

ENVIRONMENTAL ASSESSMENT FOR
**BATTLE CREEK CULINARY
WATER PIPELINE**

PLEASANT GROVE RANGER DISTRICT
UINTA NATIONAL FOREST
UTAH COUNTY, UTAH

UNITED STATES
DEPARTMENT OF
AGRICULTURE

FOREST
SERVICE

MARCH 2016

Summary

The City of Pleasant Grove (Pleasant Grove) proposes to replace aging water pipelines for the existing culinary water collection system in Battle Creek Canyon. Pleasant Grove is the holder of a special use permit (Permit #PG100901A) issued by the United States Forest Service for the operation and maintenance of several spring collection sites and an associated culinary water pipeline within Battle Creek Canyon. The existing spring collection system in Battle Creek Canyon consists of approximately eight spring collection areas and associated pipelines. The system is approximately 80 years old, is leaking in multiple locations, and has completely failed in at least four locations. This presents a risk to public health as continued corrosion of the pipeline will increase the potential for contamination of the culinary water supply.

The purpose of the proposed culinary water pipeline project is to:

- Maintain the delivery of high quality culinary drinking water to the citizens of Pleasant Grove without the need to implement extensive water treatment or additional pumping;
- Improve access to the water delivery system to allow for future maintenance needs.

The Proposed Action would:

- Abandon portions of the existing steel pipeline where aged and failing (approximately 5,530 feet);
- Install 5,600 feet of high density polyethylene pipeline (including associated air vents) on a new alignment;
- Re-establish maintenance access routes for the spring collection system, and
- Stabilize erosion prone areas in association with the pipeline.

In addition to the Proposed Action, the USFS also evaluated a No-Action alternative in accordance with the Forest Service direction for implementing the National Environmental Policy Act (NEPA). Under this alternative, the existing pipeline would not be replaced and Pleasant Grove City would continue to utilize the existing pipeline and spring collection system in Battle Creek Canyon for delivery of culinary water.

In consideration of the stated purpose and need and this analysis of environmental effects, the Pleasant Grove District Ranger of the Uinta-Wasatch-Cache National Forest, as the Responsible Official, will decide whether the proposed action will proceed as proposed, as modified, or not at all. If it does proceed, the forest supervisor will also decide what mitigation measures and monitoring requirements will be applied to the proposed action.

Table of Contents

Summary	i
Chapter 1 – Purpose and Need	1
1. Introduction	1
2. Project Location	1
3. Purpose and Need for Action.....	2
3.1 Culinary Water Delivery	2
3.2 Access.....	2
4. Proposed Action.....	4
5. Decision Framework	4
Chapter 2 – Comparison of Alternatives.....	4
2.1 No-Action Alternative	4
2.2 Proposed Action Alternative	5
2.3 Alternatives Considered but Eliminated from Further Analysis	9
2.4 Comparison of Alternatives Selected for Further Analysis	9
Chapter 3 – Affected Environment and Environmental Consequences	11
3.1 Air Quality	11
3.1.1 National Ambient Air Quality Standards.....	11
3.1.2 Affected Environment.....	12
3.1.3 Environmental Effects.....	12
3.2 Biological Resources.....	12
3.2.1 Affected Environment.....	12
3.2.2 Environmental Effects.....	21
3.3 Cultural Resources	24
3.3.1 Affected Environment.....	24
3.3.2 Environmental Effects.....	27
3.4 Geology and Soils.....	28
3.4.1 Affected Environment.....	28
3.4.2 Environmental Effects.....	29
3.5 Hydrology and Water Resources	31
3.5.1 Affected Environment.....	31
3.5.2 Environmental Effects.....	34
3.6 Recreational Resources.....	37
3.6.1 Affected Environment.....	37
3.6.2 Environmental Effects.....	37
3.7 Roadless Areas	38
3.7.1 Affected Environment.....	38
3.7.2 Environmental Effects.....	38
3.8 Visual Resources	39
3.8.1 Affected Environment.....	39
3.8.2 Environmental Effects.....	40
3.9 Cumulative Effects	41
3.9.1 Background	41
3.9.2 Past, Present, and Reasonably Foreseeable Future Actions.....	41
3.9.3 Evaluation of Cumulative Effects	42
3.10 Mitigation Summary	44

Chapter 4 – Comments and Coordination 49
 4.1 Communications with the Public 49
 4.2 Agency Correspondence 49
 References 51

Appendix A - Correspondence

Appendix B - Biological Evaluation for the Battle Creek Canyon EA

Appendix C - Battle Creek Canyon Culinary Water Pipeline Wetlands/Waters of the U.S. Delineation

List of Tables

Table 1. Comparison of Project Alternatives 9
 Table 2. National Ambient Air Quality Standards 11
 Table 3. Threatened and Endangered Species Potentially Present in the Area 13
 Table 4. Forest Sensitive Species Potentially Present in the Uinta Planning Unit of the Uinta-Wasatch-Cache National Forest 14
 Table 5. Uinta National Forest MIS Species Potentially Present in the Uinta Planning Unit of the Uinta-Wasatch-Cache National Forest 18
 Table 6. Game Species Potentially Found in Project Area 20
 Table 7. Effect Determinations for Federally-Listed Species 21
 Table 8. Impacts to Forest Sensitive and UNF Management Indicator Species 22
 Table 9: Wetlands Identified in the Project Area 32
 Table 10: Correspondence 49

List of Figures

Figure 1. Project Location Map 1
 Figure 2. Battle Creek Falls (outside project area) 2
 Figure 3. Existing pipeline alignment within a densely forested area 3
 Figure 4. Existing pipeline alignment on a steep side slope 3
 Figure 5. Proposed Action 7
 Figure 6. Legacy Access Routes 7
 Figure 7. Proposed Staging Area 8
 Figure 8. Location of Wheeler’s Angelica 17
 Figure 9. Wheeler’s Angelica in Battle Creek Canyon (photos courtesy of Jana Leinbach, USFS) 18
 Figure 10. Site 42UT1902 Feature 1: Stone masonry diversion dam 25
 Figure 11. Site 42UT1902 Feature 2: Remnants of wooden flume 26
 Figure 12. Site 42UT1902 Feature 3: Alignment/access road 26
 Figure 13. View of striated canyon walls in Battle Creek Canyon 28
 Figure 14. Wetland A 33
 Figure 15. Wetland B and Stream Crossing 1 33
 Figure 16. Stream Crossing 2 34
 Figure 17. Blue Creek crossing 35
 Figure 18. Battle Creek Crossing 35
 Figure 20. Battle Creek Canyon looking northeast towards Mt. Timpanogos 40
 Figure 21. Example of an existing air vent in the project area 40

Abbreviations Used

ACHP Advisory Council for Historic Preservation
 APE Area of Potential Effect
 BGEPA Bald and Golden Eagle Protection Act
 BMP Best management practices
 CEQ Council of Environmental Quality
 CFR Code of Federal Regulations
 CLG Certified Local Government
 EA Environmental Assessment
 EPA Environmental Protection Agency
 ESA Endangered Species Act
 HDPE High Density Polyethylene
 IPaC Information, Planning and Conservation
 MBTA Migratory Bird Treaty Act
 MIS Management Indicator Species
 msl mean sea level
 NAAQS National Ambient Air Quality Standards
 NHPA National Historic Preservation Act
 NFMA National Forest Management Act
 NRCS Natural Resources Conservation Service
 NRHP National Register of Historic Places
 NNIS Non-Native Invasive Species
 O&M Operation and Maintenance
 RACR Roadless Area Conservation Rule
 ROS Recreation Opportunity Spectrum
 SHPO State Historic Preservation Officer
 SPNM Semi-Primitive Non-Motorized
 VQO Visual Quality Objective
 UDDW Utah Division of Drinking Water
 UDWR Utah Division of Wildlife Resources
 UDWQ Utah Division of Water Quality
 ULT Ute Ladies'-tresses
 UNF Uinta National Forest
 UNHP Utah Natural Heritage Program
 USACE United States Army Corps of Engineers
 USDA United States Department of Agriculture
 USFS United States Forest Service
 USFWS United States Fish and Wildlife Service

Chapter 1 – Purpose and Need

1. Introduction

The City of Pleasant Grove (Pleasant Grove) is the holder of a special use permit (Permit #PG100901A) issued by the United States Forest Service for the operation and maintenance of several spring collection sites and an associated culinary water pipeline within Battle Creek Canyon.

The existing spring collection system in Battle Creek Canyon is a gravitational system that does not require pumps or other mechanical devices for operation, and consists of approximately eight spring collection areas and associated pipelines. The system is approximately 80 years old and in the project area, it is leaking in multiple locations and has completely failed in at least four locations. This presents a risk to public health as continued corrosion of the pipeline will increase the potential for contamination of the culinary water supply. Pleasant Grove proposes to replace portions of the existing culinary water collection system pipelines.

2. Project Location

Battle Creek Canyon is located in Utah County in the Wasatch Mountains approximately 2.5 miles east of Pleasant Grove (see Figure 1). The project area is located within Battle Creek Canyon south/southwest of the Great Western Trail and east of Battle Creek Falls in Sections 13, 14, 23, and 24 of Township 5 South, Range 2 East. The mouth of the canyon is located at 200 South and Kiwanis Park and the canyon extends about two miles east. The mouth of the canyon is approximately 5,000 feet above mean sea level (msl), and rises to about 7,400 feet above msl at the junction of the Great Western Trail, which lies at the top of the canyon.

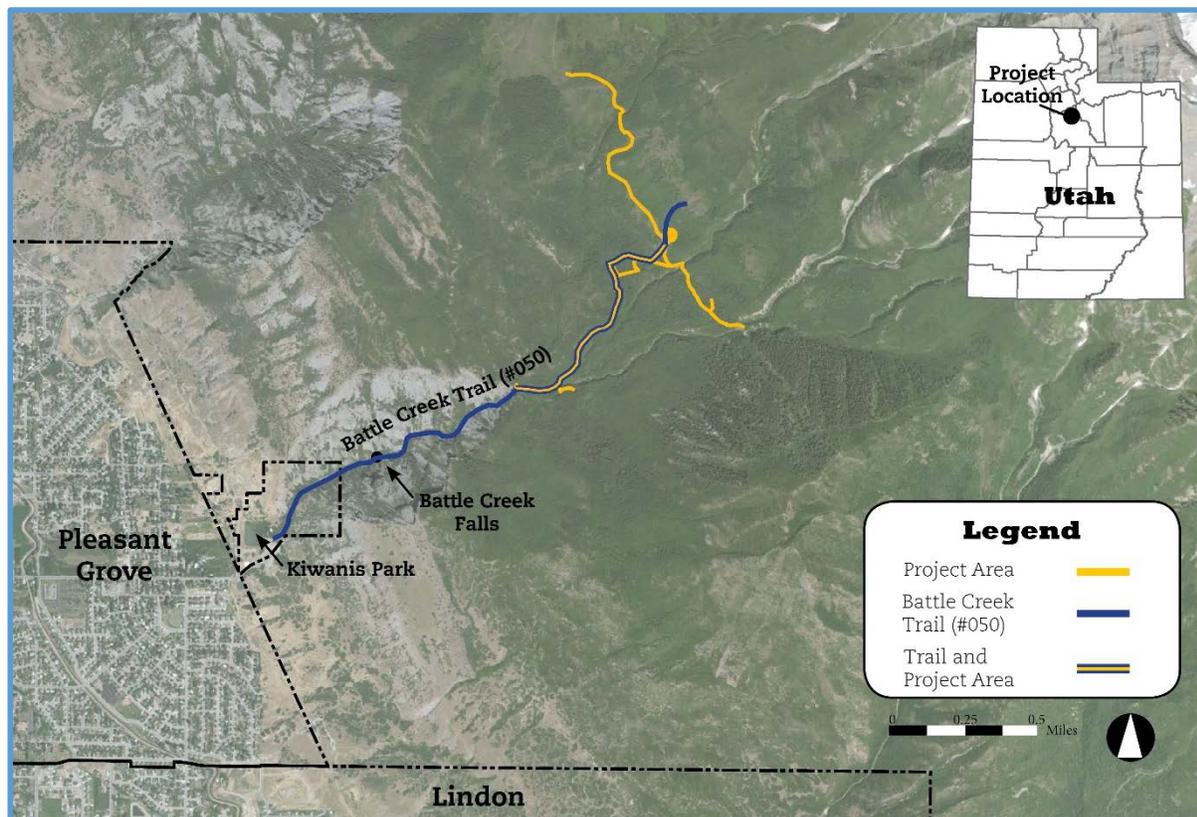


Figure 1. Project Location Map

The project area consists of an approximately 35-foot corridor running along the Battle Creek Trail with some minor deviations branching off to the northwest and southeast near the top of the project area.

Battle Creek Canyon contains the popular Battle Creek Trail, which provides access to Battle Creek Falls and other trail systems (i.e. Curley Springs Trail and the Great Western Trail). Battle Creek Falls is a naturally occurring waterfall and popular attraction for outdoor enthusiasts that is supplied by Battle Creek, a perennial stream for which the canyon was named (see Figure 2). Blue Creek (North Fork Battle Creek) and Shirt Creek are both tributaries that flow into Battle Creek above the falls. All of the water from Battle Creek is diverted at the mouth of the canyon by the Pleasant Grove Irrigation Company to provide water for agricultural and municipal use in Pleasant Grove. During the winter, when the water is not needed for agricultural purposes, excess water flows through the Pleasant Grove storm drain system.

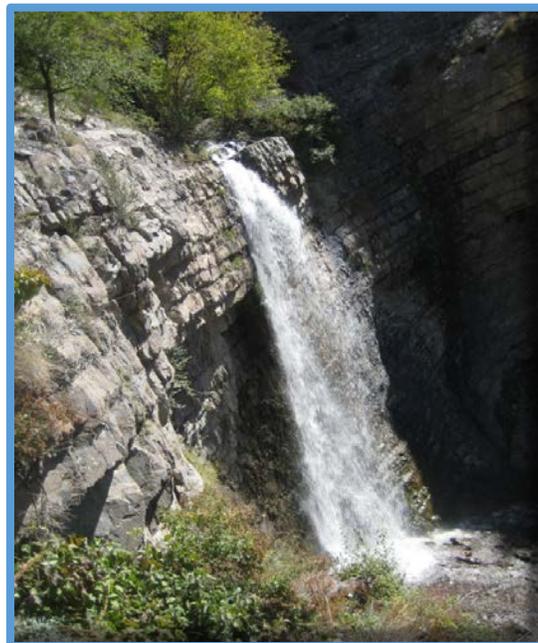


Figure 2. Battle Creek Falls (outside project area)

3. Purpose and Need for Action

The purpose of the proposed culinary water pipeline project is to:

- Maintain the delivery of high quality culinary drinking water to the residents of Pleasant Grove without having to implement extensive water treatment or additional pumping;
- Improve access to the water delivery system to allow for future maintenance needs.

3.1 Culinary Water Delivery

The proposed project is needed because the existing pipeline is approximately 80 years old and although portions of the pipeline were upgraded in 1971, the entire pipeline has exceeded its design life. The pipeline is leaking at multiple locations and has completely failed in at least four locations. The leaking pipes have resulted in culinary water losses and present the potential for public health risks from water contamination. Updating and improving the aging pipeline is necessary to ensure the citizens of Pleasant Grove continued use of culinary drinking water from Battle Creek Canyon that is in compliance with the Utah Division of Drinking Water (UDDW) standards for water quality.

3.2 Access

The project is also needed to improve access to the pipeline and spring collection areas for future maintenance activities. The location of the current pipeline makes access extremely difficult and limited. Long portions of the existing pipeline are buried in areas containing thick, woody vegetation. Other segments are located on steep side slopes, making access dangerous, and in some cases impossible, for maintenance equipment. See Figures 3 and 4.



Figure 3. Existing pipeline alignment within a densely forested area



Figure 4. Existing pipeline alignment on a steep side slope

4. Proposed Action

The action proposed by the City of Pleasant Grove to meet the purpose and need involves capping and abandoning portions of the existing pipeline; replacing those portions with pipeline installed on a new alignment; and, re-establishing maintenance access routes for the spring collection system. These activities are designed to eliminate the risk of contamination to the culinary water supply in a manner that would reduce the amount of vegetation manipulation and soil disturbance required for implementation.

The proposed action was developed at the onset of the project and is based on site-specific needs and preliminary issues. It was used during the scoping process and was provided to individuals, groups, and organizations through a formal scoping period to review and identify additional issues. The proposed action is described in detail in Chapter 2.

5. Decision Framework

In consideration of the stated purpose and need and this analysis of environmental effects, the Pleasant Grove District Ranger of the Uinta-Wasatch-Cache National Forest, as the Responsible Official, will decide whether the proposed action will proceed as proposed, as modified, or not at all. If it does proceed, the forest supervisor will decide what mitigation measures and monitoring requirements will be applied to the proposed action. This decision will be based upon an analysis of the goals and objectives set forth in the 2003 Land and Resource Management Plan for the Uinta National Forest (May 2003), in accordance with the Forest Plan management prescriptions for the project area, as well as the applicable standards and guidelines set forth therein and as discussed in further detail in this document.

CEQ regulations (40 CFR 1506.6) direct agencies to involve the public in preparing and implementing their NEPA procedures. A notice entitled *Opportunity to Comment, USDA-Forest Service, Uinta-Wasatch-Cache National Forest, Pleasant Grove Ranger District, Utah County*, was published in the Provo Daily Herald on August 7, 2014 and again on August 6, 2015, with letters being sent to the mailing matrix for the USFS on or about July 31, 2015. Comments concerning the proposed project were accepted for 30 days following the publication of both of the notices in the newspaper. One public comment was received in response to the notices. The Draft EA was published for public review and comment on February 8, 2016. No additional comments were received during the 30-day public comment period on the Draft EA. The USFS intends to issue the final Environmental Assessment (EA) for 45-day public review concurrently with its draft Decision Notice.

Chapter 2 – Comparison of Alternatives

This chapter describes and compares the alternatives considered for the Battle Creek Canyon Culinary Water Pipeline project. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative, and providing a clear basis for choice among options for the decision maker and the public.

2.1 No-Action Alternative

The “No Action” alternative is included to meet requirements of the National Environmental Policy Act [40 CFR 1502.14(d)] which stipulates that “in addition to the proposed action, the no action alternative shall always be fully developed and analyzed in detail.” Under this alternative, none of the activities

described in Alternative 2 (the Proposed Action) would occur in the project area, leaving the existing water delivery system intact.

Minor, ongoing operation and maintenance (O&M) activities to the pipeline and spring collection areas would continue as needed. Such activities would include periodic inspection of the pipeline alignment, repairs in the event of pipeline breaks or erosion issues affecting the integrity of the pipeline, clean-up of water bars to protect the pipeline from erosion, and re-seeding of any areas where repairs may have impacted vegetation. Major improvements would not be undertaken and the existing pipeline would remain in its current alignment. Modifications to the main spring collection areas would still be performed under the existing special use permit which allows for maintenance activities to occur. However, the water collected at the springs would still be conveyed through the existing pipeline.

This alternative would leave the existing pipeline in a failing condition and the potential risk of culinary water contamination by way of ongoing leaks and root incursion. This alternative could result in the need for additional water treatment or the City being forced to abandon the system. Access to the water delivery system would remain extremely difficult. Erosion prone areas would not be stabilized and drainage along affected portions of Battle Creek Trail would not be installed.

2.2 Proposed Action Alternative

The Proposed Action would:

- Abandon portions of the existing steel pipeline where aged and failing;
- Install approximately 5,600 feet of 6, 8, and 16-inch high density polyethylene pipeline (including associated air vents) on a new alignment; and
- Re-establish maintenance access routes for the spring collection system pipeline within the project area, including a new access route along a small section of the new pipeline alignment.

See Figures 5 and 6. The majority of the existing pipeline would be disconnected from all water sources, left in place, and abandoned, totaling approximately 5,530 feet. Disconnecting the pipeline may require some excavation to expose and cap the ends of the buried pipes and valves. One section of the existing pipeline in good repair, between Battle Creek Springs and Hangman Springs, would continue to function as a part of the new system, totaling approximately 3,300 feet.

The new pipeline would consist of approximately 5,600 feet of 6, 8, and 16-inch high density polyethylene pipe and associated air vents. For the new pipeline to be installed, the Proposed Action includes approximately 390 feet of 16" diameter pipeline, 4,350 feet of 8" diameter pipeline, and 760 feet of 6" diameter pipeline. The new pipeline would be re-routed to follow the alignment of the nearby Battle Creek Trail, which would be restored to its existing width (approximately two to eight feet) after the installation of the new pipeline. It is anticipated that the trail would remain in place after construction. Certain segments of the new pipeline would deviate from the trail alignment where necessary to avoid environmentally sensitive areas, improve maintenance access, minimize erosion potential, and/or provide for better water flow within the pipeline, given the topography of the area.

Except for the area between Battle Creek Spring and Hangman Springs, the old pipeline would be disconnected from all water sources, left in place, and abandoned (see Figure 6). This may require some excavation in order to expose and cap the ends of buried pipes and valves. Construction of the new

pipeline, stabilization of erosion prone areas, and restoration of affected portions of the trail would occur together.

The new pipeline would be buried approximately two to four feet below ground beneath the existing Battle Creek Trail, with the trail surface to be restored to its prior condition after the pipeline has been installed. The existing trail varies from two to eight feet wide and no permanent widening of the trail is proposed. The maximum impact to the trail would be 0.25 acres. A maximum disturbance width of 35 feet would be required for construction throughout the project area, regardless of slope. However, the majority of disturbances within the project area would be narrower than 35 feet.

Vegetation impacts are not expected to occur over the entirety of the 35-foot construction corridor. Avoidance and minimization measures would be implemented to reduce impacts to vegetation, with impacts to woody vegetation to occur only as necessary. To maintain the overstory vegetation root mass, woody vegetation would be removed using mastication.

Minor, ongoing maintenance activities to the pipeline and spring collection areas would also be performed as needed. Such activities would include periodic inspection of the pipeline alignment, repairs in the event of pipeline breaks or erosion issues affecting the integrity of the pipeline, clean-up of water bars to protect the pipeline from erosion, and re-seeding of any areas where repairs may have impacted vegetation.

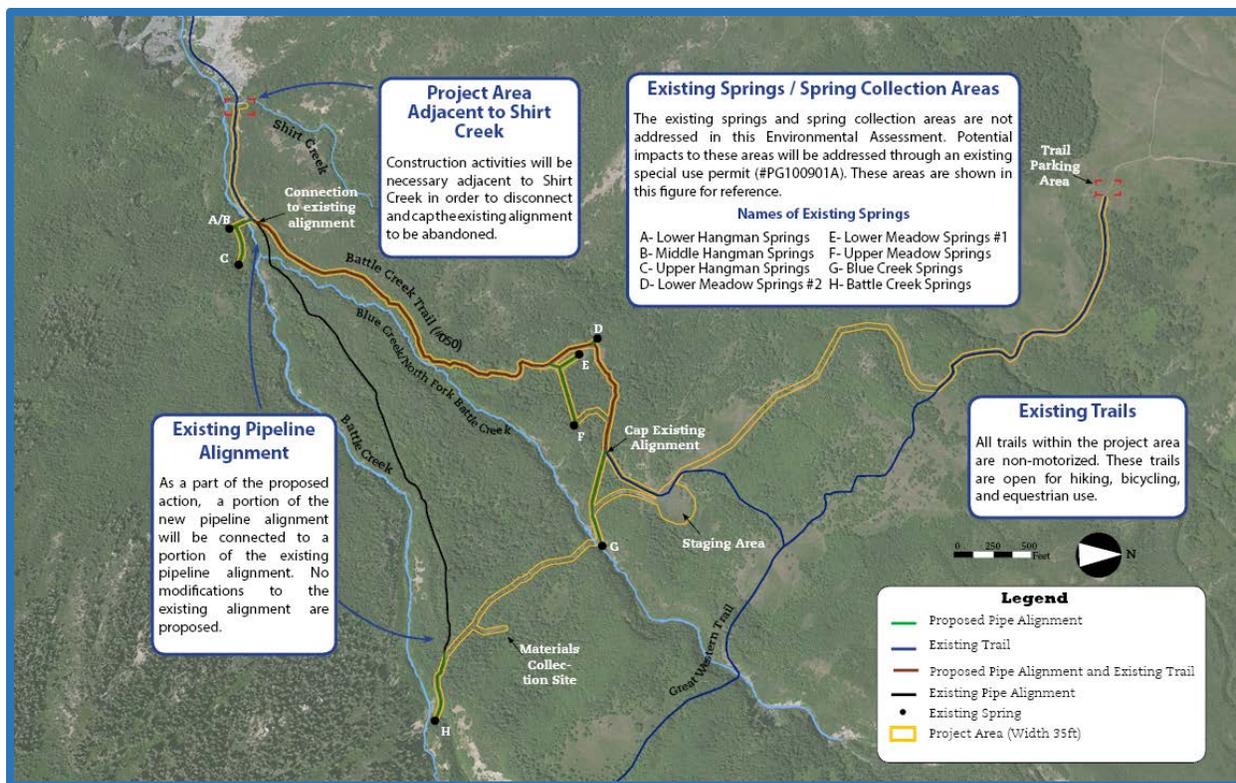


Figure 5. Proposed Action

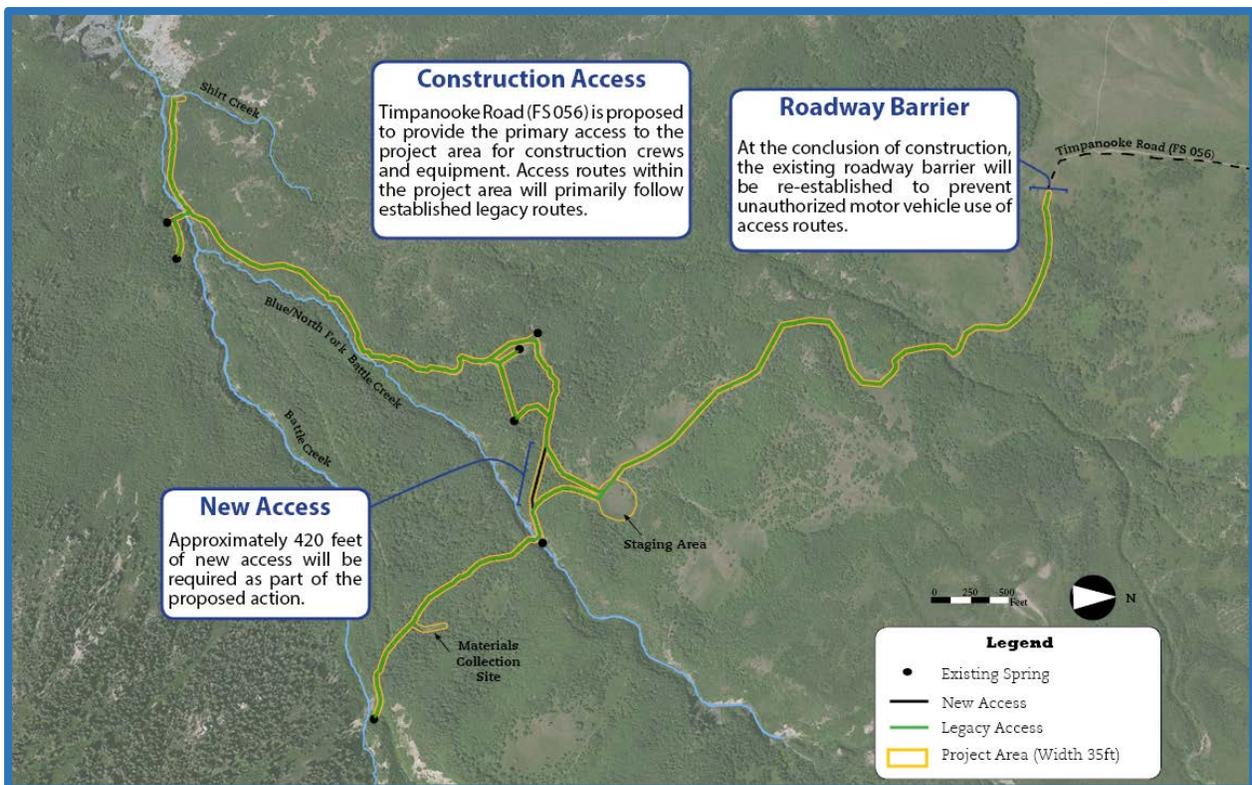


Figure 6. Legacy Access Routes

Construction activities would require the use of heavy equipment such as trenchers, compactors, backhoes, and material haulers. The use of limited blasting and explosives could be required. A project staging area would be located within the project area. This area would also serve as a campsite for workers during the construction season. See Figure 6 and 7. Due to its remote location, camping on-site would be more efficient than daily travel to and from the project area. Camping activities would be limited to the approved staging area (which has seen prior usage for such activities as recently as 2005), with all wastes to be kept contained while on site and to be removed from the area and properly disposed of at the completion of construction. Construction crews would follow all USFS guidelines and/or restrictions for camping activities throughout the duration of construction activities. The meadow will be fully restored to its original condition after construction.



Figure 7. Proposed Staging Area

Any fill materials required would be hauled from an existing material source site within the project area. Materials used to improve access, such as culverts at temporary stream crossings, would be removed at the conclusion of the project. State Route-92 (Alpine Loop Scenic Byway) in American Fork Canyon and National Forest System Road 056 (FS 056) would be utilized to access the project site. FS 056, as described in the Uinta Forest Plan (Forest Plan), is a trail open to all motor vehicles, both highway legal and non-highway legal. All motorized vehicles, including heavy machinery, would be required to utilize approximately nine miles of an unpaved portion of FS 056 that lies between Mount Timpanogos and the parking area that serves as an access point to the Great Western Trail. Motor vehicles would then utilize an old roadway that has been used in the past to access Battle Creek Canyon. The alignment of the old road is still visible and would be usable without major modifications. Legacy access routes would be utilized for access to the project location site. See Figures 6 and 7. Some woody vegetation may need to

be removed along the sides of the road to allow room for heavy machinery. All disturbed areas would be restored and re-vegetated at the conclusion of the project. The project would also require the administrative closure of the Battle Creek Trail (including the loss of public access) during construction.

Implementation is anticipated to occur between July and October of 2016. Depending on weather conditions and snow pack, construction may extend into the summer of 2017. In the event that the work cannot be completed in one year, site stabilization would occur to protect the soils and vegetation from damage over the winter months.

Pipeline installation is intended to occur in conjunction with a spring rehabilitation project that will be conducted by Pleasant Grove under their special use permit as part of ongoing operation and maintenance activities. Direct and indirect effects of the spring rehabilitation activities are not included in the direct and indirect effects analysis of the proposed action as they are outside the scope of this project. However, potential impacts from the spring rehabilitation project have been included in the cumulative effects analysis for this project. See Section 3.9.

2.3 Alternatives Considered but Eliminated from Further Analysis

Repair and/or Replace Pipeline Using Existing Alignment

One alternative that was considered but eliminated from further analysis was to repair and/or replace the existing pipeline in its current location. This alternative was eliminated for the following reasons:

- The existing pipeline would be very difficult to access for major repair and or replacement. The current alignment passes through some very rocky, steep, and densely forested areas. This alternative would require woody shrubs and trees to be cleared, as well as road construction/leveling to allow access for heavy machinery.
- If the pipeline were to remain on its existing alignment, there would be an increased potential for future pipeline failures to go unnoticed due to its remote location.
- Repairing or replacing the pipeline in its current location would not provide an opportunity to improve drainage along affected portions of the Battle Creek Trail.

2.4 Comparison of Alternatives Selected for Further Analysis

This section provides a summary of the potential effects of the No-Action and the Proposed Action alternatives. Information in Table 1 is focused on activities and effect where different levels of effects or outputs can be distinguished quantitatively or qualitatively between alternatives.

Table 1. Comparison of Project Alternatives

Resource	No-Action Alternative	Proposed Action Alternative
Air Quality	<ul style="list-style-type: none"> • No impacts to air quality 	<ul style="list-style-type: none"> • No permanent impacts to air quality or exceedances of NAAQS standards • Temporary construction impacts
Biological Resources	<ul style="list-style-type: none"> • No impacts to biological resources 	<ul style="list-style-type: none"> • No effect on identified T&E Species • May impact Wheeler’s Angelica near Hangman Springs • Temporary construction impacts to wildlife and vegetation
Cultural Resources	<ul style="list-style-type: none"> • No impacts to cultural resources 	<ul style="list-style-type: none"> • Adverse Effect to one NRHP-eligible resource • Memorandum of Agreement to be executed for mitigation

Resource	No-Action Alternative	Proposed Action Alternative
Geology and Soils	<ul style="list-style-type: none"> No impacts to geologic formations Existing erosion conditions would be unchanged 	<ul style="list-style-type: none"> Temporary construction impacts due to soil disruption and excavation, including staging and camping activities (approximately 3.2 acres) Permanent, minimal impacts to soils and/or geologic formations due to the potential for limited blasting Trail tread along Battle Creek Trail would be improved due to additional drainage features No permanent impacts to soil productivity are expected
Hydrology and Water Resources	<ul style="list-style-type: none"> No impacts to hydrology and water resources 	<ul style="list-style-type: none"> No permanent detrimental effects on the hydrology of the project area or the watershed Reduction of threat of contamination to the culinary water drinking supply No permanent impacts to water quality Temporary construction impacts to surface water (i.e., temporary crossings) Temporary direct impacts to 0.04 acres of wetland with permanent indirect impacts to 0.01 acres of wetlands (likely non-jurisdictional)
Recreational Resources	<ul style="list-style-type: none"> Battle Creek Trail would remain open Drainage would not be improved along affected portions of Battle Creek Trail 	<ul style="list-style-type: none"> Temporary closure of the Battle Creek Trail at Curley Springs Trail due to construction activities Drainage improvements made along affected portions of Battle Creek Trail Improvements to trail tread on Battle Creek Trail
Roadless Areas	<ul style="list-style-type: none"> No impacts to potential for wilderness designation 	<ul style="list-style-type: none"> No permanent impacts to wilderness designation characteristics Temporary construction impacts
Visual Impacts	<ul style="list-style-type: none"> No impacts to visual resources Existing conditions would be unchanged 	<ul style="list-style-type: none"> Temporary visual impacts related to construction activities (i.e., construction equipment, excavation, temporary loss of some vegetation, etc.) Minor permanent impacts to visual character of the project area due to inclusion of new air vents along the new pipeline alignment.

Chapter 3 – Affected Environment and Environmental Consequences

This chapter summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments from the implementation of the No-Action and Proposed Action Alternatives. It also presents the scientific and analytical basis for the comparison of the alternatives presented in Table 1.

3.1 Air Quality

3.1.1 National Ambient Air Quality Standards

The Clean Air Act Amendments of 1990 established the National Ambient Air Quality Standards (NAAQS) for airborne pollutants. The six criteria pollutants addressed in the NAAQS are carbon monoxide, particulate matter, ozone, nitrogen dioxide, lead, and sulfur dioxide. Particulate matter is broken into two categories: particulate matter with a diameter of 10 micrometers or less (PM₁₀) and particulate matter with a diameter of 2.5 micrometers or less (PM_{2.5}). The current NAAQS are shown in Table 2.

Table 2. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Level	Averaging Time	Violation Determination
Carbon Monoxide (CO)	Primary	9 ppm	8-hour	Not to be exceeded more than once per year
		35 ppm	1-hour	
Lead (Pb)	Primary/ Secondary	0.15 µg/m ³	Rolling 3-Month Average	Not to be exceeded
		1.5 µg/m ³ (1978)	Quarterly Average	
Nitrogen Dioxide (NO ₂)	Primary/ Secondary	0.053 ppm	Annual (Arithmetic Mean)	98 th percentile, averaged over 3 years
	Primary	0.100 ppm	1-hour	Annual mean
Particulate Matter (PM ₁₀)	Primary/ Secondary	150 µg/m ³	24-hour	Not to be exceeded more than once per year on average over 3 years
Particulate Matter (PM _{2.5})	Primary/ Secondary	15.0 µg/m ³	Annual (Arithmetic Mean)	Annual mean, averaged over 3 years
		35 µg/m ³	24-hour	98 th percentile, averaged over 3 years
Ozone (O ₃)	Primary/ Secondary	0.075 ppm (2008)	8-hour	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
		0.08 ppm (1997)	8-hour	
	Revoked in 1997	0.12 ppm	1-hour	Not to be exceeded more than once per year
Sulfur Dioxide (SO ₂)	Primary	75 ppb	1-hour	99 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	0.5ppm	3-hour	Not to be exceeded more than once per year

Source: EPA (as of October 2011) (www.epa.gov/air/criteria.html)

Note: Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m³), and micrograms per cubic meter of air (µg/m³). **Primary standards** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. **Secondary standards** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

3.1.2 Affected Environment

The project area is located in Utah County, which is designated as a nonattainment area for PM₁₀ and PM_{2.5} and as an attainment area for all other pollutants. The project area is also outside of the Provo carbon monoxide maintenance area.

Because the project has a federal nexus and is in a nonattainment area, it is subject to the federal general conformity air quality regulation (40 Code of Federal Regulations (CFR) 60 Part 93), which requires the federal applicant to demonstrate that the estimated emissions from the project conform to the emission estimates and air pollutant reduction strategies specified in the state's air quality implementation plan. However, the general conformity regulation does not apply if the project's annual emissions (both direct and indirect) are below the emissions levels specified in 40 CFR §93.153 (which is 100 tons per year for PM₁₀ and for PM_{2.5}).

3.1.3 Environmental Effects

No-Action Alternative

The No-Action alternative would generate minor amounts of fugitive dust and localized emissions from vehicle and equipment exhaust during minor repair and maintenance activities. Emissions and dust generated by maintenance activities would not exceed the PM₁₀ or PM_{2.5} threshold of 100 tons per year or otherwise cause any adverse air quality impacts.

Proposed Action Alternative

The Proposed Action alternative would require the use of vehicles and heavy equipment that would generate emissions and fugitive dust during construction. These impacts to air quality would be temporary in nature and would be localized to the construction area. The project's construction emissions would be relatively low. On any given day of construction, the estimated PM₁₀ and PM_{2.5} emissions would not exceed the general conformity applicability threshold of 100 tons per year; therefore, the general conformity regulation does not apply to this project and no additional air quality analysis is required. In regards to O&M operations, such activities would be isolated events with minimal, if any, impact on air quality.

Mitigation

Due to the potential for fugitive dust emissions during construction, the contractor would prepare and comply with a fugitive dust plan.

3.2 Biological Resources

3.2.1 Affected Environment

Threatened and Endangered Species

The Endangered Species Act provides protection to Federally-listed threatened and endangered species and their designated critical habitats and is under the jurisdiction of the United States Fish and Wildlife Service (USFWS). Table 3 lists the threatened and endangered (T&E) species and their associated habitat that could potentially be present within the project area (USFWS 2014).

Table 3. Threatened and Endangered Species Potentially Present in the Area

Species	Status	Habitat
Yellow-billed cuckoo <i>Coccyzus americanus</i>	Threatened	Dense willow and cottonwood stands in river floodplains.
June sucker <i>Chasmistes liorus</i>	Endangered	Endemic to Utah Lake and portions of the Provo River.
Ute ladies'-tresses <i>Spiranthes diluvialis</i>	Threatened	Stable wetland and seepy areas associated with old landscape features within the historical floodplains of major rivers and near freshwater lakes or springs, usually in association with a high water table augmented by seasonal flooding, snowmelt, runoff and irrigation. Ranges in elevation from 7200 to 7,000 ft. above msl in northern Utah.
Canada lynx <i>Lynx canadensis</i>	Threatened	Boreal/coniferous forest ecosystems in areas with deep snow and a high-density population of snowshoe hares, their principle prey.

Source: Updated Official Species List obtained from the USFWS' IPaC system (<http://ecos.fws.gov/ipac/>) dated January 5, 2016

On August 15, 2014 and again in September, Marley Haupt and Ryan Pitts of Horrocks Engineers conducted presence/absence surveys for federally-listed T&E species within the full project area. Vegetation type, hydrology, soil characteristics, and general biological observations were also recorded throughout. Exact species localities of federally-listed T&E species known to occur within and adjacent to the project area were also obtained from the Utah Natural Heritage Program's (UNHP) database.

Yellow-billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) is considered an obligate riparian species and is known to inhabit dense, deciduous riparian forests, preferring tall cottonwoods and willows. In Utah, the distribution of the species is not well understood, although yellow-billed cuckoos are considered to be a rare breeder in lowland riparian habitats across the state (UDWR 2014). Dense, continuous thickets of riparian vegetation do not occur within the project area. Additionally, the project area lies within a rugged montane environment rather than a lowland, which is typically associated with yellow-billed cuckoo habitat. Given these conditions, it is unlikely that yellow-billed cuckoo are present within the project area. No critical habitat has been identified by the U.S. Fish and Wildlife Service to exist within the project area (USFWS 2014).

June Sucker

June sucker (*Chasmistes liorus*) is endemic to Utah Lake and portions of the Provo River. June sucker adults swim up the Provo River from Utah Lake in June of each year to spawn and then return to Utah Lake (UDWR 2014). June sucker do not exist within Battle Creek Canyon. Water from the canyon is entirely allocated to either Pleasant Grove City or Pleasant Grove Irrigation Company, and only reaches the Provo River, if at all, sometimes in the winter and during unusually high spring runoff. Due to the lack of a perennial connectivion between waters where June sucker is endemic and Battle Creek, it can be assumed that the species is not found within the project area. No critical habitat has been identified by the U.S. Fish and Wildlife Service to exist within the project area (USFWS 2014).

Ute Ladies’-tresses

Spiranthes diluvialis, or Ute ladies’-tresses , is considered to be a floodplain species and is found in moist to very wet meadows, as well as along streams, abandoned stream meanders, and near lake shores and spring seeps. The elevation range of the species is between 4,300 and 7,000 ft. above msl. While Ute ladies’-tresses occur in several counties within the state of Utah, most populations are relic in nature (UDWR 2014). Several of these historical populations are known to exist within Utah County but no critical habitat has been identified by U.S. Fish and Wildlife Service within Battle Creek Canyon (USFWS 2014). Visits were made to the project site during the months of August and September when known populations of Ute ladies’ tresses were in bloom; no individuals were seen in the project area. It is unlikely that Ute ladies’ tresses occur within the project area.

Canada Lynx

Canada lynx (*Lynx canadensis*) prefer boreal/coniferous forests in areas with deep snow and an abundance of snowshoe hare, the principle prey species of the Canada lynx. The project area is dominated by bigtooth maple and gamble oak; no conifer forests were observed during field reconnaissance. In the 2003 Revised Forest Plan (Forest Plan), Battle Creek Canyon was identified as a possible linkage area for the Canada lynx between areas of more suitable habitat. However, the lack of conifer stands capable of providing expanses of habitat suitable for the species or its principle prey species makes it unlikely for Canada lynx to be found in the project area. No critical habitat was identified by the U.S. Fish and Wildlife Service to exist in Battle Creek Canyon (USFWS 2014).

Forest Sensitive Species

Forest sensitive species known to occur on the Uinta-Wasatch-Cache National Forest were also considered for impacts that could result from the proposed project. Table 4 below lists the sensitive species that could potentially be present in the project area:

Table 4. Forest Sensitive Species Potentially Present in the Uinta Planning Unit of the Uinta-Wasatch-Cache National Forest

Common Name	Scientific Name	Habitat
Bald eagle	<i>Haliaeetus leucocephalus</i>	Nests are almost always in tall trees and commonly near bodies of water where fish and waterfowl prey are available
Barneby woody aster	<i>Tonestus kingii</i> var. <i>barnebyana</i>	Barren, often heavy, clay or sandy clay soil of slopes and outcrops in sagebrush grassland and desert shrubland in the valley zone
Bonneville cutthroat trout	<i>Oncorhynchus clarki utah</i>	Occur in many habitat types including high-elevation mountain streams and lakes and low-elevation grassland streams; requires a functional stream riparian zone to provide essential structure, cover, shade, and bank stability
Boreal toad	<i>Bufo boreas</i>	Found in a variety of habitats, including slow moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Requires clear, cold, naturally flowing water with ample pools, stream cover and low-sediment gravel beds; only known to occur in isolated high-elevation headwater streams with limited access to other populations

Common Name	Scientific Name	Habitat
Columbia spotted frog	<i>Rana luteiventris</i>	Associated with riparian areas, such as spring seeps, that have a permanent water source
Dainty moonwort	<i>Botrychium crenulatum</i>	Wet, marshy, and springy areas, including marshy meadows, edges of marshes, saturated soils of seeps, bottoms and stabilized margins of small streams, and (occasionally) wet roadside swales, ditches, and drainageways at mid to high elevations (montane zone), 1200 - 2500 m; partly to heavily shaded and usually have a dense, diverse cover of forbs and graminoids; often found on soils influenced by reprecipitated calcium
Fisher	<i>Martes pennanti</i>	Preferred habitat of the fisher is dense forest; open areas are avoided; likely extirpated from Utah
Flammulated owl	<i>Otus flammeolus</i>	Common in montane pine forests, especially ponderosa pine forests
Garrett bladderpod	<i>Lesquerella garrettii</i>	Alpine tundra and spruce-fir; limestone; often talus and rock outcrops in Salt Lake and Wasatch Counties
Garrett's fleabane	<i>Erigeron cronquistii</i>	Moist cliff faces and crevices, mainly in limestone, in Salt Lake and Wasatch Counties
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Sagebrush is the predominant plant of quality habitat with a good understory of grasses and forbs, and associated wet meadow areas
Northern goshawk	<i>Accipiter gentilis</i>	Require mature, old-growth trees in which to build nests and will utilize both deciduous (i.e. aspen and cottonwood) and coniferous species (i.e. Douglas fir, white fir, ponderosa pine)
Peregrine falcon	<i>Falco peregrinus anatum</i>	Roost in close proximity to water and contain tall, steep cliff faces or similar manmade structures
Rockcress draba	<i>Draba globosa</i>	Moist, gravelly alpine meadows, slopes, summits, swales, talus, and tundra, often on limestone derived soils at elevations of 9600-12000 feet.
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>	Requires steep rocky slopes which they are able to scale using their specially adapted hooves
Santaquin draba	<i>Draba santaquinensis</i>	Ledges and cracks of limestone outcrops; 1800–2440 m; currently known only from Utah County (Santaquin, Provo, and American Fork canyons) in north-central Utah
Spotted bat	<i>Euderma maculatum</i>	Roost on rocky cliff faces, crevices, in caves, and in similar man-made structures
Slender moonwort	<i>Botrychium lineare</i>	Potential habitat in riparian areas above 9000 feet
Southern leatherside chub	<i>Lepidomeda aliciae</i>	Found in small to medium sized streams and rivers, as well as pools and ponds

Common Name	Scientific Name	Habitat
Three-toed woodpecker	<i>Picoides tridactylus</i>	Dependent upon mature, old-growth conifer forests with an abundance of insects and the presence of snags for foraging and nesting
Townsend’s big-eared bat	<i>Corynorhinus townsendii townsendii</i>	Generally prefer large and open caves, tunnels, mining structures, buildings, and other man-made structures for roosting
Utah ivesia	<i>Ivesia utahensis</i>	Arid, steep, highly eroded and eroding slopes in Summit, Utah, Wasatch, and Weber Counties
Wasatch draba	<i>Draba brachystilis</i>	Aspen and white fir/Douglas fir communities ranging from 5500 to 9800 feet
Wasatch fitweed	<i>Corydalis caseana</i> spp. <i>brachycarpa</i>	Mid-mountain along streams anywhere on the forest from 6200-10000 feet
Wasatch jamesia	<i>Jamesia Americana</i> var. <i>macrocalyx</i>	Mountain brush and spruce fir, mostly on cliffs and rock places
Wasatch pepperwort	<i>Lepidium montanum</i> var. <i>alpinum</i>	Sagebrush and spruce-fir communities in Salt Lake County
Wheeler’s (Utah) angelica	<i>Angelica wheeleri</i>	Requires riparian conditions near seeps and springs that range in elevation from 5,000 to 10,000 ft. above msl
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Usually found in large tracts of cottonwood/willow habitats with dense sub-canopies (below 10 m [33 ft])

Sources: USFS Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species List; USFS Uintah-Wasatch-Cache Sensitive Species List (obtained from USFS in August 2010)

The Utah Natural Heritage Program (UNHP) of the Utah Division of Wildlife Resources (UDWR) was contacted on October 23, 2014 to request data for all threatened, endangered, and sensitive species recorded within or near the project area. A response letter from UNHP received on October 29, 2014 indicated that there are no records of any special status (threatened, endangered, or sensitive) species occurring within a two-mile radius of the project area (see letter in Appendix A).

In August and September of 2014, Marley Haupt and Ryan Pitts of Horrocks Engineers conducted field surveys in the project area. The results of the surveys identified the presence of Wheeler’s angelica (*Angelica wheeleri*), a Forest-sensitive plant species, within the project area near Hangman Springs. Plant specimens observed by Horrocks Engineers were confirmed to be Wheeler’s angelica by plant taxonomists at Brigham Young University (See Figure 8). Also, an active northern goshawk territory was identified near the Timpooneke campground, just outside of the project area. No other Forest sensitive species were observed during the surveys conducted and no habitat for the other Forest sensitive species was identified within the project area.

Wheeler’s Angelica

Wheeler’s angelica (*Angelica wheeleri*), also known as Utah angelica, is a Forest sensitive species endemic to 11 locations, in 6 counties throughout the state of Utah. Wheeler’s angelica requires riparian conditions near seeps and springs that range in elevation from 5,000 to 10,000 ft. above msl (UDWR 2014). See Figure 9.

Northern Goshawk

Northern goshawks require mature, old-growth trees in which to build nests and will utilize both deciduous (i.e. aspen and cottonwood) and coniferous species (i.e. Douglas fir, white fir, ponderosa pine). Goshawks will build alternate nests in the same territory and have a high tendency toward site fidelity, usually using the same nesting territory for years. In general, goshawks prefer dense forests with large trees and high canopy cover (UDWR 2014). No habitat meeting this description is located within the project area, although there is an active territory near the Timpooneke campground. This area, while outside of the project area, is near where heavy equipment would be brought in to the project area and therefore could have an impact on nesting birds if it occurs during the incubation season (approximately May to June).

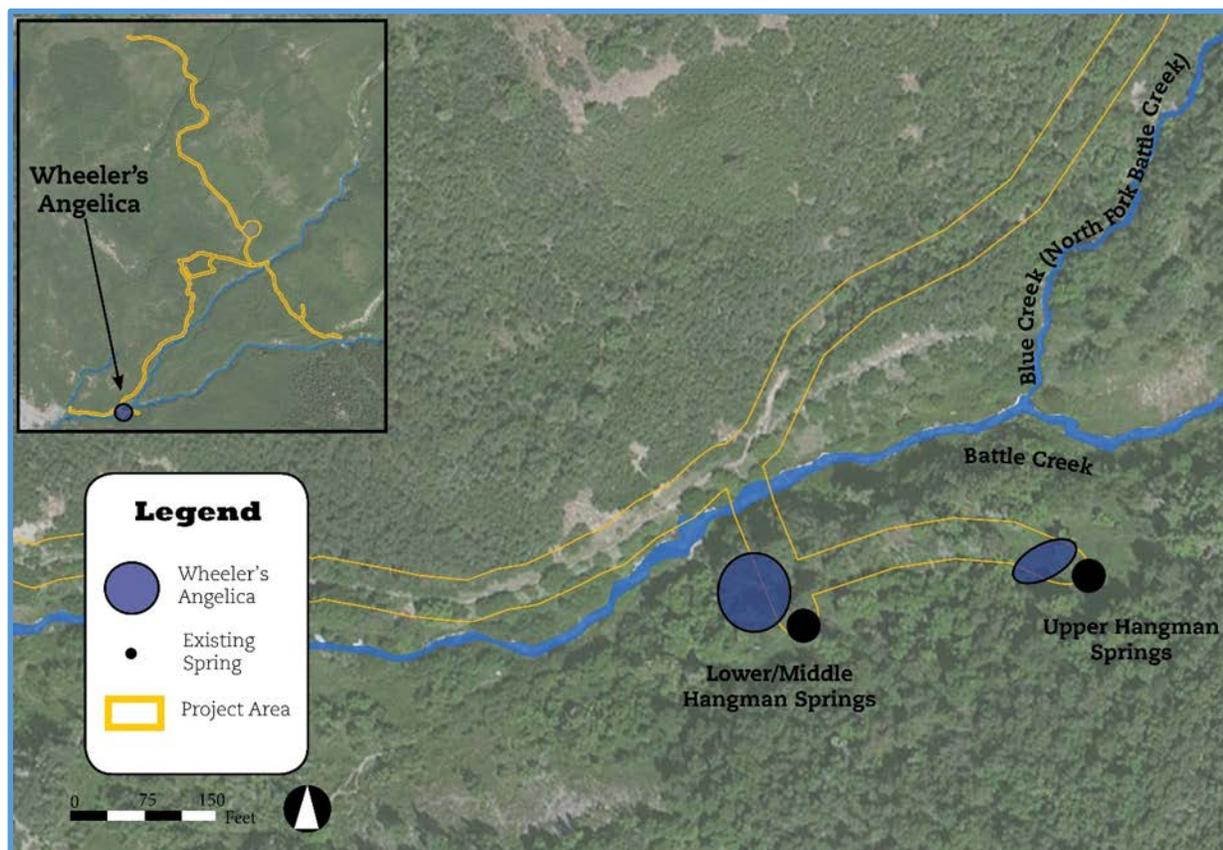


Figure 8. Location of Wheeler's Angelica

In 2011, the Utah Native Plant Society conducted surveys for Wheeler's angelica in Battle Creek Canyon. During that survey, 77 adult and 39 juvenile plants were observed above Battle Creek Falls and just below the project area for the proposed project. On July 31, 2013, Jana Leinbach of the Uinta-Wasatch-Cache NF observed several individuals growing on the banks of Battle Creek near the junction of Battle Creek Trail and Curley Springs Trail. In autumn of 2013, heavy rainstorms caused flooding and massive erosion in Battle Creek Canyon. It is believed that the flooding buried all individuals observed in July 2013 under a layer of sediment.



Figure 9. Wheeler's Angelica in Battle Creek Canyon (photos courtesy of Jana Leinbach, USFS)

Management Indicator Species

The National Forest Management Act (NFMA) requires each National Forest to identify species that are evaluated to help monitor the success of management practices within the forest. Management Indicator Species (MIS) are identified in a Forest's Land and Resource Management Plan (Forest Plan) as organisms that serve as indicators of ecosystem health and impacts to these species are evaluated at the population level. The species in Table 5 below are identified as management indicator species in the Forest Plan.

Table 5. Uinta National Forest MIS Species Potentially Present in the Uinta Planning Unit of the Uinta-Wasatch-Cache National Forest

Common Name	Scientific Name	Habitat in the Project Area?
American beaver	<i>Castor canadensis</i>	No
Three-toed woodpecker	<i>Picoides tridactylus</i>	No
Northern goshawk	<i>Accipiter gentilis</i>	No (suitable habitat just outside of project area near the Timpooneeke campground)
Bonneville cutthroat trout	<i>Oncorhynchus clarki utah</i>	No
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	No

Source: Uinta National Forest Land and Resource Management Plan, 2003

American Beaver

The American beaver is a semi-aquatic mammal that occurs in slow moving: rivers, lakes, reservoirs, wetlands, and streams. Beaver fall trees to construct dams and lodges which can enlarge and perpetuate surrounding riparian habitat (UDWR 2014). Due to the influence beaver have in the construction and perpetuation of riparian ecosystems it is considered to be a keystone species. Beaver presence is highly regulated by management agencies because of the substantial damage they can cause to agricultural and urban areas (USFS 2007). No American beaver, lodges, or dams have been observed within the project area or Battle Creek Canyon. It is unlikely that American beaver occur within the project area or Battle Creek Canyon; therefore, the project would have no effect to the population trend on the Forest.

Three-toed Woodpecker

The American three-toed woodpecker is habitat dependent upon mature, old-growth conifer forests. This species has also been known to inhabit recently burned and bark beetle infested areas because these areas contain an ample food source (UDWR 2014). The project area does not contain any old-growth conifer forests or any recently disturbed, burned, or beetle infested areas; it is dominated by big tooth maple, gamble oak, and other deciduous species. Due to the lack of suitable habitat in the project area, the project would have no effect to the population trend on the Forest.

Northern Goshawk

Northern goshawks require mature, old-growth trees in which to build nests and will utilize both deciduous (i.e. aspen and cottonwood) and coniferous species (i.e. Douglas fir, white fir, ponderosa pine). Goshawks will build alternate nests in the same territory and have a high tendency toward site fidelity, usually using the same nesting territory for years. In general, goshawks prefer dense forests with large trees and high canopy cover (UDWR 2014). No habitat meeting this description is located within the project area (although there is some suitable habitat near the beginning of the project area near the Timpooneke campground) and the project would have no effect to the northern goshawk population trends on the Forest.

Bonneville Cutthroat Trout

The Bonneville cutthroat trout is a race, or subspecies, of the cutthroat trout native to the Bonneville Basin of Utah, Wyoming, Idaho and Nevada. Bonneville cutthroat trout (*Oncorhynchus clarkia utah*) occur in many habitat types including high-elevation mountain streams and lakes and low-elevation grassland streams. In each habitat type, this species requires a functional stream riparian zone. These riparian streams provide essential structure, cover, shade, and bank stability (UDWR 2014). There is no suitable habitat in the project area. Moreover, Bonneville cutthroat trout are not known to occur within the project area, and tributaries to waters in which the species is located are not known to exist in Battle Creek Canyon. The project would have no effect to the Bonneville cutthroat trout population trend on the Forest.

Colorado River Cutthroat Trout

Colorado River cutthroat trout (*Oncorhynchus clarkia pleuriticus*) are known to occur within the upper Colorado River drainage, but non-hybridized Colorado River cutthroat trout are only known to occur in isolated high-elevation headwater streams. Colorado River cutthroat trout are now found in only five percent of their historic range, typically in isolated headwater streams with limited access to other populations. Like most trout, the Colorado River cutthroat trout requires clear, cold, naturally flowing water with ample pools, stream cover and low-sediment gravel beds. Efforts have been made by the Utah Division of Wildlife Resources to restore pure populations to their historic ranges in Utah, releasing large numbers of trout into lakes in the Uinta Mountains (UDWR 2014). There is no suitable habitat for the Colorado River cutthroat trout in the project area. Moreover, Colorado River cutthroat trout are not known to occur within the project area. Battle Creek Canyon does not contain any tributaries to waters in which the species is located. The project would have no effect to the Colorado River cutthroat trout population trends on the Forest.

General Wildlife

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the USFWS. The proposed action has

the potential to affect nesting birds protected under the MBTA, if any migratory birds are present in the project area, due to construction activities.

Game species in the state of Utah are heavily monitored and regulated by the Utah Division of Wildlife Resources (UDWR). A list of game species which may occur in Battle Creek Canyon and the project area are included below in Table 6. The list is not necessarily comprehensive; additional species could be present.

Table 6. Game Species Potentially Found in Project Area

Common Name	Scientific Name
Mule Deer	<i>Odocoileus hemionus</i>
Elk	<i>Cervus canadensis</i>
Bighorn sheep	<i>Ovis canadensis canadensis</i>
Moose	<i>Alces alces</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Black Bear	<i>Ursus americanus</i>
Cougar	<i>Felis concolor</i>
Blue Grouse	<i>Dendragapus obscurus</i>
Ruffed Grouse	<i>Bonasa umbellus</i>
Mourning dove	<i>Zenaida macroura</i>
Bobcat	<i>Lynx rufus</i>
Mountain Goat	<i>Oreamnos americanus</i>
Mountain Cottontail	<i>Sylvilagus nuttallii</i>
American Crow	<i>Corvus brachyrhynchos</i>

Source: UDWR (<http://wildlife.utah.gov/fishing-in-utah/guidebooks.html>) Accessed October 3, 2014.

Other general wildlife species are also likely to occur within the project area. Hundreds of different species are known to inhabit the Wasatch Mountains, the mountain range that contains Battle Creek Canyon. Not all of those species may live within Battle Creek Canyon or the proposed project area, but likely species may include passerine, raptors, and other birds; small and medium sized mammals such as rodents and coyotes; as well as, insects and other invertebrates.

Vegetation

The project area contains several different plant community types. General plant community designations were developed by the project team who conducted surveys in the canyon. Plant community designations are explained in the paragraphs below.

Maple/ Oak Community

The maple/oak community is the dominant plant community occurring within the project area. This community is primarily composed of deciduous shrubs and other woody vegetation with grasses and forbs in the understory. Plant species occurring in this community include: big tooth maple (*Acer grandidentatum*), box elder (*Acer negundo*), chokecherry (*Prunus virginia*), serviceberry/Saskatoon (*Amelanchier alnifolia*), elderberry (*Sambucus racemosa*), and gamble oak (*Quercus gambelii*). It was noted that gamble oak was more prevalent at lower elevations.

Meadow Community

The meadow community was the second most dominant plant community type observed within the project area. This community is composed of grasses, forbs, and other non-woody species. Smooth brome (*Bromus inermis*) and perennial ryegrass (*Lolium perenne*) constituted the majority of the groundcover; stinging nettle (*Urtica dioica*), lupine (*Lupinus argenteus*), alpine blue grass (*Poa alpina*), western salsify (*Tragopogon dubius*), wild vetch (*Vicia Americana*), and common mullein (*Verbascum thapsus*) were also frequently observed.

Wetland Community

The wetland community was found occurring at several of the spring collection locations and along portions of Battle Creek. This community type contains species that are typically associated with wetland environments and other wetland vegetation. Species observed include: coyote willow (*Salix exigua*), reed canary grass (*Phalaris arundinacea*), stinging nettle (*Urtica dioica*), western golden rod (*Solidago canadensis*), baltic rush (*Juncus balticus*), field horsetail (*Equisetum arvense*), common mullein (*Verbascum thapsus*), western willow aster (*Aster hesperius*), alpine timothy (*Phleum alpinum*), and water birch (*Betula occidentalis*). Two wetland communities within the project area near Hangman Springs were observed to contain Wheeler’s angelica.

3.2.2 Environmental Effects

No-Action Alternative

Under the No-Action alternative existing conditions would continue as at present with only minimal disturbances or impacts to biological resources during minor maintenance and repair activities.

Proposed Action Alternative

Threatened and Endangered Species

The Proposed Action Alternative would have no effect on the greater sage-grouse, the yellow-billed cuckoo, the June sucker, or the Canada lynx, either during construction or for O&M operations. The project would also have no effect on Ute ladies’-tresses. Table 7 sets forth the effect determinations for the federally-listed species.

Table 7. Effect Determinations for Federally-Listed Species

Common Name	Scientific Name	Status	Effect to Species	Reasoning
Threatened and Endangered Species				
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Candidate	No Effect	No critical/suitable habitat occurring within the project area. Greater sage-grouse were not found in the project area.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened	No Effect	No critical/suitable habitat occurring within the project area. Yellow-billed cuckoo were not found in the project area.
June sucker	<i>Chasmistes liorus</i>	Endangered	No Effect	June Sucker are not found in Battle Creek Canyon. Battle Creek does not contribute water to areas where June Sucker are endemic.

Common Name	Scientific Name	Status	Effect to Species	Reasoning
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened	No Effect	No critical habitat occurring within the project area. Potential habitat is present, but likely too steep and rocky. ULT not likely occur in Battle Creek Canyon and no individuals were observed in project area.
Canada Lynx	<i>Lynx Canadensis</i>	Threatened	No Effect	No critical/suitable habitat occurring within the project area. Battle Creek Canyon serves only as a linkage to habitat and hunting grounds.

A Biological Evaluation was prepared in connection with this project (see Appendix B). Due to the lack of suitable habitat for threatened and/or endangered species or critical habitat, no formal consultation coordination with the USFWS was required.

Wildlife and Forest Sensitive Species

Under the Proposed Action Alternative construction dust, noise, vibration, and increased human presence and equipment may result in temporary avoidance of the project area by birds and other wildlife species. However, these effects would be temporary and limited to the construction time-frame. Reseeding after construction would mitigate for impacts to vegetation as a result of excavation activities. O&M operations would be sporadic and isolated events and would be limited in scope and nature and therefore not likely to have any lasting impacts on wildlife species. Reseeding would also occur if any O&M operations result in impacts to vegetation. No permanent adverse impacts are anticipated. Table 8 sets forth the impacts to Forest sensitive species in connection with the project.

Table 8. Impacts to Forest Sensitive and UNF Management Indicator Species

Common Name/ Scientific Name	Impact	Reasoning
Forest Sensitive Species		
Wheeler’s angelica <i>Angelica wheeleri</i>	May Impact	The identified Wheeler’s angelica population near Hangman Springs may be impacted during construction. The project may impact individuals and/or habitat but will not likely contribute to a trend toward federal listing or loss of population viability.
Northern Goshawk <i>Accipiter gentilis</i>	May Impact	Suitable habitat for northern goshawks is not found within the project area, although there is some suitable habitat near the beginning of the project area near the Timpooneke campground. This area is near where heavy equipment would be brought in to the project area and therefore could have an impact on nesting birds if it occurs during the incubation season (approximately May to June).
Three-toed woodpecker <i>Picoides tridactylus</i>	No Impact	Suitable habitat for the three-toed woodpecker is not found within the project area.
Colorado River cutthroat trout <i>Oncorhynchus clarki pleuritics</i>	No Impact	Colorado River cutthroat trout are not found in Battle Creek Canyon.

Common Name/ Scientific Name	Impact	Reasoning
Bonneville cutthroat trout <i>Oncorhynchus clarki utah</i>	No Impact	Bonneville cutthroat trout are not found in Battle Creek Canyon.
Uinta National Forest Management Indicator Species		
American beaver <i>Castor canadensis</i>	No Impact	American beavers are not found within the project area.

Migratory Birds

The Proposed Action Alternative has the potential to affect nesting birds protected under the MBTA due to construction activities. To prevent undue harm to migratory birds, avian nest surveys for bird species listed under the MBTA would be conducted in accordance with the USFWS’ Nationwide Standard Conservation Measures prior to construction to determine if there are any migratory species present in the project area. If nests are encountered within the project area, mitigation measures would be required, as set forth below. No permanent impacts are anticipated.

Vegetation

The Proposed Action Alternative would require temporary ground disturbance within the project area and the removal of vegetation. Any impacts to vegetation would be temporary and limited to construction. The Proposed Action Alternative does not propose to clear and/or impact all vegetation within the entire width of the construction corridor. Avoidance and minimization measures will be implemented to reduce impacts to vegetation, especially woody vegetation. Impacts to woody vegetation will only occur as necessary.

Mitigation

The proposed project would implement the applicable UNF Forest Plan standards and guidelines for Noxious Weeds Management, Aquatic and Riparian Habitat Management, Wildlife and Fish Habitat Management, and Vegetation Management.

In regards to the northern goshawk, bird surveys would be conducted during the incubation season to determine if mating pairs are present in the area. If no nests are discovered within ½ mile of Timpooneke Road, no further mitigation is required. If nests are discovered within the ½ mile buffer zone, additional measures may be required to prevent disturbing the birds, which may include active monitoring of the nest for signs of disturbance during the movement of heavy machinery or restrictions on project implementation until after hatching (usually in June).

Mitigation for potential impacts to the Wheeler’s Angelica will include avoidance and minimization measures where possible. In addition, a pre-construction survey will be conducted to identify, map, and quantify occurrences of Wheeler’s Angelica in Battle Creek Canyon. Given that the species is most often found in association with riparian habitats, the survey area will include the banks and riparian fringes along Battle Creek for approximately 0.3 miles, both above and below Hangman Springs, as well as in the vicinity of Hangman Springs itself. The results of the survey will be provided to the USFS to be used in determining appropriate mitigation measures for impacts to Wheeler’s angelica populations, which could include: transplanting, reseeding, and/or collecting specimen for preservation in a herbarium. During construction activities within the Wheeler’s angelica survey area, an environmental specialist will observe

and document avoidance and minimization efforts. The specialist will also observe, document, and quantify all impacts to the species resulting from construction activities.

To prevent disturbances to migratory birds during construction, avian nest surveys for bird species listed under the MBTA would be conducted in accordance with the USFWS' Nationwide Standard Conservation Measures. The surveys would be conducted no more than five days prior to the start of construction activities, within a buffer area to be established by the USFS. If nests are encountered within the project area, an avoidance buffer (to be determined in accordance with the individual needs of the species in question by a qualified biologist onsite) would be established until the hatchlings fledge. The avoidance buffer would be fenced off and no construction activities would be permitted within that buffer until after the nestlings have fledged. Further, all employees, contractors, and/or site visitors would be briefed on the relevant rules and regulations protecting wildlife, including restrictions on collection of birds (live or dead) or their parts or nests without a valid permit. These mitigation measures would ensure minimal impacts to migratory birds.

To mitigate for vegetation impacts reseeding and revegetation utilizing native species will be performed as a part of the Proposed Action alternative. Best Management Practices would be implemented during construction to protect the integrity of the plant communities in the area and to help prevent introduction of noxious and invasive plant species, which would include:

- Plan activities to limit the potential introduction and spread of non-native invasive species (NNIS) prior to construction.
- Select locally native species for revegetation and restoration activities.
- Inspect and clean clothing, footwear and gear for soils, seeds, plant parts, or invertebrates before and after activities.
- Prior to moving equipment out of an infested area and into an uninfested area, clean soils, seeds, plant parts, or invertebrates from exterior surfaces, to the extent practical, to minimize the risk of transporting propagules.
- Revegetate disturbed soils as soon as feasible to minimize NNIS establishment.
- Allow natural revegetation of the ground layer to occur only where site conditions permit.
- Ensure the species specified in the plan are the ones being used.
- Monitor the revegetation site for NNIS.

No permanent impacts to native vegetation are anticipated as a result of the proposed action. The Proposed Action alternative does not propose to clear and/or impact all vegetation within the entire width of the pipeline corridor. Avoidance and minimization measures will be implemented to reduce impacts to vegetation, especially woody vegetation. Impacts to woody vegetation will only occur as necessary.

3.3 Cultural Resources

3.3.1 Affected Environment

In accordance with Section 106 of the National Historic Preservation Act (NHPA) and the Utah Historic Preservation Act (U.C.A. §9-8-102 et seq.), potential impacts of the Proposed Action on historic resources were considered. The Area of Potential Effects (APE) for the project consists of the entire project area located at the top of Battle Creek Canyon in Pleasant Grove, Utah.

Native American tribes that may have an interest in the area were contacted to inform them about the proposed project and to solicit their participation in this evaluation at whatever level they deemed

appropriate. Letters were sent to the Ute Indian tribe, as well as to the Utah Heritage Foundation and the Pleasant Grove Certified Local Government (CLG). No verbal or written responses to the letters were received. Copies of the correspondence are attached.

A Class 1 literature search and an intensive archaeological ground survey was conducted in connection with this project. The report, entitled *An Archaeological Resource Investigation for the Battle Creek Canyon Environmental Assessment* is not attached in order to protect the identified cultural resources. No architectural survey was required due to the undeveloped nature of the project area. The archaeological survey identified two (2) archaeological sites, 42UT1902 and 42UT1903, in the project area.

Site 42UT1902

Site 42UT1902 is the Battle Creek hydroelectric system of the Telluride Power Company. The site consists of several elements, including the remains of the powerhouse, an abandoned reservoir on “G” Mountain, and the remains of the water collection system at the head of Battle Creek Canyon. However, only three features associated with this site were recorded within the project area during the ground survey. Feature 1 is the stone masonry diversion dam on the south, or main, fork of Battle Creek. Feature 2 is the remnants of the wooden flume that carried water from the diversion dams to the storage reservoir. Feature 3 is the alignment/access road for the original Telluride Power wooden flume. Site 42UT1902 is **eligible** for the National Register of Historic Places (NRHP). See Figures 10 - 12.



Figure 10. Site 42UT1902 Feature 1: Stone masonry diversion dam



Figure 11. Site 42UT1902 Feature 2: Remnants of wooden flume



Figure 12. Site 42UT1902 Feature 3: Alignment/access road

Site 42UT1903

Site 42UT1903 (not pictured) consists of elements of the Pleasant Grove municipal water system located in Battle Creek Canyon and the springs above the canyon. Nine features associated with this site were recorded during the survey, including four spring collection boxes; three types of exposed metal pipe; three abutments from above-grade pipe crossings; one dirt access road; and the alignment of a 1971 concrete and ductile iron pipe. The system has been subject to regular maintenance over the years and was overhauled in 1971, which included the replacement of all of the original spring collection boxes and the installation of a new mainline pipe. These major changes have substantially damaged the integrity of the site; therefore, Site 42UT1903 is **not eligible** for the NRHP.

3.3.2 Environmental Effects

No-Action Alternative

Under the No-Action alternative, there would be no impacts to cultural resources. In regards to potential minor maintenance activities, most of the existing pipeline alignment was not included in the APE for this project and therefore was not surveyed for cultural resources.

Proposed Action Alternative

Under the Proposed Action, there would be minor impacts to Feature 3 of Site 42UT1902 as a result of the construction of the new pipeline. The use of the alignment/access road for the original Telluride Power wooden flume as an access road for construction equipment and crews to reach the proposed new pipeline alignment may involve minor temporary modifications to the roadway to accommodate the heavy machinery, as well as to allow for a crossing of Blue Creek (North Fork Battle Creek). Any modifications would be temporary and the area would be restored after construction activities. No other impacts to identified features of the site would occur. O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not impact any of the identified cultural resources in the project area.

Previously, impacts to Site 42UT1902 were determined to be an Adverse Effect. However, Pleasant Grove has committed that the structures noted in connection with Site 42UT1902 Features 1 and 2 would not be impacted and that a qualified archaeologist would be onsite during construction to monitor activities in the area of Site 42UT1902 to ensure no additional impacts would occur. Based upon the foregoing analysis and commitments, the USFS has made a **No Adverse Effect** determination for the project. The USFS consulted with the Utah State Historic Preservation Office (SHPO) in regards to the cultural resources identified in the APE. The Utah SHPO concurred in the **No Adverse Effect** determination for the impacts to Site 42UT1902. See the Determination of Significance and Effect signed by the Utah SHPO on December 4, 2014 in Appendix A.

Mitigation

A qualified archaeologist would be onsite during construction to monitor activities in the area of Site UT1902 to ensure no additional impacts would occur. Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of the discovery and the USFS would consult with the Utah SHPO and the Advisory Council on Historic Preservation (ACHP), as necessary. In the unlikely event that human remains are discovered during construction, the provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 would be followed.

3.4 Geology and Soils

3.4.1 Affected Environment

Battle Creek Canyon lies within the Semiarid Foothills sub-region of the greater Wasatch and Uinta Mountains Ecoregion. This sub region is characterized by precambrian metamorphic rocks which originate from the Cenozoic, Mesozoic, and Paleozoic eras as sediment deposits from Lake Bonneville. The steep sides of the canyon have also created large colluvial deposits from erosion events such as landslides and rockslides (EPA 2014).

Battle Creek Canyon is a stream cut limestone channel located along the Wasatch Front. Stretching of the earth's crust in this region has resulted in extensive geologic faults including the Wasatch Fault which is what gives the Wasatch Front its steep rugged morphology. See Figure 13. The Wasatch Front is considered a very seismically active area and earthquakes represent a seismic hazard for the project area. The Wasatch Fault is one of the longest and most active faults in the United States. In the event of a high magnitude earthquake there is potential to effect the project area. These effects could include surface rupture and ground shaking.

The soils in the project area are generally shallow, overlying a gravelly substrate or bedrock. Given these conditions, the project area has a very low liquefaction potential (Utah Geological Survey 1994). Landslides and avalanches are not uncommon in Battle Creek Canyon; the sidewalls of the canyon are extremely steep and prone to erosion, particularly after periods of heavy precipitation. After heavy rainfall in fall of 2013, areas within Battle Creek Canyon experienced extensive landslides, which changed the morphology of the canyon bottom, side walls, and creek beds. In the winter months, landslide-susceptible areas may also be prone to avalanches.

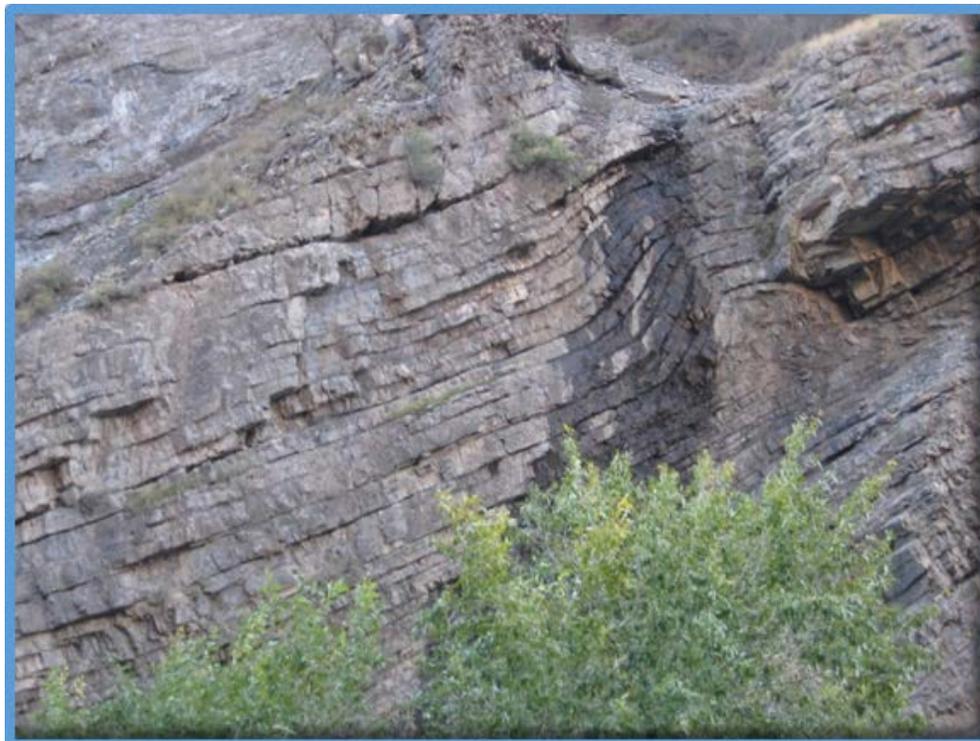


Figure 13. View of striated canyon walls in Battle Creek Canyon

Soils data for the project area indicates the presence of three different types of soil, ranging from the lower elevation to the higher elevation; McIvey family loam, 30 to 50 percent slopes, Elzinga family loam, 15 to 40 percent slopes, and Lespate family loam, 0 to 50 percent slopes. These soils are well-drained with a low to moderate available water capacity.

3.4.2 Environmental Effects

No-Action Alternative

Under the No-Action alternative existing conditions would continue as at present with only minimal disturbances or impacts to geological resources and soil resources during minor maintenance and repair activities.

Proposed Action Alternative

Under the Proposed Action Alternative, construction activities would impact geologic resources and soils in the project area during construction. The project would require excavation of the Battle Creek Trail along the new alignment to a depth of approximately two to four feet for the installation of the new pipe. Excavation would also be required at those areas identified for capping off the old pipe to be abandoned in place. Approximately two acres of soil would be disturbed by excavation activities, plus approximately a quarter acre (0.25) for material mining.

It is possible that limited blasting techniques could be required during excavation, dependent upon the existing conditions; however, blasting would only be utilized as necessary in order to excavate for the pipeline installation and would be limited in scope

Soil disturbance would also occur throughout the project area due to construction activities beyond that required by the excavation due to the movement of construction equipment and workers during the duration of the project, including within all staging and camping areas and in those areas in which vegetation is temporarily removed. Approximately one acre of disturbance is anticipated for staging and camping areas.

Impacts to soils would only occur during construction activities and would be limited to the project area and minimized to the extent possible. All excavated areas would be restored to their previous condition after construction with revegetation to occur in order to re-stabilize the soils. The contractor would be required to prepare re-vegetation plans for the Forest Service requirements, which would include salvaging topsoil and scarifying and re-seeding compacted areas. Prior to the use of blasting, the contractor would be required to prepare blasting plans, as needed, and to obtain Forest Service approval. Further, Best Management Practices (BMPs) would be implemented during and after construction for the protection of soils, as per the 2003 Forest Plan standards and guidelines for soil management, and to protect surface and ground water resources in the area from sedimentation and other sources of contamination.

Importation of fill materials (i.e. road base or hard pavements) would not be required. Any fill materials needed for the project (i.e. to construct temporary crossings over creeks and gullies and to level and stabilize access routes) would be sourced within the project and would be restored after construction.

O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not adversely impact geologic resources in the project area.

Mitigation

Impacts to soils would only occur during construction activities and would be limited to the project area and minimized to the extent possible. All excavated areas would be restored to their previous condition after construction with revegetation to occur in order to re-stabilize the soils. The contractor would be required to prepare re-vegetation plans for the Forest Service requirements, which would include salvaging topsoil and scarifying and re-seeding compacted areas. Prior to the use of blasting, the contractor would be required to prepare blasting plans, as needed, and to obtain Forest Service approval. Further, best Management Practices would be implemented during construction to protect surface and ground water resources in the area from sedimentation and other sources of contamination.

The Proposed Action would also incorporate the following *National BMPs for Water Quality Management on National Forest System Lands* (2012):

REC-4 Motorized and Nonmotorized Trails

- Relocate trail to conform to the terrain, provide suitable drainage, provide adequate pollutant filtering between the trail and nearby waterbodies, and reduce potential adverse effects to soil, water quality or riparian resources.
 - Avoid sensitive areas, such as riparian areas, wetlands, stream crossings, inner gorges and unstable areas to the extent practicable.
 - Use suitable measures to mitigate trail impacts to the extent practicable where sensitive issues are unavoidable.
 - Use suitable measures to hydrologically disconnect trails from waterbodies to the extent practicable.
- Use applicable practices of BMP Fac-2 (Facility Construction and Stormwater Control) for control of erosion and stormwater when constructing trails.
- Install and maintain suitable drainage measures to collect and disperse runoff and avoid or minimize erosion of trail surface and adjacent areas.
- Use and maintain surfacing material suitable to the trail site and use to withstand traffic and minimize runoff and erosion.

WatUses-3 (Administrative Water Developments)

- Locate water source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and erosion and sedimentation to the extent practicable.
- Design source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and to avoid or minimize erosion, sediment, and other pollutants to the extent practicable.
- Construct water source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and erosion, sediment, and other pollutants to the extent practicable.
- Design the collection system to avoid, minimize, or mitigate adverse effects to the spring development and downstream waters from excessive water withdrawal, freezing, flooding, sedimentation, contamination, vehicular traffic, and livestock as needed.

WatUses-4 (Water Diversions and Conveyances)

- Locate water conveyance structures in stable areas where they are not susceptible to damage from side drainage flooding.
- Design diversion and conveyance structures to efficiently capture and carry design flows in such a manner as to avoid or minimize erosion of streambanks, ditches, and adjacent areas.
- Construct diversion and conveyance structures to perform as intended in the most efficient manner and in such a way as to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.
- Operate and maintain diversion and conveyance structures in such a manner as to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources from failures.

3.5 Hydrology and Water Resources

3.5.1 Affected Environment

Watershed

Waters located in Battle Creek Canyon are part of the Utah Lake Watershed. This watershed receives approximately 10-60 inches of precipitation annually, much of it in the form of snow. While water from Battle Creek Canyon was once a source of inflow to Utah Lake, all of the water has been diverted for culinary and agricultural uses for several decades (UDWQ 2014). Three named perennial streams, Battle Creek, Blue Creek (also referred to as North Fork Battle Creek), and Shirt Creek are located within and/or adjacent to the project area. Several springs are also located in Battle Creek Canyon and the project area: Upper Hangman Springs, Lower Hangman Springs, Middle Hangman Springs, Lower Meadow Springs (two separate springs), Upper Meadow Springs, Blue Creek Springs, and Battle Creek Springs (See Figure 5).

Battle Creek

Battle Creek originates above the project area on the south face of Mount Timpanogos. Snowmelt, naturally occurring springs, and other smaller creeks and streams serve as tributaries to Battle Creek which is the largest perennial stream in Battle Creek Canyon. All water from Battle Creek is allocated to either Pleasant Grove City or Pleasant Grove Irrigation Company. During the summer (with the exception of flooding circumstances), all water at the mouth of the canyon is diverted to Pleasant Grove for irrigation purposes. During the winter, the water is not needed for agricultural purposes; excess water flows through the Pleasant Grove storm drain system.

Blue Creek (North Fork Battle Creek)

Blue Creek (also referred to as North Fork Battle Creek) is the second largest creek in Battle Creek Canyon and serves as a tributary to Battle Creek. Blue Creek originates above the project area on the south face of Mount Timpanogos. Snowmelt, naturally occurring springs, and other smaller creeks and streams serve as tributaries to Blue Creek. Blue Creek flows parallel to the project area for approximately 0.56 miles and converges with Battle Creek near the bottom of the project area.

Shirt Creek

Shirt Creek flows adjacent to and parallel to the project area. Shirt Creek is a small stream that originates in the mountains and hills north of the project area. The stream is very narrow (6 - 10 inches wide) and shallow (1 inch deep). Shirt Creek serves as a tributary to Battle Creek and converges with Battle Creek approximately 85 feet south of the project area.

Riparian Habitat Conservation Areas (RHCAs)

Riparian Habitat Conservation Areas (RHCAs) are areas within watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. RHCAs are found within the project area located along the North Fork Battle Creek and Blue Creek. These RHCAs are most likely classified as a Class 1, which affords the highest level of protection (300 foot buffer).

Water Quality

United States Forest Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” To enact this goal, the U.S. Army Corps of Engineers (USACE) has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency (EPA) also has responsibility for oversight and review of permits and actions that affect waters of the United States. In general, waters on Uinta-Wasatch-Cache NF are considered “high quality” waters by the Utah Division of Water Quality (UDWQ). No springs or creeks originating in Battle Creek Canyon are listed in UDWQ’s 2012-2014 Integrated Report as 303(d) impaired waters.

The culinary water system within Battle Creek Canyon currently meets EPA and Utah Division of Water Quality (UDWQ) water quality standards. However, the existing pipeline is failing and deteriorating, and unless improvements are made water quality standards will no longer be met in the future.

Wetlands

On September 12, 2014 Marley Haupt of Horrocks Engineers conducted a wetland delineation of the project area in accordance with the U.S. Army Corps of Engineers’ (USACE) 1987 *Wetland Delineation Manual* (USACE 1987) and the *Regional Supplement: Arid West Region Version 2* (USACE 2008). Approximately 0.05 acres of palustrine emergent wetlands were identified and delineated within the project area. See Table 9 and Figures 14 and 15.

Table 9 below includes a summary of the wetlands identified. See Appendix C for the *Battle Creek Canyon Culinary Water Pipeline Wetlands and Waters of the U.S. Delineation* prepared in connection with this project.

Table 9: Wetlands Identified in the Project Area

Wetland ID	Size (acres)	Hydrogeomorphic Classification
Wetland A	0.04	PEMC
Wetland B	0.01	PEMC
Total	0.05	

PEMC = Palustrine, Emergent, Seasonally Flooded

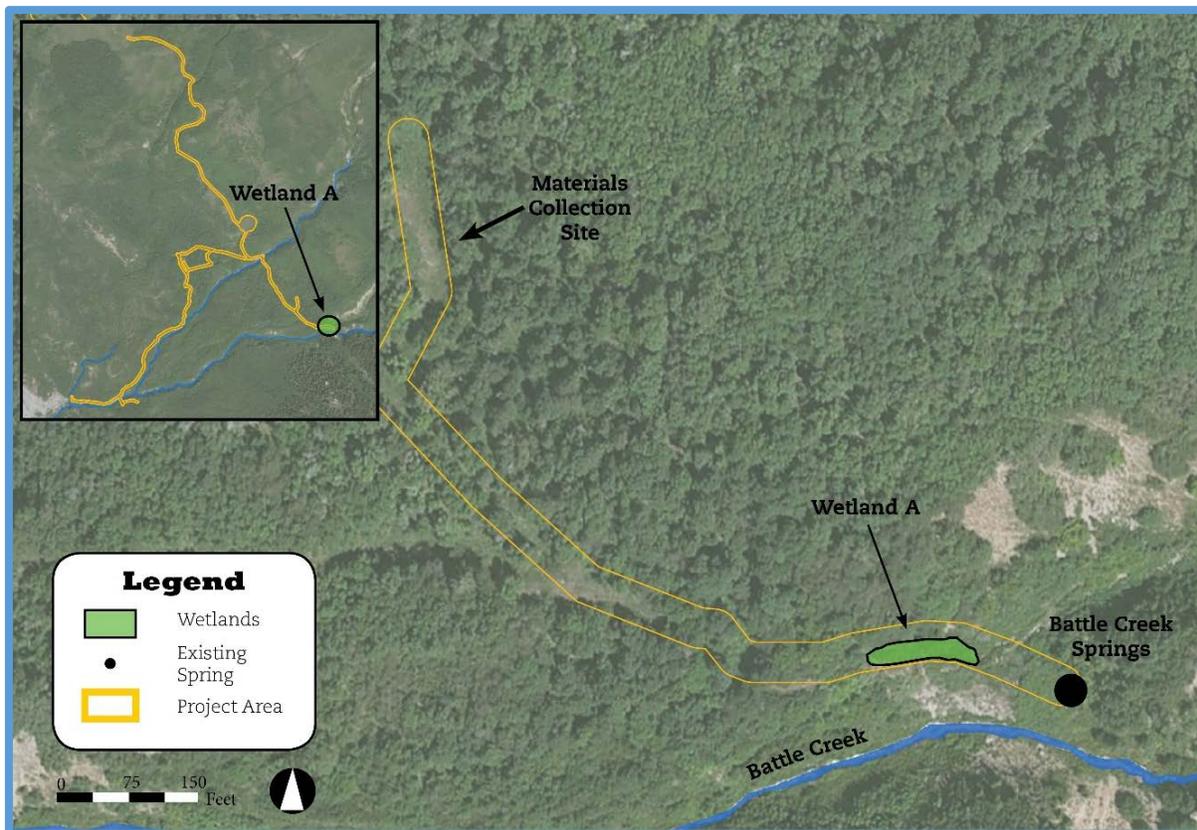


Figure 14. Wetland A

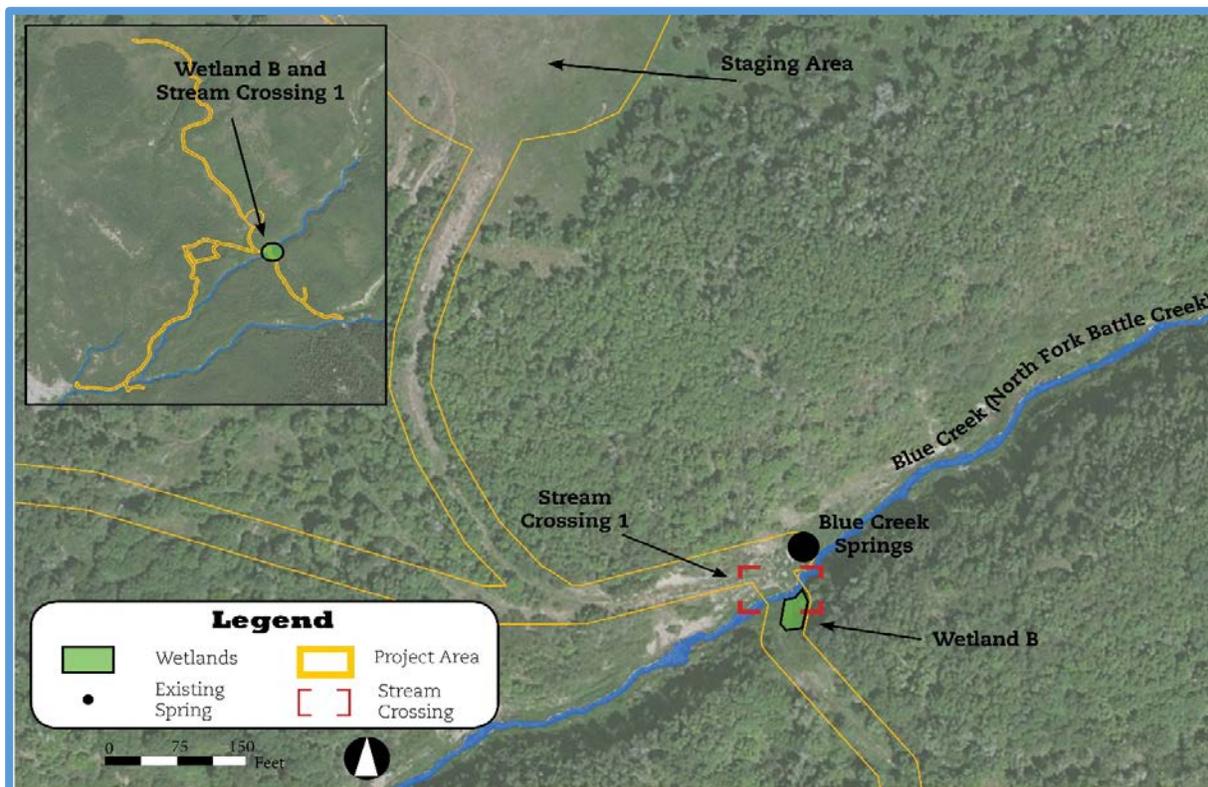


Figure 15. Wetland B and Stream Crossing 1

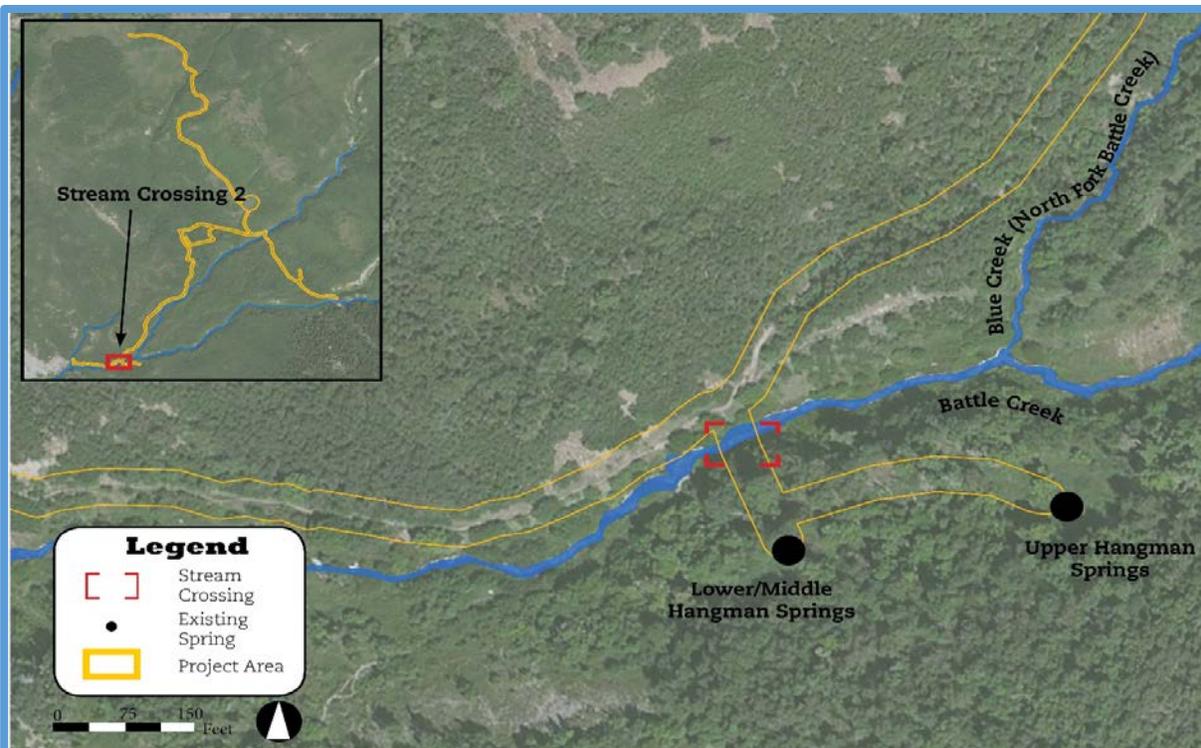


Figure 16. Stream Crossing 2

3.5.2 Environmental Effects

No-Action Alternative

Under the No-Action Alternative, existing conditions would continue as at present and would result in no impacts to the watershed or wetlands within the project area. However, contamination to the culinary water system from current and future leaks, corrosion, failures, and potential root incursions in the pipes, could eventually cause the culinary water system to no longer meet UDWQ water quality standards. The No-Action Alternative would have no impacts to RHCAs in the project area.

Proposed Action Alternative

Watershed

The Proposed Action Alternative would require heavy machinery and construction crews to cross Blue Creek at the location of Stream Crossing 1 and Battle Creek at the location of Stream Crossing 2 (See Figures 15 and 16 above, as well as Figures 17 and 18). Temporary crossings and culverts would need to be constructed to allow access for heavy machinery at these locations. Both of these stream crossing locations are within defined RHCAs, which would therefore be temporarily impacted by the inclusion of the temporary stream crossings. Best Management Practices (BMPs) would be utilized in order to prevent erosion and sedimentation from indirectly affecting the streams during the implementation of the project. No direct or indirect effects are anticipated for either groundwater or the springs.



Figure 17. Blue Creek crossing

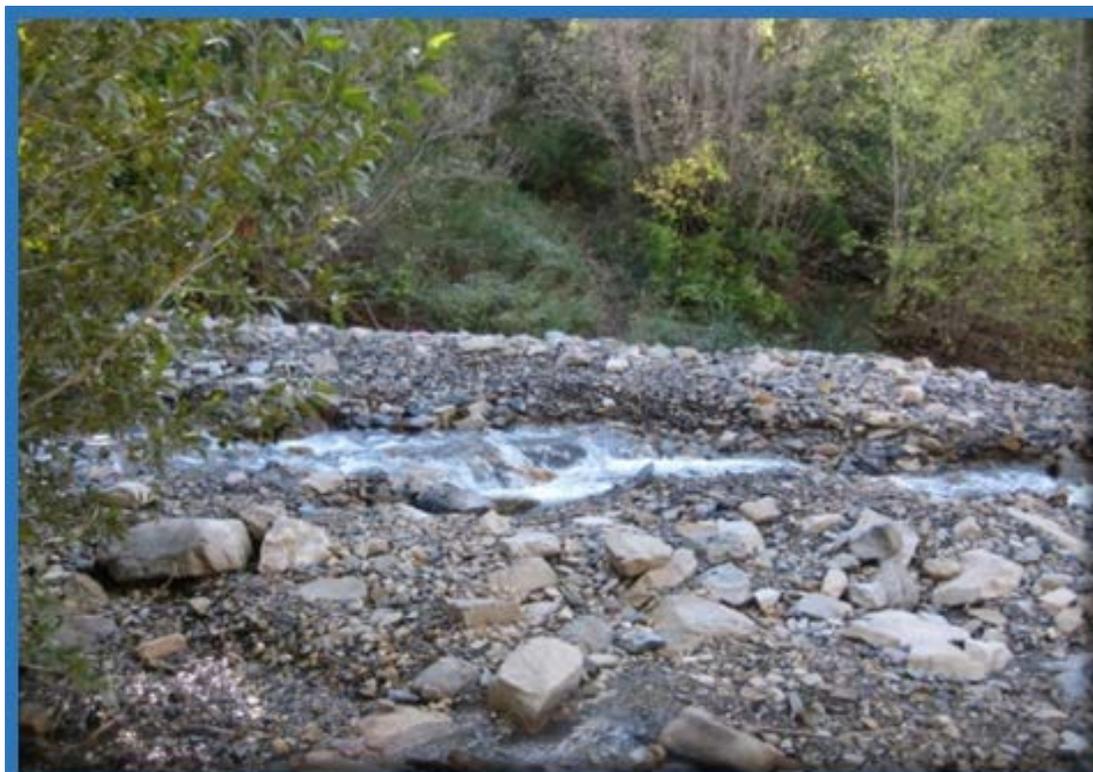


Figure 18. Battle Creek Crossing

Water Quality

Under the Proposed Action Alternative, improvements to the pipeline would comply with current UDDW standards and would ensure the continued quality of culinary water carried by the system. The Proposed Action Alternative would involve construction activities, which have the potential to impact surface waters in the area, especially at the locations of stream crossings. Shirt Creek could also be impacted under the Proposed Alternative due to construction activities that would take place on a nearby hillside. It is possible that debris (soil, rocks, plant material, etc.) could flow into the creek drainage. No impacts to water quality are anticipated from the reconstruction of the trail. Proposed drainage improvements on the trail would not impact water quality, as the improvements are only intended to stabilize erosion-prone areas of the trail. No additional contaminants would be present in the runoff and no increase in sedimentation is anticipated.

Wetlands

The Proposed Action Alternative would have a direct impact 0.04 acres of Wetland A and 0.01 acres of Wetland B during construction of the proposed project due to excavation for the installation of the pipeline. The project would also have an indirect effect on Wetland B in that the new pipeline would replace an old damaged pipeline that has been leaking water into this area to help support the wetland. The new pipeline would replace the damaged pipeline and stop the ongoing leakage, which would deprive Wetland B of some of its water supply.

No jurisdictional determination from the United States Army Corps of Engineers (USACE) has yet been made in regards to these identified wetlands. Should either or both be determined to be jurisdictional, coordination with the USACE would be undertaken, including obtaining any required permits.

Mitigation

Best Management Practices (BMPs) would be implemented during construction for the protection of water resources and to minimize impacts to Battle Creek, Blue Creek, and Shirt Creek. These BMPs (as set forth in the 2003 Forest Management Plan) include:

- **Aqua-1:** Trees shall not be felled into streams, lakes, or bogs except when needed to improve aquatic habitat.
- **Aqua-4:** Limit construction and other activities affecting stream channels to those periods when such activities will have the least detrimental effect on the aquatic environment, unless emergency conditions deem otherwise.
- **Aqua-5:** Avoid equipment operation in stream courses, open water, seeps, or springs. If use of equipment in such areas is required, impacts should be minimize.
- **Aqua-6:** Limit equipment operation in RHCAs. If the use of equipment in these areas is required, incorporate additional mitigation to minimize adverse impacts.
- **Aqua-7:** Prohibit storage of fuels and other toxicants within RHCAs. Do not fuel or service equipment in RHCAs unless there is no other alternative. If such sites are required within an RHCA, appropriate containment measures must be employed. Construction of maintenance equipment service areas shall be located and treated to prevent gas, oil, or other contaminates from washing or leaching into streams. Equipment working in open water and wetlands shall be cleaned prior to entry into such areas to remove gas, oil, and other contaminants.

- **S&W-4:** Maintain adequate ground cover to filter runoff and prevent detrimental erosion in RHCAs.
- **S&W-13:** Reduce stream sedimentation created as a result of construction.

Any impacts to streams in the project area would be fully restored at the conclusion of construction activities. Further, a Stream Alteration and/or Section 404 permit will be obtained prior to construction activities within and adjacent to streams.

O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not adversely impact the hydrology of the project area. Any potential impacts to wetlands would be permitted as appropriate.

3.6 Recreational Resources

3.6.1 Affected Environment

Battle Creek Canyon is open to the public for recreational activities such as hiking, horseback riding, mountain biking, trail running, and hunting. Battle Creek Trail is approximately two to eight feet wide and is a popular hike for recreational users. See Figure 19.



Figure 19. Battle Creek Trail (existing)

Recreation Opportunity Spectrum Classification

The Recreation Opportunity Spectrum (ROS) provides a framework for defining the types of outdoor recreation opportunities the public might desire on public lands and identifies the portion of the spectrum that any given area might be able to provide. The ROS classes reference recreation goals and objectives described in the Forest Plan. Battle Creek Canyon is classified as Semi-Primitive Non-Motorized (SPNM)

Semi-Primitive Non-Motorized (SPNM): Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size (2,500 acres). Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on site controls and restrictions may be present but subtle. Motorized use is not permitted.

3.6.2 Environmental Effects

No-Action Alternative

Under the No-Action Alternative existing conditions would continue as at present and there would be no impacts to recreational resources.

Proposed Action Alternative

The Proposed Action Alternative involves installing a new pipeline on the same alignment as Battle Creek Trail and as such, recreational users would be temporarily unable to utilize Battle Creek Trail or other portions of the project area during project construction. This temporary closure would restrict public access to the project area for the duration of the construction, which would be an impact to the public. Such a closure is unavoidable in order to protect the public. However, as part of the Proposed Action,

affected portions of Battle Creek Trail would be restored and improved to include stabilization of erosion prone areas and drainage features. The trail surface would therefore be protected from some of the more major effects of future erosion, preserving the life of the trail. Air valves would be strategically placed along the new alignment to minimize the visual intrusion and to help avoid startling horses (which constitutes a safety hazard for equestrian users of the trail).

O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not adversely impact recreational resources in the project area.

Mitigation

Public notices and appropriate signage would be utilized during construction to notify the public of the closure.

3.7 Roadless Areas

3.7.1 Affected Environment

Battle Creek Canyon is located within the Timpanogos Inventoried Roadless Area. This area was determined by the USFS as qualifying for protection under the 2001 Roadless Rule, which provides that such areas be managed for the protection of their suitability for possible future wilderness designation.

3.7.2 Environmental Effects

No-Action Alternative

Under the No-Action Alternative, existing conditions would continue as at present and the project area would continue to be suitable for wilderness designation.

Proposed Action Alternative

Under the Proposed Action Alternative, construction activities would require motorized vehicles and heavy machinery to access the project site via FS 056 (Timpooneke Road) and an existing access route. Impacts would be temporary and no permanent roads would be constructed. State Route-92 (Alpine Loop Scenic Byway) in American Fork Canyon and National Forest system road 056 ("FS 056") would be utilized to access the project site. FS 056, as described in the Uinta Forest Plan ("Forest Plan"), is a trail open to highway legal motor vehicles. All motorized vehicles, including heavy machinery, would be required to utilize approximately nine miles of an unpaved portion of FS 056 that lies between Mount Timpanogos and the parking area that serves as an access point to the Great Western Trail. Motor vehicles would then utilize an old roadway that has been used in the past to access Battle Creek Canyon. The alignment of the old road is still visible and would be usable without major modifications. Some woody vegetation may need to be removed along the sides of the road to allow room for heavy machinery. All disturbed areas would be restored and re-vegetated at the conclusion of the project. Legacy access routes would be utilized for access to the project location site, with one temporary access being required during construction. During and after construction, a physical barrier (i.e., barrier rock) would be installed at the end of Timpooneke Road to prevent unauthorized vehicle use of the construction access route. Temporary access routes will be restored to pre-construction conditions at the conclusion of the project.

Construction activities would require the use of heavy equipment such as trenchers, compactors, backhoes, and material haulers. The use of limited blasting and explosives could be required. A project staging area would be located within the project area. This area would also serve as a campsite for workers during the construction season. Any fill materials required would be hauled from an existing material

source site within the project area. Materials used to improve access, such as culverts at temporary stream crossings, would be removed at the conclusion of the project.

Minor, ongoing maintenance activities to the pipeline and spring collection areas would also be performed as needed. Such activities would include periodic inspection of the pipeline alignment, repairs in the event of pipeline breaks or erosion issues affecting the integrity of the pipeline, clean-up of water bars to protect the pipeline from erosion, and re-seeding of any areas where repairs may have impacted vegetation.

This project has been reviewed for consistency with the 2001 Roadless Area Conservation Rule (RACR) by the USFS and determined to be in compliance. See the Intermountain Region Informational Briefing Paper: Roadless Area Project Proposal dated May 26, 2015 and the Concurrence for UWC Roadless Project letter dated December 8, 2015 in Appendix A.

Mitigation

During and after construction, signage and a physical barrier (i.e., a locked gate) would be installed at the end of Timpooneke Road to prevent unauthorized motorized vehicle use of the construction access route. Temporary access routes would be restored to pre-construction conditions at the conclusion of the project.

3.8 Visual Resources

3.8.1 Affected Environment

Visual or scenic resources are considered part of the social/economic environment in the Forest Plan, which allows “suitable commodity uses [that] are provided in an environmentally sustainable and acceptable manner to contribute to the social and economic sustainability and diversity of local communities”. The USFS also has an expressed goal of maintaining and/or enhancing the scenic quality and the desired landscape character of Forest Service-administered lands, in accordance with Visual Quality Objectives (VQO).

As per UNF’s Forest Management Plan (UNF 2003), Battle Creek Canyon has a VQO of **Retention**, which stipulates that:

Management activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes should not be evident to the casual forest visitor, and all retention activities to restore the area to a naturally appearing condition should be accomplished either during the operation or immediately thereafter.

Battle Creek Canyon provides areas of natural vegetation, wildlife habitat, scenic value, and an ecosystem that abuts the Wasatch Front urban area. This kind of interaction allows the urban user to experience the forest’s natural resources both within and without the forest boundary.

For visual resources, the affected environment consists of the viewshed within Battle Creek Canyon, which is a steep and narrow canyon. The Battle Creek Canyon viewshed is somewhat limited by the high canyon walls, with striated rock formations visible in the lower area outside of the project area. In the project area, Blue Creek flows in a relatively narrow channel to where it converges with Battle Creek and flows over Battle Creek Falls below the project area. The project area includes mostly deciduous shrubs and other woody vegetation with grasses and forbs in the understory. Plant species occurring in the project area include: big tooth maple, box elder, chokecherry, serviceberry, elderberry, and gamble oak. Smooth brome and perennial ryegrass constituted the majority of the groundcover; stinging nettle, lupine, alpine blue grass, western salsify, wild vetch, and common mullein were also frequently observed. See Figure 20.

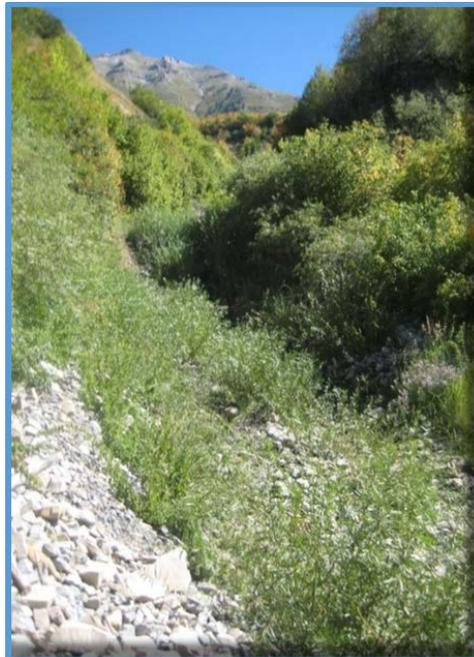


Figure 20. Battle Creek Canyon looking northeast towards Mt. Timpanogos

Manmade objects are rare in the viewshed, consisting mostly of the trail and its signage, visible pipes, and other features of the existing water delivery system that are above ground, including but not limited to the infrequent air vents associated with the existing pipeline. See Figure 21.

3.8.2 Environmental Effects

No-Action Alternative

Under the No-Action alternative, there would be no construction activities and no additional visual elements introduced into the viewshed. The No-Action Alternative would not impact visual resources in the project area.

Proposed Action Alternative

Under the Proposed Action Alternative there would be temporary visual impacts as a result of construction activities (i.e., the removal of vegetation), as well as permanent visual impacts due to the improvement of the Battle Creek Trail and the installation of air vents as part of the new pipeline. The improvements to the trail would restore it to its original condition with only minor differences due to the use of erosion control measures to help prevent future erosion.

The trail would still look much as it did when first introduced into the viewshed. The Proposed Action would include installing additional air vents beyond those that are already present in the area, which are required by the UDDW standards. Visual impacts would meet retention VQO because the air vents would be installed in such a manner as to minimize their intrusion into the viewshed through such measures as strategic placement of the air vents to conceal them from users of the Battle Creek Trail, painting or powdercoating of the vents (as directed by the USFS) to act as camouflage, etc.



Figure 21. Example of an existing air vent in the project area

Changes to the visual environment would be minor and consistent with the USFS visual quality objective for the project area in that the changes would not be evident to the casual forest visitor. O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not adversely impact visual resources in the project area.

Mitigation

All areas disturbed by construction activities would be restored to their original, natural-appearing condition after construction. Air vent location would be approved by the USFS and would be painted/powder-coated as per USFS direction to minimize their intrusion into the viewshed.

3.9 Cumulative Effects

3.9.1 Background

The Council on Environmental Quality (CEQ) regulations require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “ the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions: (40 CFR 1508.7).

This section analyzes cumulative impacts of past, present, and reasonably foreseeable projects on environmental resources within the project area. For the geographic boundaries, the cumulative impacts analysis focuses on Battle Creek Canyon, unless otherwise noted; for the temporal boundaries, the cumulative impacts analysis utilizes a 100-year time span, beginning with the installation of the spring collection system in the 1930s.

3.9.2 Past, Present, and Reasonably Foreseeable Future Actions

Battle Creek Canyon is a recreational area that is maintained in a natural, relatively undeveloped state. The only improvements that are present in the project area are the Pleasant Grove spring collection system, the Battle Creek Canyon Trail, and some limited signage. Battle Creek Canyon is utilized as a recreational resource. Activities in the area include backpacking, hiking, mountain biking, equestrian use and hunting. Battle Creek Trail runs from the base of the canyon adjacent to portions of Battle Creek and Blue Creek. In order to prevent erosion from destroying the trail, past improvements have been made to shore up the trail, especially in the area of Battle Creek Falls. Recreational use of the area results in an increased human presence and utilization of the forest resources.

Past projects in the project area (with the exception of the trail system previously mentioned) are limited to the development of the Pleasant Grove spring collection system. This system was constructed originally installed in the 1930s. Upgrades to the system have been performed over the years, most notably in the 1971, when many parts of the system were overhauled (including replacement of the original spring collection boxes and installation of the delivery pipeline).

Present and reasonably foreseeable future projects planned for the area (excluding the pipeline project that is the subject of this EA) include the spring rehabilitation project that Pleasant Grove intends to conduct concurrent with this project. That project would rehabilitate the spring collection systems at the individual springs in conjunction with the Special Use Permit. The spring rehabilitation project would include excavation activities at the individual spring sites and installing/replacing weir collection boxes and pipeline connections. No other present or reasonably foreseeable future improvements are planned by either Pleasant Grove or the USFS for Battle Creek Canyon.

3.9.3 Evaluation of Cumulative Effects

Potential cumulative impacts in Battle Creek Canyon would be associated with the combined human recreational use and the pipeline construction and maintenance activities connected with the Pleasant Grove spring collection system, both under this project and the proposed spring rehabilitation to be performed under the Special Use Permit.

Air Quality

The project area for the cumulative air quality analysis is Utah County due to the regional nature of the resource impacts. Utah County is designated as a non-attainment area for PM₁₀ and PM_{2.5}. The predominant air quality factors influencing particulate matter emissions in Utah County have historically been, and will likely continue to be, stationary and mobile sources associated with development, which is expected to continue.

As described previously, the Proposed Action Alternative would involve a minor, temporary increase in particulate matter emissions related to construction activities and, in the permanent, minor intermittent related to maintenance activities on the pipeline. The proposed project would not cause, or significantly contribute to, exceedances of the NAAQS standards, nor is it likely that the addition of the spring rehabilitation project in the project area would result in new violations of the NAAQS, increases in the frequency or severity of existing violations, or result in delays in attaining the NAAQS. The spring rehabilitation project would have temporary construction impacts in the immediate area; however, it would not involve ongoing emissions.

Biological Resources

The proposed project would have temporary impacts to wildlife and vegetation due to construction activities. There could be additional temporary impacts to biological resources due to Pleasant Grove's spring rehabilitation project, most notably in the Hangman Springs area. Wheeler's angelica, which is a Forest-sensitive plant, has been documented as being present in the vicinity of the Hangman Springs, which could likely be impacted by excavation activities with the spring rehabilitation project. The exact nature of the impacts and their potential extent is speculative at this juncture; however, it is likely that similar mitigation measures regarding the Wheeler's angelica would be required by the USFS in conjunction with this project. Cumulative impacts on wildlife and vegetation would likely be temporary and minor.

Cultural Resources

The archaeological survey for the proposed project identified two potential resources; one eligible resource and one ineligible resource. The resources identified were related to the old Telluride Power Hydroelectric System and the Pleasant Grove spring collection system, respectively. Due to the undeveloped nature of the project area and its remote location, there is low potential to encounter additional undocumented cultural resources. If undocumented cultural resources are present in the canyon, particularly in relation to the springs that Pleasant Grove intends to rehabilitate under its special use permit, there could be additional impacts to cultural resources. Typical mitigation measures would include stopping construction activities in the area of the find and contacting responsible parties with USFS.

Geology and Soils

Erosion is the primary geology and soils concern in the canyon, although there is also the potential for earthquakes along the Wasatch Front fault line that could impact the project area. As discussed

previously, heavy precipitation and flooding events have resulted in erosion damage to the Battle Creek Trail. The proposed action would disrupt approximately 0.8 miles of the trail, but would be temporary and mitigation would be implemented to reduce erosion during construction. The proposed project would also repair the trail and help stabilize soils. Recreational use of the trail, which is limited to non-motorized uses, would not be expected to substantially degrade its condition. The spring rehabilitation project would also involve impacts to soils due to the need for excavation work; however, such impacts are expected to be temporary in nature.

The limited scale and temporary nature of the present and reasonably foreseeable actions in the project area would not result in a substantial cumulative degradation of the geologic resources.

Hydrology

Erosion is the primary concern to hydrology and water quality in the canyon. The proposed project would involve only a small part of the watershed in the canyon. Heavy precipitation and flooding events have resulted in erosion damage to the Battle Creek Trail. The proposed project would disrupt approximately 0.8 miles of the trail, but this disruption would be temporary and the USFS would require mitigation to reduce erosion during construction. The project would repair the trail and help to stabilize the soils in the project area post-installation, thereby reducing the potential for water quality degradation due to erosion caused by heavy precipitation events. There would be temporary impacts to surface waters due to the construction of temporary crossings as part of the construction activities for the proposed action, but the overall hydrology of the area would not be impacted. The spring collection system rehabilitation would not alter the hydrologic patterns of the canyon and would only enable Pleasant Grove to better utilize its existing water right.

The limited scale, and temporary nature of the present and reasonably foreseeable future actions, and the relatively limited nature of the activities that are permitted in the project area under the Watershed classification of the Forest Management Prescription Plan would not result in a substantial cumulative degradation of the watershed hydrologic function.

Recreation

During construction of the proposed project and the spring rehabilitation activities (to be conducted contemporaneously), the Battle Creek trail would be temporarily closed in the project area. The proposed project would improve the trail tread within the project area without widening or otherwise altering the trail alignment. The improved trail tread would make it more attractive to recreational use. The spring rehabilitation would be conducted at the same time as the pipeline alignment construction and therefore would not result in longer impacts to the recreational usage of the area. No other projects are planned in the project area. Cumulative impacts on recreational use would be beneficial.

Roadless Areas

The project area is located within the Timpanogos Inventoried Roadless Area. The project, including the other cumulative activities that are reasonably foreseeable, would have no adverse permanent effects on the potential of the area to qualify for wilderness designation. The spring collection rehabilitation would not introduce new roads into the area or otherwise impact the qualities of the project area that qualify it for wilderness designation.

Visual Resources

The proposed project would not have any major permanent adverse impacts to the viewshed in the canyon and would maintain the natural-appearing scenic value in the area. It would include new air vents, in addition to those that are already present in the project area, as required by the UDDW standards for culinary water systems. However, the visual intrusion of these air vents would be minimized using powder-coating/painting, strategic placement and other measures. The spring collection rehabilitation would likely have temporary impacts during construction due to excavation at the spring collection sites. All disturbed areas would be restored to their existing condition after construction. The present and reasonably foreseeable future actions would have no permanent adverse effects on visual resources in Battle Creek Canyon.

3.10 Mitigation Summary

Air Quality

Mitigation

Due to the potential for fugitive dust emissions during construction, the contractor would prepare and comply with a fugitive dust plan.

Biological Resources

Mitigation

The proposed project would implement the applicable UNF Forest Plan standards and guidelines for Noxious Weeds Management, Aquatic and Riparian Habitat Management, Wildlife and Fish Habitat Management, and Vegetation Management.

Mitigation for potential impacts to the Wheeler's Angelica will include avoidance and minimization measures where possible. In addition, a pre-construction survey will be conducted to identify, map, and quantify occurrences of Wheeler's Angelica in Battle Creek Canyon. Given that the species is most often found in association with riparian habitats, the survey area will include the banks and riparian fringes along Battle Creek for approximately 0.3 miles, both above and below Hangman Springs, as well as in the vicinity of Hangman Springs itself. The results of the survey will be provided to the USFS to be used in determining appropriate mitigation measures for impacts to Wheeler's angelica populations, which could include: transplanting, reseeding, and/or collecting specimen for preservation in a herbarium. During construction activities within the Wheeler's angelica survey area, an environmental specialist will observe and document avoidance and minimization efforts. The specialist will also observe, document, and quantify all impacts to the species resulting from construction activities.

To prevent disturbances to migratory birds, avian nest surveys for bird species listed under the MBTA would be conducted in accordance with the USFWS' Nationwide Standard Conservation Measures. The surveys would be conducted no more than five days prior to the start of construction activities, within a buffer area to be established by the USFS. If nests are encountered within the project area, an avoidance buffer (to be determined in accordance with the individual needs of the species in question by a qualified biologist onsite) would be established until the hatchlings fledge. The avoidance buffer would be fenced off and no construction activities would be permitted within that buffer until after the nestlings have fledged. Further, all employees, contractors, and/or site visitors would be briefed on the relevant rules and regulations protecting wildlife, including restrictions on collection of birds (live or dead) or their parts

or nests without a valid permit. These mitigation measures would ensure minimal impacts to migratory birds.

To mitigate for vegetation impacts reseeding and revegetation utilizing native species will be performed as a part of the Proposed Action alternative. Best Management Practices would be implemented during construction to protect the integrity of the plant communities in the area and to help prevent introduction of noxious and invasive plant species, which would include:

- Plan activities to limit the potential introduction and spread of non-native invasive species (NNIS) prior to construction.
- Select locally native species for revegetation and restoration activities.
- Inspect and clean clothing, footwear and gear for soils, seeds, plant parts, or invertebrates before and after activities.
- Prior to moving equipment out of an infested area and into an uninfested area, clean soils, seeds, plant parts, or invertebrates from exterior surfaces, to the extent practical, to minimize the risk of transporting propagules.
- Revegetate disturbed soils as soon as feasible to minimize NNIS establishment.
- Allow natural revegetation of the ground layer to occur only where site conditions permit.
- Ensure the species specified in the plan are the ones being used.
- Monitor the revegetation site for NNIS.

No permanent impacts to native vegetation are anticipated as a result of the proposed action. The Proposed Action alternative does not propose to clear and/or impact all vegetation within the entire width of the pipeline corridor. Avoidance and minimization measures will be implemented to reduce impacts to vegetation, especially woody vegetation. Impacts to woody vegetation will only occur as necessary.

In regards to the northern goshawk, bird surveys would be conducted during the incubation season to determine if mating pairs are present in the area. If no nests are discovered within ½ mile of Timpooneke Road, no further mitigation is required. If nests are discovered within the ½ mile buffer zone, additional measures may be required to prevent disturbing the birds, which may include active monitoring of the nest for signs of disturbance during the movement of heavy machinery or restrictions on project implementation until after hatching (usually in June).

Cultural Resources

Mitigation

A qualified archaeologist would be onsite during construction to monitor activities in the area of Site UT1902 to ensure no additional impacts would occur. Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of the discovery and the USFS would consult with the Utah SHPO and the Advisory Council on Historic Preservation (ACHP), as necessary. In the unlikely event that human remains are discovered during construction, the provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 would be followed.

Geology and Soils

Mitigation

The Proposed Action would incorporate the following *National BMPs for Water Quality Management on National Forest System Lands* (2012):

REC-4 Motorized and Nonmotorized Trails

- Relocate trail to conform to the terrain, provide suitable drainage, provide adequate pollutant filtering between the trail and nearby waterbodies, and reduce potential adverse effects to soil, water quality or riparian resources.
 - Avoid sensitive areas, such as riparian areas, wetlands, stream crossings, inner gorges and unstable areas to the extent practicable.
 - Use suitable measures to mitigate trail impacts to the extent practicable where sensitive issues are unavoidable.
 - Use suitable measures to hydrologically disconnect trails from waterbodies to the extent practicable.
- Use applicable practices of BMP Fac-2 (Facility Construction and Stormwater Control) for control of erosion and stormwater when constructing trails.
- Install and maintain suitable drainage measures to collect and disperse runoff and avoid or minimize erosion of trail surface and adjacent areas.
- Use and maintain surfacing material suitable to the trail site and use to withstand traffic and minimize runoff and erosion.

WatUses-3 (Administrative Water Developments)

- Locate water source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and erosion and sedimentation to the extent practicable.
- Design source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and to avoid or minimize erosion, sediment, and other pollutants to the extent practicable.
- Construct water source developments, including access roads, in such a manner as to avoid or minimize disturbance to the riparian area and streambanks and erosion, sediment, and other pollutants to the extent practicable.
- Design the collection system to avoid, minimize, or mitigate adverse effects to the spring development and downstream waters from excessive water withdrawal, freezing, flooding, sedimentation, contamination, vehicular traffic, and livestock as needed.

WatUses-4 (Water Diversions and Conveyances)

- Locate water conveyance structures in stable areas where they are not susceptible to damage from side drainage flooding.
- Design diversion and conveyance structures to efficiently capture and carry design flows in such a manner as to avoid or minimize erosion of streambanks, ditches, and adjacent areas.
- Construct diversion and conveyance structures to perform as intended in the most efficient manner and in such a way as to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources.
- Operate and maintain diversion and conveyance structures in such a manner as to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources from failures.

Hydrology and Water Resources

Mitigation

Best Management Practices (BMPs) will be implemented during construction for the protection of water resources and to minimize impacts to Battle Creek, Blue Creek, and Shirt Creek. These BMPs (as set forth in the 2003 Forest Management Plan) include:

- **Aqua-1:** Trees shall not be felled into streams, lakes, or bogs except when needed to improve aquatic habitat.
- **Aqua-4:** Limit construction and other activities affecting stream channels to those periods when such activities will have the least detrimental effect on the aquatic environment, unless emergency conditions deem otherwise.
- **Aqua-5:** Avoid equipment operation in stream courses, open water, seeps, or springs. If use of equipment in such areas is required, impacts should be minimize.
- **Aqua-6:** Limit equipment operation in RHCAs. If the use of equipment in these areas is required, incorporate additional mitigation to minimize adverse impacts.
- **Aqua-7:** Prohibit storage of fuels and other toxicants within RHCAs. Do not fuel or service equipment in RHCAs unless there is no other alternative. If such sites are required within an RHCA, appropriate containment measures must be employed. Construction of maintenance equipment service areas shall be located and treated to prevent gas, oil, or other contaminants from washing or leaching into streams. Equipment working in open water and wetlands shall be cleaned prior to entry into such areas to remove gas, oil, and other contaminants.
- **S&W-4:** Maintain adequate ground cover to filter runoff and prevent detrimental erosion in RHCAs.
- **S&W-13:** Reduce stream sedimentation created as a result of construction.

Any impacts to streams in the project area would be fully restored at the conclusion of construction activities. Further, a Stream Alteration and/or Section 404 permit will be obtained prior to construction activities within and adjacent to streams.

O&M operations would be limited in scope and nature, occurring on an as-needed basis, and would not adversely impact the hydrology of the project area. Any potential impacts to wetlands would be permitted as appropriate.

Recreational Resources

Mitigation

Public notices and appropriate signage would be utilized during construction to notify the public of the closure.

Roadless Area

Mitigation

During and after construction, signage and a physical barrier (i.e., a locked gate) would be installed at the end of Timpooneke Road to prevent unauthorized motorized vehicle use of the construction access route. Temporary access routes would be restored to pre-construction conditions at the conclusion of the project.

Visual Resources

Mitigation

All areas disturbed by construction activities would be restored to their original, natural-appearing condition after construction. Air vent location would be approved by the USFS and would be painted/powder-coated as per USFS direction to minimize their intrusion into the viewshed.

Chapter 4 – Comments and Coordination

Chapter 4 summarizes the coordination efforts with agencies and the public throughout the environmental documentation process.

4.1 Communications with the Public

An article entitled *Opportunity to Comment, USDA-Forest Service, Uinta-Wasatch-Cache National Forest, Pleasant Grove Ranger District, Utah County*, was published in the Provo Daily Herald on August 7, 2014 to request public comments and again on August 6, 2015, with letters being sent to the mailing matrix for the USFS on or about July 31, 2015. Written, facsimile, hand-delivered, and electronic comments concerning the proposed project were accepted for 30 days following the publication of both of the notices in the newspaper. One public comment was received in response to the notices. The comment expressed concern that the construction access be blocked sufficiently to prevent off-road vehicles from access the project area.

4.2 Agency Correspondence

Correspondence letters (both sent and received) are shown in the table below and are included in the following pages, in order by date.

Table 10: Correspondence

Date	To	From	Subject
February 17, 2012	Sylvia Clark USFS	John Schiess Horrocks Engineers	Battle Creek Culinary Pipe Replacement and Spring Rehabilitation Project
October 2, 2012	Jon Stansfield USFS	John Schiess Horrocks Engineers	Battle Creek Culinary Pipe Replacement and Spring Rehabilitation Project - Revised
September 13, 2013	Dave Brown NRCS	Lynn Walker Pleasant Grove City	Request for emergency erosion stabilization funding
September 19, 2013	Lynn Walker Pleasant Grove City	John Schiess Horrocks Engineers	Battle Creek Canyon Culinary Water Repairs List
August 22, 2014	John Stansfield USFS	Jason Gipson USACE	Response to Scoping Request for Input
September 25, 2014	Jana Leinbach USFS	Marley Haupt Horrocks Engineers	Wheeler’s Angelica Identification
September 26, 2014	Marley Haupt Horrocks Engineers	Jana Leinbach USFS	Seeds for Identification as Wheeler’s Angelica
October 21, 2014	Marley Haupt Horrocks Engineers	Jana Leinbach USFS	Wheeler’s Angelica Verification /T&E Species
October 23, 2014	Sarah Lindsey UDWR	Marley Haupt Horrocks Engineers	Request for comments on Battle Creek Canyon EA
October 29, 2014	Marley Haupt Horrocks Engineers	Sarah Lindsay UDWR	Species of concern for Battle Creek Canyon Culinary Water Pipeline, Utah County, Utah

BATTLE CREEK CANYON CULINARY WATER PIPELINE ENVIRONMENTAL ASSESSMENT

Date	To	From	Subject
December 4, 2014	Chris Merritt Deputy SHPO	Thomas Flanigan USFS	Determination of Significance and Effect for Cultural Resources
January 13, 2015	Marley Haupt Horrocks Engineers	Jana Leinbach USFS	Mitigation for impacts to Wheeler's Angelica
March 13, 2015	David C. Whittekiend USFS	Raymond Wallace ACHP	Cultural Resources
June 17, 2015	Deon Giles Pleasant Grove CLG	Jon Stansfield USFS	Cultural Resources
June 17, 2015	Gordon Howell Ute Indian Tribe	Jon Stansfield USFS	Cultural Resources - Native American Consultation
July 31, 2015	USFS Mailing Matrix	Jon Stansfield USFS	Updated Scoping Letter
August 13, 2015	USFS	Public Comment	Access to Roadless Area
December 8, 2015	Forest Supervisor UWC National Forest	Nora Rasure Regional Forester	Inventoried Roadless Area Concurrence

Included below is a list of those who participated in the preparation of this EA.

List of Preparers

Name	Project Role	Education	Years of Experience
Horrocks Engineers			
Jennifer Hale	Environmental Analysis/Graphics	BS, Humanities MLA, Landscape Architecture	7
Judy Imlay	Environmental Analysis	BA, Political Science JD	20
Marley Haupt	Environmental Analysis	BS, Biology/Botany	2
Ryan Pitts	Environmental Analysis	BS, Horticulture MLA, Landscape Architecture	9
Stan Jorgensen	Environmental Manager	BS, Civil Engineering MS, Civil Engineering	22
PEC			
Peter Steele	Cultural Resources	BS, Anthropology MA, Anthropology	6
U.S. Forest Service			
Jana Leinbach	Botanist, Uintah-Wasatch-Cache National Forest		
Karen Hartman	Wildlife Biologist, Uinta-Wasatch-Cache National Forest	BA, Biology MS, Biology	26

Name	Project Role	Education	Years of Experience
Pete Gomben	Environmental Coordinator, Uinta-Wasatch-Cache National Forest	PhD, Land Use Planning	16
Charles Rosier	Recreation, Lands & Special Uses		
Jon Stansfield	District Ranger	BS, Forestry	16
Tom Flanigan	Forest Archaeologist		

References

Environmental Protection Agency (EPA), Air and Radiation. 2011. National Ambient Air Quality Standards (NAAQS). Accessed December 2014. Retrieved from <http://www.epa.gov/air/criteria.html>.

Environmental Protection Agency (EPA), Western Ecology Division. 2014. Ecoregions of Utah. Accessed October 1, 2014. Retrieved from http://www.epa.gov/wed/pages/ecoregions/ut_eco.htm.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetland Delineation Manual (Online Edition). Technical Report Y-87-1. U.S. Army Engineers Waterways Experiment Station. Vicksburg, Mississippi.

U.S. Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Delineation Manual: Arid West Region (Version 2.0). U.S. Army Corps of Engineer Research and Development Center. Vicksburg, Mississippi.

U.S. Department of Agriculture (USDA). 2012. Non-native Invasive Species Best Management Practices, Guidance for the U.S. Forest Service Eastern Region. Accessed on August 27, 2015.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2014. Web Soil Survey. Accessed October 2, 2014. Retrieved from <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS). 2007. North American Beaver (*Castor canadensis*): A Technical Conservation Assessment. Accessed September 29, 2014. Retrieved from <http://www.fs.fed.us/r2/projects/scp/assessments/northamericanbeaver.pdf>.

U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS), Intermountain Region (R4). Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species. February 2014.

U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS), Uinta National Forest (UNF). 2003. Land and Resource Management Plan.

U.S. Department of the Interior (USDOI), U.S. Fish and Wildlife Service (USFWS). 2014. Information, Planning, and Conservation System (IPaC) Official Species List. Accessed on 9/17,2014; updated on January 5, 2016.

U.S. Forest Service. 2010. Uinta-Wasatch-Cache Sensitive Species List.

Utah Conservation Data Center (UCDC), Utah Division of Wildlife Resources (UDWR). 2014. Accessed September 24, 2014 and August 20, 2015. Retrieved from <http://dwrcdc.nr.utah.gov/ucdc/>.

Utah Division of Water Quality (UDWQ). 2014. Utah Lake Report. Accessed October 1, 2014. Retrieved from <http://www.waterquality.utah.gov/watersheds/lakes/UTAHLAKE.pdf>.

Utah Division of Natural Resources (DNR), Utah Geological Survey. 1994. Liquefaction Potential Map for a Part of Utah County, Utah. Accessed October 1, 2014. Retrieved from <http://geology.utah.gov/utahgeo/hazards/liquefy.htm#liquemaps>.

Utah Division of Natural Resources (UDNR), Utah Division of Wildlife Resources (UDWR). 2014. Hunting and fishing guidebooks. Accessed October 3, 2014. Retrieved from <http://wildlife.utah.gov/fishing-in-utah/guidebooks.html>.