal has no floodplain connectivity to other waterbodies and does not empty into a natural drainage. Given the lack of suitable fish habitat in the Action Area, and that the Proposed Project does not include actions that would directly or indirectly affect the Colorado River channel or its associated riparian fringe, the endangered Colorado River fish species are not anticipated to be present in the Action Area. Based on this evidence and the scope of the Proposed Project, the proposed actions will have no effect to the endangered Colorado River fishes. The Proposed Project will have no effect to Critical Habitat for the razorback sucker and Colorado pikeminnow.

Colorado Hookless Cactus

While the area of the Proposed Project falls just within elevation bounds for the range of the Colorado hookless cactus and although there are documented individuals on the mesa slopes around the Town of Palisade, habitat and soil type required for this species are not present within the Action Area. Soil types present in the Action Area include (listed in order from highest percentage to lowest): Sagers Silty Clay Loam, Bebeevar Loam, Bebeevar and Green River Soils and Riverwash, Green River Clay Loam and Green River Silty Clay Loam (NRCS 2021). Most of the Project activities will occur next to the GVIC Canal and along rural-residential roads in the Town of Palisade.

The Action Area is largely disturbed by agricultural, residential, urban and commercial uses. The proposed staging areas are within parking lots that are paved or graveled; the road along the GVIC Canal is graveled; and most of the remaining alignment is located along rural-residential roads that are paved with maintained ROW shoulders. There are two routes for the Proposed Project alignment that cross agricultural fields, which are tilled and planted with crops including alfalfa, corn and grapes. Where the GVIC Canal is unlined and its banks are primarily composed of soil, the texture, composition, and existing disturbance of the soil would not support *S. glaucus*. Moreover, in Mesa County, *S. glaucus* has known populations that are determined to have a limited range within approximately 593 square miles, across three alluvial terraces of the eastern half of the Grand Valley near Grand Junction and south to the Gunnison River (USFWS 2021g). The Action Area falls outside of this delineated occurrence area for the cactus. Due to a lack of suitable habitat within the Action Area, there is anticipated to be **no effect** on this species or its habitat from the Proposed Project.

Migratory Birds

Incidental field investigations found no active nests for raptors or migratory species along the riparian habitat associated with the GVIC Canal alignment, nor along any of the irrigation ditches or roads where the alignment is located. Riparian habitat adjacent to the canal and other minor ditches is not considered suitable foraging habitat for bald eagles because the canal and ditches lack year-round continuous water flow and connectivity to the Colorado River or other waterways, which would support fish populations that constitute a food source for eagles.

Eagles may nest or roost in the tall, mature cottonwoods that grow in Riverbend Park, the east end of the Action Area, where the nearby Colorado River provides good hunting grounds. There is no planned removal or disturbance to these cottonwood trees, as a result of the Proposed Project. The Pinyon jay, Lewis' woodpecker, Virginia's warbler, and the evening grosbeak all require woodland habitats that generally have mature or second growth ponderosa pines or pinyon-juniper woodlands, habitat types which do not occur in or adjacent to the Action Area. The absence of suitable breeding habitat indicated a low likelihood of these MBTA protected species nesting within or near the Action Area, although it is possible that the Action Area may constitute stopover habitat for these birds, notably in Riverbend Park where cottonwood trees could provide roosting locations.

Construction activities are anticipated to occur outside of bird migration, breeding, and nesting seasons. If the Proposed Project cannot be timed outside of the breeding and nesting season and would require the removal of midstory vegetation that could provide suitable habitat for birds, the Action Area should be cleared for any migratory bird or eagle nests prior to the removal of large vegetation. If a nest of an ESA-identified avian species is identified within the Action Area, USFWS would be notified immediately to discuss the appropriate course of action.

Summary and Conclusion

After considering the available scientific information regarding the biological requirements and the status of ESA-listed species considered in this BA, the environmental baseline for the Action Area, and the potential effects of the Proposed Project, the following effect determinations for yellow-billed cuckoo, the Colorado River fish, the Colorado Hookless Cactus, and MBTA protected bird species were made (Table 3):

Table 3 Summary of Effects Analysis for the Town of Palisade Sewer Transfer Combination Conveyance Line Project.

Scientific Name	Designation	Determination
Yellow-billed cuckoo *(Coccyzus americanus)*	ESA Threatened	No Effect
Yellow-billed cuckoo Critical Habitat	NA	No Effect
Bonytail (*Gila elegans*)	ESA Endangered	No Effect
Humpback chub (*Gila cypha*)	ESA Endangered	No Effect
Colorado pinkeminnow *(Ptychocheilus lucius)*	ESA Endangered	No Effect
Colorado pinkeminnow Critical Habitat	NA	No Effect
Razorback sucker *(Xyrauchen texanus)*	ESA Endangered	No Effect
Razorback sucker Critical Habitat	NA	No Effect
Colorado hookless cactus *(Sclerocactus glaucus)*	ESA Threatened	No Effect
Pinyon jay (*Gymnorhinus cyanocephalus*)	MBTA Protected	No Effect
Bald eagle (*Haliaeetus leucocephalus*)	MBTA and BGEPA Protected	No Effect
Virginia's warbler (*Leiothlypis virginiae*)	MBTA Protected	No Effect
Lewis's woodpecker (*Melanerpes lewis*)	MBTA Protected	No Effect
Evening grosbeak (*Coccothraustes vespertinus*)	MBTA Protected	No Effect

It should be noted that the final authority regarding species effect determinations rests with the appropriate regulatory authority.

References

Bennett, Jason and Douglas A. Keinath. 2014. Species assessment for yellow-billed cuckoo (*Coccyzus americanus*) in Wyoming. December 2003.

Colorado Parks and Wildlife. 2020. Western Yellow-billed Cuckoo. https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/PrioritySpecies/Factsheet-and-Habitat-Scorecard_YellowBilledCuckoo.pdf. Accessed 22 September 2021.

Cornell. 2019a. Pinyon Jay: Life History. https://www.allaboutbirds.org/guide/Pinyon_Jay/lifehistory. Accessed 20 September 2021.

Cornell. 2019c. Virginia's Warbler: Life History. https://www.allaboutbirds.org/guide/Virginias_Warbler/lifehistory. Accessed 20 September 2021.

Cornell. 2019d. Evening Grosbeak: Life History. https://www.allaboutbirds.org/guide/Evening_Grosbeak/lifehistory. 11 October 2021.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. Simon and Schuster, Inc. New York, New York.

Federal Register, 86 FR 20798 (Federal Register). 2021. Department of the Interior, Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo. https://www.govinfo.gov/content/pkg/FR-2021-04-21/pdf/2021-07402.pdf. Accessed 11 October 2021.

Federal Register, 59 FR 13374. 1994. Department of the Interior, Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub and Bonytail Chub. https://www.fws.gov/carlsbad/SpeciesStatusList/CH/19940321_fCH_BOCH.pdf. Accessed 11 October 2021.

Kingery, H.E. 1998. *Colorado Breeding Bird Atlas*. Colorado Breeding Bird Atlas Partnership and Colorado Division of Wildlife.

Righter, R., R. Levad, C. Dexter, and K. Potter. 2004. *Birds of Western Colorado Plateau and Mesa County*. Grand Valley Audubon Society. 214 pp.

U.S. Fish and Wildlife Service (USFWS). 2011. Bald Eagle (*Haliaeetus leucocephalus*). https://www.fws.gov/arcata/es/birds/baldEagle/b_eagle.html. Accessed 20 September 2021.

USFWS. 2014. "Razorback Sucker (*Xyrauchen texanus*) fact sheet." *USFWS Nevada Fish and Wildlife Office*. https://www.fws.gov/nevada/protected_species/fish/species/rzbk_sucker.html. Accessed 11 June 2021.

USFWS. 2017. Species Information: Yellow-billed Cuckoo (*Coccyzus americanus*). https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B06R. Accessed 11 June 2021.

USFWS. 2021a. Western Colorado Ecological Services Field Office: IPaC Species List. https://ecos.fws.gov/ipac/. Generated 30 August 2021.

USFWS. 2021b. Yellow Billed Cuckoo Critical Habitat: Unit 55: CO-2 Colorado River 3 Mesa County, Colorado. https://www.fws.gov/sacramento/outreach/public_advisories/WesternYellow-BilledCuckoo/maps/CO/EA_YBCUunit55_CO_2.pdf. Accessed 15 October 2021.

USFWS. 2021c. Wyoming Ecological Services Office: Colorado River Fish. https://www.fws.gov/wyominges/Species/CORivFish.php. Accessed 14 July 2021.

USFWS. 2021d. Fish and Aquatic Conservation: Colorado pikeminnow. https://fws.gov/fisheries/freshwater-fish-of-america/colorado_pikeminnow.html. Accessed 14 September 2021.

USFWS. 2021e. Mountain Prairie Region Endangered Species: Plants. Colorado Hookless Cactus. https://www.fws.gov/mountain-prairie/es/coloradoHooklessCactus.php. Accessed 11 October 2021.

USFWS. 2021f. Species Status Assessment Report for Colorado hookless cactus (*Sclerocactus glaucus* and *Sclerocactus dawsonii).* https://www.fws.gov/mountain-prairie/es/species/plants/ColoradoHooklessCactus/20210712_FWS_SCL_SSA_final_508.pdf. Accessed 12 October 2021.

U.S. Natural Resource Conservation Service (NRCS). 2021. *Web Soil Survey*. Retrieved from Soils Report: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Generated 29 September 2021.

Wiggins, D. 2005. Yellow-billed cuckoo (*Coccyzus americanus*): a technical conservation assessment. *USDA Forest Service, Rocky Mountain Region*. http://www.fs.fed.us/r2/projects/scp/assessments/yellowbilledcuckoo.pdf. Accessed September 27 2021.

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 6 Cultural Resource Survey

FOR OFFICIAL USE ONLY: DISCLOSURE OF SITE LOCATIONS IS PROHIBITED (43 CFR 7.18)

CLASS III CULTURAL RESOURCES INVENTORY
OF THE PROPOSED
CITY OF PALISADE SANITARY SEWER ALIGNMENT PROJECT
MESA COUNTY, COLORADO
CULTURAL RESOURCES SUPPLEMENT TO THE ENVIRONMENTAL REPORT
[OAHP No. ME.RD.R1]

GRI Project No. 2021-10
22 July 2021

Prepared by

Carl E. Conner (Principal Investigator),
Nicole Inman (Project Historian)
and Barbara Davenport (Archaeologist)
✣ Grand River Institute ✣
P.O. Box 3543
Grand Junction, Colorado 81502
BLM Antiquities Permit No. C-52775

Submitted to

United States Department of Agriculture
Rural Development
St. Louis, Missouri

MANAGEMENT SUMMARY

At the request of the USDA Rural Development (Agency) and J-U-B Engineers (JUB), Grand River Institute (GRI) conducted a Class III (intensive) cultural resources inventory of the proposed Town of Palisade Sanitary Sewer Alignment in Mesa County, Colorado. The project is located on private land and consists of a linear route proposed to be disturbed by pipeline construction. The overall width of the proposed surface disturbance by the construction is 50ft. The field inventory occurred between 15 May and 15 July 2021, and included the inspection of 5.1 miles of proposed sewer line between Clifton and Palisade. The inspection corridor was buffered to 200 feet wide and was centered on the proposed alignment. It includes a total of 125 linear acres of private land. Field and office work were conducted by Carl Conner (Principal Investigator), Barbara Davenport, Nicole Inman, and Natalia Conner.

A prefield/files search for known cultural resources in the project area was made through the Office of Archaeology and Historic Preservation's on-line COMPASS database. This review indicated that four cultural resource sites were previously recorded within the corridor: 5ME.775, listed as the Whitman, Pattie and Gunnison Expeditions; Grand Valley Canal segments 5ME.4680.1 and 5ME.4680.38; 5ME.11841, Government Highline Canal Bridge; and, 5ME.16536, Palisade Migratory Labor Camp. It was determined that site 5ME.11841, the Government Highline Canal Bridge had been mis-plotted and is outside of the project area. No further consideration was given for this resource.

Results of the present fieldwork included the revisiting and reevaluation of previously recorded sites 5ME.775, 5ME.4680, and 5ME.16536. Site 5ME.775 has been declared officially not eligible and was not relocated within the current project. No further work is recommended. A segment of the Grand Valley Canal, 5ME.4680.78, was newly recorded. The Grand Valley Canal, as part of the larger Grand Valley Irrigation System, has been determined to be eligible for listing on the National Register of Historic Places under Criterion A and C. The current project concurs with those determinations. The canal will not be impacted by the project and no further work is necessary.

Site 5ME.16536, the Palisade Migratory Camp, was declared officially eligible in 2008. The site was revisited and found to have been previously mis-plotted. The location was corrected and the site re-mapped. There is no change to its previous eligible evaluation. Any ground disturbance within the site boundary should be monitored for subsurface cultural remains.

Thirty five land parcels with historic residences (5ME.23686-5ME.23720), and the CCC Camp Mesa / WWII POW Camp / Palisade Wastewater Lagoons (5ME.23723) were newly recorded. These resources are field evaluated as not eligible and no further work is recommended.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

History Colorado-Office of Archaeology and Historic Preservation

COLORADO CULTURAL RESOURCE SURVEY

Cultural Resource Survey Management Information Form

I. PROJECT SIZE

Total federal acres in project			Total federal acres surveyed	
Total state acres in project			Total state acres surveyed	
Total private acres in project	31.3		Total private acres surveyed	125.4
Total other acres in project			Total other acres surveyed	

II. PROJECT LOCATION

County: Mesa County

USGS Quad Maps: Clifton and Palisade

Principal Meridian: Ute

Township	1S		Range	1E	Section	01		SE	1/4		SE	1/4
Township	1S		Range	1E	Section	12		NW	1/4		NE	1/4
Township	1S		Range	1E	Section	12		NE	1/4		NE	1/4
Township	1S		Range	1E	Section	12		SE	1/4		NW	1/4
Township	1S		Range	1E	Section	12		SW	1/4		NE	1/4
Township	1S		Range	1E	Section	12		SE	1/4		NE	1/4
Township	1S		Range	1E	Section	12		NE	1/4		SW	1/4
Township	1S		Range	2E	Section	03		NW	1/4		NW	1/4
Township	1S		Range	2E	Section	03		NE	1/4		NW	1/4
Township	1S		Range	2E	Section	03		SE	1/4		NW	1/4
Township	1S		Range	2E	Section	03		SW	1/4		NW	1/4
Township	1S		Range	2E	Section	04		NE	1/4		NE	1/4
Township	1S		Range	2E	Section	04		SW	1/4		NW	1/4
Township	1S		Range	2E	Section	04		SE	1/4		NW	1/4
Township	1S		Range	2E	Section	04		SW	1/4		NE	1/4
Township	1S		Range	2E	Section	04		SE	1/4		NE	1/4
Township	1S		Range	2E	Section	05		SW	1/4		NE	1/4
Township	1S		Range	2E	Section	05		SE	1/4		NE	1/4
Township	1S		Range	2E	Section	05		NW	1/4		SW	1/4
Township	1S		Range	2E	Section	05		NE	1/4		SW	1/4
Township	1S		Range	2E	Section	05		NW	1/4		SE	1/4
Township	1S		Range	2E	Section	05		NE	1/4		SE	1/4
Township	1S		Range	2E	Section	05		SE	1/4		SW	1/4
Township	1S		Range	2E	Section	05		SW	1/4		SW	1/4
Township	1S		Range	2E	Section	06		SW	1/4		SE	1/4
Township	1S		Range	2E	Section	06		SE	1/4		SE	1/4
Township	1S		Range	2E	Section	06		SW	1/4		SW	1/4
Township	1S		Range	2E	Section	06		SE	1/4		SW	1/4
Township	1S		Range	2E	Section	07		NW	1/4		NW	1/4
Township	1S		Range	2E	Section	07		NE	1/4		NW	1/4
Township	1S		Range	2E	Section	07		NW	1/4		NE	1/4

Township	1S		Range	2E	Section	07		NE	1/4		NE	1/4
Township	1S		Range	2E	Section	07		SW	1/4		NW	1/4
Township	1S		Range	2E	Section	08		NE	1/4		NE	1/4

III. SITES

Smithsonian Number	Resource Type				Eligibility				Management Recommendations						
	Prehistoric	Historic	Paleontological	Unknown	Eligible	Not Eligible	Need Data	Contributes to a District	No Further Work	Preserve / Avoid	Monitor	Test	Excavate	Archival Research	Other
5ME.775		X				X			X						
5ME.4680.78		X			X				X						
5ME.16536		X			X					X	X				
5ME.23686		X				X			X						
5ME.23687		X				X			X						
5ME.23688		X				X			X						
5ME.23689		X				X			X						
5ME.23690		X				X			X						
5ME.23691		X				X			X						
5ME.23692		X				X			X						
5ME.23693		X				X			X						
5ME.23694		X				X			X						
5ME.23695		X				X			X						
5ME.23696		X				X			X						
5ME.23697		X				X			X						
5ME.23698		X				X			X						
5ME.23699		X				X			X						
5ME.23700		X				X			X						
5ME.23701		X				X			X						
5ME.23702		X				X			X						
5ME.23703		X				X			X						
5ME.23704		X				X			X						
5ME.23705		X				X			X						
5ME.23706		X				X			X						
5ME.23707		X				X			X						
5ME.23708		X				X			X						
5ME.23709		X				X			X						
5ME.23710		X				X			X						
5ME.23711		X				X			X						
5ME.23712		X				X			X						
5ME.23713		X				X			X						
5ME.23714		X				X			X						
5ME.23715		X				X			X						

Smithsonian Number	Resource Type				Eligibility				Management Recommendations						
	Prehistoric	Historic	Paleontological	Unknown	Eligible	Not Eligible	Need Data	Contributes to a District	No Further Work	Preserve / Avoid	Monitor	Test	Excavate	Archival Research	Other
5ME.23716		X				X			X						
5ME.23717		X				X			X						
5ME.23718		X				X			X						
5ME.23719		X				X			X						
5ME.23720		X				X			X						
5ME.23723		X				X			X						

IV. ISOLATED FINDS

Smithsonian Number	Resource Type			
	Prehistoric	Historic	Paleontological	Unknown
None				

Smithsonian Number	Resource Type			
	Prehistoric	Historic	Paleontological	Unknown

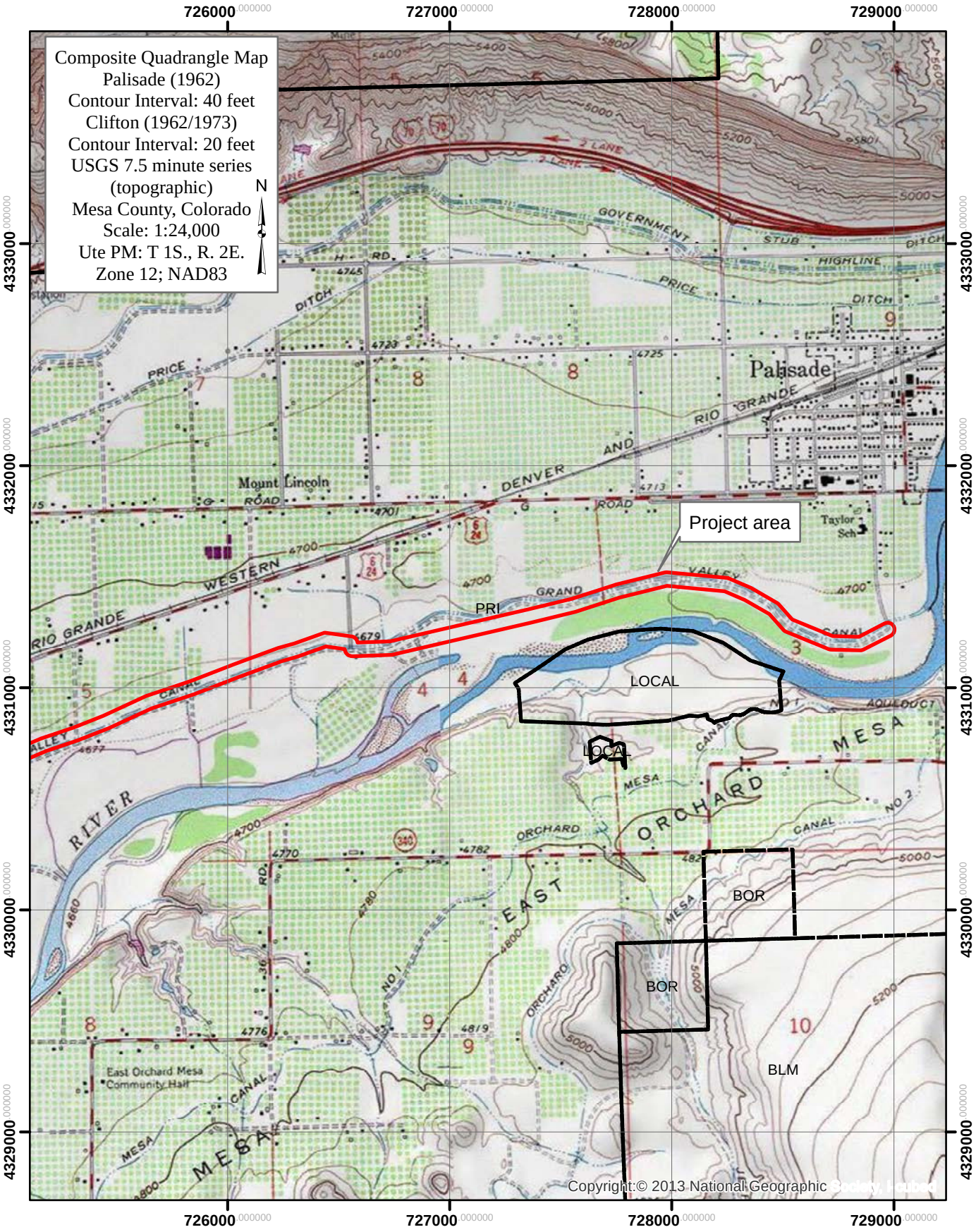


Figure 1. Project location map (1 of 2) for the Class III Cultural Resources Inventory of the Proposed Town of Palisade Sanitary Sewer Alignment Project Mesa County, Colorado. The project area is indicated. (OAHP No. ME.RD.R1; GRI Project No. 2021-10)

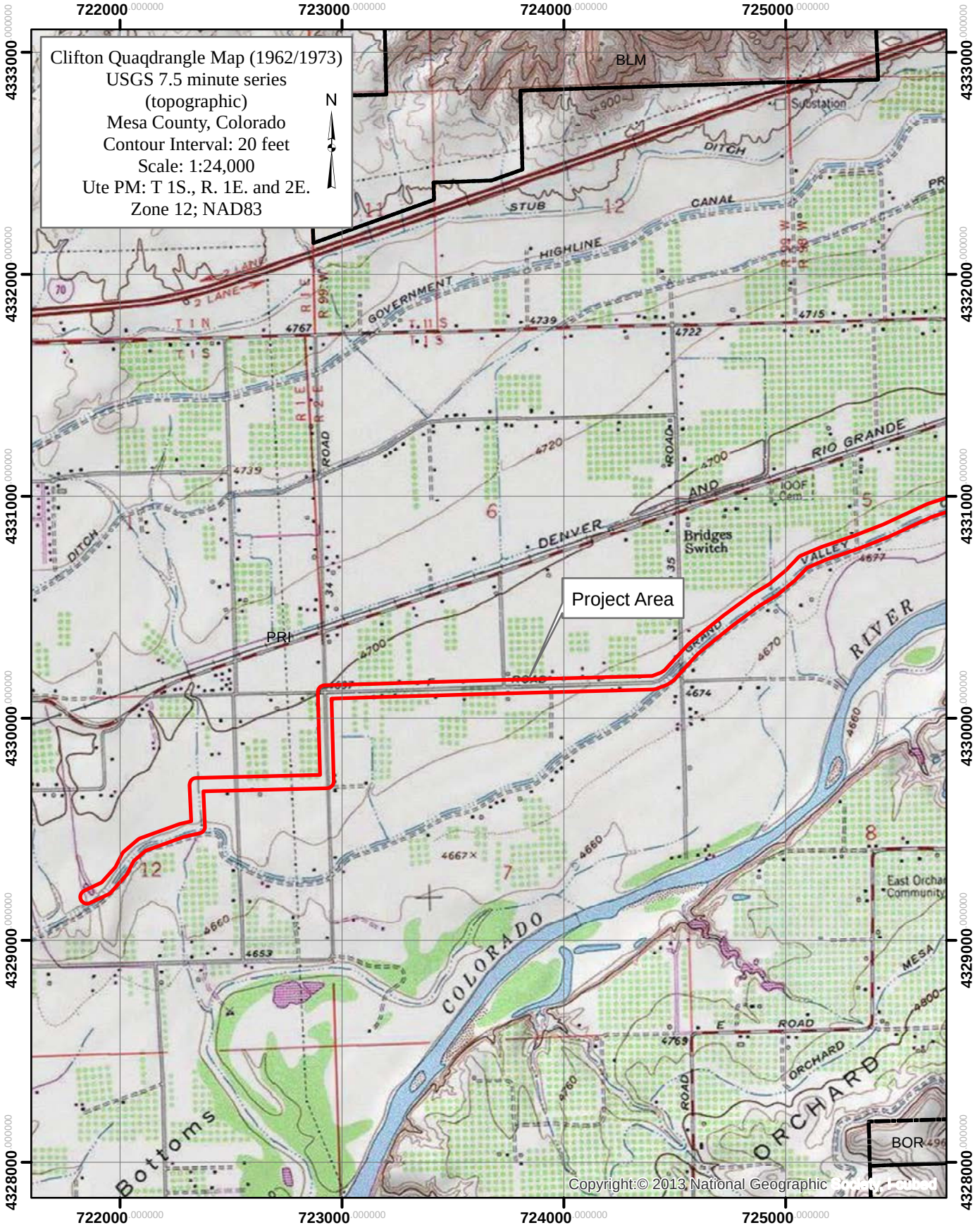


Figure 2. Project location map (2 of 2) for the Class III Cultural Resources Inventory of the Proposed Town of Palisade Sanitary Sewer Alignment Project Mesa County, Colorado. The project area is indicated. (OAHP No. ME.RD.R1; GRI Project No. 2021-10)

INTRODUCTION

At the request of the USDA Rural Development (Agency) and J-U-B Engineers (JUB), Grand River Institute (GRI) conducted a Class III (intensive) cultural resources inventory of the proposed Town of Palisade Sanitary Sewer Alignment in Mesa County, Colorado. The project is located on private land and consists of a linear route proposed to be disturbed by pipeline construction. The overall width of the proposed surface disturbance by the construction is 50ft. The field inventory occurred between 15 May and 15 July 2021, and included the inspection of 5.1 miles of proposed sewer line between Clifton and Palisade. The inspection corridor was buffered to 200 feet wide and was centered on the proposed alignment. It includes a total of 125 linear acres of private land. Field and office work were conducted by Carl Conner (Principal Investigator), Barbara Davenport, Nicole Inman, and Natalia Conner.

For federally funded or licensed projects, such studies are done to meet requirements of Section 106 (54 U.S.C. § 306108) of the National Historic Preservation Act (54 U.S.C § 300101 et seq.), the National Environmental Policy Act of 1969 (42 U.S.C. 4321), Executive Order 11593 (36 F.R. 8921), the Historical and Archaeological Data-Preservation Act of 1974 (16 U.S.C. 469), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701), and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq., as amended). These laws are concerned with the identification, evaluation, and protection of fragile, non-renewable evidence of human activity, occupation, and endeavor reflected in districts, sites, structures, artifacts, objects, ruins, works of art, architecture, and natural features that were of importance in human events. Such resources tend to be localized and highly sensitive to disturbance.

LOCATION OF THE PROJECT AREA

The project location begins on Town of Palisade land at its east extension and proceeds roughly westward following and generally contained within the right of way of the Grand Valley Canal in Mesa County, Colorado. The study area lies within portions of Sections 3, 4, 5, 6, 7 of T. 1 S., R. 2 E., and Sections 1 and 12 of T. 1 S., R. 1 E.; Ute P.M. (Figures 1 and 2).

ENVIRONMENT

In general, the project area is on the northeast margin of the Colorado Plateau physiographic province in west-central Colorado, which includes the Grand Valley and the surrounding mountainous terrain of the Uncompahgre Plateau to the south, the Book Cliffs and Roan Plateau to the north, and Grand Mesa to the east. The proposed sewer line lies within the Grand Valley, a broad valley carved by the Colorado River and its tributaries

through the weak Mancos Shale that is its bedrock (Young and Young 1977:48). Deposits of alluvium, old gravels, rock-glacier and colluvium of Holocene and Pleistocene age occur within the Valley, which overlay and occasionally expose the Mancos Shale bedrock. In general, the local terrain may be characterized as a terraced bench of the Colorado River. Soils are rocky and silty loams.

Flora

Elevation of the study area ranges from 4640 to 4700 feet which places it within the Upper Sonoran Zone. Natural vegetation is nearly non-existent along the study corridor as it has been modified over the past 140 years by EuroAmerican settlement and development. Riparian vegetation occurs near the Colorado River at the east end of the study corridor and along small drainages and ditches. The riparian community includes cottonwood, box elder, tamarisk, willow, skunkbush, rabbitbrush, and greasewood are present, as well as reed grass, sedges, rushes, and cattail. Besides offering a plethora of floral resources, the riparian habitat attracts animals seeking food, water, and cover. In terms of resource use, the riparian habitat is the most valuable habitat in the Grand Valley. On the Valley floor, other natural vegetation includes stands of sagebrush, greasewood, shadscale, rabbitbrush and cacti and yuccas in its lower reaches (ca. 4350-5500 feet with an annual precipitation range of 8 to 14 inches).

Fauna

The diversity of habitat within and surrounding the study area provides for a variety of wildlife inhabitants: large and small mammals, waterfowl and other birds, amphibians, reptiles, and fish. Use of the area is both year round and seasonal; large mammals and waterfowl tend to migrate to the grassland and riverine environments in the fall and winter, while other wildlife is present throughout the year.

Of the large mammals inhabiting the area, mule deer are the most numerous and most frequently seen. Grazing the high slopes and meadows of the Bookcliffs and the Grand Mesa in summer, these ungulates move to lower elevations when the temperatures drop. Nearly all of the lower slopes (those below 7300 feet) and terraces flanking the major rivers provide suitable winter range – and often critical winter range (Burkhard and Lytle 1978:107). Although most of the mule deer population follows a migrational pattern, occasional small groups browse along the river bottoms year-round.

Other large mammals present in the surrounding mountainous areas include elk, desert bighorn sheep, black bear, and mountain lion. Most of the elk spend summers at higher elevations and winters on the lower slopes (generally below 9000 feet) bordering the river (Burkhard and Lytle 1978:117). It is probable that, prehistorically, both elk and deer summer range extended below that of present populations, but overgrazing by domestic livestock has depleted the native grasses such that sufficient lower elevation summer range no longer exists.

Small mammals that frequent the lower elevations include prairie dog, Apache pocket mouse, and house mouse where soils are sandier. Rodents found throughout the areas are the marmot, rock squirrel, least chipmunk, Colorado chipmunk, harvest mouse, canyon mouse, deer mouse, pinyon mouse, and porcupine. The beaver and muskrat are inhabitants of riparian environments both along the river and in higher streams. Also, the whitetail jackrabbit and desert cottontail are commonly seen at the lower elevations. Hares and rabbits constitute a large portion of the small mammal population. The small rodents and lagomorphs of the area are important prey species for the diurnal predators of the area (Burkhard and Lytle 1978:117).

Avian species known in the study areas include waterfowl, raptors, upland game birds, and a variety of smaller birds. Along the rivers, harbored in sloughs and marshes, are many resident and migrant waterfowl species, including the Canada goose and numerous ducklike birds: the mallard, gadwall, pintail, green-winged teal, bluewinged teal, cinnamon teal, American wigeon, northern shoveler, ringnecked, redhead, canvasback, lesser scaup, common goldeneye, Barrow's goldeneye, bufflehead, ruddy, common merganser, and redbreasted merganser (ibid.). The most common of the resident waterfowl are the mallard and the greenwinged teal. Raptors reported in the vicinity include the turkey vulture, the redtail and other hawks, the golden eagle, the bald eagle, the prairie and peregrine falcons, the American kestrel (most common of the raptors), and several owl species. These birds prey on the abundant small mammals and aquatic resources available. The most common game birds identified locally by the Colorado Division of Wildlife are the bandtailed pigeon, mourning dove, blue grouse, turkey, ringnecked pheasant, and chukar. The last two are introduced species (ibid.). Numerous small, non-game birds occur in the area as well.

Climate

The climate of the Grand Valley is similar to that of most intermountain areas west of the Continental Divide in its aridity, wide range of daily temperatures, high percentage of bright sunny days, and high evaporation rate (U.S.D.A. Soil Conservation Service 1955). In this semiarid, cool desert environment, winters tend to be mild and summers hot and dry and render the area an attractive place to live year round. Over the Colorado River watershed (east of the Grand Valley), precipitation is recorded on an average of nearly 60 percent of the days. However, 50 percent of the annual precipitation occurs on only 16 percent of the days having precipitation (wrcc.dri.edu). Winter precipitation is derived from stratus-type clouds associated with large-scale frontal systems, whereas localized cumulus-type clouds produce most summer precipitation.

Aside from very local climatic variations within the valley, depending partly on elevation, aspect, and local exposure, climatic conditions at Grand Junction are probably representative of the area. Table 1 provides the average temperature for monthly/seasonal/ annual periods from 1900-2010, as reported by the Western Regional Climate Center. Grand Junction is situated at an elevation of 4593 feet and, in general, is relatively warm during summer months and cold during winter months. As elevations increase in surrounding terrain,

temperatures tend to decrease and precipitation increases. The highest elevations may receive up to 24 inches of precipitation per year. Over the winter months, snow accumulates above 8000 feet without completely melting until spring.

Table 1. Monthly climate summary for the Grand Valley from AD 1900-2010 (Western Regional Climate Center 2010). [Period of Record: 1/1/1900 to 7/31/2010. Percent of possible observations for period of record: Max. Temp.: 99.9% Min. Temp.: 99.9% Precipitation: 99.9% Snowfall: 99.9% Snow Depth: 99.8%]

Month	Max. Temp. (F)	Min. Temp. (F)	Total Precip. (in.)	Total SnowFall (in.)	Snow Depth (in.)
Jan	36.5	15.9	0.60	6.0	1
Feb	44.6	23.3	0.57	3.8	1
Mar	55.1	31.2	0.82	3.0	0
Apr	65.2	39.2	0.79	0.9	0
May	75.6	48.2	0.79	0.1	0
Jun	86.9	57.2	0.45	0.0	0
Jul	92.9	64.1	0.60	0.0	0
Aug	89.5	62.0	0.99	0.0	0
Sep	80.6	53.0	0.96	0.0	0
Oct	67.3	41.0	0.91	0.4	0
Nov	51.3	28.3	0.63	2.3	0
Dec	38.8	18.5	0.59	5.1	1
Annual	65.3	40.2	8.70	21.6	0

CULTURAL HISTORY

North America's first human explorers arrived near the close of the Pleistocene as early as 18,000 years ago traveling by passage along Beringia the continental land bridge between what is now Siberia and Alaska. As craniometric evidence has indicated, the immigrants were diverse in origin, identified as belonging to various populations found in Asia and along the Pacific Rim. Specifically, northern and central Asians, people who later occupied the Polynesian islands, and the Ainu who later resided on the islands of northern Japan have been identified as the earliest ancestors of the Native Americans. The number of these colonists was apparently small because evidence of the first incursions is scant. However, the fact that they rapidly spread across the continents of North and South America is found in excavations at Meadowcroft Rockshelter Pennsylvania (Adovasio et al. 1990) and at Monte Verde in Chile (Dillehay 1984), sites which date to about 18,000 and 14,000 years ago

respectively. Consensus has emerged that the dating of Monte Verde is valid; however, the dating of Meadowcroft continues to be the subject of debate (Haynes 1980, 1991). In any case, such finds suggest a pre-Clovis colonization of the Americas.

Prehistory Background

Local and regional archaeological studies indicate nearly continuous human occupation of west-central Colorado for the past 12,000 years. The prehistory of the region is outlined in the Colorado Council of Professional Archaeologists' *Colorado Prehistory: A Context for the Northern Colorado River Basin* (Reed and Metcalf 1999), and in the *Archaeological Monitoring and Data Retrieval for the Collbran Pipeline Project* (Conner et al. 2014). Discussed therein are manifestations of the Paleoindian Era big-game hunting peoples (ca. 11,500 - 6400 BC); Foothill-Mountain Tradition (ca. 9500-6500 BC); Paleoarchaic transition period (ca. 7500-5500 BC); the Archaic Era (Early, Middle, Late) hunter/gatherer groups (ca. 6500 - 400 BC); the Formative Era horticulturalist/forager (Fremont, Anasazi, Avonlea) cultures (ca. 400 BC- AD 1300); the Early Numic and Athabaskan hunter/gatherers (ca. AD 1300 - AD 1650); and, the early historic horse-riding nomads (Late Numic, Athabaskan, Plains cultures) ca. AD 1650 - AD 1920). Historic records indicate occupation or use by Euro-American trappers, settlers, miners, farmers, and ranchers as well. An overview of the history of the region is provided in a document published by the Colorado Council of Professional Archaeologists entitled *Colorado History: A Context for Historical Archaeology* (Church et al. 2007).

Reed and Metcalf (1999) summarize the prehistoric occupation in the Northern Colorado River Basin. They report that the earliest Paleoindian era sites in this Basin are identified based on projectile point style and subsistence strategies associated with Pleistocene megafauna. Dating roughly between 13,400 and 12,500 BP [cal.], "no Clovis tradition artifacts have been discovered in association with Pleistocene mega-fauna in the study area" (ibid:56). In Western Colorado, it is generalized that the area "was occupied by Foothill-Mountain complex peoples following the Folsom tradition, possibly between 15,000 and 7500 BP [cal.]... [with] higher frequencies of Great Basin Western Stemmed complex projectile point types than Plains projectile point types" (ibid:57). Unpredictable or high water flows during the Paleo-Indian Period probably limited a stable depositional context along much of the Gunnison River and the broader valley and foothills to the north may have been more usable.

The Archaic Era, as reviewed by Reed and Metcalf (1999:71), "includes radiocarbon ages from 107 sites in the database, with radiocarbon ages between 8400 and 2000 BP," and is characterized as a hunter-gatherer life way that was less mobile than that of the Paleoindian Era and that was based on a seasonal utilization of locally available resource. Technological introductions include increasing use of groundstone and projectile point diversity. Both sheltered and open camps feature slab-lined pits.

The occurrence of storage and habitation structures in this region has only in recent years been documented, primarily due to cultural resource management projects. A recent study by Metcalf and Reed (ed. 2011:139) detailed data from a sample of 65 house pits with occupations spanning nearly the entire Archaic Era in Northwest Colorado. House pit ages ranged from the oldest at 8170 to 8022 cal BP (5MF6255) to the youngest at 3970 to 3560 cal BP (5MF.2990). Their best documented/dated houses in the sample have ages between 4835 and 8170 cal BP, and the majority of houses date between 5600 and 7100 cal BP (ibid.). Notably, the use of house pits was not observed for the period 3600-2500 BP in northwest Colorado during the UBL/WIC/REX projects.

Prior to their study, two of the oldest pithouses in Colorado were found in the Yarmony site near Kremmling and dated between 5380 and 4800 BC (cf. calibrations in Metcalf and Black 1991:57-58). Also, at altitudes of 8,000 feet or more in Colorado, what were apparently wattle and daub structures have been found in the Curecanti National Recreation Area near Gunnison (Cassells 1997) and at the Hill Horn and Granby sites near the town of Granby (Wheeler and Martin 1982). The Curecanti structures date between 3400 and 1500 BC (Cassells 1997:106-108). The Granby structures date to 2500 BC and the Hill Horn structures may date as early as 7000 and as late as 2500 BC (Wheeler and Martin 1982:24).

Such structures are known to occur in the Grand Valley area (near De Beque and Parachute) during the period ca. 3000-2700 BP (Berry et al. 2013). In the 2009-2010 archaeological monitor project for the Collbran Pipeline, which occurred around the west and south sides of Battlement Mesa, two pithouse structures were discovered in the sidewalls of the pipeline trench. One at site 5ME.16786 turned out to be of the same type as at 5GF126 – found at Battlement Mesa Community – and yielded essentially the same date, ca. 2770 BP. Another well defined pithouse was found at 5GF.16789 that dated ca. 4660 BP. Three or four levels of potential house pits were identified, but disturbance by natural erosion and pipeline construction precluded their complete documentation. These ranged in dates from about 5750 to 6000 BP. The structures had shallow, dish-shaped floors and several had associated storage cists (Conner et al. 2014). Also in the vicinity is site 5GF.1185 located in Parachute Creek canyon. Excavations there exposed evidence of house floors that dated ca. 3370 and 2920 BP (Conner et al. 2014:76).

Interestingly, recent excavations at the McClane Rockshelter, 5GF.741, located in the Roan Plateau just north of Loma, provided evidence that Middle Archaic McKean Complex groups were creating structures within rockshelters by constructing brush and/or pole walls around the perimeter of the overhang – essentially making sheltered houses. The interior exhibited a centrally located thermal feature, and lined and unlined storage pits. The evidence of these houses occurred in the two lowest stratigraphic units, which contained three occupation levels dating between ca. 4200-3000 BP. Winter occupation is surmised for these three habitations (Berry et al. 2013).

In the Southwest and portions of northwest Colorado, the Formative Era refers to a

subsistence focus on corn between 400 BC and AD 1300. Formative groups constructed habitations that were permanently occupied during growing seasons, built granaries and utilized pottery. Reed and Metcalf indicate that, based on the OAHP site files, two major clusters of Formative-era structures are found in western Colorado, one in western Rio Blanco and Moffat counties, and the other in the lower San Miguel and Dolores river drainage in western Montrose County. A third "less distinct" cluster is referenced as located south of Grand Junction in the vicinity of Glade Park (Berry et al. 2013:98). For Mesa County , an "isolated anomaly" may be a more apt interpretation of the rare appearance of Fremont and Anasazi rock art styles, isolated occurrences of ceramics, and sheltered masonry structures. It is more likely that during this period in the Grand Valley, the canyons, surrounding mountains, and plateaus there was a continuation of the subsistence strategy of the Archaic era, mainly because the study area has a combination of environmental factors – highly productive vegetation communities, low rainfall and short growing season – that make farming to support large groups an unpredictable and uneconomical subsistence strategy.

Reed and Metcalf (1999:146) describe the Protohistoric Era as the "aboriginal occupation of western Colorado between the end of horticultural-based subsistence practices of the Formative era and the final expulsion of the Ute to reservations in AD 1881. ...AD 1300 will be used as the start of the Protohistoric era, because so few people appear to have attempted to maintain a horticultural lifeway between AD 1300 and 1500. Furthermore, there is evidence of the immigration of a new hunting and gathering group about AD 1300" (Reed 1994).

Sites from this period are suggested by the presence of Desert Side-notched and Cottonwood Triangular projectile points and Uncompahgre Brown Ware ceramics. Reed and Metcalf (1999:146) also suggest that "before extensive exposure to Euro-American culture, these people constructed wickiups for shelter." However, there is growing evidence – indicated by the presence of metal axe-cut wickiup poles and late dendrochronological dates – that the Utes continued to construct wickiups long after the presence of Euro-Americans in the region (Martin and Brown 2010).

Euro-American Historic Background (Nicole Inman)

Historic use of the area by Euro-Americans started with the explorations by the Spanish beginning in 1540 with Don Francisco Vasquez de Coronado and continuing with Don Diego De Vargas in 1659, Juan de Rivera in 1761 to 1765, and finally Friars Dominguez and Escalante who traversed the Grand Valley in 1776. The Spanish explorers did not establish permanent settlements but were more interested in finding a new route to settlements and missions in California or locating the legendary Cities of Cibola. Some trade was established with the natives in the area allowing the Ute to become one of the first tribes to acquire the horse (Mehls 1988:7). The acquisition of horses, guns and other trade goods gave the Ute the ability to greatly expand their territory and become more efficient in hunting and warfare.

Fur traders and trappers soon followed the explorers; in 1828 Antoine Robidoux who established a trading post at the confluence of the Uncompahgre and Gunnison Rivers near what is now Delta Colorado (Mehls 1988:19). Other mountain men who exploited the presence of good trapping in western Colorado included Kit Carson, Jim Bridger and Jedediah Smith. As the trappers penetrated the country so did the traders, resulting in the rendezvous system where the trappers gathered at a central location to trade for goods and supplies. Eventually the traders established a system of trading posts that often became the beginnings of towns. The fur trade collapsed in the 1840s when fashions changed in Europe and on the east coast, drastically reducing the market for beaver pelts.

Government exploration was the next stage in Euro-American involvement in western Colorado, starting with the Fremont expeditions of 1843, 1845, 1848 and 1853 and the Gunnison survey for a transcontinental railroad in 1853. These expeditions helped to open the country to settlement as new routes to western Colorado were established. The influx of people to western Colorado increased greatly with the 1859 gold rush, resulting in mounting friction and conflict between Euro-Americans and Utes. Additional pressure was asserted on the Ute with the discovery of rich deposits of gold and silver in the San Juan Mountains in the 1870s. Tensions reached a climax in 1879 with the Meeker Incident and associated Battle of Milk Creek in which eleven men at the White River Agency were killed by Utes following the plowing of their horse racing track. Outcry over the killings resulted in the "final removal" of the Utes from Colorado in 1881 (Silbernagel 2011). Recent studies, however, have demonstrated that significant numbers of Utes remained in west central and northwest Colorado into the early decades of the twentieth century (Martin et al. 2011).

The late 1800s saw the progressive opening of Colorado to homesteading, ranching, farming, and mineral exploration. Prospecting and mining in particular went through several boom and bust cycles in the coming years. The Gold Rush to Pikes Peak in 1859 was short lived but was followed in the 1870s by a boom in silver mining that continued until 1893 when the Sherman Silver Act was repealed resulting in a precipitous decline in silver prices. Mining continued to be a leading economic factor in Colorado, as by 1893 the State had become the nation's leading coal producer (Church et al. 2007:112). Other types of mining also occurred in western Colorado including copper, marble and lead. However, with the exception of marble (some of which was used for the Colorado State Capitol Building and the Lincoln Memorial in Washington, D.C.), the mining of other metals and minerals did not achieve the production levels of silver, gold and coal.

Important to the development of west-central Colorado was the passing of the Indian Lands Preemption Act by the Colorado Legislature. Whereby, the settlers coming into the area could purchase land previously assigned to the reservation in Western Colorado. The monies secured from those sales funded the transfer of the Northern Utes to the reservation in Utah – with the caveat of any surplus going to the Indian Fund. Buyers of these lands paid a fixed price per acre and were not required to live on the land or make improvements, as was commanded under the Homestead Acts. Consequently, the first cattle ranchers, farmers and

miners came to the Grand Valley area in 1881 and settled it under exemptions (Moores 2000: ix).

Town of Palisade

Settlement of the Grand Valley focused on areas with easy accessibility to the water of the Grand River (later renamed the Colorado). J. P. Harlow was the first to settle at the east end, in the vicinity of Rapid Creek. William A. Pease is credited with being the first settler in Palisade in 1884 (Walker, ed. 2018:2). The town was originally known as "Palisades" but was shortened to Palisade when it was incorporated in 1904.

Railway System

By the late 1880s, it became clear that a railroad would be constructed between New Castle and Grand Junction, Colorado. The Denver & Rio Grande and Colorado Midland railroads struck a deal in late 1889. Both railways were trying to reach Grand Junction and the Rio Grande Western's standard gauge connection to Salt Lake. Rather than building two parallel routes, the decision was made to build one, jointly. In 1890, the Rio Grande Junction Railway was constructed along the toll road right-of-way between New Castle and Grand Junction, Colorado. Grand Junction became the regional headquarters for the D&RGW Railroad lines that extended east, south, and west into central Utah. The line's machine shops were completed in 1883 and additional facilities were completed by the late 1880s including a large roundhouse used for locomotive repair, additional repair facilities, switch yards, a station, and a water tank (Beebe and Clegg 1962). Although the last Colorado Midland train ran in 1919, the Rio Grande Junction was not merged into the D&RG until 1947.

Coal Mining

According to local history of the area, there were more than 15 mines operating in the vicinity of Palisade in the late 1800s and early 1900s. In 1884, George Smith opened the first mine in the Grand Valley, the Book Cliff Mine, located north of Grand Junction, followed by the Mt. Lincoln Mine (located north of Palisade) in 1899, Farmer's Union Mine in late 1899, the Garfield Mine (located northwest of Palisade) in 1904, and the Farmer's Riverside Mine (located east of Palisade) in 1905 (Young 2014:5). In 1894, Smith, along with his business partner, Alexander Struthers, constructed the Smith and Struthers Ditch, which took water from Plateau Creek, just above its confluence with the Grand River. It involved 1,485 feet of flume and a 14-inch pipe supported by cables hanging above the river (Bardell and Widener 2014:8). Newspapers reported that although the ditch was completed, it was never used (*The Palisade Tribune* 1923:1). Smith, an English immigrant who spent his boyhood working in English coal mines, died in Grand Junction in 1923 (ibid).

The oldest coal mine in the vicinity of Palisade was located in a wash near Rapid Creek and operated by Jim Poole (Young 2014:5). Most of the mines located in Palisade were

wagon mines, were low total production, and often worked with picks, loading the ore into wagons. It was common for peach growers who worked the orchards from April to September to transition to mining for winter coal and railroad supplies. Other early mines in the Palisade area include Blue Flame Mine (located in Rapid Creek), Old Palisade Mine, New Palisade Mine, Stokes Mine, Midwest / Red Arrow Mine, and New Midwest Mine (Young 2014:5-6).

Irrigation Projects

By the mid-1800s the Palisade area was identified as a place with unique geologic properties which made it prime land for cultivating orchard crops. From north at Mt. Garfield ten miles south to Orchard Mesa, warm winds are pushed down valley by DeBeque Canyon. These winds, along with the warmed soil from the slopes of the palisades, increase the growing season to approximately 182 days. In 1885, John P. Harlow of Rapid Creek, located east of Palisade, harvested a ton of peaches, whereas Grand Junction growers did not find similar success (Walker, ed. 2018:2). These katabatic winds are sometimes referred to as the "million dollar wind" for the economic benefit it creates.

William and Elihu Oldham are credited with one of the first attempts to bring water to agricultural land. The following is based on William Oldham's testimony, "Claim of the Grand Valley Irrigation Company," which was recorded in the Grand Valley Ditch company archives:

> In response to the need for water, local men started several irrigation projects. The first was called Grand Valley Ditch, conceived in late October 1881 by Palisade area ranchmen William Oldham, Elihu S. Oldham, William Cline, and John Biggles. This group decided where they would locate a headgate on the Grand River and began digging a ditch with picks and shovels in late 1881. This group decided where they would locate a headgate on the Grand River and began digging a ditch with picks and shovels late in 1881. When the river froze, they suspended operation until warmer weather. Despite their work, they did not have legal rights to the land where they dug the ditch until 1882 when they filed a claim in the county seat at Gunnison. They originally planned to extend the ditch only up to the city of Grand Junction, a distance of about twelve miles. It was to be a simple project to serve a simple purpose - getting water to their croplands as soon as possible. The major portion of this original Grand Valley Ditch was to be on a line north of its present location. The first survey was completed in the winter of 1882 and the plat recorded in Gunnison County on August 22, 1882. This survey, by J. A. Blouvelt, was later found to have the ditch running uphill and was corrected by a new survey in January 1883 (Davidson 1986:4).

Construction on the first irrigation systems began in 1882 with the Pacific Slope Ditch and the Mesa County Ditch. Soon after, work was started on the Grand Valley Canal. The

Grand Valley Canal diversion dam was built south of Palisade in 1883. By 1886, there were over 10,000 acres under cultivation. In 1886, the Pacific Slope, Independent Ranchman's (providing water to the town of Fruita and Lower Valley), and Mesa County ditches were joined with the Grand Valley Canal, watering approximately 45,000 (Albers 2016; Simonds 1994:4). By the late 1890s, pumping systems were being investigated.

In 1902, the United States Reclamation Service, a branch of the U.S. Geological Survey, was established. Sale of public lands and resources that were mostly located in the states that would benefit from the act provided the funds. Water-users would replenish the fund through interest free repayment of the cost of construction of projects. The withdrawal of lands from settlement prevented them from being dispersed before project construction (Simonds 1994:5). In 1904, the Palisade Irrigation District (PID) was formed and the Vineland pumping plant began operations. The PID is one of six irrigation districts established throughout the Grand Valley. In 1908, after tense negotiations with the Grand Mesa Land, Canal, and Power Company and the Orchard Mesa Construction Company, construction on the Grand Valley Project officially began (Albers 2016).

Additional complications to the project were encountered with orchardists in the Palisade area. The canal was to cut through several orchards, and the owners were concerned about damages. On January 26, 1909, the representatives of the Water Users Association and the Mesa County Irrigation District Land Owners Protective Association met to discuss the situation. At that time, the Protective Association presented a schedule of damages to the Water Users Association. Although the Water Users Association agreed with the terms and estimates of the Protective Association, the Secretary of Interior refused to accept the terms believing the estimates to be too high. This disagreement led to prolonged negotiations that resulted in investigation of several alternative routes for the canal through the area in question and several threats of condemnation of orchard lands. Negotiations lasted for several years, and on October 1, 1912, rights-of-way through the Mesa District finally passed to the Federal government (Simonds 1994:11-12).

Negotiations with the Water Users Association and the area's irrigation districts continued for several years without agreement being reached. In addition to negotiations with land owners for rights-of-way, negotiations for use of rights-of-way held by the Rio Grande Junction Railroad were also underway. Construction of the canal would require the railroad's approval of use of land in the railroad right-of-way. In addition, construction of the diversion dam would threaten the tracks during high water. To solve this problem, the Government agreed to raise the tracks five feet at the dam site. Work had to be done without causing any significant delays to rail traffic. After much negotiation and several designs and revisions, the plan was approved and the railroad and Government signed the agreement in August 1913 (Simonds 1994:13). By the end of 1917, the entire system of canals, tunnels, flumes, siphons, and laterals had been completed (ibid:19). Currently, the Grand Valley Project is operated by the Grand Valley Water Users' Association.

Agriculture

The first orchards in Palisade are attributed to "Colonel Christopher Columbus Bower" who planted pears, peaches, and apples in 1894. Prior to the development of irrigation systems, water was hauled by barrels from the Grand River by wagons (Walker, ed. 2018:3). In 1904, George Bowman won a silver medal at the International Exposition in St. Louis for apples grown in Palisade (ibid.). After the construction of the railroad, growers brought their produce for shipment across the nation. Fruit was kept cold with ice, which was loaded on the end of each railcar. In 1912, fruit shipments had grown to 1,242 rail cars (ibid).

> By the mid 1950s, over one and a half million bushels of peaches – primarily one variety – Standard Elberta – were produced and shipped via more than 3,000 refrigerated railcars – nicknamed "reefers." In the early 1960s, mechanical refrigeration replaced bunkers of ice in the reefers. Since 1975, refrigerated semi-trucks are used for commercial shipments of Palisade fruit (ibid).

Vineyards were grown on Rapid Creek and in the Vinelands east of Palisade in the early part of the 20th century for personal use. Prohibition, as well as a vine disease wiped out early grape production. Most of these early vineyards were replaced by fruit trees. Five fruit growers in Palisade, Curtis Talley, Fred Bracken, George Zimmerman, Ken Schmidt, and Ralph Blatnik diversified their fruit orchards with 19-20 acres of grapes in the mid-1970s. Colorado Cellars was established in 1989 by Rick and Padte Turley. They continue selling wines under Colorado Winery License No. 5, the state's oldest license.

CCC Camp BR-59

CCC camp, BR-59 Company nos. 868 and 2120, was established in 1936 for the purpose of reclamation work. From the *Bureau of Reclamation's Civilian Conservation Corps Legacy: 1933-1942*:

> Camp Mesa, BR-59, opened in October 1935, a few months after *Camp BR*-22, also assigned to the Grand Valley Project. The first occupants of Camp BR-59 consisted of a cadre from a U.S. Forest Service camp, F-16. By October 26, Mesa Camp reached its cull capacity with the arrival of a company from the Fifth Corps Area, consisting of youths from Virginia to Kentucky. In January 1936, Company No. 868 came in from Oklahoma to replace the resident company, which moved on to California.
>
> During the early days of the camp's existence, enrollees focused on cleaning up the camp site and building walkways and roads through it. Thereafter, efforts turned to the primary task of rehabilitating the aging Grand Valley Project irrigation system. Obsolete wooden water control structures and

a serious seepage problem in the canals required attention. Work crews replaced outdated control structures with concrete ones and placed concrete lining in the canals and laterals.

The work program for Camps BR-59 and *BR-22* was divided into three main divisions, based largely upon the project geography: The Canyon Division, the Orchard Mesa Division, and the Main Canal-Palisade Division. Although enrollees from Camp BR-59 worked on all three divisions, they spent most of their time on the latter one, which extended from the Grand Valley Diversion Dam to the Grand Junction airport.

The initial work on the Main Canal-Palisade Division of the project consisted of clearing the canal banks of willows, trees, and brush. In 1936, enrollees from Camp BR-59 also installed over 1,800 feet of reinforced concrete lining and, in some places, paving. Because the north bank of the Main Canal in the Palisades Division is practically perpendicular, concrete lining would not have been possible without the use of formwork. Instead, enrollees paved 3,100 linear feet of that bank with native sandstone grouted in place....

As in other camps, the CCC offered Camp BR-59 enrollees educational and recreational programs considered to be important for improving morale and personal development. A camp softball team participated in a league composed of teams from various CCC camps and several teams from Grand Junction. The recreation hall provided comfortable reading chairs, good lighting, and indoor games for the "long winter evenings." The camp boasted an orchestra and a newsletter, first published in July 1936. A new educational building erected in May 1938 provided much needed space for classrooms.

In March 1940, Reclamation contemplated the closure of Camp BR-59 due to cutbacks in the CCC budget. Various irrigation and drainage districts appealed to the Reclamation Commissioner John Page to keep the camp open. It remained in operation; but in early summer, the enrollees transferred to *Camp BR-81* on the Pine River Project for several months. In May 1941, personnel and enrollees from Camp BR-59 transferred to *Camp BR-81* for a second time, and once again the camp's future was uncertain due to curtailments in the CCC program.

In a June 7, 1941, memorandum from Regional Director W. J. Chiesman to Commissioner John Page, he wrote: "It would be very serious to lose the services of Camp BR-59 as a great amount of very necessary work must yet be done to keep the project going as it should. If the future determines that the camp must go, of course, I will manage as best I can but if at possible

> the camp should continue and it is so requested." The appeal proved in vain; Camp BR-59 never reopened.
>
> A photograph of the camp shows rigid wooden barrack buildings sited along the banks of the Colorado River. In addition to six large barrack buildings, there were a number of smaller structures, including two that were added in 1937. These consisted of a small sheet iron building that served as an oil and grease house, and a building that was moved from the Reclamation yards at Grand Junction for use as a tool room/cement storehouse. In October 1937, the mess hall burned down and was reconstructed with a better building.
>
> Following the closure, Camp BR-59 was transferred first to the U.S. Army Corps of Engineers in August 1942, and then to Reclamation. As of March 1944, the camp was being leased to United Fruit Growers Association. The final disposition is unknown (Pfaff 2010:A-261-263).

The United Fruit Growers Association was formed in 1923 by George W. Bowman, a Palisade resident and inventor of the Bowman picking sack. It was a strictly grower-run organization formed as an alternative to the Grand Junction Fruit Growers Association, which was a stock-based company and not a true co-operative. It was also the first to be set up under the Colorado Cooperative Marketing Law. It was operating continuously out of Palisade and for a time had a platform at Bridges Switch. Beginning in 1937, Fred Powell managed the organization after coming from the Paonia Fruit Growers Association.

World War II POW Camp

In 1943, there were reports of labor shortages due to the many effects of World War II. According to newspaper reports, a proposal to employ prisoners of war on Colorado farms gained the support of Governor Vivian. In answer to a query by officials of the seventh service command, the governor said he had no objection to the proposal if the army supervised and took care of the prisoners (*The Daily Sentinel* 1943a:7). By May, a local member of the Colorado Producers Cooperative, Fred Powell, addressed the Kiwanis club on the matter of labor shortages.

> Frankly, he said, the labor situation does not look good but much work is being done on the problem. This valley will need 4,500 men and women to harvest the peach crop. He then discussed several angles regarding employment of Italian prisoners of war, school children, Mexican nationals, Indians, and Jap labor (*The Daily Sentinel* 1943b:6).

In June, there were discussions to discuss wages that should be paid to laborers:

> The committee was selected at a recent wage conference held at the

court house to determine a prevailing wage basis to be used in efforts to bring into this valley the necessary workers for the harvest season. The choice of laborers seems to rest between Mexican nationals, internees from Japanese camps or Italian prisoners of war.

The recent labor meeting, which represented the various departments of farm and ranch workers, went on record as requesting that all camp space in this valley be utilized for prisoners of war to work in the peach and tomato harvests or for other necessary ranch work. It was decided that if available housing permits, a request will be made for 2,000 to be recruited as a labor pool for harvest help.

Sentiment of the growers was apparently in favor of bringing into the valley Italian prisoners of war of whom thousands are now in concentrations camps in this country. These prisoners are available for this type of work. They are a federal problem and will be guarded while in the valley. They would be sent to work in small groups under guard, and at the conclusion of the war period would be rounded up by the federal government and returned to their own land.

This plan is apparently favored here, and when the local committee meets Monday with the War Labor Board, it is understood a request will be placed for 2,000 of this type of prisoners (*The Daily Sentinel* 1943c:4).

Further reports indicated that "four former CCC camps are to be made available for the quartering of such prisoners, two camps at Lincoln Park; one at Fruita and the fourth at Palisade" (*The Daily Sentinel* 1943d:4).

According to a personal history,

I started my vacation on the day that the prisoners were to arrive. I do not remember the exact date, but it was late in August (1944, I believe) when the train rolled into Palisade. Quite a crowd of curiosity seekers had gathered. Among those in attendance were members of the Peach Board of Control and a few county and city officials. The Army officers got off the train first and met the officers of our delegation to get instructions. There was one captain, one second lieutenant, a master sergeant, and several other sergeants included among the eighty American soldiers. The Army guards then cleared spectators from an area near the train, and the German prisoners were unloaded and put into formation four abreast....

Our American soldiers and the German prisoners were housed in the old Civilian Conservation Corps camp along the Colorado River south of

Palisade. When we arrived at the camp, we found that no preparations had been made and that the grounds were grown up with weeds as high as our heads and the buildings had not been cleaned. We made a rush to town for shovels, hoes, and other tools, and then the Germans began cleaning up. By evening there was not a weed left on the place and most buildings had been swamped out.

There were 250 German prisoners including their officers and we had an army captain, one second lieutenant and several sergeants plus a number of guards, all armed with rifles. The prisoners had been captured in Africa from Field Marshal Erwin Rommel's *Afrika Korps*, and shipped to Trinidad, Colorado. We had read in the papers about the atrocities and the ferociousness of the Germans and wondered before their arrival about our safety in working around them. Many of the prisoners left at Trinidad were hard core characters and would do anything to escape, but we had absolutely no trouble with any of our group. One even called our captain and told him that one of our guards leaning against a tree down on the shore of the river had gone to sleep. The German did not want anything to happen to cause them to be returned to Trinidad (Zimmerman 1987:18-21).

Use of prisoners of war for farm labor continued into 1945.

The farm labor problem rests again this year in the hands of the state extension service. Carl Davis, Mesa county agent and representative of the extension service, Saturday stated that requests for a total of 590 German prisoners of war have been filed with the army authorities at Camp Carson. Of this number 315 would be quartered at the Palisade CCC camp; 250 will be brought in by the Mesa County Canners' association, to be quartered at the former Fruita CCC camp, and a request will be made for another 25 prisoners to be quartered at Fruita for use in the harvest of any essential food crop.

It was stated that 150 of the prisoners will be brought in from Delta, where they are no longer needed. The remainder of the prisoners are expected from Camp Carson, near Colorado Springs.

Elmer Smith, of Fruita, director of the farm labor problem for the western slope, plans to be in Fort Collins Monday to secure assignment of these prisoners to the valley for the busy harvest season. A request will also be made for the assignment of other "short term" prisoners employees for the valley in case they are needed to save the fruit crop.

There are now 130 Mexican nationals here and available for essential harvest work.

> Annually, several thousand transient workers arrive in the valley for this harvest season. During the recent war years, the number has not been so great, but Saturday it was announced at the transient camp near Palisade, that already three-fourths of the 200 cabins there were occupied and that more transients were arriving daily as the busy season nears. It was expected the camp would be filled by the middle of this week (Reeds 1945:16).

The article goes on to mention that between 1943 and 1944 many of the peach growers over the valley provided quarters for seasonal employees and that other workers came prepared to camp out at the orchards. There was also mention that army camp equipment was available for rental to growers as quarters for their workers (ibid).

Palisade Migratory Camp

The Bracero program was a series of laws and diplomatic agreements, initiated on August 4, 1942, when the United States signed the Mexican Farm Labor Agreement with Mexico. The agreement guaranteed decent living conditions (sanitation, adequate shelter, and food), and a minimum wage of 30 cents an hour, as well as protections from forced military service, and guaranteed part of the wages were to be put into a private savings account in Mexico.

> The agricultural department has approved a $120,910 contract awarded the Edmonds Construction company of Phoenix, Ariz., for construction of a camp for migrant farm workers at Palisade, Colo., C. H. Willson, regional director for the Farm Security Administration announced today....
>
> The project will include 200 tent platform shelters, a community center with recreation facilities and a clinic.
>
> Construction will begin within 30 days but the community probably will not be fully available for occupancy this autumn, Willson said. It will be the initial unit under a program that can be expanded as experience dictates, he said (*The Daily Sentinel* 1941:9).

The Child & Migrant Services organization was founded to coordinate services for migrant seasonal farm workers and their families in Mesa County. In 1948, The Colorado Council of Churches began work at the Palisade Labor Camp, enlisting the aid of local churches to address the basic needs of migrant workers, including clothing, food, medical care, education, recreation, and housing. In 1954-1955, the organization was informed that they could receive federal funds for health services they were providing. In response, the Palisade Woman's Club established the Mesa County Migrant Council consisting of representatives of clubs, churches, and government agencies. As a result, in 1955, a health service was established at the Palisade Labor Camp. In time, they would become known as

Child and Migrant Services. The Palisade Labor Camp was closed in 1962. The 200 residential units were sold to individual growers.

Area Water Treatment and Sanitation

In 1923, preliminary plans were implemented to establish a sewerage district for the Town of Palisade. At some point between 1954 and 1966, the Palisade wastewater lagoons were constructed. Clifton Sanitation District #2 was formed by an election in 1967 for the purpose of providing a sanitary sewage system, including collection lines and sewage treatment facilities to serve the residents of the sanitation district.

In April 2021, the town of Palisade signed an agreement to upgrade its sewer treatment by sending its wastewater to the Clifton Sanitation District. The town will continue to be responsible for the sewer lines and meters in town, as well as tap fees and industrial pretreatment. The town will also maintain control of its ability to approve developments within its jurisdiction (West 2021).

SUMMARY OF FILES SEARCHES

Files searches for known cultural resources in the project area were made on-line at the Office of Archaeology and Historic Preservation (COMPASS) website. These searches involved consultation of a variety of sources, including, but not limited to the archaeological and historical records database (COMPASS) at History Colorado, General Land Office (GLO) title patent records and survey maps, historic topographic maps, Federal census records, and newspaper articles, ethnographic records, and other records of any relevant federal or state land management agency(s). Searches of all of these sources are part of a standard pre-field research and essential to the post-field reporting and eligibility discussions. Investing this time before fieldwork assists in identifying and understanding the nature of sites that might be encountered during inventory and provide context for judging site eligibilities.

The file search conducted through the COMPASS website of the Office of Archaeology and Historic Preservation of History Colorado indicated 55 cultural resource inventories have been conducted within a mile of the project area. These are listed in Appendix A, Table A-1. Two-hundred, forty-four cultural resources have been previously recorded within a mile of the project area and are listed in Appendix A, Table A-2. Of these, only five occur within 200 feet of the project area: 5ME.775, 5ME.4680.1, 5ME.4680.38, 5ME.11841, and 5ME.16536.

Government Land Office (GLO) Files Search

A review of the General Land Office survey plats was completed; however, no indications of cultural features were found. Additionally, a search for title records was

completed. Table 2 provides of list of patents filed within the project area. A map showing the locations of the patents (Figure 3) and a general description of persons filing follows.

Table 2. List of General Land Office (GLO) patents filed within the project area.

Legal Location	Section	Patent Details	Date	Type
T. 1S., R. 1E.	1, 12	Oscar D. Reed (Document No. 586)	1892	Cash Entry
	12	Caltha Howard (Document No. 566)	1892	Cash Entry
		Margaret Oldham (Document No. 457)	1890	Cash Entry
		James Pender (Document No. 20)	1890	Cash Entry
T. 1S., R. 2E.	3	William A. Pease (Document No. 448)	1891	Cash Entry
	3, 4	George P. Spink (Document No. 277)	1892	Cash Entry
	4, 5	Lawrence D. Christopher (Document No. 150)	1888	Cash Entry
	5, 7	James T. Jones (Document No. 115)	1890	Cash Entry
	5	William F. Lay (Document 399)	1891	Cash Entry
		Charles G. Varian (Document No. 811)	1895	Cash Entry
	6	Lars Johnsen (Document No. 623)	1892	Cash Entry
		Edwin Kellar (Document No. 426)	1892	Cash Entry
	7	Bernard K. Kennedy (Document No. 149)	1887	Cash Entry
		Frank M. Welch (Document No. 488)	1892	Cash Entry

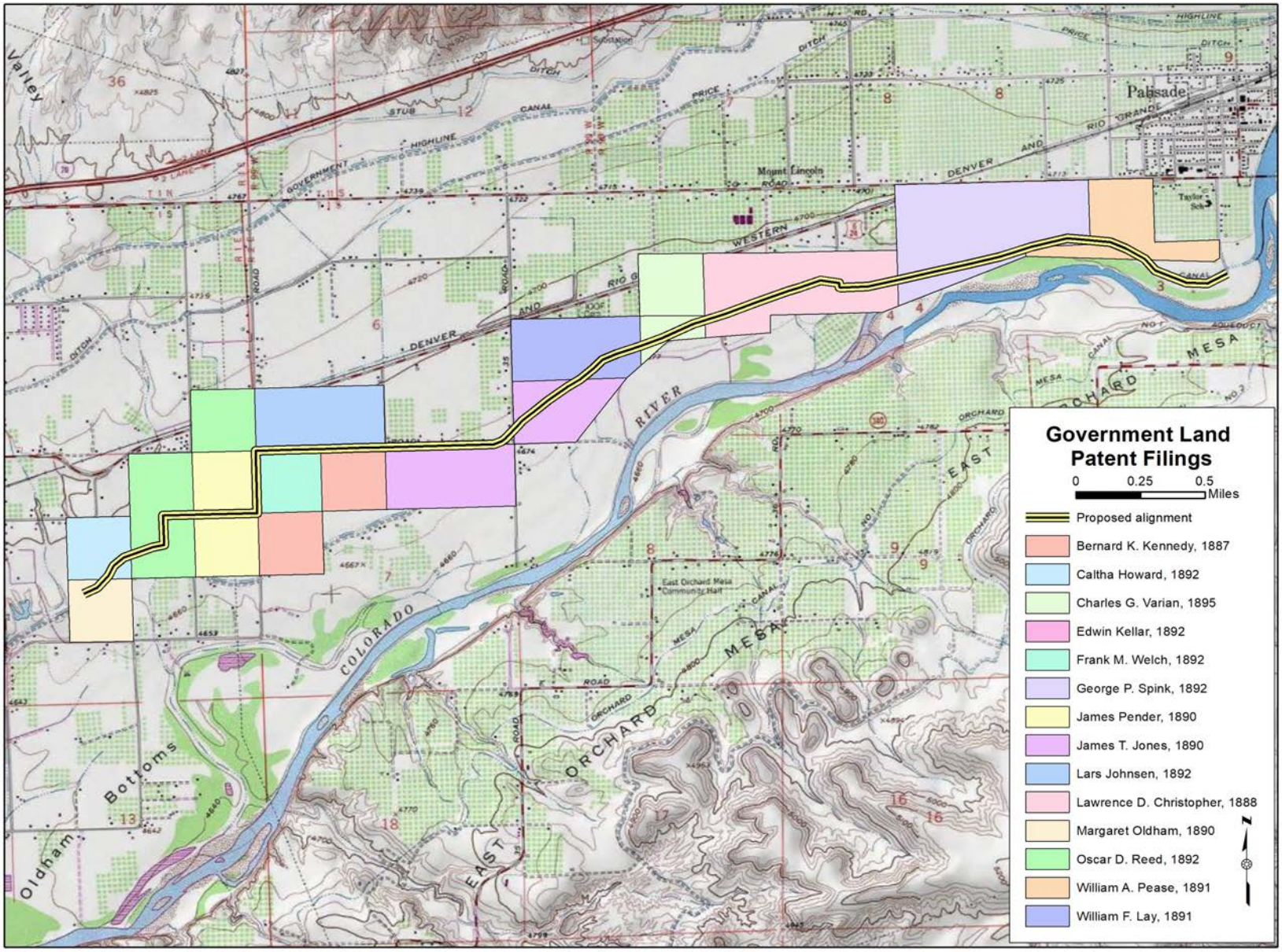


Figure 3. Map showing location of original homestead boundaries within project area

William A. Pease

William A. Pease is credited with being the first settler in Palisade in 1884 (Walker, ed. 2018:2). In 1891, he was appointed as US Postmaster for Palisades, Colorado. U.S. Federal Census records from 1900 indicate William Pease, age 64, was widowed and boarding in Grand Junction. He was working as a traveling clothing salesman. In 1891, a newspaper report indicates "W.A. Pease received a large invoice of seeds such as apple, peach, apricot, etc. He intends to plant the same this spring upon his fine ranch" (*Grand Junction News* 1891:4). Marriage records from Mesa County, Colorado indicate William A. Pease of Palisade, Colorado, married S. Edna Eldridge, of Mexico, Missouri, on February 7, 1892.

George P. Spink

Little information could be found for George Spink. A newspaper reported the following: "Joseph Dulmaine received a telegram this morning from St. Paul, Minn., announcing the death of George Spink, who was well-known here and was one of the early settlers in this valley" (*Grand Valley Star -Times* 1894:6). According to cemetery records, George P. Spink was born in 1838. He is buried in Calvary Cemetery in Saint Paul, Minnesota.

Lawrence D. Christopher

Cemetery records indicate Lawrence D. Christopher was born in 1850 in Wisconsin and died in Aspen, Colorado in 1899. Archival records indicate he was killed by a team of Bay Stallions (*Aspen Weekly Times* 3 June 1899). The inscription on his grave marker reads "Laurence D. Christopher Died May 30, 1899 age 49 yrs 4 ms 24 ds Rest in Peace Here lies a Woodman of the World."

James T. Jones

Colorado State Census records from District 1, Mesa County, Colorado, indicate James T. Jones was living in Mesa County in 1885. At that time, he was living with his wife, Caroline Jones. He was born around 1859 in Iowa. He was working as a farmer. The 1910 US Federal Census shows that he was living on Kimbell Creek Road in Collbran, Colorado with his brother, Aron F., who was the head of household. His marital status is listed as single and he was working as a laborer on a farm. In 1908, news of the Democratic Convention listed James Jones as a delegate to the state convention (*The Palisade Tribune* 1908:1).

William F. Lay

Information regarding William F. Lay is scant. In 1890, a newpaper reported on final proof of continuous residency and cultivation of the property in question. It was witnessed by Geo. P. Spink (*Grand Valley Star* 1890:5). No additional information could be found for Lay, other than a possible lawsuit filed against him to reclaim investment money attached to a mining operation (*The Eagle County Blade* 1899:3)

Charles G. Varian

No historical mentions of Charles G. Varian could be found other than notices of the

filing of land patents with the intent to seek final proof.

Lars Johnsen

Very little information could be found for Lars Johnsen. There were newspaper reports regarding Lars *Johnson* in the area of Palisade, who was the victim of a check cashing fraud perpetrated by Chris Anderson in 1913 (*The Palisade Tribune* 1913:1). He could not be located in federal census records.

Edwin Kellar

Marriage records from Mesa County indicate Edwin Kellar married Cora Bradbury, both from Grand Junction, in 1892. Ancestry records state that Thomas Edwin Kellar was born in 1869 in Austin, Texas. He was found residing in Camp, New Mexico in 1910 and died in Cochise, Arizona in 1943. They had three children, Eda Marie (1893-1979), Milton Russell (1896-1969), Irvin (1897-1975), Edwin Stanton (1909-1976). Census records show he lived in Erath, Texas in 1880, DeBeque, Colorado in 1900, and Camp, New Mexico in 1910 and in Arizona from 1920-1940.

Bernard K. Kennedy

B.K. Kennedy was involved in local business in the Grand Valley. In 1885, he bought half interest in business of W. I. Hammond (McCleod, ed. 2015:27). He was listed as the superintendent of the Grand Junction Street Railway Company in 1890 (*The Daily Sentinel* 1910: 8) and was an agent for the Continental Oil Company when they entered the oil business, offering oil at half the price of the competition (*The Colorado Daily Chieftain* 1890:2). *Grand Junction News* reported the installation of Bernard K. Kennedy as a Masonic officer to the Grand Junction Chapter No. 24 R.A.M. for the year (1892:8).

Frank M. Welch

Ancestry records show Frank M. Welch was born in Indiana in 1849. He married Florence Nightingale Steel in 1877 in Jasper, Missouri. The 1880 US Federal Census indicates he was living in Jasper with his wife and three children, Frank, age 7, Edwin R., age 2, and Edith, age 4/12. He was working as a bar tender. The 1910 US Federal Census shows the couple was living at 530 Ute Avenue in Grand Junction with daughter Eddith E., age 30, Pearl E., age 28, Eugene M, age 21, Earl Charles, age 16, and Evadna V., age 13. Frank was working as an agent in an insurance shop. Cemetery records show he died in 1911 in Grand Junction.

Oscar D. Reed

No historical mentions of Oscar D. Reed could be found other than notices of the filing of land patents with the intent to seek final proof.

Caltha Howard

Marriage records from Mesa County indicate Caltha Howard married A. L. Barnhouse in October, 1891 (Adelbert L. Barnhouse). The 1900 U.S. Federal Census indicates that they and their three children were living in Oregon in 1900. Cemetery records indicate she died in

1943 and was buried with her husband in Rainier, Washington.

Margaret Oldham

Colorado State Census records from District 1, Mesa County, Colorado, indicate Margaret E. Oldham was living in Mesa County in 1885. At that time, she was living with her siblings, E. S. [Elihu] Oldham, and brother, Wm. Oldham. She was born around 1859 in Pennsylvania. They worked as farmers.

In 1900, Margaret E. Kindt was living with her husband, Amos, a German immigrant, in Teller, Colorado. These records indicate they were married in 1891. They had three children, James Hanna, Anna M., and Amos O. Cemetery records indicated she died in 1910 and is buried in Santa Ana, California.

Elihu S. Oldham was born in 1847 and died in 1907 and is buried in Grand Junction. They were a Union Army Civil War veteran (CO. B., 140th Illinois Infantry). According to the US Federal Census of 1900, William [Vaughn?] Oldham was born in 1850 in Pennsylvania and married Minnie Elmira Reed in about 1890. They were living in Grand Junction and had three children, Myrtle, Willie, and Lois. He was working as a teamster at the time and was a member of Woodmen of the World. William died in 1915 and is buried in Palisade.

William and Elihu are credited with one of the first attempts to bring water to agricultural land. The following is based on William Oldham's testimony, "Claim of the Grand Valley Irrigation Company," which was recorded in the Grand Valley Ditch company archives:

> In response to the need for water, local men started several irrigation projects. The first was called Grand Valley Ditch, conceived in late October 1881 by Palisade area ranchmen William Oldham, Elihu S. Oldham, William Cline, and John Biggles. This group decided where they would locate a headgate on the Grand River and began digging a ditch with picks and shovels in late 1881. This group decided where they would locate a headgate on the Grand River and began digging a ditch with picks and shovels late in 1881. When the river froze, they suspended operation until wanner weather. Despite their work, they did not have legal rights to the land where they dug the ditch until 1882 when they filed a claim in the county seat at Gunnison. They originally planned to extend the ditch only up to the city of Grand Junction, a distance of about twelve miles. It was to be a simple project to serve a simple purpose - getting water to their croplands as soon as possible. The major portion of this original Grand Valley Ditch was to be on a line north of its present location. The first survey was completed in the winter of 1882 and the plat recorded in Gunnison County on August 22, 1882. This survey, by J. A. Blouvelt, was later found to have the ditch running uphill and was corrected by a new survey in January 1883 (Davidson 1986:4).

James Pender

According to the Mesa County Clerk and Recorder's Office, in 1883, James Pender transferred ownership of his property in Section 12, Township 1 South, Range 1 East to Sarah C. Pender. The document, recorded in Mesa County (Instrument no. 379) indicated that they were both residents of Chaffee County, Colorado. In 1885, Sarah C. Pender of Chaffee County, along with J.W. Yelton, filed a deed of trust in Mesa County with a promise to pay the sum of $500 at 1.5% interest per month to John S. Holsey.

According to his obituary, dated 21 July 1913, James was a former detective for the Ogden police department. He was appointed in 1894 until his retirement in 1912. After his retirement he was working as a special agent for express companies. His obituary was lengthy, including details about his "stirring life" as a plainsman, including his work as messenger at the military reservation in Fort Scott, Colorado and as a scout in the Indian wars with Gen. George A. Custer. "In 1868 he was with the Papoon scouts in the massacre of Black Kettle Indians in the Panhandle of Texas" and was friends with "Wild Bill" Hickok, and "California Joe." He is also said to have known William H. Cody. He moved to Utah in 1887. During his career as a detective, he was connected to several famous criminal cases including the capture of Sir Henry Cooper, a forger of international notoriety, whom he not only captured, but secured a confession that led to his conviction. He was congratulated by Scotland Yard for this apprehension. He also captured three members of the Maybray gang (*The Ogden Standard* 1913:6).

STUDY OBJECTIVES

The purposes of the inventory were to conduct an intensive cultural resources survey of the area potentially subject to disturbance by pipeline construction; to identify and accurately locate archaeological sites and/or districts and isolated finds; to evaluate these surface finds for inclusion on the National Register of Historic Places (NRHP); to determine the potential effect of the project on all NRHP-eligible resources; and to make recommendations for the mitigation of the adverse effects on those cultural resources. The presence of cultural resources was considered likely based on previously recorded sites in the vicinity.

FIELD METHODS

A Class III, 100% pedestrian, cultural resources survey of the proposed linear alignment was inspected at a width of 200 feet. The study area included a total of 125 acres of private land. The intensive survey was performed by two archaeologists using a 7.5' minute USGS quadrangle map as a field guide. The inventory was limited by the vegetation cover in portions of study area. Also, the proposed alignment primarily follows disturbed areas associated with the Grand Valley Canal and developed farmland.

Cultural resources were sought as surface exposures and were characterized as sites or

isolated finds. A site is the locus of previous human activity (50 year minimum) at which the preponderance of evidence suggests either a one-time use or repeated use overtime, or multiple classes of activities. For example: a) Isolated thermal feature such as hearths are to be designated as sites, due to the interpretable function of such utilization and the potential for chronometric and economic data of recovery; b) Single element rock art panels are to be designated as sites due to the interpretive nature of such an event and the potential diagnostic value of the motif; c) Similarly, isolated human burials are to be designated as sites; or, d) Loci exhibiting groundstone and flake stone in association.

An isolate refers to one or more culturally modified objects not found in the context of a site as defined above. Note that this definition makes no reference to an absolute quantitative standard for the site/isolate distinction. For example: a) A discrete concentration of flakes from the same material regardless of the number of artifacts present likely represents a single, random event and is properly designated as an isolate, or b) Similarly, a ceramic pot bust is to be recorded as an isolate, regardless of the number of shards that remain.

In general, sites are recorded by GRI using the following methods of mapping and note taking. The basic approach to data collection is the continuous mapping of observed artifacts and features by recording UTM coordinates (NAD 83 Datum) using a Trimble Geo XH (or 7X). Site maps are then created using corrected GPS data and ArcGIS. Photographs are taken of a recorded site or isolated find and include general site views and specific views of artifacts and/or features. For this project, in the case of the historic parcels on private land, the photos with the forms are from the Mesa County Assessor website. This methodology was utilized in the completion of the project.

Accordingly, documentation of the cultural resources was set to the SHPO standards, and the sites were reevaluated for eligibility for nomination to the National Register of Historic Places (NRHP). Field notes and digital photographs for this project are on file at Grand River Institute. No artifacts were collected during the course of the inventory work.

STUDY FINDINGS

The following section of the report presents a discussion of site significance evaluation and describes the recorded sites. Four cultural resource sites were previously recorded within the corridor: 5ME.775, listed as the Whitman, Pattie and Gunnison Expeditions; Grand Valley Canal segments 5ME.4680.1 and 5ME.4680.38; 5ME.11841, Government Highline Canal Bridge; and, 5ME.16536 , Palisade Migratory Labor Camp. It was determined that site 5ME.11841, the Government Highline Canal Bridge had been mis-plotted and is outside of the project area. No further consideration was given for this resource. Newly recorded are Grand Valley Canal segment 5ME.4680.78, 35 land parcels with historic residences (5ME.23686-5ME.23720), and 5ME.23723 CCC Camp Mesa / WWII POW Camp / Palisade Wastewater Lagoons. Detailed information for these resources is provided in Appendix B:

Cultural Resources Location Data and OAHP Forms (available at OAHP and USDA Rural Development).

Site Significance

The National Historic Preservation Act of 1966 (NHPA) directs federal agencies to ensure that federally-initiated or authorized actions do not inadvertently disturb or destroy significant cultural resource values. Significance is a quality of cultural resource properties that qualifies them for inclusion in the NRHP. The statements of significance included in this report are field assessments to support recommendations to the USACE and the State Historic Preservation Officer (SHPO). The final determination of site significance is made by the controlling agencies in consultation with the SHPO and the Keeper of the Register. The eligibility determination and consultation process is guided by Section 106 of the NHPA (36 CFR 60, 63, and 800). Inventory to identify, evaluate, and mitigate potential effects to cultural resources affected by an undertaking is the first step in the Section 106 process. Title 36 CFR 60.4 establishes the measure of significance that is critical to the determination of a site's NRHP eligibility, which is used to assess a site's research potential:

> *The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and* ***a)*** *that are associated with events that have made a significant contribution to the broad patterns of history; or* ***b)*** *that are associated with the lives of persons significant in our past; or* ***c)*** *that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or* ***d)*** *that have yielded, or may be likely to yield, information important in prehistory or history.*

Cultural Resource Descriptions

Site **5ME.775** is listed as the Whitman, Pattie and Gunnison Expeditions. The Expeditions are purported to have crossed the survey corridor at the west end of the project area. Remnants of the site were not observed in the field, and it is probable that the routes have been subsumed by modern roads and development.

<u>Evaluation and Management Recommendation</u>

There is no evidence of the historic trails within the present inventory corridor. The site has been determined officially not eligible (2010) by the State Historic Preservation Officer. There is no change to that assessment with the present project and no further work is recommended.

The current study intersects two segments of the Grand Valley Canal, **5ME.4680.1** and **5ME.4680.38** – titled as segments of the "Grand Valley Irrigation Company System," "Grand Valley Canal (Main Line)." The first segment was recorded in 1983 by Lewis Hyer. From that site form, the canal is described as follows:

> The irrigation canal has a construction date of 1882-1886 and is built mostly of earthen; some guniting (a spray-on concrete lining). In addition to serving agricultural lands on either side of it, the Grand Valley Canal delivers water to the Grand Valley High Line, Kiefer Extension and Independent Ranchmen's Ditch. These canals, plus the Mesa County Ditch, were consolidated under the Grand Valley Irrigation Company in 1894.

The site form further states regarding significance:

The canal dates from the 1880s, although all structures have been replaced and some of the canal has been lined, destroying the canal's original architectural integrity. Newer structures represent changes in irrigation design and construction techniques. The Grand Valley Canal (Main Line) is of more significance historically. It was constructed 1882-1886 and was one of the first imitation canals to be constructed in the valley (Pioneer and Pacific Slope Ditches, and Independent Ranchman's Ditch were also begun in 1882). As such, it has been of great importance to the development of the Grand Valley since its settlement.

According to Martorano and Hyer: "The Grand Valley Irrigation Company System (5ME.4680) is considered the most historically significant system in the [Grand] Valley and it meets criterion 36CFR60 4a for nomination to the National Register as a historic site. Included in the system are some of the earliest irrigation canals constructed in the Grand Valley: Grand Valley Canal (1882-1886), Grand Valley Highline Canal (ca. 1885), and Independent Ranchmens Ditch (1884) (Martorano and Hyer 1984).

The current project revisited the portion of the canal that extends through the project area, from the take out at the Colorado River, west to a point just west of County Road 34, recording it as segment 5ME.4680.78. It is regularly maintained and aging features of the canal have been upgraded as needed.

Evaluation and Management Recommendation

The Grand Valley Canal, as part of the larger Grand Valley Irrigation System, has been determined to be eligible for listing on the NRHP under Criterion A and C. The current project concurs with those determinations. The canal will not be impacted by the project and no further work is necessary.

Site **5ME.16536** is listed as the historic Palisade Migratory Labor Camp and was originally recorded in 2008 by RUS, the Rural Utilities Service (Farmers Home

Administration). The camp was mis-plotted and several aspects of the historic property were misidentified. Very little information describing the site was included on the original recording.

The site contains a historic marker which describes the site as follows:

> You are standing at the site of the former Palisade Migratory Labor Camp. The camp was established by the U.S. Department of Agriculture in 1941 in an effort to provide decent housing for migratory farm laborers.
>
> Since the early 1900's, local peach growers and packers in the Grand Valley have used temporary labor to help during the peach harvest. As more orchards were established, more and more labor was required. Thousands of people would come to the Grand Valley for two weeks a year to help pick, sort, pack and ship peaches.
>
> The Palisade Migratory Labor Camp was built for the laborers and their families to improve living conditions. Prior to the Labor Camp these groups would camp all over the Grand Valley during their stay. In 1948, the federal government sold the Labor Camp to several local agricultural commodity groups who immediately transferred it to the Palisade Peach Board of Control. The Board of Control managed the Camp until it was closed in the early 1960's. There are still several old building foundations on this site, but most of the buildings were sold to growers and moved onto their property.

The Palisade Migratory Labor Camp was constructed in 1941 to provide safe and sanitary housing for migrant labor workers. In addition to 200 sleeping cabins, the camp included a community center, a clinic, shower areas, washing and cooking areas, a basketball court, and horseshoe pits. According to a display at the Palisade History Museum, in 1943, the camp housed in excess of 800 people. The Mesa County Migrant Council, consisting of clubs, churches, and government agencies was formed in order to secure federal funds to support health services for migrant workers. In time, this organization would come to be known as Child and Migrant Services, which is still in operation today. The Palisade Labor Camp was closed in 1962 and the 200 residential units were sold to individual growers.

The site form from 2008 states, “While the camp was active for quite a few years, all structures were removed with the exception of a few concrete pads.” Within the current boundary of Palisade River Bend Park were two historic camps: site 5ME.16536, Palisade Migratory Labor Camp, located at the far west end of River Bend Park, and site 5ME.23723, CCC Camp Mesa BR-59 / World War II POW camp / Palisade wastewater lagoons, located at the east end of River Bend Park. The original records plotted site 5ME.16536 at the former CCC Camp location; however photos supplied on this original form show both locations, including the lagoons located at the CCC camp as well as foundations still remaining at the Migratory Labor Camp. Accordingly, we have corrected location of the Palisade Migratory Camp and newly documented the original CCC Camp under site 5ME.23723.

The current project revisited the site and corrected the locations of the camps. Within 5ME.16536, are many intact foundations. At least 34 building foundations are present as well as sections of the original roads and pathways through the camp. Additional foundations and cultural materials may be present and obscured by dense brush.

The camp overlaps two original patentees, Lawrence D. Christopher and George P. Spink. Christopher filed his patent on Lot 5 in 1888 and Spink filed his patent on Lot 7 in 1892. It is unclear to whom the property was granted to after their ownership.

Evaluation and Management Recommendation

The site is associated with events that have made a significant contribution to the broad patterns of our history (Criterion A); it is not associated with the lives of persons significant in our past (Criterion B); nor does it embody the distinctive characteristics of a type, period, or method of construction (Criterion C). The site has yielded and may be likely to yield additional information important to history (Criterion D). It is field evaluated as eligible for listing on the NRHP. Due to the potential for buried cultural materials, monitoring of surface disturbance is recommended.

Site 5ME.23686
Township 1 South, Range 2 East; Section 3
675 Brentwood Dr., Palisade

The parcel at 675 Brentwood Dr., Palisade, contains a single story, bungalow-style house with asphalt shingles covering a gabled roof. Based on the Mesa County Assessor's property records the building was constructed in 1909 and was remodeled in 1978. The structure measures 1689 sq. ft. with three bedrooms and two baths.

The exterior is stone over a wood frame with an unfinished basement and finished enclosed porch, which appears more recent than the rest of the structure based on difference in exterior building materials. The property also contains a detached garage, barns and sheds, which were constructed in the 1980s. The land was originally patented to William A. Pease in 1891 and is still zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23687
Township 1 South, Range 2 East; Section 3
3733 ½ G Road, Palisade

The parcel at 3733 ½ G Rd., Palisade, contains a single story, vernacular style house with an asphalt shingle covered cross gabled roof. Based on the Mesa County Assessor's property records the building was constructed in 1920 and moved to the current location in 1978. The structure measures 2195 sq. ft. with three bedrooms and 1.75 baths.

The exterior is wood siding over a wood frame with a partially finished basement, patio, and wood deck. The property also contains and unfinished detached garage which was constructed in 1980. The land was originally patented to William A. Pease in 1891 and is still zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23688
Township 1 South, Range 2 East; Section 3
3727 ½ G Road, Palisade

The parcel at 3727 ½ G Rd., Palisade, contains a single story, ranch style house with asphalt shingles over a side gabled roof. Based on the Mesa County Assessor's property records the building was constructed in 1958 and remodeled in 1976. The structure measures 1876 sq. ft. with three bedrooms and two baths.

The exterior is wood siding over a wood frame with a partially finished basement, a finished open porch and an open porch and deck. The property contains four utility buildings, two of which were constructed in 1950, one in 1970 and one in 1980, as well as a finished detached garage and detached unfinished garage, both constructed in 1980. The land was originally patented to William A. Pease in 1891 and is still zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional

information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23689
Township 1 South, Range 2 East; Section 4
3637 Front St., Palisade

The parcel at 3637 Front St., Palisade, contains a craftsman bungalow style, 1.5 story house with corrugated metal covering a combination roof that is gabled on the second story with a large overhanging bonnet along all four sides of the first story. Based on the Mesa County Assessor's property records the building was constructed in 1909. The structure measures 1708 sq. ft. with three bedrooms and 1.5 baths.

The exterior is wood siding over a wood frame with a finished half story, a finished enclosed porch, a wood deck, and an unfinished open porch. The property also contains a utility shed and an equipment shed which were constructed in 1986. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23690
Township 1 South, Range 2 East; Section 4
3603 Front St., Palisade

The parcel at 3603 Front St., Palisade, contains a single story, ranch style house with asphalt shingling covering a hipped roof. Based on the Mesa County Assessor's property records the building was constructed in 1952. The structure measures 1156 sq. ft. with two bedrooms and one bath.

The exterior is stucco over a masonry frame with a finished enclosed porch. The property also contains a detached garage, likely constructed at the same time as the house structure and utility shed constructed in 1956. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23691
Township 1 South, Range 2 East; Section 5
3601 Front St., Palisade

The parcel at 3601 Front St., Palisade, contains a single story, ranch style house with asphalt shingles covering a gabled roof. Based on the Mesa County Assessor's property records the building was constructed in 1958. The structure measures 1056 sq. ft. with three bedrooms and 1 bath.

The exterior is wood siding over a wood frame with an unfinished open porch, unfinished storage, and an unfinished carport. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23692
Township 1 South, Range 2 East; Section 5
3589 Front St., Palisade

The parcel at 3589 Front St., Palisade, contains a single story, ranch style house with asphalt shingles covering a hipped roof. Based on the Mesa County Assessor's property records the building was constructed in 1958. The structure measures 1224 sq. ft. with two bedrooms and one bath.

The exterior is common brick over a masonry frame with a finished enclosed porch, an unfinished open porch, an unfinished storage room, and unfinished carport. The property also contains a modern equipment shed and a hay shed. The land was originally patented to

Lawrence D. Christopher in 1888 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23693
Township 1 South, Range 2 East; Section 5
3583 Front St., Palisade

The parcel at 3583 Front St., Palisade, contains a single story, ranch style house with asphalt shingles covering an open gabled roof. Based on the Mesa County Assessor's property records the building was constructed in 1930 and had a major renovation in 1976. The structure measures 2348 sq. ft. with four bedrooms and 1.5 baths.

The exterior is concrete block over a masonry frame with an unfinished open porch and an unfinished detached garage. The property also contains a modern utility shed. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23694
Township 1 South, Range 2 East; Section 5
3583 Grand Valley Canal Rd., Palisade

The parcel at 3583 Grand Valley Canal Rd., Palisade, was originally a single story, ranch style house with asphalt shingles. Based on the Mesa County Assessor's property records the building was constructed in 1952, and was significantly remodeled in 2012, adding a half story with a cross gabled roof and dormers. The structure measures 3463 sq. ft. with five bedrooms and 3 and 3/4 baths.

The exterior is aluminum/ vinyl siding over a wood frame. Renovations include a finished bonus room, finished garage, finished open porch, patio, unfinished basement, and an unfinished open porch. The property also contains a modern equipment shed and utility shed, constructed in 1986. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23695
Township 1 South, Range 2 East; Section 5
3561 Front St., Palisade

The parcel at 3561 Front St., Palisade, contains two residences. The first, and larger of the two, is a 1.5 story, cottage style house with asphalt shingles covering a gabled roof and central dormer and pediment over the front entry. Based on the Mesa County Assessor's property records the building was constructed in 1928 and had a major renovation in 1976. The structure measures 2080 sq. ft. with three bedrooms and two baths. The exterior is wood siding over a wood frame, with a finished half story, an unfinished basement, a finished storage room, and a detached garage.

The second residence is a smaller, farm and ranch style house with asphalt shingles covering a gabled roof. The building was constructed in 1944 with a renovation in 1971. The structure measures 640 sq. ft. with two bedrooms and one bath. The exterior is concrete block over a wood frame, with an unfinished open porch and an unfinished carport. The land was originally patented to Charles G. Varian in 1895 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23696
Township 1 South, Range 2 East; Section 5
3557 Front St., Palisade

The parcel at 3557 Front St., Palisade, contains two residences. The first, and larger of the two, is a 1.5 story house with asphalt shingles covering a gable and valley roof with exposed rafters and slightly flaring eaves. It is similar to an I-house style, as characterized by a narrow, long construction; however, it is cross gabled, with a pediment porch and ornamental shutters. Based on the Mesa County Assessor's property records the building was constructed in 1908. The structure measures 2720 sq. ft. with three bedrooms and 1.75 baths. The exterior is wood siding over a wood frame, with a finished upper story, partially finished basement and an unfinished open porch and deck.

The second residence, a small ranch style structure with asphalt shingles covering a side gable roof, was constructed in 1943. It measures 540 sq. ft. with 1 bedroom and a 3/4 bath. The exterior is stucco over a masonry frame. A barn, utility building, and equipment shed were constructed in 1986. The land was originally patented to Charles G. Varian in 1895 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23697
Township 1 South, Range 2 East; Section 5
641 35 ½ Rd., Palisade

The parcel at 641 35 ½ Rd., Palisade, contains a ranch style house with asphalt shingles covering a cross hip roof. Based on the Mesa County Assessor's property records the building was constructed in 1959. The structure measures 1886 sq. ft. with three bedrooms and two baths. The exterior is wood siding over a wood frame, with a finished garage and basement, an unfinished basement, and a covered patio. A pool was constructed in 1985. Two storage sheds are present on the property, one constructed in 1980 and the other in 2000, and a barn was constructed in 1996. The land was originally patented to William F. Lay in 1891 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to

the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23698
Township 1 South, Range 2 East; Section 5
3527 Front St., Palisade

The parcel at 3527 Front St., Palisade, contains a vernacular style house with asphalt shingles covering a gable and valley roof. Based on the Mesa County Assessor's property records the building was constructed in 1945. The structure measures 1328 sq. ft. with three bedrooms and one bath. The exterior is wood siding over a wood frame, with an unfinished basement and carport. An equipment shed was constructed in 1986. The land was originally patented to Charles G. Varian in 1895 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23699
Township 1 South, Range 2 East; Section 5
3527 Grand Valley Canal Rd., Clifton

The parcel at 3527 Grand Valley Canal Rd., Clifton, contains two residences, only one of which is historic. According to the Mesa County Assessor's property records, the historic house is a minimal traditional style with asphalt shingles covering a gabled roof and was constructed in 1938. The structure measures 1438 sq. ft. with three bedrooms and one bath.

The exterior is wood siding over a wood frame, with two unfinished open porches, an unfinished carport, and a detached garage. In addition to modern utility buildings and grain bins, a barn, which was constructed in 1900, is still standing. The parcel sits on two pieces of property originally patented to James T. Jones in 1890 and William F. Lay in 1891 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23700
Township 1 South, Range 2 East; Section 5
3525 Grand Valley Canal Rd., Clifton

The parcel at 3525 Grand Valley Canal Rd., Clifton, contains a ranch style house with corrugated metal covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1956. The structure measures 1233 sq. ft. with two bedrooms and one bath. The exterior is wood siding over a wood frame with patio, unfinished basement, unfinished carport, and an unfinished open porch. Three modern storage sheds are present on the property. The land was originally patented to James T. Jones in 1890 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23701
Township 1 South, Range 2 East; Section 5
3513 Front St., Palisade

The parcel at 3513 Front St., Palisade, contains a farmhouse style, 1.5 story house with asphalt shingles covering a gabled roof. The house has a central dormer. Based on the Mesa County Assessor's property records the residential building was constructed in 1904. The structure measures 1469 sq. ft. with three bedrooms and one bath.

The exterior is wood siding over a wood frame with a finished enclosed porch, finished half story, unfinished basement, and an unfinished open porch. The property contains a fruit packing shed constructed in 1960 and 2 additional sheds of modern construction. One of the sheds appears to have been converted to a cottage. The land was originally patented to Lawrence D. Christopher in 1888 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23702
Township 1 South, Range 2 East; Section 6
611 35 Rd., Clifton

The parcel at 611 35 Rd., Clifton, contains a ranch style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1932 and was remodeled in 1981. It measures 1536 sq. ft. with three bedrooms and two baths. The exterior is wood siding over a wood frame and has a detached unfinished storage area. The land was originally patented by Edwin Keller in 1892 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23703
Township 1 South, Range 2 East; Section 6
603 35 Rd., Clifton

The parcel at 603 35 Rd., Clifton, contains a ranch style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1955. It measures 1080 sq. ft. with three bedrooms and one bath. The exterior is wood siding over a wood frame and there is a detached unfinished garage. The land was originally patented to Edwin Keller in 1892 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to

the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23704
Township 1 South, Range 2 East; Section 7
597 35 RD., Clifton

The parcel at 597 35 Rd., Clifton, contains a single story, vernacular style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1919. The structure measures 1104 sq. ft. with 3 bedrooms and 1 and 3/4 baths. The exterior is wood siding over a wood frame and features an unfinished open porch and an unfinished enclosed porch, as well as a detached garage. The property also contains two modern utility sheds. The land was originally patented to James T. Jones in 1890 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23705
Township 1 South, Range 2 East; Section 7
3481 F Rd., Clifton

The parcel at 3481 F Rd., Clifton, contains a ranch style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1937. The structure measures 784 sq. ft. with one bedroom and one bath. The exterior is slump block/adobe over a masonry frame and features a finished enclosed porch, an unfinished open porch, a detached unfinished garage and an unfinished carport. The land was originally patented to James T. Jones in 1890 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons

significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23706
Township 1 South, Range 2 East; Section 6
3478 F Rd., Clifton

The parcel at 3478 F Rd., Clifton, contains a minimal traditional style house with a jerkinhead (truncated gable) roof. According to the Mesa County Assessor's property records the building was constructed in 1928. It measures 864 sq. ft. with two bedrooms and one bath. The exterior is wood siding over a wood frame with a metal roof covering. There is an unfinished, enclosed porch. The land was originally patented to Edwin Keller in 1892 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23707
Township 1 South, Range 2 East; Section 6
3472 F Rd., Clifton

The parcel at 3472 F Rd., Clifton, contains a minimal traditional style house with a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1908. It measures 1398 sq. ft. with two bedrooms and one bath. The exterior is wood siding over a wood frame and a corrugated metal roof. A cattle shed constructed in 1950 is also present on the property. The land was originally patented to Edwin Keller in 1892 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not

eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23708
Township 1 South, Range 2 East; Section 6
3462 F Rd., Clifton

The parcel at 3462 F Rd., Clifton, contains a one and one-half story, classic cottage style house with a central dormer and hip roof. According to the Mesa County Assessor's property records the building was constructed in 1922. It measures 2910 sq. ft. with three bedrooms and two baths. The building is a large, one and a half story structure over an unfinished basement, with an unfinished, open porch. The exterior is block and stucco over a masonry frame with an asphalt shingle roof. A saltbox style barn and two hay sheds, also constructed in 1922, are still present on the property. The land was originally patented to Edwin Keller in 1892 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23709
Township 1 South, Range 2 East; Section 6
3456 F Rd., Clifton

The parcel at 3456 F Rd., Clifton, contains a two story house with asphalt shingles covering a hipped roof. It appears that it was originally constructed as a foursquare style, although it lacks dormers and has a second story balcony over a wide front porch. According to the Mesa County Assessor's property records the building was constructed in 1908 and at some point was moved to the current location.

During the 1980s and 1990s the structure was significantly remodeled and expanded, and became a multi-unit nursing home. At least 40% of the house was remodeled in 1981. This period coincides with the opening of the Blossom View residential nursing facility at this address. While the records do not specify which portions were remodeled, it likely consisted of an addition off the west side of the structure. Records filed in 1982 state that the building measured 3635 sq. ft. and contained six bedrooms, 1 and 3/4 baths and a detached garage located to the east of the residence. In 1990, a "residence addition" was created between the house and garage. This addition consisted of a kitchen, dining area, two bathrooms, and four

bedrooms. The garage was converted to an area containing two living rooms and an office. In 1999, another large addition was constructed off the north side of the former garage, which contained a living room, four bathrooms, and eight bedrooms.

The structure currently measures 8642 sq. ft. There are at least 16 units, a finished screened in porch, a finished storage area, a finished upper story, a wood deck, an unfinished open porch and a patio. The exterior is wood siding over a wood frame with an asphalt shingle roof. The original house portion has a hipped roof, however the additions are gabled. The land was originally patented to Edwin Keller in 1892 and is currently zoned for multiple occupancy residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23710
Township 1 South, Range 2 East; Section 6
3452 F Rd., Clifton

The parcel at 3452 F Rd., Clifton, contains a two-story, vernacular style house that likely compared to a foursquare style when originally constructed, with two wrap around wings that were added at an unknown point in time. Asphalt shingles cover a roof that is front gabled with a second story balcony over a wide front porch. According to the Mesa County Assessor's property records the building was constructed in 1925. The structure currently measures 3440 sq. ft. with 15 units.

The exterior is wood siding over a wood frame. The property also contains a barn and storage shed constructed in 1925. Currently, the property functions as a retirement/ nursing home under the name Peachtree Assisted Living. The land was originally patented to Edwin Keller in 1892 and is currently zoned for multiple occupancy residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23711
Township 1 South, Range 2 East; Section 6
3450 F Rd., Clifton

The parcel at 3450 F Rd., Clifton, contains a two story, vernacular style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1940. The structure has undergone significant remodeling to convert it to a multi-unit residential nursing facility. At least 33% of the building was remodeled in 1975. The structure currently measures 1552 sq. ft. There are at least 5 units, a wood deck, and an unfinished upper story, which is not heated and therefore does not contribute to the overall square footage calculations for a residence.

The exterior of the structure is wood-sided over a wood frame. Multiple modern storage sheds are also present on the property. The land was originally patented to Edwin Keller in 1892 and is currently zoned for multiple occupancy residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23712
Township 1 South, Range 2 East; Section 7
3451 F Rd., Clifton

The parcel at 3451 F Rd, Clifton, contains a two story, I-style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1905 and was remodeled in 1973. The structure measures 1748 sq. ft. with three bedrooms and one bath. The exterior is wood siding over a wood frame and features a finished half story, an unfinished open porch, an unfinished enclosed porch and an unfinished, detached garage. The property also contains a number of other structures constructed in 1926 or earlier, including a barn, a fruit packing shed, a hay shed, and a utility shed. The land was originally patented to James T. Jones in 1890 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type,

period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23713
Township 1 South, Range 2 East; Section 7
3431 F Rd., Clifton

The parcel at 3431 F Rd., Clifton, contains a two story, I-style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1906. The structure measures 896 sq. ft. with two bedrooms and one bath. The exterior is aluminum or vinyl siding covering a wood frame and features a finished upper story, a patio, and an unfinished open porch. The property also contains modern structures, including a detached garage, an agricultural carport, and an equipment shed. The land was originally patented to Bernard K. Kennedy in 1887 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23714
Township 1 South, Range 2 East; Section 6
3420 F Rd., Clifton

The parcel at 3420 F Rd., Clifton, contains a one and one-half story, minimal traditional style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1918. The structure measures 1488 sq. ft. with three bedrooms, two baths, a finished half story, an unfinished basement, and a patio at the back of the house. An unfinished, open porch in the front entry has a pediment roof. The exterior of the house has wood siding over a wood frame. The land was originally patented to Lars Johnsen in 1892 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type,

period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23715
Township 1 South, Range 2 East; Section 6
3413 Front St., Clifton

The parcel at 3413 Front St., Clifton, contains a single story, vernacular style house with asphalt shingles covering a jerkinhead (truncated gable) roof. According to the Mesa County Assessor's property records the building was constructed in 1928. The structure measures 1167 sq. ft. with two bedrooms, one bath, a finished garage, a wood deck, and an unfinished open porch. The exterior is wood siding over a wood frame. The property also contains a modern hay shed and a utility shed. The land was originally patented to Lars Johnsen in 1892 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23716
Township 1 South, Range 2 East; Section 7
3415 F Rd., Clifton

The parcel at 3415 F Rd., Clifton, contains two residences. The first is a gable front and wing, vernacular style farm house. According to the Mesa County Assessor's property records the building was constructed in 1898. This early house measured 584 sq. ft. and consisted of three rooms with no indoor plumbing. It was set on a mud sill foundation with wood siding and wood shingles covering the roof and utilized a stove for heating and cooking.

The second house is a hipped box, vernacular style structure with an asphalt shingled roof. The building was constructed in 1908. It measures 896 sq. ft. with two bedrooms and one bath. The exterior is wood siding over a wood frame. The property also contains two utility sheds constructed in/before 1950 and a cattle shed constructed in/before 1980. The land was originally patented to Frank M. Welch in 1892 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23717
Township 1 South, Range 2 East; Section 7
572 34 Rd., Clifton

The parcel at 572 34 Rd., Clifton, contains a ranch style, side-gabled house and asphalt shingled roof. According to the Mesa County Assessor's property records the building was constructed in 1946 and remodeled in 1988 to add a cross-gabled section to the original structure. It currently measures 888 sq. ft. with 2 bedrooms and one bath. The exterior is aluminum/vinyl siding over a wood frame and features an unfinished open porch, a detached, unfinished garage, an unfinished carport, and unfinished storage. The property was originally patented to Bernard K. Kennedy in 1887 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23718
Township 1 South, Range 1 East; Section 12
595 34 Rd., Clifton

The parcel at 595 34 Rd., Clifton, contains a two story, vernacular style house with an asphalt shingled gable roof. According to the Mesa County Assessor's property records the building was constructed in 1943 and was remodeled in 1977. It is not certain which portion of the residence was originally constructed. It currently measures 2532 sq. ft. with four bedrooms and one bath and features a finished upper story and a finished, detached garage. The exterior is wood siding covering a wood frame. The land was originally patented to James Pender 1890 and is currently zoned for residential use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23719
Township 1 South, Range 1 East; Section 12
574 33 3/4 Rd., Clifton

The parcel at 574 33 3/4 Rd., Clifton, contains a single story, ranch style house with asphalt shingles covering a hipped roof. According to the Mesa County Assessor's property records the building was constructed in 1960. It currently measures 1524 sq. ft. with two bedrooms and 1 and 3/4 baths, and has an unfinished open porch. The exterior is wood siding over a wood frame. The land was originally patented to James Pender 1890 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site 5ME.23720
Township 1 South, Range 1 East; Section 12
573 33 3/4 Rd., Clifton

The parcel at 573 33 3/4 Rd., Clifton, contains a split-level style house with asphalt shingles covering a gabled roof. According to the Mesa County Assessor's property records the building was constructed in 1938. It measures 2207 sq. ft. with four bedrooms and 1 and 3/4 baths with a finished and unfinished basement, a wood deck, and an unfinished, open porch. The exterior is stucco over a wood frame. The property also contains a detached garage, horse stables, and three utility sheds. The land was originally patented to Oscar D. Reed in 1892 and is currently zoned for agricultural use.

Evaluation and Management Recommendations

The property is not associated with events that have made a significant contribution to the broad patterns of history (Criterion A); is not associated with the lives of persons

significant in our past (Criterion B); does not embody the distinctive characteristics of a type, period, or method of construction (Criterion C); and is not likely to yield additional information important to history (Criterion D). Accordingly, it is field evaluated as not eligible for listing on the NRHP and no further work is recommended.

Site **5ME.23723** is a historic site consisting of CCC Camp Mesa BR-59 / World War II POW camp / Palisade wastewater lagoons. Within the current boundary of Palisade River Bend Park were two camps: site 5ME.16536, Palisade Migratory Labor Camp, located at the far west end of River Bend Park and site 5ME.23723, CCC Camp Mesa BR-59 / World War II POW camp / Palisade wastewater lagoons, located at the east end of River Bend Park. The original records plotted site 5ME.16536 at the former CCC Camp location; however photos supplied on this original form show both locations, including the lagoons located at the CCC camp as well as foundations still remaining at the Migratory Labor Camp. Accordingly, we have corrected the location of the Palisade Migratory Camp and newly documented the original CCC Camp under site 5ME.23723.

CCC camp, BR-59 Company nos. 868 and 2120, was established in 1936 for the purpose of reclamation work. The camp opened in 1935 as a Bureau of Reclamation camp for the purpose of completing upgrades to the aging Grand Valley Project irrigation system. This work program was divided into three divisions based on geographic locations: The Canyon Division, the Orchard Mesa Division, and the Main Canal - Palisade Division. The camp consisted of rigid wooden barrack buildings, and a number of smaller structures and support structures. Two buildings were added in 1937, including a small sheet iron building that served as an oil and grease house and a building moved from the Reclamation yards at Grand Junction for use as a tool room/cement storehouse. The mess hall burned down in 1937 and was reconstructed. The camp was closed in 1942, with the transfer of the property to the U.S. Army Corps of Engineers and then to Reclamation. In 1944, the camp was leased to the United Fruit Growers Association.

In 1944, the camp was converted to quarter German prisoners of war. Labor shortages and gas rationing created a need for additional workers in canneries and orchards in the Grand Valley. This site was used for POW housing into 1945, as well. In 1950, the CCC camp barracks housed Bureau of Reclamation employees and their families working to repair the collapsed Government Highline Canal Tunnel #1. At some point between 1954 and 1966, the camp area was developed by the Town of Palisade into wastewater lagoons. These lagoons were modified between 1977 and 1986. The east lagoon was filled in and the west lagoon was divided into 3 separate ponds. Between 1986 and 1996, an additional pond was added to the west (outside the current site boundary) and after 1996, a smaller fifth lagoon was added in the abandoned eastern portion of the site. Currently, the northeast portion of the site is being used as debris storage. These lagoons will be decommissioned as part of the currently proposed project.

The camp area was visited for the current project and was found to have been completely disturbed. It lacks all of the elements of integrity that might convey significance, including location, design, setting, materials, workmanship, feeling, and association. Although the wastewater lagoons retain all aspects of integrity, none of these elements support the eligibility of the resource, as no archaeological evidence of cultural materials remain from the period of construction.

Evaluation and Management Recommendation

The site is associated with events that made a significant contribution to the broad patterns of history both as a CCC / World War II era POW camp and the wastewater lagoons as a public works project that contributed to community development (Criterion A). The site is not associated with the lives of persons significant in our past (Criterion B); nor does it embody the distinctive characteristics of a time, period, or method of construction (Criterion C). Further, it was determined that the CCC / POW camp has been totally disturbed and no archaeological remains are present from the period of construction of the wastewater facilities. As such it has little potential to yield additional information important to the history of the area (Criterion D). Due to the level of disturbance (complete), it is field evaluated as not eligible for listing on the NRHP. No further work is recommended.

DISCUSSION

The study area embodies the transitional character and history of agricultural development in the Grand Valley. Early settlers in the area in and around Palisade identified the unique nature of the topography and successfully exploited it for generations of success in the fruit growing industry.

The GLO maps and document searches provided information on the early settlers and farmers. Homestead patents filed within the project area range from 1887 to 1895. One patentee, William Pease, is credited with being the first settler in Palisade (Walker, ed. 2018:2); however, the project did not find any remains which could be clearly associated with Pease or these other early settlers. The thirty-five historic structures recorded date from 1904 to 1960. Of these, 21 are still zoned for agricultural use, indicating the value this community places on continuing the agricultural nature of the area. Most importantly, this project gave investigators an opportunity to correct the historic record regarding the Palisade Migratory Camp (5ME.16536) and CCC Camp Mesa (5ME.23723). The previous recording of the Palisade Migratory Camp was convoluted; the location was plotted at the CCC Camp and photographs were taken of both the CCC Camp area as well as the Migratory Camp. Through the efforts of this project, we were able to conduct research to determine the correct information and have provided concrete evaluations of the integrity and significance of each.

DETERMINATIONS OF EFFECT/MANAGEMENT RECOMMENDATIONS

The eligibility determination and consultation process is guided by Section 106 of the NHPA (36 CFR 60, 63, and 800). Inventory to identify, evaluate, and mitigate potential effects to cultural resources affected by an undertaking is the first step in the Section 106 process. USACE actions cannot be authorized until the Section 106 process is completed (36 CFR 800.3). Final determinations of National Register eligibility and effect should be sought from the controlling federal agencies in consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation.

At the request of the USDA Rural Development (Agency) and J-U-B Engineers (JUB), Grand River Institute (GRI) conducted a Class III (intensive) cultural resources inventory of the proposed Town of Palisade Sanitary Sewer Alignment in Mesa County, Colorado. The current project is located on private land and consists of a linear route proposed to be disturbed by pipeline construction. The overall width of the proposed surface disturbance by the construction is 50ft. The field inventory occurred between 15 May and 15 July 2021, and included the inspection of 5.1 miles of proposed sewer line between Clifton and Palisade. The inspection corridor was buffered to 200 feet wide and was centered on the proposed alignment. It includes a total of 125 linear acres of private land. Field and office work were conducted by Carl Conner (Principal Investigator), Nicole Inman, Barbara Davenport, and Natalia Conner.

A prefield/files search for known cultural resources in the project area was made through the Office of Archaeology and Historic Preservation's on-line COMPASS database. This review indicated that four cultural resource sites were previously recorded within the corridor: 5ME.775, listed as the Whitman, Pattie and Gunnison Expeditions; Grand Valley Canal segments 5ME.4680.1 and 5ME.4680.38; 5ME.11841, Government Highline Canal Bridge; and, 5ME.16536, Palisade Migratory Labor Camp. It was determined that site 5ME.11841, the Government Highline Canal Bridge had been mis-plotted and is outside of the project area. No further consideration was given for this resource.

Results of the present fieldwork included the revisiting and reevaluation of previously recorded sites 5ME.775, 5ME.4680, and 5ME.16536. Site 5ME.775 has been declared officially not eligible and was not relocated within the current project. No further work is recommended. A segment of the Grand Valley Canal, 5ME.4680.78, was newly recorded. The Grand Valley Canal, as part of the larger Grand Valley Irrigation System, has been determined to be eligible for listing on the National Register of Historic Places under Criterion A and C. The current project concurs with those determinations. The canal will not be impacted by the project and no further work is necessary.

Site 5ME.16536, the Palisade Migratory Camp, was declared officially eligible in 2008. The site was revisited and found to have been previously mis-plotted. The location was corrected and the site re-mapped. There is no change to its previous eligible evaluation. Any ground disturbance within the site boundary should be monitored for subsurface cultural

remains.

Thirty five land parcels with historic residences (5ME.23686-5ME.23720), and the CCC Camp Mesa / WWII POW Camp / Palisade Wastewater Lagoons (5ME.23723) were newly recorded. These sites are field evaluated as not eligible and no further work is recommended.

REFERENCES

Adovasio, J. M., J. Donahue and R. Stuckenrath

1990 The Meadowcroft Rockshelter Radiocarbon Chronology 1975-1990. *American Antiquity* 55:348-354.

Albers, Samantha Arbeiter

2016 Grand Valley Irrigation. *Colorado Encyclopedia*. Electronic document, www.coloradoencyclopedia.org/article/grand-valley-irrigation, accessed 23 June 2021.

The Aspen Weekly Times

1899 A Sad Accident, L.D. Christopher Killed at the Race Track by a Runaway Team. 3 June, page 4. Electronic document www.coloradohistoricnewspapers.org, accessed 30 June 2021.

Bardell, Paul. H. Jr. and Jeffrey M. Widener

2014 *The History of Irrigation in Palisade and East Orchard Mesa, Colorado.* Palisade Historical Society, Palisade.

Beebe, Lucius Morris and Charles Clegg

1962 *Rio Grande: Mainline of the Rockies*. Howell-North Books, Berkley.

Berry, Michael S., Carl Conner, James Miller, Richard Ott, Courtney Groff, Carl McIntyre, and Michael Brown

2013 Archaeological Investigations at the McClane Rockshelter 5GF741 in Garfield County, Colorado BLM CRIR 15811-02; OAHP No. GF.LM.R504. Grand River Institute. Submitted to Colorado Historical Society, State Historical Fund No. 2010-02-029. Ms on file at the BLM Grand Junction Field Office.

Burkhard, W.T., and T.A. Lytle

1978 Final Report for Fish and Wildlife Resource Analysis of the West Divide Project. Colorado Department of Natural Resources, Division of Wildlife, Grand Junction.

Cassells, E. Steve

1997 *The Archaeology of Colorado*. Johnson Books, Boulder.

Church, Minette C., Steven G. Baker, Bonnie J. Clark, Richard F. Carrillo Jonathan C. Horn, Carl D. Späth, David R. Guilfoyle and E. Steve Cassells

2007 *Colorado History: A Context for Historical Archaeology*. Colorado Council of Professional Archaeologists, Denver, Colorado.

The Colorado Daily Chieftain

1890 The Continental Company Begins a Competition in Oil with Home Production. Feb 4, page 2. Electronic document www.newspapers.com, accessed 23 June 2021.

Conner, Carl E., James Miller, Dakota Kramer, Curtis Martin, Brian O'Neil, Carl McIntyre, Courtney Groff, Jessica Hostrup, Hannah Mills, Cheryl Harrison, and Michael S. Berry

2014 Archaeological Monitoring and Data Retrieval for the Collbran Pipeline Project in Garfield and Mesa Counties, Colorado. Grand River Institute. Ms on file BLM Grand Junction Field Office.

The Daily Sentinel

1910 Grand Junction 20 Years Ago. 10 May, page 8. Electronic document www.newspapers.com, accessed 23 June 2021.

1941 Approve Contract Transient Camp Near Palisade. 08 Jul, page 9. Electronic document www.newspapers.com, accessed 28 June 2021.

.

1943a A proposal to employ Italian prisoners of war. 20 Jan, page 7. Electronic document www.newspapers.com, accessed 25 June 2021.

1943b Powell Discusses Problems of Farm Before Kiwanians. 07 May, page 6. Electronic document https://www.newspapers.com accessed 25 June 2021.

1943c Conference on Peach Wages to Be Held Monday. 27 Jun, page 4. Electronic document www.newspapers.com, accessed 23 June 2021.

1943d 2,000 Prisoners of War Sought In Crop Harvest. 2 Jul, page 4. Electronic document www.newspapers.com accessed 25 June 2021.

Davidson, Don

1986 "The Grand River Ditch: A Short History of Pioneering Irrigation in Colorado's Grand Valley." *Journal of the Western Slope* 4(1): 1-31.

Dillehay, Tom

1984 A Late Ice-Age Settlement in Southern Chile. *Scientific American* 251:106-117.

The Eagle County Blade

1899 Sue on Notes. 1 June, page 3. Electronic document www.coloradohistoricnewspapers.org, accessed 30 June 2021.

Grand Junction News

1891 Palisade Items. 7 Mar, page 4. Electronic document www.coloradohistoricnewspapers.org, accessed 30 June 2021.

1892 Masonic Installation. 2 Jan, page 8. Electronic document www.newspapers.com, accessed 12 May 2021.

Grand Valley Star

1890 Notice for Publication. 21 June, page 5. Electronic document www.coloradohistoricnewspapers.org, accessed 30 June 2021.

Grand Valley Star-Times

1894 Saturday's Daily. 7 April, page 6. Electronic document, www.coloradohistoricnewspapers.org, accessed 23 June 2021.

Haynes, C.V.

1980 Paleoindian Charcoal from Meadowcroft Rockshelter: Is Contamination a Problem? *American Antiquity* 45:582-587.

1991 Geoarchaeological and Paleohydrological Evidence for Clovis-age Drought in North America and its Bearing on Extinction. Quaternary Research 35:438-450.

Martin, Curtis and Michael J. Brown

2010 The Colorado Wickiup Project Volume V: Test Excavation of the Ute Hunters' Camp (5RB563) and Documentation of Five Additional Aboriginal Wooden Feature Sites in Rio Blanco County, Colorado. Ms on file, Office of Archaeology and Historic Preservation, Denver.

Martin, Curtis, Michael J. Brown, and John E. Lindstrom

2011 The Colorado Wickiup Project Volume VI: Test Excavation of the Black Canyon Ramada (5DT222) and the Documentation of Four Additional Premier Aboriginal Wooden Feature Sites in Colorado. Ms on file, Office of Archaeology and Historic Preservation, Denver.

Martorano, Marilyn A., and Lewis Hyer

1984 Class III Cultural Resources Survey of the Grand Valley Unit, Stage Two, Mesa County Colorado. Prepared by Laboratory of Public Archaeology, Colorado State University, Fort Collins. Ms on file at Colorado OAHP, Denver.

McLeod, Robert W. (Editor)

2015 *A Valley So Grand... The Pioneer Citizens and Early History of Mesa County, Colorado*. CreateSpace, Charleston, SC.

Mehls, Steven F.
1988 *The Valley of Opportunity: A History of West-Central Colorado*. Bureau of Land Management Cultural Resources Series No. 12, Denver.

Metcalf, Michael D. and Alan D. Reed (editors)
2011 Synthesis of Archaeological Data Compiled for the Piceance Basin Expansion, Rockies Express Pipeline, and Uinta Basin Lateral Projects Moffat and Rio Blanco Counties, Colorado, and Sweetwater County, Wyoming, Volume 2. Prepared by Alpine Archaeological Consultants, Inc. and Metcalf Archaeological Consultants, Inc. Ms on file, BLM Colorado State Office, Lakewood.

Moores, Jean (Editor)
2000 *Gateway/Unaweep Canyon At Some Point In Time.* Anundsen Publishing Company, Decorah, Iowa.

The Odgen Standard
1913 James Pender Dies At His Home. 21 July, page 6. Electronic document www.coloradohistoricnewspapers.org, accessed 1 July 2021.

The Palisade Tribune
1908 The Democratic Convention. 5 Sept, page 1. Electronic document www.coloradohistoricnewspapers.org, accessed 12 May 2021.

1913 A Fondness for Checks. 19 Sept, page 1. Electronic document www.newspapers.com, accessed 12 May 2021.

1923 George Smith Buried Sunday. 27 Apr, page 1. Electronic document, www.coloradohistoricnewspapers.org, accessed 25 June 2021.

1941 News from Our CCC Camp. 30 May, page 8. Electronic document, www.coloradohistoricnewspapers.org, accessed 25 June 2021.

Pfaff, Christine E.
2010 *The Bureau of Reclamation's Civilian Conservation Corps Legacy: 1933-1942.* U.S. Department of the Interior Bureau of Reclamation, Denver.

Reed, Alan D.
1994 The Numic Occupation of Western Colorado and Eastern Utah during the Late Prehistoric and Protohistoric Periods. In *Across the West: Human Population Movement and Expansion of the Numa.* Edited by David B. Madsen and David Rhode, pp. 188-189. University of Utah Press, Salt Lake City.

Reed, Alan D. and Michael D. Metcalf
1999 *Colorado Prehistory: A Context for the Northern Colorado River Basin*. Colorado Historical Society, Denver.

Reeds, Frank H.
1945 Peach Season of Valley Will Open Within Week; Labor Uncertainty. *The Daily Sentinel*, 19 Aug, page 16. Electronic document, www.newspapers.com, accessed 25 June 2021.

Simonds, Wm. Joe
1994 "Grand Valley Project." Bureau of Reclamation, Upper Colorado Basin Region, Salt Lake City.

Silbernagel, Robert
2011 *Troubled Trails: the Meeker Affair and the Expulsion of the Utes from Colorado.* University of Utah Press, Salt Lake City.

U.S.D.A. Soil Conservation Service
1955 Soil Survey of the Grand Junction area, Colorado. *USDA Soil Survey Series 1940*, No 19. Government Printing Office, Washington, D.C.

Walker, Priscilla (Editor)
2018 *The History of Fruit and Wine in Palisade, Colorado*. Palisade Historical Society, Palisade, Colorado.

West, Dan
2021 Palisade signs agreement with Clifton Sanitation on future wastewater treatment. *The Daily Sentinel* 26 May. Electronic document, www.gjsentinel.com, accessed 23 June 2021.

Western Regional Climate Center
2010 Monthly climate summary for the Grand Valley from AD 1900-2010. wrcc.dri.edu NOAA National Centers for Environmental Information. Reno.

Wheeler, C.W. and G. Martin
1982 The Granby Site: Early-Middle Archaic Wattle and Daub Structure. *Southwestern Lore* 48(3):16-25.

Young, Bennett
2014 *Coal Mining in Palisade, Colorado*. Palisade Historical Society, Palisade, Colorado.

Young, Robert G. And Joann W. Young
1977 *Colorado West, Land of Geology and Wildflowers*. Wheelwright Press Ltd.

Zimmerman, Harold
1987 “Harvesting Peaches with German Prisoners of War.” *Journal of the Western Slope* 2(1): 15-18.

Appendix A: Files Search data

Table A-1. Projects conducted within one mile of the project area.

Project No.	Title/Date/Author/Contractor
ME.LM.R415	Title: Cultural Resource Inventory Report: W.O. Callaway Palisade Valley #1 Federal, Mesa County, Colorado Author: Kranzush, Kris J. Date: 05/1978 Contractor: Gordon & Kranzush, Inc. on Behalf of Resource Marketing Services, Inc. for the U.S. Department of Interior, Bureau of Land Management, Grand Junction Resource Area
ME.R.NR12	Title: Report of Cultural Resources Clearance Survey (Request NR GJPO-80-9, Water Pipeline Crossing, Highline Canal, CRWQI, Grand Valley) Author: Unknown Date: 07/01/1980 Contractor: Bureau of Land Management
ME.R.NR19	Title: Cultural Resources Clearance Surveys at the Proposed Location of Two Drill Sites Grand Valley Unit, Stage II, Mesa County, Colorado (GJPO-82-18) Author: Stermitz Matthew Date: 01/01/1983 Contractor: Bureau of Reclamation
ME.R.NR16	Title: A Cultural Resources Clearance Survey for the Proposed Location of a Cathodic Protection System, Government Highline Canal, Grand Valley Project Mesa County, Colorado (GJPO-83-3) Author: Stermitz Matthew Date: 02/01/1983 Contractor: Bureau of Reclamation
ME.R.NR15	Title: A Cultural Resources Clearance Survey 23 Cobble Aquifer Exploratory Drill Sites, Grand Valley Unit Stage II, Colorado River Basin Salinity Control Project (GJPO-83-8) Author: Barnett, Peggy Date: 09/01/1983 Contractor: Bureau of Reclamation - Grand Junction Projects Office
ME.SC.R2	Title: Class I and Class II Inventory of Orchard Mesa Canals #1 and #2 Proposed Laterals for the Natural Resource Conservation Service's Colorado River Salinity Control Program Author: Crum, Sally Date: 5/1995 Contractor: Natural Resource Conservation Service
ME.CH.NR16	Title: An Intensive Cultural Resource Survey of Clifton Overpass on U.S. Highway 6, Mesa County, Colorado (BR 0064-025) Author: Hand, O.D. Date: 08/05/1997 Contractor: Colorado Department of Transportation

Project No.	Title/Date/Author/Contractor
ME.LM.R183	Title: Class III Cultural Resources Inventory Report for the Proposed East Orchard Mesa Fence Line in Mesa County, Colorado for the Bureau of Land Management, Grand Junction Resource Area (GRI# 9868) Author: Conner, Carl E. Date: 01/22/1999 Contractor: Grand River Institute for the Bureau of Land Management, Grand Junction Resource Area
ME.LM.R250	Title: Class III Cultural Resource Inventory for a Proposed 11 Mile-long East Grand Junction Reinforcement Pipeline Between Palisade and Whitewater in Mesa County, Colorado (GRI No. 2107) Class III Cultural Resource Inventory of a 10 Acre-block and Associated 1500-foot Long, Existing, To-be-widened Access Road (Addendum) Class III Cultural Resource Inventory of a 5-acre-block and Associated 340 Foot Long Power Line Connection as (Addendum #2)(GRI No. 2107 Addendum #2) Author: Conner, Carl E. Date: 03/13/2001 Contractor: Grand River Institute for Public Service Company of Colorado and the Bureau of Land Management
ME.R.R15	Title: Class III Historic Property Inventory Report of the East Orchard Mesa Wetland Enhancement, Mesa County, Colorado Author: Coulam, Nancy Date: 06/01/2001 Contractor: US Bureau of Reclamation
ME.SC.NR4	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands Author: Reed, Lloyd Date: 03/27/2008 Contractor: Para-Professional for the Natural Resources Conservation Services
ME.SC.NR5	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands Author: Reed, Lloyd Date: 03/27/2008 Contractor: Para-professional for the Natural Resources Conservation Services
ME.SC.NR6	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands Author: Reed, Lloyd Date: 03/27/2008 Contractor: Para-professional for the Natural Resources Conservation Services
ME.SC.NR7	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands Author: Reed, Lloyd Date: 03/27/2008 Contractor: Para-professional for the Natural Resources Conservation Services
ME.R.R27	Title: Cultural Resources Inventory of Portions of the Grand Valley Canal, Two Soil Borrow Areas, and a Gravel Pit Mesa County, Colorado Author: Horn, Jonathon C. Date: 10/2008 Contractor: Alpine Archaeological Consultants, Inc. for the Bureau of Reclamation

Project No.	Title/Date/Author/Contractor
ME.LM.R639	Title: An Intensive Cultural Resources Inventory of the Aspen Whitewater-grand Mesa Slopes Project, Mesa County, Colorado (BLM CRIR GJFO 8307-05) Author: Reed, Alan D. Date: 2/2009 Contractor: Alpine Archaeological Consultants, Inc. BLM, Grand Junction Field Office
ME.SC.NR9	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands-High County Orchards, LLC Author: Fusaro, John Date: 02/25/2009 Contractor: USDA Natural Resource Conservation Service Para-Professional
ME.SC.NR54	Title: Mesa Limited Results Cultural Resources Survey Report on Private Lands-John T. Mueller Author: Reed, Lloyd Date: 01/13/2010 Contractor: USDA Natural Resource Conservation Service Para-Professional
ME.LM.R671	Title: Renewable Energy ARRA Project, A Class III Cultural Resource Inventory in Mesa County, Colorado (BLM - GJFO CRIR# 17310-02) Author: McDonald, Kae, Ph.D., RPA Date: 2010 Contractor: BLM, Grand Junction Field Office
ME.SC.NR67	Title: Mesa County Limited-results Cultural Resources Survey Form on Private Lands - Bryce V. Fast Author: Reed, Lloyd Date: 05/24/2010 Contractor: Para-Professional for the Natural Resources Conservation Service
ME.SC.NR69	Title: Mesa County Limited-results Cultural Resources Survey Form on Private Lands - James H. Sterling Author: Reed, Lloyd Date: 05/26/2010 Contractor: Para-Professional for the Natural Resources Conservation Service
ME.SC.NR74	Title: Mesa County Limited-results Cultural Resources Survey Form on Private Lands - Michael E. Leak Author: Reed, Lloyd Date: 05/24/2010 Contractor: Para-Professional for the Natural Resources Conservation Service
ME.SC.NR80	Title: Mesa County Limited Results Cultural Resources Survey Report on Private Lands-David D. Bain Author: Reed, Lloyd Date: 01/21/2011 Contractor: Para-Professional for the USDA Natural Resource Conservation Service

Project No.	Title/Date/Author/Contractor
ME.SC.NR79	Title: Mesa County Limited Results Cultural Resources Survey Report on Private Lands-Thomas Craig (NRCS GRJU11-004) Author: Reed, Lloyd Date: 01/18/2011 Contractor: Para-Professional for the USDA Natural Resource Conservation Service
ME.R.R32	Title: Class III Cultural Resource Inventory of the Orchard Mesa Irrigation System Improvements Mesa County, Colorado Author: Piontkowski, Michael and Dea Funka Date: 3/2011 Contractor: JGMS, Inc. and the Louis Berger Group, Inc. for the Bureau of Reclamation
ME.SC.NR84	Title: Mesa County Limited Results Cultural Resource Survey Form on Private Lands, Bryan Noland (GRJU11-015) Author: Reed, Lloyd Date: 03/02/2011 Contractor: USDA Natural Resources Conservation Service (NRCS)
ME.SC.NR86	Title: Mesa County Limited Results Cultural Resource Survey Form on Private Lands, C & R Orchards L.L.C. (GRJU11-019) Author: Reed, Lloyd Date: 04/01/2011 Contractor: USDA Natural Resources Conservation Service (NRCS)
ME.SC.NR93	Title: Mesa County Limited Results Cultural Resource Survey Form on Private Lands (GRJU11-018) (Lila McLean) Author: Reed, Lloyd Date: 04/01/2011 Contractor: USDA Natural Resources Conservation Service (NRCS)
ME.SC.NR96	Title: Mesa County Limited Results Cultural Resources Survey Report on Private Lands-Harry C. Talbott Author: Reed, Lloyd Date: 06/03/2011 Contractor: Para-professional for the USDA Natural Resource Conservation Service
ME.SC.NR98	Title: Mesa County Limited Results Cultural Resources Survey Report on Private Lands-Layne and Marian Brown Author: Reed, Lloyd Date: 06/03/2011 Contractor: Para-Professional for the USDA Natural Resource Conservation Service

Project No.	Title/Date/Author/Contractor
ME.R.R31	Title: Cultural Resource Inventory of Portions of the Grand Valley Canal, Independent Ranchmen's Ditch, and Pioneer Ditch/mesa County Ditch, Mesa County, Colorado Author: Horn, Jonathon and Jack Pfertsh Date: 08/2011 Contractor: Alpine Archaeological Consultants, Inc. for the Bureau of Reclamation
ME.AE.R3	Title: A Tale of Wicki-ups and Woes: A Cultural Resources Survey for the Continuing Authorities Program, Section 206, Tamarisk Ecosystem Restoration Project, Mesa County, Colorado Author: Polson, Nikki Date: 09/2011 Contractor: U.S. Army Corps of Engineers, Sacramento District
ME.SC.NR123	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Black Bear Orchards) Author: Reed, Lloyd Date: 11/02/2011 Contractor: USDA Natural Resources Conservation Service
ME.SC.NR100	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Shaffer) Author: Reed, Lloyd Date: No Date Listed Contractor: USDA Natural Resources Conservation Service
ME.SC.NR105	Title: Mesa County Limited Results Cultural Resource Survey Form on Private Lands (Sanders) Author: Reed, Lloyd Date: No Date Listed Contractor: USDA Natural Resources Conservation Service
ME.SC.NR122	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Black Bear Orchards) Author: Reed, Lloyd Date: 02/29/2012 Contractor: USDA Natural Resources Conservation Service
ME.SC.NR103	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Talbott Land) Author: Reed, Lloyd Date: 03/12/2012 Contractor: USDA Natural Resources Conservation Service
ME.SC.NR102	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Mikkelson) Author: Reed, Lloyd Date: 03/20/2012 Contractor: USDA Natural Resources Conservation Service

Project No.	Title/Date/Author/Contractor
ME.SC.NR140	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (O'Callaghan) Author: Reed, Lloyd Date: 10/05/2012 Contractor: USDA Natural Resources Conservation Service (NRCS)
ME.SC.R9	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Trevor Taylor) Author: Reed, Lloyd Date: 2/12/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR143	Title: Mesa County Limited-results Cultural Resource Survey Report on Private Lands (Lorrane Cerda) (748b051201g) Author: (Lorrane Cerda) (748b051201g) Date: 2/13/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR167	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands - Danette Bruno (748B051201F) Author: Reed, Lloyd Date: 2/13/2013 Contractor: Natural Resources Conservation Service
ME.SC.R11	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Trevor Taylor Wildlife) Author: Reed, Lloyd Date: 2/20/2013 Contractor: Natural Resources Conservation Service
ME.SC.R7	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Clarence Davis) Author: Reed, Lloyd Date: 3/6/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR171	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Colorado Vineyard - Brickey) Author: Reed, Lloyd Date: 3/6/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR172	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Colorado Vineyard - Decker) Author: Reed, Lloyd Date: 3/6/2013 Contractor: Natural Resources Conservation Service

Project No.	Title/Date/Author/Contractor
ME.SC.NR173	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Colorado Vineyards - Horn) Author: Reed, Lloyd Date: 3/6/2013 Contractor: Natural Resources Conservation Service
ME.SC.R8	Title: Mesa County Limited Results Cultural Resource Survey Report on Private Lands (Lindsey Kruckenberg) Author: Reed, Lloyd Date: 3/6/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR152	Title: Mesa County Limited-results Cultural Resource Survey Report on Private Lands - The Vinelands LLC(748b051212n) Author: Reed, Lloyd Date: 3/8/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR165	Title: Mesa County Limited-results Cultural Resource Survey Report on Private Lands - Brittany Dunn (748b05121mi) Author: Reed, Lloyd Date: 3/18/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR160	Title: Mesa County Limited-results Cultural Resource Survey Report on Private Lands - James Hosburght Author: Reed, Lloyd Date: 5/6/2013 Contractor: Natural Resources Conservation Service
ME.SC.NR145	Title: High Country Orchards LLC Limited-results Cultural Resource Survey Report: Mesa County, Colorado Author: Reed, Lloyd and Marsha Sims Date: 2/20/2015 Contractor: USDA NRCS
ME.R.R39	Title: A Class III Cultural Resource Inventory for the Government Highline Canal Salinity Project, Mesa County, Colorado Author: Pfertsh, Jack E. Date: 4/1/2016 Contractor: Alpine Archaeological Consultants, Inc.
ME.LM.R971	Title: Palisade Plunge Singletrack Trail, A Class III Cultural Resource Inventory for the Bureau of Land Management and the Grand Mesa National Forest in Mesa County, Colorado (BLM-GJFO CRIR 15417-02) Author: Leavitt-Reynolds, Alissa Date: 8/30/2017 Contractor: BLM - GJFO

Project No.	Title/Date/Author/Contractor
ME.SC.NR184	Title: John Mueller (EQIP No. 748B05190W3) Author: None Listed Date: 1/15/2020 Contractor: None Listed

Table A-2. Cultural resources recorded within one mile of the project area.

Site	Site Type	Assessment
5ME.00290	Orchard Mesa Canal 1 - Orchard Mesa Canal No. 1	Eligible - Officially
5ME.00290.12	Orchard Mesa Canal No. 1 - Segment	Needs Data - Officially
5ME.00290.14	Orchard Mesa Canal No. 1 - Segment	No Assessment
5ME.00297	Orchard Mesa Pumping Plant	Eligible - Officially
5ME.00426	Historic Habitation	Not Eligible - Field
5ME.00427	Open Lithic	Not Eligible - Officially
5ME.00446	Residence	No Assessment
5ME.00763	Historic, Structure/Foundation/Alignment	No Assessment
5ME.00775	Whitman, Pattie & Gunnison Expeditions Trail	Not Eligible - Field
5ME.00924	Roan Creek Toll Road	No Assessment
5ME.01180	Clifton Community Center and Church, Clifton Christian Church	Listed - National Register
5ME.02412	Palisade Survey Area	Eligible - Field
5ME.02415	House, Fraternal-Organization Lodge, Church	Eligible - Field
5ME.02415.04	Masonic Lodge, Masons Lodge, Palisade Masonic Temple	Eligible - Field
5ME.02415.12	Cooper Property	Not Eligible - Field
5ME.02415.13	Historic Single Dwelling	Not Eligible - Field
5ME.02415.14	Historic Single Dwelling	Not Eligible - Field
5ME.02415.15	Historic Single Dwelling	Not Eligible - Field
5ME.02415.16	Historic Single Dwelling	Not Eligible - Field
5ME.02415.26	Church of the Nazarene (Palisade)	Not Eligible - Field
5ME.02415.27	Historic Single Dwelling	Not Eligible - Field
5ME.02418	Historic Single Dwelling	No Assessment
5ME.02419	Historic Warehouse	No Assessment
5ME.02420	Historic Single Family Housing	No Assessment
5ME.02421	Historic Single Family Housing	No Assessment
5ME.02422	Historic Single Family Housing	No Assessment
5ME.02423	Historic Single Family Housing	No Assessment

5ME.02424	Historic Single Family Housing	No Assessment
5ME.02426	Historic Single Family Housing	No Assessment
5ME.02427	Historic Commercial Structure	No Assessment
5ME.02428	Historic Single Family Housing	No Assessment
5ME.02429	Historic Single Family Housing	No Assessment
5ME.02430	Historic Single Family Housing	No Assessment
5ME.02431	Historic Single Family Housing	No Assessment
5ME.02433	Historic Single Family Housing	No Assessment
5ME.02434	Historic Single Family Housing	No Assessment
5ME.02435	Historic Single Family Housing	No Assessment
5ME.02436	Historic Single Family Housing	No Assessment
5ME.02437	Historic Single Family Housing	No Assessment
5ME.02438	Historic Single Family Housing	No Assessment
5ME.02439	Historic Single Family Housing	No Assessment
5ME.02440	Historic Single Family Housing	No Assessment
5ME.02441	Historic Single Family Housing	No Assessment
5ME.02443	Historic Single Family Housing	No Assessment
5ME.02444	Historic Single Family Housing	No Assessment
5ME.02445	Historic Single Family Housing	No Assessment
5ME.02446	Historic Single Family Housing	No Assessment
5ME.02447	Historic Single Family Housing	No Assessment
5ME.02448	Historic Single Family Housing	No Assessment
5ME.02449	Historic Single Family Housing	No Assessment
5ME.02451	Historic Single Family Housing	No Assessment
5ME.02452	Historic Single Family Housing	No Assessment
5ME.02453	Historic Single Family Housing	No Assessment
5ME.02454	Historic Single Family Housing	No Assessment
5ME.02455	Historic Single Family Housing	No Assessment
5ME.02456	Historic Single Family Housing	No Assessment
5ME.02457	Historic Single Family Housing	No Assessment
5ME.02460	Historic Commercial Structure	No Assessment
5ME.02463	Historic Single Family Housing	No Assessment
5ME.02467	Historic Single Family Housing	No Assessment
5ME.02468	Historic Single Family Housing	No Assessment
5ME.02469	Historic Single Family Housing	No Assessment
5ME.02472	Historic Single Family Housing	No Assessment
5ME.02474	Historic Single Family Housing	No Assessment

5ME.02475	Historic Single Family Housing	No Assessment
5ME.02476	Historic Single Family Housing	No Assessment
5ME.02478	Historic Single Family Housing	No Assessment
5ME.02479	Historic Single Family Housing	No Assessment
5ME.02481	Historic Single Family Housing	No Assessment
5ME.02486	Historic Single Family Housing	No Assessment
5ME.02487	Historic Single Family Housing	No Assessment
5ME.02488	Historic Single Family Housing	No Assessment
5ME.02489	Historic Single Family Housing	No Assessment
5ME.02490	Historic Single Family Housing	Not Eligible - Officially
5ME.02493	Historic Commercial Structure	No Assessment
5ME.02494	Historic Single Family Housing	No Assessment
5ME.02495	Historic Single Family Housing	No Assessment
5ME.02496	Historic Single Family Housing	No Assessment
5ME.02497	Historic Single Family Housing	No Assessment
5ME.02500	Historic Single Family Housing	No Assessment
5ME.02503	Historic Single Family Housing	No Assessment
5ME.02504	Historic Single Family Housing	No Assessment
5ME.02505	Historic Single Family Housing	No Assessment
5ME.02507	Historic Single Family Housing	No Assessment
5ME.02508	Historic Single Family Housing	No Assessment
5ME.02509	Historic Single Family Housing	No Assessment
5ME.02510	Historic Single Family Housing	No Assessment
5ME.02511	Historic Single Family Housing	No Assessment
5ME.02512	Historic Single Family Housing	No Assessment
5ME.02513	Historic Commercial Structure	No Assessment
5ME.02514	Historic Single Family Housing	No Assessment
5ME.02515	Historic Single Family Housing	No Assessment
5ME.02516	Historic Single Family Housing	No Assessment
5ME.02517	Brown Property, Single Dwelling	Not Eligible - Family
5ME.02518	Historic Single Family Housing	No Assessment
5ME.02519	Historic Single Family Housing	No Assessment
5ME.02520	Historic Single Family Housing	No Assessment
5ME.02521	Historic Single Family Housing	No Assessment
5ME.02522	Historic Single Family Housing	No Assessment
5ME.02523	Historic Single Family Housing	No Assessment
5ME.02524	Historic Single Family Housing	No Assessment

5ME.02527	Historic Single Family Housing	No Assessment
5ME.02528	Historic Single Family Housing	No Assessment
5ME.02529	Historic Single Family Housing	No Assessment
5ME.02530	Historic Single Family Housing	No Assessment
5ME.02531	Historic Single Family Housing	No Assessment
5ME.02533	Historic Single Family Housing	No Assessment
5ME.02534	Historic Single Family Housing	No Assessment
5ME.02536	Historic Single Family Housing	No Assessment
5ME.02537	Historic Single Family Housing	No Assessment
5ME.02538	Historic Single Family Housing	No Assessment
5ME.02539	Historic Single Family Housing	No Assessment
5ME.02540	Metzger Residence, Single Dwelling	Not Eligible - Field
5ME.02541	Historic Single Family Housing	No Assessment
5ME.02542	Historic Single Family Housing	No Assessment
5ME.02543	Historic Single Family Housing	No Assessment
5ME.02544	Historic Single Family Housing	No Assessment
5ME.02545	Historic Single Family Housing	No Assessment
5ME.02547	Historic Single Family Housing	No Assessment
5ME.02548	Historic Single Family Housing	No Assessment
5ME.02549	Historic Single Family Housing	No Assessment
5ME.02550	Historic Single Family Housing	No Assessment
5ME.02553	Historic Single Family Housing	No Assessment
5ME.02554	Historic Single Family Housing	No Assessment
5ME.02557	Historic Single Family Housing	No Assessment
5ME.02558	Historic Single Family Housing	No Assessment
5ME.02559	Historic Single Family Housing	No Assessment
5ME.02560	Historic Single Family Housing	No Assessment
5ME.02565	Historic Single Family Housing	No Assessment
5ME.02567	Historic Single Family Housing	No Assessment
5ME.02568	Historic Single Family Housing	No Assessment
5ME.02570	Historic Single Family Housing	No Assessment
5ME.02571	Historic Single Family Housing	No Assessment
5ME.02572	Historic Single Family Housing	No Assessment
5ME.02573	Historic Single Family Housing	No Assessment
5ME.02574	Historic Single Family Housing	No Assessment
5ME.02575	Historic Single Family Housing	No Assessment
5ME.02576	Historic Single Family Housing	No Assessment

5ME.02577	Historic Single Family Housing	No Assessment
5ME.02578	Historic Single Family Housing	No Assessment
5ME.02579	Historic Single Family Housing	No Assessment
5ME.02580	Historic Single Family Housing	No Assessment
5ME.02581	Historic Single Family Housing	No Assessment
5ME.02582	Historic Single Family Housing	No Assessment
5ME.02583	Historic Single Family Housing	No Assessment
5ME.02584	Historic Single Family Housing	No Assessment
5ME.02585	Historic Single Family Housing	No Assessment
5ME.02586	Historic, Church	No Assessment
5ME.02588	Historic Single Family Housing	No Assessment
5ME.02589	Historic Single Family Housing	No Assessment
5ME.02590	Historic Single Family Housing	No Assessment
5ME.02591	Historic Single Family Housing	No Assessment
5ME.02592	Historic Single Family Housing	No Assessment
5ME.02593	Historic Single Family Housing	No Assessment
5ME.02594	Historic Single Family Housing	No Assessment
5ME.02595	Historic Single Family Housing	No Assessment
5ME.02596	Historic Single Family Housing	No Assessment
5ME.02597	Historic Single Family Housing	No Assessment
5ME.02598	Historic Single Family Housing	No Assessment
5ME.02599	Historic Single Family Housing	No Assessment
5ME.02602	Historic Single Family Housing	No Assessment
5ME.02603	Historic Single Family Housing	No Assessment
5ME.02604	Historic Single Family Housing	No Assessment
5ME.02605	Historic Single Family Housing	No Assessment
5ME.02606	Historic Single Family Housing	No Assessment
5ME.02607	Historic Single Family Housing	No Assessment
5ME.02608	Historic Single Family Housing	No Assessment
5ME.02609	Historic Single Family Housing	No Assessment
5ME.02610	Historic Single Family Housing	No Assessment
5ME.02611	Historic Single Family Housing	No Assessment
5ME.02613	Historic Single Family Housing	No Assessment
5ME.02614	Historic Single Family Housing	No Assessment
5ME.02615	Historic Single Family Housing	No Assessment
5ME.02616	Historic Single Family Housing	No Assessment
5ME.02617	Historic Single Family Housing	No Assessment

5ME.02618	Historic Single Family Housing	No Assessment
5ME.02619	Historic Single Family Housing	No Assessment
5ME.02620	Historic Single Family Housing	No Assessment
5ME.02621	Historic Single Family Housing	No Assessment
5ME.02622	Historic Single Family Housing	No Assessment
5ME.02623	Historic Single Family Housing	No Assessment
5ME.02624	Historic Single Family Housing	No Assessment
5ME.02625	Historic Single Family Housing	No Assessment
5ME.02626	Historic Single Family Housing	No Assessment
5ME.02627	Historic Single Family Housing	No Assessment
5ME.02628	Historic Single Family Housing	No Assessment
5ME.02629	Historic Single Family Housing	No Assessment
5ME.02638	Historic Single Family Housing	No Assessment
5ME.02639	Historic Single Family Housing	No Assessment
5ME.02640	Historic Single Family Housing	No Assessment
5ME.02644	Historic Single Family Housing	No Assessment
5ME.02645	Historic Single Family Housing	No Assessment
5ME.02748	Historic Single Family Housing	No Assessment
5ME.02749	Historic Single Family Housing	No Assessment
5ME.02750	Historic Single Family Housing	No Assessment
5ME.02752	Historic Single Family Housing	No Assessment
5ME.02753	Historic Single Family Housing	No Assessment
5ME.02754	Historic Single Family Housing	No Assessment
5ME.02755	Historic Single Family Housing	No Assessment
5ME.02756	Historic Single Family Housing	No Assessment
5ME.02758	Historic Single Family Housing	No Assessment
5ME.02759	Historic Single Family Housing	No Assessment
5ME.02761	Historic Single Family Housing	No Assessment
5ME.04536	Herbert and Edith Crissey House, Carstens Residence	Listed - National Register
5ME.04665	Grand Valley Diversion Dam (Lower)	Eligible - Officially
5ME.04673	Historic Trash Dump	Not Eligible - Field
5ME.04676	Government Highline Canal	Eligible - Officially
5ME.04676.32	Government Highline Canal - Segment	Supports - Linear
5ME.04677	Orchard Mesa Power Canal	Eligible - Officially
5ME.04677.7	Orchard Mesa Power Canal - Segment	
5ME.04678	Price Ditch	Eligible - Field

5ME.04680.1	Grand Valley Irrigation Company System, Grand Valley Canal (Main Line)	Eligible - Officially
5ME.04680.38	Grand Valley Irrigation Company System - Segment	Supports - Linear
5ME.04926	Orchard Mesa Canal No.2	Eligible - Officially
5ME.06988	Adobe Storage Structure	Not Eligible - Officially
5ME.07351.37	Denver and Rio Grande Western Railroad - Segment	Supports - Linear
5ME.07405	Palisade Depot, United Fruit Growers Office	Eligible - Field
5ME.11816	Colorado River Bridge, Palisade, Milepost 43.26, Cdot No. H-03-e	Eligible - Field
5ME.11841	Government Highline Canal Bridge, Mesa-36.3-g.8	Not Eligible - Officially
5ME.12575	Historic Homestead, Barn	Not Eligible - Officially
5ME.12922.2	Us Highway 6 - Segment	Supports - Linear
5ME.14576	The Lester Place, White Lily Ranch	Eligible - Officially
5ME.15004	Nemnick Residence	Not Eligible - Officially
5ME.16499	Palisade High School, Mt. Garfield East School	Not Eligible - Officially
5ME.16536	Palisade Migratory Labor Camp	Eligible - Officially
5ME.17391	Historic, Habitation (Homestead)	Eligible - Officially
5ME.17523	Prehistoric Isolated Find	Not Eligible - Field
5ME.17551	Prehistoric Isolated Feature (Cairn)	Not Eligible - Field
5ME.17552	Prehistoric Isolated Find	Not Eligible - Field
5ME.17604	Grand Valley Power Plant	Eligible - Officially
5ME.17996.2	Shoshone - Palisade Transmission Line - Segment	Supports - Linear
5ME.17996.6	Shoshone - Palisade Transmission Line - Segment	Supports - Linear
5ME.18173	Protohistoric; Open Architectural	Eligible - Officially
5ME.18174	Historic; Isolated Feature	Not Eligible - Field
5ME.18175	Historic; Isolated Feature	Not Eligible - Field
5ME.18176	Prehistoric; Isolated Find	Not Eligible - Field
5ME.21600	Combination	Not Eligible - Field
5ME.22006	Built Environment	Officially - Not eligible
5ME.23644	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet
5ME.23645	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet
5ME.23646	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet
5ME.23647	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet
5ME.23648	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet
5ME.23654	Assigned 12/23/2020 to Alpine - No Form Yet	Not Available Yet

Appendix B: Cultural Resources Location Map and OAHP Site Forms
(OAHP and USDA Rural Development Copies Only)

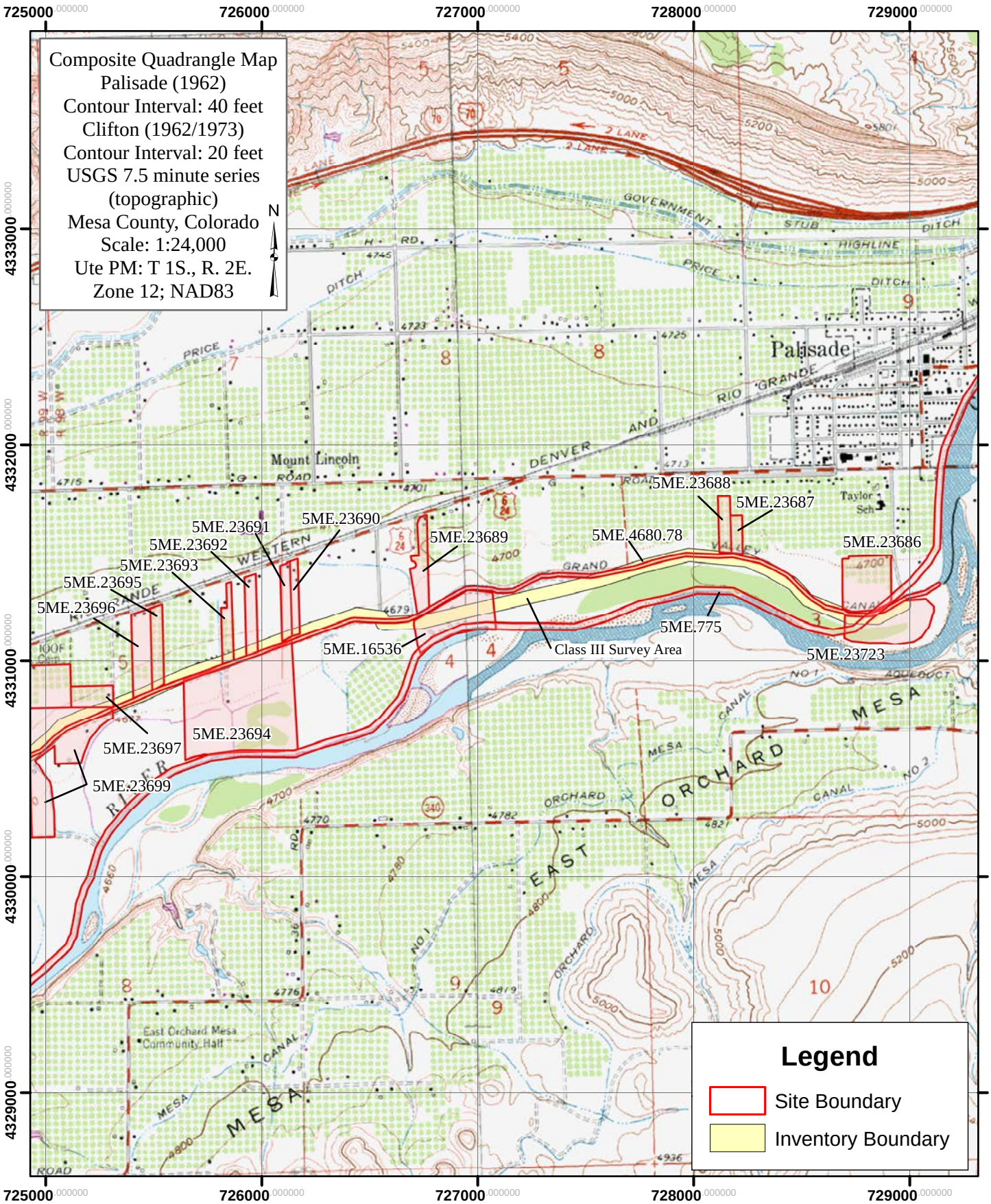


Figure B-1. Cultural Resource location map (1 of 2) for the Class III Cultural Resources Inventory of the Proposed Town of Palisade Sanitary Sewer Alignment Project Mesa County, Colorado. Cultural Resources are indicated. (OAHP No. ME.RD.R1; GRI Project No. 2021-10)

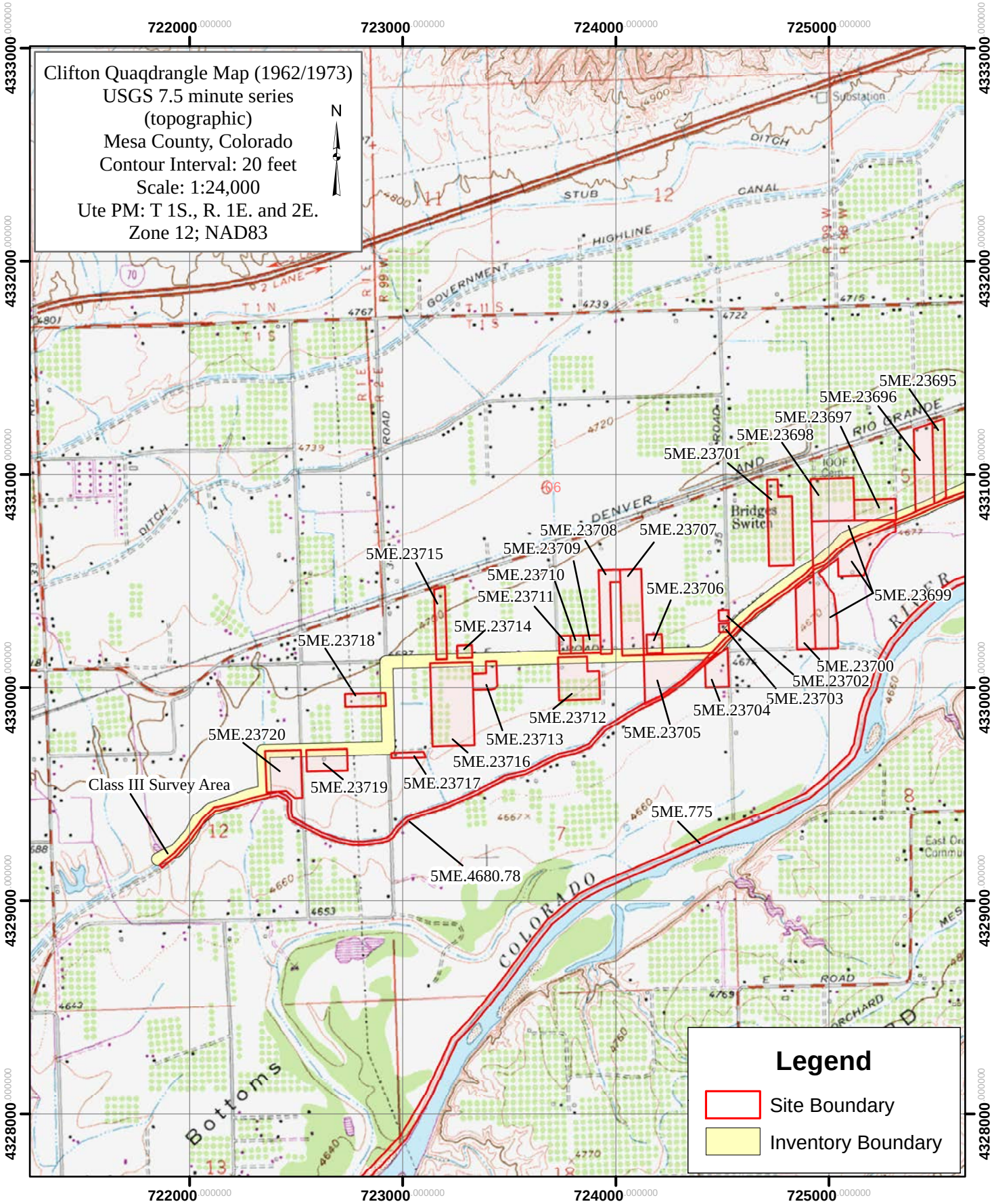


Figure B-2. Cultural Resource location map (2 of 2) for the Class III Cultural Resources Inventory of the Proposed Town of Palisade Sanitary Sewer Alignment Project Mesa County, Colorado. Cultural Resources are indicated. (OAHP No. ME.RD.R1; GRI Project No. 2021-10)

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX B – 7 Socioeconomic and Environmental Justice Documentation

EJSCREEN Census 2010 Summary Report

Location: User-specified linear location
Ring (buffer): 0.5-miles radius
Description: Palisade Sewer Transfer

Summary	Census 2010
Population	2,710
Population Density (per sq. mile)	480
People of Color Population	369
% People of Color Population	14%
Households	1,213
Housing Units	1,303
Land Area (sq. miles)	5.64
% Land Area	98%
Water Area (sq. miles)	0.13
% Water Area	2%

Population by Race	Number	Percent
Total	2,710	-------
Population Reporting One Race	2,654	98%
White	2,472	91%
Black	10	0%
American Indian	39	1%
Asian	12	0%
Pacific Islander	6	0%
Some Other Race	115	4%
Population Reporting Two or More Races	56	2%
Total Hispanic Population	284	10%
Total Non-Hispanic Population	2,426	90%
White Alone	2,341	86%
Black Alone	9	0%
American Indian Alone	20	1%
Non-Hispanic Asian Alone	11	0%
Pacific Islander Alone	6	0%
Other Race Alone	2	0%
Two or More Races Alone	38	1%

Population by Sex	Number	Percent
Male	1,346	50%
Female	1,364	50%

Population by Age	Number	Percent
Age 0-4	171	6%
Age 0-17	583	22%
Age 18+	2,127	78%
Age 65+	509	19%

Households by Tenure	Number	Percent
Total	1,213	
Owner Occupied	773	64%
Renter Occupied	439	36%

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, Census 2010 Summary File 1.

EJSCREEN ACS Summary Report

Location: User-specified linear location
Ring (buffer): 0.5-miles radius
Description:

Summary of ACS Estimates	2014 - 2018
Population	3,022
Population Density (per sq. mile)	545
People of Color Population	499
% People of Color Population	17%
Households	1,193
Housing Units	1,282
Housing Units Built Before 1950	209
Per Capita Income	27,084
Land Area (sq. miles) (Source: SF1)	5.55
% Land Area	98%
Water Area (sq. miles) (Source: SF1)	0.14
% Water Area	2%

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	3,022	100%	676
Population Reporting One Race	2,813	93%	1,001
White	2,746	91%	725
Black	8	0%	119
American Indian	30	1%	42
Asian	4	0%	43
Pacific Islander	4	0%	39
Some Other Race	21	1%	33
Population Reporting Two or More Races	209	7%	145
Total Hispanic Population	247	8%	336
Total Non-Hispanic Population	2,775		
White Alone	2,523	83%	619
Black Alone	8	0%	119
American Indian Alone	28	1%	36
Non-Hispanic Asian Alone	4	0%	43
Pacific Islander Alone	4	0%	39
Other Race Alone	1	0%	27
Two or More Races Alone	209	7%	145
Population by Sex			
Male	1,630	54%	506
Female	1,392	46%	344
Population by Age			
Age 0-4	165	5%	154
Age 0-17	552	18%	324
Age 18+	2,470	82%	430
Age 65+	671	22%	157

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2014 - 2018 .

EJSCREEN ACS Summary Report

Location: User-specified linear location
Ring (buffer): 0.5-miles radius
Description:

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	2,266	100%	375
Less than 9th Grade	33	1%	114
9th - 12th Grade, No Diploma	322	14%	171
High School Graduate	714	32%	243
Some College, No Degree	709	31%	298
Associate Degree	192	8%	100
Bachelor's Degree or more	489	22%	164
Population Age 5+ Years by Ability to Speak English			
Total	2,857	100%	590
Speak only English	2,730	96%	542
Non-English at Home[1+2+3+4]	127	4%	219
[1]Speak English "very well"	100	4%	173
[2]Speak English "well"	7	0%	39
[3]Speak English "not well"	16	1%	101
[4]Speak English "not at all"	4	0%	47
[3+4]Speak English "less than well"	20	1%	101
[2+3+4]Speak English "less than very well"	26	1%	101
Linguistically Isolated Households*			
Total	5	100%	80
Speak Spanish	4	78%	79
Speak Other Indo-European Languages	0	0%	12
Speak Asian-Pacific Island Languages	1	22%	12
Speak Other Languages	0	0%	12
Households by Household Income			
Household Income Base	1,193	100%	188
< $15,000	192	16%	185
$15,000 - $25,000	156	13%	147
$25,000 - $50,000	314	26%	159
$50,000 - $75,000	213	18%	151
$75,000 +	319	27%	162
Occupied Housing Units by Tenure			
Total	1,193	100%	188
Owner Occupied	781	65%	186
Renter Occupied	412	35%	180
Employed Population Age 16+ Years			
Total	2,555	100%	380
In Labor Force	1,403	55%	362
Civilian Unemployed in Labor Force	103	4%	111
Not In Labor Force	1,152	45%	316

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: User-specified linear location
Ring (buffer): 0.5-miles radius
Description:

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	3,030	100%	651
English	2,832	93%	622
Spanish	186	6%	288
French	0	0%	17
French Creole	N/A	N/A	N/A
Italian	N/A	N/A	N/A
Portuguese	N/A	N/A	N/A
German	2	0%	23
Yiddish	N/A	N/A	N/A
Other West Germanic	N/A	N/A	N/A
Scandinavian	N/A	N/A	N/A
Greek	N/A	N/A	N/A
Russian	N/A	N/A	N/A
Polish	N/A	N/A	N/A
Serbo-Croatian	N/A	N/A	N/A
Other Slavic	N/A	N/A	N/A
Armenian	N/A	N/A	N/A
Persian	N/A	N/A	N/A
Gujarathi	N/A	N/A	N/A
Hindi	N/A	N/A	N/A
Urdu	N/A	N/A	N/A
Other Indic	N/A	N/A	N/A
Other Indo-European	2	0%	17
Chinese	0	0%	17
Japanese	N/A	N/A	N/A
Korean	0	0%	17
Mon-Khmer, Cambodian	N/A	N/A	N/A
Hmong	N/A	N/A	N/A
Thai	N/A	N/A	N/A
Laotian	N/A	N/A	N/A
Vietnamese	0	0%	17
Other Asian	0	0%	17
Tagalog	8	0%	32
Other Pacific Island	N/A	N/A	N/A
Navajo	N/A	N/A	N/A
Other Native American	N/A	N/A	N/A
Hungarian	N/A	N/A	N/A
Arabic	0	0%	17
Hebrew	N/A	N/A	N/A
African	N/A	N/A	N/A
Other and non-specified	0	0%	17
Total Non-English	198	7%	900

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2014 - 2018.
*Population by Language Spoken at Home is available at the census tract summary level and up.

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX C – Agency Correspondence Documentation

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX C – 1 Cooperative Planning Area Documentation

August 9, 2021

City of Grand Junction and Mesa County,

The Town of Palisade has been evaluating ways to improve its sanitary sewer treatment facilities for some time now. The Town is concerned they will not be able to meet future CDPHE permit limits with the current treatment facility and are proactively pursuing a more regional alternative to treat their wastewater.

The Town currently treats their wastewater with an aerated lagoon system. In recent years the Town has struggled to meet permitted treatment requirements for this existing facility. The Town also anticipates that this system is not capable of meeting future anticipated discharge limits from the Colorado Department of Public Health and Environment (CDPHE). The Town has been working with the CDPHE and Clifton Sanitation District (CSD) on a project to transfer the Town's wastewater to CSD for treatment. This regional approach is preferred by the CDPHE, the Town of Palisade, and CSD.

Conveyance of the Town's wastewater to CSD would require that a piped outfall from the Town to CSD be constructed. This piped system would cross through the established "Buffer Zone" between the Town of Palisade and the unincorporated area of Clifton in Mesa County.

The Buffer Zone was established with the 1998 Cooperative Planning Agreement between Mesa County, the City of Grand Junction and the Town of Palisade. Section 4 of the Resolution states:

"4. Within the 'cooperative planning area', all parties will not
a. extend any sanitary sewer line
b. recommend amendment to any 201 sewer service area boundary without the mutual consent of all parties."

The Town is not interested in modifying the limits of the established buffer zone or establishing a sewer service area within the buffer zone. CSD is also not interested in extending it's service area limits to include areas within the established buffer zone.

This regional approach to wastewater treatment also provides benefit to the Colorado River in having sanitary sewage treatment taking place at CSD. CSD's focus is on wastewater treatment and they have an exemplary record of providing this service to the community. Another benefactor of this regionalized approach is the Clifton Water District that has an intake on the Colorado River that is used during the low flow winter months. Transferring the Palisade waste stream to CSD would eliminate a wastewater treatment plant discharge point that is relatively close to the Clifton Water District's wintertime intake.

The Town would like your consideration in moving this project forward by providing consent from the City of Grand Junction and Mesa County to pursue this regional approach for Palisades sewer treatment.

Sincerely,

J Hawkinson

Janet Hawkinson, MLAP

Palisade Town Manager

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX C – 2 Example Agency Scoping Letter

June 7, 2021

Name of Addressee
Street Address
City, State Zip

RE: Town of Palisade Sewer Transfer Combination Conveyance Line Project

Dear Name of Addressee,

We are seeking information from your agency regarding any known environmental issues associated with the proposed Town of Palisade Sewer Transfer Combination Conveyance Line Improvement Project (Proposed Project) located in Mesa County, Colorado. Your comments are being solicited pursuant to the U.S. Department of Agriculture (USDA) Rural Development (RD) NEPA implementing regulations. The Proposed Project would help the Town meet the organic load capacity allowed by their current Colorado Department of Public Health and Environment (CDPHE) discharge permit by constructing a combination of gravity sewer and force main piping from the Town to the Clifton Sanitation Department. An Environmental Assessment (EA) will be prepared by the USDA RD to analyze the potential impacts of the Proposed Project.

The following information is being provided to aid in your evaluation of the proposal:

1. **Area of Potential Effect (APE)**: The APE is located in and around the Town of Palisade, extending southwest towards Clifton in Mesa County. Figure 1 identifies the APE, including the sewer lines and force main described in the project description.
2. **Location:** The APE is within Sections 3, 4, 5, 6, 7, and 8, Township 1 South, Range 2 East; and within Sections 1 and 12, Township 1 South, Range 1 East, Ute Meridian.
3. **Federal Agencies Involved:** Federal agencies involved or likely to potentially be involved include the United States Department of Agriculture – Rural Development (USDA-RD) – as the lead federal agency, Colorado Department of Public Health and Environment (CDPHE), Colorado Water Conservation Board (CWCB), and U.S. Army Corps of Engineers (USACE).
4. **Project Description:** A project description is provided in the attached "Project Description" document.
5. **Environmental Information:** Environmental information relating to compliance of the proposed activity with applicable environmental statues and descriptions of the current environmental condition of the proposed site is briefly described in the Town of Palisade Sewer Transfer Study. In general, the APE and vicinity include agricultural lands, canals, wetlands, and the floodplain of the Colorado River.
6. **Attachments:** Figure 1 identifies the APE. The Project Description describes components of the Proposed Project.

Please provide your comments on the enclosed comment sheet or by letter within 30 days of the date of this letter to 305 South Main Street, Suite 6, P.O. Box 1161, Palisade, CO, 81526, attention Bret Guillory. If you have any questions regarding the proposed project, please contact Zachary Scott at (509) 458-3727 or by email at zscott@jub.com.

Sincerely,

Zachary Scott, Environmental Specialist
J-U-B ENGINEERS, Inc.

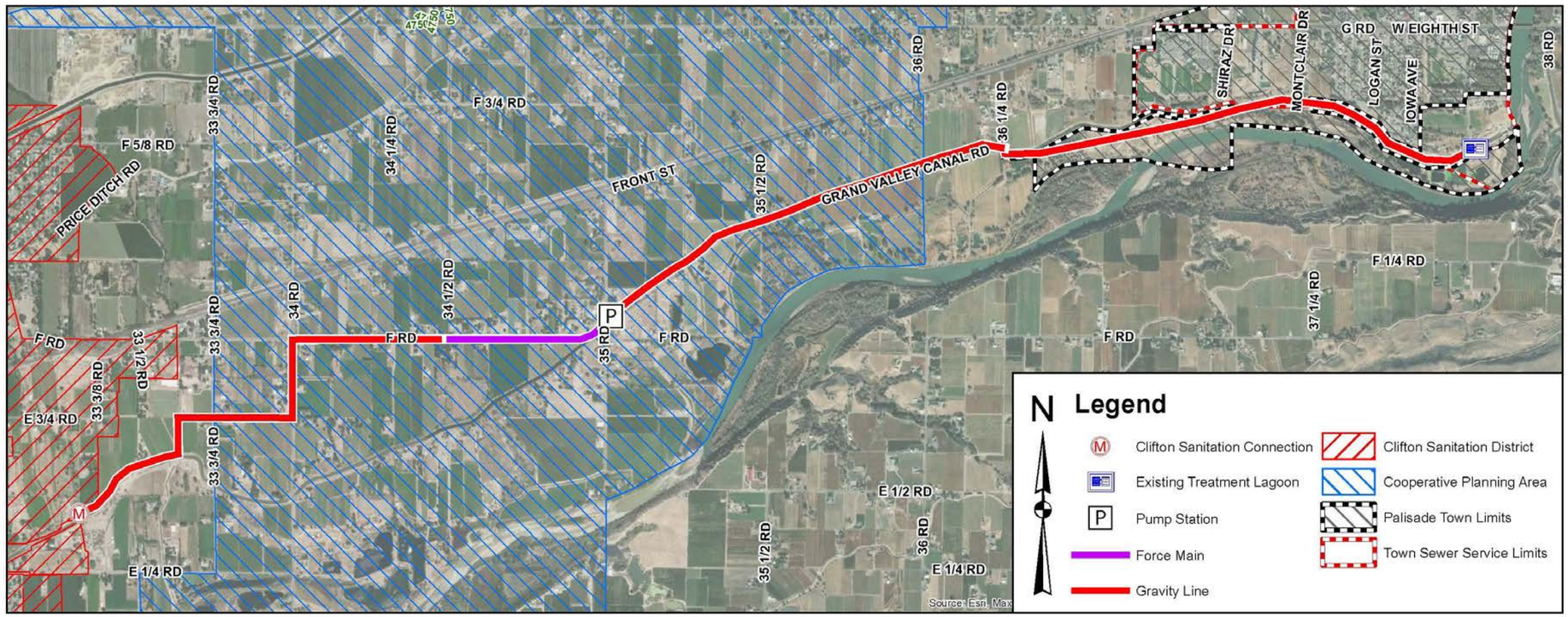
Town of Palisade

Sewer Transfer Combination Conveyance Line Improvement Project

Project Description

The Town of Palisade is proposing a sewer transfer project utilizing a combination of gravity sewer and force main to relay wastewater from the south of Palisade to the nearby Clifton Sanitation District (CSD). The project would occur over a distance of approximately 5.0 miles (Figure 1). The proposed project would construct:

- A new gravity line that would run from the south of the Town following the north side of the Grand Valley Irrigation Company (GVIC) canal alignment, then transferring to the existing roadway right-of-way near the intersection of 35 Road and F Road (approximately 3.03 miles).
- A lift station and short force main (approximately 0.57 miles) would be constructed along the route near this intersection of 35 Road and F Road to make up the elevation difference necessary to maintain adequate slope on the remaining gravity sections of the sewer line.
- Following the section of force main, an additional gravity line would be installed following the alignment of F Road to the intersection of 34 Road. The line would then turn south for approximately 0.25 miles before traveling west towards 33 ¾ Road and later following the GVIC alignment to the CSD connection.



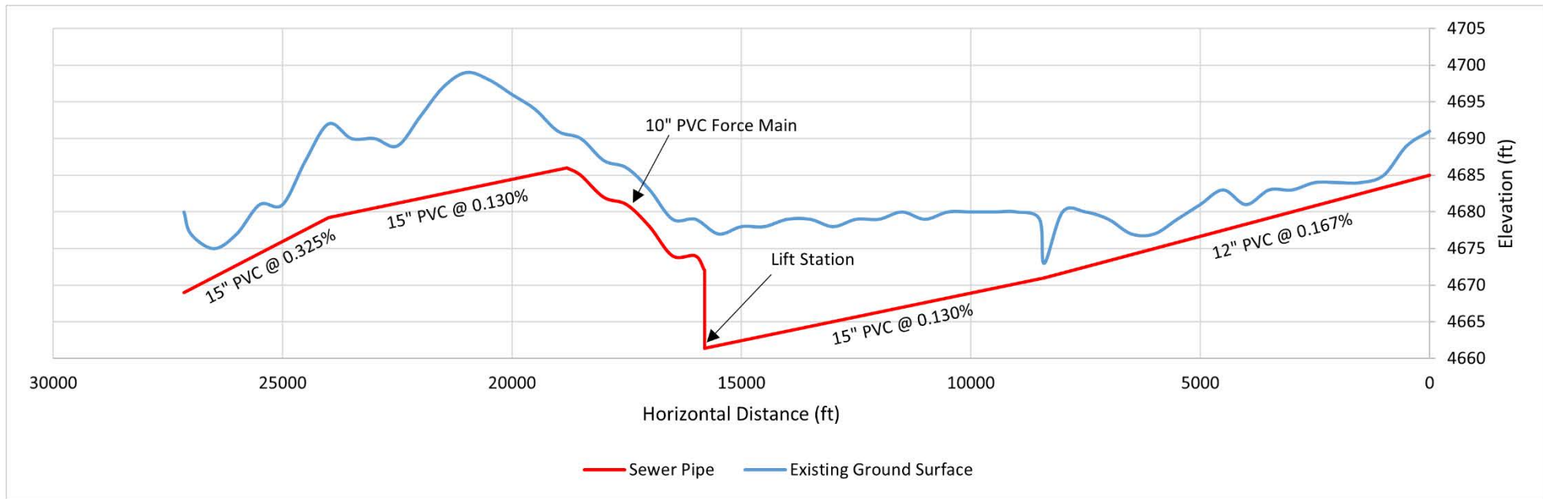


Figure 1 – Proposed Project Exhibit

INTERGOVERNMENTAL REVIEW COMMENT SHEET
FOR

Town of Palisade, CO
(APPLICANT NAME)

Sewer Transfer Conveyance Line Construction Project
(PROJECT TYPE)

****

TO AGENCY ADDRESSED:

If you intend to comment but cannot respond to USDA, Rural Development within 30 calendar days, please notify USDA, Rural Development immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

****

PROGRAM REVIEW AND COMMENT

TO USDA, RURAL DEVELOPMENT:

We have reviewed the subject preapplication for Federal assistance and have reached the following conclusions on its relationship to our plans and programs:

[ ] It has no adverse effect.

[ ] We have no comment.

[ ] Effects, although measurable, would be acceptable.

[ ] It has adverse effects. (Explain in the Remarks Section.)

[ ] We are interested but require more information to evaluate the proposal. (Explain in the Remarks Section)

[ ] Additional comments for project improvement. (Attach if necessary)

REMARKS:

AGENCY: _____

BY: _____

PHONE NUMBER: _____

Town of Palisade, Colorado

Draft Environmental Assessment for the
Palisade Sewer Transfer Conveyance Line Project

APPENDIX C – 3 Agency Contact List

Agencies:

- U.S. Army Corps of Engineers Grand Junction Field Office
  - 400 Rood Ave, Room 224, Grand Junction, CO 81501
  - Travis Morse
    - w.travis.morse@usace.army.mil
- U.S. Fish and Wildlife Service – Grand Junction Office
  - 445 West Gunnison Avenue, Suite 140, Grand Junction, CO 81501
  - Dale Ryden
    - dale_ryden@fws.gov
    - 970-628-7200
- U.S. Forest Service – Rocky Mountain Region
  - 1617 Cole Boulevard, Building 17, Lakewood, CO 80401-3305
  - Bart Lander, Environmental Compliance and NEPA Program Manager
    - 303-908-7114
- Bureau of Land Management – Grand Junction Field Office
  - 2815 H Road, Grand Junction, CO 81506
  - Greg Wolfgang, Field Manager
    - 970-244-3000
- Colorado Department of Public Health and Environment
  - 4300 Cherry Creek Drive South, Denver, CO 80246
  - Margo Griffin
    - 303-692-3607
    - Margo.griffin@state.co.us
- Colorado Water Conservation Board
  - 1313 Sherman Street, Room 718, Denver, CO 80203
  - Kevin Houck, Watershed and Flood Protection Section Chief
    - 303-866-3441 x3219
    - Kevin.houck@state.co.us
- Colorado Department of Natural Resources
  - 1313 Sherman Street, Room 718, Denver, CO 80203
  - Douglas Vilsack, Assistant Director for Parks, Wildlife, and Lands
    - 303-566-3311
    - Douglas.Vilsack@state.co.us
- Colorado Parks and Wildlife – Grand Junction Office
  - 711 Independent Avenue, Grand Junction, CO 81505
  - Taylor Elm
    - taylor.elm@state.co.us
    - 970-255-6100

- Mesa County Planning Division, Department of Public Works
  - P.O. Box 20000, Grand Junction, CO 81502

    - Jeff Hofman, Senior Planner
        - Jeff.hofman@mesacounty.us
        - 970-244-1636
- Clifton Sanitation District
    - 3217 D Road, Clifton, CO 81520
    - Eli Jennings, District Manager
        - Ejennings@cliftonsanitation.com
        - 970-434-7422

Tribes:

- Southern Ute Indian Tribe
    - P.O. Box 737, 356 Ouray Drive, Ignacio CO 81137
    - Melvin J. Baker, Chairman
        - 970-563-0100
- Ute Mountain Ute Tribe
    - 125 Mike Wash Rd., Towaoc, CO 81334
    - Manuel Heart, Chairman
        - Manuel.Heart@utemountain.org
- Ute Tribe of the Uintah and Ouray Reservation
    - P.O. Box 190, Ft. Duchesne, UT 84026
    - Luke Duncan, Chairman
        - luked@utetribe.com
        - 435-722-5141

Cultural/Historic:

- History Colorado
    - 1200 Broadway, Denver, CO 80203
    - Steve Turner, State Historic Preservation Officer
        - Steve.turner@state.co.us
        - 303-866-2776