
Thornton Water Project Larimer County 1041 Permit Application

Executive Summary



Submitted to:
Larimer County Planning Department
200 West Oak Street, Suite 3100
Fort Collins, CO 80521

Date: January 2018



CH2MHILL

Prepared By:
CH2M HILL
9191 South Jamaica Street
Englewood, CO 80112



City of Thornton

Prepared For:
City of Thornton
9500 Civic Center Drive
Thornton, CO 80229



Executive Summary Table of Contents

- Executive Summary Table of Contents ES-ii**
 - List of Tables ES-iii
 - List of Figures ES-iii
- Executive Summary Acronyms and Abbreviations ES-iv**
- Larimer County 1041 Permit Request ES-1**
- Purpose and Need of the Project ES-1**
- Project Description ES-2**
 - TWP Corridor ES-4
 - Concept Evaluation ES-4
 - Initial Proposed Corridor ES-4
 - TWP Corridor ES-5
 - TWP Components ES-7
 - Final Water Pipeline Alignment Design Criteria ES-9
 - Land Acquisition ES-9
 - Construction Activities ES-10
 - Traffic Control Installation ES-11
 - Survey ES-11
 - Stormwater BMP and Access Installation ES-11
 - Site Clearing ES-12
 - Stage Materials/Staging Area Setup ES-12
 - Excavate the Water Pipeline Trench/Bore Pit ES-12
 - Water Pipeline Installation ES-12
 - Backfill the Trench/Bore Pit ES-13
 - Conduct Pressure Testing ES-13
 - Clean Up ES-14
 - Restore Ground Surface ES-14
 - Road Restoration ES-14
 - Revegetation ES-14
 - Ongoing Stewardship ES-14
 - Timeframe ES-14
 - Operation and Maintenance Activities ES-14
 - Project Description General Specifications ES-15
 - Land Use ES-15
 - Stakeholder Outreach ES-16
 - Agency Outreach ES-16
 - Public Outreach ES-17
- Compliance with 1041 Permit Requirements ES-19**
- Technical Reports ES-25**
 - Wetland Mitigation Plan ES-25
 - Wildlife Conservation Plan ES-25
 - Federal Threatened, Endangered, and Candidate Animal Species ES-26
 - State Animal Species of Concern ES-26
 - Raptor and Other Migratory Birds ES-28

Big Game and Large Mammals	ES-28
Other Game and Nongame Species.....	ES-28
Aquatic Species and Habitat	ES-29
Federal Threatened, Endangered, and Candidate Plant Species.....	ES-29
Natural Hazard Mitigation Plan	ES-29
Wildfire Hazards.....	ES-29
Geologic Hazards	ES-29
Traffic Impact Study.....	ES-30
Trip Generation.....	ES-30
Project Access	ES-30
Road Crossings.....	ES-31
Railroad Crossings.....	ES-31
Possible Delivery, Commuting Routes, and Material Storage	ES-31
Construction Traffic Mitigation Measures.....	ES-31
Drainage and Erosion Control Report and Plan	ES-32
Construction Water Quality Management	ES-32
Post-Construction Stormwater Runoff	ES-32
Floodplain Hydraulic/Hydrologic Modeling Report	ES-32
Groundwater Modeling Report	ES-33
Non-Subdivision Water Supply Inquiry.....	ES-33
Simulation of the Appearance of the Facility	ES-33
Computer-Modeled Electromagnetic Field Measurements	ES-33
Noise Analysis	ES-33
Air Quality Impact and Mitigation Report	ES-34
Additional Information.....	ES-34
Cultural Resources	ES-34
Noxious Weed Management	ES-34

List of Tables

ES-1	Probable Water Pipeline Installation Construction Method at Defined Existing Features	ES-13
ES-2	Typical TWP Specifications.....	ES-15
ES-3	Vegetative Communities within the TWP Corridor	ES-16
ES-4	Evaluation Criteria Cross-Reference Guide.....	ES-20
ES-5	Suitable or Potential Habitat for State Animal Species	ES-27

List of Figures

ES-1	TWP Corridor Map	ES-3
ES-2	Typical Easement	ES-10
ES-3	Construction Activities.....	ES-11

Executive Summary Acronyms and Abbreviations

BMP	Best Management Practice
CDOA	Colorado Department of Agriculture
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CNDIS	Colorado Natural Diversity Information System
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
ERO	ERO Resources, Inc.
ESA	Endangered Species Act
G1	Critically Imperiled Globally
G2	Imperiled Globally
G3	Vulnerable Throughout Its Range
G4	Apparently Secure Globally
HOA	Home Owners' Association
HUC	Hydrologic Unit Code
IPM	Integrated Pest Management
LUC	Larimer County Land Use Code
MBTA	Migratory Bird Treaty Act
mgd	Million Gallons per Day
NHD	National Hydrography Dataset
NI	No Information
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OAHP	Office of Archeology and Historic Preservation
Preble's	Preble's Meadow Jumping Mouse
Project	Thornton Water Project
PVREA	Poudre Valley Rural Electrical Association
ROW	Right-of-Way
S1	Critically Imperiled in State

S2	Imperiled in State
S3	Vulnerable in State
S4	Apparently Secure in State
SC	State Species of Concern
SE	State Endangered Species
ST	State Threatened Species
SWMP	Stormwater Management Plan
Thornton	City of Thornton
TWP	Thornton Water Project
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States
WSSC	Water Supply and Storage Company

Larimer County 1041 Permit Request

The city of Thornton (Thornton), Colorado is requesting a 1041 permit for the Thornton Water Project (TWP), the siting and development of which has been designated as an area and activity of state interest as authorized by Title 24, Section 65.1-501 of the Colorado Revised Statutes, and Section 12 Common Procedures for Development Review and 14 Area and Activities of State Interest (1041 Permit) of Part II of the Larimer County Land Use Code (LUC), Version September 13, 2017. The matter of state interest, as defined by the LUC, involves the siting and development of a new domestic water transmission line that is contained within new permanent easements greater than 30 feet.

The TWP 1041 permit application (Application) requests approval of an approximate 500-foot to ¼-mile wide TWP corridor to construct, operate, and maintain the TWP, which includes up to approximately 26 miles of a buried 48-inch domestic water transmission line (water pipeline) and associated appurtenances in unincorporated Larimer County. The TWP corridor width varies depending on location.

The TWP is a water delivery system that will convey domestic water from the Water Supply and Storage Company (WSSC) system purchased by Thornton in the mid-1980's to Thornton.

The Application addresses areas in unincorporated Larimer County, which include private or public lands within the boundaries of unincorporated Larimer County but outside the boundaries of any municipality (city or town). The Application is organized consistent with the *Larimer County Planning Department Procedural Guide for 1041 Permits, Submittal Requirements for 1041 Permits*, October 20, 2008 (*Larimer County Planning Department Procedural Guide for 1041 Permits*). The siting and development of the TWP conforms to Larimer County 1041 permit requirements as described in this Application.

Purpose and Need of the Project

The purpose of the TWP is to convey domestic water from the WSSC system purchased by Thornton in the mid-1980's to enhance Thornton's water supply reliability and drought resiliency, help address source water quality issues, and meet municipal and industrial demands of Thornton's water customers through 2065.

Thornton's population is projected to increase from its current estimated population of 136,574 residents (City of Thornton, Third Quarter 2017 Population Estimate and Housing Inventory Report) to 242,000 residents by 2065. Thornton has proactively planned for the anticipated population increase to ensure that Thornton can provide a reliable, high quality, and economical water supply to meet the needs of its residents and businesses. Thornton's existing water system, including an extensive water conservation program, has served to meet municipal and industrial water needs of Thornton's current water customers in its service area, as well as to meet existing contractual obligations. Thornton water supply projects in development will allow Thornton to provide water service up to a population of 158,000 residents. Beyond 158,000 residents, which Thornton projects to reach by 2025, additional water supplies are needed to ensure reliable water service to Thornton's water customers. Water from the WSSC system in Northern Colorado purchased by Thornton in the mid-1980's from willing sellers has been decreed in Water Court for use in Thornton, but Thornton currently lacks the infrastructure to deliver that water to Thornton. The TWP will provide the necessary infrastructure for delivery of this water to Thornton, and provides

the means by which Thornton’s customers will receive the benefit of Thornton’s decades-long planning for and investment in this additional water supply. The TWP is being configured to deliver an average of 14,000 acre feet of water annually, which is sufficient to meet the municipal and industrial demands of Thornton’s water customers through 2065. In addition to meeting water demand, in adding this high quality source the TWP provides diversity, enhanced water supply reliability, quality and drought resiliency to Thornton’s supply.

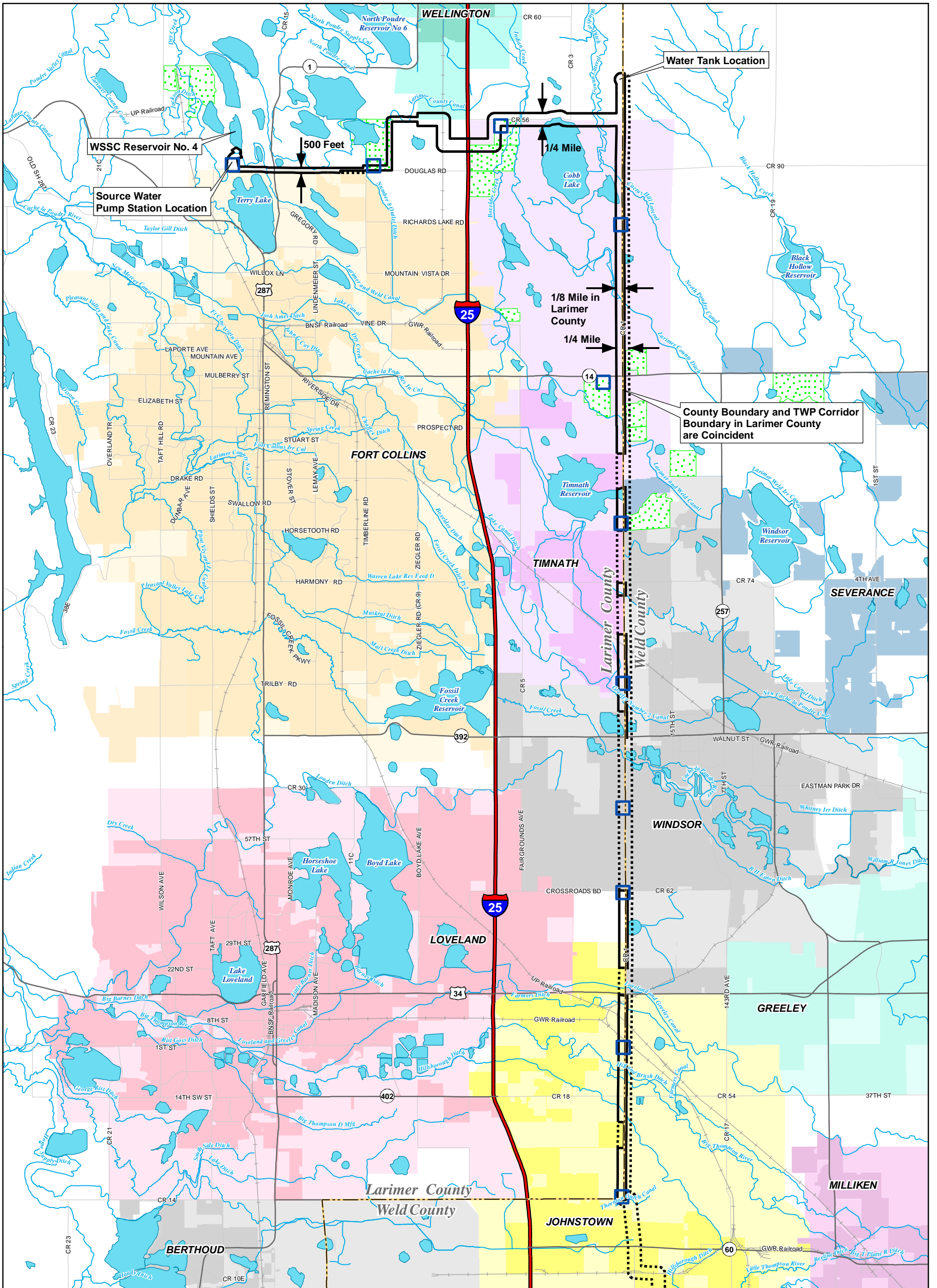
Project Description


Thornton is proposing to construct, operate, and maintain the TWP, which includes up to approximately 26 miles of a buried 48-inch water pipeline and associated appurtenances in unincorporated Larimer County, Colorado. TWP appurtenances include an approximate 1-million-gallon aboveground steel water tank and various buried water pipeline structures and valve vaults including access manways, blow-off assemblies, air release vaults, and isolation valve vaults. The TWP is a water delivery system that will convey domestic water Thornton purchased in the mid-1980’s from the WSSC system to Thornton. **Figure ES-1** shows the TWP corridor from the WSSC system to the southern Larimer County border (County Road 14) at County Road 1 and includes the TWP corridor in both Larimer and Weld Counties.

The TWP will also include an approximate 40 million gallon per day (mgd) source water pump station located near WSSC Reservoir No. 4. As discussed with Larimer County Planning staff at the Pre-Application Conference held on May 26, 2016, the source water pump station is not part of this Application, but will be separately permitted through the Site Plan Review permit process. Information on the source water pump station provided in this Application is of a general nature and is included to present a more complete scope of the TWP. To date no design has been completed for the source water pump station and Thornton will submit a Site Plan Review permit application to Larimer County in accordance with LUC Section 6.0.

Land uses in the TWP area of unincorporated Larimer County are predominantly agricultural. Other uses include residential use. The TWP is consistent with continuation of current land uses. Property owners who grant a permanent easement to Thornton can continue to use the land within the easement area for purposes such as farming, grazing, or access, so long as such uses do not interfere with or endanger the operation of the TWP.

Thornton Water Project






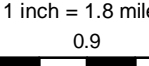
**CITY OF THORNTON
COLORADO**

12450 WASHINGTON ST
THORNTON, CO 80241-2405

12/29/2017



1 inch = 1.8 miles



0 0.9 1.8 Miles

<ul style="list-style-type: none"> TWP Corridor in Unincorporated Larimer County TWP Corridor outside Unincorporated Larimer County Railroad Thornton Farm County Boundary Lake/Reservoir River/Stream/Canal/Ditch Potential Staging Area 	<p>Boundaries Crossed by the Proposed Corridor</p> <table border="0"> <tr> <th>Corporate Boundary</th> <th>GMA Boundary</th> </tr> <tr> <td> Fort Collins</td> <td> Fort Collins</td> </tr> <tr> <td> Johnstown</td> <td> Johnstown</td> </tr> <tr> <td> Loveland</td> <td> Loveland</td> </tr> <tr> <td> Timnath</td> <td> Timnath</td> </tr> <tr> <td> Wellington</td> <td> Wellington</td> </tr> <tr> <td> Windsor</td> <td> Windsor</td> </tr> </table>	Corporate Boundary	GMA Boundary	Fort Collins	Fort Collins	Johnstown	Johnstown	Loveland	Loveland	Timnath	Timnath	Wellington	Wellington	Windsor	Windsor
Corporate Boundary	GMA Boundary														
Fort Collins	Fort Collins														
Johnstown	Johnstown														
Loveland	Loveland														
Timnath	Timnath														
Wellington	Wellington														
Windsor	Windsor														

**Figure ES-1
TWP Corridor Map**

Sources: NHD, USGS, CDWR, Larimer and Weld Counties, CDOT, City of Thornton

TWP Corridor

Thornton is seeking approval for an approximately 500-foot to ¼-mile wide corridor for TWP components in unincorporated Larimer County. The final water pipeline alignment within the Larimer County approved corridor will be developed during final design. Typically, a 50-foot permanent easement for the water pipeline and an additional 40-foot temporary easement for construction will be purchased from property owners except where the TWP will be constructed in road right-of-way (ROW). The TWP corridor width varies to allow for flexibility when developing the final water pipeline alignment and location of appurtenances. TWP corridor limits are shown on **Figure ES-1**. Areas bounded by a dashed line show the TWP corridor outside of unincorporated Larimer County.

A series of evaluations were conducted to develop the TWP corridor. The basis of the evaluations ensured that the TWP corridor would meet the TWP purpose and need. A three-tiered evaluation program was implemented: First, alternative conceptual project configurations were evaluated and a preferred delivery concept was selected. Second, alternative project corridors consistent with the preferred delivery concept and within a broader evaluation area were evaluated with input from potentially impacted communities. Lastly, with input from potentially impacted residents via public outreach efforts and from Larimer County staff, alternative configurations were evaluated within the preferred corridor from step two.

Concept Evaluation

A high-level evaluation of alternative conceptual project configurations was conducted to determine the preferred TWP delivery concept. The configuration alternatives included:

- Concept 1: Pipeline from WSSC reservoirs to Thornton
- Concept 2: Pipeline from lower on the Cache la Poudre River to Thornton
- Concept 3: Colorado Big Thompson System Exchange/Deliveries
- Concept 4: River Exchange up the South Platte River

Criteria used to evaluate the relative probability of success at meeting TWP purpose and need for each conceptual project configuration included:

- Water quality as related to meeting the need for a higher quality water source for Thornton's water portfolio
- Water quantity as related to meeting the annual volumetric water need over the project planning period
- Permitting requirements as related to meeting the required in-service date for the TWP
- Intergovernmental constraints as related to meeting the required in-service date for the TWP

Initial Proposed Corridor

Prior to conducting public outreach, which is not required by Larimer County's 1041 permit application process, and in an effort to determine the alternative corridor least impactful to local communities in Northern Colorado, Thornton conducted a series of outreach meetings with local governments and agencies that could be impacted by the TWP. Input from local governments and agencies was utilized in developing alternative corridors and identifying the initial proposed corridor. The TWP corridor was developed based on multiple rounds of local government outreach with Larimer County and the cities/towns of Berthoud, Fort Collins, Johnstown, Loveland, Timnath, Wellington, and Windsor.

Alternative corridors were identified using readily and publicly available geographic information system (GIS) data. Guidelines used to identify the alternative corridors include the following:

- Input from potentially affected local governments
- Minimizing impacts to ROW
- Minimizing impacts to water bodies and wetlands
- Bypassing geological hazardous areas
- Minimizing impacts to environmentally sensitive areas such as open land or conservation areas
- Minimize impacts to congested areas, typically in developed, densely populated areas
- Utilizing Thornton-owned property
- Following ROW/easements/property lines

Alternative corridors were analyzed using non-economic data to determine the initial proposed corridor. The non-economic criteria and method of measurement used in the evaluation of alternative corridors included the following:

- Local Government Preference - Rating scale from 1 to 8 based on compliance with local government preferences
- Geologic Hazards - Estimated length within areas identified as having mine subsidence
- Community impact – Number of local government boundaries crossed
- Wetland/Riparian Crossings – Estimated length of wetland/riparian areas crossed
- Floodplain Crossings – Estimated length of floodplain areas crossed
- Number of parcel owners crossed
- ROW – Estimated possible length of water pipeline in ROW

The location of the initial proposed corridor was based on the TWP purpose and need, as well as information and guidance received from Larimer County Public Works and Planning staff, the city of Fort Collins, and others. The initial proposed corridor was presented to area residents during public open houses (in the fourth quarter of 2016) and at an outreach meeting with residents requested by the residents from the areas around WSSC Reservoir No. 4 (in the first quarter of 2017). At these meetings, residents requested that Thornton look at additional alternative water pipeline alignments and pump station locations. Subsequent to these meetings with area residents, Thornton met with Larimer County staff to discuss the concerns and requests of the residents, and Larimer County staff provided guidance for the Application for the TWP.

TWP Corridor

Larimer County staff requested that Thornton propose a preferred alignment with a 500-foot wide corridor for the TWP in the area around the WSSC Reservoirs and east to Larimer County Road 9. The 500-foot wide corridor allows flexibility in locating the water pipeline during final design of the TWP, and future action or approval by Larimer County under Larimer County's 1041 permit process should not be required so long as the water pipeline is installed within the 500-foot wide corridor. The final water pipeline alignment within the Larimer County approved corridor will be developed during final design. Typically, a 50-foot permanent easement for the water pipeline and an additional 40-foot temporary easement for construction will be purchased from property owners except where the TWP will be constructed in the road right of way.

Larimer County staff requested that an analysis of alternative water pipeline alignments and pump station locations be included in the Application. Larimer County staff indicated that the alternative analysis should be conducted from the connection to the WSSC system to approximately County Road 9. No revisions to the initial proposed corridor east of County Road 9 were required, and Thornton understands that the $\frac{1}{8}$ - to $\frac{1}{4}$ -mile corridor continues to be acceptable for the Application.

After receiving input from area residents and adopting the *Larimer County Transportation Master Plan* in the third quarter of 2017, Larimer County staff indicated that locating the water pipeline in Larimer County road ROW may be allowed at some locations. Thornton understands that, if the water pipeline is to be located in Larimer County ROW other than as specifically approved in a 1041 permit, then use of that ROW will require Larimer County approval.

Based on the guidance from Larimer County staff, an analysis of alternative water pipeline alignments and pump station locations was completed. Ten alternative configurations were analyzed using evaluation criteria and comparative cost estimates. The location of the ten alternative configurations were based on the TWP purpose and need. Common concerns communicated to Thornton during the public open houses, the outreach meetings, and meetings with Larimer County staff were considered in the development of evaluation criteria. The evaluation criteria and method of measuring the criteria used in the analysis included the following:

- Residential - Number of homes within 250 feet of the proposed water pipeline alignment location within an easement (does not include water pipeline in the ROW, WSSC- or Thornton-owned property).
- Pump Station Visual/Noise/Vibration –
 - Visual: Number of homes within $\frac{1}{2}$ mile of pump station with probable line of sight.
 - Noise and Vibration: Number of homes within 250 feet of pump station, within 251-500 feet, and within 501-1,000 feet.
- TWP Operations - Length of road in feet within a residential area required to drive to access pump station plus length of easement in feet on private property.
- Traffic - Ratio of length in feet to the estimated relative production factor to install the pipeline within the ROW multiplied by average daily traffic (ADT) volume plus ratio of length in feet to the estimated relative production factor adjacent to the ROW multiplied by 25 percent of the ADT.
- Environmental - Estimated acres crossed identified as riparian and/or populated with trees.
- Coordinated Projects Opportunity - Shared length in feet of possible coordinated projects to minimize community impacts multiplied by the possible number of projects TWP can coordinate with.

The TWP proposed preferred alignment in the area around the WSSC Reservoirs and east to Larimer County Road 9 presented for approval in this Application is a 500-foot wide corridor that had the best scoring based on the analysis of alternatives.

The east/west section of the TWP corridor is approximately 10 miles long, extending east in unincorporated Larimer County north of Fort Collins from WSSC Reservoir No. 4, then across Interstate 25 to Larimer County Road 1/Weld County Road 13 (County Road 1). The TWP corridor is 500-foot wide along Douglas Road to Larimer County Road 9. The TWP corridor is $\frac{1}{4}$ -mile wide east of Larimer County Road 9 and generally follows roads and property lines.

The section of the TWP corridor that generally runs north/south in unincorporated Larimer County is ¼-mile wide and approximately 16 miles long. The TWP corridor follows County Road 1 from just south of County Road 58 to County Road 14. County Road 1 is the Larimer County/Weld County line and the full ¼-mile wide TWP corridor is centered on the County line, encroaching ⅛-mile into each county. The TWP corridor continues south of County Road 14 into Weld County and then into Adams County where it terminates at the Thornton water treatment plants.

Portions of the TWP corridor include approximately 10 ½ miles in incorporated areas of Fort Collins, Johnstown, Timnath or Windsor, including roads that have been annexed by local governments.

As discussed with Larimer County Planning staff at the Pre-Application Conference held on May 26, 2016, for the TWP, Larimer County's process can accommodate a corridor approach for the Application. Seeking permit approval for the TWP corridor will:

- Allow the continued efficient integration of the TWP into planned future county or municipal developments within the approved corridor through continuing coordination and outreach meetings as the TWP is developed and implemented.
- Provide property owners greater flexibility in working with Thornton to locate the water pipeline within the approved TWP corridor that best meets property owners' preferences.

The process to develop the final water pipeline alignment is iterative and deviations may occur as a result of negotiations with individual property owners or if detailed land, utility, or resource surveys reveal engineering or environmental constraints. If, following approval by the Larimer County Board of County Commissioners, the water pipeline alignment is required to extend outside of the approved corridor, Thornton will consult with the Larimer County Planning Department. After approval in a 1041 permit, alignment refinements within the TWP corridor are not anticipated to result in substantive changes to potential impacts associated with the proposed TWP and are not expected to require additional Larimer County approval under Larimer County's 1041 permit process.

TWP Components

TWP components within the TWP corridor in unincorporated Larimer County include the following:

- **Water pipeline.** Up to approximately 26 miles of a buried, 48-inch diameter water pipeline capable of conveying 40 mgd of water will be constructed. The water pipeline will be buried at a minimum depth of 4 feet below grade. The depth of bury will vary based on existing utility crossings, road crossings, water crossings, other existing or proposed features, and property owner preferences. Typically, a 50-foot permanent easement for the water pipeline and an additional 40-foot temporary easement for construction will be purchased from property owners. Where the TWP corridor parallels Douglas Road and County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County. However, in the event that the location of the water pipeline cannot be accommodated in the Douglas Road or County Road 56 ROW, easements will be purchased from property owners to locate the water pipeline on private property.
- **Appurtenances**
 - **Source water connection.** Two buried valve vaults will be constructed to connect the TWP to two existing outlet pipelines at WSSC Reservoir No. 4.
 - **Water tank.** An approximate 1 million gallon water tank will be constructed. The water tank will require an approximate 2-acre site for the approximate 85-foot diameter, 24-foot tall steel water tank. Land will be purchased from property owners for this appurtenance. The

- water tank is planned to be painted a shade of tan to blend into the surrounding area. Gravel access will be constructed and the remaining disturbed area, including vegetation, will be restored to pre-construction conditions. Lighting will be installed for security and will comply with LUC Section 8.15 and other applicable regulations. Security fencing will be located around the perimeter of the site and will comply with LUC Section 8.16.
- Communications. Up to approximately 26 miles of buried fiber optic cable, including buried manholes, test stations, and other fiber optic cable appurtenances will generally parallel the water pipeline. The fiber optic cable will be installed in close proximity to the water pipeline. The fiber optic cable will allow Thornton to remotely communicate with and operate the TWP. The cable will be buried at a minimum depth of 3 feet below grade. The depth of bury will vary based on existing utility crossings, road crossings, water crossings or other existing or proposed features, and property owner preferences.
 - Other appurtenances. Various buried water pipeline appurtenances and structures, including access manways, blow off assemblies (used to drain the water pipeline), combination air release valve vaults (used to exhaust air when filling the water pipeline and admitting air during draining operations), and isolation valve vaults will be constructed. Additional permanent and temporary easements could be obtained for these appurtenances.

The TWP appurtenances also include an approximate 40 mgd source water pump station located near WSSC Reservoir No. 4. The source water pump station will require an approximate 2 acre site with up to an approximate 10,000 square-foot building to house pumps and associated equipment. An emergency backup diesel generator might be located outside of the source water pump station, if a second independent power source is not included. Thornton contacted Poudre Valley Rural Electrical Association (PVREA) to determine if current infrastructure in the area supports the proposed load, and they confirmed sufficient power is available in the area to supply the source water pump station. In addition, it may be possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power. If a second feed is feasible and cost-effective, an emergency diesel powered backup generator will not be required. Thornton will continue to coordinate with PVREA to determine specific requirements for power service to the source water pump station.

Lighting for the source water pump station will be installed for security and will comply with LUC Section 8.15 and other applicable regulations. A lighting plan will be submitted to Larimer County with the Site Plan Review Permit application. Security fencing will be installed around the perimeter of the site. The access driveway and parking areas are anticipated to be gravel. Land will be purchased from property owner(s) for the source water pump station.

As discussed with Larimer County Planning staff at the Pre-Application Conference, the source water pump station is not part of this Application, but will be separately permitted through the Site Plan Review permit process. Information on the source water pump station provided in this Application is of a general nature and is included to present a more complete scope of the TWP. To date no design has been completed for the source water pump station and Thornton will submit a Site Plan Review permit application to Larimer County in accordance with LUC Section 6.0. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station to reduce the visual impacts of the facility.

Final Water Pipeline Alignment Design Criteria

During the Pre-Application Conference, Larimer County staff requested that the Application include design criteria that will be used for the selection and development of the final water pipeline alignment location within a Larimer County approved corridor. The majority of the TWP corridor follows the Larimer/Weld County line along County Road 1. For this area, water pipeline alignment design criteria will take into account Larimer County staff's indicated preference for the water pipeline to be located outside of existing Larimer County ROW and outside of future ROW where feasible. Thornton plans to use existing ROW for construction access and temporary construction easements, where appropriate. Thornton understands that, if the water pipeline is to be located in Larimer County ROW, other than as specifically approved in a 1041 permit, then use of that ROW will require Larimer County approval. It is anticipated that the water pipeline alignment will cross back and forth over the County line to accommodate property owner preferences where practicable, and to meet water pipeline alignment design criteria.

Where practicable, water pipeline design criteria are as follows:

- Be outside the current and future planned road ROW unless otherwise approved by Larimer County. Where the corridor parallels Douglas Road and County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County.
- Be adjacent to roads, current or future ROW, existing utility easements, and property lines.
- Utilize Thornton-owned property within the corridor.
- Minimize impacts to agricultural use.
- Minimize impacts to existing structures.
- Cross waters, irrigation ditches, roads, and railroads perpendicular to the feature.
- Minimize road crossings.
- Minimize impacts to environmental and cultural resources.
- Minimize impacts to open lands/conservation easements.

Land Acquisition

Thornton will typically acquire non-exclusive permanent easements for installation, operation and maintenance of the water pipeline and appurtenances. The typical permanent easement width is anticipated to be 50-feet wide, and the typical temporary construction easement is anticipated to be an additional 40-feet wide as shown on **Figure ES-2**. The final alignment of the water pipeline is subject to negotiation with individual property owners. Thornton's land services representatives will work with property owners along the TWP corridor to explain water pipeline construction, operations and maintenance activities and to negotiate the purchase of easements where needed based on fair market value. The easements will grant Thornton an area to construct, operate, and maintain the water pipeline, and property owners will maintain fee title to the land. Property owners who have granted a permanent easement to Thornton can continue to use the land within the easement area for purposes such as farming, grazing, or access, so long as such uses do not interfere with or endanger the operation of the water pipeline. The predominant land use in the TWP area, agricultural use, is compatible with operation of the TWP because the water pipeline and fiber optic cable will be buried below the plow line. The buried water pipeline and fiber optic cable are compatible with other land uses, such as residential use, that the TWP corridor crosses. As discussed with Larimer County Planning staff at the Pre-Application Conference, Thornton will

supply final alignment and construction plans to Larimer County prior to construction to meet 1041 permit site map requirements. Construction plans are anticipated to be delivered in multiple packages.

Land for the source water pump station and water tank will be purchased from individual property owner(s). It is anticipated that up to 2 acres will be required for each site. Thornton's land services representatives will work with property owner(s) to negotiate purchase of land. This could require land division of property. Thornton will follow the appropriate Larimer County Land Division process.

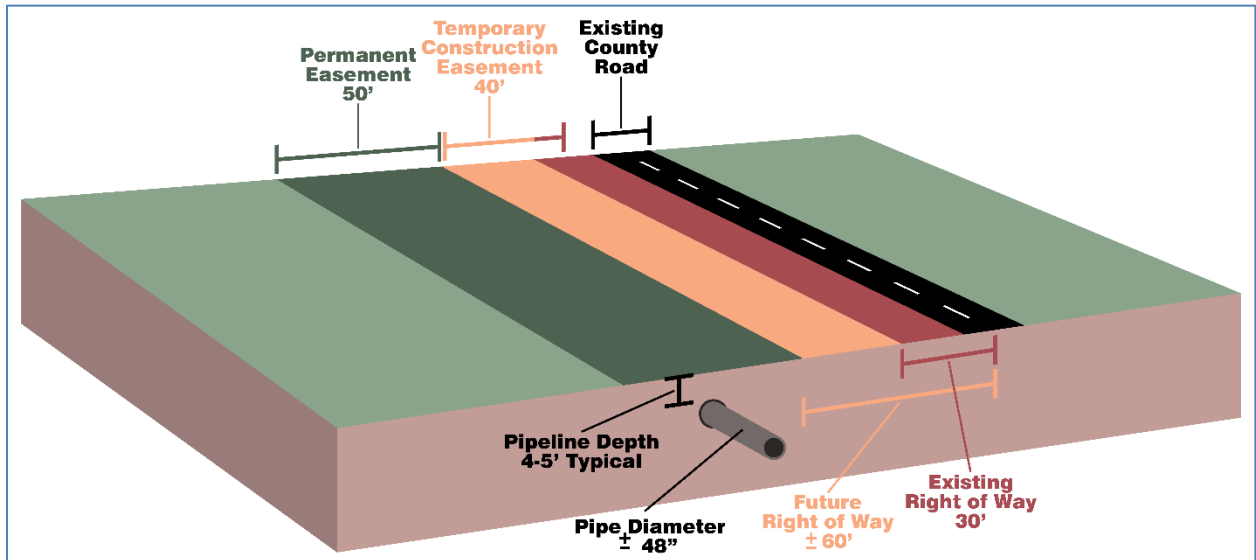


FIGURE ES-2
Typical Easements

Construction Activities

Construction activities in Larimer County are proposed to begin in 2019, and operation of the TWP is scheduled to begin in 2025. Work on multiple construction packages including the water pipeline, trenchless water pipeline, source water pump station, and water tank may occur concurrently with multiple crews of 10 to 55 workers each. At the peak of construction, approximately 80 to 100 workers could be required at multiple sites along the TWP. Construction work hours will typically be from 7 a.m. to 7 p.m. Monday through Saturday unless otherwise approved by Larimer County. Construction may extend beyond these hours on an as-required and case-by-case approved basis. For example, some construction activities, such as hydrostatic testing, require 24/7 operation, and shift work may be required. However, shifts are not anticipated for construction on a day-to-day basis.

The following are major activities involved in construction in typical sequence:

- Traffic control installation
- Survey
- Stormwater best management practice (BMP) and access installation
- Site clearing
- Stage materials/staging area setup
- Excavate the water pipeline trench/bore pit
- Water pipeline installation

- Backfill the trench/bore pit
- Conduct pressure testing
- Clean up
- Restore ground surface
- Road restoration
- Revegetation
- Ongoing stewardship

Figure ES-3 shows typical construction activities within the work limits.

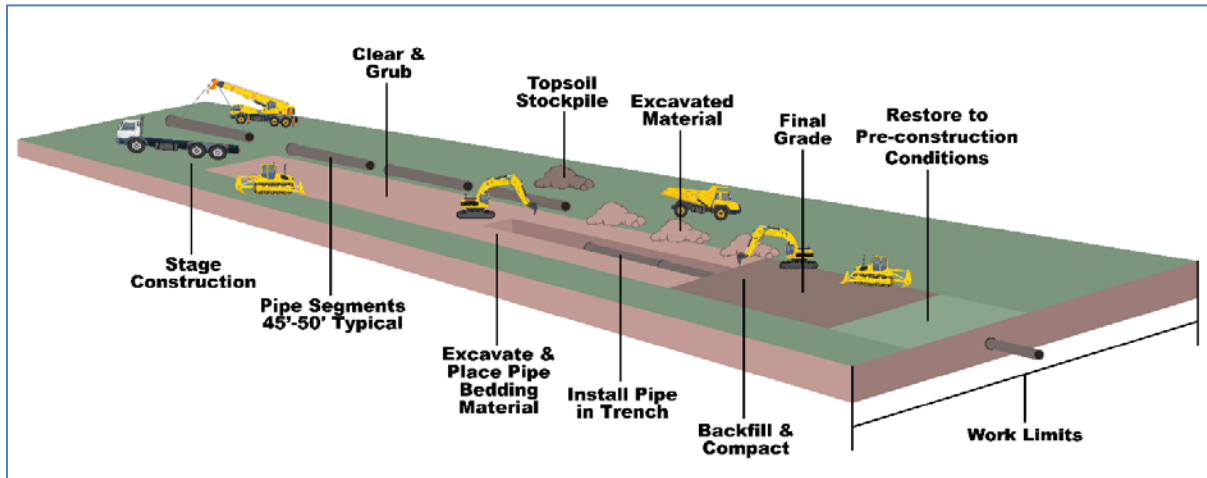


FIGURE ES-3
Construction Activities

Traffic Control Installation

Prior to work in the ROW, traffic control measures will be implemented. Thornton places a high priority on safety during construction. TWP contractors will implement traffic management plans based upon local traffic control requirements and general safe operating practices. Thornton and/or the TWP contractors will develop traffic control plans that include adequate levels of service and safety measures for construction. Proper signage, flaggers, lighting, speed limits, work hours, postings, notifications, and other precautionary safety measures will be taken to protect the residents of Larimer County and the TWP contractors' employees. Access will be maintained to local area residents. Emergency vehicle access needs will be maintained and construction activities coordinated with local fire departments, police departments, ambulance services, and other emergency responders as necessary.

Survey

The water pipeline location will be surveyed and staked to ensure that the water pipeline will be installed as indicated on the contract documents. Work limits will also be surveyed to establish the boundaries that the contractor is allowed to work in. Work limits include the permanent and temporary construction easements and the Larimer County approved ROW.

Stormwater BMP and Access Installation

Surface drainage stormwater BMPs will include application of erosion control techniques and the successful revegetation of disturbed areas. The required Colorado Department of Public Health and Environment (CDPHE) construction stormwater permits and stormwater management plans

(SWMPs) will include detailed descriptions of BMPs that will be used to protect surface hydrology and water quality.

Thornton will obtain access permits from Larimer County or other agencies for any necessary temporary or permanent access locations as applicable. Stabilized construction entrances/exits will be installed for access from existing roads. Access for the water tank will include a permanent gravel access.

Site Clearing

After stormwater BMPs are in place, ground disturbing activities will commence. This includes clearing and grubbing the site. As applicable, pavement and vegetation will be removed from the site and will be properly disposed of. If top soil exists, it will be removed and stockpiled separately away from other excavated material.

Surface disturbance for the TWP will be limited to the ROW, the permanent and temporary easements, and land purchased from individual property owners for the source water pump station and water tank.

Stage Materials/Staging Area Setup

At this time, Thornton anticipates using up to 11 temporary staging areas within unincorporated Larimer County during construction of the TWP. These staging areas are anticipated to each require approximately 2 acres of land. Staging areas will be used for material storage, parking, equipment storage, field offices, and storage of excavated materials. Parking and vehicle storage during construction will be primarily on property within the permanent or temporary easement or at temporary staging areas. Thornton owns multiple properties in the area that can be utilized for parking and staging, and additional temporary staging areas will be obtained as needed.

Thornton plans to off-load and temporarily store the water pipeline along the easement as it is delivered when possible to reduce the number of trips required for material delivery until the water pipeline is placed in its permanent buried location. If needed, stockpiling of pipe could take place within the temporary and permanent easement or at temporary staging areas. Stockpiling in lieu of stringing the water pipeline will only be conducted where additional space is required.

Preliminary anticipated locations in and outside of unincorporated Larimer County are shown on **Figure ES-1**. Some of these areas could be used for stringing water pipeline or as temporary staging areas. Thornton will negotiate with property owners or agencies for the short-term use of temporary staging areas. TWP contractors could negotiate agreements with property owners for additional staging areas if additional area is required for construction operations as determined by TWP contractors.

Excavate the Water Pipeline Trench/Bore Pit

Typically, excavated materials will be stockpiled next to the trench/bore pit. If additional area is required, excavated material could be stored in temporary staging areas.

Water Pipeline Installation

It is anticipated that both open-cut and trenchless construction methods will be used for water pipeline installation. Whether employing open-cut or trenchless construction methods, the installation and construction methods employed will follow standard industry practices designed to produce a safe, environmentally sound, and quality operation.

Trenchless construction methods could include methods such as tunneling or auger boring techniques to install the water pipeline. This means of construction is used to minimize ground disturbance at locations such as road crossings and environmentally sensitive areas including Waters of the United States (WOTUS) (jurisdictional waters), and irrigation ditches. Thornton will consult with affected property owners, Larimer County, and applicable agencies such as the U.S. Army Corps of Engineers (USACE) to determine where trenchless construction methods are needed.

Table ES-1 presents the probable water pipeline installation construction methods that are expected to be utilized at existing features.

TABLE ES-1

Probable Water Pipeline Installation Construction Method at Defined Existing Features

Existing Feature Crossing	Probable Water Pipeline Installation Construction Method
Jurisdictional Waters	Trenchless Construction
Federal Interstates and State Highways	Trenchless Construction
Railroads	Trenchless Construction
Irrigation Ditches	Open-Cut or Trenchless as Required by Ditch Company or Other Requirements
Larimer County Roads	Open-Cut or Trenchless as Required by Larimer County*
Driveways within Property	Open-Cut or Trenchless as Negotiated with Property Owner
Existing Utilities	Open-Cut Construction
Floodplains	Trenchless within Jurisdictional Waters and Open-Cut Outside Jurisdictional Waters

*Where the corridor parallels Douglas Road and County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County, and the water pipeline is anticipated to be installed utilizing open-cut construction methods.

Construction of the water tank and source water pump station are anticipated to be included with one of the water pipeline construction packages.

Backfill the Trench/Bore Pit

After the water pipeline is installed, the trench/bore pit will be backfilled using appropriate backfill materials and compaction techniques, including use of a backhoe and vibration equipment to obtain proper soil compaction.

Conduct Pressure Testing

Hydrostatic pressure testing will be completed to verify that the water pipeline is capable of withstanding the designed maximum allowable operating pressure. It is anticipated that the water pipeline will be tested in sections. Where feasible, hydrostatic test water will be routed from one section of the water pipeline to another to recycle that water.

Clean Up

Clean up of areas disturbed during construction will be conducted prior to final grading and revegetation. Clean up includes removing:

- BMPs not needed for revegetation activities
- Excess materials
- Temporary fencing, if used
- Temporary facilities
- Large stones and other debris

Restore Ground Surface

Land will be restored to pre-construction grades.

Road Restoration

ROW will be restored to pre-construction conditions and in accordance with Larimer County standards or other standards as applicable.

Revegetation

Disturbed areas will be revegetated at the conclusion of construction. Certified weed-free seed mix consisting of drought-tolerant native grasses will be specified in the SWMP for the revegetation of disturbed areas to meet property owner preferences and regulatory requirements. Disturbed mature vegetation will be replaced, per a property owner's reasonable request, with a like species.

Ongoing Stewardship

Surface areas disturbed by construction will be monitored after construction, and Thornton will continue to maintain the site until the area is restored to meet property owner preferences and regulatory requirements.

Timeframe

Construction activities in unincorporated Larimer County are proposed to begin in 2019, and are expected to last approximately 5 to 6 years with operation of the TWP scheduled to begin in 2025. Work on multiple water pipeline construction packages, trenchless water pipeline packages, source water pump station, and water tank may occur concurrently along the TWP corridor. Depending on the size and scope of individual construction packages, the timeframe to complete construction of a package could be multiple years.

Operation and Maintenance Activities

The TWP facilities will be unmanned. Normal operations and maintenance activities could include TWP operators periodically traveling in a pickup truck along the water pipeline route visually inspecting the route. To the extent practicable, visual inspections could be from public roads to minimize impacts to property owners. Up to twice per year, it is anticipated that TWP operators will enter vault and manhole appurtenances to exercise valves and conduct routine maintenance of equipment. TWP operators are also anticipated to conduct up to one visit per day of the source water pump station and water tank locations to inspect security of each facility. Typically, operation of the pump station, including video monitoring of site security will be conducted remotely from another Thornton-owned facility.

Project Description General Specifications

Table ES-2 presents a general overview of typical TWP specifications.

TABLE ES-2
 Typical TWP Specifications

Project Specification	Description
Length of TWP corridor in unincorporated Larimer County	Up to 26 miles
Width of TWP corridor	Approximately 500 feet to 1/4 mile
Water pipeline size	48 inches
Width of permanent easement	50 feet
Width of temporary construction easement	40 feet
Minimum water pipeline depth	4 feet below grade
Minimum fiber optic cable depth	3 feet below grade
Construction period	Approximately 5 to 6 years (2019 through 2025)
Construction activities	Traffic control installation, surveying, stormwater BMP installation, vegetation clearing, staging materials, water pipeline trenching, water pipeline installation, backfilling the water pipeline trench, pressure-testing, cleanup, re-grading the surface to pre-construction contours, road restoration, revegetation, revegetation monitoring, and ongoing stewardship

Land Use

The majority of the TWP corridor within unincorporated Larimer County is located in areas categorized as rural lands and designated as farming and open zoning districts. The water pipeline and fiber optic cable will be buried, and land use effects on agricultural and other similar use will be temporary during construction and are anticipated to be minimal after construction. Agricultural use within the permanent easement can continue after construction. The buried water pipeline and fiber optic cable are compatible with other land uses, such as residential use, that the TWP corridor crosses.

Vegetation provides some indication of land uses. For example, nonnative upland vegetation typically occurs in areas that have been historically disturbed by heavy grazing and hay production. Vegetation types found in the TWP corridor are presented in **Table ES-3**.

TABLE ES-3
 Vegetative Communities within the TWP Corridor

Vegetative Community	Approximate Total Acres in TWP Corridor	Description
Agricultural Lands	1,193	Tilled or managed agricultural lands.
Developed/ Disturbed Areas	808	Have received heavy human use, including buildings and surrounding disturbed areas, livestock concentration areas, roads, trails, and other developed areas.
Nonnative Upland	649	Occurs throughout the TWP corridor in areas that have been historically disturbed by heavy grazing, tilling, and hay production.
Mixed Upland	54	Occurs primarily in historically undisturbed upland areas.
Wetlands	43	Fringes or wide benches along drainages, roadside swales, ponds and lakes, and isolated depressions
Riparian	7	Moist areas along larger tributaries and rivers.

Stakeholder Outreach

Agency Outreach

In an effort to determine the alternative corridor least impactful to local communities in Northern Colorado, Thornton, in 2015, conducted a series of outreach meetings with local governments and agencies that could be impacted by the TWP. During the initial outreach meeting with each local government and agency, feedback was collected to determine preference(s) and/or determine potential problems for the location of the water pipeline within the local government or agency's jurisdictional and/or Growth Management Area boundaries.

Secondary outreach meetings were conducted with local governments and agencies that had incorporated areas or Growth Management Areas overlapping alternative corridor locations to present the three initial alternative corridors. During this second round of outreach, additional feedback was collected from the local governments and agencies and, as a result, a fourth alternative corridor, was developed as the local government's preferred corridor.

Outreach meetings were conducted with the following local governments:

- Berthoud
- Dacono
- Firestone
- Fort Collins
- Frederick
- Greeley
- Johnstown
- Larimer County
- Loveland
- Mead

- Milliken
- Timnath
- Weld County
- Wellington
- Windsor

Thornton has been in discussions with USACE beginning in 2014 to provide information on the TWP to USACE staff. Thornton will continue consulting with USACE and plans to submit a jurisdictional determination request to USACE to determine which areas in the TWP corridor are jurisdictional waters

Additional outreach and coordination activities included:

- Meeting with local major utility providers.
- Meeting with the Colorado Department of Transportation.
- Meeting with Colorado Parks and Wildlife (CPW)
- Meeting with local fire district (Poudre Fire Authority)
- Presenting the TWP at the Energy Industry Working Group (Weld County oil and gas companies) on December 15, 2016.
- Sending letters to initiate coordination activities with local irrigation and ditch companies, utility providers, railroad companies, CPW, U.S. Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), and local fire districts.

Public Outreach

TWP Website, TWP E-mail, and TWP Phone Line

Public outreach is not required by Larimer County's 1041 permit application process. However, to introduce the public and potentially affected property owners to the TWP, the TWP website, TWP e-mail address, and TWP phone line (www.ThorntonWaterProject.com, info@ThorntonWaterProject.com, and 720-977-6700) launched on October 28, 2016. The website, e-mail, and phone line provides opportunities for questions and the collection of input from the public and potentially affected property owners.

Open Houses

Public outreach is not required by Larimer County's 1041 permit application process. However, in order to introduce the public and potentially affected property owners to the TWP, respond to questions, and to collect input from the public and potentially affected property owners, the following Open Houses were held in Larimer and Weld Counties:

- November 14, 2016 at Southwest Weld Services Complex, 4209 Weld County Road 24 ½, Longmont.
- November 16, 2016 at Poudre Valley REA, 7649 REA Parkway, Fort Collins.
- December 6, 2016 at Larimer County Courthouse, 200 West Oak Street, Fort Collins.
- December 8, 2016 at Johnstown Senior Center, 101 Charlotte Street, Johnstown.

A total of 1,272 invitations to the Open Houses were sent to Larimer County and Weld County property owners within the initial proposed corridor and within Larimer and Weld County's major land use permit notification areas. Of the invitations sent, a total of 849 Larimer County property owners within the initial proposed corridor and within 500 feet of the initial proposed corridor were

mailed invitations. Invitations were also sent to local municipality representatives and the home owners' association (HOA) near WSSC Reservoir No. 4. After the first two Open House events, a second invitation was sent to remind invitees that two Open Houses were still forthcoming. One hundred forty-six attendees signed in and provided an address at one or more of the four Open Houses.

Materials presented at the Open Houses included display boards and maps. Open House attendees were given the opportunity to ask TWP representatives specific questions about the TWP and its potential impact to their properties, and to sign up for project updates. Thornton also provided forms for the attendees to submit written comments, and has reviewed each comment provided by the attendees. Attendees were provided the opportunity to sign up for email project updates.

Home Owner Association Outreach

Public outreach is not required by Larimer County's 1041 permit application process. However, Thornton presented TWP information to HOA groups in Larimer County near WSSC Reservoir No. 4 on Monday, February 27, 2017 at the Northside Aztlan Center in Fort Collins, CO. This presentation was requested by area residents, and was attended by Board Members and residents of Eagle Lake HOA, Braidwood HOA, Woody Creek HOA, other local residents that were not affiliated with an HOA, and a representative of Save the Poudre. The HOA groups provided the notification for the meeting, and 47 attendees signed in at this presentation. Thornton also provided forms for the attendees to submit written comments, and has reviewed each comment provided by the attendees. The presentation included information on, population growth estimates for the Front Range, Colorado water needs, Thornton's water system, TWP purpose and need, corridor study activities, projected permitting activities, general water pipeline routing discussions, Thornton owned farms, reservoir water levels, source water pump station construction, and TWP schedule.

Community Update Meeting

Public outreach is not required by Larimer County's 1041 permit application process. However, to introduce the public and potentially affected property owners to the TWP, respond to questions, and to collect input from the public and potentially affected property owners, a Community Update meeting was held in Larimer to present the results of the alternative analysis from the connection to the WSSC system to approximately County Road 9 requested by Larimer County staff. The Community Update meeting was held on September 12, 2017 at the Larimer County Courthouse in Fort Collins.

Nine hundred seven property owners within the Larimer County alternative configuration analysis area were mailed invitations to the Community Update meeting, and an additional 215 people were e-mailed invitations. People who were e-mailed invitations had provided their e-mail addresses for via the TWP website or via comment cards or sign-in sheets from previously held Open Houses. One hundred fifty-three attendees signed in and provided an address at the Community Update meeting.

Materials presented at the Community Update meeting included display boards and maps. Frequently asked questions and land acquisition brochures were available. Thornton also provided forms for the attendees to submit written comments, and has reviewed each comment provided by the attendees. Community Update meeting attendees were given the opportunity to ask TWP representatives specific questions about the TWP and its potential impact to their properties, and to sign up for e-mail project updates.

Thornton presented the results of the alternatives analysis, and Larimer County staff presented information regarding Douglas Road improvements included in the *Larimer County Transportation Master Plan*.

Compliance with 1041 Permit Requirements

Thornton’s Larimer County 1041 permit application fully complies with the LUC requirements for areas and activities of state interest. The Application itemizes and discusses compliance with the review criteria in LUC Section 4.2.2 (Floodplain Overlay Zones), Section 8 (Standards for All Development), Section 14 (Areas and Activities of State Interest), and the *Larimer County Planning Department Procedural Guide for 1041 Permits*.

Table ES-4 presents an evaluation criteria cross-reference guide showing how the Application meets the requirements for the *Larimer County Planning Department Procedural Guide for 1041 Permits* and the LUC.

TABLE ES-4
 Evaluation Criteria Cross Reference Guide

Applicable Land Use Code Requirements	N/A	Section 2 - Project Description												Section 8 - Technical Reports												Appendix													
		1 - Application Form	2.a - General Description, Including Purpose and Need	2.b - Location and Total Area	2.c - Description of the Site Selection Process	2.d - Description of Other Alternatives	2.e - Consistency with Master Plans and Intergovernmental Agreements	2.f - Description of Recent and Present Uses of the Site	2.g - Description of the Site Inventory Maps	2.h - Description of Any Potential Negative Impacts of the Project to Public Health and Safety	2.i - Description of Existing and Proposed Utilities and Facilities	2.j - Projected Development Schedule	2.k - Description of Public Input Process	2.l - Additional Explanation	3 - Vicinity Maps	4 - Site Inventory Maps	5 - 1041 Permit Site Map(s)	6 - Reduced 1041 Site Permit Map(s)	7 - Legal Description	8.a - Wetland Mitigation Plan	8.b - Wildlife Conservation Plan	8.c - Natural Hazard Mitigation Plan	8.d - Traffic Impact Study	8.e - Drainage and Erosion Control Report and Plan	8.f - Floodplain Hydraulic/Hydrologic Modeling Report	8.g - Groundwater Modeling Report	8.h Non-Subdivision Water Inquiry	8.k - Noise Analysis	8.l - Air Quality Impact and Mitigation Report	9 - Adjacent Property Owners List	10 - Application Fee	11 - Signed Pre-Application Conference Form and Submittal Checklist	12 - Other	Appendix A - Alternative Analysis	Appendix B - Public Outreach Information	Appendix C - Natural and Cultural Resources Report	Appendix D - Best Management	Appendix E - Stakeholder Outreach	
Larimer County Procedural Guide for 1041 Permits, Submittal Requirements for 1041 Permits		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
Section 4.0 - Zoning																																							
4.2.2 – Floodplain Overlay Zones						√																	√																
Section 8.0 - Standards for All Development																																							
8.1 - Adequate Public Facilities						√			√													√	√			√													
8.2 - Wetland Areas						√												√						√												√			
8.3 - Hazard Area						√														√																			
8.4 - Wildlife						√														√																√			
8.5 - Landscaping						√																																	
8.6 - Private Local Access Road and Parking Standards	√																																						
8.7 - Road Surfacing Requirements	√																																						
8.8 - Irrigation Facilities						√																																√	
8.9 - Reserved	√																																						
8.10 - None	√																																						
8.11 - Air Quality Standards						√																						√											
8.12 - Water Quality Management Standards						√		√															√		√												√		
8.13 - Commercial Mineral Deposits	√																																						

TABLE ES-4
 Evaluation Criteria Cross Reference Guide

Applicable Land Use Code Requirements	N/A	Section 2 - Project Description												Section 8 - Technical Reports											Appendix														
		1 - Application Form	2.a - General Description, Including Purpose and Need	2.b - Location and Total Area	2.c - Description of the Site Selection Process	2.d - Description of Other Alternatives	2.e - Consistency with Master Plans and Intergovernmental Agreements	2.f - Description of Recent and Present Uses of the Site	2.g - Description of the Site Inventory Maps	2.h - Description of Any Potential Negative Impacts of the Project to Public Health and Safety	2.i - Description of Existing and Proposed Utilities and Facilities	2.j - Projected Development Schedule	2.k - Description of Public Input Process	2.l - Additional Explanation	3 - Vicinity Maps	4 - Site Inventory Maps	5 - 1041 Permit Site Map(s)	6 - Reduced 1041 Site Permit Map(s)	7 - Legal Description	8.a - Wetland Mitigation Plan	8.b - Wildlife Conservation Plan	8.c - Natural Hazard Mitigation Plan	8.d - Traffic Impact Study	8.e - Drainage and Erosion Control Report and Plan	8.f - Floodplain Hydraulic/Hydrologic Modeling Report	8.g - Groundwater Modeling Report	8.h Non-Subdivision Water Inquiry	8.k - Noise Analysis	8.l - Air Quality Impact and Mitigation Report	9 - Adjacent Property Owners List	10 - Application Fee	11 - Signed Pre-Application Conference Form and Submittal Checklist	12 - Other	Appendix A - Alternative Analysis	Appendix B - Public Outreach Information	Appendix C - Natural and Cultural Resources Report	Appendix D - Best Management	Appendix E - Stakeholder Outreach	
8.14 - Development Design for Land Division	√																																						
8.15 - Lighting			√			√			√																														
8.16 - Fences			√						√																														
8.17 - Hazardous Waste Treatment and Disposal	√																																						
8.18 - Large Retail Development	√																																						
Section 12.0 Common Procedures for Development Review																																							
12.1 Application Materials Requirements																																							
12.1.A Application Form		√																																					
12.1.B Project Description/Consistency with Master Plan			√			√																																	
12.1.C Application Fee																													√										
12.1.D Property Taxes	√																																						
Section 14.0 - Areas and Activities of State Interest																																							
14.10.D Review criteria for approval of all 1041 permits:																																							
14.10.D.1 - The proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development.						√																																	

TABLE ES-4
 Evaluation Criteria Cross Reference Guide

Applicable Land Use Code Requirements	N/A	Section 2 - Project Description											Section 8 - Technical Reports											Appendix															
		1 - Application Form	2.a - General Description, Including Purpose and Need	2.b - Location and Total Area	2.c - Description of the Site Selection Process	2.d - Description of Other Alternatives	2.e - Consistency with Master Plans and Intergovernmental Agreements	2.f - Description of Recent and Present Uses of the Site	2.g - Description of the Site Inventory Maps	2.h - Description of Any Potential Negative Impacts of the Project to Public Health and Safety	2.i - Description of Existing and Proposed Utilities and Facilities	2.j - Projected Development Schedule	2.k - Description of Public Input Process	2.l - Additional Explanation	3 - Vicinity Maps	4 - Site Inventory Maps	5 - 1041 Permit Site Map(s)	6 - Reduced 1041 Site Permit Map(s)	7 - Legal Description	8.a - Wetland Mitigation Plan	8.b - Wildlife Conservation Plan	8.c - Natural Hazard Mitigation Plan	8.d - Traffic Impact Study	8.e - Drainage and Erosion Control Report and Plan	8.f - Floodplain Hydraulic/Hydrologic Modeling Report	8.g - Groundwater Modeling Report	8.h Non-Subdivision Water Inquiry	8.k - Noise Analysis	8.l - Air Quality Impact and Mitigation Report	9 - Adjacent Property Owners List	10 - Application Fee	11 - Signed Pre-Application Conference Form and Submittal Checklist	12 - Other	Appendix A - Alternative Analysis	Appendix B - Public Outreach Information	Appendix C - Natural and Cultural Resources Report	Appendix D - Best Management	Appendix E - Stakeholder Outreach	
14.10.D.6 - The proposal will not negatively impact public health and safety.						√		√												√	√	√	√			√	√												
14.10.D.7 - The proposal will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards.						√														√			√																
14.10.D.8 - Adequate public facilities and services are available for the proposal or will be provided by the applicant, and the proposal will not have a significant adverse effect on the capability of local government to provide services or exceed the capacity of service delivery systems.						√				√												√	√			√													
14.10.D.9 - The applicant will mitigate any construction impacts to county roads, bridges and related facilities. Construction access will be re-graded and re-vegetated to minimize environmental impacts.						√																																	

TABLE ES-4
 Evaluation Criteria Cross Reference Guide

Applicable Land Use Code Requirements	N/A	Section 2 - Project Description													Section 8 - Technical Reports											Appendix												
		1 - Application Form	2.a - General Description, Including Purpose and Need	2.b - Location and Total Area	2.c - Description of the Site Selection Process	2.d - Description of Other Alternatives	2.e - Consistency with Master Plans and Intergovernmental Agreements	2.f - Description of Recent and Present Uses of the Site	2.g - Description of the Site Inventory Maps	2.h - Description of Any Potential Negative Impacts of the Project to Public Health and Safety	2.i - Description of Existing and Proposed Utilities and Facilities	2.j - Projected Development Schedule	2.k - Description of Public Input Process	2.l - Additional Explanation	3 - Vicinity Maps	4 - Site Inventory Maps	5 - 1041 Permit Site Map(s)	6 - Reduced 1041 Site Permit Map(s)	7 - Legal Description	8.a - Wetland Mitigation Plan	8.b - Wildlife Conservation Plan	8.c - Natural Hazard Mitigation Plan	8.d - Traffic Impact Study	8.e - Drainage and Erosion Control Report and Plan	8.f - Floodplain Hydraulic/Hydrologic Modeling Report	8.g - Groundwater Modeling Report	8.h Non-Subdivision Water Inquiry	8.k - Noise Analysis	8.l - Air Quality Impact and Mitigation Report	9 - Adjacent Property Owners List	10 - Application Fee	11 - Signed Pre-Application Conference Form and Submittal Checklist	12 - Other	Appendix A - Alternative Analysis	Appendix B - Public Outreach Information	Appendix C - Natural and Cultural Resources Report	Appendix D - Best Management	Appendix E - Stakeholder Outreach
14.10.D.10 - The benefits of the proposed development outweigh the losses of any natural resources or reduction of productivity of agricultural lands as a result of the proposed development.						√	√											√	√																			
14.10.D.11 - The proposal demonstrates a reasonable balance between the costs to the applicant to mitigate significant adverse affects and the benefits achieved by such mitigation.						√		√										√	√	√	√	√	√	√	√	√	√	√							√	√		
14.10.D.12 - The recommendations of staff and referral agencies have been addressed to the satisfaction of the county commissioners.	√																																					

Technical Reports

As indicated in the *Larimer County Planning Department Procedural Guide for 1041 Permits*, a number of reports and plans are required to be submitted with Larimer County's 1041 permit application. The reports and plans required to be submitted with Thornton's Application as discussed during the Pre-Application Conference are summarized below:

Wetland Mitigation Plan

Thornton retained ERO Resources, Inc. (ERO) to provide a natural and cultural resources assessment for the TWP. ERO assessed the TWP corridor plus an additional study buffer at most locations on either side of the TWP corridor for potential isolated wetlands, jurisdictional wetlands, and other WOTUS. Additional study buffer was not evaluated in areas where environmental impacts are expected to be minor, that is, where the water pipeline is proposed to be located in the Larimer County Douglas Road ROW or on Thornton-owned property near Douglas Road where ground-disturbing activities already take place. Where incorporated, the study buffer included an additional 500-feet on either side of the TWP corridor and additional 1,200 feet around the TWP corridor at the source water pump station and water tank sites. Boundaries of wetlands and open water areas were defined based on 2016 and 2017 site visits, National Wetland Inventory (NWI) mapping, U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) mapping, and 2015 and 2016 aerial photographs. The determination on whether a wetland or open water area is a potential WOTUS was based on reviewing NHD mapping to determine if the area has a possible connection to any known WOTUS.

Twelve potential wetlands (43.38 acres) and 33 potential other WOTUS (90.50 acres) were mapped within the TWP corridor in Larimer County.

Thornton is proposing to use trenchless construction methods to cross jurisdictional WOTUS including wetlands. This construction method will eliminate surface disturbance to the waterbody and effects on water quality. Based on this approach, it is anticipated that the TWP would not require any federal approvals such as a Clean Water Act 404 permit. Thornton plans to submit a jurisdictional determination request to USACE to determine which areas in the TWP corridor are jurisdictional WOTUS.

Open waters and wetlands determined to be nonjurisdictional and riparian areas will be temporarily impacted by trenching activities. During construction, the trench will be as narrow as safely practicable when crossing nonjurisdictional waters and wetlands or any riparian areas. Temporary impacts will be restored to pre-construction conditions following completion of the proposed activities.

BMPs will be implemented during construction, which will help minimize or eliminate impacts within the TWP corridor and study buffer. These BMPs include installing temporary fencing to deter access to sensitive areas outside the TWP corridor limits, placing staging areas in previously disturbed upland areas, and installing sediment and erosion control devices to minimize surface runoff in disturbed areas. Temporarily disturbed areas will be restored to pre-construction grades, planted with native seed mixes or as specified by property owner, and mulched.

Wildlife Conservation Plan

Thornton retained ERO to provide a natural and cultural resources assessment for the TWP. ERO assessed the TWP corridor plus an additional study buffer at most locations on either side of the

TWP corridor for terrestrial and aquatic animals and habitat. Additional study buffer was not evaluated in areas where environmental impacts are expected to be minor, that is, where the water pipeline is proposed to be located in the Larimer County Douglas Road ROW or on Thornton-owned property near Douglas Road where ground-disturbing activities already take place. Where incorporated, the study buffer included an additional 500 feet on either side of the TWP corridor and an additional 1,200 feet around the TWP corridor at the source water pump station and water tank sites. Information was obtained from various sources including CPW, Colorado Natural Diversity Information System (CNDIS), Colorado Natural Heritage Program (CNHP), USFWS, published literature, and field surveys. Site visits to the TWP corridor and study buffer, where accessible, were conducted in 2016 and 2017 to assess potential wildlife habitat, potential habitat for federally threatened, endangered, and candidate species protected under the Endangered Species Act (ESA).

Federal Threatened, Endangered, and Candidate Animal Species

No impacts are anticipated on federally threatened, endangered, and candidate species protected under the ESA or their habitat. The Preble's meadow jumping mouse (Preble's) is listed as a federally and state threatened species. No impacts on Preble's or its habitat are anticipated to occur from the TWP and none of the drainages that occur within the TWP corridor and study buffer have been identified by the USFWS as area essential to the recovery of Preble's. Field reviews indicate the section of the Big Thompson River where the TWP corridor and study buffer cross provides low-quality Preble's habitat, with limited shrub cover and heavy human disturbance present. Use of trenchless construction methods in areas with suitable Preble's habitat will eliminate impacts on Preble's habitat. A site assessment will be completed to determine the boundaries of potential or suitable habitat for Preble's to confirm which construction methods should be implemented in those areas. A habitat assessment will be submitted to the USFWS when the final water pipeline alignment has been determined to confirm the boundaries of potential habitat identified within the alignment and to confirm that the TWP will have no effect on Preble's or its habitat.

State Animal Species of Concern

The TWP corridor and study buffer were assessed for potential habitat for Colorado threatened, endangered, and species of special concern, as well as species that have been described as rare, vulnerable, or imperiled in the state by the CNHP. The TWP corridor contains suitable or potentially suitable habitat for several state-listed and sensitive wildlife species as presented in **Table ES-5**. The table presents state animal species of concern potentially found in the TWP corridor and study buffer or with potential to be affected by the TWP.

TABLE ES-5
 Suitable or Potential Habitat for State Animal Species

Common Name	State Status ¹	CNHP Rank ²	Suitable Habitat Present	Impact
Amphibians and Reptiles				
Common garter snake	SC	NI	Yes – tributaries to the South Platte River in the TWP corridor and study buffer	The trenchless construction methods proposed to eliminate impacts on wetlands and waters will minimize long-term adverse impacts; therefore, the TWP would not likely adversely affect the overall populations.
Northern leopard frog	SC	G5, S3	Yes – wetlands and streams in the TWP corridor and study buffer	
Mammals				
Black-tailed prairie dog	SC	G4, S3	Yes – active prairie dog colonies observed in the TWP corridor and study buffer	Mitigation methods such as minimizing limits of construction disturbance, passive dispersal during construction, or trenchless construction methods will minimize long-term adverse impacts on these species and their habitat; therefore, the TWP will not likely adversely affect the overall populations.
River otter	ST	—	Yes – north end of the TWP corridor and study buffer cross known species' range	
Swift fox	SC	G3, S3	Yes – marginally suitable habitat in TWP corridor and study buffer, but no dens observed	
Birds				
Bald eagle	SC	G5, S1/3	Yes – suitable nesting habitat in the TWP corridor and study buffer; winter roosts and potential foraging areas in the TWP corridor and study buffer	These birds are federally protected under the Migratory Bird Treaty Act (MBTA) and the bald eagle is also protected the Bald and Golden Eagle Protection Act. Mitigation methods such as seasonal restrictions and buffers, clearance surveys, minimizing limits of construction disturbance, passive dispersal during construction, and trenchless construction methods will minimize long-term adverse impacts on these species and their habitat; therefore, the TWP will not likely adversely affect the overall populations.
Black-necked stilt	—	G5, S3	Yes – suitable habitat in the TWP corridor and study buffer	
Burrowing owl	ST	G4, S4	Yes – prairie dog burrows located in the TWP corridor and study buffer	
Ferruginous hawk	SC	G4, S3/4	Yes – nests in Weld County, may winter along entire TWP corridor and study buffer	
Long-billed curlew	SC	G5, S2	Potentially – known to breed in Weld and Adams Counties	
Peregrine falcon	SC	G4, S2	Yes – winter/ migration in the TWP corridor and study buffer; no suitable breeding habitat	
Fish				
Brassy minnow	ST	G5, S3	Potentially – known to occur in St. Vrain Creek, Poudre River, and South Platte River	The trenchless construction methods proposed to eliminate impacts to open water will

TABLE ES-5
 Suitable or Potential Habitat for State Animal Species

Common Name	State Status ¹	CNHP Rank ²	Suitable Habitat Present	Impact
Common shiner	ST	G5, S2	Potentially – known to occur in cool transitional zone streams in the South Platte River Basin	minimize long-term adverse impacts; therefore, the TWP will not likely adversely affect the overall populations.
Iowa darter	SC	G5, S3	Potentially – known to occur in St. Vrain Creek, Big Thompson River, and Poudre River	
Stonecat	SC	G5, S1	Potentially – St. Vrain Creek near Longmont	
Suckermouth minnow	SE	G5, S2	Potentially – known to occur in St. Vrain Creek	

¹SE = State Endangered Species; ST = State Threatened Species; SC = State Species of Concern.

²CNHP Ranking: G1 = Critically imperiled globally, G2 = Imperiled globally, G3 = Vulnerable throughout its range, G4 = Apparently secure globally, G5 = Demonstrably secure globally, S1 = Critically imperiled in state, S2 = Imperiled in state, S3 = Vulnerable in state, S4 = Apparently secure in state, NI = No information. *Source:* Colorado Division of Wildlife (CDOW) 2006; Colorado Natural Diversity Information Source (CNDIS) 2016; CNHP 2016; CPW 2016a, 2016b; Woodling 1985.

Raptor and Other Migratory Birds

Raptors are protected under the Migratory Bird Treaty Act (MBTA). Several active nests of raptors, red-tailed hawks and a great horned owl are located in or near the TWP corridor and study buffer based on 2016 and 2017 site visits and from a CPW database. No migratory bird nests were observed during the site visit; however, suitable nesting habitat is present throughout the TWP corridor and study buffer. Physical disturbance, displacement, and clearing of habitats could affect the birds during construction. Impacts will be temporary, and many habitats are anticipated to recover quickly following construction. Thornton will review the CPW raptor nest data and perform nest surveys for raptors before the nesting season to identify potential active raptor nests before construction. Thornton will coordinate with CPW regarding any potential conflicts between scheduled construction and potential raptor nests, and develop measures acceptable to CPW to minimize impacts on nesting raptors.

Big Game and Large Mammals

American pronghorn, black bear, mountain lion, mule deer, and white-tailed deer are the big game species with potential habitat in or near the TWP corridor and study buffer. Although these animals could wander in or near the TWP corridor and study buffer, it is unlikely the TWP will impact big game and large mammals.

Other Game and Nongame Species

Areas within the proposed TWP corridor and study buffer provide potential habitat for other common Front Range plains animals, amphibians, and reptiles. The TWP could displace some individuals during construction, but would not have a significant long-term negative impact on these animals because these species are common and widespread throughout Larimer, Weld, and Adams Counties.

Aquatic Species and Habitat

Several perennial, intermittent, and ephemeral streams, lakes and ponds, wetlands, ditches, and canals occur within the TWP corridor and study buffer. These water bodies provide habitat for aquatic invertebrates that play an important role in the food chain to support larger species including mammals and birds. Many of these areas will not be impacted because jurisdictional waters and wetlands will be crossed using trenchless construction methods. Impacts on aquatic habitat will be temporary, and no long-term effect on aquatic species or aquatic habitat are anticipated.

Federal Threatened, Endangered, and Candidate Plant Species

The Colorado butterfly plant and ute ladies'-tresses orchid, both federally listed as threatened, were observed during 2016 site visits as having potential habitat within drainage crossings in the TWP corridor and study buffer. Trenchless construction methods proposed to eliminate impacts to drainage ways and/or areas that contain potential habitat will mitigate impacts on these plant species. A habitat assessment will be submitted to the USFWS before construction to confirm the proposed TWP will have no effect.

No impacts on rare or imperiled plant species will occur from the TWP because suitable habitat is not present in the TWP corridor and study buffer.

Natural Hazard Mitigation Plan

Wildfire Hazards

Based on Larimer County GIS data downloaded in August 2016 from Larimer County's GIS Digital Data, the TWP corridor is located outside of designated wildfire hazard areas. With the exception of the source water pump station and water tank, the majority of the TWP is underground including the water pipeline and underground appurtenances that would not be susceptible to wildfires.

Geologic Hazards

Based on Larimer County GIS data downloaded August 2016 from Larimer County's GIS Digital Data, the majority of the TWP corridor is located in a low geologic hazard category. The TWP corridor crosses a Moderate Class 3 and 4 geologic hazard area generally described as marshy with wetlands and sandy soils with increased sloughing. Mitigation measures will be implemented in areas outside of any jurisdictional waters. Jurisdictional waters will be crossed using trenchless construction methods.

The TWP corridor crosses several locations defined as Severe Class 5, 6, and 7 geologic hazard areas. These locations are associated with major drainages and generally correspond to areas of greater slope and soil erodibility. These geologic hazard areas could be mitigated by implementing measures similar to those described for Moderate Class 3 and 4 areas depending on specific conditions at each location. Jurisdictional waters will be crossed using trenchless construction methods.

A subsurface geotechnical investigation of geologic conditions utilizing soil borings will be completed during design to further determine the subsurface soil conditions and associated geological hazards along the TWP corridor. Mitigation measures will be further refined during design to meet site-specific geological hazards.

Traffic Impact Study

Impacts caused by construction equipment and activity on Larimer County roads will be short term during construction. Access will be maintained to local area residents. Emergency vehicle access needs will be maintained and construction activities coordinated with local fire departments, police departments, ambulance services, and other emergency responders as necessary. Thornton places a high priority on safety during construction. TWP contractors will implement traffic management plans based upon local traffic control requirements and general safe operating practices. Proper signage, flaggers, lighting, speed limits, work hours, postings, notifications, and other precautionary safety measures will be taken to protect the residents of Larimer County and contractor's employees.

Thornton understands that if the water pipeline is required to be located parallel to and within Larimer County ROW other than as specifically approved in a 1041 permit, then use of that ROW will require Larimer County approval.

The TWP was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*, adopted in July 2017. The *Larimer County Transportation Master Plan* identifies multiple road improvement projects within the area along the TWP corridor. Thornton will coordinate design efforts with Larimer County improvement projects to minimize conflicts with future plans. If Larimer County's improvement projects occur within the timeframe of the construction of the TWP, Thornton will work with Larimer County and other involved parties to coordinate construction and minimize disruption. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road within the TWP corridor. To the extent feasible, Thornton will coordinate TWP construction activities with Larimer County's planned improvements for Douglas Road. The TWP construction will utilize trenchless construction methods to cross Larimer County roads where required by Larimer County, resulting in little to no disruption to traffic at those crossing locations. Where the corridor parallels Douglas Road and County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County and the water pipeline is anticipated to be installed utilizing open-cut construction methods.

Trip Generation

Trip generation will be primarily related to construction activities, including delivery of materials and equipment, worker transport, and water pipeline installation.

On average, five to ten trips per day to the site are expected for each type of vehicle: pickup trucks, welding trucks, pipe/material hauling trucks, water trucks, and equipment transport trucks for each construction package.

Post-construction trip generation will be primarily related to the operation and maintenance of the water pipeline, source water pump station, and water tank facility. Normal operations and maintenance activities could include TWP operators periodically traveling in a pickup truck to the source water pump station or water tank location, and along the water pipeline route for a visual inspection. To the extent practicable, visual inspections could be from public roads to minimize impacts to property owners.

Project Access

Access along the water pipeline alignment will be along roadways, at existing access locations when practicable, or via properties owned by Thornton that are within the construction work limits. New access locations are anticipated to be required for temporary and permanent use. Thornton will

obtain individual Larimer County, Colorado Department of Transportation, and other municipal access permits for any necessary temporary and permanent access locations as applicable. Temporary and permanent access locations will be closed to the public. Additionally, gates or other approved barriers on temporary access roads may be utilized when construction workers are not present to control unauthorized access. Temporary access locations will be restored to pre-construction conditions upon the completion of construction.

It is anticipated that access to the water pipeline alignment will be required along Interstate 25 frontage roads, Douglas Road, County Road 56, and County Road 1. Other potential access locations, depending on the water pipeline alignment, could be required along other local roads. Starlite Drive could provide access for construction vehicles during construction of the water pipeline, connection to WSSC Reservoir No. 4, and for future maintenance as necessary. Starlite Drive is a private gravel road and, if used, use of this road will be negotiated with the property owner.

Access to the water tank location will be along County Road 1. A new permanent gravel access will be built onto the parcel from County Road 1. This access will serve as the access for vehicles during construction as well as future maintenance. Future access requirements will be minimal as the water tank is anticipated to be unmanned with limited maintenance requirements.

Road Crossings

Unless required otherwise by Larimer County, water pipeline road crossings in unincorporated Larimer County will be constructed using open-cut construction. Road closures with detour routes or partial road closures could be required. Larimer County standards will be followed, and permits will be obtained for any required closures. The ROW will be restored to pre-construction conditions and in accordance with Larimer County standards.

Railroad Crossings

Railroad crossings for water pipeline construction will be coordinated with the applicable railroad operator and required license agreements will be obtained from the appropriate railroad company.

Possible Delivery, Commuting Routes, and Material Storage

Material delivery and construction worker transit could occur along a variety of defined routes depending on the water pipeline alignment; however, it is not expected that any road improvements or closures would be required on any of the possible routes to facilitate the transport of materials. Thornton will avoid parking in public ROW and will instead utilize parking on Thornton-owned property, parking on property within permanent or temporary easement areas, and parking in areas that have been negotiated with property owners and commercial businesses.

The water pipeline and other materials are expected to be transported via truck haul routes to the temporary and permanent easement or temporary staging areas. When possible, Thornton plans to off-load and string water pipeline along the easements as it is delivered to reduce the number of trips required for material delivery. Thornton will comply with Larimer County regulations regarding material storage, transport, and land use.

Construction Traffic Mitigation Measures

Access will be maintained to local area residents. Impacts to community services will be mitigated by coordinating with Poudre School District and Weld RE-4 School district to minimize conflicts with school bus routes. Thornton will coordinate with local fire departments, police departments, and other emergency responders to maintain emergency vehicle access. Disturbances from construction traffic to the surrounding soil can be mitigated with water application to control dust and stabilized

construction entrances/exits will be installed to mitigate soil transfer onto county roads and state highways.

Drainage and Erosion Control Report and Plan

The TWP corridor within unincorporated Larimer County spans four 10-digit hydrologic unit code (HUC) watersheds. HUC watersheds along the TWP corridor are delineated based on the following basins:

- Horsetooth Reservoir-Cache la Poudre River Basin
- Boxelder Creek Basin
- City of Greeley-Cache la Poudre River basin
- Outlet Big Thompson River Basin

The TWP corridor will be restored to pre-construction topography and vegetation conditions following construction. The water pipeline crossing of jurisdictional waters, including wetlands, will be constructed using trenchless construction methods. Irrigation ditches will be crossed using trenchless construction methods as required by ditch owner. Existing ditches, streams, and natural drainages will be preserved, and no permanent effects on area drainage are anticipated.

Construction Water Quality Management

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity – General (Construction Stormwater Discharge) Permits from the CDPHE. SWMPs will be developed under the general permit to protect the quality of stormwater runoff during construction in accordance with the Construction Stormwater Discharge Permit requirements.

Post-Construction Stormwater Runoff

The TWP corridor will be restored to pre-construction topography and vegetation conditions following construction. To mitigate impacts caused by erosion, landscaping for the TWP will consist of vegetation restoration and maintenance of areas disturbed by the TWP. Effects to vegetation along the work areas will be temporary and mostly associated with construction. Any vegetated areas disturbed during maintenance or any required repairs will be restored by the methods used during construction.

Floodplain Hydraulic/Hydrologic Modeling Report

The TWP corridor in Larimer County crosses the following designated 100-year floodplains:

- Box Elder Creek
- Cache la Poudre River
- Big Thompson River

The TWP will not alter floodplains. The TWP will utilize trenchless construction methods under jurisdictional waters, including streams, rivers, lakes, and wetland areas, and work conducted within the floodplain fringe areas using open-cut construction will be restored to pre-construction grades and vegetation at the conclusion of construction. Therefore, the TWP will have no impact on the hydraulics and hydrology of the floodplain.

Groundwater Modeling Report

The TWP corridor is located within the South Platte River Basin. The major aquifers in the South Platte River Basin are alluvial aquifers associated with the South Platte River and its tributaries. The TWP corridor crosses through the Upper South Platte River Alluvium, which is specifically associated with the Cache la Poudre River.

In general, along the Interstate 25 corridor, which includes the TWP corridor, from Wellington south near Windsor, and along Interstate 25 near Loveland, groundwater is anticipated to be less than approximately 20 feet below ground surface. Along the other stretches of the TWP corridor, groundwater is generally expected to be found at depths greater than 20 feet below ground surface, although higher groundwater levels may exist near surface water sources. The typical depth of bury for the water pipeline will be a minimum of 4 feet below grade. During the design phase, the depth to groundwater along the TWP corridor will be further identified and monitored through geotechnical investigations.

Mitigation measures could be implemented to minimize impacts to ground water and could consists of trench plugs, impervious water pipeline trench backfill material, compacting backfill material and soil disturbed during trenching, installing porous backfill material, and dewatering. Before construction, a General Permit for Construction Dewatering Activities would be acquired from CDPHE.

Non-Subdivision Water Supply Inquiry

As discussed during the Pre-Application Conference, the TWP facilities will be unmanned facilities and no permanent potable water source is anticipated to be needed; therefore, submission of a Non-Subdivision Water Supply Inquiry is not required.

Simulation of the Appearance of the Facility

As discussed during the Pre-Application Conference, a Simulation of the Appearance of the Facility is not required. The water pipeline and most appurtenant infrastructure will be buried.

Computer-Modeled Electromagnetic Field Measurements

As discussed during the Pre-Application Conference, submission of a Computer Modeled Electromagnetic Field Measurement is not required.

Noise Analysis

During construction of the TWP, the TWP will comply with Larimer County's then-existing Noise Level Ordinance (currently Ordinance No. 97-03). Noise from construction equipment will be of short duration during construction. Noise levels from equipment will be controlled through the use of standard maintenance procedures and the use of appropriate mufflers, and construction activities will be limited to the hours between 7:00 a.m. and 7:00 p.m., Monday through Saturday to the extent practicable. If necessary and as approved by Larimer County to complete uninterrupted tasks, meet an in-service date, or minimize short-term impacts to traffic, construction may occur on Sundays and other hours outside of the hours of 7:00 a.m. to 7:00 p.m. After construction activities are complete, no noises related to the water pipeline and water tank are anticipated.

Air Quality Impact and Mitigation Report

Thornton and/or the TWP contractors will develop a fugitive dust control plan, submit an air pollution emissions notice, and obtain a permit from CDPHE before construction activities begin in accordance with state air quality regulations.

Construction activities, such as vehicles driven over cleared ground, general disturbance to vegetated areas, or soil stockpiles susceptible to winds, can cause fugitive dust. During construction, dust control measures will be implemented. Examples of mitigation measure that may be used on the TWP include:

- Speed limits for construction vehicles within the work area
- Water application to disturbed areas, dirt access roads, and stockpiles
- Erosion control techniques and best management practices
- Revegetation of disturbed areas following construction activities

Water will be used as needed for dust suppression during construction. Water sources would be nearby fire hydrants, water pipelines, and water trucks. Water will be purchased from local water providers for construction activities.

Additional Information

Cultural Resources

ERO conducted a file search and literature review of the TWP corridor and study buffer with the Office of Archaeology and Historic Preservation (OAHP). The Class I review indicates that there are no cultural sites and structures that are listed on the State and National Register of Historic places within the TWP corridor within unincorporated Larimer County.

Noxious Weed Management

Several noxious weed species were observed in the TWP corridor and study buffer during 2016 site visits, including cheatgrass, curly dock, diffuse knapweed, field bindweed, and Russian olive. Noxious weeds within the TWP construction limits will be controlled using the Integrated Pest Management (IPM) methods as prescribed by the Colorado Department of Agriculture (CDOA).

Thornton will revegetate with certified weed-free seed mix for post-construction vegetation.