Thornton Water Project
Larimer County
1041 Permit Application
Supplement 3
Volume 1 of 2

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

Date: December 10, 2018

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

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

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Acronyms and Abbreviations

ADT	Average Daily Traffic
ARDEC	Agricultural Research, Development, and Education Center
BMP	Best Management Practice
BNSF	Burlington Northern and Santa Fe Railway
C-BT	Colorado-Big Thompson
CCR	Code of Colorado Regulations
CDOA	Colorado Department of Agriculture
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CFR	Code of Federal Regulations
CIA	Community Influence Area
CNDIS	Colorado Natural Diversity Information System
CNHP	Colorado Natural Heritage Program
CORA	Colorado Open Records Act
CPA	Cooperative Planning Act
CPW	Colorado Parks and Wildlife
CSU	Colorado State University
CWCWD	Central Weld County Water District
DRCOG	Denver Regional Council of Governments
DWR	Colorado Division of Water Resources
ELCO	East Larimer County Water District
ERO	ERO Resources, Inc.
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FM	Floodway
FRICO	Farmers Reservoir and Irrigation Company
GIS	Geographic Information System

GM	Growth Management
GMA	Growth Management Area
HOA	Home Owners' Association
HUC	Hydrologic Unit Code
HVAC	Heating, Ventilation, and Air Conditioning
IGA	Intergovernmental Agreement
IPM	Integrated Pest Management
LCR	Larimer County Road
LU	Land Use
LUC	Larimer County Land Use Code
MBTA	Migratory Bird Treaty Act
Min	Minimum
mgd	million gallons per day
MS4	Municipal Separate Storm Sewer System
MOU	Memorandum of Understanding
NAIP	National Agricultural Imagery Program
NHD	National Hydrography Dataset
NISP	Northern Integrated Supply Project
Northern Water	Northern Colorado Water Conservancy District
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWCWD	North Weld County Water District
NWI	National Wetland Inventory
OAHP	Office of Archeology and Historic Preservation
Preble's	Preble's Meadow Jumping Mouse
Project	Thornton Water Project
PSCo	Public Service Company of Colorado
PVREA	Poudre Valley Rural Electrical Association
RT^2	Regional Transmission and Treatment Feasibility Study
ROW	Right-of-Way
SCS	Soil Conservation Service
SDS	Safety Data Sheet

SHPO	State Historic Preservation Officer
SWMP	Stormwater Management Plan
Thornton	City of Thornton
TWP	Thornton Water Project
Typ	Typical
UDFCD	Urban Drainage and Flood Control District
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USDCM	Urban Storm Drainage Criteria Manual
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCR	Weld County Road
WOTUS	Waters of the United States
WSSC	Water Supply and Storage Company
WQCC	Colorado Water Quality Control Division
WRF	Water Reclamation Facility

Introduction

The city of Thornton (Thornton), Colorado is requesting a 1041 permit for the Thornton Water Project (TWP) water pipeline and appurtenant facilities, 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 Sections 12 and 14 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.

At the Larimer County Land Use hearing on August 1, 2018, on Thornton's 1041 permit Application, the Larimer County Board of County Commissioners (BOCC) continued the hearing until December 17, 2018 to allow Larimer County and Thornton to work with the public to better define and analyze issues and alternatives, mitigate the effects of the project to residents in the area, identify benefits to Larimer County and engage in additional public outreach related to the TWP water pipeline. As a result of the direction of the BOCC, Thornton participated in the Larimer Water Projects Working Group (Working Group) process which was convened by Larimer County staff. During Larimer County's public involvement (Public Involvement) process, Thornton listened to community interests and concerns and gathered ideas about options, maximizing community benefits, minimizing or mitigating negative impacts, and creating efficiencies for the project. As a result of the Public Involvement process and as further discussed below and supplemented herein, Thornton proposes a pipeline route identified as Alternative 3 (Option C) Corridor which is similar to the West 2 alternative route described in the Application, as modified to reflect input received from the Public Involvement process. Thornton Water Project Larimer County 1041 Application Supplement 3 (Supplement 3) provides information on this reasonable siting and design alternative that meets expressed community interests and the purpose and need of the TWP. Information included in this Supplement 3 is to assist the BOCC in their decision-making process on the TWP water pipeline.

Background

Thornton's purpose and need of the TWP is to provide an adequate, reliable source of high quality drinking water to the Thornton community, its families, children, schools, residents, business and the people of the state as a whole who visit or work in Thornton. Water is vital to the ability of any community to thrive and providing safe drinking water is a foremost government responsibility. Thornton purchased WSSC system water 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 obtained a water court Decree, changing the water rights it purchased so that they could be used for municipal purposes in Thornton. The Decree that Thornton pursued, and was entered, sought to: 1) preserve source water quality to protect public health; 2) provide water supply reliability; 3) protect yield; and 4) protect WSSC, its shareholders and other water users.

On January 5, 2018, the city of Thornton (Thornton) filed its Thornton Water Project Larimer County 1041 Application (Application) for a 1041 permit to construct, operate and maintain a new buried 48-inch domestic water transmission line and associated appurtenances in Larimer County. Thornton requested approval of a corridor alignment as shown in **Figure 2.a-1** of the Application. Due to concerns expressed by Larimer County residents that the corridor approach could impact their homes, trees and other improvements, Larimer County indicated that Thornton should

consider limiting construction to the Larimer County right-of-way (ROW), and encouraged Thornton to review multiple alternatives in the corridor between WSSC Reservoir No. 4 to County Road 9.

After receiving feedback from residents and staff, Thornton reviewed and analyzed ten alternative pipeline alignments and pump station locations between those locations. As a result of this analysis, an alignment identified as South 2 was selected as Thornton's preferred alignment and presented for consideration by Larimer County. *See* **Application Appendix A**, Technical Memorandum No. 5.1.12.2 *Larimer County Alternative Configurations Analysis-WSSC Reservoir Area to Larimer County Road 9* at p. 5.1.12.2-31 and Figure 5.1.12.2-11. This alignment, which proposed to construct the water pipeline along Douglas Road entirely within the ROW, became commonly known as the "Douglas Road" alignment.

On April 2, 2018, Thornton submitted "Supplemental Additional Information" (SAI) to provide additional technical information and materials requested by Larimer County on the Douglas Road alignment from approximately Bayshore Road to Turnberry Road, as well as additional information on the source water pump station. On April 10, 2018 Thornton submitted a "Supplemental Addendum" (SA) providing additional information and clarification to materials submitted in the SAI requested by Larimer County.

As a part of the Agenda for the Larimer County Planning Commission (Planning Commission) hearing for May 16, 20918, Planning Commission staff provided a Report and recommendation to the Planning Commission on Thornton's 1041 permit Application. Subject to enumerated conditions, Larimer County staff recommended approval of Thornton's 1041 permit Application. On May 16, 2018, Thornton's Application was heard by the Planning Commission. The Planning Commission voted to recommend that the BOCC deny the Application but it did not issue a written decision. The Planning Commission recommendation is not binding on the BOCC.

Thornton provided a legal *Statement in Support of the Thornton Water Project Application* dated June 29, 2018. *See* **Supplement 3 Appendix E**. The June 29, 2018 statement sets forth Thornton's legal position that the source water pump station is not regulated under Larimer County's 1041 process but without waiving any of its rights, that Thornton would proceed to address the source water pump station as part of its 1041 Application. That statement also set forth Thornton's legal position that consideration of any Cache la Poudre River water delivery option for Thornton's drinking water supply was not within Larimer County's 1041 powers. While Thornton maintains these legal positions, as described in this Supplement 3 Thornton seriously considered, analyzed and evaluated River Delivery Alternatives presented as a part of the Public Involvement process.

On July 31, 2018, Thornton provided a Rebuttal Statement of Legal Points in Support of the Thornton Water Project Application. *See* **Supplement 3 Appendix F**. The July 31 rebuttal sets forth Thornton's legal positions, among others, that Criterion 10 is not limited to consideration of the benefits only as to Larimer County but must also consider the benefits of the proposal to Thornton as well as to the people of the state of Colorado. Thornton also provided its legal position that Criterion 2 does not include Cache la Poudre River or canal delivery options as reasonable siting and design alternatives for a water pipeline permit process. While Thornton maintains the legal positions set forth in its July 31 rebuttal, as described in this Supplement 3 Thornton seriously considered, analyzed and evaluated River Delivery Alternatives and Canal Delivery Alternatives presented as a part of the Public Involvement process.

Thornton's Application was heard by the BOCC on July 9 and 23, 2018 and August 1, 2018. At the conclusion of the hearing on August 1, 2018 the BOCC moved to "continue the hearing of Thornton's 1041 permit application to 6:30 p.m. on December 17, 2018, to allow county staff and Thornton

time to provide the specific additional information as discussed by the Board of County Commissioners at tonight's hearing and to direct county staff to involve the public in the information gathering process through public meetings or open houses."

Working Group and Open Houses

As a result of the BOCC's direction, Larimer County staff hired Peak Facilitation Group to assist stakeholders, known as the Working Group, to develop shared understanding, identify interests, identify ways to maximize community benefits and minimize or mitigate negative impacts, evaluate ideas against the interests, and submit a report on this work to the BOCC. Thornton was not a member of the Working Group but participated as a resource to the Working Group to assist them in finding ways to maximize community benefits and mitigate impacts from the water pipeline project and provide technical expertise and educational materials for their consideration and evaluation.

Thornton attended all Public Involvement meetings, listened to community interests, suggestions and concerns, and provided information as requested by Larimer County, the facilitator, the Working Group and the public, by answering questions, providing technical memos and a webinar.

Revised Preferred Alignment

The Application sought a permit for construction of the South 2 alternative (Douglas Road) as the preferred alternative. *See* **Application Appendix A**, Technical Memorandum No. 5.1.12.2 *Larimer County Alternative Configurations Analysis-WSSC Reservoir Area to Larimer County Road 9* at p. 5.1.12.2-31 and Figure 5.1.12.2-11. This is commonly known as the Douglas Road alignment. This alternative was re-analyzed as a part of the Working Group and Public Involvement process and it remains a reasonable siting and design alternative as set forth in the Application, so long as the project is not co-located with the NISP pipeline in Douglas Road. It is no longer being put forth as the preferred alternative because the Working Group and the public showed consistent support of co-location of the water pipeline and the NISP pipeline. While co-location of these pipelines in Douglas Road can be done, such a project would significantly impact traffic and increase construction timelines which were identified by the Working Group and the public to be negative impacts.

As part of the Public Involvement process Thornton considered, reviewed, analyzed and provided information to the Working Group and public on five Options evaluated by the Working Group:

- Option A: Canal Conveyance
- Option B: Douglas Road (Alternative in Thornton's 1041 Application)
- Option C: County Road 56 (Alternative in Thornton's 1041 application)
- Option D: Poudre River; and
- Option E: Shields Street and Poudre River

Thornton considered, analyzed and evaluated Options A, D and E independently of Thornton's legal position on whether these suggested options can be considered under 1041 permitting authority.

Thornton then developed six reasonable siting and design alternatives. Of these six, four were presented as part of Thornton's Application. Four of these six alternatives were also based on Working Group Options B or C or variations of thereof.

After vetting these Options and the Alternatives developed by Thornton, Thornton requests approval for the TWP corridor as presented in the Application from County Road 9 to County Road 14 but with a new preferred alternative at the beginning of the route for the water pipeline to be

installed from the source water pump station on Douglas Road around the west side of WSSC Reservoir No. 4 and meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The pipeline would be co-located with the NISP pipeline from this point west to County Road 9, generally in the County Road 56 corridor. *See* **Figure 2.c-2S**. This alignment was evaluated by the Working Group as a part of Option C and is analyzed in Section 2.c. as the Alternative 3 (Option C) Corridor.

The Alternative 3 (Option C) Corridor is substantially similar to the West 2 Alternative as presented in the Application and shown on Figure **5.1.12.2-8** of the Alternative Configurations Analysis (**Application Appendix A**). **Figure 2.c-S6** shows a comparison of Alternative 3 (Option C) Corridor and the West 2 Alternative presented in the Application for reference. Modifications to the West 2 Alternative from the Application were made to place the source water pump station closer to Douglas Road and coordinate the alignment with the currently-proposed NISP pipeline between WSSC Reservoir No. 3 and WSSC Reservoir No. 4, and on each side of Highway 1. As such, this Supplement 3 is not a new application but only selects a new preferred alignment from the alignments previously presented in the Application as the result of additional information gathered during the Public Involvement process.

The TWP corridor with Alternative 3 (Option C) Corridor best meets what Thornton understood to be important considerations expressed by the Working Group and the public, such as: 1) the opportunity to co-locate with NISP; 2) to minimize traffic/construction duration; and 3) reduce impacts to private property. At the same time, because the public engagement process was designed to consider community interests at the exclusion of Thornton's interests, Thornton also evaluated the alignments and proposed ideas on whether they are or are not reasonable siting and design alternatives to meet the purpose and need of Thornton's drinking water supply project including: 1) preserving source water quality to protect public health; 2) providing water supply reliability; 3) protecting yield; 4) abiding by the water court Decree; 5) protecting WSSC and its shareholders; 6) being fiscally responsible with taxpayer money; and 7) delivering water to Thornton by 2025. Combined with addressing the important considerations that Thornton heard through the public process, the TWP corridor with Alternative 3 (Option C) Corridor is a reasonable siting and design alternative that best addresses Thornton's interests in the purpose and need of the project.

In addition, Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

The Application also included a water tank as an appurtenance to the Application. However after listening to the interests and concerns of the community through the hearing, Working Group process and Open House about the location of the water tank in Larimer County, Thornton has determined not to locate the water tank within Larimer County, and that request is withdrawn from the Application.

Benefits to Larimer County

As benefits to Larimer County associated with the water pipeline:

- Emergency Raw Water Interconnects: Thornton is willing to enter into agreements with other municipal water supply agencies in Larimer County to provide an interconnect with the TWP water pipeline to deliver short-term raw water supplies in the case of emergencies such that the raw water supply for those agencies is temporarily impacted due to circumstances such as infrastructure failure.
- Transportation Mitigation and Improvement: As mitigation for impacts to transportation assets affected by TWP construction, as well as providing additional community benefit, Thornton proposes contributing $1,000,000 to Larimer County for use at its discretion for mitigation of "off-site" impacts of TWP construction on transportation assets, or for transportation improvements that are important to the community.

Additional Benefits to Larimer County

At the August 1, 2018 hearing on Thornton's 1041 Application, the BOCC made several comments suggesting that Thornton identify broader community benefits as a part of its Application. Thornton has identified broader community benefits that go above and beyond direct mitigation of the pipeline impacts. Because these benefits are not directly related to the pipeline project, Thornton proposes to memorialize these enhanced community benefits in a separate Intergovernmental Agreement (Community Benefits IGA) to be entered into between Larimer County and Thornton upon issuance of a 1041 Permit to Thornton for the TWP corridor with Alternative 3 (Option C) Corridor with terms and conditions as agreed to by Thornton. These enhanced benefits have an estimated value to Larimer County of approximately $60 million dollars. These enhanced benefits are detailed in **Section 12.b Additional Benefits to Larimer County** and include:

- Thornton commits to continue working with the Colorado Water Conservation Board (CWCB), the Colorado Division of Parks and Wildlife, the Colorado Water Trust, the cities of Fort Collins and Greeley, the Northern Water Conservation District, to establish the legal framework necessary to protect and improve flows in a 50-mile reach of the Cache la Poudre River from the canyon mouth to its confluence with the South Platte River to obtain an Instream Flow Augmentation Plan for the Poudre River (Poudre Flows Augmentation Plan).
- Thornton proposes to dedicate and deliver up to 3,000 acre-feet a year of water to the CWCB for use in the Poudre Flows Augmentation Plan. It would cost about $45 million dollars to acquire 3,000 acre feet of comparable Cache la Poudre River water on the open market. Thornton will also continue to explore ways that it might voluntarily lease to CWCB additional Cache la Poudre River supplies on a temporary or permanent basis.
- Thornton commits to partnering with the above and other entities, and proposes to contribute $750,000 toward the study, implementation and evaluation of efforts related to improving Cache la Poudre River connectivity, aquatic and environmental health, and water rights administration.
- Thornton proposes to contribute $1,000,000 toward establishing a Water Innovation Fund which could be used to fund creative strategies to enhance Cache la Poudre River health and address local water supply challenges.

- Thornton proposes to provide Larimer County with approximately 1.25 miles of 50 foot wide easement across Thornton-owned properties along Boxelder Creek for connectivity of the Boxelder Creek Regional Trail. This easement has an approximate value of $65,000.
- Thornton commits to coordinating with Larimer County and other local stakeholders to identify the interests of the community with respect to Thornton owned properties in Larimer and Weld Counties and to develop these properties in a manner in which both Thornton's water interests and the communities' vision are preserved.
- As an enhanced community benefit, where legally possible, Thornton will provide Larimer County with 12 strands of fiber-optic cable in the TWP corridor Alternative 3 (Option C) Corridor within Larimer County for the County to use for institutional services or its residents. Access to this fiber is conservatively valued at $12 million dollars.
- Thornton proposes that as long as Thornton is the fee owner of farms in Larimer County, Thornton pay the assessed valuation of those farms as agricultural property as a voluntary payment in lieu of taxes.

Compliance with 1041 Permit Requirements

Thornton's Application, together with its supplements, including this Supplement 3, details and demonstrates how the TWP corridor with Alternative 3 (Option C) Corridor for its water pipeline project fully complies with Larimer County's 12 review criteria set forth in LUC 14.10.D.

Executive Summary

Larimer County 1041 Permit Request

The city of Thornton (Thornton), Colorado is requesting a 1041 permit for the Thornton Water Project (TWP) water pipeline in Larimer County, 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.

Thornton requests approval of an approximate 500-foot to ¼-mile wide corridor to construct, operate, and maintain the TWP, which includes up to approximately 27 miles of a buried 48-inch domestic water transmission line (water pipeline) and associated appurtenances in unincorporated Larimer County. The corridor width varies depending on location and is less than 500-feet wide at some locations to minimize impacts to existing infrastructure.

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.

This Supplement 3 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). This Supplement 3 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 water pipeline conforms to Larimer County 1041 permit requirements as described in this Supplement 3.

Purpose and Need of the TWP

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 139,622 residents (City of Thornton, Third Quarter 2018, 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 cost efficient 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.

Supplement 3

Unless otherwise noted, information provided in this TWP Larimer County 1041 Permit Application Supplement 3 (Supplement 3) is in addition to information that was previously provided. It is not intended to replace previously submitted Application materials. The following Application materials were previously submitted:

- TWP Larimer County 1041 Permit Application (Application), January 5, 2018.
- TWP Larimer County 1041 Permit Application Supplemental Additional Information (Supplement), April 2, 2018.
- TWP Larimer County 1041 Permit Application Supplement Addendum (Supplement Addendum), April 10, 2018.

At the Larimer County Land Use Hearing on August 1, 2018, the Board of Larimer County Commissioners (BOCC) continued the hearing until December 17, 2018 to allow Larimer County and Thornton to work with the public to better define and analyze issues and alternatives related to the TWP water pipeline. Larimer County initiated the following activities in response to the BOCC request for additional information:

- Hired an independent outside facilitator, Peak Facilitation Group, to manage the public engagement process.
- Formed a working group (Working Group) comprised of representatives from interested parties. Thornton attended the meetings and provided requested information but was not a member.
- Hosted two public open house meetings to provide information to the public and obtain feedback on Larimer County's process for the TWP.
- Administered additional technical analysis for the TWP.

As a result of Larimer County's process, additional alternatives for the TWP were developed by the Working Group. This Supplement 3 provides information on a reasonable alternative resulting from Larimer County's public involvement (Public Involvement), process the Alternative 3 (Option C) Corridor, that presents a reasonable siting and design alternative that meets the purpose and need of the TWP. Information included in this Supplement 3 is to assist the BOCC in their decision-making process on the TWP water pipeline.

Project Description

Thornton is proposing to construct, operate, and maintain the TWP, and the Application before the BOCC is for approximately 27 miles of a buried 48-inch water pipeline and associated appurtenances in unincorporated Larimer County, Colorado. TWP appurtenances include various buried water pipeline structures and valve vaults including access manways, blow-off assemblies, air release vaults, and isolation valve vaults. The TWP as a whole is a water delivery system that will convey domestic water Thornton purchased in the mid-1980's from the WSSC system to Thornton.

Land uses in the TWP area of unincorporated Larimer County are predominantly agricultural. Other uses include residential use. The TWP water pipeline 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.

The Application included a water tank as an appurtenance to the TWP. However, after listening to the interests and concerns of the community through the hearing, Working Group process and Open House about the location of the water tank in Larimer County, Thornton has determined not to locate the water tank within Larimer County, and that request is withdrawn from the Application.

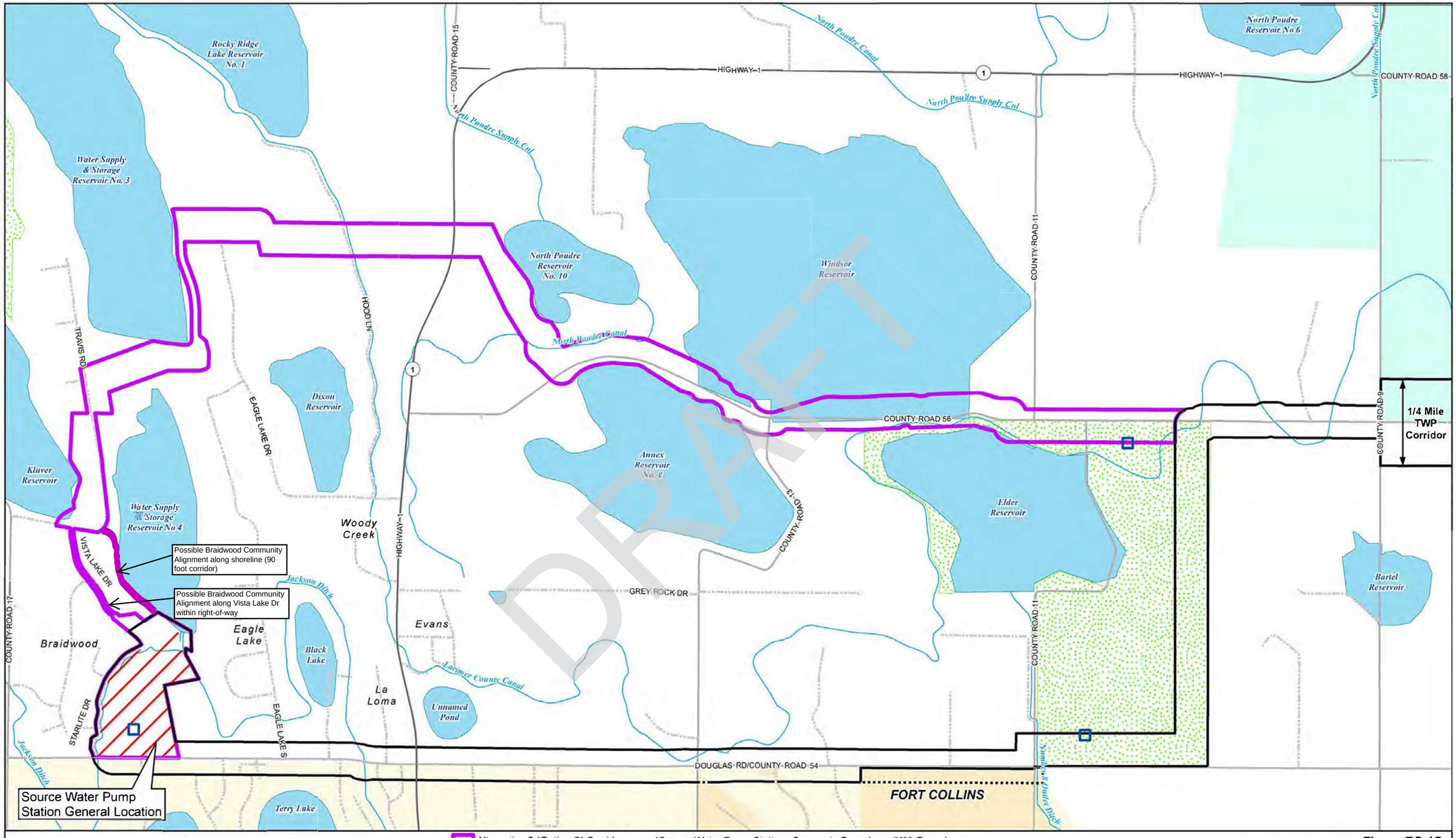
Alternative 3 (Option C) Corridor

The Alternative 3 (Option C) Corridor is typically 500-feet wide for TWP components in unincorporated Larimer County. The final water pipeline alignment within a 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 Alternative 3 (Option C) Corridor width allows for flexibility when developing the final water pipeline alignment and location of appurtenances. Alternative 3 (Option C) Corridor limits are shown on **Figure ES-1S.**

The Alternative 3 (Option C) Corridor is approximately 6 miles long in unincorporated Larimer County north of Fort Collins. It includes an area that extends south from Water Supply and Storage Company (WSSC) Reservoir No. 4 to the proposed location of the source water pump station. This area will accommodate the connection to WSSC Reservoir No. 4, the water pipeline to the source water pump station, and the water pipeline from the source water pump station. The Alternative 3 (Option C) Corridor extends north then east from the west side of WSSC Reservoir No. 4 to County Road 9. The Alternative 3 (Option C) Corridor includes options to construct the water pipeline in Vista Lake Drive or on private property adjacent to WSSC Reservoir No. 4.

The Alternative 3 (Option C) Corridor ties into the TWP corridor presented in the Application at County Road 9. The TWP with Alternative 3 (Option C) Corridor (which is the Alternative 3 (Option C) Corridor plus TWP corridor east of County Road 9) is approximately 27 miles long in unincorporated Larimer County.

The Alternative 3 (Option C) Corridor appurtenances also include an approximate 40-million gallon per day (mgd) source water pump station located near WSSC Reservoir No. 4. The source water pump station will be permitted through the Site Plan Review permit process. Information on the source water pump station provided in this Supplement 3 is of a general nature and is included to present a more complete scope of the TWP and seek siting and location approval from Larimer County.



CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

12/6/2018

N
W E
S

0 500 1,000 Feet
1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- Thornton Farm
- Potential Staging Area

Corporate Boundary
- Fort Collins
- Wellington

GMA Boundary
- Fort Collins
- Wellington

Figure ES-1S
Alternative 3 (Option C) Corridor Map

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

W:\76868_THORNTON_NORTHERN_PROJECT\TASK_ORDER_5\S1_PERMITTING\GIS\MAPFILES\LARIMER_1041\SUPPLEMENT\SECTION2_OVERVIEW\FIGURE 2.A-1S_TWP_CORRIDOR_20181204.MXD DHEYERDA 12/6/2018 3:31:53 PM

Alternative 3 (Option C) Corridor Components

The Alternative 3 (Option C) Corridor components in unincorporated Larimer County include the following:

- Water pipeline. Up to approximately 6 miles of a buried, 48-inch diameter water pipeline capable of conveying 40 mgd of water will be constructed in unincorporated Larimer County. 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 except where the Alternative 3 (Option C) Corridor will be constructed in road ROW. If property owners object to granting an easement for the Alternative 3 (Option C) Corridor parallel to County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County.
- Appurtenances
    - Source water connection. Two buried valve vaults will be constructed to connect the TWP water pipeline to two existing outlet pipelines at WSSC Reservoir No. 4. From the valve vaults up to approximately ½ mile of buried 48-inch diameter water pipeline and fiber optic cable will be routed to the source water pump station.
    - Communications. Up to approximately 6 miles of buried fiber optic cable, including buried manholes, test stations, and other fiber optic cable appurtenances will generally parallel the water pipeline in unincorporated Larimer County. 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 Alternative 3 (Option C) Corridor appurtenances also include an approximate 40-million gallon per day (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. Thornton has confirmed with Poudre Valley Rural Electrical Association (PVREA) that sufficient power is available in the area to supply the source water pump station. In public comments, Thornton heard community concerns that the emergency diesel powered backup generator associated with the source water pump station proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

The final siting of the source water pump station will be completed during final design. The preferred location is adjacent to Douglas Road. **Figure ES-2S** shows an example rendering of the source water pump station adjacent to Douglas Road. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station that reduce the visual impacts of the facility. The facility will be designed to meet the then-existing Larimer County Noise Level Ordinance.

FIGURE ES-2S
Example Pump Station Rendering adjacent to Douglas Road

TWP Corridor with Alternative 3 (Option C) Corridor

The TWP corridor with Alternative 3 (Option C) Corridor includes up to approximately 27 miles of a buried 48-inch water pipeline and associated appurtenances in unincorporated Larimer County, Colorado. If the TWP corridor with Alternative 3 (Option C) Corridor is approved by BOCC, the water pipeline and appurtenant facilities will be constructed as follows:

- Within the Alternative 3 (Option C) Corridor as presented in this Supplement 3 from WSSC Reservoir No. 4 to County Road 9.
- Within the TWP corridor as presented in the Application from County Road 9 to County Road 14.

Site Selection Process and Alternatives Analysis

The TWP corridor with Alternative 3 (Option C) Corridor was developed using a series of evaluations. Reasonable siting and design alternatives for the TWP are those that include taking delivery of drinking water from WSSC Reservoir No. 4 and conveying it east via pipeline.

As a result of listening to public comments during the hearing and engagement with Larimer County's Working Group and Open Houses process, certain alternatives presented in the original

Application, and additional options were analyzed further. Supplement 3 includes six alternative water pipeline alignments for the WSSC Reservoir area to County Road 9 portion of the project. Of these six, four were presented as part of the Application.

In the Application, Thornton selected an alternative identified as South 2 as the preferred alternative. This is commonly known as the Douglas Road alignment. This alternative was re-analyzed as a part of the Working Group and Public Involvement process and it remains a reasonable siting and design alternative as set forth in the Application, so long as the project is not co-located with the Northern Integrated Supply Project (NISP) pipeline in Douglas Road.

However, based on the results of the alternative development and analysis, Thornton requests approval for the TWP corridor with Alternative 3 (Option C) Corridor, a water pipeline installed around the west side of WSSC Reservoir No. 4 meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The TWP water pipeline would be co-located with the NISP pipeline from this point west to County Road 9, generally in the County Road 56 corridor. This is the West 2 alternative described in the Application of the Alternative Configurations Analysis. This alternative was reviewed by the Working Group as Option C.

The TWP corridor with Alternative 3 (Option C) Corridor best meets what Thornton understood to be important considerations expressed by the Working Group and the public, such as: 1) the opportunity to co-locate with NISP; 2) to minimize traffic/construction duration; and 3) reduce impacts to private property. At the same time because the public engagement process was designed to consider community interests at the exclusion of Thornton's interests, Thornton also evaluated the alignments and proposed ideas on whether they are or are not reasonable siting and design alternatives to meet the purpose and need of Thornton's drinking water supply project including: 1) preserving source water quality to protect public health; 2) providing water supply reliability; 3) protecting yield; 4) abiding by the water court Decree; 5) protecting WSSC and its shareholders; 6) being fiscally responsible with taxpayer money; and 7) delivering water to Thornton by 2025. Combined with addressing the important considerations that Thornton heard through the Public Involvement process, the TWP corridor with Alternative 3 (Option C) Corridor is a reasonable siting and design alternative that best addresses Thornton's interests in the purpose and need of the project.

In addition, Thornton evaluated the following ideas presented by the Working Group:

- Use the Cache la Poudre River instead of a pipeline (River Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option D: Poudre River)
- Use existing ditches or canals instead of a pipeline (Canal Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option A: Canal Conveyance)
- Use lake taps (micro-tunneled lake intakes) to access water in the WSSC reservoir system instead of trenched pipelines from reservoir outlets (Lake Tap Concept)

For the River Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. For the Canal Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. With respect to the use of lake taps, the analysis concluded that lake taps were not a reasonable alternative to the use of conventional, open-trench excavation for pipeline installation.

Accordingly between its Application and this Supplement 3, Thornton has presented six reasonable siting and design alternatives. Of those, because of expressed community preferences, Thornton has

changed its preferred alignment from that sought in its Application (South 2) to the TWP corridor with Alternative 3 (Option C) Corridor.

Land Use

The majority of the Alternative 3 (Option C) Corridor within unincorporated Larimer County is located in areas categorized as rural lands and designated as farming, rural estate, 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 Alternative 3 (Option 3) Corridor crosses.

With respect to the source water pump station, the location proposed for the source water pump station site (2 acres) is zoned farming. Thornton will work with the property owner to locate the source water pump station to minimize impact to the property owner to the extent it is reasonably possible.

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 Alternative 3 (Option C) Corridor and the TWP corridor with Alternative 3 (Option C) Corridor are presented in are presented in **Table ES-1S**.

TABLE ES-1S
Vegetative Communities

Vegetative Community	Approximate Total Acres in Alternative 3 (Option C) Corridor	Approximate Total Acres in the TWP Corridor with Alternative 3 (Option C) Corridor	Description
Agricultural Lands	34	1,227	Tilled or managed agricultural lands.
Developed/ Disturbed Areas	67	875	Have received heavy human use, including buildings and surrounding disturbed areas, livestock concentration areas, roads, trails, and other developed areas.
Nonnative Upland	170	820	Occurs in areas that have been historically disturbed by heavy grazing, tilling, and hay production.
Mixed Upland	34	88	Occurs primarily in historically undisturbed upland areas.
Wetlands	13	64	Fringes or wide benches along drainages, roadside swales, ponds and lakes, and isolated depressions
Riparian	0	7	Moist areas along larger tributaries and rivers.

Stakeholder Outreach

During the land use hearing on August 1, 2018, the BOCC voted to continue the hearing regarding Application for the development of a water pipeline. The BOCC cited the need for additional evaluation of alternative water conveyance concepts, pipeline routes, mitigation of the effects of the project to residents in the area, identification of benefits to the Larimer County as well as the need for additional public outreach on the project.

In an effort to address these needs, the BOCC asked that Larimer County staff establish a public engagement framework and process to solicit community input on the project.

Larimer County initiated their public engagement process by contracting with Peak Facilitation Group, an independent third-party facilitator, to establish a process outline, public engagement framework, and to facilitate a stakeholder discussion that would identify ways to maximize community benefit and minimize or mitigate negative impacts of potential water conveyance alternatives for Thornton's and NISP pipelines through the community. Larimer County staff indicated to Thornton and Northern Water that there was interest on Larimer County's behalf in exploring the co-location of the pipelines to reduce impacts to the community.

Larimer County staff, in consultation with the facilitator, established the Larimer Water Projects Working Group (Working Group) comprised of twenty-eight representatives of interested parties and organizations to "maximize the benefits and minimize or mitigate impacts" to Larimer County. Thornton was not a participant in the selection of Working Group participants. In addition to the formation of the Working Group, Larimer County also noticed two public meetings (Open House) to ensure the general public had an opportunity to review the work products from the Working Group and offer input of their own.

While Thornton was not an official member of the Working Group, it provided, upon request, technical expertise and educational materials to the Working Group for their consideration and evaluation. The Working Group convened on five separate occasions where it was asked to evaluate interests, impacts and benefits relative to five proposed alternative water conveyance concepts identified by Larimer County and the Working Group itself. The Working Group was established by Larimer County to be a venue for public input (without decision-making authority).

Thornton staff attended each of the Working Group meetings as audience members and were available for questions and answers from the Working Group members, County staff and the facilitator.

Thornton was asked by Larimer County to provide technical studies and background educational material on each of the five alternative water conveyance concepts put forth by the Working Group including, water quality and quantity evaluations, and constructability. Thornton staff and consultants, Larimer County staff and Larimer County contracted consultants, evaluated what would be required to implement the alternative concepts and presented that evaluation to the Working Group members in three informational webinars.

Thornton staff and consultants also attended the two Open House meetings set by Larimer County. Thornton staff was asked by Larimer County to provide a display of informational material on Thornton's project and to be on hand to answer questions from the attendees, including Working Group members, about their proposed ideas and to provide information on what legal, technical, infrastructure, operational and financial needs would be required for each concept.

In addition to Thornton's participation in the official Larimer County public outreach process, Thornton also proactively engaged with the community. In early November, Thornton and the Eagle Lakes Community agreed to meet for the purpose of evaluating the potential impacts to eight property owners in Eagle Lakes along a possible pipeline alignment through their community. Some Working Group members expressed concerns about the timing and purpose of that meeting, and it was ultimately cancelled in order to avoid a disruption to the Working Group process. Thornton feels it is important to continue its public engagement with the Working Group members, property owners and homeowners associations along possible pipeline routes to ensure they have sufficient opportunity to assist in the siting and development of the pipeline in a manner that limits community impacts and provides sufficient mitigation.

From Thornton's perspective, Larimer County's Public Involvement process and the Working Group activity was useful in further understanding the community's concerns and interests and was instrumental to informing this Supplement 3. The process resulted in a supplement that includes feedback and data from Larimer County, the Working Group, and from the residents of Larimer County. As a result of community engagement since the August 1, 2018 hearing, this Supplement 3 provides information on a reasonable alternative that proposes a pipeline route, Alternative 3 (Option C) Corridor similar to the West 2 route described in the Application, modified to reflect input received from the community. Thornton did not make this decision lightly, and is appreciative to the community and the Working Group for their efforts and willingness to inform the process. Thornton believes the Alternative 3 (Option C) Corridor proposed in this Supplement 3 mitigates many of the concerns of the community, provides additional benefits to the community, and respects the values and the residents of Larimer County.

Compliance with 1041 Permit Requirements

The TWP corridor with Alternative 3 (Option C) Corridor meets the review criteria for approval described in Larimer County Land Use Code (LUC) Section 14.10.D.

14.10.D1 The proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development.

Impacts to Larimer County Master Plan goals, IGAs, and plans resulting from construction of the pipeline and the source water pump station will be temporary. Impacts to traffic, sensitive environmental biological resources and agriculture can be avoided or mitigated during construction. For example, the TWP will utilize trenchless construction methods for water pipeline installation to minimize impacts to natural resources such as jurisdictional waters and wildlife habitat associated with those areas. With respect to traffic impacts during construction, selection of the Alternative 3 (Option C) Corridor avoids more major impacts on other routes because the impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low. In addition, Thornton and the TWP contractors will exercise care and will coordinate with property owners to minimize impacts to property owner's existing access locations. With respect to land use, where the TWP corridor with Alternative 3 (Option C) Corridor parallels Larimer County roads, the water pipeline is proposed to be located in the Larimer County ROW as approved by Larimer County if the property owner is not agreeable to selling an easement for the water pipeline.

Long-term, because the water pipeline will be buried and disturbed areas will be restored to pre-construction grades and vegetation, a there are no impacts to the Master Plan goals resulting from the water pipeline. For example, the majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in rural land use areas that include lands zoned open, rural estate, and farming.

After construction, agricultural use within the permanent easement can continue as before. With respect to the source water pump station, the location proposed for the source water pump station site (2 acres) is zoned farming. Thornton will work with the property owner to locate the source water pump station to minimize impact to the property owner to the extent it is reasonably possible. The source water pump station will be designed to be compatible with the surrounding area. After listening to the interests and concerns of the community through the hearing, Working Group process and Open House concerning noise and emission resulting from the proposed installation of an emergency diesel backup generator in the Application, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. After construction, the source water pump station will be unmanned, though it will be monitored and operated remotely, inspected daily, and repaired and maintained as needed.

The Application also included a water tank as an appurtenance to the Application. However, after listening to the interests and concerns of the community through the hearing, Working Group process and Open House about the location of the water tank in Larimer County, Thornton has determined not to locate the water tank within Larimer County, and that request is withdrawn from the Application.

Accordingly the proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development. Therefore, TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 1.

14.10.D.2 The applicant has presented reasonable siting and design alternatives or explained why no reasonable alternatives are available.

The TWP corridor with Alternative 3 (Option C) Corridor was developed using a series of evaluations. Reasonable siting and design alternatives for the TWP are those that include taking delivery of drinking water from WSSC Reservoir No. 4 and conveying it east via pipeline.

As a result of listening to public comments during the hearing and engagement with Larimer County's Working Group and Open Houses process, certain alternatives presented in the original Application, and additional options were analyzed further. Supplement 3 includes six alternative water pipeline alignments for the WSSC Reservoir area to County Road 9 portion of the project. Of these six, four were presented as part of the Application.

In the Application, Thornton selected an alternative identified as South 2 as the preferred alternative. This is commonly known as the Douglas Road alignment. This alternative was re-analyzed as a part of the Working Group and public process and it remains a reasonable siting and design alternative as set forth in the Application, so long as the project is not co-located with the NISP pipeline in Douglas Road.

However, based on the results of the alternative development and analysis and the Public Involvement process, Thornton requests approval for the TWP corridor with Alternative 3 (Option C) Corridor, a water pipeline installed around the west side of WSSC Reservoir No. 4 meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The TWP water pipeline would be co-located with the NISP pipeline from this point west to County Road 9, generally in the County Road 56 corridor. This is the West 2 alternative described in the Application of the Alternative Configurations Analysis. This alternative was reviewed by the Working Group as Option C.

The TWP corridor with Alternative 3 (Option C) Corridor best meets what Thornton understood to be important considerations expressed by the Working Group and the public, such as: 1) the opportunity to co-locate with NISP; 2) to minimize traffic/construction duration; and 3) reduce impacts to private property. At the same time because the public engagement process was designed to consider community interests at the exclusion of Thornton's interests, Thornton also evaluated the alignments and proposed ideas on whether they are or are not reasonable siting and design alternatives to meet the purpose and need of Thornton's drinking water supply project including: 1) preserving source water quality to protect public health; 2) providing water supply reliability; 3) protecting yield; 4) abiding by the water court Decree; 5) protecting WSSC and its shareholders; 6) being fiscally responsible with taxpayer money; and 7) delivering water to Thornton by 2025. Combined with addressing the important considerations that Thornton heard through the public process, the TWP corridor with Alternative 3 (Option C) Corridor is a reasonable siting and design alternative that best addresses Thornton's interests in the purpose and need of the project.
In addition, Thornton evaluated the following ideas presented by the Working Group:

- Use the Cache la Poudre River instead of a pipeline (River Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option D: Poudre River)
- Use existing ditches or canals instead of a pipeline (Canal Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option A: Canal Conveyance)
- Use lake taps (micro-tunneled lake intakes) to access water in the WSSC reservoir system instead of trenched pipelines from reservoir outlets (Lake Tap Concept)

For the River Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. For the Canal Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. With respect to the use of lake taps, the analysis concluded that lake taps were not a reasonable alternative to the use of conventional, open-trench excavation for pipeline installation.

Accordingly between its Application and this Supplement 3, Thornton has presented six reasonable siting and design alternatives. Of those, because of expressed community preferences Thornton has changed its preferred alignment from that sought in its Application (South 2) to the TWP corridor with Alternative 3 (Option C) Corridor. Therefore, Thornton has complied with Criterion No. 2.

14.10.D.3 The proposal conforms with adopted county standards, review criteria and mitigation requirements concerning environmental impacts, including but not limited to those contained in this Code.

and

14.10.D.4 The proposal will not have significant adverse affect on or will adequately mitigate significant adverse affects on the land or its natural resources, on which the proposal is situated and on lands adjacent to the proposal.

The TWP corridor with Alternative 3 (Option C) Corridor was developed considering adopted county standards, review criteria and mitigation requirements concerning environmental impacts and compatibility with sensitive natural areas. The TWP corridor with Alternative 3 (Option C) Corridor was chosen and will be constructed to minimize impacts to sensitive natural areas.

Resources have been identified within the TWP corridor with Alternative 3 (Option C) Corridor and are either mitigable or have no significant impact. For those resources that require mitigation,

appropriate mitigation measures will be implemented in the development of the final pipeline alignment considering data received from the Planning Division, environmental field surveys that will be completed for the TWP once access is available, and other sources as additional studies are conducted during the design phase.

Surface drainage BMPs implemented during construction will include application of erosion control techniques and the successful revegetation of disturbed areas.

The TWP will utilize trenchless construction methods for water pipeline installation to minimize effects to natural resources such as jurisdictional waters and wildlife habitat associated with those areas.

The area disturbed for constructing the water pipeline will be restored to pre-construction conditions, including grade and revegetation, thus avoiding any long-term impacts to wildlife the environment, the land, land adjacent to the proposal or natural resources.

As described in detail in the Application and Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor conforms with adopted county standards, review Criteria and mitigation requirements concerning environmental impacts, including but not limited to those contained in this Code and complies with Criterion No. 3.

In addition, TWP corridor with Alternative 3 (Option C) Corridor will not have significant adverse affect on or will adequately mitigate significant adverse affects on the land or its natural resources, on which the proposal is situated and on lands adjacent to the proposal. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 4.

14.10.D.5 The proposal will not adversely affect any sites and structures listed on the State or National Registers of Historic Places.

A Class I File Search and Literature Review for cultural resources was conducted in 2016, 2017, and 2018. Based on that review, there are no cultural sites or structures that are listed on the State and National Register of Historic places within the TWP with Alternative 3 (Option C) Corridor within unincorporated Larimer County.

Accordingly because the proposal will not adversely affect any sites and structures listed on the State or National Registers of Historic Places, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 5.

14.10.D.6 The proposal will not negatively impact public health and safety.

The TWP corridor with Alternative 3 (Option C) Corridor will not negatively impact public health and safety.

Although the TWP crosses three designated 100-year floodplains, the TWP will not alter the floodplains. Therefore, the TWP will have no impact on the hydraulics and hydrology of the floodplain and no impact to public health and safety. The TWP will have no impact on wildfire hazards because it is outside of the wildfire hazard area and is mostly buried pipeline. Appurtenances will be constructed of steel, concrete, and other non-flammable materials. Therefore, because the TWP has no impact on wildfire hazards, it will have no impact on public health and safety.

The majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in a low geologic hazard category. Where mitigation measures are needed, these hazards can be avoided through use

of mitigation. Therefore, because the TWP is sited through mostly low geologic hazards, or can be mitigated to avoid geologic hazards, it will have no impact on public health and safety.

With respect to traffic, 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. 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.

Any areas impacted during construction will be restored to pre-construction conditions upon completion of the TWP. Traffic impacts after completion of the construction of the TWP are expected to be limited as the facilities will be unmanned and operations will require minimal traffic. Therefore, the TWP will not negatively impact public health and safety.

Thornton will protect water quality during construction through surface drainage BMPs and the successful revegetation of disturbed areas. Development of the final water pipeline alignment will consider water pipeline construction locations that minimize impacts to historical surface and subsurface water flows in the project area. Water pipeline crossings of jurisdictional waters, including wetlands, will be constructed utilizing trenchless construction methods. This construction method will eliminate surface disturbance to the waterbody and effects on water quality. No direct effects on water quality in irrigation ditches that the TWP crosses are anticipated. Stormwater management practices will be incorporated in the design of the source water pump station site. Therefore, because water quality will not be negatively impacted, the TWP will not negatively impact public health and safety.

Air quality will not be negatively impacted because 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 prior to construction activities in accordance with state air quality regulations and will mitigate fugitive dust caused by construction activities. Permanent facilities associated with the TWP will comply with air pollution control regulations. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. This will eliminate the noise and emissions otherwise associated with a diesel backup generator.

The TWP will not pose environmental hazards because Thornton and the TWP contractors will provide and maintain sanitary accommodations for the use of their employees during construction of the TWP in a manner that complies with the requirements and regulations of health departments and other governmental bodies. Construction, operation, and maintenance activities will follow best management practices for the management of wastes to avoid and minimize impacts from potential spills or other releases to the environment. Thornton will also comply with applicable federal, state, and local laws and regulations regarding the handling, storage, disposal, transportation, and use of hazardous substances.

Accordingly because the proposal will not negatively impact public health and safety, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 6.

14.10.D.7 The proposal will not be subject to significant risk from natural hazards including floods, wildfire or geological hazards.

The TWP corridor with Alternative 3 (Option C) Corridor will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards.

The TWP crosses three designated 100-year floodplains, the TWP will not alter the floodplains. Therefore, the TWP will have no impact on the hydraulics and hydrology of the floodplain and be at no risk of flooding because it is a buried pipeline.

The TWP will not be subject to wildfire hazards because it is outside of the wildfire hazard area and is mostly buried pipeline. Appurtenances will be constructed of steel, concrete, and other non-flammable materials.

Based on Larimer County GIS data downloaded from Larimer County's GIS Digital Data, the majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in a low geologic hazard category. Where mitigation measures are needed, these hazards can be avoided through mitigation.

Therefore, because the TWP is sited through mostly low geologic hazards, or can be mitigated to avoid geologic hazards, it will not be subject to significant risk from geologic hazards.

Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards and therefore complies with Criterion No. 7.

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.

The TWP corridor with Alternative 3 (Option C) Corridor adequate public facilities and services are available for the proposal or will be provided by Thornton, 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.

The TWP will not have a negative effect on local government or any other existing public facilities and services. The construction, operation, and maintenance of the underground water pipeline and associated facilities will not require any new public facilities or impact existing services such as police, fire, waste water, and healthcare. During construction water and sanitary facilities will be provided by Thornton or its TWP contractor. After construction, water and sewer utility services for operations and maintenance will not be required. After construction, no on-site personnel will be required, and no added burden will be placed on existing fire and police facilities. During construction of the water pipeline short-term disruptions could occur to domestic water service if utility requires relocation. Area residents will be notified in advance of any service disruptions. The TWP will employ Thornton employees, a construction management team, and contractors to construct the TWP. No lodging or temporary housing is expected to be required for Thornton employees or the construction management team. Some workers may require local lodging or temporary housing in the area during construction. After construction, no lodging or housing will be required.

TWP will not reduce existing service below adequate levels. Larimer County residents will not subsidize the TWP. Similar to other utility/water providers, Thornton's water utility customers will pay for the TWP.

Existing transportation facilities are adequate to serve construction of the TWP, and no new roads or improvements to existing roads are anticipated to be necessary in unincorporated Larimer County. Access will be via existing roads, temporary construction access, and the ROWs negotiated through individual easements. The existing County Road 56 road network has adequate capacity to serve anticipated construction traffic needs for facilities within the TWP corridor with Alternative 3 (Option C) Corridor. The impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low.

After construction, the TWP facilities may operate year-round, 24 hours of a day; however, the facilities are intended to be unmanned. The source water pump station will be monitored and operated remotely, inspected daily, and repaired and maintained as needed. The existing road network has adequate capacity to serve anticipated operational traffic needs.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction.

Thornton contacted 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. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Accordingly, Thornton has demonstrated that the TWP corridor with Alternative 3 (Option C) Corridor has adequate public facilities and that services are available for the proposal or that such will be provided by Thornton 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. Therefore, Thornton has demonstrated compliance with Criterion No. 8.

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 revegetated to minimize environmental impacts.

Thornton will mitigate any construction impacts to county roads, bridges and related facilities related to the TWP corridor with Alternative 3 (Option C) Corridor. Construction access will be re-graded and revegetated to minimize environmental impacts.

The TWP with Alternative 3 (Option C) Corridor 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 with Alternative 3 (Option C) 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.

Traffic impacts due to construction and post-construction operation of the water pipeline and appurtenances have been considered. 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. Any areas impacted during construction will be re-graded and re-vegetated to pre-construction conditions upon completion of the TWP. Traffic impacts after completion of the construction of the TWP are expected to be limited as the facilities will be unmanned and operations will require minimal traffic.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction. These existing roads could provide access for construction vehicles during construction of the source water pump station and for future maintenance. The access drive and parking areas are anticipated to be gravel. Future access requirements will be minimal as this is anticipated to be an unmanned facility with limited maintenance requirements.

Accordingly, Thornton has demonstrated that it will mitigate any construction impacts to county roads, bridges and related facilities and that construction access will be re-graded and revegetated to minimize environmental impacts. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 9.

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.

The TWP corridor with Alternative 3 (Option C) Corridor provides benefits that outweigh the losses of any natural resources or reduction of productivity of agricultural lands as a result of the project. The TWP corridor with Alternative 3 (Option C) Corridor avoids impacts to natural resources, and any reduction of productivity of agricultural lands as a result of the project will be temporary; the impacted landowner will be compensated for any reduction in production, and the property will be restored to its previous condition to resume normal crop production.

Thornton has demonstrated that the proposed development outweighs the losses of any natural resources or reduction of productivity of agricultural lands as a result of the proposed project. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 10.

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.

The TWP corridor with Alternative 3 (Option C) Corridor does not pose significant adverse affects to the master plan, applicable IGAs, county standards, the community, the environment, the land directly impacted by the project or lands adjacent, natural resources, any sites or structures listed on the State or National Registers of Historic Places, public health and safety, natural hazards such as floods, wildfire or geologic hazards, the capability of local government to provide services or exceed the capacity of service delivery systems, county roads, bridges and related facilities,

agricultural productivity, wildlife, water or air. Where there are impacts, mostly short-term, Thornton has demonstrated the ability to mitigate those in a cost efficient manner.

Accordingly, the proposal demonstrates a reasonable balance between the costs to the applicant to mitigate significant adverse affects and the benefits achieved by such mitigation. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 11.

14.10.D.12 The recommendations of staff and referral agencies have been addressed to the satisfaction of the county commissioners.

Thornton addressed staff and referral agency recommendations as a part of the Application. Thornton will continue to coordinate with staff and local agencies on any recommendations resulting from this Supplement 3.

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

Wetland Mitigation Plan

Thornton retained ERO Resources, Inc. (ERO) to provide a natural and cultural resources assessment for the TWP. ERO assessed the Alternative 3 (Option C) Corridor plus an additional study buffer for potential isolated wetlands, jurisdictional wetlands, and other waters of the United States. (WOTUS). Boundaries of wetlands and open water areas were defined based on 2018 site visits, National Wetland Inventory (NWI) mapping, U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) mapping, and 2017 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.

Six potential wetlands (12.77 acres) and eight potential other WOTUS (3.48 acres) were mapped within the Alternative 3 (Option C) 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 U.S. Army Corps of Engineers (USACE) to determine which areas in the Alternative 3 (Option C) 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 Alternative 3 (Option C) Corridor. These BMPs include installing temporary fencing to deter access to sensitive areas outside the Alternative 3 (Option C) 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 Alternative 3 (Option C) Corridor plus an additional study buffer for terrestrial and aquatic animals and habitat. Information was obtained from various sources including Colorado Parks and Wildlife (CPW), Colorado Natural Diversity Information System (CNDIS), Colorado Natural Heritage Program (CNHP), U.S. Fish and Wildlife Service (USFWS), published literature, and field surveys. Site visits to the Alternative 3 (Option C) Corridor and study buffer, where accessible, were conducted in 2018 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 Alternative 3 (Option C) Corridor and study buffer have been identified by the USFWS as area essential to the recovery of Preble's. Field reviews indicate the potential wetlands and riparian habitat where the Alternative 3 (Option C) Corridor and study buffer cross. These areas are not suitable habitat or are unlikely to support a population of Preble's because they are largely dominated by cattails, are isolated from known Preble's populations, or do not contain adequate shrub cover to be considered suitable habitat. 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 Alternative 3 (Option C) 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 Alternative 3 (Option C) Corridor contains suitable or potentially suitable habitat for several state-listed species as presented in **Table ES-2S.** The table presents state animal species of concern potentially found in the Alternative 3 (Option C) Corridor and study buffer or with potential to be affected by the TWP.

TABLE ES-2S
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 Alternative 3 (Option C) 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 – banks and shallow portions of marshes, wet meadows, ponds, lakes, and streams in the Alternative 3 (Option C) Corridor and study buffer	
Birds				
Black-necked stilt	—	G5, S3	Yes – suitable habitat in the Alternative 3 (Option C) Corridor and study buffer	These birds are federally protected under the Migratory Bird Treaty Act (MBTA). 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.
Ferruginous hawk	SC	G4, S3/4	Yes – known to breed in scattered locations in eastern Larimer County; no breeding ferruginous hawks were recorded near the Alternative 3 (Option C) Corridor	
Long-billed curlew	SC	G5, S2	Potentially – has not been recorded in the Alternative 3 (Option C) Corridor and study buffer	

[1]SE = State Endangered Species; ST = State Threatened Species; SC = State Species of Concern.
[2]CNHP 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 MBTA. The CPW raptor nest database shows one red-tailed hawk nest, one osprey nest, one great horned owl nest, and one unknown hawk nest located in or near the Alternative 3 (Option C) Corridor and study buffer; however, the locations of these nests could not be verified due to limited land access. Three inactive raptor nests were observed during the 2018 site visit. Additional suitable nesting habitat is also present in the Alternative 3 (Option C) Corridor and study buffer. Ground-nesting and other birds could nest in the grasslands and trees in and near the Alternative 3 (Option C) Corridor. Physical disturbance, displacement, and clearing of upland and wetland habitats could affect raptors and other migratory 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.

Other Game and Nongame Species

Areas within the proposed Alternative 3 (Option C) Corridor and study buffer may provide habitat for other animals, including coyote, red fox, racoon, cottontail rabbit, deer mouse, prairie vole, plains pocket gopher, and ground squirrel. 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 County.

Natural Hazard Mitigation Plan

Wildfire Hazards

Based on Larimer County GIS data downloaded in December 2018 from Larimer County's GIS Digital Data, the Alternative 3 (Option C) Corridor is located outside of designated wildfire hazard areas. With the exception of the source water pump station, 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 December 2018 from Larimer County's GIS Digital Data, the Alternative 3 (Option C) Corridor is located in a low geologic hazard category.

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 Alternative 3 (Option C) Corridor. Mitigation measures will be further refined during design to meet site-specific geological hazards.

Jurisdictional waters will be crossed using trenchless construction methods. Mitigation measures will be implemented as required in areas outside of any jurisdictional waters.

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.

In the fourth quarter of 2018, Larimer County recorded traffic volume data at intersections along County Road 56. That data is documented in the *Memorandum TWP – Summary of Existing Conditions and Project Impacts* by Felsburg Holt & Ullevig, November 13, 2018. The level of vehicle movements along County Road 56 are less than 10 vehicle peak hours. The analysis results presented in the memorandum indicate that construction impacts from Alternative 3 (Option C)

Corridor will be almost undetectable because traffic volumes are extremely low and no improvements were recommended.

The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*, adopted in July 2017. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

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 TWP. Normal operations and maintenance activities could include TWP operators periodically traveling in a pickup truck to the source water pump station 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 final 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 and CDOT access permits for any necessary temporary and permanent access locations as applicable. If access is needed using private roads or drives, Thornton will negotiate use with owners. Stabilized construction entrances/exits will be installed, as necessary, at the intersections of the TWP temporary access roads with paved roads. Permanent access locations will be designed per municipal standards based on location of access. Temporary access will be unpaved and used primarily for transport of materials and construction workers. Temporary and permanent access locations will be closed to the public. Temporary access locations could include warning signs, flaggers, and controlled access, as necessary. 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 final water pipeline alignment will be required along County Road 56. Other potential access locations, depending on the final water pipeline alignment, could be required along other local roads. It is anticipated that Travis Road will be required to provide access for construction vehicles during construction of the water pipeline, connection to WSSC Reservoir No. 4, and for future maintenance as necessary depending on the final water pipeline alignment. Vista Lake Drive or 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. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent on the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction. These existing roads could provide access for construction vehicles during construction of the source water pump station and for future maintenance as necessary. The access drive and parking areas are anticipated to be gravel. Future access requirements will be minimal as this is anticipated to be an unmanned facility with limited maintenance requirements. Site access will be submitted for review to Larimer County with the Site Plan Review Permit application.

Possible Delivery, Commuting Routes, and Material Storage

Truck haul routes for material deliveries from off-site locations will be chosen to facilitate safe and expedient delivery while minimizing traffic impacts. It is expected that the daily commuting route for construction workers would also follow the same roads as the truck haul routes to the construction site or temporary staging areas for parking. It is not expected that any road improvements or closures would be required to facilitate the transport of materials. In the event that a closure is necessary, the duration of the closure will be minimized, and Larimer County standards and procedures will be followed. 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.

Construction in ROW

Unless required otherwise by Larimer County, water pipeline installation in ROW including 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.

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 Alternative 3 (Option C) Corridor within unincorporated Larimer County spans two 10-digit hydrologic unit code (HUC) watersheds. HUC watersheds along the Alternative 3 (Option C) Corridor are delineated based on the following basins:

- Horsetooth Reservoir-Cache la Poudre River Basin
- Boxelder Creek Basin

The Alternative 3 (Option C) 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 Alternative 3 (Option C) 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 Alternative 3 (Option C) Corridor does not crosses any designated 100-year floodplain.

Simulation of the Appearance of the Facility

The Alternative 3 (Option C) Corridor appurtenances also include an approximate 40-million gallon per day (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.
The final siting of the source water pump station will be completed during final design. The preferred location is adjacent to Douglas Road. **Figure ES-2S** shows an example rendering of the source water pump station adjacent to Douglas Road. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station that reduce the visual impacts of the facility.

Noise Analysis

Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Air Quality Impact and Mitigation Report

Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions

detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Additional Information

Enhanced Community Benefits to Larimer County

At the August 1, 2018 hearing on Thornton's 1041 Application, the BOCC made several comments suggesting that Thornton identify broader community benefits as a part of its Application. Thornton utilized the public hearings, the enhanced community engagement process, and other stakeholder outreach to collect input regarding community interests and enhanced benefits. Because these benefits are not directly related to the pipeline project, Thornton proposes to memorialize these community benefits in a separate Intergovernmental Agreement (Community Benefits IGA) to be entered into between Larimer County and Thornton upon issuance of a 1041 Permit to Thornton for the TWP corridor with Alternative 3 (Option C) Corridor with terms and conditions as agreed to by Thornton.

Thornton is proposing the following benefits to be included in the Community Benefits IGA. These benefits have an estimated value to Larimer County of approximately $60 million dollars:

1. Cache la Poudre River Health
    a. Thornton will work with the Colorado Water Conservation Board and other parties to establish a framework consistent with Colorado water law that would preserve and enhance river flows on the Poudre River. This project is called Poudre Flows, and seeks to obtain an Instream Flow Augmentation Plan for the Poudre River (Poudre Flows Augmentation Plan). This augmentation plan would establish minimum seasonal flows in specific reaches of the Poudre River to protect and improve the natural environment. These minimum flow designations are recognized by Colorado law, established by the CWCB in conjunction with the Colorado Division of Parks and Wildlife, and the water dedicated to these reaches is then administered within Colorado's water rights priority system by the State and Division Engineers. Poudre River water rights holders could then temporarily or permanently convey water to the CWCB that would be used to meet these minimum flow designations, resulting in additional water to the river that is protected through the river reach by Colorado water law.
    b. Thornton proposes to dedicate and deliver up to 3,000 acre-feet a year of water to the CWCB for use in the Poudre Flows Augmentation Plan. Under the Poudre Flows Augmentation Plan, Thornton will make this water available to the CWCB to release to the Poudre River at specific times and locations upstream of critical river reaches to help meet the flow targets identified in the Poudre Flows Augmentation Plan, and will be protected from diversion or exchange as it flows through the protected reaches. This is not something that Thornton could do on its own. It would cost about $45 million dollars to acquire 3,000 acre feet of comparable Poudre River water on the open market.
    c. Additional measuring devices as well as physical modifications to several diversion structures in the Poudre River will be necessary in order to maximize the benefits of

added flows from the Poudre Flows Augmentation Plan and other flow enhancement efforts. Thornton proposes to contribute $750,000 toward the study, implementation and evaluation of efforts related to improving Poudre River connectivity, aquatic and environmental health, and water rights administration.

2. Water supply challenges on the Poudre River are complex, and are just one factor of many that influence overall Poudre River health. To help address these challenges, Thornton proposes to contribute $1,000,000 toward the establishment of a Water Innovation Fund which could be used to fund creative strategies to enhance Poudre River health and address local water supply challenges.

3. Boxelder Creek flows through two of Thornton's farms east of I-25. Thornton proposes providing Larimer County with approximately 1.25 miles of 50 foot wide easement across Thornton-owned properties along Boxelder Creek for connectivity of the Boxelder Creek Regional Trail. This easement has an approximate value of $65,000.

4. As part of the Thornton Water Project, a fiber optic conduit will be installed throughout the length of the pipeline to provide for communication and operability of the many mechanisms needed to transmit and monitor the water supply. Thornton proposes to provide Larimer County with 12 strands of fiber-optic cable for the County to use for institutional services or its residents. This has the capability of providing up to 115 terabits per second of throughput. Access to this fiber is conservatively valued at $12 million dollars.

5. Thornton will begin a community-based planning process to evaluate and identify future land uses for the properties that Thornton owns in Larimer and Weld Counties. As a part of this process, Thornton will coordinate with Larimer County and other local stakeholders to identify the interests of the community, and to develop Thornton's properties in a manner in which both Thornton's water interests and the communities' vision are preserved.

6. Since 1987, Thornton has made voluntarily payments in lieu of taxes on the farms that Thornton owns in Larimer County, even though as a governmental entity Thornton is exempt from taxation on those properties. Total payments to Larimer County taxing districts since 1987 have exceeded $800,000. Thornton proposes that as long as Thornton is the fee owner of farms in Larimer County, Thornton pay the assessed valuation of those farms as agricultural property as a voluntary payment in lieu of taxes.

Section 1 Application Form

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 1, and the criteria and standards described in LUC Section 12.1.A.

Information for this section was provided in the Application and does not need to be supplemented.

Section 2 Project Description

2.a General Description, Including Purpose and Need for the Project

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2, and the criteria and standards described in LUC Sections 8.15, 8.16, and 12.1.B.

2.a.1 Purpose and Need

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 139,622 residents (City of Thornton, Third Quarter 2018, 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 cost efficient 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.

2.a.2 General Description

Alternative 3 (Option C) Corridor

The Alternative 3 (Option C) Corridor is typically 500-feet wide for TWP components in unincorporated Larimer County. The final water pipeline alignment within a 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 Alternative 3 (Option C) Corridor width allows for flexibility when developing the final water pipeline alignment and location of appurtenances. Alternative 3 (Option C) Corridor limits are shown on **Figure 2.a-1S.**

The Alternative 3 (Option C) Corridor is approximately 6 miles long in unincorporated Larimer County north of Fort Collins. It includes an area that extends south from Water Supply and Storage Company (WSSC) Reservoir No. 4 to the proposed location of the source water pump station. This area will accommodate the connection to WSSC Reservoir No. 4, the water pipeline to the source

water pump station, and the water pipeline from the source water pump station. The Alternative 3 (Option C) Corridor extends north then east from the west side of WSSC Reservoir No. 4 to County Road 9. The Alternative 3 (Option C) Corridor shown on **Figure 2.a-1S** is less than 500-feet wide at some locations to minimize impacts to existing infrastructure. The Alternative 3 (Option C) Corridor generally follows roads and property lines.

The Alternative 3 (Option C) Corridor ties into the TWP corridor at County Road 9. The TWP with Alternative 3 (Option C) Corridor (which is the Alternative 3 (Option C) Corridor plus TWP corridor east of County Road 9) is approximately 27 miles long in unincorporated Larimer County.

As discussed during the Pre-Application Conference for the project, Larimer County's process can accommodate a corridor approach for the Application. Seeking permit approval of a corridor will:

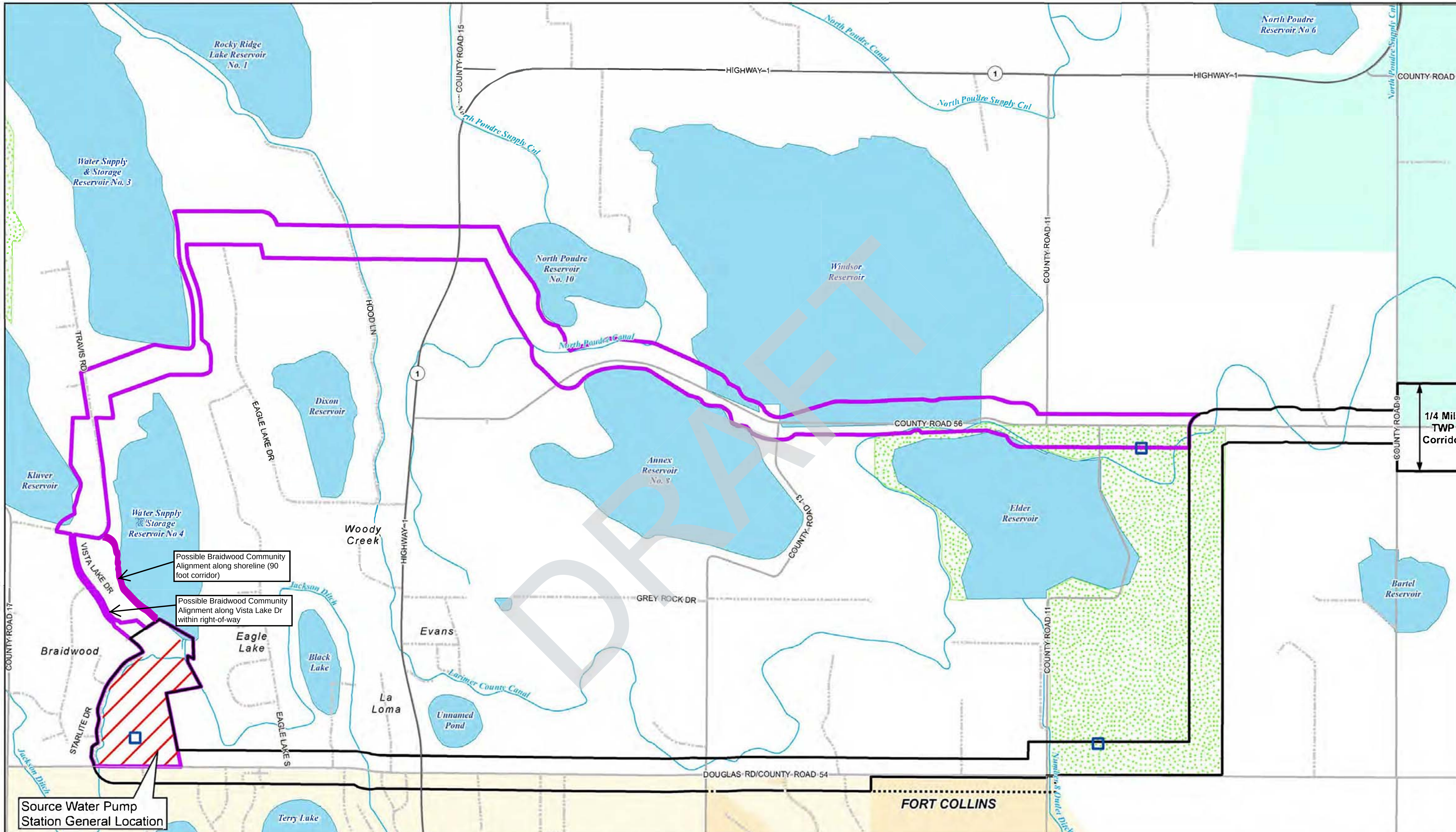
- Allow the continued efficient integration of the TWP into planned future county or municipal developments within the approved corridor through continuing coordination and outreach meetings as the TWP is developed and implemented.
- Provide property owners greater flexibility in working with Thornton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

The process to develop a final water pipeline alignment route 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. For example the corridor east of County Road 9 crosses Interstate 25 south of County Road 56; property owners may prefer that the alignment continue parallel to County Road 56 for the crossing of Interstate 25. After approval of a 1041 permit, alignment refinements within the approved 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.

Alternative 3 (Option C) Corridor Components

The Alternative 3 (Option C) Corridor components in unincorporated Larimer County include the following:

- Water pipeline. Up to approximately 6 miles of a buried, 48-inch diameter water pipeline capable of conveying 40 mgd of water will be constructed in unincorporated Larimer County. 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 except where the Alternative 3 (Option C) Corridor will be constructed in road ROW. If property owners object to granting an easement for the Alternative 3 (Option C) Corridor parallel to County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County.


Rocky Ridge Lake Reservoir No. 1
Water Supply & Storage Reservoir No. 3
North Poudre Reservoir No 6
North Poudre Canal
North Poudre Supply Cnl
North Poudre Supply Canal
HIGHWAY-1
COUNTY ROAD 58
COUNTY ROAD 15
North Poudre Reservoir No. 10
Windsor Reservoir
COUNTY ROAD 11
HOOD LN
TRAVIS RD
Dixon Reservoir
EAGLE LAKE DR
Kluver Reservoir
Water Supply & Storage Reservoir No 4
Annex Reservoir No. 8
COUNTY ROAD 56
1/4 Mile TWP Corridor
COUNTY ROAD 9
Elder Reservoir
COUNTY ROAD 13
Woody Creek
HIGHWAY-1
VISTA LAKE DR
Possible Braidwood Community Alignment along shoreline (90 foot corridor)
Possible Braidwood Community Alignment along Vista Lake Dr within right-of-way
Jackson Ditch
GREY ROCK DR
Bartel Reservoir
COUNTY ROAD 17
Braidwood
Eagle Lake
Evans
Black Lake
La Loma
Larimer County Canal
Unnamed Pond
STARLITE DR
EAGLE LAKE S
DOUGLAS RD/COUNTY ROAD 54
FORT COLLINS
Terry Lake
Source Water Pump Station General Location
DRAFT

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0 500 1,000 Feet
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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- Thornton Farm
- Potential Staging Area

Corporate Boundary
- Fort Collins
- Wellington

GMA Boundary
- Fort Collins
- Wellington

Figure 2.a-1S
Alternative 3 (Option C) Corridor Map

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

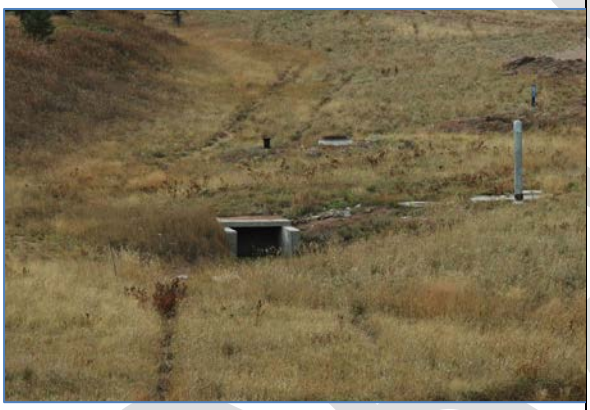
- Appurtenances
  - Source water connection. Two buried valve vaults will be constructed to connect the TWP to two existing outlet pipelines at WSSC Reservoir No. 4. From the valve vaults up to approximately ½ mile of buried 48-inch diameter water pipeline and fiber optic cable will be routed to the source water pump station.
  - Communications. Up to approximately 6 miles of buried fiber optic cable, including buried manholes, test stations, and other fiber optic cable appurtenances will generally parallel the water pipeline in unincorporated Larimer County. 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. Photographs of example appurtenances and structures are shown in **Figure 2.a-2S**. The size of structures and interior components of manholes and vaults will be designed specifically for the TWP and could vary from the description. Additional permanent and temporary easements could be obtained for these appurtenances.

The Alternative 3 (Option C) Corridor 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. Thornton has confirmed with Poudre Valley Rural Electrical Association (PVREA) that sufficient power is available in the area to supply the source water pump station. In public comments, Thornton heard community concerns that the emergency diesel powered backup generator associated with the source water pump station proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. Thornton will continue to coordinate with PVREA to determine specific requirements for power service to the source water pump station.

The source water pump station will be permitted through the Site Plan Review permit process. Information on the source water pump station provided in this Supplement 3 is of a general nature and is included to present a more complete scope of the TWP and seek siting and location approval from Larimer County. The final siting of the source water pump station will be completed during final design. The preferred location is adjacent to Douglas Road. **Figure 2.a-3S** shows an example rendering of the source water pump station adjacent to Douglas Road. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station that reduce the visual impacts of the facility. The facility will be designed to meet the then-existing Larimer County Noise Level Ordinance.

Combination Air Release Valve Vault. Photo of combination air release valve vault after construction. Vault is a concrete vault, buried below grade. Vault houses air release valves and an access manway. Visible features include the air vent, access hatch, and valve box markers.

Isolation Valve Vault. Photo of isolation vault after construction. Vault is a concrete vault, buried below grade. Vault houses an isolation valve, air release/vacuum valves, and miscellaneous piping. Visible features include the air vent, access hatches, and valve box markers.



Blow-off Assembly with Discharge Structure. Photo of blow-off manhole, pump well manhole, and dissipation structure after construction. The blow-off manhole is a concrete manhole that houses a blow-off drain valve. The pump well manhole is a concrete manhole that houses a pump out pipeline. The dissipation structure is a concrete structure located at grade. Visible features include the air vent, dissipation structure, manhole covers, and valve box markers.

Blow-off Assembly with Pump Out. Photo of blow-off manhole and pump well manhole after construction. The blow-off manhole is a concrete manhole that houses a blow-off drain valve. The pump well manhole is a concrete manhole that houses a pump out pipeline. Visible features include the air vent, manhole covers, and valve box markers.

FIGURE 2.a-2S
Example Buried Appurtenances

FIGURE 2.a-3S
Example Pump Station Rendering Adjacent to Douglas Road

The TWP with Alternative 3 (Option C) Corridor includes up to approximately 27 miles of a buried 48-inch water pipeline and associated appurtenances in unincorporated Larimer County, Colorado. If the TWP with Alternative 3 (Option C) Corridor is approved by the Board of Larimer County Commissioners, the water pipeline and appurtenant facilities will be constructed as follows:

- Within the Alternative 3 (Option C) Corridor as presented in this Supplement 3 from WSSC Reservoir No. 4 to County Road 9.
- Within the TWP corridor as presented in the Application from County Road 9 to County Road 14.

2.b Supplement Location and Total Area of the Project

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.b.

The water pipeline and associated temporary staging areas of the TWP with Alternative 3 (Option C) Corridor are anticipated to require up to 140 acres for permanent easements and up to 134 acres for temporary construction easements within unincorporated Larimer County for the TWP. These are approximate maximum amounts based on the corridor length within unincorporated Larimer County. The total area of the TWP will depend on the final alignment established for the water pipeline.

2.c Description of the Site Selection Process If Applicable

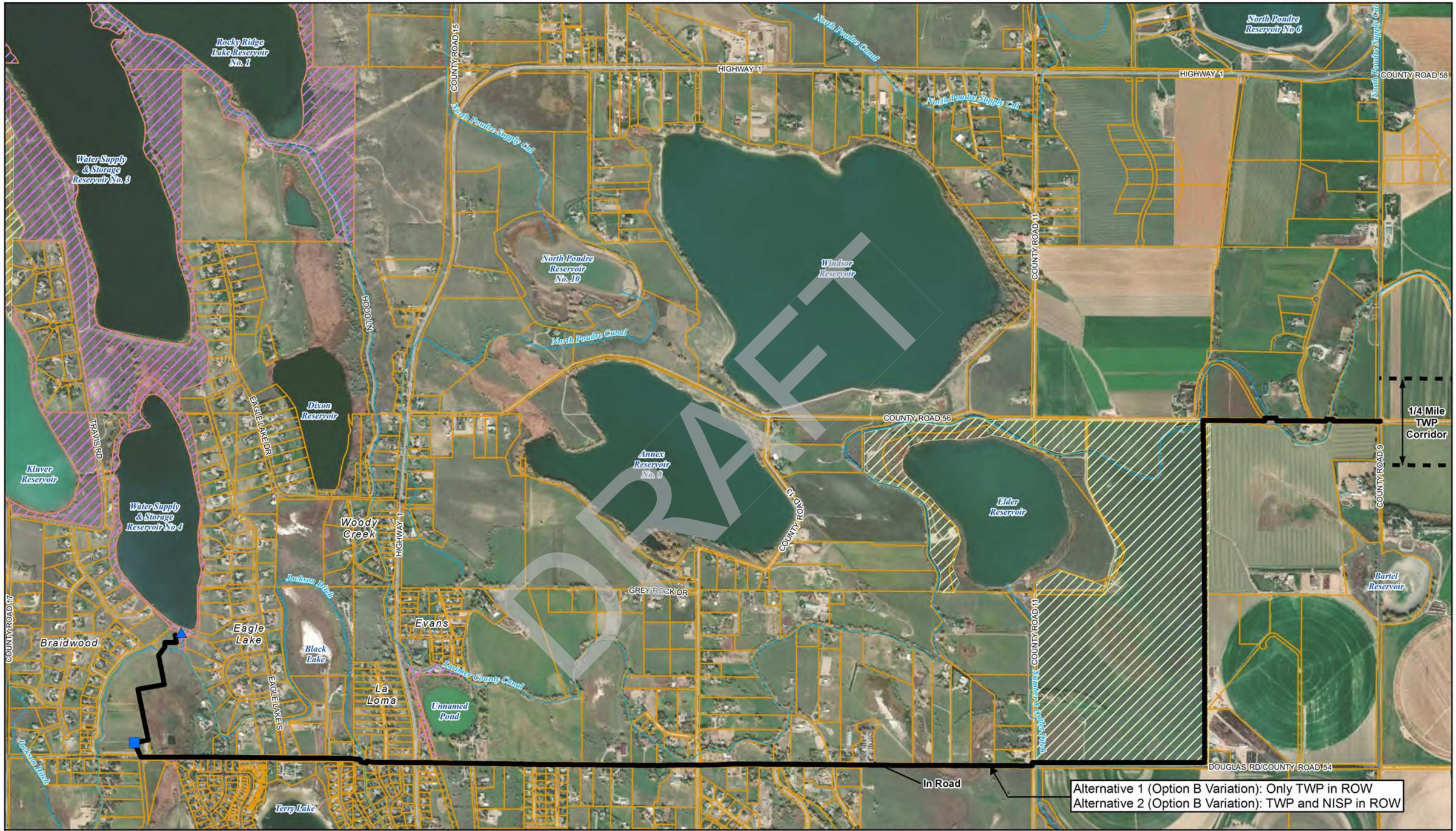
This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.c, and the criteria and standards described in LUC Section 14.10.D.2.

General

Reasonable siting and design alternatives for the Thornton Water Project are those that include taking delivery of drinking water from WSSC Reservoir No. 4 and conveying it east via pipeline. Section 2.d of this Supplement 3 presents a summary of other alternatives considered, and explanation why those alternatives were not carried forward for further site selection analysis.

The following alternatives are reasonable siting and design alternatives and further analysis was performed to determine a preferred alternative:

- Alternative 1 (Option B variation): A water pipeline installed in the Douglas Road right-of-way (ROW) to Turnberry Road and turning north to the County Road 56 corridor. The NISP pipeline would be installed in a separate corridor. *See* **Figure 2.c-1S**. This is the South 2 alternative selected as the preferred alternative in the Application and shown on **Figure 5.1.12.2-11** of **Application Appendix A,** *Technical Memorandum, Thornton Water Project, Larimer County Alternative Configurations Analysis – WSSC Reservoir Area to Larimer County Road 9,* October 2017 (Alternative Configurations Analysis). This alternative was reviewed by the Working Group as a variant of Option B.
- Alternative 2 (Option B variation): The alignment is the same as Alternative 1 (Option B Variation). The difference is co-locating a water pipeline with the NISP pipeline also installed in the Douglas Road ROW. *See* **Figure 2.c-1S**. This alternative was reviewed by the Working Group as a variant of Option B.
- Alternative 3 (Option C) Corridor: A water pipeline installed around the west side of WSSC Reservoir No. 4 meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The pipelines would be co-located from this point west to County Road 9, generally in the County Road 56 corridor. *See* **Figure 2.c-2S.** This is the West 2 alternative described in the Application and shown on **Figure 5.1.12.2-8** of the Alternative Configurations Analysis (**Application Appendix A**). This alternative was reviewed by the Working Group as Option C.
- Alternative 4 (Option C variation): A water pipeline installed around the east side of WSSC Reservoir No. 4, meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The pipelines would be co-located from this point west to County Road 9, generally in the County Road 56 corridor. *See* **Figure 2.c-3S.** This was suggested by the Working Group as a variant to Option C.
- Alternative 5 Central alignment: A water pipeline installed through the Eagle Lake and Woody Creek neighborhoods to Highway 1, continuing east in the Grey Rock Drive corridor to Turnberry Road, routing north to County Road 56. *See* **Figure 2.c-4S.** This is the Central alternative described in the Application and shown on **Figure 5.1.12.2-9** of the Alternative Configurations Analysis (**Application Appendix A**).
- Alternative 6 South 4 alignment: A water pipeline installed in the Douglas Road ROW to a point approximately ½-mile east of Highway 1, then turning north and east to the County Road 56 corridor at County Road 13. *See* **Figure 2.c-5S**. This is the South 4 alternative described in the Application and shown on **Figure 5.1.12.2-13** of the Alternative Configurations Analysis (**Application Appendix A**)



Thornton WATER PROJECT

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THORNTON, CO 80241-2405

12/5/2018

N W E S

0 500 1,000 Feet

1 inch = 1,400 feet

River/Stream/Canal/Ditch
Pump Station (PS-#)
WSSC Reservoir Outlet Structure
Parcel Boundary
Thornton Owned Property
WSSC Owned Property
Alternative 1 (Option B Variation) and Alternative 2 (Option B Variation) Alignment

Figure 2.c-1S
Larimer County
Alternative 1 (Option B Variation) and Alternative 2 (Option B Variation) Alignment

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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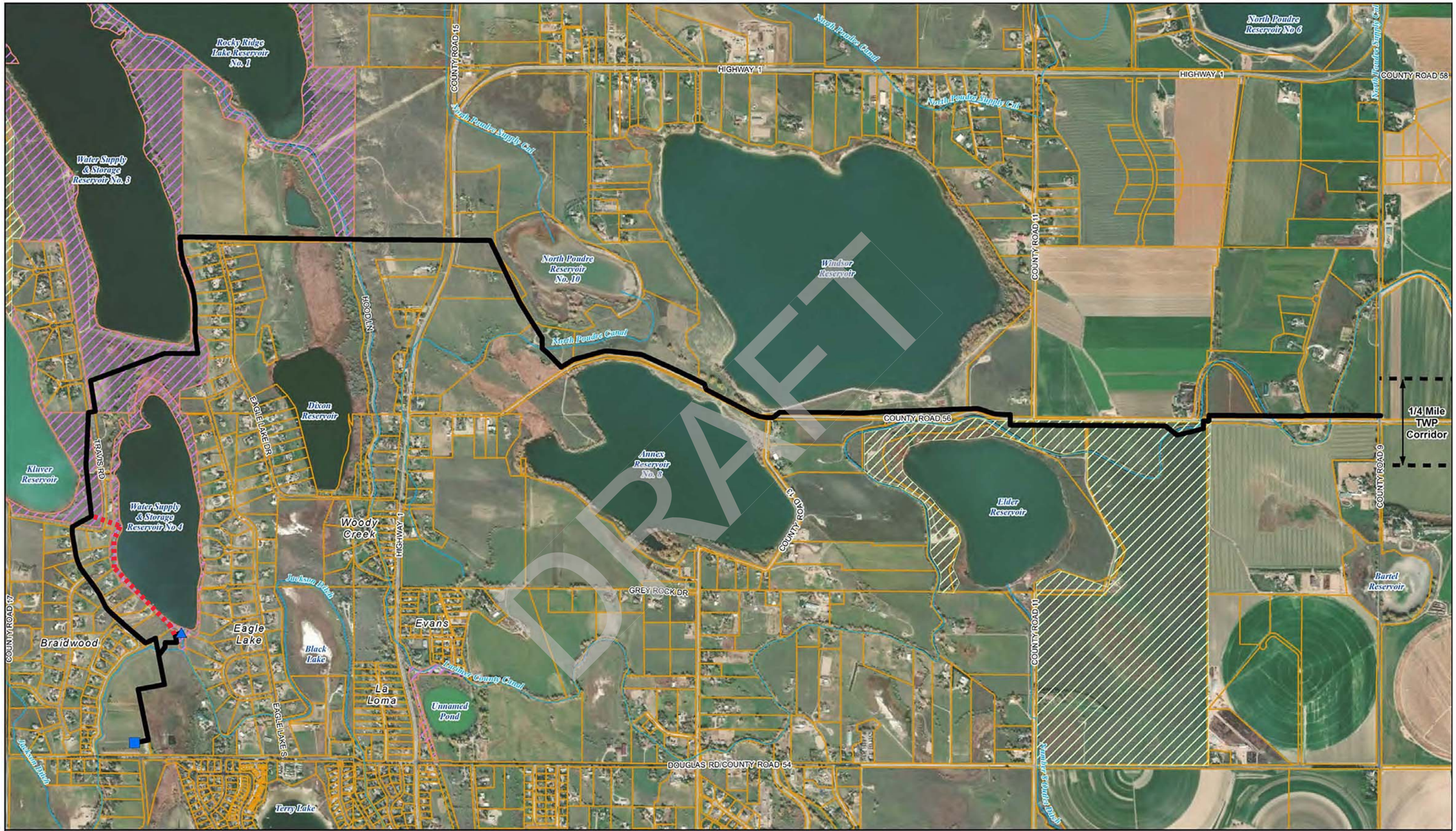

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1 inch = 1,400 feet

- River/Stream/Canal/Ditch
- Pump Station (PS-#)
- WSSC Reservoir
- Outlet Structure
- Parcel Boundary
- Thornton Owned Property
- WSSC Owned Property
- Alternative 3 (Option C) Alignment
- Alternative 3 (Option C) Possible Braidwood Community Alignment

Figure 2.c-2S
Larimer County
Alternative 3 (Option C) Alignment

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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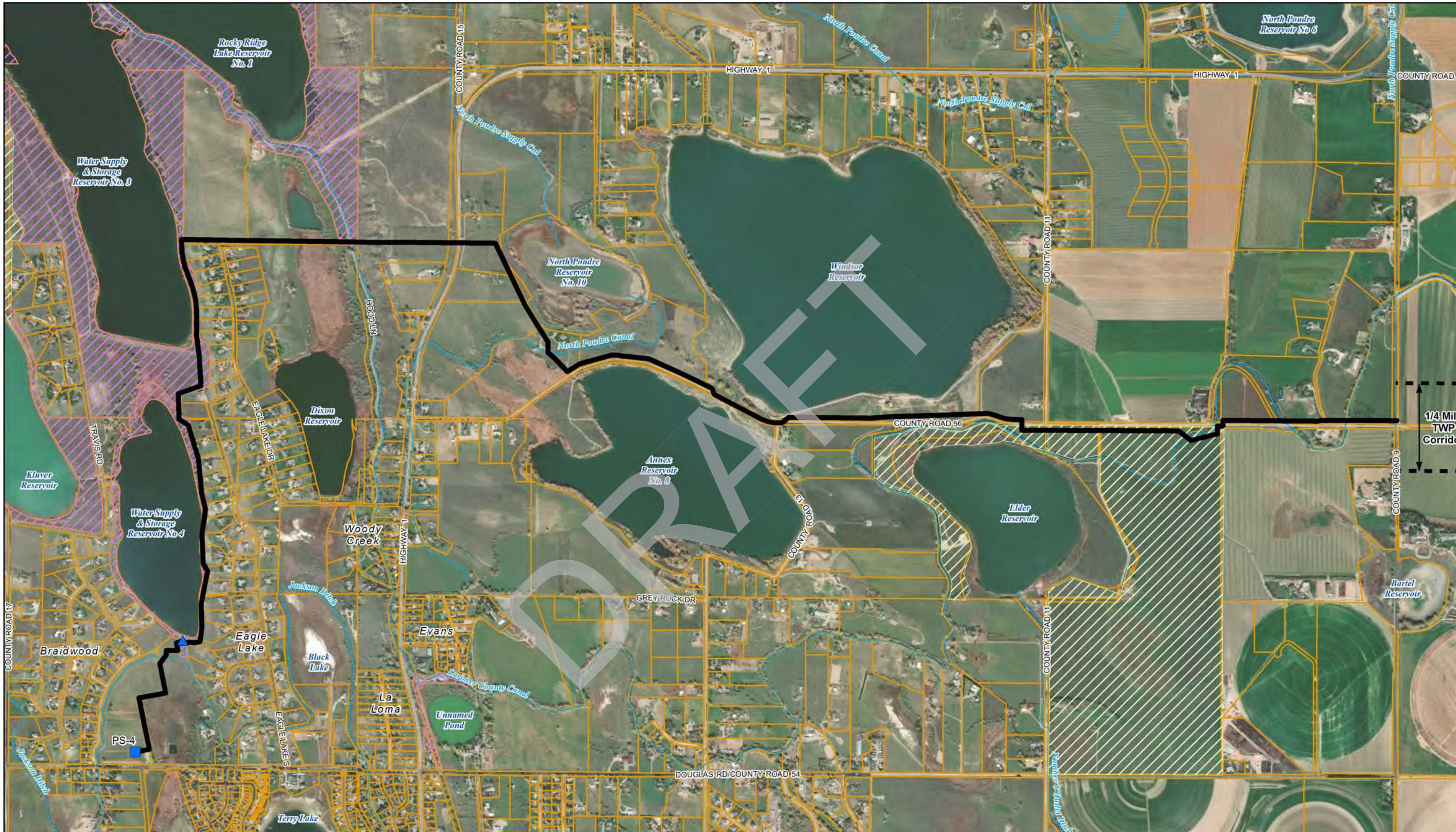
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Water Supply & Storage Reservoir No. 3
North Poudre Reservoir No 6
North Poudre Canal
North Poudre Supply Cnl
HIGHWAY 1
COUNTY ROAD 58
COUNTY ROAD 15
North Poudre Reservoir No. 10
Windsor Reservoir
COUNTY ROAD 11
HOOD LN
North Poudre Canal
Dixon Reservoir
EAGLE LAKE DR
COUNTY ROAD 56
1/4 Mile TWP Corridor
TRAVIS RD
Kluver Reservoir
Annex Reservoir No. 8
Elder Reservoir
COUNTY ROAD 9
Water Supply & Storage Reservoir No 4
Woody Creek
HIGHWAY 1
COUNTY ROAD 13
Jackson Ditch
GREY ROCK DR
Bartel Reservoir
COUNTY ROAD 17
Braidwood
Eagle Lake
Evans
Black Lake
Larimer County Canal
La Loma
EAGLE LAKE S
Unnamed Pond
PS-4
Jackson Ditch
DOUGLAS RD/COUNTY ROAD 54
Terry Lake
DRAFT

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1 inch = 1,400 feet

- River/Stream/Canal/Ditch
- Pump Station (PS-#)
- WSSC Reservoir Outlet Structure
- Parcel Boundary
- Thornton Owned Property
- WSSC Owned Property
- Alternative 4 (Option C Variation) Alignment

Figure 2.c-3S
Larimer County
Alternative 4 (Option C Variation) Alignment

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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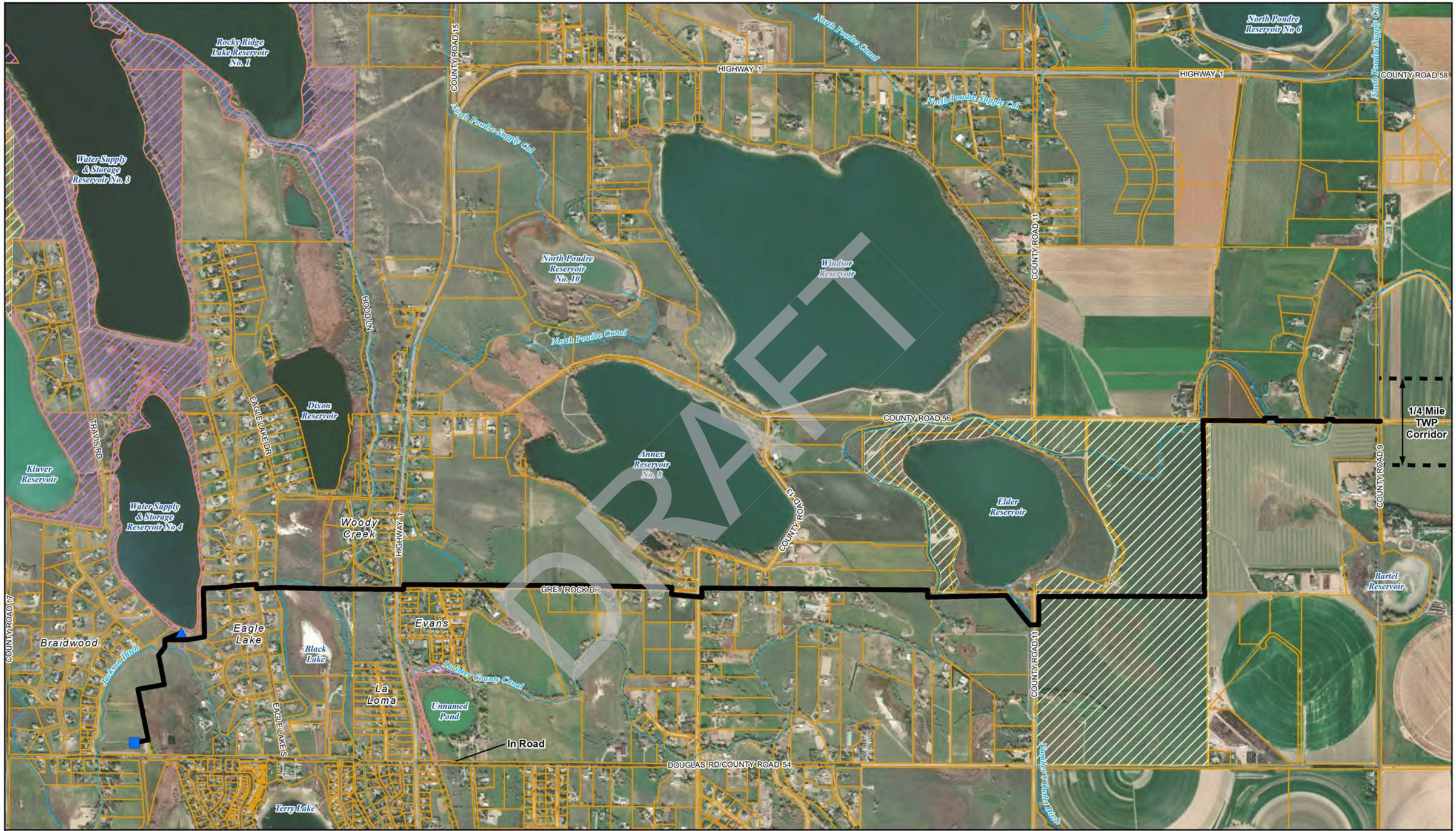

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1 inch = 1,400 feet

River/Stream/Canal/Ditch
Pump Station (PS-#)
WSSC Reservoir Outlet Structure
Parcel Boundary
Thornton Owned Property
WSSC Owned Property
Alternative 5 Central Alignment

Figure 2.c-4S
Larimer County
Alternative 5 Central Alignment

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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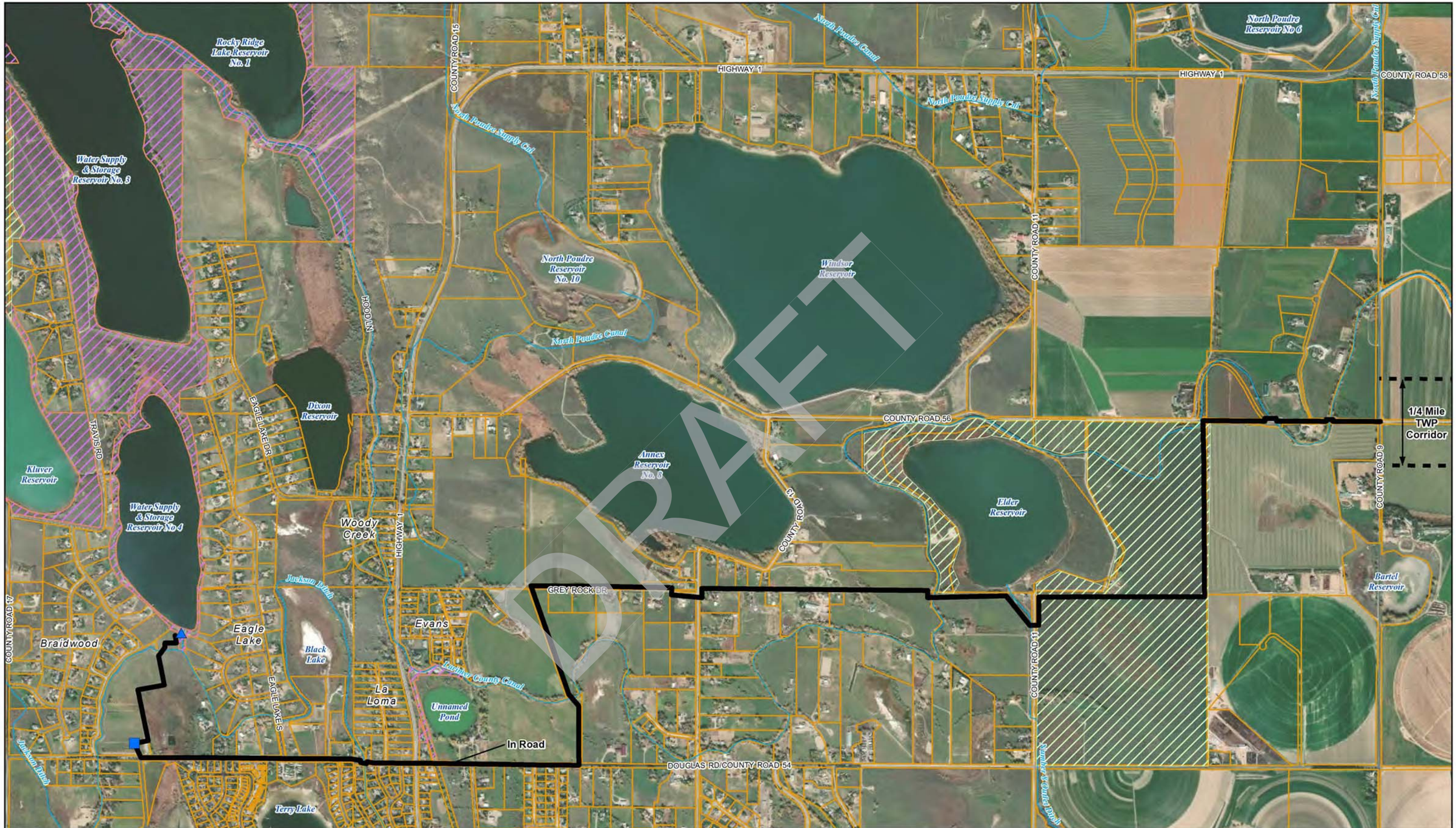

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1 inch = 1,400 feet

River/Stream/Canal/Ditch
Pump Station (PS-#)
WSSC Reservoir Outlet Structure
Parcel Boundary
Thornton Owned Property
WSSC Owned Property
Alternative 6 South 4 Alignment

Figure 2.c-5S
Larimer County
Alternative 6 South 4 Alignment

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

Description of Site Selection Process

The six alternatives listed above are reasonable siting and design alternatives and are acceptable to Thornton. The Larimer Water Projects Working Group (Working Group) was tasked with developing interests most important to Larimer County residents and stakeholders, which were used to inform the site selection process. Highly rated interests identified by the Working Group and supported by feedback given at the community open house (Open House) were used to develop screening levels against which the alternatives could be judged. This process, with supporting feedback given by the Working Group and supported by public comment at the Open House, is described below.

Screening Level 1 – Opportunity to Co-Locate with NISP

At the November 15, 2018 community open house (Open House), attendees were posed the following question:

> *Larimer County is currently processing two applications for two different water conveyance projects. One is the Thornton Water Project. The other is the Northern Integrated Supply Project proposed by Northern Water. If there are two pipelines, how important is it for them to be co-located / constructed in the same alignment?*

Of the 55 responses, 39 (71%) indicated that that co-location is "Important" or "Very Important".

At the November 27, 2018 Working Group meeting, group members were asked the following question:

> *If a pipeline option is selected, do you think that Thornton and Northern should coordinate construction and co-locate their respective pipelines?*

Responses to this question were given by 19 of the 26 attendees. Of those Working Group members who responded, 84% indicated "Yes they should/they need to."

Working Group and public comment is consistent in support of co-locating the water pipeline and NISP pipeline. Alternative 1 (Option B variation) includes only the water pipeline in the Douglas Road ROW, with the NISP pipeline located elsewhere, so it does not meet this community interest. Alternative 5 Central alignment and Alternative 6 South 4 alignment include co-location of the TWP pipeline and NISP pipeline in a limited area between Turnberry Road and County Road 9, less than 20% of the length of each of those alternatives between WSSC Reservoir No. 4 and County Road 9. On the other hand, Alternative 2 (Option B variation), Alternative 3 (Option C) Corridor, and Alternative 4 (Option C variation) result in at least 75% of the length between WSSC Reservoir No. 4 and County Road 9 co-located with the NISP pipeline, so these alternatives most meet the interest expressed to co-locate the two pipelines. Accordingly, these three Alternatives (2, 3 and 4) were carried forward to the second screening level.

Screening Level 2 – Disruption to Traffic/Construction Duration

At the Open House, attendees were posed the following question and gave the following responses:

> *Option B: Douglas Road Pipeline: What are potential negative impacts in Larimer County (and mitigation measures)?*
>
> - Likely has the highest traffic impact of the pipeline options because of construction duration, number of properties and homes affected, and full closures to through traffic. (50 responses)
> - 2-4 years construction impact. Like a war zone. (41 responses).

This question received 100 total responses, 91% of which indicated a negative impact based on traffic disruption and construction duration. Additionally, traffic disruption was indicated to be a significant impact on the Shields Street alternative. Less traffic impact was viewed to be a benefit.

At the November 27, 2018 Working Group meeting, group members were asked the following question related to Option B: Douglas Road Pipeline(s):

> *Based on the dots exercise at the November 15 community meeting, the following 5 potential negative impacts of Option B (Douglas Road Pipeline(s)) are of most concern to the community. Of these, which is of the most concern to you? (Select one.)*
>
> *A. Likely has the highest traffic impact of the pipeline options because of construction duration, number of properties and homes affected, and full closures through traffic.*
>
> *B. 2-4 years construction impact. Like a war zone.*
>
> *C. Construction time and impacts are affected by whether one or two pipelines are built concurrently (may be addressed by hours of construction, night work, monetary incentives to speed construction).*
>
> *D. Wetlands-impact wildlife.*
>
> *E. Not NISP preferred option (Tied for 5th).*
>
> *F. Utility shuts off (water, power, cable) (Tied for 5th).*

Responses to this question were given by 21 of the 26 attendees. Of the Working Group members who responded, 95% indicated that traffic impacts and construction duration are of the most concern.

As part of the Working Group process, Larimer County undertook a traffic study to determine potential impacts of construction based on various water pipeline projects. The study is summarized in **Supplement 3 Appendix D** – *Thornton Water Project Summary of Existing Conditions and Project Impacts* (Felsburg, Holt, & Ullevig, November 13, 2018). As described in the memorandum, traffic counts are significantly higher on Douglas Road than County Road 56. Accordingly, traffic impact of construction in the Douglas Road ROW, whether constructing only the water pipeline proposed in the Application or in co-locating two pipelines, would be significantly higher than in the County Road 56 ROW.

As described in **Supplement 3 Appendix B** Thornton Water Project Douglas Road Dual Water Pipeline Construction Schedule and Sequence (CH2M HILL, October 29, 2018), concurrent construction of both the water pipeline and NISP pipeline in the Douglas Road ROW would require rolling road closures over an approximate 3-year period along Douglas Road. While it is feasible to construct two pipelines in the Douglas Road ROW, it does not meet the interest of the Working Group and Larimer County residents of minimizing disruptions to traffic and construction duration. Accordingly, Alternative 2 (Option B variation) was not carried forward to the third screening level. Alternative 3 (Option C) Corridor and Alternative 4 (Option C variation) meet this interest in that they are located mostly outside of road ROWs, or in roads with low traffic counts and were carried forward to the third screening level.

Screening Level 3 – Impacts to Private Property

The difference between Alternative 3 (Option C) Corridor and Alternative 4 (Option C variation) is the route taken around WSSC Reservoir No. 4. Alternative 3 (Option C) Corridor routes around the west side of the reservoir, in the Vista Lake Drive ROW, or adjacent to the lake in the back portion of 7 occupied residential lots, and on WSSC properties. Alternative 4 (Option C variation) routes around

the east side of WSSC Reservoir No. 4, in the back portion of 15 occupied residential lots. Both alternatives fall under "Option C: County Road 56 Pipeline" as presented to the Working Group and at the Open House.

At the Open House, attendees were asked what they perceived to be benefits to Larimer County of Option C. The top 3 responses were:

1. Potentially most feasible to co- locate Thornton and Northern pipelines while minimizing area and duration of construction in the County. (37 responses)
2. Thornton's participation in Poudre River instream flow (i.e., 3,000- acre feet/year) would augment river flows. Other acquisition of water rights could occur as noted in "B - Douglas Road". (17 responses)
3. If in right of way, minimizes disruption to private properties. (12 responses).

At the November 27, 2018 Working Group meeting, group members were asked the following questions related to Option C: North Route (CR 56) Pipeline(s):

Based on the dots exercise at the November 15 community meeting, the following 5 potential community benefits of Option C (North Route (CR 56) Pipeline(s)) are the most important to the community. Of these, which is the highest priority to you? (Select one.)

A. Potentially most feasible to co-locate Thornton and Northern pipelines while minimizing area and duration of construction in the County.

B. Better from standpoint of traffic impacts versus Douglas Road.

C. If in right of way, minimizes disruption to private properties.

D. Thornton's participation in Poudre River instream flow (i.e., 3,000-acre feet/year) would augment river flows. Other acquisition of water rights could occur as noted in "B – Douglas Road".

E. No taking of private property.

12 of the 26 attendees responded to this question, and the top 2 responses were:

1. Potentially most feasible to co-locate Thornton and Northern pipelines while minimizing area and duration of construction in the County. (58%)
2. No taking of private property. (17%)

Based on the dots exercise at the November 15 community meeting, the following 5 potential negative impacts of Option C (North Route (CR 56) Pipeline(s)) are of most concern to the community. Of these, which is of the most concern to you? (Select one.)

10 of the 26 attendees responded to this question, and the top 3 responses were:

1. Lowest traffic impact of the pipeline options because of construction duration and number of properties and homes affected. (40%)
2. Impacts of properties on east side of Reservoirs 3 and 4 (36 properties). (20%)
3. Impacts private property (Eagle Lake and CR 56) but CR 54 is all in right of way. (20%)

Alternative 3 (Option C) Corridor and Alternative 4 (Option C variation) are essentially equal in relation to co-location potential of the water pipeline and NISP pipeline, Thornton's participation in Cache la Poudre River in-stream flows, and traffic impacts. While Alternative 3 (Option C) Corridor is longer than Alternative 4 (Option C variation), where the two alternatives differ, Alternative 3 (Option C) Corridor is located in road ROW, on 7 occupied residential lots, or on property owned by

WSSC, rather than on 15 occupied residential lots. **Table 2.cS** shows a comparison of Alternative 3 (Option C) Corridor and Alternative 4 (Option C variation).

TABLE 2.cS
Comparison of Alternative 3 (Option C) Corridor and Alternative 4 (Option C variation) based on Community Interests

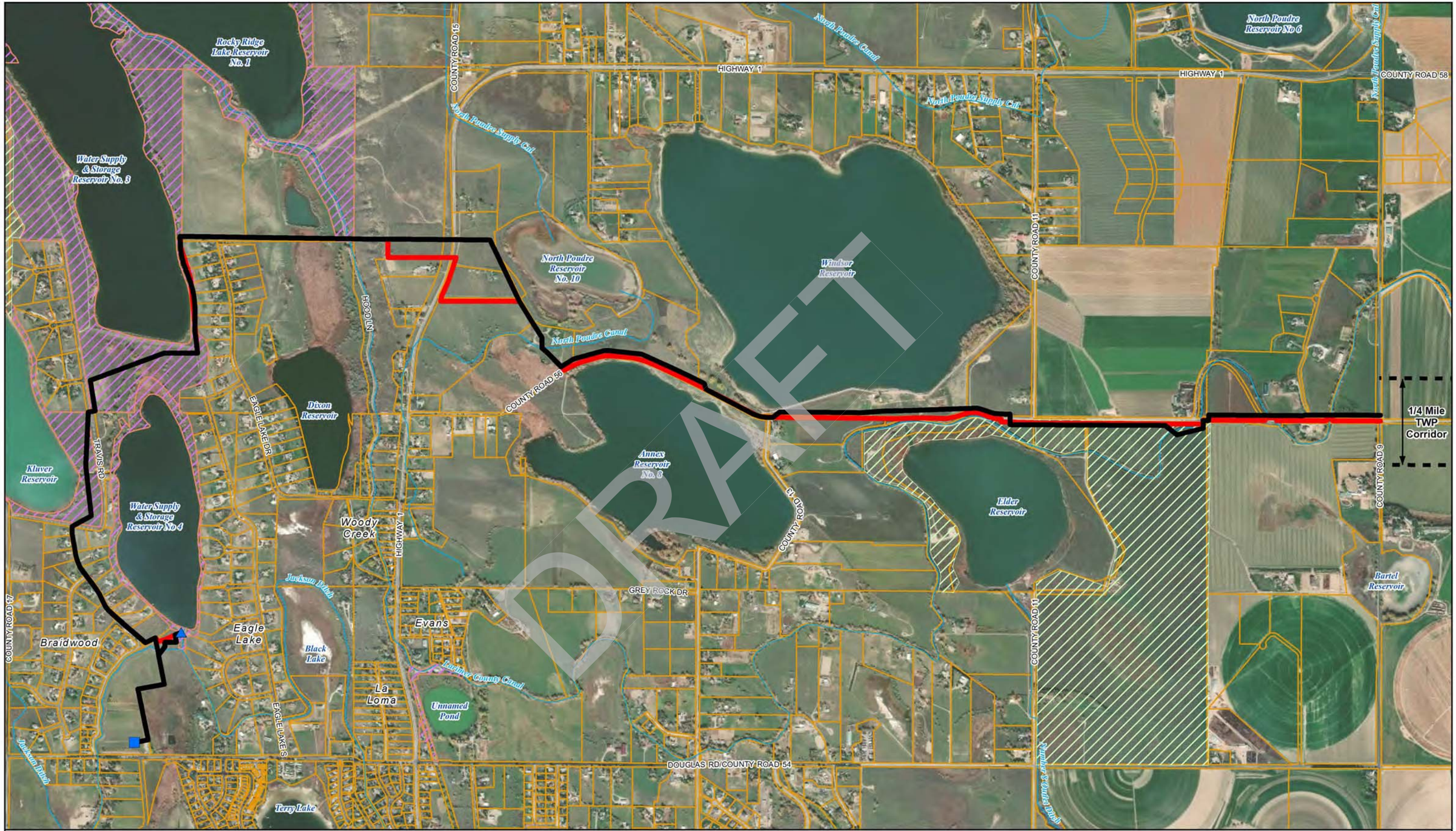
Interest	Alternative 3 (Option C) Corridor– West side of WSSC Res No. 4	Alternative 4 (Option C variation) – East side of WSSC Res No. 4	Preferred Alternative
Potential Percentage of Alternative Length Co-located with NISP	76.8	76.7	3
Percentage of Alternative Length Located in Public ROW	9.4	4.4	4
Percentage of Alternative Length Located in Private Easement (excludes Thornton and WSSC owned properties)	66.5	76.2	3
Number of parcels crossed (excludes Thornton and WSSC owned properties)	21	34	3

Note: Table 2.cS Alternative 3 (Option C) describes use of Vista Lake Drive ROW. Use of private property adjacent to WSSC #4 is an alternative

As shown in **Table 2.cS,** Alternative 3 (Option C) Corridor presents slightly more opportunity for co-location with the NISP pipeline, less of the overall alignment located on private properties not owned by Thornton or WSSC, and crosses fewer private parcels. The additional parcels crossed by Alternative 4 (Option C variation) are occupied residential parcels. Three out of the four measurable criteria developed based on the most-supported interests of the Working Group and Open House feedback favor Alternative 3 (Option C) Corridor.

Summary

Based on the site selection process described above, using community and Working Group feedback, Thornton requests approval for a corridor based Alternative 3 (Option C) Corridor, also known as Working Group Option C: North Route (CR 56) Pipeline(s). This alternative is substantially similar to the West 2 Alternative as presented in the original 1041 Application. **Figure 2.c-6S** shows a comparison of Alternative 3 (Option C) Corridor and the West 2 alternative presented in the Application for reference. Modifications to the West 2 Alternative from the Application were made to place the source water pump station closer to Douglas Road and coordinate the alignment with the currently-proposed NISP pipeline between WSSC Reservoir No. 3 and WSSC Reservoir No. 4, and on each side of Highway 1.



Thornton WATER PROJECT

CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

12/5/2018

N
W E
S

0 500 1,000 Feet

1 inch = 1,400 feet

- River/Stream/Canal/Ditch
- Pump Station (PS-#)
- WSSC Reservoir Outlet Structure
- Parcel Boundary
- Thornton Owned Property
- WSSC Owned Property
- Alternative 3 (Option C) Alignment Alternative
- West 2 Alignment Alternative

Figure 2.c-6S
Larimer County
Alternative 3 (Option C) and West 2 Comparison

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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2.d Description of Other Alternatives Considered, or Explanation of Why No Reasonable Alternatives are Available

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.d, and the criteria and standards described in LUC Section, 14.10.D.2.

General

Through the Larimer County facilitated public engagement process (Public Involvement), Working Group members presented ideas, concepts and potential enhancements (ideas) as to how Thornton might convey its drinking water supply from its decreed diversion point on the Cache la Poudre River to Thornton. This subsection of Supplement 3 presents a description of those ideas as understood by Thornton and evaluates those ideas in the context of various project configurations (alternatives) and how those alternatives are or are not reasonable siting and design alternatives and can or cannot meet the purpose and need of the TWP.

In addition, WSSC is the owner and operator of the irrigation company that delivers the water to Thornton, as well as to several agricultural operations in Larimer and Weld counties; and has interests in the operation and configuration of the project. Therefore, we have included evaluation of how the various alternatives meet WSSC's interests, or provide benefits to or negatively impact WSSC.

The following ideas were presented by the Working Group:

- Use the Cache la Poudre River instead of a pipeline (River Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option D: Poudre River)
- Use existing ditches or canals instead of a pipeline (Canal Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option A: Canal Conveyance)
- Use lake taps (micro-tunneled lake intakes) to access water in the WSSC reservoir system instead of trenched pipelines from reservoir outlets (Lake Tap Concept)

In coming up with these ideas and concepts, Working Group members were thoughtful and creative. However, because the Public Involvement process was designed to consider community interests at the exclusion of Thornton's interests, the ideas put forward were developed based only on individual or neighborhood interests and positions without regard to how those ideas are or are not reasonable siting and design alternatives and might, or might not, meet the interests of Thornton in meeting the purpose and need of the TWP. To present a complete picture, Thornton has evaluated the proposed ideas as to whether they are or are not reasonable siting and design alternatives and its ability to meet the purpose and need of Thornton's drinking water supply project.

The purpose of the Thornton Water Project, as proposed in the 1041 permit application is the cost effective and efficient construction of conveyance infrastructure to deliver Thornton's drinking water supply to:

Need 1: Meet projected drinking water needs in Thornton;

Need 2: Meet the need to improve water supply reliability through the addition of a new water supply source to Thornton's water supply portfolio;

Need 3: Meet the need to secure a high-quality source of water; and

Need 4: Meet the need to have the project deliver water no later than January 2025.

The subsections below present evaluation results of alternatives based on each idea from the Working Group, whether it is or is not a reasonable siting and design alternative and whether it meets Thornton's purpose and need for the project. Also included is an assessment of whether the alternative also meets the interests of or provides benefits to or negatively impacts WSSC.

River Delivery Alternatives

The original River Delivery Alternative (designated Cache la Poudre River 1 (CLP1)) is to leave the water in the river and take it out at Windsor. Additional variations of that alternative are:

- Leave the water in the river and take it out just upstream of the Mulberry Water Reclamation Facility outfall (designated Cache la Poudre River 2 (CLP2)).
- Continue to divert the water into the Larimer County Canal and have it flow through the WSSC Reservoir system and then deliver the water to the river through a pipeline generally constructed along Shields Street with a take out at Windsor (designated Shields1).
- Continue to divert the water into the Larimer County Canal and have it flow through the WSSC Reservoir system and then deliver the water to the river through a pipeline generally constructed along Shields Street with a take out just upstream of the Mulberry Water Reclamation Facility outfall (designated Shields2).

Note: The Shields alternatives are also labeled in the Larimer County Public Involvement process as Option E: Shields Street to Poudre River. It should be noted that Option E in the Larimer County Public Involvement process was not the original proposal made by Mick Ondris in his document titled *Shields Street/Poudre River Alternative to the Thornton Pipeline Proposal*, dated September 19, 2018 (Ondris Proposal) (**Supplement 3 Appendix D**). It was modified by Thornton as described in *Thornton Water Project Modified Poudre River Alternative*, dated November 12, 2018 (**Supplement 3 Appendix B**) to reduce water quality impacts of leaving the water in the river. Based on the feedback from the public and the Working Group the modified Ondris proposal was rejected by the Working Group. Accordingly, the analysis presented in this Supplement 3 is based on the original Ondris proposal.

Figure 2.d-1S presents the four (4) River Delivery Alternatives. **Table 2.d-1S** presents a tabulation of infrastructure required for each River Delivery Option. Each of the infrastructure requirements are discussed in the following subsections. Note: The Ondris proposal included multi-jurisdictional, regional improvements to storm and waste water infrastructure by others and settling ponds for sediment reduction (to address water quality) that are not included in this list of infrastructure requirements.

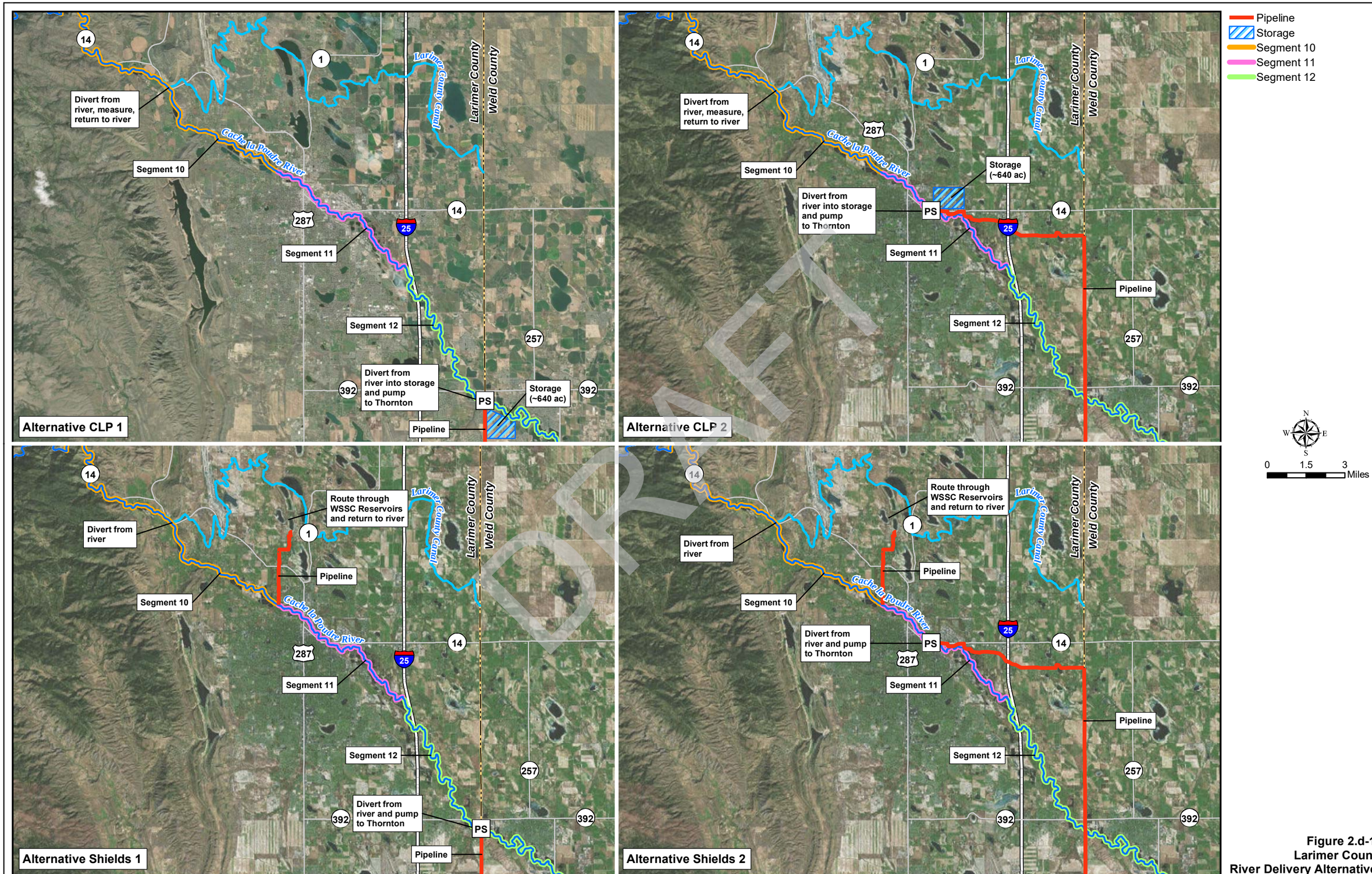


Figure 2.d-1S
Larimer County
River Delivery Alternatives

TABLE 2.d-1S
Infrastructure Requirements for River Delivery Alternatives

Alternative Designation	Required Infrastructure
CLP1	Modifications to the LCC Head gate to allow flows to be measured and returned to the River 13 bypass structures along the Cache la Poudre River from the LCC head gate to Windsor to ensure that flows are protected from downstream diverters as the water flows downstream A river diversion at Windsor 12,482 acre-feet of storage near the diversion location at Windsor A pump station at the storage location in Windsor A pipeline from Windsor to Thornton Additional treatment unit processes to reduce disease risk to people
CLP2	Modifications to the LCC Head gate to allow flows to be measured and returned to the River 8 bypass structures along the Cache la Poudre River from LCC head gate to Mulberry to ensure that flows are protected from downstream diverters as the water flows downstream A river diversion at Mulberry or modifications of the Timnath Reservoir Inlet diversion channel, if the NISP project is approved and the Mulberry Water Reclamation Facility (WRF) outfall is relocated 12,482 acre-feet of storage near the diversion location at Mulberry or Timnath Reservoir Inlet diversion channel A pump station at Mulberry A pipeline from Mulberry to Windsor A pipeline from Windsor to Thornton Additional treatment unit processes to reduce disease risks to people
Shields1	Connection of a pipeline to the existing WSSC Reservoir 4 outlet structure A pipeline along Shields to the River 7 bypass structures along the Cache la Poudre River between Shields and Windsor to ensure that flows are protected from downstream diverters as the water flows downstream A river diversion at Windsor A pump station at Windsor A pipeline from Windsor to Thornton Additional treatment unit processes to reduce disease risks to people
Shields2	Connection of a pipeline to the existing WSSC Reservoir 4 outlet structure A pipeline along Shields to the River 2 bypass structures between Shields and Mulberry to ensure that flows are protected from downstream diverters as the water flows downstream A river diversion at Mulberry or modifications of the Timnath Reservoir Inlet diversion channel, if the NISP project is approved and the Mulberry WRF outfall is relocated A pump station at Mulberry A pipeline from Mulberry to Windsor A pipeline from Windsor to Thornton Additional treatment unit processes to reduce disease risks to people

Diversions and Bypass Structures

Because some ditch companies have the right to "sweep the river" (i.e., divert the entire flow in the river), all river delivery alternatives require the construction of bypass structures within the river to ensure that flows put into the river are measured and not diverted by downstream ditch companies at their head gates. All the Cache la Poudre River options require modification of the LCC head gate to allow diverted water to be measured at the head gate as required by Thornton's decree and to provide a mechanism to put Thornton's share of that water back into the river. Construction of these structures will require a United States Army Corps of Engineers (USACE) 404 Permit as the Cache la Poudre River is considered a water of the United States (WUS). Diversions will divert water from the river into a diversion channel that will convey the water to either water storage (alternatives CLP1 and CLP2) or to a pump station intake (alternatives Shields 1 and Shields 2). Diversions at Mulberry (alternatives CLP2 and Shields2) are either through a new diversion, if the Mulberry WRF outfall is not relocated, or through modifications of the Timnath Reservoir Inlet diversion channel, if NISP is approved and the Mulberry WRF outfall is relocated.

Water Storage

CLP1 and CLP2 alternatives also require the construction of a storage reservoir at the diversion point to replace the WSSC reservoir storage bypassed under the Cache la Poudre River alternatives. Water storage is integral to the TWP and access to it was part of the purchase of the WSSC shares by Thornton. Water storage: 1) provides the means to deliver a steady and reliable quantity of drinking water on a year round basis; 2) provides a greater opportunity to mix incoming water off the river with stored water to allow delivery of a relatively consistent source quality; and 3) allows water to be delivered at a lower rate than the rate water comes into the reservoir storage, allowing construction of smaller downstream infrastructure which reduces the construction impacts from constructing larger downstream infrastructure.

Construction of storage to replace the WSSC reservoir storage bypassed by the Cache la Poudre River alternatives at another location will be extensive and significantly more impactful than using existing storage at WSSC. The existing WSSC reservoirs occupy more than 640 acres (1 square mile). Possible off channel storage sites of 640 acres do not exist at the Mulberry location and possible off channel storage sites at the Windsor location are already owned and being used by others (United Water and Sanitation District and Central Weld Water Conservancy District). Siting and designing the project without storage (existing or new) will require that all downstream infrastructure be larger, producing greater construction impacts. Also, construction of a reservoir will require a 1041 Permit if constructed in Larimer County, and likely require a 404 Permit as the size of the reservoir is likely to require placement of fill material within WUS or wetlands.

Pump Stations

All Cache la Poudre River alternatives require a pump station near the diversion location. For the Shields alternatives, the pump station will take water from the diversion channel and pump it into a pipeline. For the Cache la Poudre River alternatives, the pump station will take water from the newly constructed storage reservoirs and pump it into a pipeline. The size of the pump station will be inversely proportional to storage, i.e., less storage requires a bigger pump station, resulting in more construction impacts.

Pipelines

Alternatives with diversions at Mulberry (CLP2 and Shields 2) also require a pipeline from Mulberry to Windsor. All alternatives require a pipeline from Windsor to Thornton for final delivery of the water. The size of any of the proposed pipelines is inversely proportional to the availability of water

storage upstream of the pipeline, i.e., less storage requires a bigger pipeline, resulting in more construction impacts.

Water Treatment and Water Quality Impacts to Public Health

To reduce disease risks to people, all River Delivery Alternatives will require Thornton to construct additional water treatment processes at its water treatment facilities. These additional water treatment processes are beyond the base case of treating water from WSSC Reservoir 4 and result from degradation of water within the Cache la Poudre River as it travels east and is exposed to both wastewater treatment plant discharges, runoff from urban areas, runoff from agricultural lands and impacts from geologic influences to groundwater inflows. *Water Quality Ramifications of Locating Thornton's Water Intake at a Downstream Location,* Jacobs, November 14, 2018) (Water Quality Report) (**Supplement 3 Appendix B**) presents an analysis of water quality impacts from alternate diversion points along the Cache la Poudre River and LCC. The conclusion of that analysis is as follows:

> *"Diversion of Thornton's drinking water supply from the Cache La Poudre (Poudre) River below the current diversion point at the Larimer County Canal (LCC) will result in several adverse raw water quality issues associated with ensuring drinking water quality, including increased public health risk associated with the water supply, decreased water supply reliability, increased community impacts, and increased cost for drinking water treatment."*

Additional water quality information resulting from this analysis was also presented to the public via a Larimer County webinar titled, *Water Flows and Quality* on November 5, 2018 and uploaded to https://www.larimerwaterprojects.org/ for public access and viewing.

The water quality analysis presented data indicating that water quality in the Cache la Poudre River degrades as it flows downstream. This is reflected in Colorado Department of Public Health and Environment's (CDPHE) designation that stream segment 10 (upstream of Shields Street) is suitable for use as a water supply, but stream segments 11 (between Shields Street and Boxelder Creek) and 12 (downstream of Boxelder Creek) are not suitable for use as a water supply. Thornton's purchased and decreed water rights are diverted at the LCC head gate within stream segment 10 and have been diverted at that location for over 100 years. A drinking water supply diversion downstream of the current diversion is influenced by man-made factors resulting from urbanization, such as sediment, runoff from roadways, pesticides and nutrients from lawns and gardens, viruses, bacteria and nutrients from leaky septic tanks, road salts and heavy metals from roof shingles. The presence of these contaminants within the watershed increases the risk that one or more contaminants or pathogens will pass through the treatment facility and will, at a minimum, affect the reliability of the delivery of treated drinking water or at worse, cause disease or affect public health. This would be an ongoing, unnecessary and unreasonable public health risk to Thornton customers, in comparison to the temporary construction impacts for pipeline construction. Consequently, use of the Cache la Poudre River as a conveyance element for a public drinking water supply is not a reasonable siting and design alternative.

With respect to water quality, Thornton solicited feedback from other local water providers diverting water from the Cache la Poudre River upstream of Fort Collins regarding the alternatives to use the Cache la Poudre River as a drinking water conveyance element. The City of Greeley sent to the Board of Commissioners a letter (**Exhibit 2.d-1S**) with the following statement:

> *"Effective utility management guides municipal water suppliers to use the best water quality available for a source, and to protect that water from degradation. To ask a municipal water supplier to place undue risk to public health, to incur unnecessary energy consumption to clean-up further degraded water down river and to unwind the agreements made for the protection of the ditch company is an unprecedented request. If the request is mandated as a permit condition, it would lack a logical nexus with the project's impacts. Cleaning degraded source water with energy intensive and less sustainable treatment technology is not a wise option in terms of efficient stewardship of community resources or public health."*

The City of Greeley concurs with Thornton's assessment as presented in the Water Quality Report that municipal water suppliers use the best quality water available for treatment and delivery to people. In addition, to ask a municipal supplier to further degrade that water and be required to incur additional expense to treat that water places the public at increased risk and is an unreasonable request.

WSSC Interests

The interests of WSSC were articulated to the Working Group by Dennis Harmon/WSSC General Manager in a presentation to the Working Group on Tuesday, October 9, 2018 (**Supplement 3 Appendix D**). Mr. Harmon was also WSSC's representative on the Working Group. In that presentation, WSSC indicated the following major benefits to WSSC shareholders if Thornton's water goes through the WSSC reservoir system and is withdrawn at WSSC Reservoir No. 4 and put into a pipeline:

Improves utilization of existing reservoir storage: WSSC can dedicate 7,000 acre-feet of storage capacity solely for Thornton's use, which frees up capacity in other company reservoirs for other shareholders. This also resolves the need for future uncertain, irregular exchanges with other ditch companies for water stored in Reservoirs 3, 4 and Kluver Reservoir, which historically have not always been available.

Mitigates impacts of reduced flows in main canal: Maintains normal canal levels from river head gate to WSSC Reservoir No. 4 and obviates the need for additional check structures that reduce canal efficiencies.

Alternatives CLP1 and CLP2 bypass the WSSC Reservoir system and adversely impact the WSSC System. WSSC has expressed serious concerns regarding substantial negative impacts to its system and its shareholders that would result from bypassing the Company's head gate. *See* July 2, 2018 letter from Keith Amen, President of WSSC to the BOCC (**Exhibit 2.d-2S**). Shields1 and Shields2 use the WSSC Reservoir system and therefore can provide benefits to WSSC.

Conclusion

Table 2.d-2S presents a summary assessment of whether the River Delivery Alternatives are or are not reasonable siting and design alternatives and the ability of any of the River Delivery Alternatives to meet the purpose and need of the project and provide benefits to or does not negatively impact WSSC. As presented in **Table 2.d-2S**, none of the River Delivery Alternatives are reasonable siting or design alternatives as they cannot meet the project purpose and need. Therefore, these options were eliminated from additional consideration.

TABLE 2.d-2S
Assessment of River Delivery Alternatives

Designation	Need 1: Meet projected drinking water needs in Thornton.	Need 2: Meet the need to improve water supply reliability through the addition of a new water supply source to Thornton's water supply portfolio.	Need 3: Meet the need to secure a high-quality source	Need 4: Meet the need to have the project deliver water no later than January 2025.	WSSC Interests, benefits and impacts.
CLP1	The State Engineer will assess a 0.5% loss in water for each river mile reducing Thornton's yield from its water rights by almost 12%.	Taking water from the river without access to off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the river, thus reducing Thornton's ability to reliably deliver water from this source to its customers.	Water quality in stream segment 12 of the Cache la Poudre River is significantly degraded from that at the decreed location (stream segment 10) and proposed WSSC Reservoir 4 withdrawal location. Although additional water treatment can provide some mitigation, the risk to human health is increased. Use of water from stream segment 12 as a water supply is not a listed use by CDPHE.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years.	Water bypasses reservoirs and may have substantial negative impacts to WSSC.
CLP2	The State Engineer will assess a 0.5% loss in water for each river mile reducing Thornton's yield from its water rights by over 5%.	Taking water from the river without access to off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the river, thus reducing Thornton's ability to reliably deliver water from this source to its customers.	Water quality in the lower reaches of stream segment 11 of the Cache la Poudre River is degraded from the decreed location (stream segment 10). Although additional water treatment can provide some mitigation, the risk to human health is increased. Use of water from stream segment 11 as a water supply is not a listed use by CDPHE.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years.	Water bypasses reservoirs and does may have substantial negative impacts to WSSC.

TABLE 2.d-2S
Assessment of River Delivery Alternatives

Designation	Need 1: Meet projected drinking water needs in Thornton.	Need 2: Meet the need to improve water supply reliability through the addition of a new water supply source to Thornton's water supply portfolio.	Need 3: Meet the need to secure a high-quality source	Need 4: Meet the need to have the project deliver water no later than January 2025.	WSSC Interests, benefits and impacts.
Shields1	The State Engineer will assess a 0.5% loss in water for each river mile reducing Thornton's yield from its water rights by over 8%.	Taking water from the river downstream of off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the river, thus reducing Thornton's ability to reliably deliver water from this source to its customers.	Water quality in stream segment 12 of the Cache la Poudre River is significantly degraded from that at the decreed location (stream segment 10) and proposed WSSC Reservoir 4 withdrawal location. Although additional water treatment can provide some mitigation, the risk to human health is increased. Use of water from stream segment 12 as a water supply is not a listed use by CDPHE.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years.	Water flows through WSSC reservoir system and provides benefits to WSSC.
Shields2	The State Engineer will assess a 0.5% loss in water for each river mile reducing Thornton's yield from its water rights by almost 2%.	Taking water from the river downstream of off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the river, thus reducing Thornton's ability to reliably deliver water from this source to its customers.	Water quality in the lower reaches of stream segment 11 of the Cache la Poudre River is degraded from that taken from the decreed location from stream segment 10. Although additional water treatment can provide some mitigation, the risk to human health is increased. Use of water from stream segment 11 as a water supply is not a listed use by CDPHE.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years.	Water flows through WSSC reservoir system and provides benefits to WSSC.

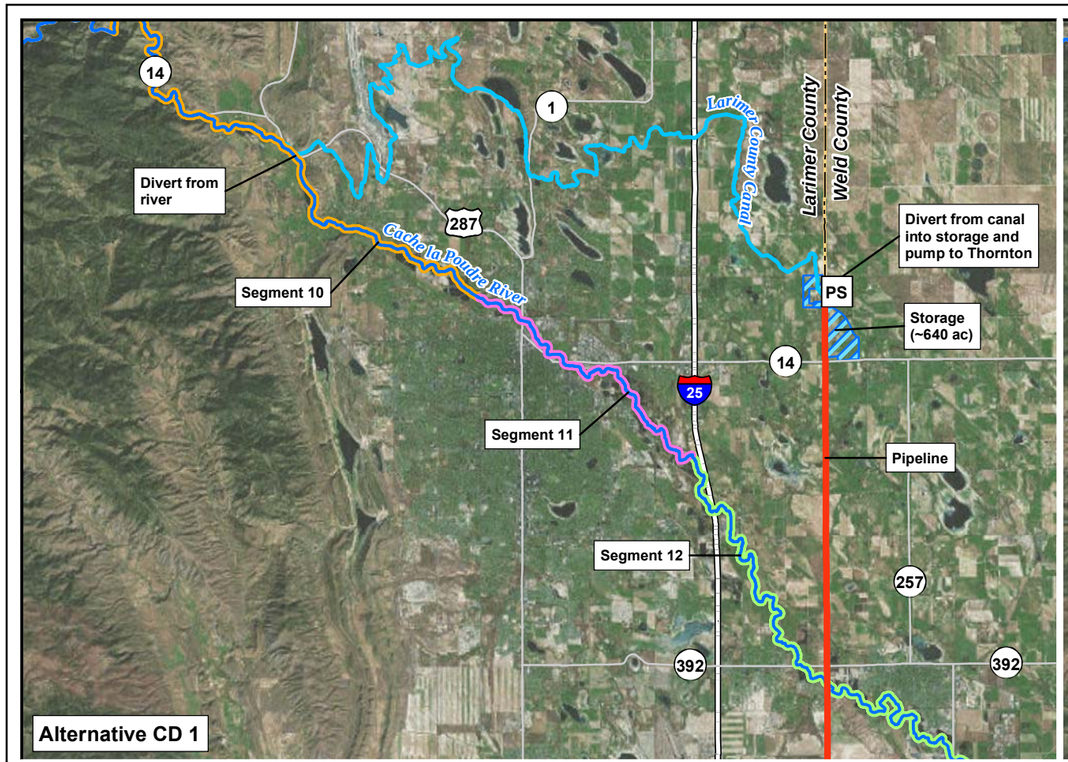
Canal Delivery Alternatives

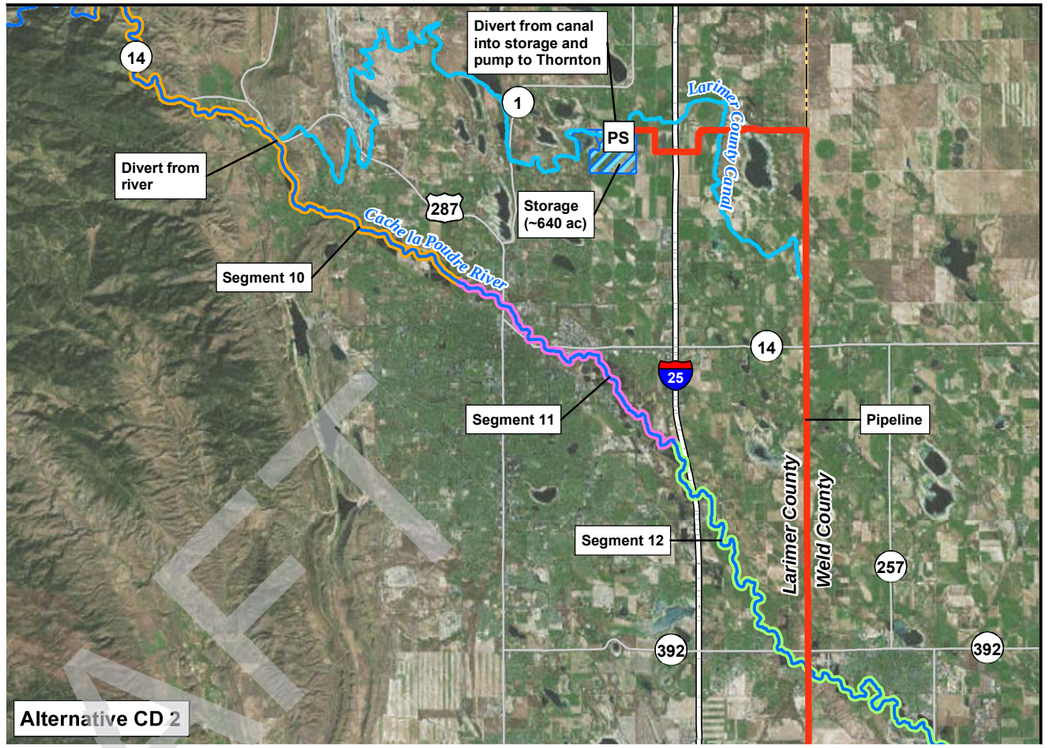
The original Canal Delivery Alternative (designated CD1) is to continue to divert the water into the LCC, but leave the water in the LCC and take it out where the LCC crosses County Line Road. Additional variations in that alternative are:

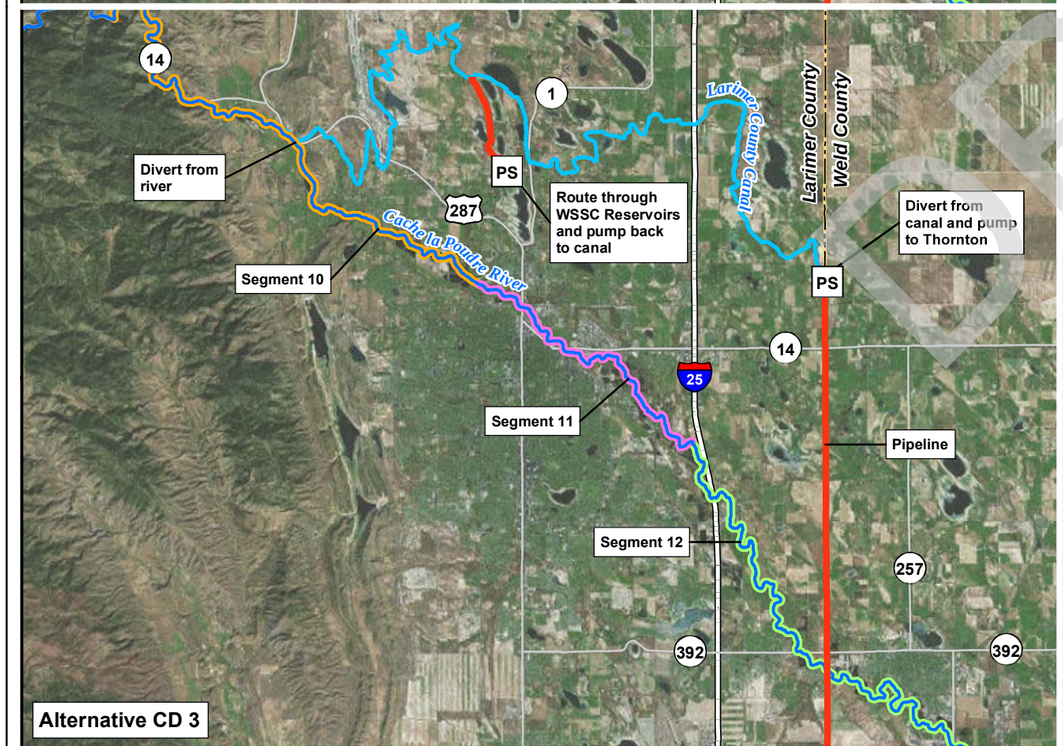
- Continue to divert the water into the LCC, but leave the water in the LCC and take it out on Thornton's farm near Turnberry Road and County Road 56 (designated CD2);
- Continue to divert the water into the LCC and have it flow through the WSSC Reservoir system and then deliver the water back to the LCC through a pump station at WSSC Reservoir No. 4 and a pipeline that goes along the west side of WSSC Reservoir No. 4 and WSSC Reservoir No. 3 and then use the LCC to convey water to a takeout location where the LCC crosses County Line Road (designated CD3);
- Continue to divert the water into the LCC and have it flow through the WSSC Reservoir system and then deliver the water back to the LCC through a pump station at WSSC Reservoir No. 4 and a pipeline that goes along the west side of WSSC Reservoir No. 4 and WSSC Reservoir No. 3 and then use the LCC to convey water to a takeout location on Thornton's farm near Turnberry Road and County Road 56 (designated CD4);

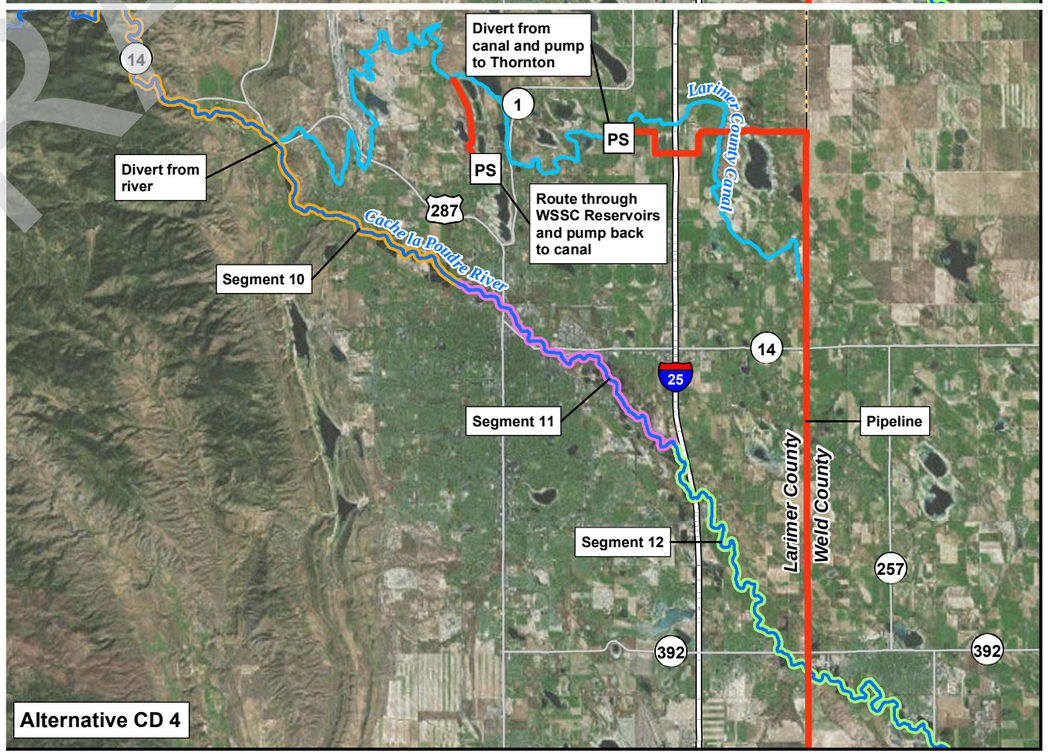
Note: Alternative CD3 is labeled In the Larimer County Public Involvement process as Option A: Canal Conveyance. It should be noted that Option A in the Larimer County Public Involvement process was not the original proposal made by the Working Group. It was modified by Thornton as described in *Thornton Water Project Larimer County Canal Alternative Configuration and Cost*, dated November 12, 2018 to comply with the requirements of WSSC that Thornton's water go through the reservoirs and be taken out at WSSC Reservoir No. 4 which allows water to be delivered at a lower rate than the rate water comes into the reservoir storage, allowing construction of smaller downstream infrastructure (pump station and pipeline) which reduces the construction impacts from constructing larger downstream infrastructure.

Figure 2.d-2S presents the four (4) Canal Delivery Alternatives. **Table 2.d-3S** presents a tabulation of infrastructure required for each Canal Delivery Alternative. Each of the infrastructure requirements are discussed in the following subsections.









Pipeline
Storage
Segment 10
Segment 11
Segment 12

N
W E
S

0 1.5 3 Miles

Figure 2.d-2S
Larimer County
Canal Delivery Alternatives

TABLE 2.d-3S
Infrastructure Requirements for Canal Delivery Alternatives

Alternative Designation	Required Infrastructure
CD1	A diversion structure from the LCC at County Line Road A pipeline from the LCC diversion along County Line Road to a Thornton farm adjacent to County Line Road 12,482 acre-feet of storage on Thornton's farm and/or adjacent land A pump station on Thornton's farm A pipeline from Windsor to Thornton Additional water treatment unit processes to reduce disease risk to people
CD2	A diversion structure from the LCC at Thornton's farm near Turnberry Road and County Road 56 12,482 acre-feet of storage on Thornton's farm and/or adjacent lands A pump station on Thornton's farm A pipeline from the new storage reservoir in Larimer County to Thornton (generally along County Road 56 and County Line Road) Additional water treatment unit processes to reduce disease risk to people
CD3	Pump station at WSSC Reservoir 4 and a pipeline that goes along the west side of WSSC Reservoir 4 and WSSC Reservoir 3 to the LCC A diversion structure from the LCC at County Line Road A pipeline from the LCC diversion along County Line Road to a Thornton farm adjacent to County Line Road A pump station on Thornton's farm A pipeline from the pump station on Thornton's farm to Thornton (generally along County Line Road) Additional treatment unit processes to reduce disease risk to people
CD4	Pump station at WSSC Reservoir 4 and a pipeline that goes along the west side of WSSC Reservoir 4 and WSSC Reservoir 3 to the LCC A diversion from the LCC at Thornton's farm near Turnberry Road and County Road 56 A pump station on Thornton's farm A pipeline from the pump station on Thornton's farm in Larimer County to Thornton (generally along County Road 56 and County Line Road) Additional treatment unit processes to reduce disease risk to water users

Diversions and Bypass Structures

All alternatives require the construction of diversions structures from the LCC. No bypass structures are required for these alternatives. Construction of these diversion structures are likely to require a USACE 404 Permit as the USACE has indicated that the LCC is likely to be considered a water of the United States (WUS).

Water Storage

Alternatives not having the water go through the reservoir system (CD1 and CD2) also require the construction of a new storage reservoir at or near the diversion point out of the LCC. Water storage is integral to the TWP and access to it was part of the purchase of the WSSC shares by Thornton. Water storage: 1) provides the means to deliver a steady and reliable quantity of drinking water on a year round basis; 2) provides a greater opportunity to mix incoming water off the river with stored water to allow delivery of a relatively consistent source quality; and 3) allows water to be delivered at a lower rate than the rate water comes into the reservoir storage, allowing construction of smaller downstream infrastructure which reduces the construction impacts from constructing larger downstream infrastructure.

Construction of new storage to replace the WSSC reservoir storage bypassed by alternatives CD1 and CD2 at another location will be extensive and significantly more impactful than using existing storage at WSSC. The existing WSSC reservoirs occupy more than 640 acres (1 square mile). Possible reservoir storage sites of 640 acres do not exist at Thornton's farms in Weld County near County Line Road or at Thornton's Farm near Turnberry and County Road 56, which will require Thornton to acquire additional private lands for a new storage reservoir. Construction of replacement storage will be lengthy with major earth moving operations like sand and gravel mining. Also, construction of a reservoir will require a 1041 Permit, if constructed within Larimer County, and likely require a 404 Permit as the size of the reservoir is likely to require placement of fill material within WUS or wetlands.

All options require a pump station near the diversion from the LCC. For alternatives CD1 and CD2 this pump station will take water from the new storage reservoirs and pump into a pipeline to Thornton. For alternatives CD3 and CD4 this pump station will take water from the LCC diversion canal and pump it into a pipeline to Thornton. Alternatives CD1 and CD2 also include a second pump station at WSSC Reservoir 4 that will pump stored water back to the LCC. The size of the pump station will be inversely proportional to storage, i.e., less storage requires a bigger pump station, resulting in more construction impacts.

Pipelines

All alternatives require a pipeline to deliver water to Thornton. For reliability purposes, Alternatives CD3 and CD4 also include a pipeline from the pump station at WSSC Reservoir No. 4 to return stored water to the LCC. The size of any of the proposed pipelines is inversely proportional to water storage upstream of the pipeline, i.e., less storage requires a bigger pipeline, resulting in more construction impacts.

Water Treatment and Water Quality Impacts to Public Health

To reduce disease risks to water customers, all Canal Delivery Alternatives will require Thornton to construct additional water treatment processes at its water treatment facilities. These additional water treatment processes are beyond the base case of treating water from WSSC Reservoir No. 4 and result from degradation of water within the LCC as it travels east and is exposed to both runoff from agricultural lands and impacts from geologic influences. *Water Quality Ramifications of*

Locating Thornton's Water Intake at a Downstream Location (Jacobs, November 14, 2018) (Water Quality Report) presents water quality data along the LCC from the head gate to Highway 85 in Weld County. With respect to the water quality in the LCC at the WSSC reservoir system, average turbidity at the nearest sampling point east of the WSSC reservoir system and near the County Line Road location are 145% and 152% higher, respectively. Similarly, total dissolved solids are 61% and 182% higher. With respect to taking water from the LCC east of the WSSC reservoir system, the Water Quality Report concludes:

> *"Cost and community impacts would be expected to be similar to those for diversions downstream of the treatment plants and could be as high as for a diversion in Segment 12 (i.e., the Windsor Diversion)."*

In other words, the water in the LCC downstream of the WSSC Reservoir system degrades to a point that it is expected to be like water from the Cache la Poudre River downstream of one or more of the wastewater treatment plants and potentially as degraded as the water in the Cache la Poudre River downstream of Boxelder Creek. This degradation in source water quality requires Thornton to construct additional water treatment unit processes to reduce the increased risk to public health from disease causing pathogens and other contaminants.

Additional water quality information resulting from this analysis was also presented to the public via a Larimer County webinar titled, *Water Flows and Quality* on November 5, 2018 and uploaded to https://www.larimerwaterprojects.org/ for public access and viewing.

WSSC Interests/Benefits/Impacts

As mentioned above in the River Delivery Alternatives subsection, the WSSC interests and benefits were communicated to the Working Group by Dennis Harmon/WSSC General Manager in a presentation to the Working Group on Tuesday, October 9, 2018. In summary, withdrawal of the water through the WSSC reservoir system with a take out at the WSSC Reservoir No. 4 outlet into a pipeline: 1) improves utilization of existing reservoir storage and 2) mitigates impacts of reduced flows in the main canal. Following the final Working Group meeting, Mr. Harmon sent Peak Facilitation Group, the Public Involvement process firm hired by Larimer County, an email (**Exhibit 2.d-3S**) presenting WSSC's interests with respect to the Canal Delivery Alternatives. That email stated the following:

> *"The Working Group should eliminate the Canal Conveyance as an option to be considered further as WSSC's Board would not approve it. For reasons that may not be obvious to most, operating the ditch outside its historical May through mid-September seasonal pattern would be detrimental to the canal and its appurtenant facilities.*
>
> *Not only would cold winter operations be damaging to the canal itself because of low temperatures and icing concerns which have been mentioned before, those operations would interfere with WSSC's essential seasonal maintenance over the 58 mile length of the canal most of which can only be undertaken when the canal is empty.*
>
> *Those activities include tree removal, sand and silt removal, canal bank maintenance, cleaning of head gates and measuring flumes, replacement and repair of head gates and check structures, weed control spraying and burning, dam outlet structure maintenance and so on. In addition, a potential ditch*

> *failure during the winter months could be extremely difficult and expensive to repair, a risk our shareholders should not and will not accept, in my judgement."*

Excerpt from an email from Dennis Harmon/WSSC General Manager to Peak Facilitation Group, November 28, 2018.

Alternatives CD1 and CD2 bypass the WSSC Reservoir system and do not provide the benefits WSSC has presented to the Working Group. In addition, WSSC has expressed serious concerns regarding substantial negative impacts to its system and its shareholders that would result from bypassing the Company's head gate (**Exhibit 2.d-2S**). Alternatives CD3 and CD4 use the WSSC Reservoir system and therefore can provide benefits to WSSC.

Conclusion

Table 2.d-4S presents a summary of the assessment of whether any of the Canal Delivery Alternatives are or are not reasonable siting and design alternatives and the ability of any of the Canal Delivery Alternatives to meet the purpose and need of the project. As presented in **Table 2.d-4S**, none of the Canal Delivery Alternatives are reasonable siting or design alternatives as they cannot meet the project purpose and need. Therefore, these options were eliminated from additional consideration.

TABLE 2.d-4S
Assessment of Canal Delivery Alternatives

Designation	Need 1: Meet projected drinking water needs in Thornton.	Need 2: Meet the need to improve water supply reliability through the addition of a new water supply source to Thornton's water supply portfolio.	Need 3: Meet the need to secure a high-quality source	Need 4: Meet the need to have the project deliver water no later than January 2025.	WSSC Interests, benefits and impacts.
CD1	There will be seepage losses from the ditch between the WSSC Reservoirs and County Line Road, reducing Thornton's yield from its water rights. The amount lost will vary depending on season of operation and the rate at which Thornton's water is delivered by the canal, from minor (no net loss) during the irrigation season to major (unknown at this time) during the non-irrigation season, making water deliveries impractical.	Taking water from the LCC without access to off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the LCC, thus reducing Thornton's ability to reliably deliver water from this source to its customers	Water quality data indicates water quality degradation as the LCC flows east. Although additional water treatment can provide some mitigation, the risk to human health is increased.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years	Water bypasses reservoirs and does not provide any benefit to WSSC. May have substantial negative impacts to WSSC. Use of canal outside of irrigation season would be denied by WSSC.
CD2	There will be seepage losses from the ditch between the WSSC Reservoirs and County Line Road, reducing Thornton's yield from its water rights. The amount lost will vary depending on season of operation and the rate at which Thornton's water is delivered by the canal, from minor (no net loss) during the irrigation season to major (unknown at this time) during the non-irrigation season, making water deliveries impractical.	Taking water from the LCC without access to off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the LCC, thus reducing Thornton's ability to reliably deliver water from this source to its customers	Water quality data indicates water quality degradation as the LCC flows east. Although additional water treatment can provide some mitigation, the risk to human health is increased.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years	Water bypasses reservoirs and does not provide any benefit to WSSC. May have substantial negative impacts to WSSC. Use of canal outside of irrigation season would be denied by WSSC.

TABLE 2.d-4S
Assessment of Canal Delivery Alternatives

Designation	Need 1: Meet projected drinking water needs in Thornton.	Need 2: Meet the need to improve water supply reliability through the addition of a new water supply source to Thornton's water supply portfolio.	Need 3: Meet the need to secure a high-quality source	Need 4: Meet the need to have the project deliver water no later than January 2025.	WSSC Interests, benefits and impacts.
CD3	There will be seepage losses from the ditch between the WSSC Reservoirs and County Line Road, reducing Thornton's yield from its water rights. The amount lost will vary depending on season of operation and the rate at which Thornton's water is delivered by the canal, from minor (no net loss) during the irrigation season to major (unknown at this time) during the non-irrigation season, making water deliveries impractical.	Taking water from the LCC downstream of off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the LCC, thus reducing Thornton's ability to reliably delver water from this source to its customers	Water quality data indicates water quality degradation as the LCC flows east. Although additional water treatment can provide some mitigation, the risk to human health is increased.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years	Water flows through WSSC reservoir system and provides benefits to WSSC. Use of canal outside of irrigation season would be denied by WSSC.
CD4	There will be seepage losses from the ditch between the WSSC Reservoirs and County Line Road, reducing Thornton's yield from its water rights. The amount lost will vary depending on season of operation and the rate at which Thornton's water is delivered by the canal, from minor (no net loss) during the irrigation season to major (unknown at this time) during the non-irrigation season, making water deliveries impractical.	Taking water from the LCC downstream of off channel storage (WSSC Reservoirs) increases risk that no water is available in the event of a negative water quality event in the LCC, thus reducing Thornton's ability to reliably delver water from this source to its customers	Water quality data indicates water quality degradation as the LCC flows east. Although additional water treatment can provide some mitigation, the risk to human health is increased.	Obtaining a 404 Permit from the USACE for a Northern Colorado water supply project is estimated to take more than 10 years	Water flows through WSSC reservoir system and provides benefits to WSSC. Use of canal outside of irrigation season would be denied by WSSC.

Lake Tap Idea

General

The original Lake Tap idea was included in the 1041 Application as part of the evaluation of alternatives as presented in *Technical Memorandum, Thornton Water Project, Larimer County Alternative Configurations Analysis – WSSC Reservoir Area to Larimer County Road 9, October 2017* (Alternatives TM) (**Application Appendix A**). Lake taps were included in that analysis because potentially affected residents wanted Thornton to consider other means to take its water from the WSSC reservoir systems without a trenched pipeline being constructed from WSSC Reservoir No. 4 through portions of some of the neighborhoods within the area. County Commissioners, at the August 1, 2018, Board of County Commissioner hearing, inquired as to the feasibility of lake taps. The subsections below present a summary of additional investigation into the feasibility of lake taps as presented in *Thornton Water Project Assessment of Proposed Microtunneled Intakes, CH2MHILL, October 31, 2018* (Lake Tap TM) (**Supplement 3 Appendix B**). In addition, Larimer County contracted with Lithos Engineering, a local geotechnical engineering services company to serve as a consultant to Larimer County to assess technical feasibility of lake taps in the project area. Lithos, as part of the Larimer County facilitated Public Involvement process created and presented a webinar on geotechnical engineering aspects of the project titled *Geotechnical and Tunneling* (**Supplement 3 Appendix C**) on November 3, 2018 and uploaded to https://www.larimerwaterprojects.org/ for public access and viewing.

Summary of Lake Tap TM

The Lake Tap TM was based on evaluating the technical feasibility of the four (4) alternatives in the Alternatives TM that included lake taps. The pertinent information for each is presented in **Table 2.d-5S**.

TABLE 2.d-5S
Proposed Lake Taps from Alternatives TM

Intake Scheme	Intake Tunnel Drives	Proposed Tunnel Length (feet)	Estimated Shaft Depth (feet)	Estimated Intake Depth (feet)	Comments
West 1	W1	1,980	60	50	One intake: Reservoir 4
North 1	N1a	2,100	60	50	Two intakes: Reservoir 3 and 4
	N1b	3,900	60	50	
North 2	N2	3,900	60	50	One intake: Reservoir 4
North 3	N3	6,420	80	50	One intake: Reservoir 4, tunneled below Reservoirs 3 and 4

The Lake Tap TM presented a review of the geologic setting, geology and literature review of local and North American tunnel projects. It is noted that limited subsurface information is available, but does present data from two (2) geotechnical reports from projects within the area of WSSC Reservoir 3. The data from those projects provides confirmation of the geologic setting, but were not specifically prepared to assess feasibility of constructing a lake tap. The Lake Tap TM concluded that the most likely method of constructing the lake tap is microtunneling with a slurry microtunnel

boring machine (MTBM) or slurry mix-shield MTBM with a wet recovery within a benched excavation within the reservoir. This is similar to the lake tap for Standley Lake in Westminster, CO, completed in 2004.

In addition to the local data and information, the Lake Tap TM considered microtunneled projects within North America and presented graphical summaries of those projects, plotting average drive distance against diameter for tunnels with and without intermediate jacking stations, noting that drive distance increased with pipe diameter. The Lake Tap TM concludes that a 48-inch microtunneled intake is not practical or feasible for the drive distances noted in **Table 2.d-5S** and a 60-inch microtunneled intake is only practical or feasible for the intake for the W1 alternative and the N1a intake of alternative N1. All others are not practical or feasible for the diameters being considered. It should be noted, however, that Lithos concluded that all lake taps were feasible provided there was some optimization, such as shortening the drive distance and/or using larger diameter tunnels. Lithos did conclude that tunnels, especially lake taps, are inherently risky and expensive and are only appropriate when other alternatives are not.

Table 2.d-6S presents a summary of the reasons to and not to tunnel as presented in the Lithos webinar. As noted in the table, tunneling is expensive and inherently risky. Lithos, in its webinar noted that its scope was to determine if it was technically feasible to construct a lake tap into the reservoirs, not to determine the reasonableness of constructing a lake tap in comparison to other alternatives, such as conventional, open-cut trenching. As such, Lithos was not tasked to provide information regarding construction schedule and possible construction impacts from performing a lake tap. The section below provides a comparison of the anticipated construction schedule, possible construction impacts and potential mitigation requirements for lake tap and open trench construction.

TABLE 2.d-6S
Reasons to and not to Tunnel (From Lithos Webinar November 5, 2018)

Reasons to Tunnel	No options for open cut
	Crossing infrastructure
	Crossing environmentally sensitive areas
	Reduce permitting requirements
	Minimize third-party impacts
Reasons not to Tunnel	Expensive
	Inherently risky

Comparison of Lake Tap and Open Cut Construction and Estimated Cost

This subsection presents a comparison of lake tap and open-cut trenching for an approximate 1,980 feet of pipeline associated with the West 1 and West 2 alternatives as presented in the Alternatives TM. For the West 1 Alternative, the 1,980 feet of pipeline is associated with the lake tap proposed for that alternative and for the West 2 Alternative, the 1,980 feet of pipeline is from the WSSC Reservoir No. 4 outlet along Vista Lake Drive through the Braidwood neighborhood that would be open-cut construction.

Lake Tap

Construction Sequence and Estimated Schedule: Lake taps require construction of a drive shaft to reach the depth at which the tunnel operation can commence. Once the drive shaft is constructed, tunneling can begin. Construction of the shaft requires excavation of soil and/or rock, erection of a ground support system to keep the shaft open during tunneling operations, and control of groundwater if present. Temporary utilities, either on-site generators or utility extensions are required to provide power for lighting, ventilation, water pumping, and slurry recovery systems. It is anticipated that construction of a 60-foot deep shaft, 50-foot in diameter will take between 1 to 2 months. Once the shaft is completed, tunneling can begin. Production rates for microtunnels are highly variable, ranging from 2 to 4 feet in a day to as much as 50 feet, depending on ground conditions. It is probable that rates will vary and not be consistent as different subsurface soils/rock are encountered. For the West 1 intake (1,980-foot tunnel) and assuming 20 feet per day, it will take almost 100 work days, or almost 20 weeks to complete the tunneling operation. At 50 feet per day it will take 40 work days, or almost 8 weeks to complete the tunnel. During that time, dewatering pumps, if required, will need to operate continuously to keep the excavation from flooding and slurry used at the face of the excavation will be recycled through setting tanks requiring additional pumping equipment. The inherent risk of tunnel construction is that any unforeseen changes in ground conditions could extend the total construction period as the contractor changes equipment to adjust to the changed ground condition, or worse yet, must abandon the drive and start a new one. Following tunnel construction, the intake in the lake needs to be connected to the tunnel and the shaft backfilled (approximately 2 to 4 weeks) Total construction time for the West 1 tunnel could be from 14 weeks to 32 weeks.

Construction Impacts and Mitigation: Impacts from construction are mostly related to noise and air quality impacts from dust and equipment operations at the shaft where significant utility support systems are required to operate 24/7 to keep the shaft and tunnel dewatered (if groundwater is present); provide temporary storage and possible treatment systems to capture and treat water from the dewatering activities; maintain ventilation of the shaft and tunnel for worker safety; operate slurry recovery systems; and provide power for construction operations. The site at the shaft also will allow storage of excavated material until it is hauled from the site. Most often portable, diesel generators with fuel storage are mobilized to the shaft site to provide the necessary temporary power for shaft and tunnel operations. Mitigation is typically through implementation of best management practices of watering exposed excavated materials to reduce or eliminate the creation of dust, using equipment in good working condition and certified for applicable air emission and noise standards, and erection of temporary noise barriers.

Cost: As presented in the webinar, tunneling is risky and costly. Lithos, in a working group meeting stated that tunneling can cost 10 to 100 times (one to two orders of magnitude) greater than open cut, trenched pipeline construction. The Lake Tap TM presented a cost range of from $100/ft/inch of tunnel diameter to $1,250/ft/inch of tunnel diameter. For a 60-inch tunnel that equals $6,000/ft to $75,000 foot, or approximately $12,000,000 to $146,000,000 for the 1,980-foot microtunneled intake for the shortest lake tap.

Open Cut Trenching

Construction Sequence and Estimated Schedule: Open cut trenching involves the removal and stockpiling of topsoil or removal of surface paving; excavation of a trench, either with the trench slopes placed at the angle of repose, or with a trench box to minimize trench excavation; placement of granular material for bedding the pipe; placing and joining the pipe; backfilling; and surface restoration. Production rates with sloped trench sides and shored trench could be 100 to 200 feet

per day and 50 to 100 feet per day, respectively. For a comparable 1,980 feet of open trench constructed pipe, the estimated open trench construction is 4 weeks to 8 weeks, followed by a 2 to 4-week period for surface restoration, for a total of 6 to 12 weeks of construction.

Construction Impacts and Mitigation: Impacts from open-cut trenching are mostly related to noise and air quality impacts from dust and equipment operations; and disruption to traffic, if construction is within a roadway. Mitigation is typically through implementation of best management practices of watering exposed excavated materials to reduce or eliminate the creation of dust, using equipment in good working condition and certified for applicable air emission and noise standards, and development and implementation of a traffic control and maintenance of access plan, if construction is within a roadway.

Cost: At a planning level, open-cut trenching of pipelines typically cost between $12/ft/inch of diameter to $15/ft/inch of diameter. For a 48-inch pipeline that equals $576/ft to $720 foot, or approximately $1,100,000 to $1,400,000 for 1,980-feet of open-cut and trenched pipeline.

Discussion

Table 2.d-7S presents a comparison of the two construction methods. As noted in the table, the lake tap construction takes longer; has similar impacts as open-cut trenching (except for traffic impacts), but those impacts are localized to the drive shaft location; and has an estimated cost 10 to 100 times that of the open-cut construction method. The open-cut trenching method of construction is shorter to construct; has similar noise and dust impacts, but does impact traffic, if constructed in a roadway; but is significantly less in cost.

TABLE 2.D-7S
Comparison of Lake Tap Construction and Open-cut Trenching for 1,980 feet of Pipeline

Item	Lake Tap	Open-Cut Trenching
Schedule	Longer, 14 to 32 weeks	Shorter, 6 to 12 weeks
Construction Impacts	Noise and dust localized at drive shaft, but for longer time	Noise and dust along the length, localized to active construction zone; disruption to traffic, if in a roadway
Cost	Most, $12,000,000 to $146,000,000	Least, $1,100,000 to $1,400,000

Conclusion

Based on this analysis, Thornton concludes that alternatives that include lake taps are not reasonable siting and design alternatives to consider because, in comparison to open-cut trenching: 1) lake taps take longer to construct; 2) have significant construction risks; 3) have similar, but longer noise and dust impacts; and 4) the more than ten-fold cost increase is not a reasonable cost to mitigate temporary traffic impacts caused by open-cut trenching methods.

City of Greeley Colorado

1001 11th Avenue, Suite 200
Greeley, CO 80631

November 27, 2018

Larimer County Board of County Commissioners
200 West Oak Street, Suite 2200
Fort Collins, CO 80521

Re: Importance of Water Quality Best Management Practices and Vested Water Rights Decreed through the Colorado Water Court

To Whom It May Concern:

The City Greeley, through its Water & Sewer Enterprise, offers the following testimony regarding the City of Thornton's Larimer County 1041 land use application presently before the Board of County Commissioners. Greeley is a municipal water provider reliant upon sustainable and high quality water from the Cache La Poudre River. Greeley is a shareholder of the Water Supply and Storage Company (WSSC) system, and an organization deeply committed to preserving the resiliency and ecological health of the river system. Consequently, we feel compelled to empathize with the Larimer County Board of County Commissioners in this difficult deliberation and proffer comments on the potential that a 1041 land use process would make findings that may limit, restrict or damage water rights or access to high quality water previously decreed through the due process of law in Colorado's Water Court.

The City of Greeley provides water to over 107,000 people within the City of Greeley and treats and delivers water to regional partners that equate to another 15,000 single family equivalents. Source water quality is of great importance to us, and it is the foundation for providing safe, reliable, cost effective, good tasting drinking water. We are aware of the expectations by some in the community who seek to require Thornton's release of its water back in the Poudre River through Fort Collins, contrary to decree terms, before it is diverted for use as a drinking water source. Effective utility management guides municipal water suppliers to use the best water quality available for a source, and to protect that water from degradation. To ask a municipal water supplier to place undue risk to public health, to incur unnecessary energy consumption to clean-up further degraded water down river and to unwind the agreements made for the protection of the ditch company is an unprecedented request. If the request is mandated as a permit condition, it would lack a logical nexus with the project's impacts. Cleaning degraded source water with energy intensive and less sustainable treatment technology is not a wise option in terms of efficient stewardship of community resources or public health.

The City of Greeley won the American Water Works Association's (the national association of drinking water providers and professionals) national best tasting water award in 2017 largely due to having the high-quality water source diverted at the mouth of the Poudre Canyon and treated at Greeley's water treatment plant in Bellvue. The City of Greeley forefathers had the foresight to secure this water source in 1905. Back at the turn of the 20th century, it was the best practice for Greeley to secure a high-quality source of drinking water from a distant location instead of using water from the Poudre River degraded by many uses upstream of Greeley. The City of Thornton exercised similar foresight when it purchased

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Letter to BOCC from City of Greeley Director of Water & Sewer (page 1 of 2)

shares in the Water Supply and Storage Company, which diverts from the Poudre River just down river from Greeley's diversion. That kind of planning and investment should be recognized as a prudent approach to protecting public health, proper water supply planning, and consistent with the parameters set forth by the WSSC ditch company.

A great number of productive farms in the WSSC system have a vested interest in ongoing irrigated farming, livestock and dairy activities. These farms, including some owned by Greeley, Fort Collins and Tri-Districts, all depend upon effective operation of the WSSC irrigation system. There are specific terms that the WSSC Company requires for municipal interests to use water with minimal impact to agriculturalists; and in Thornton's case, the Water Court objectors and the WSSC Company agreed that water would continue to be taken consistent with historic diversions at the Companies' head gate. Deference should be paid to long standing agreements with the ditch company and to the specific property rights vested by Colorado's Water Court decrees that allow use of water by Thornton within specific terms and conditions. Such decrees and agreements have endured rigorous review by other water users and contain agreed upon terms and conditions of use designed to protect against injury to other water users.

Greeley shares the Board of Commissioners goal of protecting and enhancing the health of the Poudre River, and a regional approach to this goal is the upmost importance. However, we do not believe a land use permit under 1041 regulations is the appropriate vehicle for guiding this shared goal when said permitting terms run contrary to past Water Court findings and decree terms. One may look towards regional cooperative efforts among significant Poudre River water users, including Greeley and Thornton, such as the Instream Flow Augmentation Program, as examples of more effective means to achieve river health and flow goals while protecting private property rights (application pending with the Colorado Water Conservation Board).

The Poudre River is a tremendous ecological, municipal, agricultural, recreational and economic resource to our communities and the region. Working collaboratively on impact avoidance, minimization and enhancement efforts is the path forward for Greeley and others who rely upon this beautiful working river. It will continue to require collaborative adaptive management within the established legal framework to allow our communities to co-create a healthier river environment and prosperous future.

If you have any questions or feedback regarding the concerns outlined herein, please don't hesitate to contact me directly.

Sincerely

Sean P. Chambers
Director of Water & Sewer
City of Greeley
Greeley, CO 80631

Cc: Mr. Roy Otto, City Manager, City of Greeley
Mr. Harold Evans, Chairman, Greeley Water & Sewer Board
Ms. Jennifer Petrzelka, Water Rights Manager, City of Greeley

Water and Sewer Department • 1001 11th Avenue, 2nd Floor, Greeley, CO 80631 • (970) 350-9811 Fax (970) 350-9805

A City Achieving Community Excellence

EXHIBIT 2.d-1S

Letter to BOCC from City of Greeley Director of Water & Sewer (page 2 of 2)

THE WATER SUPPLY AND STORAGE COMPANY
P.O. BOX 2017
2319 E. Mulberry Street
FORT COLLINS, COLORADO 80522-2017

July 2, 2018

Larimer County Board of County Commissioners
200 West Oak Street
Fort Collins, CO 80521

Re: Thornton Water Project 1041, File #18-ZONE2305

Larimer County Board of County Commissioners:

As you know, the City of Thornton has applied to Larimer County for approval of a 1041 permit to allow Thornton to construct a water pipeline to deliver water associated with its ownership in the Water Supply and Storage Company (the "Company"). As it currently stands, Thornton is proposing to take delivery of its water following diversion from the Poudre River at the Larimer County Canal and storage in Water Supply and Storage Company Reservoir No. 4. The Company is writing this letter to advise the County of the Company's understanding of Thornton's rights and obligations as a shareholder.

The Company was established over 125 years ago. The Company's water supply and delivery system is one of the largest and most complex privately held irrigation systems in the State of Colorado. The system is comprised of four transmountain diversions[1], two high mountain reservoirs[2], nine plains reservoirs[3], and over 100 miles of canals[4]. Additionally, the Company operates numerous exchanges and trades of water with other local water providers, including other ditch companies and local municipalities. The Company diverts water to satisfy approximately 40,000 acres of irrigated lands in Larimer and Weld counties every year.

Shortly before 1986, the City of Thornton began acquiring shares in the Company, ultimately acquiring 283.354 out of 600 outstanding shares, or 47.23% of the Company. Litigation between the Company and Thornton resulted. To settle the case and to protect its shareholders, the Company entered into an agreement with Thornton dated December 12, 1986 (the "1986 Agreement"). Importantly, the 1986 Agreement recites that:

---

[1] The Grand River Ditch, the Cameron Pass Ditch, the Skyline Canal, and the Laramie-Poudre Tunnel.
[2] Long Draw Reservoir and Chambers Lake.
[3] Curtis Lake, Rocky Ridge Reservoir, Kluver Lake, Water Supply Reservoirs Nos. 3 and 4, Richards Lake, Long Pond, Lindenmeier Lake and Black Hollow Reservoir
[4] Including the Larimer County Canal (a/k/a Larimer County Ditch), the Jackson Ditch and Jackson Ditch Extension, Pierce Lateral, Collins Lateral, and the Lone Tree Lateral.

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Letter to BOCC from President of WSSC (page 1 of 3)

> Thornton agrees that if it removes water from the Water Supply system, it must do so only under conditions that historic water deliveries to other shareholders (whether they are served directly from the Larimer County Ditch or other structures owned or operated by Water Supply, or from lateral ditches from the Larimer County Ditch) are not altered in time or quantity, their expenses not increased, nor their other rights adversely affected.

Thornton subsequently filed an application with the Water Court seeking approval of a change of use of its shares in the Company to allow the water to be used by Thornton for municipal purposes, and Thornton obtained a decree in 1998 from the Water Court approving its project (the "Thornton Northern Project Decree" or "TNP Decree").

Since Thornton acquired its ownership in the Company and obtained its TNP Decree, other municipalities have also acquired ownership in the Company, including the City of Fort Collins[5], the City of Greeley, East Larimer County Water District ("ELCO"), and North Weld County Water District ("NWCWD").

The Company balances its operations and water supply deliveries to its municipal shareholders while maintaining historical deliveries to its remaining shareholders. These operations are vital to the continued viability of irrigated lands in Larimer and Weld counties, and deliveries of water to the Company's municipal shareholders, including Thornton, are expressly conditioned upon the Company's ability to maintain operations and deliveries to all of its shareholders. The operations rely on Thornton's compliance with their TNP Decree and the 1986 Agreement.

The Company has concerns with the possibility of Thornton altering Company operations by bypassing the Company's river headgate. For example, such an operation would: (1) remove water from the ditch system thereby increasing ditch losses which would ultimately need to be born by Thornton; (2) drastically alter the Company's historical operation of the system, and (3) reduce water quality and cause greater algae growth in the system leading to additional operational difficulties. Ultimately, the water owned by Thornton historically has been delivered within the Company's system, benefiting the system as a whole. It would be extremely detrimental to the Company and its shareholders to see that water removed from the system.

To be clear, the Company holds paramount its obligation to deliver water to its agricultural shareholders, consistent with historical practice, without injury from Thornton's operations. However, the Company also recognizes its obligation to deliver water to all of its shareholders, including Thornton, provided other shareholders are not impacted. The Company has serious concerns regarding substantial negative impacts to

[5] The majority of the City of Fort Collins' ownership was actually obtained prior to the City of Thornton's own acquisitions.

EXHIBIT 2.d-2S
Letter to BOCC from President of WSSC (page 2 of 3)

its system and its shareholders that would result from bypassing the Company's headgate and taking deliveries at another location.

The Company would be happy to meet with representatives from the County to further discuss the Company's water rights, operations and its concerns in this matter.

Sincerely,

Keith W. Amen

Keith W. Amen
President
Water Supply and Storage Company

EXHIBIT 2.d-2S
Letter to BOCC from President of WSSC (page 3 of 3)

From: Dennis Harmon <dharmon@wtrsupply.com>
Sent: Wednesday, November 28, 2018 7:55 AM
To: Heather Bergman <heather@peakfacilitation.com>
Cc: Lesli Ellis <ellislk@co.larimer.co.us>
Subject: comments Heather requested at the conclusion of our meeting

11/28/18

Heather:

At the conclusion of the meeting last evening, you asked for comments on the proceedings. Please pass along the following comments to the Working Group:

The Working Group should eliminate the Canal Conveyance as an option to be considered further as WSSC's Board would not approve it. For reasons that may not be obvious to most, operating the ditch outside its historical May through mid-September seasonal pattern would be detrimental to the canal and its appurtenant facilities.

Not only would cold winter operations be damaging to the canal itself because of low temperatures and icing concerns which have been mentioned before, those operations would interfere with WSSC's essential seasonal maintenance over the 58 mile length of the canal **most of which can only be undertaken when the canal is empty**.

Those activities include tree removal, sand and silt removal, canal bank maintenance, cleaning of head gates and measuring flumes, replacement and repair of head gates and check structures, weed control spraying and burning, dam outlet structure maintenance and so on. In addition, a potential ditch failure during the winter months could be extremely difficult and expensive to repair, a risk our shareholders should not and will not accept, in my judgement.

The lateral ditches fed from our main canal which are independently owned and operated by subsets of our shareholders would be similarly (negatively) impacted.

Dennis Harmon

Dennis J. Harmon, General Manager

Water Supply & Storage Co.
Tunnel Water Company
Jackson Ditch Company

EXHIBIT 2.d-3S
E-mail to Peak Facilitation Group from General Manager of WSSC

2.e Description of the Features of the Project that Make It Consistent with the Intent of the Master Plan and Any Applicable Intergovernmental Agreements Affecting Land Use and Development

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.e, and the criteria and standards described in LUC Sections 4.2.2, 8.1 through 8.5, 8.8, 8.11, 8.12, 8.15, 12.1.B, 14.10.D.1, and 14.10.D.3 through 14.10.D.11.

Larimer County adopted a Master Plan in 1997 to guide land use and development in unincorporated Larimer County (Larimer County 1997). The Alternative 3 (Option C) Corridor is consistent with applicable Larimer County Master Plan policies and their associated lists of goals regarding the following:

- Chapter 2, Growth Management
- Chapter 3, Land Use
- Chapter 4, Public Facilities and Services
- Chapter 5, Transportation
- Chapter 6, Environmental Resources and Hazards

The Alternative 3 (Option C) Corridor is consistent with the plans listed below:

- Larimer County Open Lands Master Plan (Larimer County, June 2015)
- Larimer County Transportation Master Plan (Larimer County, July 2017)

2.e.1 Larimer County Master Plan

The Larimer County Master Plan contains policies to guide land use within unincorporated areas of Larimer County. Many of the policies are directed toward residential development, transportation, or other areas not directly related to the Alternative 3 (Option C) Corridor. For this reason, the following discussion addresses only those land use and other policies relevant to the Alternative 3 (Option C) Corridor. The information provided herein demonstrates that the Alternative 3 (Option C) Corridor is consistent with the goals and policies of the Larimer County Master Plan.

Larimer County Master Plan, Chapter 2 – Growth Management

The growth management (GM) process established in the Larimer County Master Plan is designed to ensure that Larimer County operates within its resources, protects the environment, and enhances the lives of Larimer County residents.

No long-term effects resulting from the Alternative 3 (Option C) Corridor are anticipated to the following:

- The volume of traffic on local streets
- The use of local utilities
- The need for additional law enforcement or fire protection
- Sensitive biological resources
- Agricultural lands

No long-term effects resulting from the source water pump station are anticipated to the following:

- The volume of traffic on local streets
- The use of local utilities
- The need for additional law enforcement or fire protection
- Sensitive biological resources

The location proposed for the source water pump station 2 acre site is zoned farming. Thornton will work with the property owner to locate the source water pump station to minimize impact to the property owner to the extent it is reasonably possible. Thornton will purchase the 2 acre site based on fair market value.

The Larimer County policies related to growth management are discussed below.

GM-1 Larimer County shall plan for long-term growth and physical expansion based on environmental, land use, community design, and infrastructure considerations.

TWP facilities within the Alternative 3 (Option C) Corridor will be designed to minimize effects on the environment, land use, and community resources. The Alternative 3 (Option C) Corridor will utilize trenchless construction methods for water pipeline installation to minimize impacts to natural resources such as jurisdictional waters and wildlife habitat associated with those areas. The area disturbed in constructing the water pipeline will be restored to pre-construction conditions, including grade and vegetation, minimizing long-term impacts to wildlife. Trenchless construction methods will also be used at major road crossings as required by the regulatory agencies having jurisdiction of the road to minimize impacts to traffic and public safety.

The Alternative 3 (Option C) Corridor is located in rural land use areas that include lands zoned open, rural estate, and farming. The water pipeline and fiber optic cable will be buried, and effects on agricultural use will be minimal. Agricultural use within the permanent easement may 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.

Where the Alternative 3 (Option C) Corridor parallels County Road 56, the water pipeline is proposed to be located in the Larimer County ROW as approved by Larimer County if the property owner is not agreeable to selling an easement for the water pipeline. The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*, adopted in July 2017. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

The location proposed for the source water pump station 2 acre site is zoned farming. Thornton will work with the property owner to locate the source water pump station to minimize impact to the property owner to the extent it is reasonably possible. Thornton will purchase the 2 acre site based on fair market value.

GM-2 Service demands of new development shall not exceed the capacities of existing roads and streets, utilities or public services.

During construction, water may be purchased from local water providers for construction activities such as watering the site to minimize fugitive dust or hydrotesting the water pipeline. The Alternative 3 (Option C) Corridor and source water pump station contractors will provide bottled water, water cooler service, or other temporary sources of drinking water during construction. Portable toilets will be used during construction. No additional level of service from Larimer County is anticipated to be required.

The existing road network has adequate capacity to serve anticipated construction traffic needs for facilities within the Alternative 3 (Option C) Corridor. As indicated in *Memorandum TWP – Summary of Existing Conditions and Project Impacts* (Felsburg Holt & Ullevig, 2018 November 13), the impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low. A copy of the memorandum is included in **Supplement 3 Appendix D**.

After construction, the TWP facilities may operate year-round, 24 hours a day; however, the facilities are intended to be unmanned. The source water pump station will be monitored and operated remotely, inspected daily, and repaired and maintained as needed. The existing road network has adequate capacity to serve anticipated operational traffic needs. It is anticipated that TWP operators could visit facilities daily to check operations. This entails one pickup truck accessing the source water pump station and driving along the water pipeline corridor for inspection and maintenance activities. Inspections of the water pipeline corridor will be done from public roads to the extent practicable. Consequently, there will be minimal effects on the volume of traffic on local streets.

The Alternative 3 (Option C) Corridor facilities have no additional effect on the need for law enforcement or fire protection. Fire hydrants are located along the roadway adjacent to the proposed source water pump station site. Final design of the source water pump station will meet fire protection level-of-service standards as required in LUC Section 8.1.4. A Larimer County Site Plan Review permit application will be submitted to Larimer County for the source water pump station after design.

The unmanned source water pump station is not anticipated to require any permanent drinking water source or sewage disposal system. Thornton contacted PVREA to determine if current infrastructure in the area supports the proposed load, and PVREA confirmed sufficient power is available in the area to supply the source water pump station. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

GM-13 Larimer County supports the development of a local economy that is increasingly self-reliant and that meets the needs of the present without compromising the needs of future generations.

GM-13-s1 County-sponsored economic development activities shall be supportive of existing businesses and retain existing employment, as well as fostering new employment opportunities, which create a positive impact on the County.

The TWP will employ Thornton employees, a construction management team, and contractors to complete construction for facilities within the Alternative 3 (Option C) Corridor and source water pump station. It is anticipated that Thornton will provide approximately 10 to 15 employees during the construction phase of the TWP. No lodging or temporary housing is expected to be required for Thornton employees or the construction management team. Contractors for the construction phase will be hired. The TWP contractors will provide construction crews that are not anticipated to exceed approximately 50 workers at any one time within the Alternative 3 (Option C) Corridor. Some workers may reside outside of the local areas and will require lodging or temporary housing. The number of construction workers on site will depend on the contractor and the construction activity occurring during a particular time. Thornton will endorse hiring local workers.

Contractors and construction workers will likely support local businesses to meet a need for durable and nondurable goods and services.

Normal operations and maintenance of the Alternative 3 (Option C) Corridor facilities and the source water pump station will be completed by Thornton employees from within the region, and no significant demand for goods and services is anticipated.

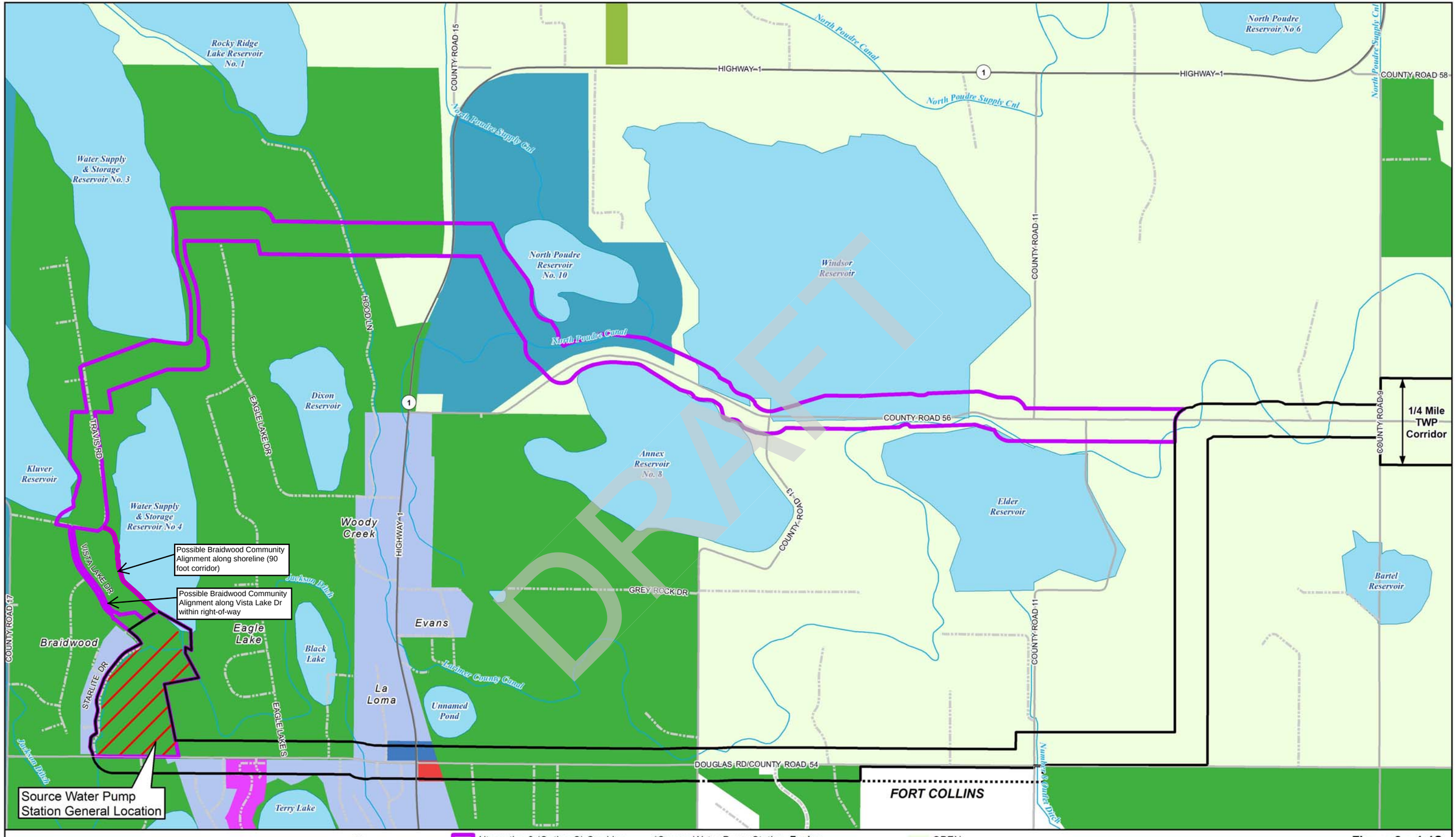
Larimer County Master Plan, Chapter 3 – Land Use

Future land use (LU) issues comprise the core of the Larimer County Master Plan. The Alternative 3 (Option C) Corridor and source water pump station are not located within any Growth Management Area (GMA).

LU-4 In rural areas, allowed uses and residential densities shall be based on the current zoning of the property.

The Alternative 3 (Option C) Corridor is located in rural land use areas designated as open, rural estate, and farming zoning. 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 pipeline and fiber optic cable are compatible with other land uses, such as residential use, that the Alternative 3 (Option C) Corridor crosses. **Figure 2.e.1-1S** shows the zoning within the Alternative 3 (Option C) Corridor in Larimer County.

The location proposed for the source water pump station 2 acre site is zoned farming. Pump station does not exist as a use in the LUC. However, locating the source water pump station on property zoned farming is consistent with existing pump stations and other utility infrastructure in Larimer County.



CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

12/6/2018

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0 500 1,000 Feet
1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Zoning

- COMMERCIAL
- FARMING
- FORESTRY
- MULTIPLE FAMILY
- OPEN
- RESIDENTIAL
- RURAL ESTATE
- TOURIST

Figure 2.e.1-1S
Alternative 3 (Option C) Corridor Zoning

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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LU-9 Undevelopable land shall be defined in the Land Use Code and shall include the Floodway (FW) zone district and land below the high water mark of existing bodies of water.

No floodway zone district is located in the Alternative 3 (Option C) Corridor. Water pipeline crossings of jurisdictional waters will utilize trenchless construction methods.

LU-10 All new development shall be located and designed for compatibility with sensitive natural areas.

LU-10-s1 The Land Use Code shall include the provision that mapping of natural hazard areas, wetlands, ridgelines and other natural and cultural resource area information available from the Planning Division, be included on initial development submittals and considered in development design. Additional natural resource information that becomes available through the development review process should be incorporated in the design. (See also Sec. 6.1.).

Natural hazards information including figures for the Alternative 3 (Option C) Corridor are presented in this supplement in Section 8.c, Natural Hazard Mitigation Plan. The Alternative 3 (Option C) Corridor is located outside of any Larimer County designated wildfire hazard areas. The Alternative 3 (Option C) Corridor crosses locations defined as low geologic class hazard condition. A subsurface geotechnical investigation of geologic conditions utilizing soil borings will be completed during the design phase of the TWP to further determine the subsurface soil conditions and associated geological hazards and identify the best mitigation measures for the TWP.

The Alternative 3 (Option C) Corridor was assessed for potential jurisdictional waters and wildlife habitat using publicly available mapping and aerial photographs, and by conducting a windshield survey of areas that could be publicly accessed. Site surveys will be performed once access to the land is available to aid in the determination of jurisdictional waters and wildlife habitat. Information from the corridor assessment and survey information will be used to develop the final pipeline alignment. Mitigation methods to minimize impacts to these areas will be incorporated into the design and construction as appropriate. Jurisdictional water crossings will be constructed using trenchless construction methods.

A Class I File Search and Literature Review for cultural resources was conducted for the Alternative 3 (Option C) Corridor and study buffer. Based on that review, there are no cultural sites or structures that are listed on the State and National Register of Historic places within the Alternative 3 (Option C) Corridor. Additional information on natural and cultural resources within the Alternative 3 (Option C) Corridor is presented in this supplement in **Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resource Assessment.

Appropriate mitigation measures will be implemented in the development of the final water pipeline alignment within the Alternative 3 (Option C) Corridor considering data received from the Planning Division, environmental field surveys that will be completed for the Alternative 3 (Option C) Corridor once access is available, and other sources as additional studies are conducted during the design phase.

LU-10-s3 The Land Use Code shall establish standards to control erosion and prevent infestation of noxious weeds during construction of new development.

Surface drainage BMPs implemented during construction of the Alternative 3 (Option C) Corridor facilities will include application of erosion control techniques and the successful revegetation of disturbed areas. The required CDPHE construction stormwater permits will be obtained prior to construction, and the associated SWMPs will include detailed descriptions of BMPs that will be used

to control erosion. Disturbed areas will be restored to pre-construction grades and 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 and regulatory requirements. Disturbed mature vegetation will be replaced, per a property owner's reasonable request, with a like species. Measures that may be employed to protect surface water and control erosion are provided in the **Application Appendix D**.

A noxious weed mitigation plan is included in the **Application Appendix C.**

LU-11 Compatibility with adjacent land use shall be considered in the design of all new development.

The water pipeline and fiber optic cable within the Alternative 3 (Option C) Corridor will be compatible with adjacent land uses because they will be buried at a depth sufficient to prevent interference with anticipated land uses. The Alternative 3 (Option C) Corridor is located in and adjacent to rural land use areas. Agricultural use within the permanent easement can continue after construction. The TWP is not anticipated to impact standard agricultural practices once the TWP is installed. Thornton will coordinate placement of the water pipeline and appurtenances, including bury depth, with individual property owners to minimize impacts to property operations.

LU-11-s1 Neighborhood meetings shall be required where compatibility with existing residential uses is an issue.

The Alternative 3 (Option C) Corridor is not incompatible with existing residential uses. 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, Thornton conducted public outreach as described in the Application Section 2.k.

At the Larimer County Land Use Hearing on August 1, 2018, the BOCC continued the Application hearing until December 17, 2018 to allow Larimer County and Thornton to work with the public to better define and analyze issues and alternatives related to the TWP water pipeline. Larimer County initiated the following activities in response to the BOCC's request for additional information:

- Hired an independent outside facilitator, Peak Facilitation Group, to manage the public engagement process.
- Formed a working group comprised of representatives from interested stakeholders. Thornton was determined not to be a member of the working group but attended the meetings so that working group members could ask questions, request documents or presentations about technical subjects or the project process, or provide Thornton with suggestions.
- Hosted two public open house meetings to provide information to the public and obtain feedback on Larimer County's process for the TWP.
- Administered additional technical analysis for the TWP.

Discussions were held with Eagle Lake and Braidwood residents regarding the impacts of constructing a pipeline or pipelines in their community.

Section 2.k in this Supplement 3 includes additional information on the public process directed by the BOCC conducted after continuation of the August 1, 2018 hearing.

LU-11-s2 Development adjacent to agricultural uses shall provide adequate buffers to minimize conflicts and complaints concerning standard agricultural practices.

The Alternative 3 (Option C) Corridor is located in and adjacent to rural land use areas. The water pipeline and fiber optic cable will be compatible with agricultural uses because they will be buried at a depth sufficient to prevent interference with agricultural uses and agricultural use within the permanent easement can continue after construction. The TWP is not anticipated to impact standard agricultural practices once the water pipeline and fiber optic cable are installed. Thornton will coordinate placement of the water pipeline and appurtenances, including bury depth, with individual property owners to minimize impacts to property operations.

LU-11-s3 The Land Use Code shall include guidelines for the use of design elements such as landscaping and buffer areas to help achieve compatibility.

Areas disturbed within the Alternative 3 (Option C) Corridor for the construction of the water pipeline will be restored to pre-construction conditions, including grade and vegetation. The landscaping at the source water pump station site will adhere to LUC Section 8.5. Landscape plans or narrative, as appropriate, will be provided to Larimer County with the Site Plan Review permit application in accordance with LUC Section 6.0.

LU-11-s4 Landscaping plans shall be required as part of all major development applications and all multi-family, commercial and industrial building permits. Existing vegetation shall be maintained wherever possible, except in wildfire hazard areas where thinning to achieve defensible space is necessary. Native plants, existing drainage patterns and natural designs should be used to increase the sustainability of the landscaping.

Within the Alternative 3 (Option C) Corridor, the majority of the impacts on vegetation will be temporary during construction of the water pipeline and long-term impacts to native vegetation communities are not expected. Disturbed areas will be restored to pre-construction grades and 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 owners preferences and regulatory requirements. Disturbed mature vegetation will be replaced, per a property owner's reasonable request, with a like species.

Potential future repairs and maintenance could affect discrete areas of vegetation when the water pipeline is accessed in a particular location. Any vegetated areas disturbed during maintenance or required repairs will be restored by the methods used during construction.

Based on site visits conducted in 2018 along publicly accessible areas and using Google Earth imagery, six broad vegetation communities within the Alternative 3 (Option C) Corridor and study buffer were identified and are as follows:

- Mixed upland
- Nonnative upland
- Riparian
- Wetlands
- Agricultural lands
- Developed/disturbed areas

Water pipeline crossings of high-quality vegetation such as wetlands or riparian communities will be constructed using trenchless construction methods. Additional information on existing vegetation in the Alternative 3 (Option C) Corridor is included in **Supplement 3 Appendix A**.

Permanent impacts will occur from construction of the source water pump station. Landscaping at the source water pump station site will adhere to LUC Section 8.5. Landscape plans or narrative, as appropriate, will be provided to Larimer County with the Site Plan Review and building permit applications in accordance with Larimer County requirements.

LU-12 Site design of commercial and industrial uses shall enhance and protect the aesthetic quality of community gateways and other high visibility corridors, including I-25, US Highways 34 and 287, and Colorado Highway 14.

LU-12-s1 The Land Use Code shall establish aesthetic standards and guidelines for commercial and industrial development addressing landscaping, screening of outdoor storage and operations, orientation of buildings (so that businesses do not back onto high visibility corridors), parking lot design and similar design considerations.

The water pipeline will be buried and will not affect community gateways or other high-visibility corridors. Activities will include removal of existing vegetation, exposure of bare soils, earthwork and grading, and revegetation. There will not be significant long-term visual effects. Screening and/or buffering will not be necessary. Following construction, disturbed areas will be revegetated and the water pipeline will not be visible. Water pipeline markers will be installed and maintained over the water pipeline and extend approximately 4 feet above ground. Water pipeline markers will occur approximately every 500 feet or in line of sight and at changes in direction to identify the location of the water pipeline for safety and to reduce the risk of inadvertent third-party damage or interference. **Figure 2.e.1-2S** shows a photo from a similar water project after construction and revegetation. Other items that could be visible above ground include vent pipes, access manways, and manhole covers that are associated with water pipeline appurtenances located below grade. *See* Section 2.a.2, General Description, Project Components and **Figure 2.a-2S** in this Supplement 3 for additional information.

FIGURE 2.e.1-2S
Photo of Similar Water Pipeline Project Restoration

Design of the source water pump station will incorporate aesthetic standards and guidelines to meet Larimer County requirements.

LU-13 New development in wildfire hazard areas shall be designed to allow defensible space around structures and otherwise mitigate potential hazards to life and property.

Based on Larimer County mapping, the Alternative 3 (Option C) Corridor is not located in any wildfire hazard areas. See Section 8.c, Natural Hazard Mitigation Plan for additional information.

LU-14 Energy-efficient design, including the potential for solar access, shall be considered in subdivision design and in the orientation of individual building sites.

Pumps for the source water pump station will be chosen to operate near their best efficiency point and equipped with variable frequency drives to increase energy efficiency.

LU-15 New roadways, including Larimer County roads, shall be designed and constructed in a manner that minimizes the impact on water quality and sensitive environmental areas and considers aesthetics.

No new permanent roadways will be necessary to construct and maintain the TWP. At most locations, construction traffic will parallel existing roadways and use permanent and temporary construction easements. Existing access points will be used whenever possible. Cross-country travel during construction will be necessary along property lines and other locations within easements in unincorporated Larimer County. Thornton and the TWP contractors will exercise care and will coordinate with property owners to minimize impacts to property owner's existing access locations. New temporary access locations may be required. They will be designed and constructed outside of sensitive environmental areas and will be designed to minimize impacts on water quality by implementing appropriate BMPs.

Surface drainage BMPs will include application of erosion control techniques and the revegetation of disturbed areas. SWMPs will include detailed descriptions of BMPs that will be used to protect surface hydrology and water quality.

Larimer County Master Plan, Chapter 4 – Public Facilities and Services

The TWP does not include any publicly accessible facilities, and impacts to existing facilities will be managed and mitigated. Further utility investigation will be conducted for the development of the final pipeline alignment within the Alternative 3 (Option C) Corridor. The design will incorporate criteria for crossing existing utilities, such as minimum clearance requirements between pipelines.

PF-1 New development shall be approved only when adequate public facilities and services are available, or when necessary improvements will be made as part of the development project.

PF-1-s1 Adequate facilities and service levels shall be clearly defined in the Land Use Code and shall include standards for water, sewer, fire protection, stormwater management and transportation at a minimum. In Growth Management Areas, service level standards shall be compatible with those of the adjacent municipality, as specified in an Intergovernmental Agreement with the municipality. In other areas, standards shall be based on the density and intensity of the use.

During construction, water may be purchased from local water providers for construction activities such as watering the site to minimize fugitive dust or hydrotesting the water pipeline. TWP contractors will provide bottled water, water cooler service, or other temporary sources of drinking water during construction. Portable toilets will be used during construction. No additional level of service from Larimer County is anticipated to be required.

The existing road network has adequate capacity to serve anticipated construction traffic needs for facilities within the Alternative 3 (Option C) Corridor. As indicated in *Memorandum TWP – Summary of Existing Conditions and Project Impacts* (Felsburg Holt & Ullevig, 2018 November 13), the impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low. A copy of the memorandum is included in **Supplement 3 Appendix D**.

After construction, the TWP facilities may operate year-round, 24 hours a day; however, the facilities are intended to be unmanned. The source water pump station will be monitored and operated remotely, inspected daily, and repaired and maintained as needed. The existing road network has adequate capacity to serve anticipated operational traffic needs. It is anticipated that TWP operators could visit facilities daily to check operations. This entails one pickup truck accessing the source water pump station and driving along the pipeline corridor for inspection and maintenance activities. Inspections of the water pipeline corridor will be done from public roads to the extent practicable. Consequently, there will be minimal effects on the volume of traffic on local streets.

The TWP facilities have no additional effect on the need for law enforcement or fire protection. Fire hydrants are located along the roadway adjacent to the proposed source water pump station site. Final design of the source water pump station will meet fire protection level-of-service standards as required in LUC Section 8.1.4. A Larimer County Site Plan Review permit application will be submitted to Larimer County for the source water pump station after design.

The unmanned source water pump station is not anticipated to require any permanent drinking water source or sewage disposal system. Thornton contacted PVREA to determine if current infrastructure in the area supports the proposed load, and PVREA confirmed sufficient power is available in the area to supply the source water pump station. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

The Application Section 8.e, Drainage and Erosion Control Report and Plan includes information on stormwater management.

PF-4 Larimer County water service providers and fire protection districts shall coordinate domestic water service standards and fire protection standards for water supply to ensure that all County residents have adequate water supplies for domestic use and for fire protection.

TWP designers will coordinate with water service providers and applicable fire protection districts during the design phase.

PF-5-s1 Guidelines for defining, acquiring and maintaining open lands are contained in the Help Preserve Open Space Initiative and in the Mission Statement for the Larimer County Open Lands Program, adopted by the Board of County Commissioners in July 1996.

The construction of the TWP will not conflict with the overall Mission Statement for the Larimer County Open Lands Program or the Help Preserve Open Space Initiative. The water pipeline will be constructed below ground, and the surface will be restored to pre-construction conditions after the water pipeline is installed.

In 2019 Thornton will begin a community-based planning process to evaluate and identify future land uses for the properties that Thornton owns in Larimer and Weld Counties. As a part of this process, Thornton commits to coordinating with Larimer County and other local stakeholders to identify the interests of the community, and to develop Thornton's properties in a manner in which both Thornton's water interests and the communities' vision are preserved.

The proposed Alternative 3 (Option C) Corridor intersects the Kraft Farm Conservation Easement northwest of Bartel Reservoir within unincorporated Larimer County based on the Larimer County Parks and Open Space GIS layer, downloaded in August 2016. The Kraft Farm Conservation Easement abuts County Road 56 on the north side of the easement. During the development of the final pipeline alignment, designers will consider routing the water pipeline location around this area where practicable. If the water pipeline cannot be routed around the dedicated conservation easement or wildlife area, impacts to this area will be temporary and only occur while the water pipeline construction is taking place. After construction is completed, the area will be restored to pre-construction grades and vegetation, restoring it to its open lands condition. Thornton will coordinate with stakeholders of this area to determine if other appropriate mitigation measures may need to be implemented. If the property owners of this easement and of the property north of the easement object to granting an easement for the TWP, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County.

PF-8 The location and design of new public facilities shall be consistent with the Master Plan.

The TWP facilities in the Alternative 3 (Option C) Corridor are consistent with applicable guiding principles of Chapter 4 of the Master Plan. More specifically:

- The TWP will not permanently impact community gateways and view corridors.
- No public facilities and services for construction, operations, or maintenance will be required.
- The existing road network has adequate capacity to serve anticipated operational traffic needs.
- No water and sewer utility services for operations and maintenance will be required.
- No on-site personnel will be required, and no added burden will be placed on existing fire and police facilities.

PF-10 New development shall not reduce existing service below adequate levels, nor shall capital improvements to support new development be subsidized by existing residents.

The TWP will not reduce existing service below adequate levels. Larimer County residents will not subsidize the TWP. Similar to other utility/water providers, Thornton's water utility customers will pay for the TWP.

Larimer County Master Plan, Chapter 5 – Transportation

The Alternative 3 (Option C) Corridor is located in rural land use areas. The existing road network has adequate capacity to meet anticipated operational traffic needs. Trenchless construction methods will be used at major road crossings as required by the regulatory agency having jurisdiction of the road to minimize effects to traffic and public safety. If property owners object to granting an easement for the Alternative 3 (Option C) Corridor parallel to County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County. At other locations, the water pipeline alignment is proposed to be located outside current and future planned road ROW, unless otherwise approved by Larimer County. The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

TR-1 The Larimer County transportation planning process shall complement the development patterns and principles of the Master Plan.

TR-1-s1 The Functional Road Classification Map shall be used as the official future roadway plan for the County.

Water pipeline installation within Larimer County ROW other than as specifically approved in a 1041 permit will require approval from Larimer County. At most locations the final water pipeline alignment is anticipated to parallel existing ROW and, if practicable, future road ROW. If property owners object to granting an easement for the Alternative 3 (Option C) Corridor parallel to County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County. Efforts to locate the TWP outside of environmentally sensitive areas or minimize disturbance to existing structures, such as homes, may require locating the water pipeline and fiber optic cable in Larimer County ROW for short distances.

The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

TR-2 New development shall occur only where existing transportation facilities are adequate or where necessary improvements will be made as part of the development project.

Existing transportation facilities are adequate to serve construction of the TWP, and no new roads or improvements to existing roads are anticipated to be necessary in unincorporated Larimer County. Access will be via existing roads, temporary construction access, and the ROWs negotiated through individual easements.

Larimer County Master Plan, Chapter 6 – Environmental Resources and Hazards

The TWP facilities within the Alternative 3 (Option C) Corridor will utilize trenchless construction methods for water pipeline installation to minimize effects to natural resources such as jurisdictional waters and wildlife habitat associated with those areas. The area disturbed for constructing the water pipeline will be restored to pre-construction conditions, including grade and revegetation, thus minimizing long-term impacts to wildlife. Areas of significant concern can utilize trenchless construction methods or the alignment of the water pipeline could be adjusted to reduce the impact the water pipeline has in a particular area. Additional information is included in **Supplement 3 Appendix A** and the following reports in Section 8:

- 8.a Wetland Mitigation Plan
- 8.b Wildlife Conservation Plan
- 8.c Natural Hazard Mitigation Plan
- 8.f Floodplain Hydraulic/Hydrologic Modeling Report

ER-1 Resources and environmental conditions potentially impacted by proposed development shall be identified in the initial stages of the project, to best design a development that protects the environment.

Supplement 3 Appendix A presents an assessment of natural and cultural resources within the Alternative 3 (Option C) Corridor and study buffer. Site surveys will be performed once access to land is available to aid in the determination of jurisdictional waters and wildlife habitat. Information from the assessment and survey information will be used to develop the final water pipeline alignment. Mitigation methods to minimize impacts to these areas will be incorporated into the design and construction as appropriate.

ER-1-s1 Environmental review shall be a formal required process beginning at the concept stage of all new development projects. Applicants will submit a checklist indicating which environmental resources and conditions will have significant, mitigable or no significant impact. In addition, resource information available from the Planning Department, pertaining to the project site and the area at least 1200 feet beyond project boundaries, shall be included on the concept plan submitted with the application.

Supplement 3 Appendix A presents an assessment of natural resources within the Alternative 3 (Option C) Corridor and study buffer. Thornton has met multiple times with staff from the Larimer County Planning Department regarding the TWP, the 1041 permit application process, and permit requirements. The Pre-Application Conference and follow-up meetings provided Thornton with guidance and recommendations from Larimer County staff to help ensure a complete permit application submittal. For long linear projects, Larimer County staff indicated that an environmental study of the project corridor would be sufficient. However, Thornton included an additional study buffer that typically extended 500 feet each side of the Alternative 3 (Option C) Corridor centerline and a 1,200-foot buffer around the source water pump station location.

Table 2.e.1-1S presents the anticipated effects on resources within the Alternative 3 (Option C) Corridor and study buffer.

TABLE 2.e.1-1S
Environmental Checklist for Resources Identified within the Alternative 3 (Option C) Corridor

Resource	Impact	Supplement 3 Section Reference
100-Year Floodplains	No Significant Impact	Section 8.f, Floodplain Hydraulic/Hydrologic Modeling Report
Wildfire Hazards	No Significant Impact	Section 8.c, Natural Hazard Mitigation Plan
Geological Hazards	Mitigable	Section 8.c, Natural Hazard Mitigation Plan
Cultural	No Significant Impact	Supplement 3 Appendix A, Addendum A to the Natural and Cultural Resources Assessment
Jurisdictional Waters	No Significant Impact	Section 8.a, Wetland Mitigation Plan and Supplement 3 Appendix A, Addendum A to the Natural and Cultural Resources Assessment
Vegetation	Mitigable	Supplement 3 Appendix A, Addendum A to the Natural and Cultural Resources Assessment
Wildlife	Mitigable	Section 8.b, Wildlife Conservation Plan and Supplement 3 Appendix A, Addendum A to the Natural and Cultural Resources Assessment
Special Status Species	Mitigable	Section 8.b, Wildlife Conservation Plan and Supplement 3 Appendix A, Addendum A to the Natural and Cultural Resources Assessment

100-Year Floodplains

The Alternative 3 (Option C) Corridor and study buffer do not cross any designated 100-year floodplains.

Wildfire Hazards

The Alternative 3 (Option C) Corridor and study buffer are not located in a wildfire hazard area.

Geologic Hazards

Based on Larimer County GIS data downloaded August 2016 from Larimer County's GIS Digital Data and shown in **Figure 8.c-2S**, the Alternative 3 (Option C) Corridor and study buffer are located in a low geologic hazard category. 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 Alternative 3 (Option C) Corridor. Mitigation measures will be further refined during design to meet site-specific geological hazards. Geologic hazards could be mitigated by using trenchless construction methods for water pipeline installation. Jurisdictional waters will be crossed using trenchless construction methods. Other possible mitigation measures that could be implemented are described in Section 8.c.

Cultural

A Class I File Search and Literature Review for cultural resources was conducted for the Alternative 3 (Option C) Corridor and study buffer. No cultural sites or structures listed on the State and National

Register of Historic Places are located within the Alternative 3 (Option C) Corridor or study buffer. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A.**

Jurisdictional Waters

The Alternative 3 (Option C) Corridor and study buffer cross multiple open waters, riparian areas, and wetlands. Water pipeline crossings of jurisdictional waters will be constructed using trenchless construction methods. Thornton has been in discussions with USACE, and Thornton plans to submit a jurisdictional determination request to USACE to determine which areas in the Alternative 3 (Option C) Corridor are jurisdictional. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment **Supplement 3 Appendix A.**

Vegetation

Impacts to vegetation will be temporary during construction except at the source water pump station site. Restoration around the source water pump station will be determined during design. Temporarily disturbed areas will be returned to pre-construction grades and will be seeded with native vegetation to meet property owner preferences and regulatory requirements. No long-term adverse effects on vegetation will occur. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A.**

Wildlife

An assessment of the Alternative 3 (Option C) Corridor and study buffer was conducted for wildlife and wildlife habitat. Information on terrestrial and aquatic animals was obtained from various sources including Colorado Parks and Wildlife, Colorado Natural Diversity Information System, Colorado Natural Heritage Program, U.S. Fish and Wildlife Service, published literature, and field surveys. Additional information including mitigation measures to minimize impacts to wildlife can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A.**

Special Status Species

An assessment of the Alternative 3 (Option C) Corridor and study buffer was conducted for potential habitat of federally threatened, endangered, and candidate species protected under the Endangered Species
Act. The TWP will have no effect on federally listed threatened, endangered, or candidate wildlife or plant species. Mitigation measures such as restricting construction during nesting seasons may be implemented as appropriate. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

ER-3 Larimer County shall endeavor to protect all identified wetland areas of the County, in recognition of their importance in maintaining water quality, wildlife habitat, flood protection and other critical environmental functions.

ER-3-s3 A Wetland Mitigation Plan shall be developed for any development project which impacts a wetland. Requirements and performance standards for the mitigation plan shall be clearly established in the Land Use Code, and shall be the basis for approval of that plan.

Based on desktop analysis and field surveys conducted where access was available, the Alternative 3 (Option C) Corridor and study buffer cross multiple wetlands. More detailed field surveys will be conducted during the design phase once access is available to determine the extent of wetlands and

other jurisdictional waters. Water pipeline crossings of jurisdictional waters including wetlands will be constructed using trenchless construction methods. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

ER-4 Larimer County shall endeavor to protect all areas identified as highest priority on the Important Wildlife Habitat Map, which is adopted by reference as part of the Master Plan.

An assessment of the Alternative 3 (Option C) Corridor and study buffer was conducted for wildlife and wildlife habitat. Information on terrestrial and aquatic animals was obtained from various sources including Colorado Parks and Wildlife, Colorado Natural Diversity Information System, Colorado Natural Heritage Program, U.S. Fish and Wildlife Service, published literature, and field surveys. Wildlife, including habitat and special status species, and associated mitigation measures that could be implemented to minimize impacts to wildlife are discussed in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

ER-4-s3 A Wildlife Impact Mitigation Plan shall be developed for any development project which impacts an Important Habitat, or which presents concerns of detrimental human-wildlife interaction. Requirements and performance standards for the mitigation plan shall be clearly established in the Land Use Code and shall be the basis for approval of the plan.

Wildlife, including habitat and special status species, and associated mitigation measures that could be implemented to minimize impacts are discussed in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

ER-5 Approval of development in hazard areas shall require a finding that the proposed development is compatible with the potential hazards and that future owners or the County shall not be subject to safety hazards or economic costs associated with development related to the natural disturbance.

ER-5-s2 Moderate hazard areas shall be avoided wherever possible or the potential disturbance adequately mitigated. The Land Use Code shall establish guidelines for mitigation plans and require that the plans be reviewed by professionals having demonstrated expertise in the appropriate field, i.e., geology or wildfire management.

The Alternative 3 (Option C) Corridor and study buffer do not cross any designated 100-year floodplains

The Alternative 3 (Option C) Corridor and study buffer are not located in a wildfire hazard area.

Based on Larimer County GIS data downloaded August 2016 from Larimer County's GIS Digital Data and shown in **Figure 8.c-2S**, the Alternative 3 (Option C) Corridor and study buffer are located in a low geologic hazard category. 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 Alternative 3 (Option C) Corridor. Mitigation measures will be further refined during design to meet site-specific geological hazards. Geologic hazards could be mitigated by using trenchless construction methods for water pipeline installation. Jurisdictional waters will be crossed using trenchless construction methods. Other possible mitigation measures that could be implemented are described in Section 8.c.

ER-5-s3 Potential disturbances shall be eliminated in constraint areas as part of the development design process. Approval of development in constraint areas shall be conditional, based on adequate mitigation of the potential natural disturbance.

Strategies for follow-up monitoring to ensure that mitigation has occurred shall be incorporated when appropriate.

The design team will coordinate with Larimer County to determine the location of any constraint areas and will implement required mitigation or avoidance practices in line with industry standards. Monitoring requirements will be coordinated with the County should any mitigation take place.

ER-6 New development in wildfire hazard areas shall be designed to create communities less susceptible to loss of life and property from wildfire.

ER-6-s1 All new development in designated wildfire hazard areas shall complete and implement a wildfire mitigation plan specific to that development. Mitigation plan standards and guidelines shall be clearly established in the Land Use Code and shall be the basis for plan approval. Standards shall include provisions for emergency equipment access and year-round water supply.

Based on the *Larimer County Wildfire Hazard Areas Map*, the Alternative 3 (Option C) Corridor is located outside of the wildfire hazard area. The water pipeline will be buried and is not susceptible to wildfires. Appurtenances will be constructed of steel, concrete, and other non-flammable materials.

ER-8 Larimer County shall protect its commercial mineral resources, pursuant to 34-1-302(1) C.R.S.

No significant mineral resources have been identified within the Alternative 3 (Option C) Corridor. The TWP is a linear project that follows many existing linear corridors. The development of undiscovered mineral resources would not be limited by the TWP. **Figure 4.nS** shows locations of commercial mineral mines, active hard rock mines, sand and gravel construction mines, and Division of Reclamation Mining and Safety mines in Larimer County.

ER-13 Development proposals shall minimize negative air quality impacts to the maximum extent possible.

ER-13-s2 Development applicants shall comply with State requirements for controlling dust emissions during the construction phase of development. The Land Use Code shall reference performance standards for dust control.

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 prior to construction activities in accordance with state air quality regulations. Additional information including possible mitigation measures to be used during construction can be found in Section 8.l, Air Quality Impact and Mitigation Report.

ER-14 Water quality shall be protected by analyzing potential impacts of development proposals, the application of best management practices to reduce or control sources of contamination, and a demonstration of compliance with local, State and Federal requirements.

ER-14-s1 Applicants for new development shall address potential water quality impacts for properties that contain surface water or have the potential to impact surface or groundwater quality. A water quality management plan shall be included as part of the stormwater report in the development review process.

Development of the final water pipeline alignment within the Alternative 3 (Option C) Corridor will consider water pipeline construction locations that minimize impacts to historical surface and subsurface water flows in the project area. Water pipeline crossings of jurisdictional waters, including wetlands, will be constructed utilizing trenchless construction methods. This construction method will eliminate surface disturbance to the waterbody and effects on water quality. The Alternative 3 (Option C) Corridor and study buffer cross multiple open waters, riparian areas, and wetlands. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

The Option C corridor crosses multiple irrigation ditches as presented in **Table 2.e.1-2S**. Thornton has begun initial outreach to each irrigation ditch company to begin coordination activities. Thornton will obtain appropriate agreements for each crossing prior to construction. No direct effects on water quality in the irrigation ditches are anticipated. Crossings will be constructed using either open-cut or trenchless construction methods as directed by the irrigation ditch company and during off season, if required.

TABLE 2.e.1-2S
Alternative 3 (Option C) Corridor Irrigation Ditch Crossings

Irrigation Ditch Name	Irrigation Ditch Owner
Jackson Ditch	The Jackson Ditch Company
Larimer County Ditch/Larimer County Canal	Water Supply and Storage Company
North Poudre Canal	North Poudre Irrigation Company
No. 8 Outlet Ditch	Windsor Reservoir and Canal Company

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity - General Permit from 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.

Construction wastewater associated with the potential dewatering of trenches would be handled in accordance with CDPHE permit discharge requirements. Prior to construction, Thornton and/or the TWP contractors will obtain a General Permit for Construction Dewatering Activities from CDPHE and specify the management measures to be used to capture and manage any generated discharge.

Section 8.e, Drainage and Erosion Control Report and Plan and **Application Appendix D**, Construction Stormwater Best Management Practices – Example Descriptions include additional information.

Construction, operation, and maintenance activities will comply with applicable federal, state, and local laws and regulations regarding the use of hazardous substances as described in the Application in Section 2.h.

ER-14-s2 Drinking water sources shall be provided the highest achievable levels of environmental protection. Stormwater from new developments must not be discharged into a drinking water supply reservoir unless it can be demonstrated that water quality will not be impaired. Water quality management plans shall address water chemistry, as well as sediment transport and control.

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity - General Permit from 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.

ER-14-s3 Local and State requirements for individual on-site sewage disposal systems shall be considered in the initial stages of the development review process. All new lots to be served with individual septic systems shall be at least 2.29 acres and shall demonstrate the ability to meet local standards prior to preliminary subdivision approval.

After construction, the TWP facilities may operate year-round, 24 hours a day; however, the facilities are intended to be unmanned. The source water pump will be monitored remotely, inspected daily, and repaired and maintained as needed. The unmanned facilities are not anticipated to require any permanent drinking water source or sewage disposal system.

ER-14-s4 Applicants for construction activities, industrial uses and mining activities which meet thresholds under State law shall demonstrate that they have obtained a Colorado Stormwater Permit. Colorado Stormwater permits require applicants to identify and carry out appropriate best management practices to minimize polluted runoff from their sites.

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity - General Permit 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.

ER-15 All new development shall be required to adequately provide for stormwater management in a manner which reflects current engineering practice and which takes into account up-to-date hydrologic standards.

Stormwater management practices will be incorporated in the design of facilities within the Alternative 3 (Option C) Corridor and the source water pump station site.

ER-17 Larimer County shall develop noise and glare performance standards and enforce State odor condition standards to protect the health, safety and welfare of County residents.

ER-17-s1 Noise standards from the County Noise Ordinance shall be used in the development review process to ensure that new development does not create unacceptable noise conditions beyond its property boundaries. The Land Use Code shall reference maximum permissible noise levels consistent with the existing County Noise Ordinance. If the County has reason to believe that a proposed use may cause noise which would be objectionable or otherwise cause a nuisance, a noise mitigation plan may be required as part of a development application.

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.

Post-construction, noise at the source water pump station is anticipated to come from air conditioning unit(s) and from equipment inside the building such as pumps and motors. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. The facility will be designed to meet the then-existing Larimer County Noise Level Ordinance. No noises related to the water pipeline is anticipated. A Larimer County Site Plan Review permit application will be submitted to Larimer County for the source water pump station after design.

Section 8.k, Noise Analysis includes additional information.

ER-17-s2 Performance standards for glare shall be addressed in the development review process to limit off-site impacts associated with glare and light level disturbance. The Land Use Code shall specifically address outdoor lighting standards and provide a review process for outdoor lighting activities and uses such as lighted playing fields and outdoor arenas.

Lighting is not required for the water pipeline. For security, lighting will be provided at the source water pump station. The lighting plan for the source water pump station will be submitted to Larimer County with the Site Plan Review Permit application. Fixtures will be designed, shielded, aimed, located and maintained to prevent glare and light trespass on abutting properties and the vicinity.

The Application also included a water tank as an appurtenance to the Application. However after listening to the interests and concerns of the community through the hearing, Working Group process and Open House about the location of the water tank in Larimer County, Thornton has determined not to locate the water tank within Larimer County, and that request is withdrawn from the Application.

ER-18 The development review process shall assist in the protection of the special places of Larimer County.

A Class I File Search and Literature Review for cultural resources was conducted for the Alternative 3 (Option C) Corridor and study buffer. No cultural sites or structures listed on the State and National Register of Historic Places are located within the Alternative 3 (Option C) Corridor or study buffer within Larimer County. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

2.e.2 Applicable Intergovernmental Agreements and Municipality Plans

No IGAs exist in the Alternative 3 (Option C) Corridor area.

The Alternative 3 (Option C) Corridor and source water pump station are not located within any GMA.

2.e.3 Larimer County Open Lands Master Plan

The Alternative 3 (Option C) Corridor does not cross any existing Larimer County Open Space and Parks identified in the Larimer County Open Lands Master Plan. One conservation easement, the

Kraft Farm Conservation Easement, indicated in the Larimer County Open Lands Master Plan, is within the Alternative 3 (Option C) Corridor. The Kraft Farm Conservation Easement abuts County Road 56 on the north side of the easement. During the development of the final pipeline alignment, designers will consider routing the water pipeline location around this area where practicable. If the water pipeline cannot be routed around the dedicated conservation easement or wildlife area, impacts to this area will be temporary and only occur while the water pipeline construction is taking place. After construction is completed, the area will be restored to pre-construction grades and vegetation, restoring it to its open lands condition. Thornton will coordinate with stakeholders of this area to determine if other appropriate mitigation measures may need to be implemented. If the property owners of this easement and of the property north of the easement object to granting an easement for the TWP, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County.

The Alternative 3 (Option C) Corridor crosses one priority area, the Wellington Separator Area, that Larimer County considers as prime candidates for protection when willing property owners desire to sell or donate their land or conservation easements to Larimer County. Thornton will obtain easements for the water pipeline in this area and will not purchase any property that could be considered for conservation easements. Impacts in the Wellington Separator area will be temporary during construction because the water pipeline will be buried and disturbed areas will be restored to pre-construction grades and vegetation, effectively restoring these areas to their open lands condition.

From the Larimer County Open Lands Master Plan:

> *Requests for easements that affect open spaces must be considered within this context. Accordingly, the general policy is to avoid, to the maximum extent feasible, granting easements for activities that will adversely affect the resource and open space values and their protection. Where easements are determined to be acceptable, the general policy is to minimize the impact on the open space by limiting the size, scope, and visibility of the area affected, by managing construction or other human activities with respect to their timing, duration, and frequency of occurrence, and by restoring affected areas to a condition that is equal to or better than the condition at the time the easement is granted.*

The TWP will implement mitigation measures to minimize impacts during construction, especially in sensitive areas. Existing grades will be restored to their pre-construction conditions and revegetated to match existing conditions. Additional information and mitigation measures that could be implemented are discussed in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**.

From the Larimer County Open Lands Master Plan:

> *Underground Utility Transmission Facilities or Pipelines. To the extent possible, underground utility transmission facilities (e.g. electric, telephone, fiber optic, etc.) and pipelines (e.g. gas, water, sewer) will be located within the street and utility right-of-way adjacent to the open space. In instances where the existing right-of-way does not conform to the planned future street right-of-way as depicted on the applicable adopted Transportation Master Plan, cable or pipeline easements will be located parallel to the existing roadway and within the area encompassed by the future street and utility right-of-way.*

> *Some larger utility transmission facilities or pipelines are not typically placed beneath streets due to reliability or safety concern. In instances where the facility or pipeline cannot be placed within the road right-of-way, it will be located as close as practicable, and parallel to the road right-of-way.*

The final water pipeline alignment will be developed based on a number of criteria including minimizing impacts to environmental resources and open lands/conservation easements. If locating the water pipeline outside the ROW other than as specifically approved in a 1041 permit is not practicable, Larimer County approval will be pursued to allow the water pipeline to be located within the ROW. As required, alternatives within the Alternative 3 (Option C) Corridor will be examined prior to making such a request to Larimer County to verify that the proposed alternative is the best reasonable alternative.

From the Larimer County Open Lands Master Plan

> C*oordination with Other Entities: The County will generally discourage exclusive easements. As a condition of approval, the applicant must contact other utility service providers in the project vicinity to determine if they have current or future plans for additional facilities in the area. To the extent feasible, the planning, design, and construction of facilities shall be coordinated among utility providers to conserve easement corridors and to avoid repeated construction activities that may affect the open space. Applicants must provide copies of the written request for utility coordination and the responses received from other service providers.*

Thornton has initiated outreach to local utility providers and will review the possibility of shared future easements with those entities.

2.e.4 Larimer County Transportation Master Plan

The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*, adopted in July 2017. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

2.f Description of Recent and Present Uses of the Site such as Pasture, Irrigated or Dry Land Crops, Etc.

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.f, and the criteria and standards described in LUC Section 14.10.D.10.

The Alternative 3 (Option C) Corridor is located in areas categorized as rural lands as shown on **Figure 2.fS**. Zoning within the Alternative 3 (Option C) Corridor is designated as open, rural estate, and farming 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 is anticipated to be minimal after construction. Agricultural use within the permanent easement can continue after construction. **Figure 2.e.1-1S** shows the zoning within the Alternative 3 (Option C) Corridor.

Vegetation provides some indication of land uses. For example, nonnative upland vegetation typically occurs in areas that have been historically disturbed by heavy grazing, tilling, and hay production. Vegetative communities are described in and are shown on figures in the Addendum A to the Natural and Cultural Resources Assessment in **Supplement 3 Appendix A**. Vegetation types found in the Alternative 3 (Option C) Corridor and the TWP with Alternative 3 (Option C) Corridor are presented in **Table 2.fS**. The TWP with Alternative 3 (Option C) Corridor includes the Alternative 3 (Option C) Corridor plus the TWP corridor east of County Road 9.

TABLE 2.fS
Vegetative Communities within the Alternative 3 (Option C) Corridor and TWP with Alternative 3 (Option C) Corridor in Larimer County

Vegetative Community	Approximate Total Acres in Alternative 3 (Option C) Corridor	Approximate Total Acres in TWP Corridor with Alternative 3 (Option C) Corridor	Description
Agricultural Lands	34	1,227	Tilled or managed agricultural lands.
Developed/ Disturbed Areas	67	875	Have received heavy human use, including buildings and surrounding disturbed areas, livestock concentration areas, roads, trails, and other developed areas.
Nonnative Upland	170	820	Occurs throughout the TWP corridor in areas that have been historically disturbed by heavy grazing, tilling, and hay production.
Mixed Upland	34	88	Occurs primarily in historically undisturbed upland areas.
Wetlands	13	64	Fringes or wide benches along drainages, roadside swales, ponds and lakes, and isolated depressions
Riparian	0	7	Moist areas along larger tributaries and rivers.

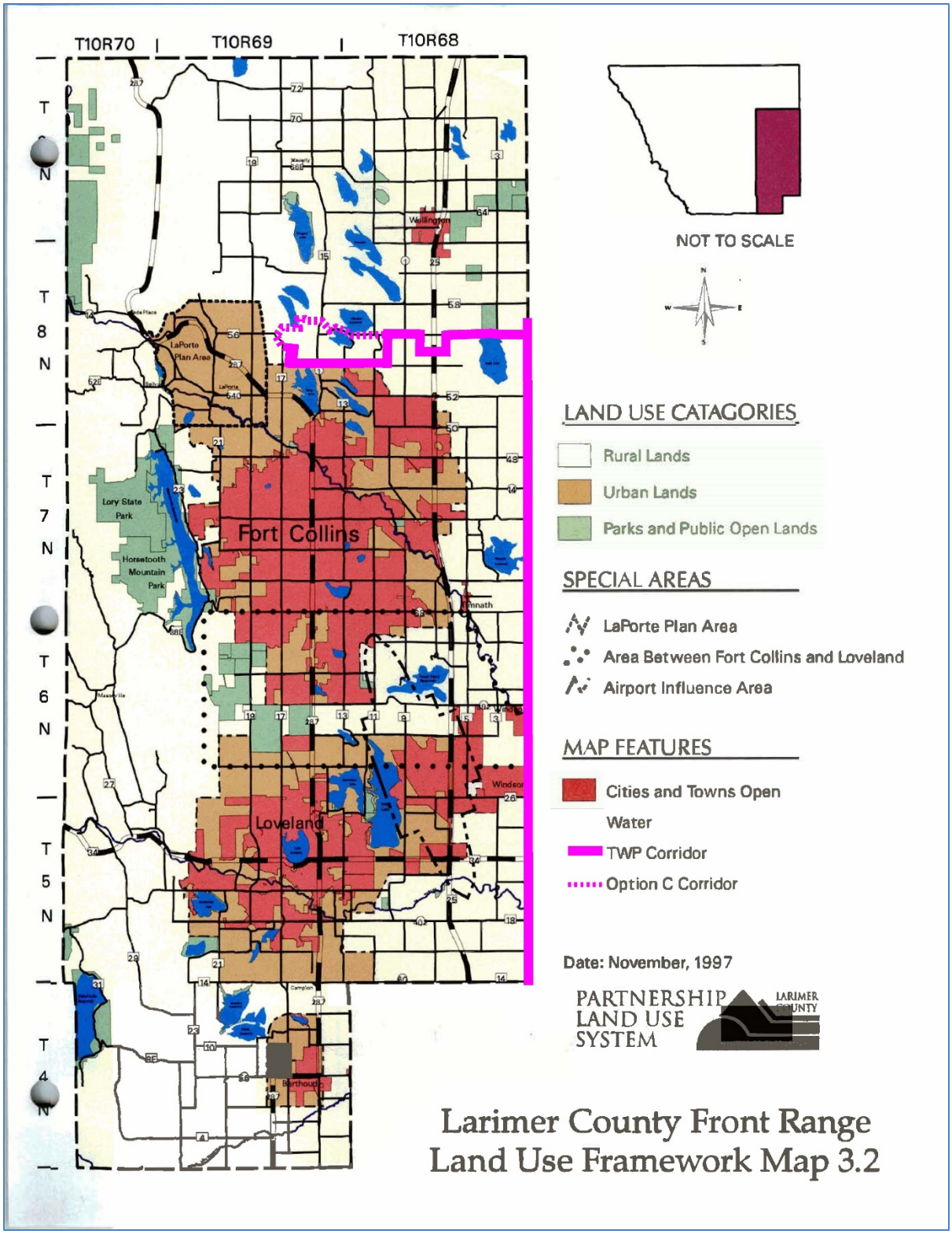


FIGURE 2.fS

Larimer County Front Range Land Use Framework Map 3.2 with TWP Corridor with Alternative 3 (Option C) Corridor

2.g Description of the Information Obtained on the Site Inventory Map(s) (See 4. Below) and Any Mitigation Measures Proposed to Address Existing Hazards or Adverse Impacts of the Project on Existing Conditions

This section addresses *Larimer County Procedural Guide for 1041 Permit,* Item 2.g.

A description of the Alternative 3 (Option C) Corridor Site Inventory Maps can be found in Section 4. Mitigation measures for resources are presented throughout this supplement as presented in **Table 2.gS**.

TABLE 2.gS
Alternative 3 (Option C) Corridor Impacted Existing Condition Reference to Mitigation Measures Location in Supplement 3

Alternative 3 (Option C) Corridor Impacted Existing Condition	Impact	Supplement 3 Section Reference
100-Year Floodplains	No Significant Impact	Section 8.f, Floodplain Hydraulic/Hydrologic Modeling Report
Wildfire Hazards	No Significant Impact	Section 8.c, Natural Hazard Mitigation Plan
Geological Hazards	Mitigable	Section 8.c, Natural Hazard Mitigation Plan
Cultural	No Significant Impact	**Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resources Assessment
Jurisdictional Waters	No Significant Impact	Section 8.a, Wetland Mitigation Plan and **Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resources Assessment
Vegetation	Mitigable	**Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resources Assessment
Wildlife	Mitigable	Section 8.b, Wildlife Conservation Plan and **Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resources Assessment
Special Status Species	Mitigable	Section 8.b, Wildlife Conservation Plan and **Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resources Assessment
Transportation	Mitigable	Section 8.d, Traffic Impact Study
Drainage and Erosion	Mitigable	Section 8.e, Drainage and Erosion Control Report and Plan
Groundwater	Mitigable	Section 8.g, Groundwater Modeling Report
Noise	Mitigable	Section 8.k, Noise Analysis
Air Quality	Mitigable	Section 8.l, Air Quality Impact and Mitigation Report
Public Health and Safety	Mitigable	Application Section 2.h

2.h Description of Any Potential Negative Impacts of the Project to Public Health and Safety and Mitigation Measures Proposed to Address the Impacts

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.h, and the criteria and standards described in LUC Sections 8.12, 14.10.D.3, 14.10.D.6, and 14.10.D.11.

Information for this section was provided in the Application and does not need to be supplemented.

2.i Description of Existing and Proposed Utilities and Facilities Needed to Provide Adequate Public Facilities (See Section 8.1 of the Code), and How Adequate Facilities will be Provided

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.i, and the criteria and standards described in LUC Sections 8.1, 8.15, 8.16, and 14.10.D.8.

Information for this section was provided in the Application and does not need to be supplemented.

2.j Projected Development Schedule

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.j.

Information for this section was provided in the Application and does not need to be supplemented.

2.k Description of the Public Input Process Requested by the Board of County Commissioners, Including the Comments and Concerns Raised During the Process and How They are Addressed in the Proposal

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.k.

During the land use hearing on August 1, 2018, the BOCC voted to continue the hearing regarding Thornton's TWP Larimer County 1041 Permit Application for the development of a water pipeline. The BOCC cited the need for additional evaluation of alternative water conveyance concepts, pipeline routes, mitigation of the effects of the project to residents in the area, identification of benefits to Larimer County as well as the need for additional public outreach on the project.

In an effort to address these needs, the BOCC asked that Larimer County staff establish a public engagement framework and process to solicit community input on the project. Larimer County initiated their public engagement process by contracting with Peak Facilitation Group, an independent third-party facilitator, to establish a process outline, public engagement framework, and to facilitate a stakeholder discussion that would identify ways to maximize community benefit and minimize or mitigate negative impacts of potential water conveyance alternatives for Thornton's and Northern Water's Northern Integrated Supply Project (NISP) pipelines through the community. Larimer County staff indicated to Thornton and Northern Water that there was interest on Larimer County's behalf in exploring the co-location of the pipelines to reduce impacts to the community. Larimer County staff, in consultation with the facilitator, established the Larimer Water Projects Working Group (Working Group) comprised of twenty-eight representatives of interested parties and organizations to "maximize the benefits and minimize or mitigate impacts" to Larimer County. Thornton was not a participant in the selection of Working Group participants. In addition to the formation of the Working Group, Larimer County also noticed two public meetings (Open

Houses) to ensure the general public had an opportunity to review the work products from the Working Group and offer input of their own.

While Thornton was not an official member of the Working Group, it provided, upon request, technical expertise and educational materials to the Working Group for their consideration and evaluation. The Working Group convened on five separate occasions where it was asked to evaluate interests, impacts and benefits relative to five proposed alternative water conveyance concepts identified by Larimer County and the Working Group itself. The Working Group met five times in fall 2018: September 18, October 9, October 24, November 13, and November 27. The Working Group was established by Larimer County to be a venue for public input (without decision-making authority). Members were asked to perform the following functions:

- Attend and participate in five scheduled evening meetings.
- Represent an organization's interests (e.g., neighborhood, public agency, or non-profit) and relay information from dialogue to the organization's membership regarding other points of view, and possible alternatives and mitigation.
- Work constructively to understand the concerns of others in the group and help find ways to address them.
- Assist with ranking ideas and outcomes but not voting.

Several individuals were asked to be at large representatives on the Working Group and the following organizations, neighborhoods, and areas were asked to provide people to represent them on the Working Group: Agricultural Advisory Board, Braidwood, Country Club Road area, County Road 56 area, WSSC, Eagle Lake Home Owners' Association (HOA), Hearthfire, Highway 1/Douglas Road area, Lochland Park, No Pipe Dream, North Shields Area, S Bar G Representation, Save the Poudre, Starlite Drive area, Terry Acres HOA, Terry Cove HOA, Terry Point Townhomes HOA, Terry Shores, The Hill at Cobb Lake HOA, Woody Creek HOA, city of Fort Collins, town of Timnath, town of Windsor, Weld County Government. Several of the organizations also designated individuals to serve as alternates to the Work Group.

Thornton staff attended each of the Working Group meetings as audience members and were available for questions and answers from the Working Group members, Larimer County staff, and the facilitator.

Thornton was asked by Larimer County to provide technical studies and background educational material on each of the five alternative water conveyance concepts put forth by the Working Group including, water quality and quantity evaluations, and constructability. Thornton staff and consultants, Larimer County staff and Larimer County contracted consultants, evaluated what would be required to implement the alternative concepts and presented that evaluation to the Working Group members in three informational webinars.

In addition to Thornton's participation in the official Larimer County public outreach process, the city also proactively engaged with the community. In early November, Thornton and the Eagle Lakes community agreed to meet for the purpose of evaluating the potential impacts to eight property owners in Eagle Lakes along a possible pipeline alignment through their community. Some Working Group members expressed concerns about the timing and purpose of that meeting, and it was ultimately cancelled in order to avoid a disruption to the Working Group process. Thornton feels it is important to continue its public engagement with the Working Group members, property owners and home owners' associations along possible pipeline routes to ensure they have sufficient

opportunity to assist in the siting and development of the water pipeline in a manner that limits community impacts and provides sufficient mitigation.

From Thornton's perspective, Larimer County's public engagement process and the Working Group activity was useful in further understanding the community's concerns and interests and was instrumental to developing this Supplement 3. The process resulted in this Supplement 3 that includes feedback and data from Larimer County, the Working Group, and from the residents of Larimer County. As a result of community engagement since the August 1, 2018 hearing, this Supplement 3 provides information on a reasonable alternative that proposes a pipeline route Alternative 3 (Option C) Corridor similar to the West 2 route described in the Application, modified to reflect input received from the community. Thornton did not make this decision lightly, and is appreciative to the community and the Working Group for their efforts and willingness to inform the process. Thornton believes the Alternative 3 (Option C) Corridor proposed in this Supplement 3 mitigates many of the concerns of the community, provides additional benefits to the community, and respects the values and the residents of Larimer County.

As part of the public engagement process, the Working Group identified "interests" that served as the baseline for evaluation of the various alternative water conveyance options. The below interests were identified by the Working Group as important considerations to the community. Thornton is also proposing a comprehensive set of benefits (*see* **Section 12.b Additional Benefits to Larimer County** for details) which when evaluated along with the identified Working Group interests below create the basis for the decision that the Alternative 3 (Option C) Corridor best meets the needs of Larimer County and Thornton. Associated with each interest below is an explanation of how those community interests influenced Thornton's decision to propose the Alternative 3 (Option C) Corridor as the preferred alignment for the water pipeline in this Supplement 3.

Working Group Interests addressed or satisfied by Supplement 3:

1. **Minimize the use of private lands for these projects.**

    - Using the Alternative 3 (Option C) Corridor proposed in this Supplement 3 uses less private property than other routes suggested by the Working Group, such as an alignment along the east side of WSSC Reservoir No. 4. The proposed route uses property owned by WSSC for a significant portion of the route between the source water pump station and the Eagle Lake subdivision.

2. **Minimize or eliminate construction impacts to Larimer County road users and residents.**

    - Thornton collaborated with Northern Water to identify alternative routes where co-location of pipelines could occur to eliminate the impact of two separate pipeline construction projects along separate routes at different times through Larimer County. The Alternative 3 (Option C) Corridor was accommodating of both pipelines with less impact to the community than the Douglas Road route.
    - Thornton in consultation with Larimer County experts conducted a constructability analysis that determined the Alternative 3 (Option C) Corridor could be constructed in a significantly shorter period of time, with less impact on the travelling public, than the Douglas Road route.

- Where the landowner is amenable to selling an easement, pipeline construction will happen adjacent to the County road right-of-way, which will minimize impacts to users of the road.

3. **Minimize overall impacts on neighborhoods (including construction).**

- A shorter construction timeline for the Alternative 3 (Option C) Corridor than other alternatives reduces the community impacts related to noise, detours, and delays.
- A significant portion of the construction will occur on property owned by WSSC, and away from houses, which will help minimize impacts on neighborhoods.
- With fewer travelers and fewer private properties impacted by the Alternative 3 (Option C) Corridor and its shorter construction timeline, the pipeline implementation should lessen the impact in the short term and have no noticeable impact in the long term.

4. **Maintain the overall quality of life.**

- Several steps have been taken to address concerns heard at the hearings and in the Working Group and the Open House. First, the decision to eliminate the need for a permanent diesel backup generator for the source water pump station will significantly reduce noise from a motor and odor and emissions from exhaust. The source water pump station will at a minimum comply with Larimer County's noise ordinance. Next, locating the source water pump station close to Douglas Road with easy access will eliminate the need for maintenance vehicles to drive deep into any neighborhoods.
- Once the water pipeline is buried, lands will be restored and visual impacts of the construction process will fade. Roads will be restored to conditions as good or better than prior to construction.

5. **Use objective, fact-based criteria to determine the conveyance route.**

- Thornton and Larimer County hired experts to conduct studies and contracted independent third-party professionals to evaluate the determinations that Thornton had made. This fact-based analysis and oversight included:
    - Dr. William Bellamy from the University of Wyoming and Jason Curl from Jacobs Engineering Group evaluated water quality concerns along the Poudre River and the Larimer County Canal.
    - Jacobs Engineering Group provided information on lakes taps, which was reviewed and evaluated by Larimer County's consultant Lithos Engineering.
    - Jacobs Engineering Group and Northern Water provided information on pipeline construction and constructability, which was reviewed and evaluated by Larimer County's consultant John Bambei.
    - Rich Follmer from Felsburg, Holt and Ullevig, the Larimer County's consultant, provided an overview of traffic considerations associated with pipeline construction.
- Thornton believes that the evaluation of the alternative routes was conducted with fact-based integrity. Thornton's evaluation was also guided by the legal and operational parameters of its agreements with WSSC and Thornton's water court Decree.

6. **Protect property values.**

- Thornton recognized the concern of local residents who expressed worry about reduced property values and has worked hard to minimize any circumstances that would result in reduced property values. All property owners will be compensated for any easements needed, and no studies have been found that indicate that a buried pipeline in adjacent properties or right of way have an adverse effect on property values.

7. **Avoid creating significant adverse effects on public health and safety (including those created by rattlesnakes).**

- The Working Group expressed concern that the Douglas Road route could have potentially increased emergency response times due to road closure and traffic delays. The construction of the Alternative 3 (Option C) Corridor minimizes those concerns as County Road 56 has far less traffic and multiple opportunities for alternative routes to residences. Thornton will ensure that residents and emergency responders will have access to properties at all times. Thornton will work with The Hill at Cobb Lake community during design and construction to address their concerns about rattlesnakes.

8. **Use the shortest pipeline possible to get the water out of Larimer County.**

- The shortest route that met Thornton's needs would have had more impacts on private property and traffic. Although the Alternative 3 (Option C) Corridor is longer, it is proposed because that route meets more community interests.

9. **Protect habitat and wildlife, including special designation areas that protect and support them.**

- Thornton has completed studies of wildlife habitat, including wetlands and riparian areas, along the Alternative 3 (Option C) Corridor, and has determined that construction along this route can be completed without significant adverse impacts on wildlife or its habitat. The TWP will utilize appropriate mitigation measures in the development of the final pipeline alignment including utilizing trenchless construction methods for water pipeline installation to minimize effects to natural resources such as jurisdictional waters and wildlife habitat associated with those areas. The TWP will have no effect on any federally listed threatened, endangered, or candidate wildlife species.
- Thornton proposes to commit nearly 3,000 acre feet of water as part of a collaborative effort called "Poudre Flows" to preserve and improve the natural stream environment of the Cache la Poudre River.

10. **Minimize traffic disruptions.**

- Consultants hired by Larimer County conducted a traffic analysis of the alternative routes and determined that construction of a pipeline along the Alternative 3 (Option C) Corridor would result in far less traffic disruption, fewer road closures and greater residential access

than the Douglas Road route. This information was presented to the Working Group in a webinar.

11. **Ensure that WSSC users and shareholders can receive the quality and quantity of water that they have historically.**

- The Alternative 3 (Option C) Corridor route preserves the operation of the WSSC system and protects the quality and quantity of water delivered to WSSC shareholders. The Alternative 3 (Option C) Corridor is in compliance with Thornton's agreement with WSSC and Thornton's water court Decree.

12. **Provide a recommendation to the County Commissioners that maximizes benefits for Larimer County and its citizens, minimizes or mitigates negative impacts, respects the environment and Poudre River, and sets the standard for how counties should conduct the 1041 process.**

- Thornton believes this Supplement 3, including the proposed Alternative 3 (Option C) Corridor, is based on information gained during Larimer County's public outreach process, along with the proposed package of benefits (*see* **Section 12.b Additional Benefits to Larimer County** for details), provides the BOCC with a proposal that maximizes benefits for Larimer County, sufficiently mitigates concerns expressed by the community about the Douglas Road route, and improves the condition of the Cache la Poudre River. This includes :
    - Minimizes and mitigates traffic impacts.
    - Accommodates co-location of the Thornton and Northern pipelines.
    - Maintains the integrity of the WSSC storage system and protects its shareholders.
    - Minimizes the number residents and private properties impacted by construction as much as possible.
    - Provides for coordination with and no disruption to safety and emergency services.
    - Thornton's commitment to partnering with others interested in Poudre River health to develop an innovative legal and operational framework that would add and protect flows in the Poudre River.
    - Thornton's contribution of water to Poudre Flows is a benefit worth $45 million dollars and will result in increased flows in portions of the Cache la Poudre River.
    - Preserves property values.
    - Protects public health.

13. **Help the city of Thornton find an alternative conveyance route that addresses the interests listed so far, particularly the health of the Poudre River.**

- As detailed throughout this section, this Supplement 3 addresses many of the concerns heard at the hearings, from the Working Group and in the Open House. Proposed changes, taken into account along with the proposed benefits (*see* **Section 12.b Additional Benefits to Larimer County** for details), address plans to help improve the health of the Poudre River. The Poudre Flows program directly addresses instream flows for critical areas of the river.

14. **Prioritize the future water supply via river health.**

- Through Thornton's involvement in the Poudre Flows program, water that Thornton owns will benefit the overall health of the Cache la Poudre River and enhance stream flow through Fort Collins.

  Additionally, Thornton is proposing in **Section 12.b Additional Benefits to Larimer County** establishment of a Water Innovation Fund, to which Thornton proposes to contribute $1,000,000 of seed money. This fund could be used to acquire additional water to enhance Cache la Poudre River flows, or could help fund additional innovative mechanisms to enhance Poudre River health.

15. **Determine if leaving water in the Poudre River is feasible or not.**

- As a benefit to be memorialized in an Intergovernmental Agreement should the Alternative 3 (Option C) Corridor be approved with terms and conditions acceptable to Thornton, Thornton will dedicate and deliver up to 3,000 acre-feet per year of water to the Colorado Water Conservation Board (CWCB) for use in the Poudre Flows Augmentation Plan. This 3,000 acre-feet of water Thornton will deliver consists of approximately 2,250 acre-feet for other water rights holders on the Cache la Poudre River and South Platte River, plus approximately 750 acre-feet of additional water necessary to account for stream losses. Under the Poudre Flows Augmentation Plan, Thornton will make this water available to the CWCB to release to the Cache la Poudre River upstream of the locations where Thornton is required to deliver the water. This water will be released at specific times and locations to help meet flow targets, and will be protected from diversion or exchange as it flows through the protected reaches. The ultimate average annual delivery of water from the TWP is approximately 14,000 acre-feet; therefore, Thornton is committing to providing the equivalent of over 20% of the total project yield to upstream locations on the Cache la Poudre River to meet flow targets. It would cost about $45 million dollars to acquire 3,000 acre feet of comparable Cache la Poudre River water on the open market.
- Thornton conducted a comprehensive analysis of what would be required to provide the same quality and quantity of water that it purchased from the WSSC system to its residents if it were to utilize the Cache la Poudre River to convey its water. This analysis was presented in an 80 minute and 96-page webinar to the Working Group. This analysis explored:
  - Legal requirements to change the Decree, impacts to WSSC, additional infrastructure and legislative requirements to usher the water downstream, impacts to existing reservoir storage in WSSC reservoirs, the need to identify and build additional storage if existing storage was not used, water quality degradation associated with flowing Thornton water through Fort Collins, and water treatment facilities required to clean the water. Ultimately, Thornton determined that leaving its water in the Cache la Poudre River was not a reasonable or feasible alternative as it did not meet the project's purpose and need.

16. **Maintain the current feel of the community and better understand what the community values.**

- Thornton's participation in the public outreach process gave it a greater understanding of the community's values and interests and the current feel of Larimer County. As the results from the Working Group demonstrated, the Alternative 3 (Option C) Corridor better protects the current feel of the community and respects community values better than the Douglas Road route.
- A compatible design for the source water pump station will create a building that fits the character of surrounding neighborhoods.

17. **Protect and restore the Poudre River**

- If Thornton's 1041 permit for the Alternative 3 (Option C) Corridor is approved with terms and conditions acceptable to Thornton, together with the other proposed benefits, under the Poudre Flows Augmentation Plan Thornton will make up to 3,000 acre-feet of water a year available to the CWCB to release to the Cache la Poudre River at upstream locations. This water will be released at specific times and locations to help meet flow targets, and will be protected from diversion or exchange as it flows through the protected reaches.

18. **Protect reservoirs near northern Larimer County neighborhoods.**

- The Alternative 3 (Option C) Corridor route will protect the WSSC system reservoirs and will likely result in more consistent water levels in the reservoir.

19. **Ensure that information about the project is accurate**

- Thornton has been working with many experts in regards to all aspects of the proposed water conveyance project. Nationally recognized experts on water quality and construction have provided their opinions on critical components of the TWP. Larimer County hired their own experts to verify and provide information to the Working Group and the community.

20. **Prioritize, respect and preserve the rights of Larimer County citizens, not those of those outside of Larimer County.**

- Larimer County and the facilitator of the Working Group made clear at the start of this process that the goal was to find solutions that "maximize benefits and minimize or mitigate impacts to Larimer County." This Supplement 3 is a reflection of this process and provides a route change and benefits that meet this goal.

21. **Assess the impacts of the project on Windsor residents.**

- The project, as proposed in Supplement 3 will have the same impacts on Windsor residents as the project proposed in the original 1041 Application. Thornton has negotiated an IGA with the Town of Windsor regarding construction of the project through Windsor, as originally proposed.

22. **Do no harm and ensure that any project provides benefits to Larimer County.**

- Thornton's engagement with the Working Group and the change to the Alternative 3 (Option C) Corridor has resulted in additional mitigation to community concerns and has resulted in additional benefits (*see* **Section 12.b Additional Benefits to Larimer County** for details) to Larimer County.

23. **Be a good neighbor to the City of Thornton**

- Thornton appreciates the Working Group's efforts to provide a significant amount of information and insight and believes moving forward that Thornton and the community can work together for mutually beneficial solutions.

24. **Find a solution in 2018**

- While a final decision is not likely in 2018, Thornton's engagement in the Working Group and public outreach process did advance the discussion enough for this Supplement 3, which includes the proposed the Alternative 3 (Option C) Corridor and a substantial benefit package, and is otherwise reflective of the community interests identified by the Working Group, to be developed and presented to the BOCC at the December 17, 2018 hearing.

25. **Find a solution that makes sense with the current conditions, not past conditions.**

- Thornton believes this Supplement 3 is responsive to conditions that currently exist in Larimer County. This Supplement 3 addresses construction and traffic impacts in a comprehensive manner and proposes solutions designed for current conditions.

26. **Find a win-win for Larimer County and the City of Thornton.**

- The Supplement 3 proposal is a win-win for the County and Thornton as it resulted from the extensive community input process designed by the County, and:
    - Allows for co-location of the Thornton and Northern pipelines
    - Reduces temporary construction impacts to local residents
    - Does not impact a major east west transportation corridor or any north south corridors
    - Avoids impact to the existing reservoir conditions.
    - Provides substantial additional benefits as described in **Section 12.b Additional Benefits to Larimer County**.

27. Protect agriculture and personally-owned farms.

- This Supplement 3 proposal ensures operation of the WSSC system is preserved.
- Thornton's water will continue to flow through the Larimer County Canal head gate to the WSSC reservoir system.
- WSSC agricultural shareholders will continue to receive their water as they have historically.

28. **Maintain the current aesthetics of the construction area (tree type, size, ground cover, etc.).**

- Thornton will restore any construction areas to as near pre-construction condition as is reasonably possible, and will avoid impacts to mature trees where reasonably possible.

Once again, Thornton was glad to have the opportunity to participate in Larimer County's public outreach effort. Thornton feels that the efforts of the Working Group resulted in a more favorable pipeline route that maintains the look and feel of the existing neighborhood, allows for co-location of Thornton's and NISP's pipelines, reduces construction time and impacts to traffic, and ensures the existing WSSC users remain whole while meeting the criteria established by Larimer County for a water pipeline.

2.l Any Additional Explanation Detailing How the Application Meets the Applicable Review Criteria as Stated in the Land Use Code

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 2.l.

TWP with Alternative 3 (Option C) Corridor and Approval Criteria

This section summarizes the information presented in the Application and this Supplement 3 demonstrating that the TWP corridor with Alternative 3 (Option C) Corridor meets the review criteria for approval described in Larimer County Land Use Code (LUC) Section 14.10.D.

LUC Approval Criteria

14.10.D.1 The proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development.

Larimer County adopted a Master Plan in 1997 to guide land use and development in unincorporated Larimer County. The following the Intergovernmental Agreements (IGA) and plans listed below also affect land use and development:

- IGA for Growth Management City of Loveland, Colorado and Larimer County, Colorado approved January 12, 2004
- IGA (Regarding Cooperation on Managing Urban Development) by and between Larimer County, Colorado and the town of Windsor, executed January 8, 2001
- Larimer County Open Lands Master Plan
- Larimer County Transportation Master Plan

The TWP corridor with Alternative 3 (Option C) Corridor is consistent with applicable Larimer County Master Plan policies and their associated lists of goals regarding the following:

- Chapter 2, Growth Management
- Chapter 3, Land Use
- Chapter 4, Public Facilities and Services
- Chapter 5, Transportation
- Chapter 6, Environmental Resources and Hazards

As described in the Application and this Supplement 3, impacts to these Master Plan goals, IGAs, and plans resulting from construction of the water pipeline and the source water pump station will be temporary. Impacts to traffic, sensitive environmental biological resources and agriculture can be

avoided or mitigated during construction. For example, the TWP will utilize trenchless construction methods for water pipeline installation to minimize impacts to natural resources such as jurisdictional waters and wildlife habitat associated with those areas. With respect to traffic impacts during construction, selection of the Alternative 3 (Option C) Corridor avoids more major impacts on other routes because the impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low. See *Memorandum TWP – Summary of Existing Conditions and Project Impacts* (Felsburg Holt & Ullevig, 2018 November 13). In addition, Thornton and the TWP contractors will exercise care and will coordinate with property owners to minimize impacts to property owner's existing access locations. With respect to land use, where the TWP corridor with Alternative 3 (Option C) Corridor parallels Larimer County roads, the water pipeline is proposed to be located in the Larimer County ROW as approved by Larimer County if the property owner is not agreeable to selling an easement for the water pipeline.

Long-term, because the water pipeline will be buried and disturbed areas will be restored to pre-construction grades and vegetation, there are no impacts to the Master Plan goals resulting from the pipeline. For example, the majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in rural land use areas that include lands zoned open, rural estate, and farming. After construction, agricultural use within the permanent easement can continue as before. With respect to the source water pump station, the location proposed for the source water pump station site (2 acres) is zoned farming. Thornton will work with the property owner to locate the source water pump station to minimize impact to the property owner to the extent it is reasonably possible. The source water pump station will be designed to be compatible with the surrounding area. After listening to the interests and concerns of the community through the hearing, Working Group process and Open House concerning noise and emission resulting from the proposed installation of an emergency diesel backup generator in the Application, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. After construction, the source water pump station will be unmanned, though it will be monitored and operated remotely, inspected daily, and repaired and maintained as needed.

The Application also included a water tank as an appurtenance to the Application. However, after listening to the interests and concerns of the community through the hearing, Working Group process and Open House about the location of the water tank in Larimer County, Thornton has determined not to locate the water tank within Larimer County, and that request is withdrawn from the Application.

Accordingly the proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development. Therefore, TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 1.

14.10.D.2 The applicant has presented reasonable siting and design alternatives or explained why no reasonable alternatives are available.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor was developed using a series of evaluations. *See* Sections 2.c. and 2.d. Reasonable siting and design alternatives for the Thornton Water Project are those that include taking delivery of drinking water from WSSC Reservoir No. 4 and conveying it east via pipeline.

As a result of listening to public comments during the hearing and engagement with Larimer County's Working Group and Open Houses process, certain alternatives presented in the original Application, and additional options were analyzed further. Supplement 3 includes six alternative

water pipeline alignments for the WSSC Reservoir area to County Road 9 portion of the project. Of these six, four were presented as part of the Application, *see* **Application Appendix A**.

In the Application, Thornton selected an alternative identified as South 2 as the preferred alternative as shown on **Figure 5.1.12.2-11** of **Application Appendix A,** *Technical Memorandum, Thornton Water Project, Larimer County Alternative Configurations Analysis – WSSC Reservoir Area to Larimer County Road 9,* October 2017 (Alternative Configurations Analysis). This is commonly known as the Douglas Road alignment. This alternative was re-analyzed as a part of the Working Group and Public Involvement process and it remains a reasonable siting and design alternative as set forth in the Application, so long as the project is not co-located with the NISP pipeline in Douglas Road.

However, based on the results of the alternative development and analysis, Thornton requests approval for the TWP corridor with Alternative 3 (Option C) Corridor, a water pipeline installed around the west side of WSSC Reservoir No. 4 meeting up with the NISP pipeline alignment at a point between WSSC Reservoir No. 3 and WSSC Reservoir No. 4. The pipelines would be co-located with the NISP pipeline from this point west to County Road 9, generally in the County Road 56 corridor. *See* **Figure 2.c-2S.** This is the West 2 alternative described in the Application and shown on **Figure 5.1.12.2-8** of the Alternative Configurations Analysis (**Application Appendix A)**. This alternative was reviewed by the Working Group as Option C.

The TWP corridor with Alternative 3 (Option C) Corridor best meets what Thornton understood to be important considerations expressed by the Working Group and the public, such as: 1) the opportunity to co-locate with NISP; 2) to minimize traffic/construction duration; and 3) reduce impacts to private property. At the same time because the public engagement process was designed to consider community interests at the exclusion of Thornton's interests, Thornton also evaluated the alignments and proposed ideas on whether they are or are not reasonable siting and design alternatives to meet the purpose and need of Thornton's drinking water supply project including: 1) preserving source water quality to protect public health; 2) providing water supply reliability; 3) protecting yield; 4) abiding by the water court Decree; 5) protecting WSSC and its shareholders; 6) being fiscally responsible with taxpayer money; and 7) delivering water to Thornton by 2025. Combined with addressing the important considerations that Thornton heard through the public process, the TWP corridor with Alternative 3 (Option C) Corridor is a reasonable siting and design alternative that best addresses Thornton's interests in the purpose and need of the project.

In addition, Thornton evaluated the following ideas presented by the Working Group:

- Use the Cache la Poudre River instead of a pipeline (River Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option D: Poudre River)
- Use existing ditches or canals instead of a pipeline (Canal Delivery Alternatives—also labeled by Larimer County in the Public Involvement process as Option A: Canal Conveyance)
- Use lake taps (micro-tunneled lake intakes) to access water in the WSSC reservoir system instead of trenched pipelines from reservoir outlets (Lake Tap Concept)

For the River Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. For the Canal Delivery Idea, four (4) alternatives were developed and evaluated. The analysis concluded that none of the alternatives were reasonable. With respect to the use of lake taps, the analysis concluded that lake taps were not a reasonable alternative to the use of conventional, open-trench excavation for pipeline installation. *See* Section 2.d.

Accordingly between its Application and this Supplement 3, Thornton has presented six reasonable siting and design alternatives. Of those, because of expressed community preferences Thornton has changed its preferred alignment from that sought in its Application (South 2) to the TWP corridor with Alternative 3 (Option C) Corridor as described herein. Therefore, Thornton has complied with Criterion No. 2.

14.10.D.3 The proposal conforms with adopted county standards, review criteria and mitigation requirements concerning environmental impacts, including but not limited to those contained in this Code.

and

14.10.D.4 The proposal will not have significant adverse affect on or will adequately mitigate significant adverse affects on the land or its natural resources, on which the proposal is situated and on lands adjacent to the proposal.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor was developed considering adopted county standards, review criteria and mitigation requirements concerning environmental impacts and compatibility with sensitive natural areas. The TWP corridor with Alternative 3 (Option C) Corridor was chosen and will be constructed to minimize impacts to sensitive natural areas. *See* **Application Appendix C** and **Supplement 3 Appendix A** for assessments of natural and cultural resources within the TWP corridor with Alternative 3 (Option C) Corridor.

Resources identified within the TWP corridor with Alternative 3 (Option C) Corridor are either mitigable or have no significant impact. For those resources that require mitigation, appropriate mitigation measures will be implemented in the development of the final pipeline alignment considering data received from the Planning Division, environmental field surveys that will be completed for the TWP once access is available, and other sources as additional studies are conducted during the design phase.

Surface drainage BMPs implemented during construction will include application of erosion control techniques and the successful revegetation of disturbed areas as more thoroughly described in **Application Appendix D**.

The TWP will utilize trenchless construction methods for water pipeline installation to minimize effects to natural resources such as jurisdictional waters and wildlife habitat associated with those areas.

The area disturbed for constructing the water pipeline will be restored to pre-construction conditions, including grade and revegetation, thus avoiding any long-term impacts to wildlife the environment, the land, land adjacent to the proposal or natural resources.

As described in detail in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor conforms with adopted county standards, review criteria and mitigation requirements concerning environmental impacts, including but not limited to those contained in this Code and complies with Criterion No. 3.

In addition, the TWP corridor with Alternative 3 (Option C) Corridor will not have significant adverse affect on or will adequately mitigate significant adverse affects on the land or its natural resources, on which the proposal is situated and on lands adjacent to the proposal. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 4.

14.10.D.5 The proposal will not adversely affect any sites and structures listed on the State or National Registers of Historic Places.

A Class I File Search and Literature Review for cultural resources was conducted in 2016, 2017, and 2018. Based on that review, there are no cultural sites or structures that are listed on the State and National Register of Historic places within the TWP corridor with Alternative 3 (Option C) Corridor within unincorporated Larimer County. Additional information on natural and cultural resources within the TWP corridor with Alternative 3 (Option C) Corridor is presented in **Application Appendix C**, Natural and Cultural Resource Assessment and **Supplement 3 Appendix A**, Addendum A to the Natural and Cultural Resource.

Accordingly because the proposal will not adversely affect any sites and structures listed on the State or National Registers of Historic Places, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 4.

14.10.D.6 The proposal will not negatively impact public health and safety.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor will not negatively impact public health and safety.

The Application and this Supplement 3 details that although the TWP crosses three designated 100-year floodplains, the TWP will not alter the floodplains. Therefore, the TWP will have no impact on the hydraulics and hydrology of the floodplain and no impact to public health and safety. The TWP will have no impact on wildfire hazards because it is outside of the wildfire hazard area and is mostly buried pipeline. Appurtenances will be constructed of steel, concrete, and other non-flammable materials. Therefore, because the TWP has no impact on wildfire hazards, it will have no impact on public health and safety.

Based on Larimer County GIS data downloaded from Larimer County's GIS Digital Data and shown in Application **Figure 8.c-2** (GIS data downloaded August 2016) and **Supplement 3 Figure 8.c-2S** (GIS data downloaded December 2018), the majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in a low geologic hazard category. Where mitigation measures are needed, these hazards can be avoided through use of mitigation, such as:

- Installing the water pipeline using trenchless construction methods
- Stream and bank stabilization methods such as riprap protection or concrete mats
- Imported backfill material such as low-strength concrete
- Revegetation
- Soil erosion blankets during construction
- Trenchless construction methods
- Locating the final alignment outside of the geohazard area if possible, but still within the TWP corridor with Alternative 3 (Option C) Corridor

Therefore, because the TWP is sited through mostly low geologic hazards, or can be mitigated to avoid geologic hazards, it will have no impact on public health and safety.

With respect to traffic, 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. Prior to the start of construction, Thornton will acquire necessary access permits and ROW permits from Larimer County.

Any areas impacted during construction will be restored to pre-construction conditions upon completion of the TWP. Traffic impacts after completion of the construction of the TWP are expected to be limited as the facilities will be unmanned and operations will require minimal traffic. Therefore, the TWP will not negatively impact public health and safety.

Thornton will protect water quality during construction through surface drainage BMPs and the successful revegetation of disturbed areas. Development of the final water pipeline alignment will consider water pipeline construction locations that minimize impacts to historical surface and subsurface water flows in the project area. Water pipeline crossings of jurisdictional waters, including wetlands, will be constructed utilizing trenchless construction methods. This construction method will eliminate surface disturbance to the waterbody and effects on water quality. No direct effects on water quality in irrigation ditches that the TWP crosses are anticipated. Thornton will obtain appropriate agreements for each crossing prior to construction.

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity - General Permit from CDPHE and a General Permit for Construction Dewatering Activities from CDPHE. Stormwater management practices will be incorporated in the design of the source water pump station site. Therefore, because water quality will not be negatively impacted, the TWP will not negatively impact public health and safety.

Air quality will not be negatively impacted because 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 prior to construction activities in accordance with state air quality regulations and will mitigate fugitive dust caused by construction activities. Permanent facilities associated with the TWP will comply with air pollution control regulations. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site. This will eliminate the noise and emissions otherwise associated with a diesel backup generator.

The TWP will not pose environmental hazards because Thornton and the TWP contractors will provide and maintain sanitary accommodations for the use of their employees during construction of the TWP in a manner that complies with the requirements and regulations of health departments and other governmental bodies. Construction, operation, and maintenance activities will follow best management practices for the management of wastes to avoid and minimize impacts from potential spills or other releases to the environment. Thornton will also comply with applicable federal, state, and local laws and regulations regarding the handling, storage, disposal, transportation, and use of hazardous substances.

Accordingly because the proposal will not negatively impact public health and safety, TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 6.

14.10.D.7 The proposal will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards.

The Application and this Supplement 3 details that although the TWP crosses three designated 100-year floodplains, the TWP will not alter the floodplains. Therefore, the TWP will have no impact on the hydraulics and hydrology of the floodplain and be at no risk of flooding because it is a buried pipeline. The TWP will not be subject to wildfire hazards because it is outside of the wildfire hazard area and is mostly buried pipeline. Appurtenances will be constructed of steel, concrete, and other non-flammable materials.

Based on Larimer County GIS data downloaded from Larimer County's GIS Digital Data and shown in Application **Figure 8.c-2** (GIS data downloaded August 2016) and **Supplement 3 Figure 8.c-2S** (GIS data downloaded December 2018), the majority of the TWP corridor with Alternative 3 (Option C) Corridor is located in a low geologic hazard category. Where mitigation measures are needed, these hazards can be avoided through mitigation, such as:

- Installing the water pipeline using trenchless construction methods
- Stream and bank stabilization methods such as riprap protection or concrete mats
- Imported backfill material such as low-strength concrete
- Revegetation
- Soil erosion blankets during construction
- Trenchless construction methods
- Locating the final alignment outside of the geohazard area if possible, but still within the TWP corridor with Alternative 3 (Option C) Corridor

Therefore, because the TWP is sited through mostly low geologic hazards, or can be mitigated to avoid geologic hazards, it will not be subject to significant risk from geologic hazards.

Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards and therefore complies with Criterion No. 7.

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.***

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor adequate public facilities and services are available for the proposal or will be provided by Thornton, 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.

The TWP will not have a negative effect on local government or any other existing public facilities and services. The construction, operation, and maintenance of the underground water pipeline and associated facilities will not require any new public facilities or impact existing services such as police, fire, waste water, and healthcare. During construction water and sanitary facilities will be provided by Thornton or its TWP contractor. After construction, water and sewer utility services for operations and maintenance will be required. After construction, no on-site personnel will be

required, and no added burden will be placed on existing fire and police facilities. During construction of the water pipeline short-term disruptions could occur to domestic water service if utility requires relocation. Area residents will be notified in advance of any service disruptions. The TWP will employ Thornton employees, a construction management team, and contractors to construct the TWP. No lodging or temporary housing is expected to be required for Thornton employees or the construction management team. Some workers may require local lodging or temporary housing in the area during construction. After construction, no lodging or housing will be required.

TWP will not reduce existing service below adequate levels. Larimer County residents will not subsidize the TWP. Similar to other utility/water providers, Thornton's water utility customers will pay for the TWP.

Existing transportation facilities are adequate to serve construction of the TWP, and no new roads or improvements to existing roads are anticipated to be necessary in unincorporated Larimer County. Access will be via existing roads, temporary construction access, and the ROWs negotiated through individual easements. The existing County Road 56 road network has adequate capacity to serve anticipated construction traffic needs for facilities within the TWP corridor with Alternative 3 (Option C). As indicated in *Memorandum TWP – Summary of Existing Conditions and Project Impacts* (Felsburg Holt & Ullevig, 2018 November 13), the impact of rerouting through vehicle movements is almost undetectable since traffic volumes on County Road 56 are extremely low. A copy of the memorandum is included in **Supplement 3 Appendix D**. During the construction phase of the TWP, trip generation will be primarily related to construction activities, including delivery of materials and equipment, worker transport, and water pipeline and appurtenances installation.

After construction, the TWP facilities may operate year-round, 24 hours of a day; however, the facilities are intended to be unmanned. The source water pump station will be monitored and operated remotely, inspected daily, and repaired and maintained as needed. The existing road network has adequate capacity to serve anticipated operational traffic needs. It is anticipated that TWP operators could visit these facilities daily to check operations. These checks entail one pickup truck accessing the source water pump station site and driving along the water pipeline corridor for inspection and maintenance activities. Inspections of the water pipeline corridor will be done from public roads to the extent practicable. Consequently, there will be minimal effects on the volume of traffic on local streets. *See* Application and Supplement 3 Section 8, Technical Reports, 8.d Traffic Impact Study for additional information.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction. These existing roads could provide access for construction vehicles during construction of the source water pump station and for future maintenance as necessary and as approved by the property owner. The access drive and parking areas are anticipated to be gravel. Future access requirements will be minimal as this is anticipated to be an unmanned facility with limited maintenance requirements.

Thornton contacted 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. Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have

emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Accordingly, Thornton has demonstrated that the TWP corridor with Alternative 3 (Option C) Corridor has adequate public facilities and that services are available for the proposal or that such will be provided by Thornton 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. Therefore, Thornton has demonstrated compliance with Criterion No. 8.

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 revegetated to minimize environmental impacts.

As described in the Application and this Supplement 3, Thornton will mitigate any construction impacts to county roads, bridges and related facilities related to the TWP corridor with Alternative 3 (Option C) Corridor. Construction access will be re-graded and revegetated to minimize environmental impacts.

In the fourth quarter of 2018, Larimer County recorded traffic volume data at intersections along County Road 56. That data is documented in the *Memorandum TWP – Summary of Existing Conditions and Project Impacts* by Felsburg Holt & Ullevig, November 13, 2018. The level of vehicle movements along County Road 56 are less than 10 vehicle peak hours. The analysis results presented in the memorandum indicate that construction impacts from Alternative 3 (Option C) Corridor will be almost undetectable because traffic volumes are extremely low and no improvements were recommended.

The TWP corridor with Alternative 3 (Option C) Corridor 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 with Alternative 3 (Option C) 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.

Traffic impacts due to construction and post-construction operation of the water pipeline and appurtenances have been considered. 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. Any areas impacted during construction will be re-graded and re-vegetated to pre-construction conditions upon completion of the TWP. Traffic impacts after completion of the construction of the TWP are expected to be limited as the facilities will be unmanned and operations will require minimal traffic.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during

construction and restored to pre-construction or better condition after construction. These existing roads could provide access for construction vehicles during construction of the source water pump station and for future maintenance. The access drive and parking areas are anticipated to be gravel. Future access requirements will be minimal as this is anticipated to be an unmanned facility with limited maintenance requirements.

Accordingly, Thornton has demonstrated that it will mitigate any construction impacts to county roads, bridges and related facilities and that construction access will be re-graded and revegetated to minimize environmental impacts. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor

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.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor provides benefits that outweigh the losses of any natural resources or reduction of productivity of agricultural lands as a result of the project. The TWP corridor with Alternative 3 (Option C) Corridor avoids impacts to natural resources, and any reduction of productivity of agricultural lands as a result of the project will be temporary; the impacted landowner will be compensated for any reduction in production, and the property will be restored to its previous condition to resume normal crop production.

Thornton has demonstrated that 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 project. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criterion No. 10.

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.

As described in the Application and this Supplement 3, the TWP corridor with Alternative 3 (Option C) Corridor does not pose significant adverse affects to the master plan, applicable IGAs, county standards, the community, the environment, the land directly impacted by the project or lands adjacent, natural resources, any sites or structures listed on the State or National Registers of Historic Places, public health and safety, natural hazards such as floods, wildfire or geologic hazards, the capability of local government to provide services or exceed the capacity of service delivery systems, county roads, bridges and related facilities, agricultural productivity, wildlife, water or air. Where there are impacts, mostly short-term, Thornton has demonstrated the ability to mitigate those in a cost efficient manner.

Accordingly, the proposal demonstrates a reasonable balance between the costs to the applicant to mitigate significant adverse affects and the benefits achieved by such mitigation. Accordingly, the TWP corridor with Alternative 3 (Option C) Corridor complies with Criteria No. 11.

14.10.D.12 The recommendations of staff and referral agencies have been addressed to the satisfaction of the county commissioners.

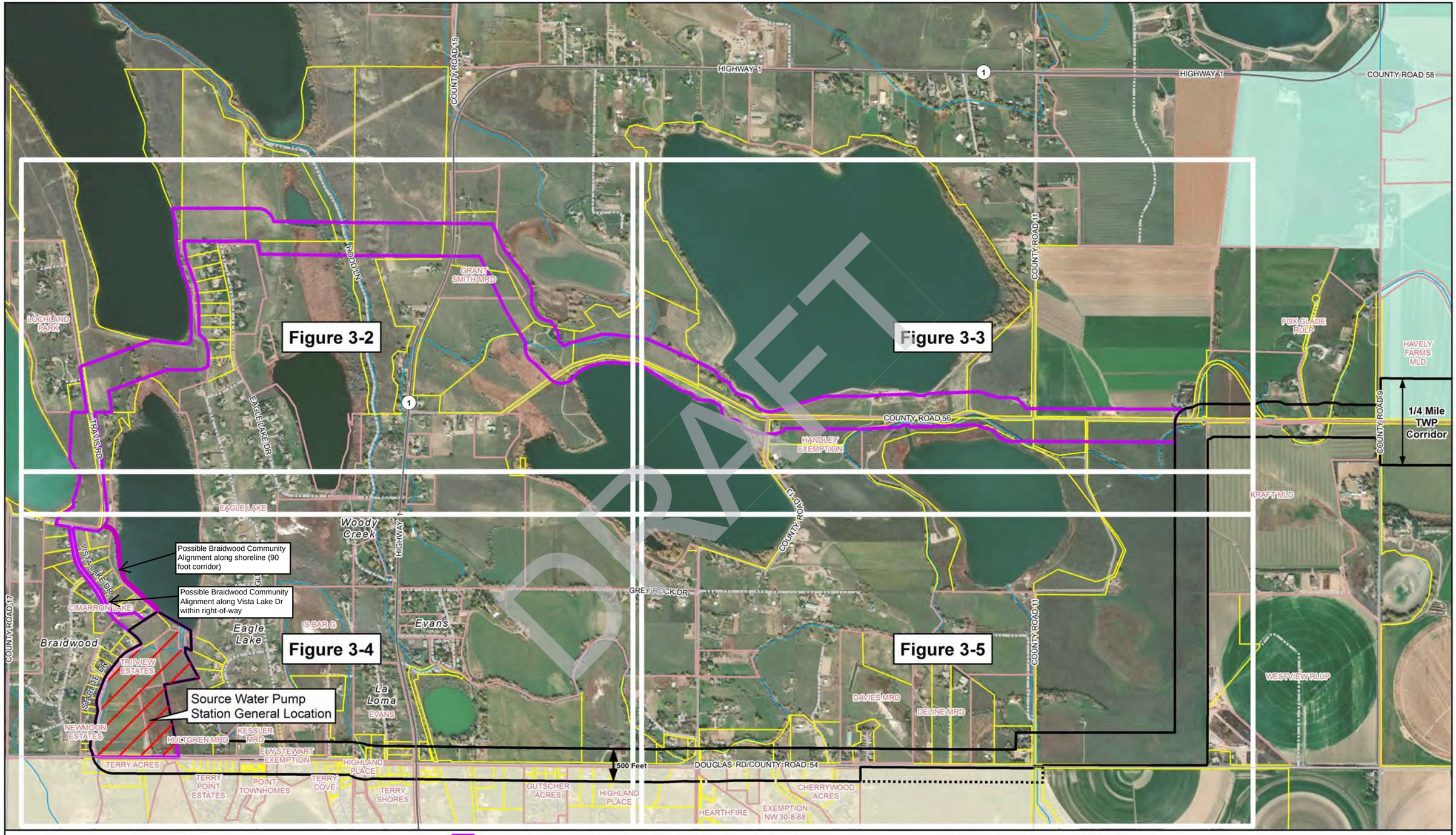
Thornton addressed staff and referral agency recommendations as a part of the Application. Thornton will continue to coordinate with staff and local agencies on any recommendations resulting from this Supplement 3.

Section 3 Vicinity Maps

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 3.

The vicinity maps for the TWP are shown in **Figures 3-1S** through **3-4S**. In accordance with permit requirements, the vicinity maps include the following:

- Alternative 3 (Option C) Corridor limits within unincorporated Larimer County.
- Property parcels. Parcel information within the Alternative 3 (Option C) Corridor is presented in **Table 3S**.
- Locations of all residences and business as shown on the aerial photo.
- Abutting subdivision outlines and names.
- Boundaries of adjacent municipalities and Growth Management Areas.
- Roads.
- Significant natural features.



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THORNTON, CO 80241-2405

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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Subdivision
- Parcel Boundary
- ## Table 3 Parcel Map ID Number

GMA Boundary
- Fort Collins
- Wellington

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 3-1S
Alternative 3 (Option C) Corridor Vicinity Map Index

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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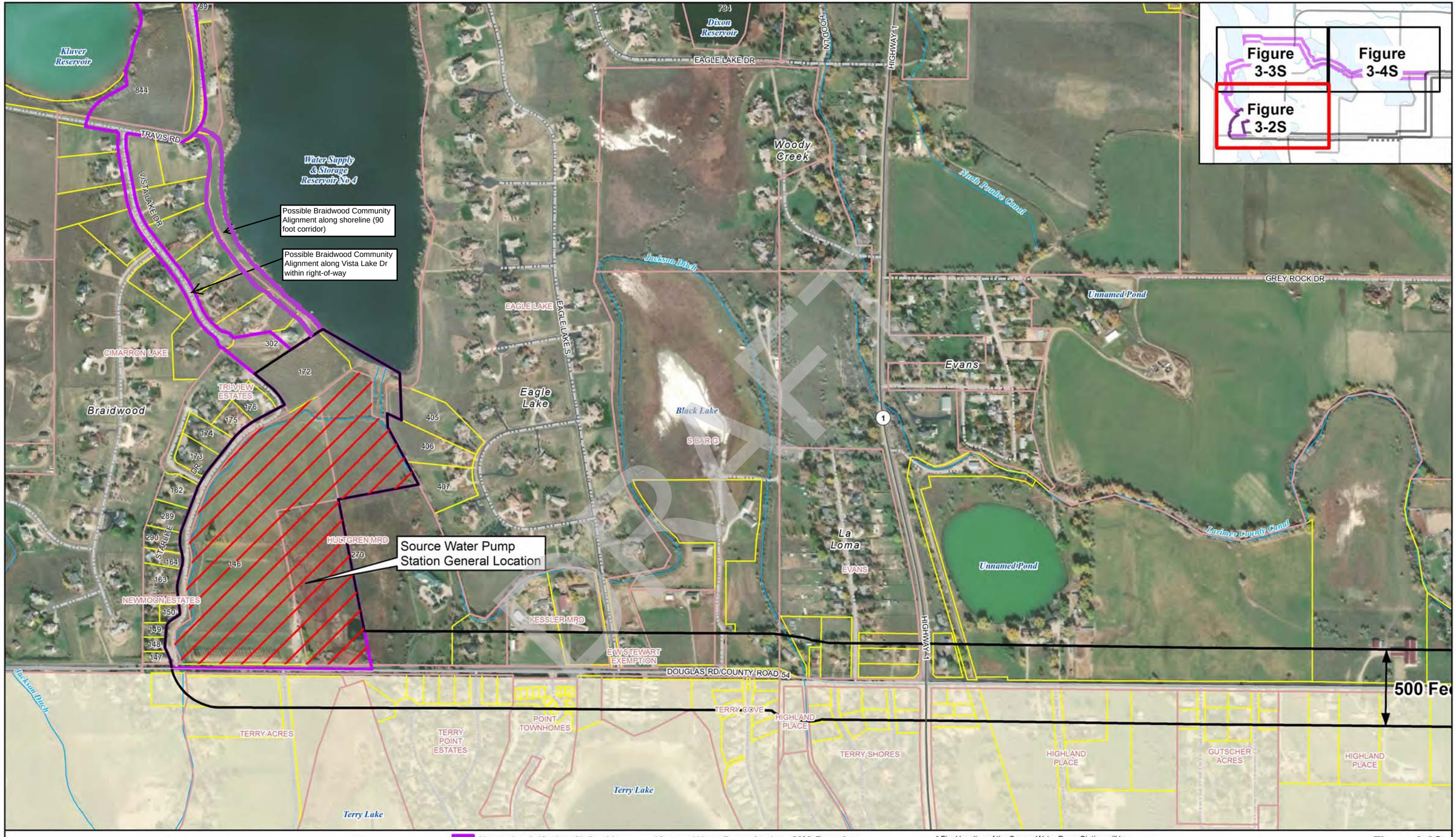

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- Alternative 3 (Option C) Corridor
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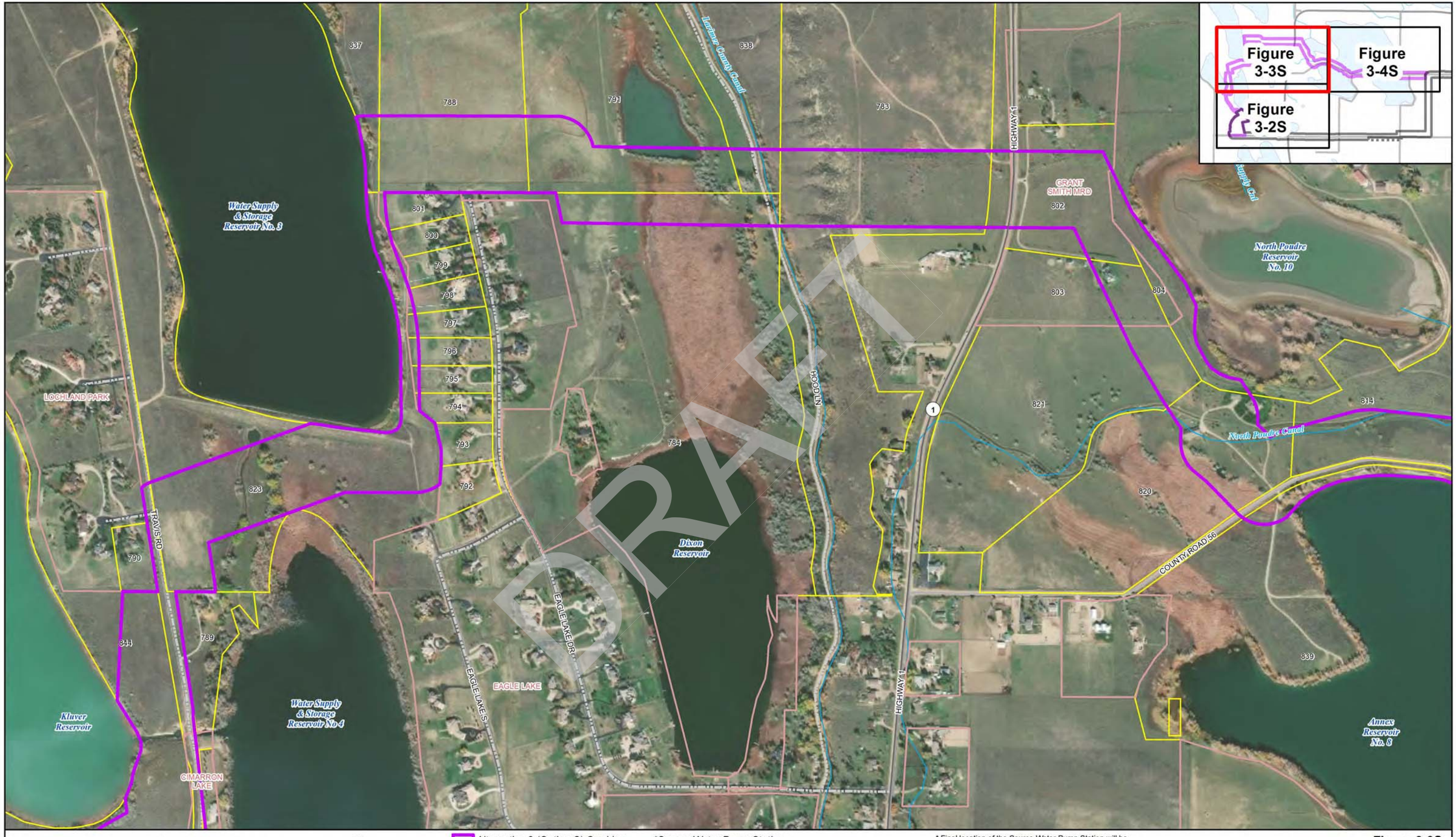
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Subdivision
- Parcel Boundary
- ## Table 3S Parcel Map ID Number

GMA Boundary
- Fort Collins

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 3-2S
Alternative 3 (Option C) Corridor
Vicinity Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI



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- Alternative 3 (Option C) Corridor
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- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Subdivision
- Parcel Boundary
- ## Table 3S Parcel Map ID Number

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 3-3S
Alternative 3 (Option C) Corridor Vicinity Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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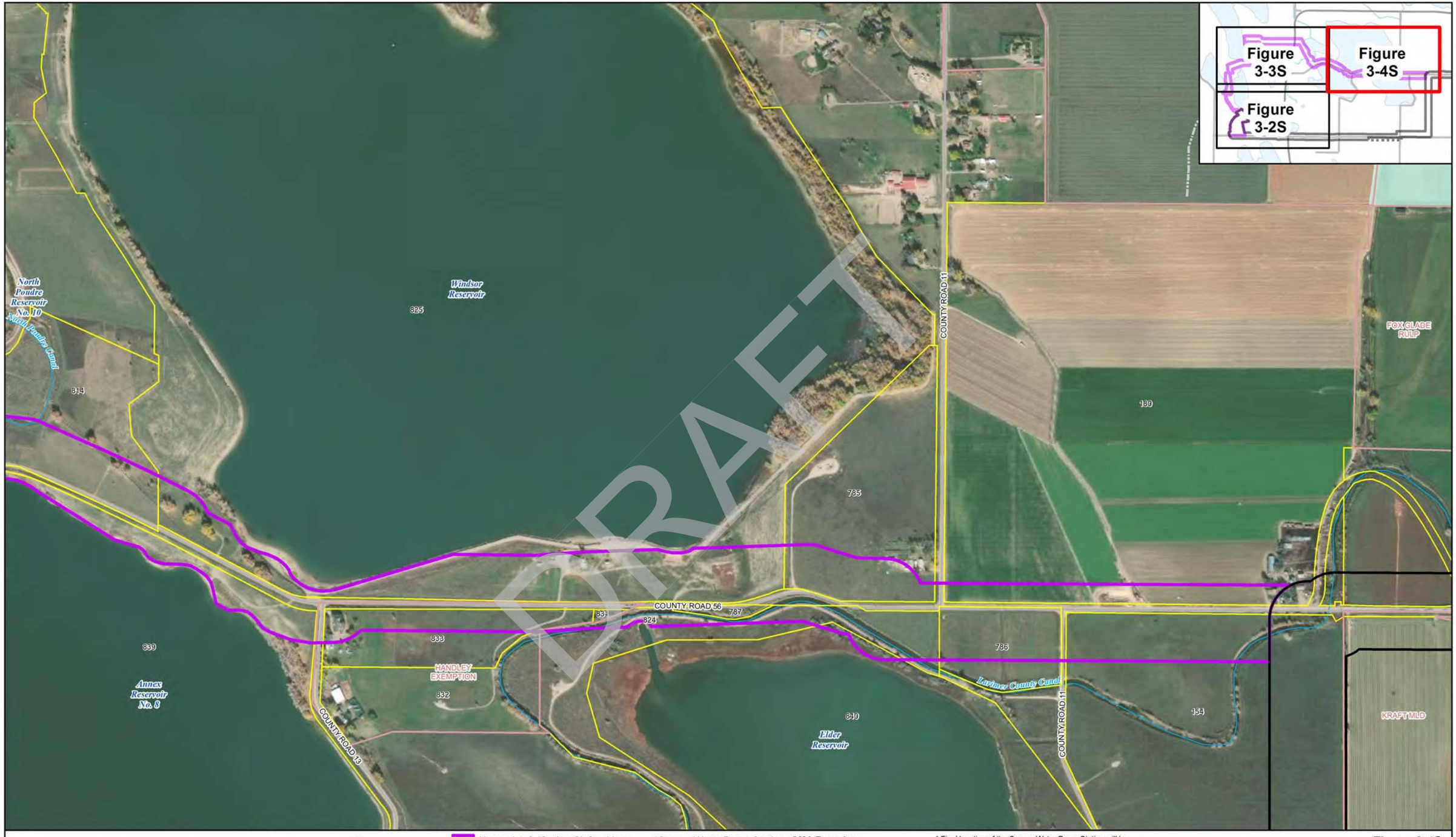

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- *Source Water Pump Station General Location
- Subdivision
- Parcel Boundary
- ## Table 3S Parcel Map ID Number
- GMA Boundary
- Wellington

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 3-4S
Alternative 3 (Option C) Corridor Vicinity Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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TABLE 3S

Parcel Infomation within the Alternative 3 (Option C) Corridor

Map ID	Parcel Number	Property Owner	C/O	Assessor Mailing Address
783	9813000003	ROCKY RIDGE DEVELOPMENT INC		PO BOX 1443, FORT COLLINS, CO, 80522-1443
784	9814000002	TIPS COREY ALLEN/KAREN KRISTIN		540 GREGORY RD, FORT COLLINS, CO, 80524-0524
785	8818000006	MCKAY FAMILY LIMITED PARTNERSHIP ASSOC		11755 N COUNTY ROAD 15, WELLINGTON, CO, 80549-0549
786	8820000903	CITY OF THORNTON		9500 CIVIC CENTER DR, THORNTON, CO, 80229-0229
787	8819000001	MARTIN LAUREN EVA		85 REVETT DR, BRECKENRIDGE, CO, 80424-0424
788	9814000004	MESERLIAN CHARLES L		PO BOX 1443, FORT COLLINS, CO, 80522-1443
789	9823000020	FEBVRE PAUL F/MARIAN		4640 TRAVIS RD, FORT COLLINS, CO, 80524-9632
790	9814305001	SCHOETTLE ANNA W		901 LOCHVIEW CT, FORT COLLINS, CO, 80524-9623
791	9814000007	MESERLIAN CHARLES L		PO BOX 1443, FORT COLLINS, CO, 80522-1443
792	9814405020	BIERITZ TRUST		4835 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
793	9814405021	TATE CYNTHIA SPANG		4855 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
794	9814405022	HEINRICH JOHN P		4921 EAGLE LAKE DR, FORT COLLINS, CO, 80524-9674
795	9814405023	DINKINS PAUL J		4953 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
796	9814405024	BARKAU ROBERT L/LAN NGOC		4965 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
797	9814406028	KELLER JAMES		5017 EAGLE LAKE DR, FORT COLLINS, CO, 80524-9691
798	9814406029	SALOMON GARY MICHAEL		5025 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
799	9814406030	YOUNG RONALD M/CLELIA A		5133 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
800	9814406031	ZIBELL TED G/PATRICIA ELLEN		5141 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
801	9814406032	MACKENZIE TOM/LORRAINE		5149 EAGLE LAKE DR, FORT COLLINS, CO, 80524-0524
802	9813005702	SMITH GRANT M		PO BOX 858, LAPORTE, CO, 80535-0535
803	9813005703	MAYER MARKUS P		5218 N HIGHWAY 1, FORT COLLINS, CO, 80524-0524
804	9813006901	NORTH POUDRE IRRIGATION COMPANY	3729 CLEVELAND AVE	PO BOX 100, WELLINGTON, CO, 80549-0549
814	9813000031	JACKSON SHERREL LEE		3924 N COUNTY ROAD 13, FORT COLLINS, CO, 80524-0524
820	9813000036	THOMPSON LIVING TRUST		2901 S COLLEGE AVE, FORT COLLINS, CO, 80525-0525
821	9813000036	THOMPSON LIVING TRUST		2901 S COLLEGE AVE, FORT COLLINS, CO, 80525-0525
823	9814000901	WATER SUPPLY AND STORAGE CO		2319 E MULBERRY ST, FORT COLLINS, CO, 80524-0524
824	8819000950	CITY OF THORNTON		9500 CIVIC CENTER DR, THORNTON, CO, 80229-0229
825	8818000904	WRCC INC		106 ELM ST, EATON, CO, 80615-0615
831	8819205001	BETS AND NELL LLC		4536 N COUNTY ROAD 13, FORT COLLINS, CO, 80524-0524

TABLE 3S

Parcel Infomation within the Alternative 3 (Option C) Corridor

Map ID	Parcel Number	Property Owner	C/O	Assessor Mailing Address
832	8819205001	BETS AND NELL LLC		4536 N COUNTY ROAD 13, FORT COLLINS, CO, 80524-0524
833	8819206001	ANTHONY MICHAEL F		4598 N COUNTY ROAD 13, FORT COLLINS, CO, 80524-0000
837	9814000909	WATER SUPPLY AND STORAGE CO		2319 E MULBERRY ST, FORT COLLINS, CO, 80524-0524
838	9814000909	WATER SUPPLY AND STORAGE CO		2319 E MULBERRY ST, FORT COLLINS, CO, 80524-0524
839	9824100901	WRCC INC		106 ELM ST, EATON, CO, 80615-0615
840	8819100901	WRCC INC		106 ELM ST, EATON, CO, 80615-0615
844	9823224902	WATER SUPPLY AND STORAGE CO		PO BOX 1584, FORT COLLINS, CO, 80522-0522

Section 4 Site Inventory Maps

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 4.

4.a The applicant must identify all resources and environmental conditions potentially impacted by the proposed development. The inventory must include the following features on the site and within one half mile of the boundaries of the project perimeter (1,000 feet for linear facilities). If access to adjacent land is not possible the inventory may be completed by using map resources available in the Planning Department. The inventory may include a narrative explanation and/or maps depicting the location of the features. The site inventory may be integrated with the Project Description to give a complete picture of the proposal. The title of the project must appear on each map sheet. If an aerial photo is being used, indicate the date of the photography.

Site inventory maps identify resources and environmental conditions potentially impacted by the TWP. As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, a site inventory is not required beyond the corridor. However, Thornton included an additional study buffer at most locations that includes a 500-foot buffer from the centerline of the Alternative 3 (Option C) Corridor.

The aerial imagery utilized in the creation of the site inventory maps is from multiple sources; the three main sources are Denver Regional Council of Governments (DRCOG) 2016, Digital Globe 10/22/2017, and National Agricultural Imagery Program (NAIP) 2015. The information shown in these maps is the best available data downloaded from Larimer County's website and other local agencies. Each figure lists its source information.

The Site Inventory Map(s) may be required to contain the following information:

4.b Existing buildings, structures, utilities (water transmission lines and sewer collection lines), easements and other features including irrigation facilities, fences, roads, etc.;

Figure 4.bS shows the best available data for existing utility corridors, which includes gas, electrical, telecommunications, water, and sanitary sewer utilities within the Alternative 3 (Option C) Corridor. Oil and gas wells are also shown. Subsurface utility engineering will be completed during the design and construction phases of the TWP and will include surface geophysical methods and test holes to determine the locations of existing utilities.

Other existing infrastructure such as buildings, other structures, irrigation facilities, and roads are shown on the Vicinity Maps in Section 3. Infrastructure information is shown on separate maps to enhance legibility.

4.c Location of all residences, any abutting subdivision outlines and names, and the boundaries of any adjacent municipality or Growth Management Area.

The location of residences, subdivision outlines and names, and the boundaries of adjacent municipality and GMAs are shown on the Vicinity Maps in Section 3.

4.d Existing vegetation, soil types for SCS Soil Survey, water bodies, and other natural features;

Figure 4.d-1S show soil types with the Soil Conservation Service (SCS) soil type, water bodies, and other natural features. Existing vegetation information within the Alternative 3 (Option C) Corridor and study buffer can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Appendix A**. Vegetation is shown on **Figure Addendum-A3** in **Appendix A**.

4.e Officially designated 100 year flood plains with Flood Way and Flood Fringe clearly shown;

The Alternative 3 (Option C) Corridor does not cross any designated 100-year floodplain as shown on **Figure 4.eS**. The 100-year floodplain and floodway were identified using Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM). The flood fringe is identified as those areas within the floodplain but outside the floodway.

4.f Geologic Hazards rated 3 through 7 with location and classification shown, including areas with expansive soils and other moderate hazards;

Figure 4.f-1s shows geological hazards with rating and classifications within the Alternative 3 (Option C) Corridor. Additional information can be found in Section 8.c, Natural Hazard Mitigation Plan.

Figure 4.f-2S shows the Natural Resources Conservation Service (NRCS) soil erodibility K factor values. K factor values represent the susceptibility of soil erosion, transportability of the sediment, and the amount and rate of runoff given a particular rainfall event. The majority of the Alternative 3 (Option C) Corridor is located within the medium soil erodibility range. Additional information can be found in Section 8.e, Drainage and Erosion Control Report and Plan.

4.g Wetlands – area of wetlands (*See* Section 8.2)

Open waters, wetlands, and riparian areas within the Alternative 3 (Option C) Corridor and study buffer are described in the Addendum A to the Natural and Cultural Resources Assessment in **Appendix A**. **Figure Addendum-A3** shows these areas in the **Appendix A**.

4.h Drainage patterns and general direction of flows on and through the site;

Figure 4.hS shows drainage patterns and the general direction of flows in the Alternative 3 (Option C) Corridor. Additional information can be found in Section 8.e, Drainage and Erosion Control Report and Plan.

4.i Topography with a contour interval sufficient to evaluate the proposal but no greater than 40-foot intervals. Contours must be labeled every 5 to 7 inches and every 5th contour line clearly shown by a heavier line. Areas of 20% or greater slope must be clearly shown by shading or other means;

Figure 4.iS shows the topography of the Alternative 3 (Option C) Corridor with 10-foot contour intervals and areas of 20 percent or greater slope.

4.j Wildlife habitat and migration corridors with a description of the ways wildlife use the site and the species involved, with proposed setbacks or other potential mitigation measures;

Wildlife habitat and migration corridors within the Alternative 3 (Option C) Corridor and study buffer with description of the ways that wildlife use the site and the species involved, with proposed setback and other potential mitigation measures, can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Appendix A**. Wildlife is shown on **Figure Addendum-A3** in **Appendix A**.

4.k Habitat for rare and endangered plants with species clearly indicated;

Information on habitat for rare and endangered plants, and specifically the species within the Alternative 3 (Option C) Corridor and study buffer, can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Appendix A**.

4.l Wildfire Hazards with location and classification shown;

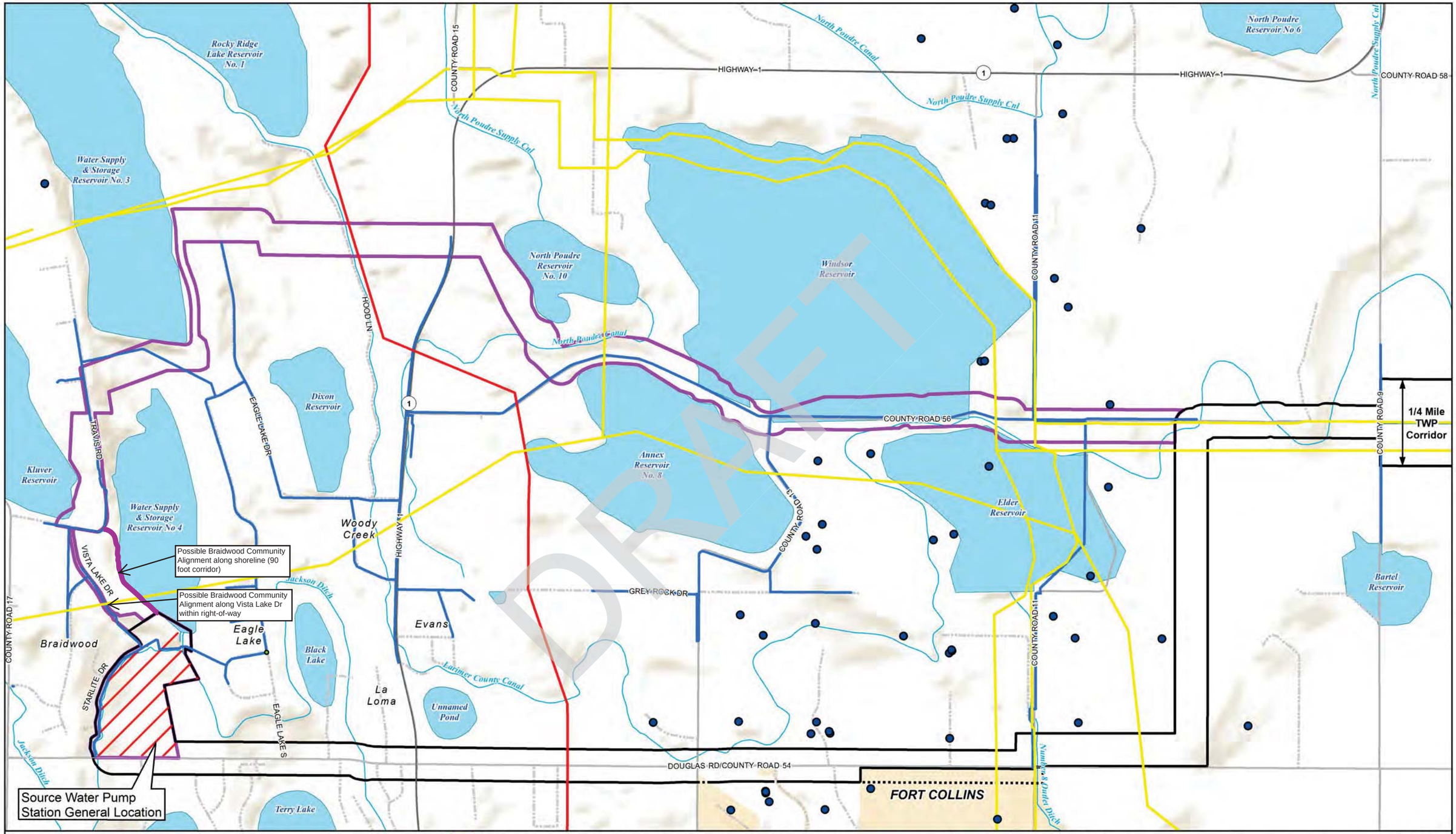
Figure 4.lS shows wildfire hazards with location and classification in the area surrounding the Alternative 3 (Option C) Corridor. The Alternative 3 (Option C) Corridor is located outside of wildfire hazard areas. Additional information can be found in Section 8.c, Natural Hazard Mitigation Plan.

4.m Sites and structures listed on the State and National Register of Historic Places;

No cultural sites and structures listed on the State and National Register of Historic Places are located within the Alternative 3 (Option C) Corridor. Additional information can be found in the Addendum A to the Natural and Cultural Resources Assessment in **Appendix A**. **Figure Addendum A4** shows the Office of Archaeology and Historic Preservation search results can be found in Appendix A.

4.n Commercial Mineral Deposits with the type of mineral deposit indicated along with estimates of the quantity and quality of the mineral and the amount of overburden present.

Commercial mineral deposits are not present within the Alternative 3 (Option C) Corridor. **Figure 4.nS** shows locations of commercial mineral mines, active hard rock mines, sand and gravel construction mines, and other mines from the Division of Reclamation Mining and Safety.



CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

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1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Oil and Gas Wells
- Electrical Transmission Line
- Telecommunications Line
- Gas Line
- Water Pipeline
- Sanitary Sewer Line

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.bS
Alternative 3 (Option C) Corridor
Existing Utility Corridors

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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Soil Map Unit Name		
5a - Aquepts, loamy	54 - Kim loam, 3 to 5 percent slopes	90 - Renohill clay loam, 3 to 9 percent slopes
6a - Aquepts, ponded	55 - Kim loam, 5 to 9 percent slopes	95 - Satanta loam, 1 to 3 percent slopes
34a - Fort Collins loam, 0 to 1 percent slopes	63a - Longmont clay, 0 to 3 percent slopes	101 - Stoneham loam, 1 to 3 percent slopes
35 - Fort Collins loam, 0 to 3 percent slopes	65a - Midway clay loam, 5 to 25 percent slopes	103 - Stoneham loam, 5 to 9 percent slopes
36 - Fort Collins loam, 3 to 5 percent slopes	71 - Nelson fine sandy loam, 3 to 9 percent slopes	102 - Stoneham loam, 3 to 5 percent slopes
37 - Fort Collins loam, 5 to 9 percent slopes	73a - Nunn clay loam, 0 to 1 percent slopes	106 - Tassel sandy loam, 3 to 25 percent slopes
48a - Heldt clay loam, 0 to 3 percent slopes	74 - Nunn clay loam, 1 to 3 percent slopes	108 - Thedalund loam, 3 to 9 percent slopes
49 - Heldt clay loam, 3 to 6 percent slopes	76a - Nunn clay loam, wet, 1 to 3 percent slopes	107 - Thedalund loam, 0 to 3 percent slopes
53a - Kim loam, 1 to 3 percent slopes	80a - Otero-Nelson sandy loams, 3 to 25 percent slopes	118 - Wiley silt loam, 1 to 3 percent slopes
	85 - Water	

Possible Braidwood Community Alignment along shoreline (90 foot corridor)

Possible Braidwood Community Alignment along Vista Lake Dr within right-of-way

Source Water Pump Station General Location

500 Feet

1/4 Mile TWP Corridor

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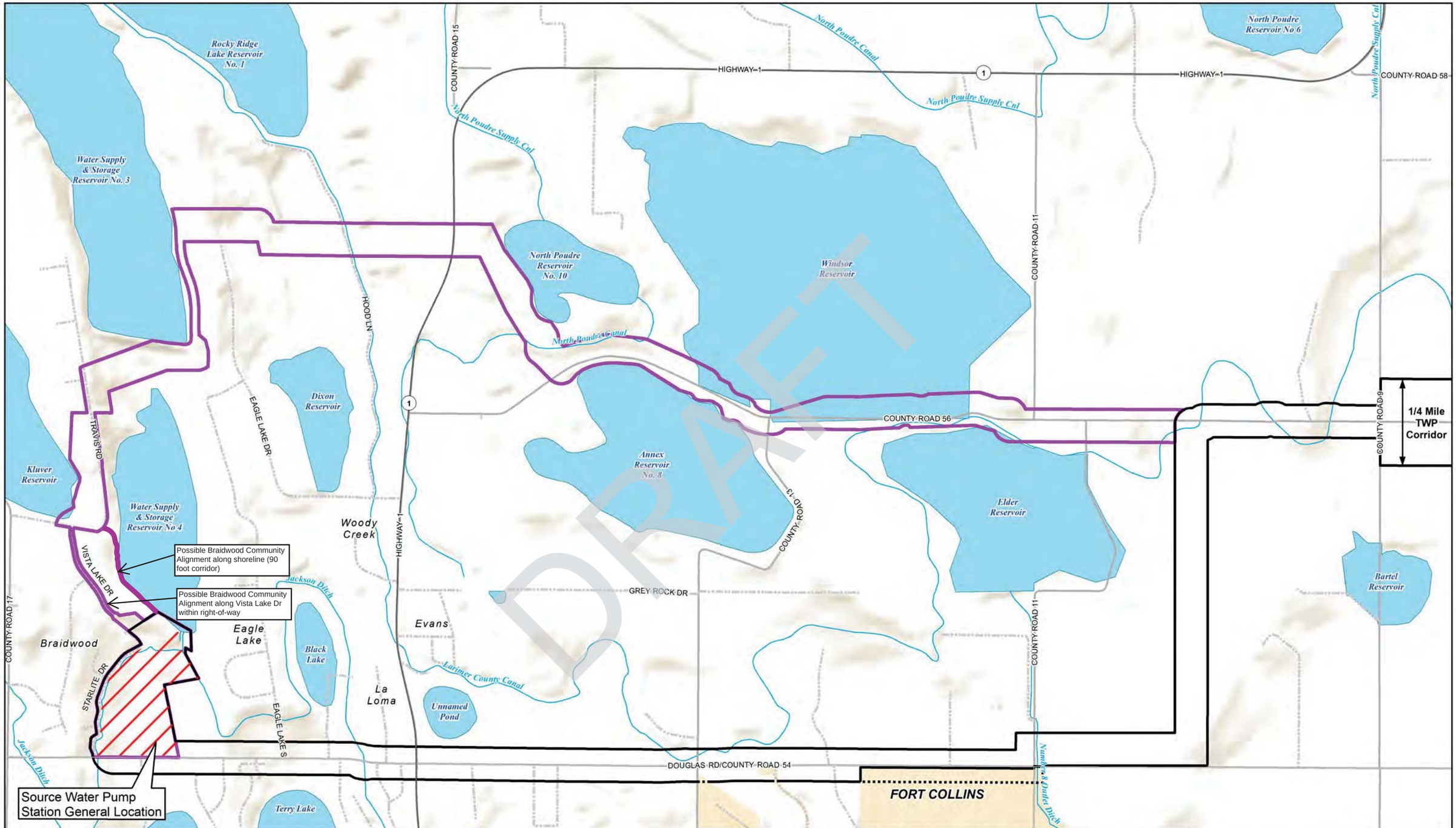
- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Study Buffer
- Soil Map Unit
- ## Soil Map Unit Number

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.dS
Alternative 3 (Option C) Corridor Soil Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI



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1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- 100-yr Flood Fringe
- 100-yr Floodway
- Outside Floodway

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.eS
Alternative 3 (Option C) Corridor
100-yr Floodplain

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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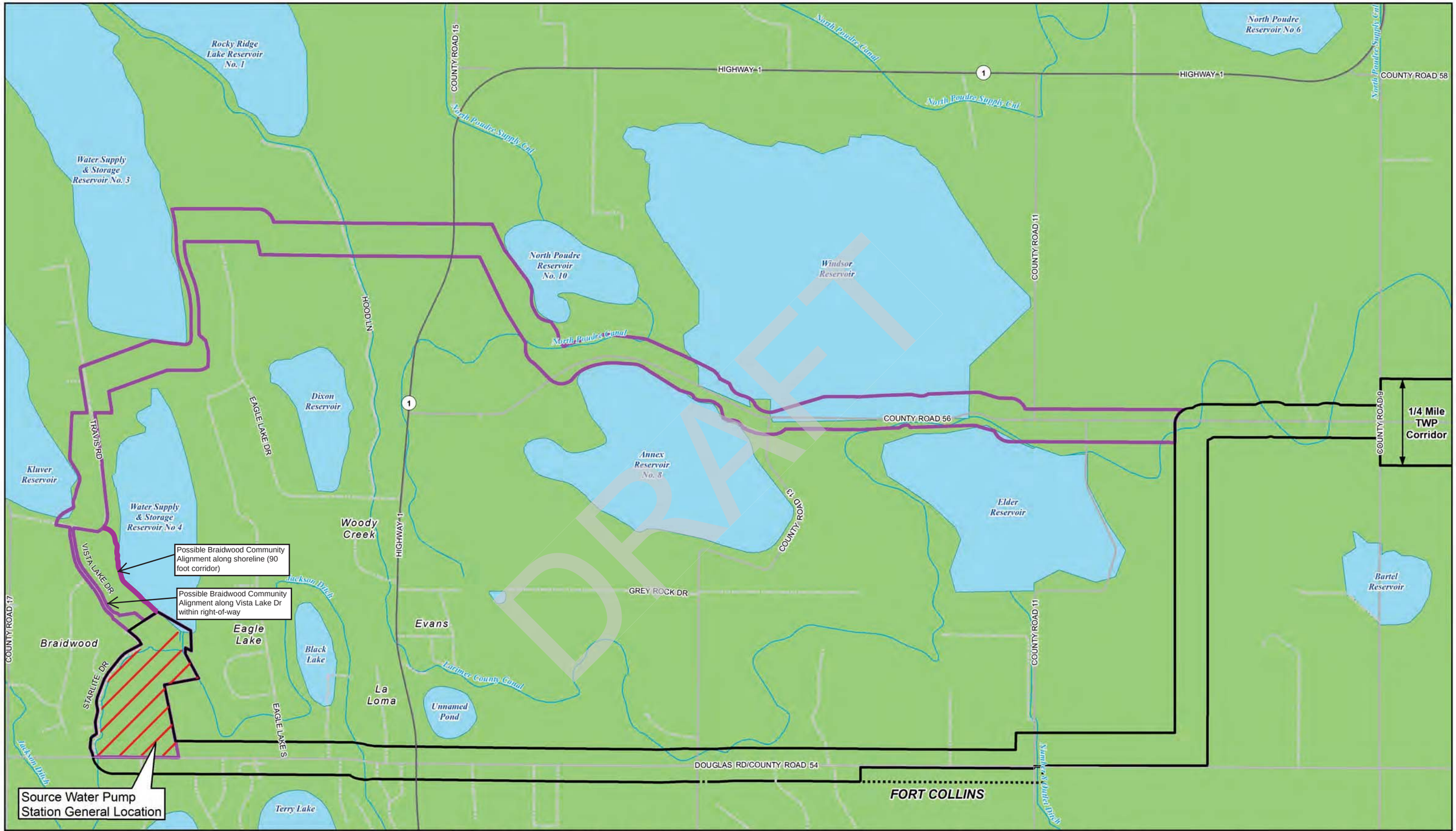

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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Geologic Hazard
- Severe (Class 5, 6, 7)
- Moderate (Class 3, 4)
- Low

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.f-1S
Alternative 3 (Option C) Corridor Geologic Hazards

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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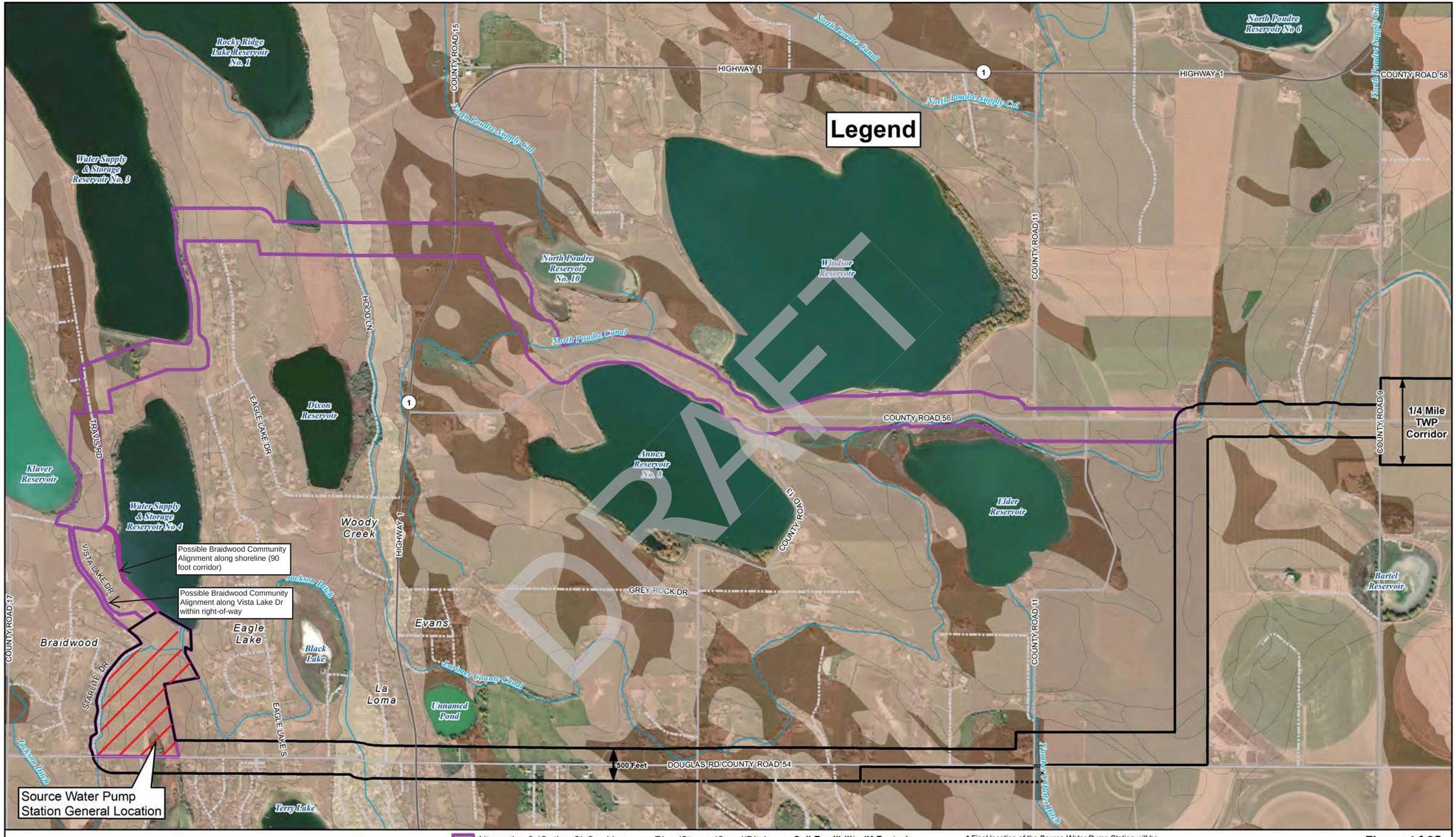

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1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location

Soil Erodibility (K Factor)

- No Value
- Low (<0.20)
- Medium (0.20 - 0.40)
- High (>0.40)

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.f-2S
Alternative 3 (Option C) Corridor
Soil Erodibility Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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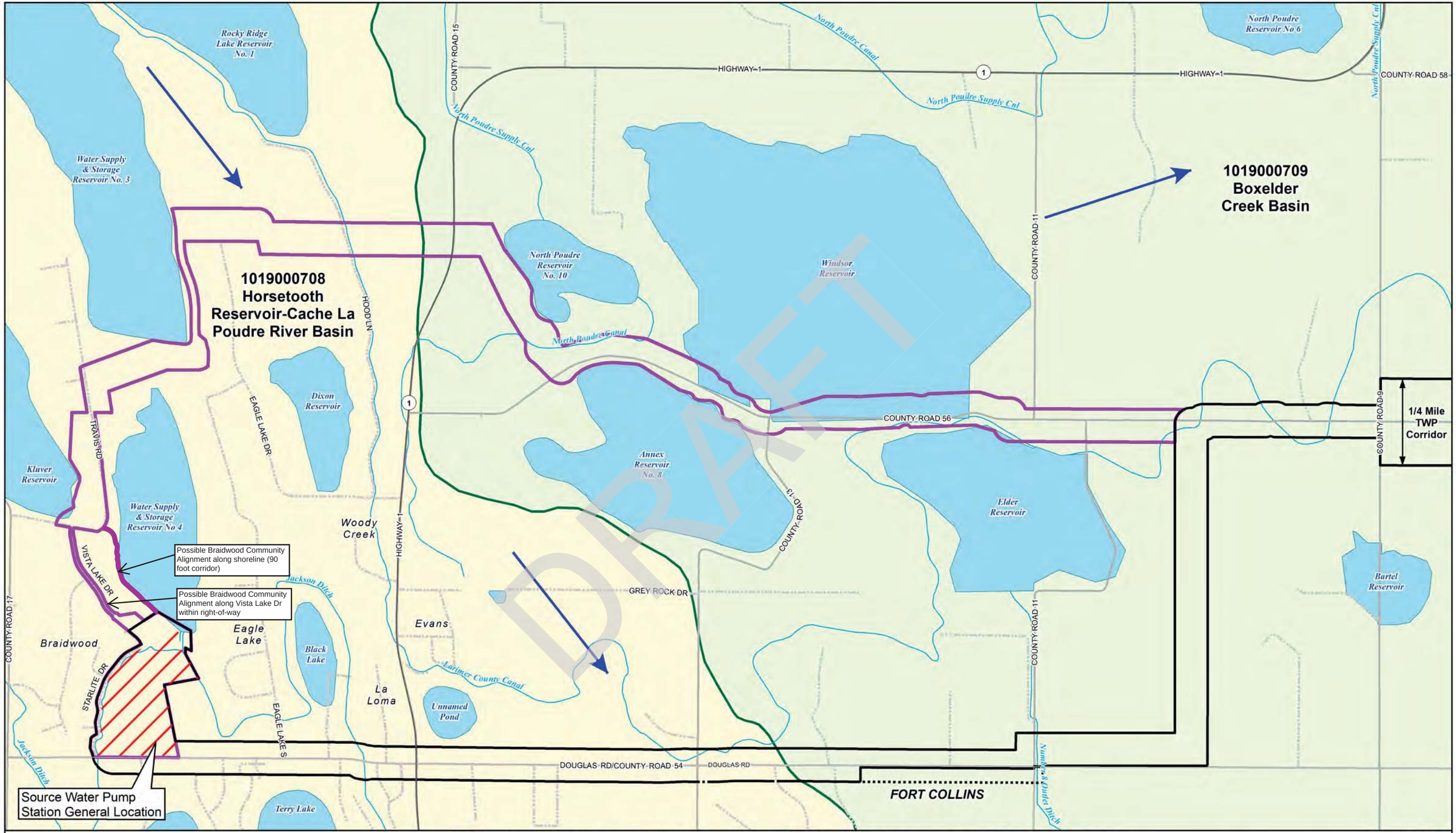

Thornton WATER PROJECT

CITY OF THORNTON
COLORADO

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THORNTON, CO 80241-2405

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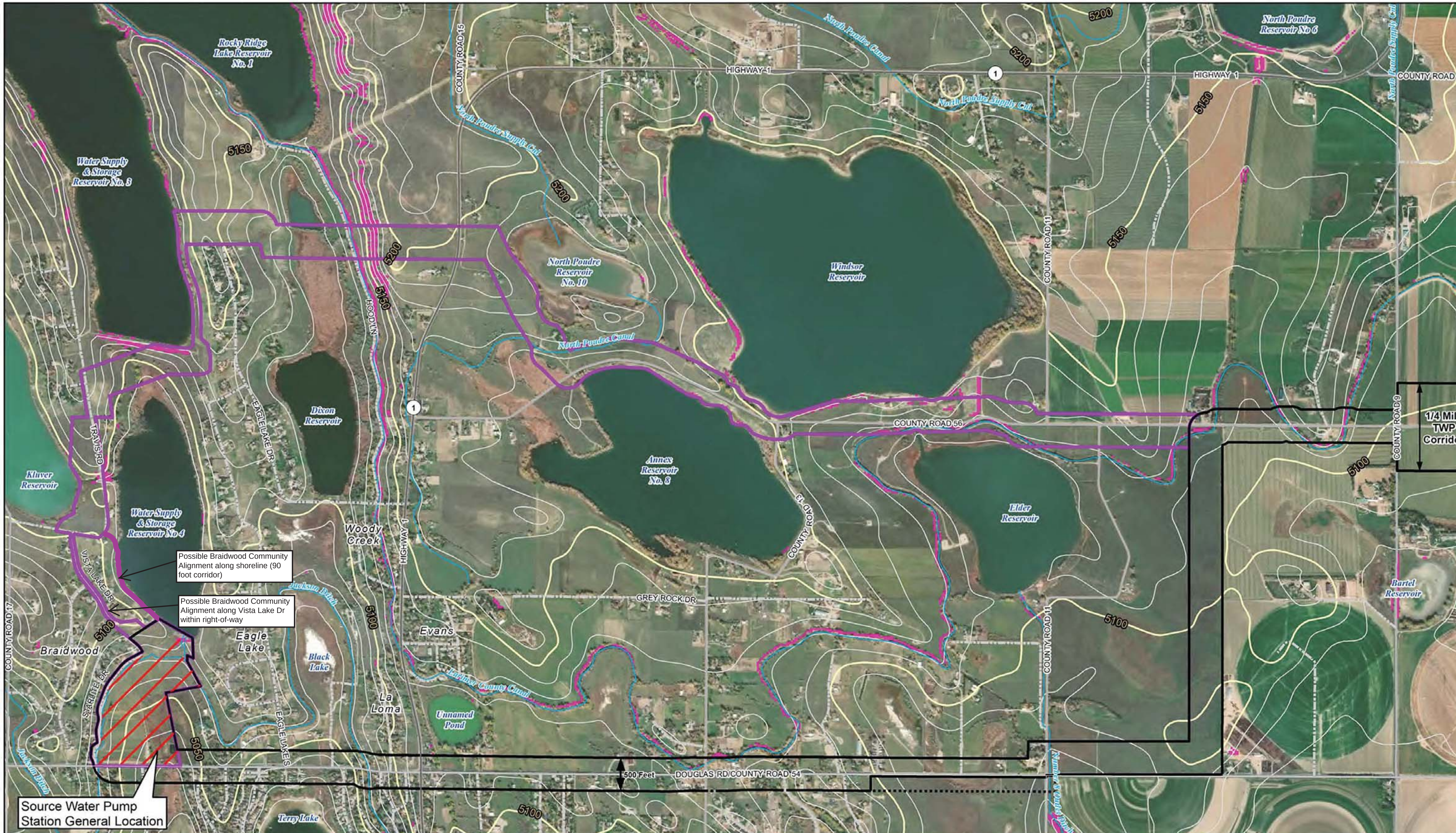
1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- HUC 10 Boundary
- Boxelder Creek
- Horsetooth Reservoir - Cache La Poudre River
- Flow Direction

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.hS
Alternative 3 (Option C) Corridor
HUC Watersheds

Sources: NHD, CDWR, Larimer County, CDOT, ESRI



Rocky Ridge Lake Reservoir No. 1
Water Supply & Storage Reservoir No. 3
Water Supply & Storage Reservoir No 4
North Poudre Reservoir No. 10
North Poudre Reservoir No 6
Windsor Reservoir
Annex Reservoir No. 8
Elder Reservoir
Dixon Reservoir
Kluver Reservoir
Bartel Reservoir
Black Lake
Terry Lake
Unnamed Pond
Eagle Lake
Woody Creek
Evans
La Loma
Braidwood
North Poudre Canal
North Poudre Supply Cnl
Larimer County Canal
Jackson Ditch
HIGHWAY 1
COUNTY ROAD 15
COUNTY ROAD 11
COUNTY ROAD 13
COUNTY ROAD 9
COUNTY ROAD 17
COUNTY ROAD 56
COUNTY ROAD 58
GREY ROCK DR
DOUGLAS RD/COUNTY ROAD 54
HOOD LN
TRAVIS RD
EAGLE LAKE DR
VISTA LAKE DR
STARLITE DR
5050
5100
5150
5200
1/4 Mile TWP Corridor
500 Feet
Possible Braidwood Community Alignment along shoreline (90 foot corridor)
Possible Braidwood Community Alignment along Vista Lake Dr within right-of-way
Source Water Pump Station General Location

CITY OF THORNTON
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12/6/2018

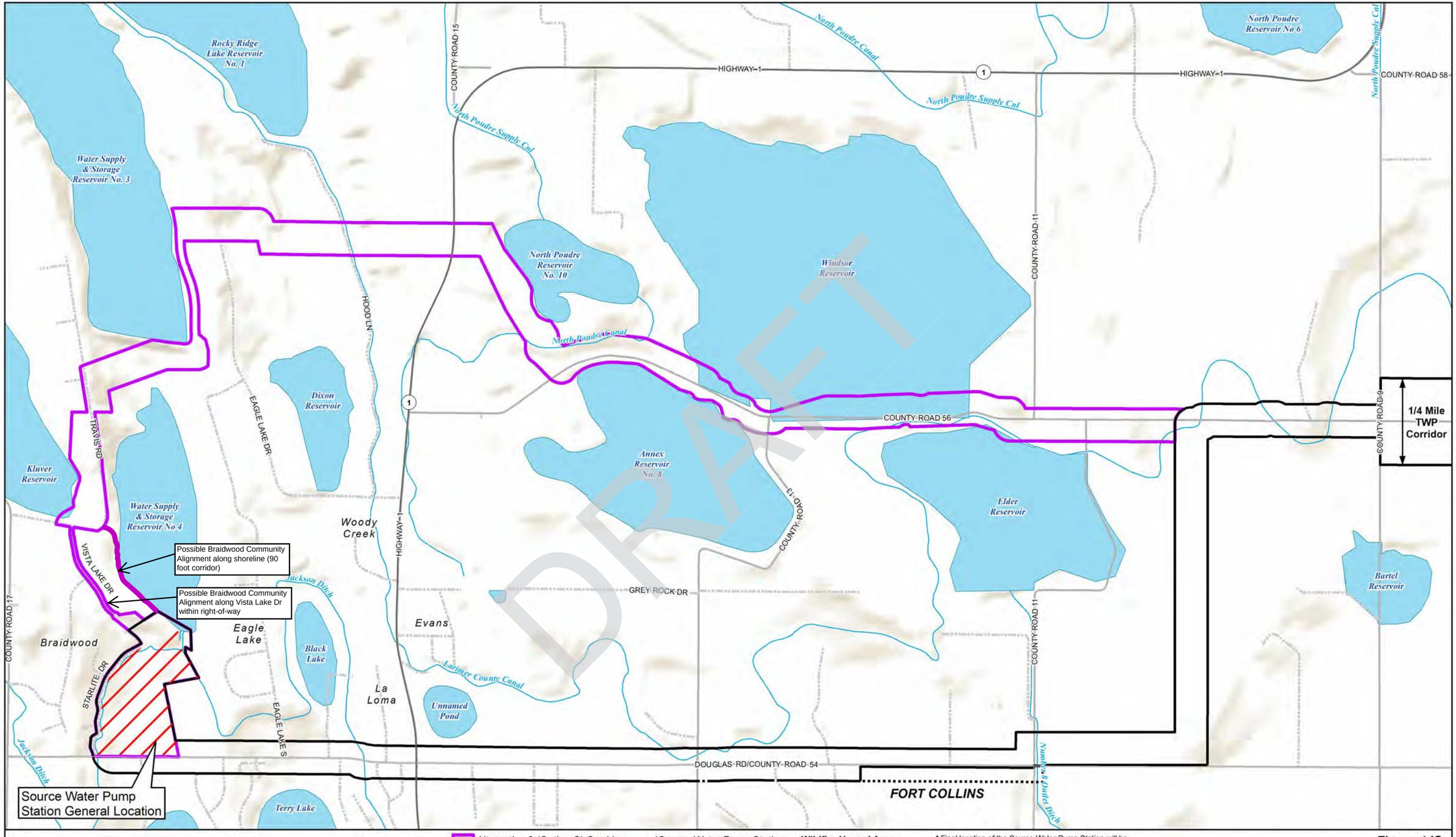
0 500 1,000 Feet
1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location
- Major Contour (Yellow Line)
- Minor Contour (White Line)
- >= 20%

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.iS
Alternative 3 (Option C) Corridor Topographic Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI



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1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Wildfire Hazard Area
- Very High Hazard
- High Hazard
- Moderate Hazard
- Low Hazard
- Outside Hazard Mitigation Area

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.IS
Alternative 3 (Option C) Corridor
Wildfire Hazards

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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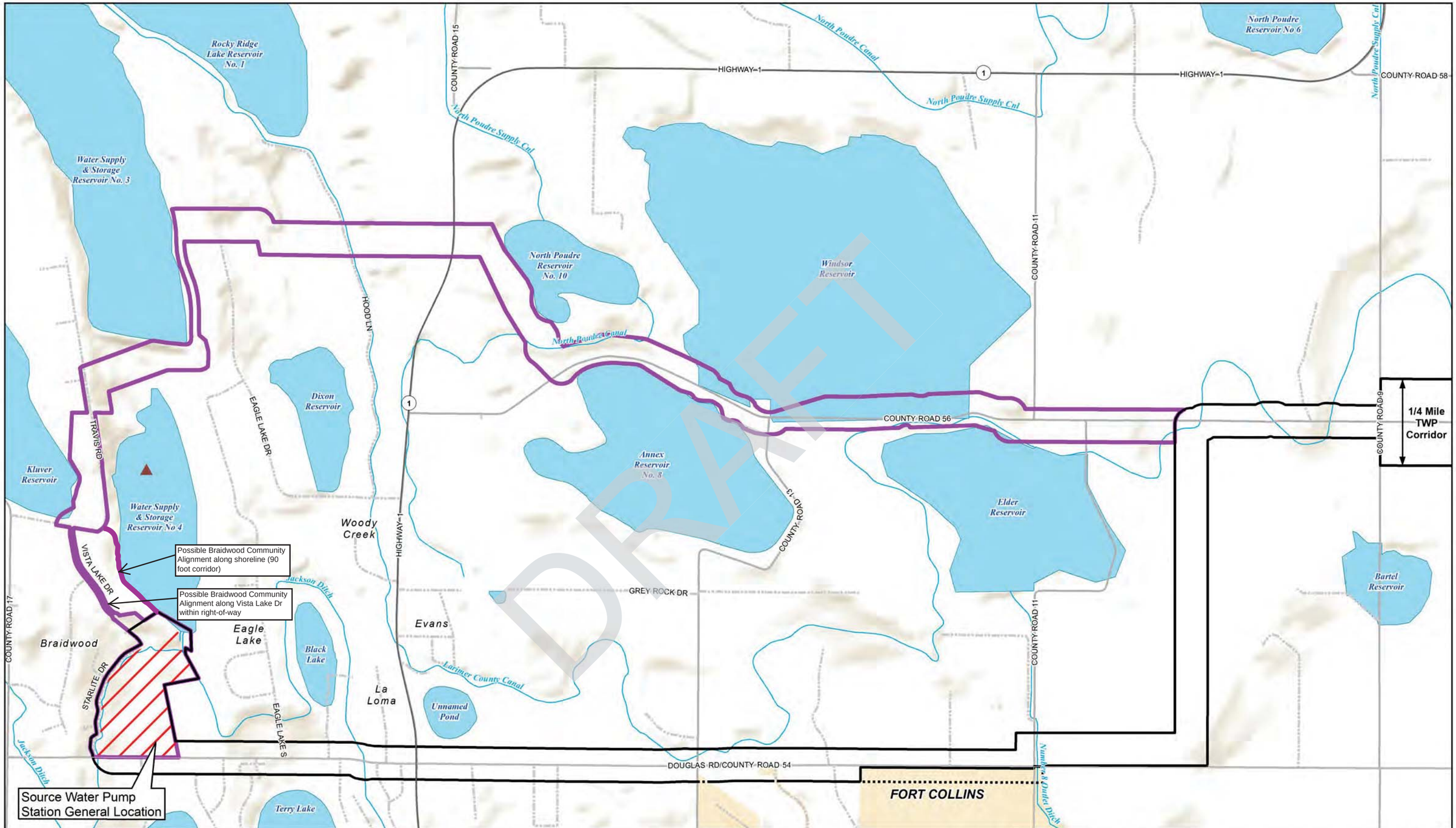

CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

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1 inch = 1,400 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Mineral Resource Data System - Mines

- Stone, Crushed/Broken

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 4.nS
Alternative 3 (Option C) Corridor
Commercial Mineral Mines

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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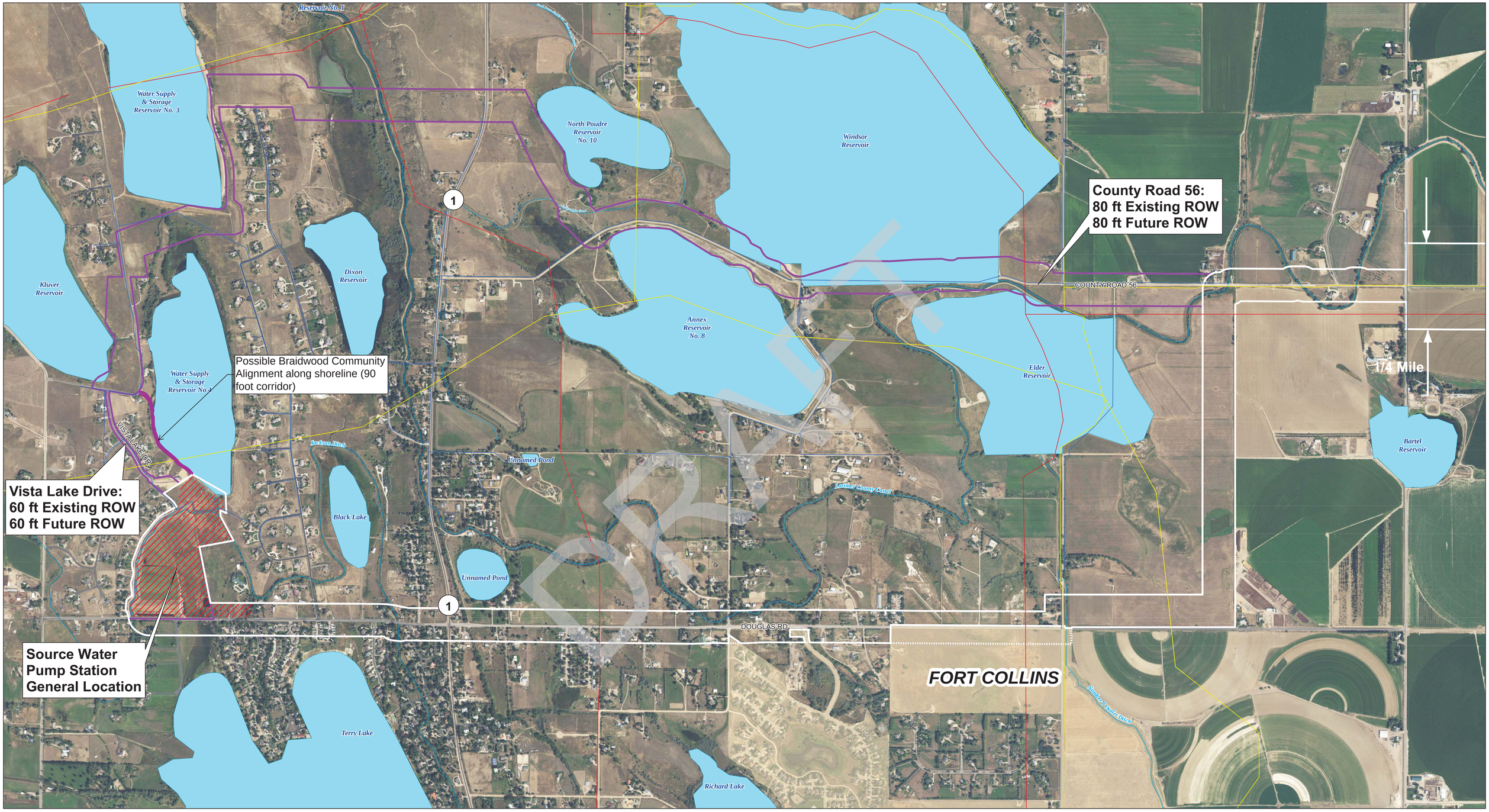
Section 5 1041 Permit Site Maps

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 5.

As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, 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. **Figure 5-1S** shows the 1041 Permit Site Maps for the Alternative 3 (Option C) Corridor (24” x 36” sheets).

Thornton Water Project



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THORNTON, CO 80241-2405

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1 inch = 650 feet

- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Water Tank General Location
- County Boundary
- Railroad
- Lake/Reservoir
- River/Stream/Canal/Ditch
- Telecommunications Line
- Gas Line
- Electrical Transmission Line
- Sanitary Sewer Line
- Water Pipeline

Boundaries Crossed by the Proposed Corridor Corporate Boundary

- Fort Collins
- Johnstown
- Loveland
- Timnath
- Wellington
- Windsor

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 5-1S
1041 Permit Site Map for Alternative 3 (Option C) Corridor

Sources: NHD, USGS, CDWR, Larimer and Weld Counties, CDOT, City of Thornton, DRCOG, NAIP, Zayo, Xcel Energy, Penwell, Tri-State Power, Town of Windsor, Northern Water, NWCWD, ELCO

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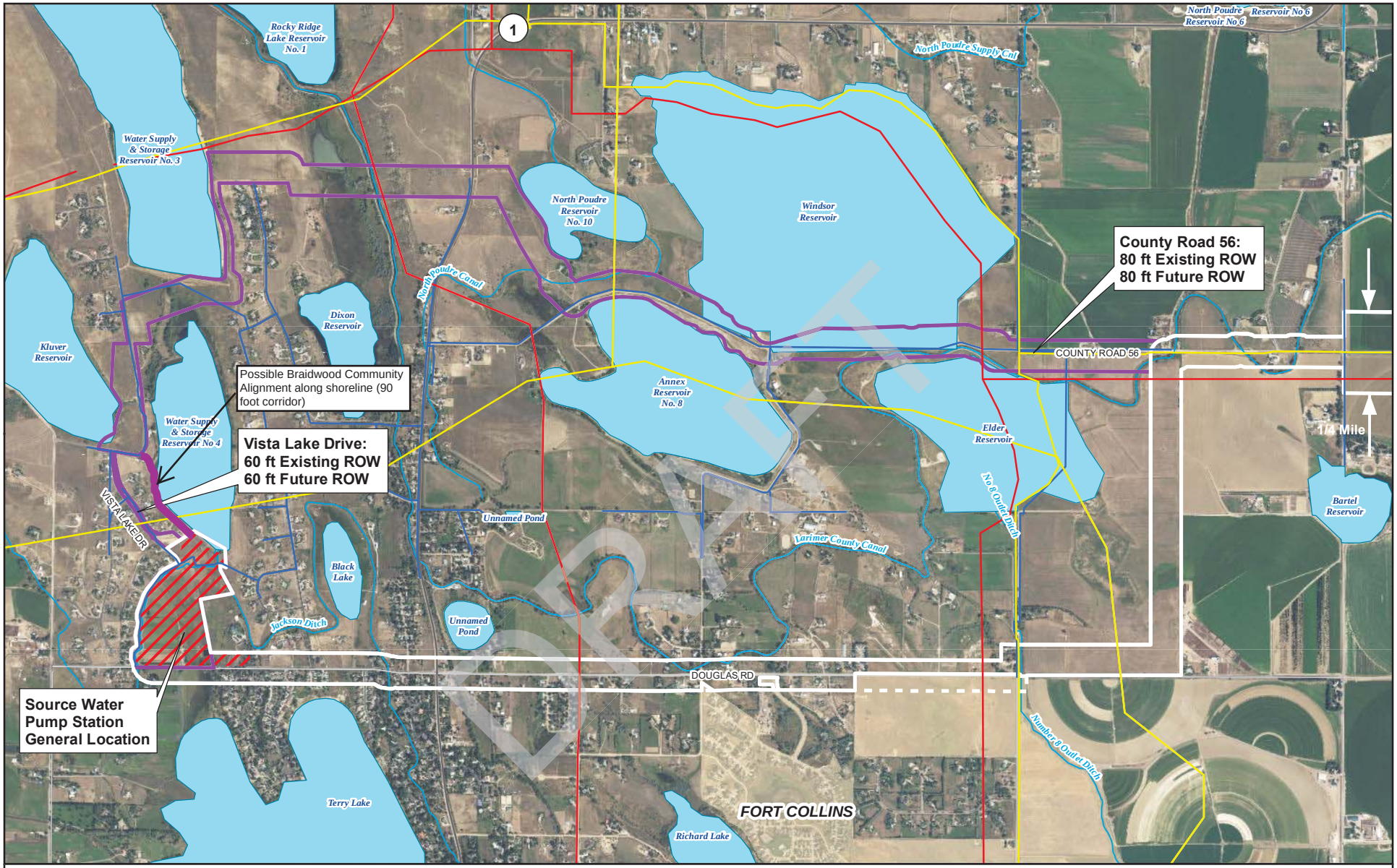
Section 6 Reduced 1041 Site Permit Maps

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 6.

As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, Thornton will supply final alignment and construction plans to Larimer County prior to construction to meet 1041 Site Permit Map requirements. Construction plans are anticipated to be delivered in multiple packages. **Figure 6-1S** shows the Reduced 1041 Site Permit Maps for the Alternative 3 (Option C) Corridor (8 ½" x 11" sheets).



Thornton WATER PROJECT

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COLORADO
12450 WASHINGTON ST
THORNTON, CO 80241-2405

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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Water Tank General Location
- County Boundary
- Railroad
- Lake/Reservoir
- River/Stream/Canal/Ditch
- Telecommunications Line
- Gas Line
- Electrical Transmission Line
- Sanitary Sewer Line
- Water Pipeline

Corporate Boundaries Crossed by the Proposed Corridor

- Fort Collins
- Johnstown
- Loveland
- Timnath
- Wellington
- Windsor

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 6-1S
Reduced 1041 Site Permit Map for Alternative 3 (Option C) Corridor

Sources: NHD, USGS, CDWR, Larimer County, CDOT, City of Thornton, DRCOG, NAIP, Zayo, Xcel Energy, Penwell, Tri-State Power, Town of Windsor, Northern Water, NWCWD, ELCO

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Section 7 Legal Description

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 7.

As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, a general project corridor description will meet this requirement for permitting a linear project corridor. No final pipeline alignment has been developed and no easements in unincorporated Larimer County have been executed at the time that this Supplement 3 is being submitted. Once complete, final design/construction drawings will be submitted to Larimer County.

Alternative 3 (Option C) Corridor

The Alternative 3 (Option C) Corridor is typically 500-feet wide for TWP components in unincorporated Larimer County. The final water pipeline alignment within a 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 Alternative 3 (Option C) Corridor width allows for flexibility when developing the final water pipeline alignment and location of appurtenances.

The Alternative 3 (Option C) Corridor is approximately 6 miles long in unincorporated Larimer County north of Fort Collins. It includes an area that extends south from Water Supply and Storage Company (WSSC) Reservoir No. 4 to the proposed location of the source water pump station. This area will accommodate the connection to WSSC Reservoir No. 4, the water pipeline to the source water pump station, and the water pipeline from the source water pump station. The Alternative 3 (Option C) Corridor extends north then east from the west side of WSSC Reservoir No. 4 to County Road 9. The Alternative 3 (Option C) Corridor is less than 500-feet wide at some locations to minimize impacts to existing infrastructure. The Alternative 3 (Option C) Corridor generally follows roads and property lines

The Alternative 3 (Option C) Corridor ties into the TWP corridor at County Road 9.

TWP with Alternative 3 (Option C) Corridor

If Alternative 3 (Option C) Corridor is approved by the Board of Larimer County Commissioners, the water pipeline and appurtenant facilities will be constructed within the Alternative 3 (Option C) Corridor as described above. Where the Alternative 3 (Option C) Corridor ties into the TWP corridor at County Road 9, the water pipeline and appurtenant facilities will be constructed within the TWP corridor east of County Road 9 as presented in the Application. The TWP with Alternative 3 (Option C) Corridor includes up to approximately 27 miles of a buried 48-inch water pipeline and associated appurtenances in unincorporated Larimer County, Colorado. The TWP with Alternative 3 (Option C) Corridor width typically varies from 500-feet to ¼-mile depending on location and exceeds ¼-mile at some locations to allow for flexibility when developing the final water pipeline alignment. The corridor is less than 500-feet wide at some locations to minimize impacts to existing infrastructure.

The east/west section of the TWP with Alternative 3 (Option C) 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 with Alternative 3 (Option C) Corridor is typically 500-feet wide along County Road 56 to Larimer County Road 9. The corridor is less than 500-feet wide at some locations to minimize

impacts to existing infrastructure. The TWP with Alternative 3 (Option C) Corridor is ¼-mile wide east of Larimer County Road 9 and generally follows roads and property lines.

The section of the TWP with Alternative 3 (Option C) Corridor that generally runs north/south unincorporated in Larimer County is ⅛-mile wide and approximately 16 miles long. The TWP with Alternative 3 (Option C) 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 with Alternative 3 (Option C) Corridor is centered on the County line, encroaching ⅛-mile into each county. The TWP with Alternative 3 (Option C) 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 with Alternative 3 (Option C) Corridor include approximately 9 ½ miles in incorporated areas of Johnstown, Timnath, or Windsor, including roads that have been annexed by local governments.

Section 8 Technical Reports

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.f, and the criteria and standards described in LUC Sections 4.2.2, 8.1 through 8.4, 8.11, 8.12, 14.10.D.3, 14.10.D.4, and 14.10.D.6 through 14.10.D.11.

The following technical reports are provided in this section:

Section 8.a Wetland Mitigation Plan and 8.b Wildlife Conservation Plan

Sections 8.a and 8.b summarize the report Addendum A to the Natural and Cultural Resources Assessment found in **Appendix A**. The report identifies possible natural resources within the Alternative 3 (Option C) Corridor and associated monitoring and mitigation measures to minimize or eliminate potential impacts. The natural resources presented in the report include:

- Open waters, wetlands, and riparian areas
- Terrestrial and aquatic animals and habitats
- Terrestrial and aquatic plant life
- Noxious weeds

Section 8.c – Natural Hazard Mitigation Plan

The Natural Hazard Mitigation Plan identifies geologic hazard areas within the Alternative 3 (Option C) Corridor and associated mitigation measures that could be implemented to minimize potential impacts. The geologic information is based on Larimer County GIS data downloaded in August 2016 from Larimer County's GIS Digital Database.

The Alternative 3 (Option C) Corridor is located outside of wildfire hazard areas based on Larimer County GIS data downloaded in August 2016 from Larimer County's GIS Digital Data.

Section 8.d – Traffic Impact Study

As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, the Traffic Impact Study includes a traffic narrative that identifies the short- and long-term impacts of vehicular traffic and associated mitigation measures to minimize potential impacts. The narrative was developed in consideration with area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*.

Section 8.e – Drainage and Erosion Control Report and Plan

As discussed during the Pre-Application Conference, the Drainage and Erosion Control Report and Plan includes a drainage narrative. This section presents the existing site drainage within the Alternative 3 (Option C) Corridor including drainage watersheds and general flow paths, construction water quality management, and post-construction stormwater runoff. Possible mitigation measures to minimize potential impacts are also included.

Section 8.f – Floodplain Hydraulic/Hydrologic Modeling Report

The Floodplain Hydraulic/Hydrologic Modeling Report shows that the Alternative 3 (Option C) Corridor does not cross any floodplains. The TWP will not alter floodplains.

Section 8.g – Groundwater Modeling Report

Information for this section was provided in the Application and does not need to be supplemented.

Section 8.h – Non-Subdivision Water Supply Inquiry (Not Required)

As discussed during the Pre-Application Conference, a Non-Subdivision Water Supply Inquiry is not required.

Section 8.i – Simulation of the Appearance of the Facility (Not Required)

As discussed during the Pre-Application Conference, a Simulation of the Appearance of the Facility is not required.

Section 8.j – Computer Modeled Electromagnetic Field Measurements (Not Required)

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

Section 8.k – Noise Analysis

The Noise Analysis presents anticipated noise impacts during construction and post-construction operations and associated mitigation measures that could be implemented to meet the most current Larimer County Noise Level Ordinance.

Section 8.l – Air Quality Impact and Mitigation Report

The Air Quality Impact and Mitigation Report identifies potential sources of air pollution during construction and post-construction operations and associated mitigation measures that could be implemented to minimize potential impacts.

Section 8 Technical Reports

8.a Wetland Mitigation Plan

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 8.a, and the criteria and standards described in LUC Sections 8.2, 14.10.D.3, 14.10.D.4, 14.10.D.10, and 14.10.D.11.

The Alternative 3 (Option C) Corridor and study buffer cross multiple open waters, riparian areas, and wetlands. Additional information can be found in **Appendix A**, Addendum A to the Natural and Cultural Resources Assessment.

Section 8 Technical Reports

8.b Wildlife Conservation Plan

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 8.b, and the criteria and standards described in LUC Sections 8.4, 14.10.D.3, 14.10.D.4, 14.10.D.10, and 14.10.D.11.

The Alternative 3 (Option C) Corridor and study buffer cross multiple wildlife habitats. Additional information can be found in **Appendix A**, Addendum A to the Natural and Cultural Resources Assessment.

Section 8 Technical Reports

8.c Natural Hazard Mitigation Plan

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.c, and the criteria and standards described in LUC Sections 8.3, 14.10.D.3, 14.10.D.4, 14.10.D.6, 14.10.D.7, and 14.10.D.11.

Based on Larimer County GIS data downloaded in December 2018 from Larimer County's GIS Digital Data and shown in **Figure 8.c-1S**, the Alternative 3 (Option C) Corridor is located outside of designated wildfire hazard areas. With the exception of the source water pump station, the majority of the TWP is underground including the water pipeline and underground appurtenances that would not be susceptible to wildfires.

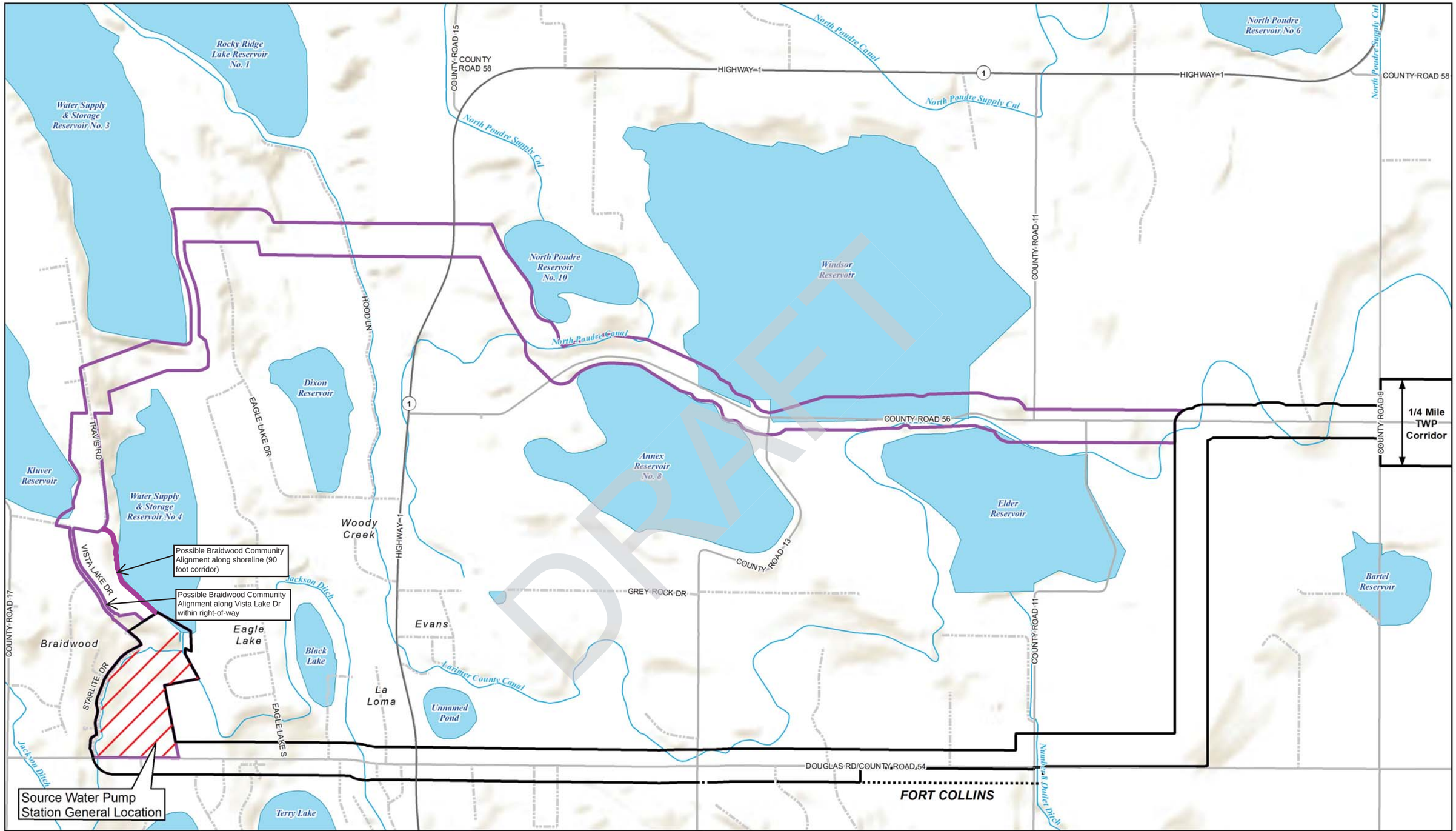
Based on Larimer County GIS data downloaded December 2018 from Larimer County's GIS Digital Data and shown in **Figure 8.c-2S**, the Alternative 3 (Option C) Corridor is located in a low geologic hazard category.

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 Alternative 3 (Option C) Corridor. Mitigation measures will be further refined during design to meet site-specific geological hazards.

If geologic hazards are found during the subsurface geotechnical investigation, mitigation measures may include, but are not limited to, the following:

- Stream and bank stabilization methods such as riprap protection or concrete mats
- Imported backfill material such as low-strength concrete
- Revegetation
- Soil erosion blankets during construction
- Trenchless construction methods
- Locating the final alignment outside of the geohazard area if possible, but still within the Alternative 3 (Option C) Corridor

Jurisdictional waters will be crossed using trenchless construction methods. Mitigation measures will be implemented as required in areas outside of any jurisdictional waters.



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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Wildfire Hazard Area
- Very High Hazard
- High Hazard
- Moderate Hazard
- Low Hazard
- Outside Hazard Mitigation Area

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.c-1S
Alternative 3 (Option C) Corridor
Wildfire Hazards

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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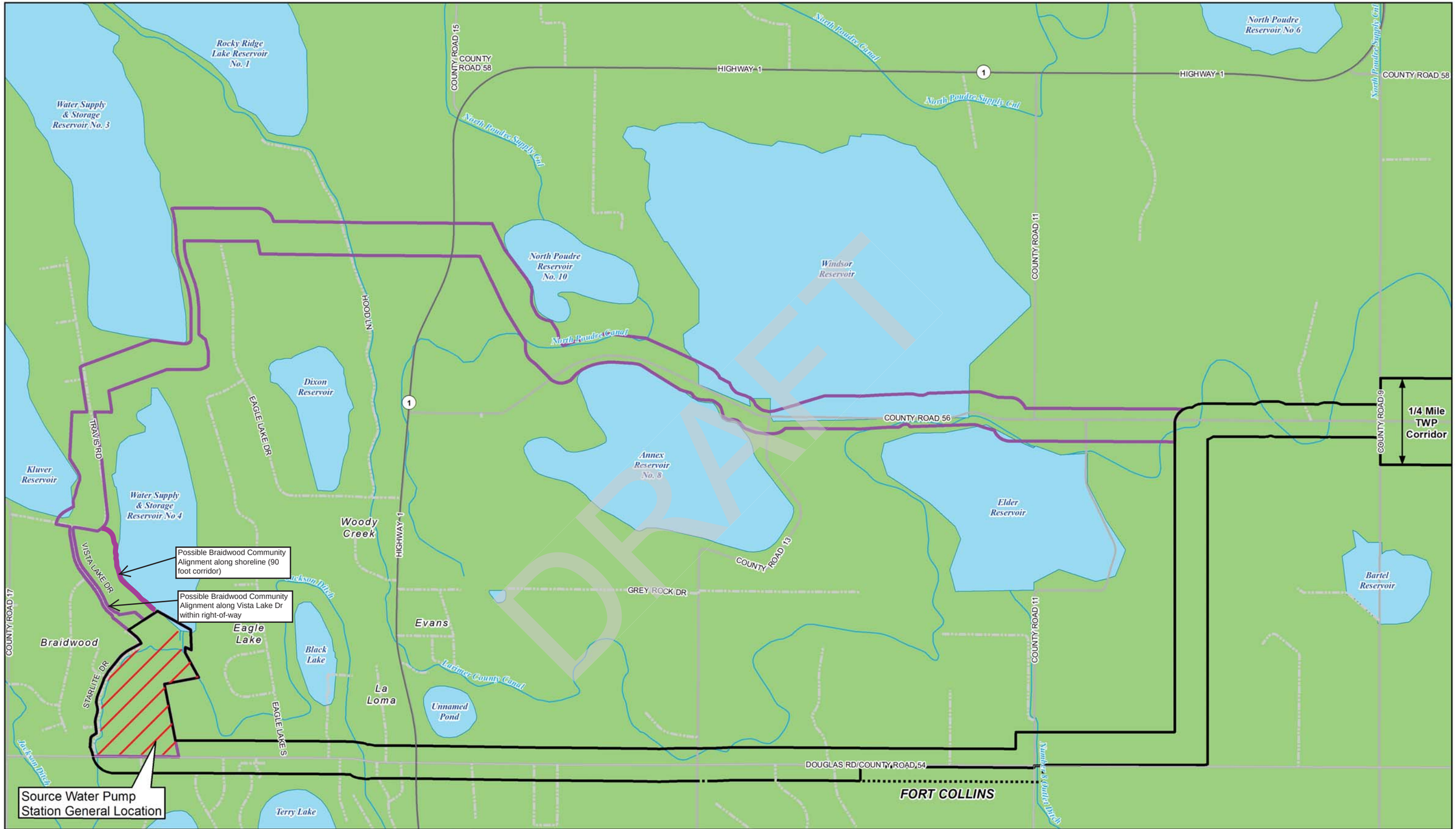

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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch

Geologic Hazard
- Severe (Class 5, 6, 7)
- Moderate (Class 3, 4)
- Low

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.c-2S
Alternative 3 (Option C) Corridor Geologic Hazards

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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Section 8 Technical Reports

8.d Traffic Impact Study

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.d, and the criteria and standards described in LUC Sections 8.1, 14.10.D.6, 14.10.D.8, 14.10.D.9, and 14.10.D.11.

General Transportation Information

The Alternative 3 (Option C) Corridor is typically 500-feet wide for TWP components in unincorporated Larimer County. The final water pipeline alignment within a 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 ROW. The Alternative 3 (Option C) Corridor width allows for flexibility when developing the final water pipeline alignment and location of appurtenances as described in Section 2: Project Description. The Alternative 3 (Option C) Corridor limits are shown on **Figure 8.d-1S**

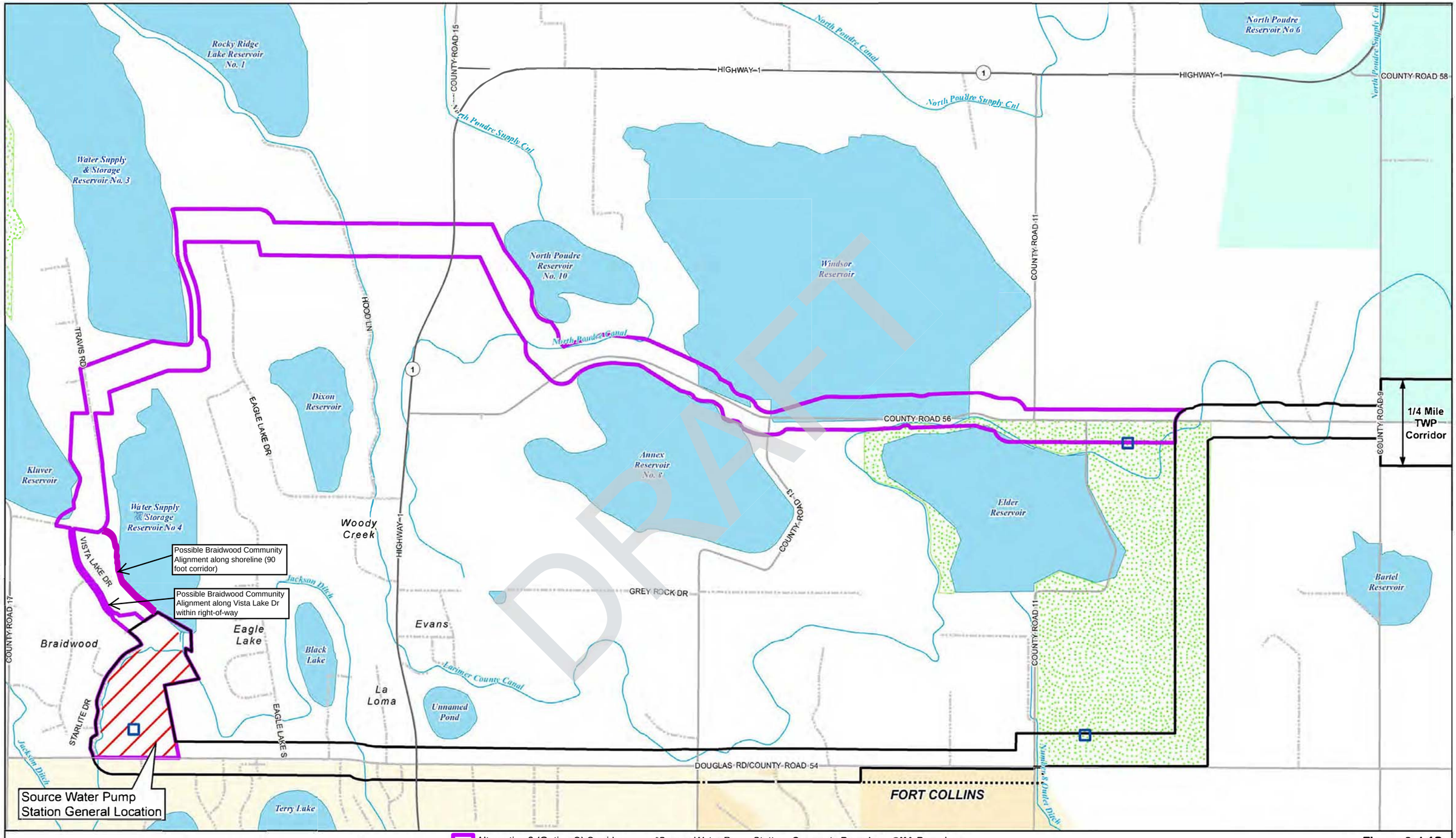
Thornton understands that, if the TWP is located parallel to and within the Larimer County ROW other than as specifically approved in a 1041 permit, then use of that ROW will require Larimer County approval.

The Alternative 3 (Option C) Corridor is approximately 6 miles long in unincorporated Larimer County north of Fort Collins. It includes an area that extends south from WSSC Reservoir No. 4 to the proposed location of the source water pump station. This area will accommodate the connection to WSSC Reservoir No. 4, the water pipeline to the source water pump station, and the water pipeline from the source water pump station. The Alternative 3 (Option C) Corridor extends north then east from the west side of WSSC Reservoir No. 4 to County Road 9. The Alternative 3 (Option C) Corridor shown on **Figure 8.d-1S** is less than 500-feet wide at some locations to minimize impacts to existing infrastructure. The Alternative 3 (Option C) Corridor generally follows roads and property lines.

The Alternative 3 (Option C) Corridor ties into the TWP corridor at County Road 9. The TWP with Alternative 3 (Option C) Corridor plus TWP corridor east of County Road 9) is approximately 27 miles long in unincorporated Larimer County.

The Alternative 3 (Option C) Corridor does not cross any municipal boundaries or established GMA.

Table 8.d-1S presents the multiple roads within the Alternative 3 (Option C) Corridor and the ADT of those roads. The basis for the ADT data was developed from the Traffic Section ADT asset layer from the *Larimer County Road Information Maps*, 2016-2018 data; and Colorado Department of Transportation (CDOT) Online Transportation Information System as applicable.



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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- Thornton Farm
- Potential Staging Area

Corporate Boundary
- Fort Collins
- Wellington

GMA Boundary
- Fort Collins
- Wellington

Figure 8.d-1S
Alternative 3 (Option C) Corridor Map

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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TABLE 8.d-1S
Roadway Classifications and ADT

Roadway	Limits	Classification	ADT	Impact
Douglas Road	Adjacent to source water pump station location	Minor Arterial (Road system: primary, mainline road, not a regional road, owned by Larimer County)	2,500-3,600	Is parallel to TWP corridor with Alternative 3 (Option C) Corridor
Starlite Drive	WSSC Reservoir No. 4 to Douglas Road	Not Applicable (Road system: non-chargeable, not a mainline road, not a regional road, owned by public/ general, gravel)	Not applicable	Is parallel to Alternative 3 (Option C) Corridor
Joey Road	Southwest of WSSC Reservoir No. 4	Not Applicable (Road system: non-chargeable, not a mainline road, not a regional road, owned by public/ general, gravel)	Not applicable	Is parallel to Alternative 3 (Option C) Corridor
Vista Lake Drive	Joey Road to Travis Road	Not Applicable (Road system: non-chargeable, not a mainline road, not a regional road, owned by public/ general, paved)	Not applicable	Is parallel to Alternative 3 (Option C) Corridor
Travis Road	Vista Lake Drive to northwest of WSSC Reservoir No. 4	Local (Road System: Secondary, mainline road, not a regional road, owned by Larimer County, paved)	190	Is parallel to and Intersects Alternative 3 (Option C) Corridor
Hood Lane	At the Larimer County Canal Crossing	Not Applicable, Private, gravel	Not Applicable	Intersects Alternative 3 (Option C) Corridor
State Highway 1	County Road 56	Minor Arterial/State Highway (Not maintained by Larimer County, not a mainline road, not a regional road, owned by CDOT)	5,600	Intersects Alternative 3 (Option C) Corridor
County Road 56	Highway 2 to County Road 9	Minor Collector (Road system: secondary, mainline road, not a regional road, owned by Larimer County)	95-120	Is parallel to TWP corridor
County Road 13	At County Road 56	Minor Collector (Road system: secondary, mainline road, not a regional road, owned by Larimer County, gravel)	55	Intersects Alternative 3 (Option C) Corridor
County Road 11 (north of County Road 56)	At County Road 56	Minor Collector (Road system: secondary, mainline road, not a regional road, owned by Larimer County, gravel)	75	Intersects Alternative 3 (Option C) Corridor

TABLE 8.d-1S
Roadway Classifications and ADT

Roadway	Limits	Classification	ADT	Impact
County Road 11 (south of County Road 56)	At County Road 56	Minor Collector (Road system: secondary, mainline road, not a regional road, owned by Larimer County, gravel)	80	Intersects Alternative 3 (Option C) Corridor
Fox Ridge Court	At County Road 56	Not Applicable (Road system: non-chargeable, not a mainline road, not a regional road, owned by public/ general, Bladed)	N/A	Intersects Alternative 3 (Option C) Corridor
Giddings Road (County Road 9)	At County Road 56	Major Collector (Road system: primary, mainline road, not a regional road, owned by Larimer County)	2,300-2,400	Intersects TWP corridor

Memorandum TWP – Summary of Existing Conditions and Project Impacts

In the fourth quarter of 2018, Larimer County recorded traffic volume data at intersections along County Road 56. That data is documented in the *Memorandum TWP – Summary of Existing Conditions and Project Impacts* by Felsburg Holt & Ullevig, November 13, 2018. Figure 2 from that memorandum shows the AM and PM peak hours of a typical weekday as shown in **Figure 8.d-2S**. The level of vehicle movements along County Road 56 are less than 10 vehicle peak hours. The analysis results presented in the memorandum indicate that construction impacts from Alternative 3 (Option C) Corridor will be almost undetectable because traffic volumes are extremely low and no improvements were recommended.

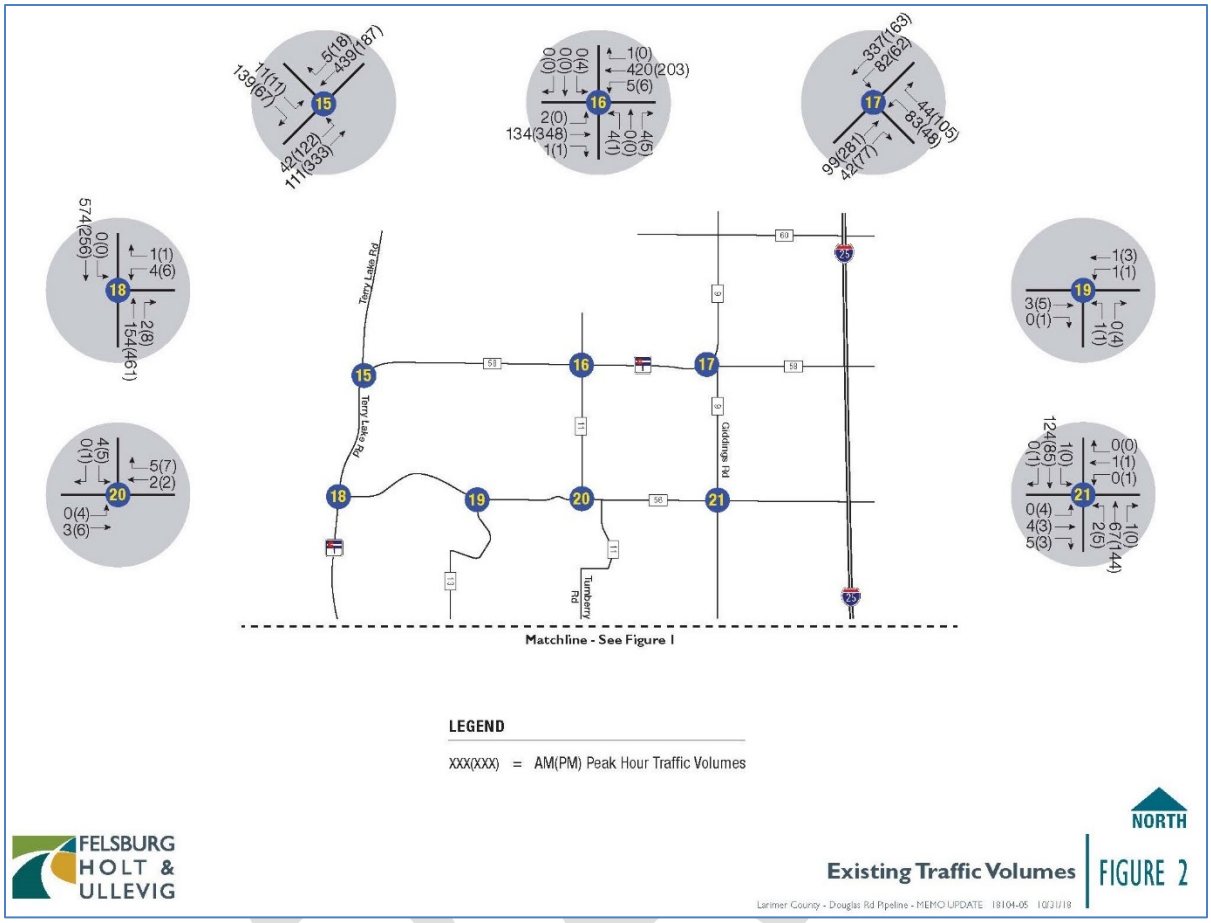


FIGURE 8.d-2S
County Road 56 Existing Traffic Volumes

The Alternative 3 (Option C) Corridor does not cross any railroad.

Larimer County Transportation Master Plan

The Alternative 3 (Option C) Corridor was reviewed in conjunction with the area goals and transportation improvement plans outlined in the *Larimer County Transportation Master Plan*, adopted in July 2017. No planned improvements were identified along the Alternative 3 (Option C) Corridor for County Road 56. The *Larimer County Transportation Master Plan* includes planned improvements for Douglas Road near WSSC Reservoir No. 4. If Larimer County's improvement projects occur within the timeframe of the construction of the water pipeline and source water pump station near WSSC Reservoir No. 4, Thornton and/or the Alternative 3 (Option C) Corridor contractor will work with Larimer County and other involved parties to coordinate construction and minimize disruption.

Other Considerations

Traffic impacts due to construction and post-construction operation of the water pipeline and appurtenances have been considered. 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. Any areas impacted during construction will be restored to pre-construction conditions upon completion of the TWP. Traffic impacts after completion of the construction of the TWP are expected to be limited as the facilities will be unmanned and operations will require minimal traffic. Therefore, no level-of-service calculations or traffic modeling have been performed; however, the following elements are discussed in this section:

- Trip Generation
- Project Access
- Possible Delivery and Commuting Routes
- Material Storage
- Parking and Vehicle Storage
- Construction in ROW
- Permits

Trip Generation

During the construction phase of the TWP, trip generation will be primarily related to construction activities, including delivery of materials and equipment, worker transport, and water pipeline and appurtenances installation. Types of construction vehicles accessing the construction area will likely include those presented in **Table 8.d-2S**.

TABLE 8.d-2S
Anticipated Construction Vehicles

Construction Phase	Vehicle
Preparing the TWP Easements for Construction	Equipment Transport Truck
	Dump Truck
	Loader
	Trackhoe
	Motor Grader
	Crew Truck
	Service Truck

TABLE 8.d-2S
Anticipated Construction Vehicles

Construction Phase	Vehicle
	Inspection Vehicle
Pipeline Trenching and Installation	Pipe/Material Hauling Truck
	Equipment Transport Truck
	Pipe Installation Crew Truck
	Inspection Truck
	Concrete Truck
	Trackhoe
	Loader
	Dump Truck
	Welding Truck
	Water Truck
Backfilling	Equipment Transport Truck
	Dump Truck
	Loader
	Trackhoe
	Crew Truck
	Inspection Truck
	Concrete Truck
	Water Truck
	Compaction Equipment
Re-grading/Reseeding	Equipment Transport Truck
	Motor Grader
	Reclamation Vehicle
	Crew Truck
	Inspection Vehicle
	Water Truck

Construction activities within the Alternative 3 (Option C) Corridor are proposed to begin in 2020, and are expected to last up to approximately 2 years with operation of the TWP scheduled to begin in 2025. Construction of a water pipeline construction package, trenchless water pipeline package, and source water pump station may occur concurrently along the Alternative 3 (Option C) Corridor. Depending on the size and scope of individual construction packages, the timeframe to complete construction of a package could be multiple years. Construction of each water pipeline mile is expected to last between 4 and 10 weeks not including revegetation or ROW restoration activities.

Trip generation will vary according to the phase and location of construction. 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. 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 basis. For example, some construction activities, such as hydrostatic testing, require 24/7 operation, and shift work may be required.

Construction of a water pipeline construction package, trenchless water pipeline package, and source water pump station may occur concurrently with multiple crews of 10 to 55 workers each within the Alternative 3 (Option C) Corridor. At the peak of construction approximately 50 workers total could be required at various sites along the Alternative 3 (Option C) Corridor.

Post-construction trip generation will be primarily related to the operation and maintenance of the TWP. Normal operations and maintenance activities could include TWP operators periodically traveling in a pickup truck to the source water pump station 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 final 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 and CDOT access permits for any necessary temporary and permanent access locations as applicable. If access is needed using private roads or drives, Thornton will negotiate use with owners. Stabilized construction entrances/exits will be installed, as necessary, at the intersections of the TWP temporary access roads with paved roads. Permanent access locations will be designed per municipal standards based on location of access. Temporary access will be unpaved and used primarily for transport of materials and construction workers. Temporary and permanent access locations will be closed to the public. Temporary access locations could include warning signs, flaggers, and controlled access, as necessary. 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 final water pipeline alignment will be required along County Road 56. Other potential access locations, depending on the final water pipeline alignment, could be required along other local roads. It is anticipated that Travis Road will be required to provide access for construction vehicles during construction of the water pipeline, connection to WSSC Reservoir No. 4, and for future maintenance as necessary depending on the final water pipeline alignment. Vista Lake Drive or 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. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction.

Access to the source water pump station will be determined after the final site location has been determined. Access to the source water pump station is anticipated to be from Douglas Road, but is dependent on the final location. Vista Lake Drive and Starlite Drive are Larimer County public roads that are privately maintained. Vista Lake Drive is a paved road and Starlite Drive is a gravel road and, if used, Thornton will work with the community to ensure that roads are maintained during construction and restored to pre-construction or better condition after construction. These existing roads could provide access for construction vehicles during construction of the source water pump station and for future maintenance as necessary. The access drive and parking areas are anticipated

to be gravel. Future access requirements will be minimal as this is anticipated to be an unmanned facility with limited maintenance requirements. Site access will be submitted for review to Larimer County with the Site Plan Review Permit application.

Possible Delivery and Commuting Routes

Truck haul routes for material deliveries from off-site locations will be chosen to facilitate safe and expedient delivery while minimizing traffic impacts. It is expected that the daily commuting route for construction workers would also follow the same roads as the truck haul routes to the construction site or temporary staging areas for parking. The major roads and highways within unincorporated Larimer County that could be utilized depending on the final water pipeline alignment and location of appurtenances for delivery of construction materials and construction worker trips as part of construction operations are presented in **Table 8.d-3S**.

TABLE 8.d-3S
Possible Delivery and Commuting Routes for Alternative 3 (Option C) Corridor

County or Major Roads	State Highways	Federal Highways
Giddings Road, Mountain Vista Drive, County Road 56, Douglas Road, Starlite Drive, Shields Street, Travis Road, Vista Lake Drive	State Highway 1	Interstate 25, Interstate 25 Northeast Frontage Road

Anticipated delivery and commuting routes are shown in **Figure 8.d-3S**. It is not expected that any road improvements or closures would be required to facilitate the transport of materials. In the event that a closure is necessary, the duration of the closure will be minimized, and Larimer County standards and procedures will be followed.

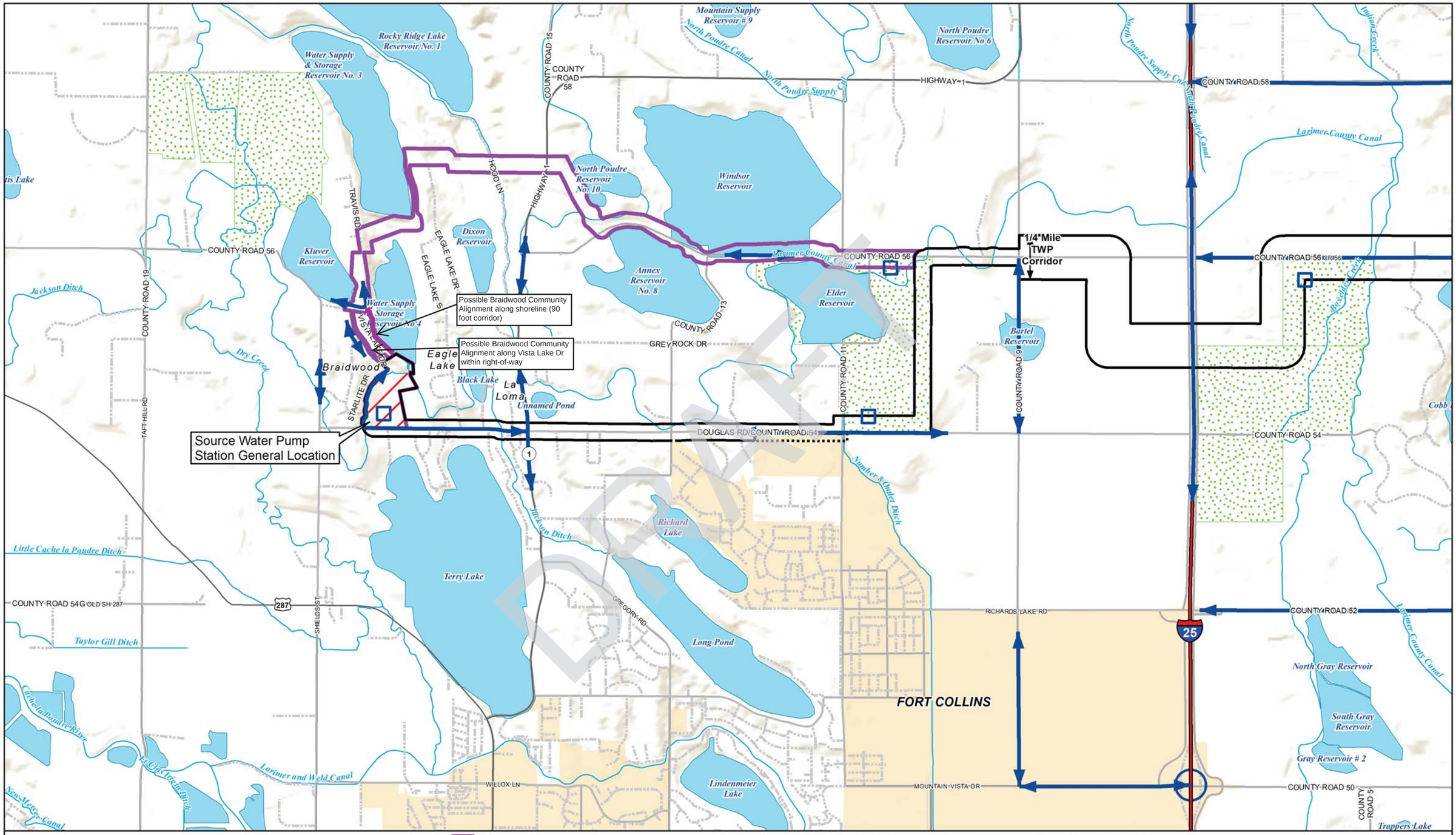
Material Storage

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. Preliminary anticipated staging locations within the Alternative 3 (Option C) Corridor are shown on **Figure 8.d-1S**. Additional information on staging areas is described in Application Section 2, Project Description. 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.

Parking and Vehicle Storage

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 staging areas could be obtained. When additional parking is required, Thornton will negotiate with property owners and commercial businesses to provide additional parking to avoid parking in the public ROW. Temporary staging areas and worker buses or shuttles may also be implemented to reduce traffic when practicable. Construction workers will be instructed to abide by applicable laws and regulations both while commuting to and working at the TWP sites.

The source water pump station is anticipated to have an unpaved parking area on-site for use during regular maintenance activities. Post-construction maintenance and regular use is not expected to require extended vehicle parking or storage at either location.



Thornton WATER PROJECT

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* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.d-3S
Alternative 3 (Option C) Corridor Possible Delivery and Commuting Routes

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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Construction in ROW

Road Crossings

Unless required otherwise by Larimer County, water pipeline road crossings including the appurtenant buried fiber optic cable in the Alternative 3 (Option C) Corridor 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. ROW will be restored to pre-construction conditions and in accordance with Larimer County standards.

The TWP construction will utilize trenchless construction methods to cross Larimer County roads where required by Larimer County. Additional temporary construction easements could be required to accommodate trenchless construction methods. Where trenchless construction methods are used, shafts will be located on either side of the road for launching and receiving the water pipeline and the fiber optic cable. These shafts are expected to be located outside the ROW, if feasible. Equipment, pipe/materials, and temporarily stockpiled excavated material from the trenchless installation operation are expected to be stored on either side of the road. Larimer County standards will be followed, and permits will be obtained as required. Shafts will be backfilled and compacted, and affected areas will be restored to pre-construction conditions.

Pipeline Installation within ROW

Water pipeline installation within Larimer County ROW other than as specifically approved in a 1041 permit will require approval from Larimer County. At most locations the final water pipeline alignment within the Alternative 3 (Option C) Corridor is anticipated to parallel existing ROW and, if practicable, future road ROW. If property owners object to granting an easement for the Alternative 3 (Option C) Corridor parallel to County Road 56, the water pipeline is proposed to be located in the Larimer County ROW where feasible and as approved by Larimer County. Efforts to locate the TWP outside of environmentally sensitive areas or minimize disturbance to existing structures, such as homes, may require locating the water pipeline and fiber optic cable in Larimer County ROW for short distances. In areas where the water pipeline is located in the ROW, utilizing open-cut construction methods is anticipated.

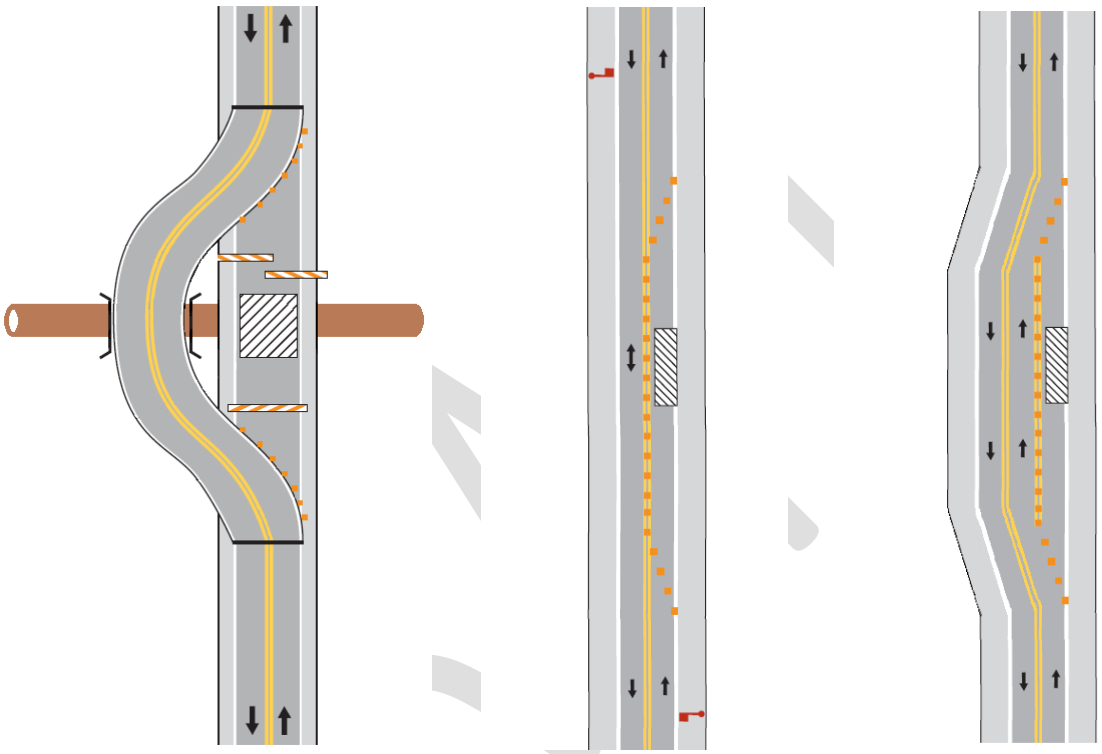
Full or partial road closures will be required for TWP installation in Larimer County ROW. Thornton will coordinate with Larimer County on road closures and required permits will be obtained. Restoration requirements within ROW will be coordinated with Larimer County during design development. Larimer County standards will be followed and permits will be obtained for any required closures. ROW will be restored to pre-construction conditions and in accordance with Larimer County standards.

Permits

Required access permits from Larimer County will be obtained for access from any Larimer County road prior to start of construction in the Alternative 3 (Option C) Corridor. Access permit application(s) will be submitted to the Public Works Department (Engineering). The TWP will abide by the Larimer County Access Policy (*Urban Area Street Standards* or *Rural Area Road Standards)* as applicable. Larimer County ROW permits will be obtained for road crossings and to construct the TWP within Larimer County ROW. Requirements and stipulations of the permits will be followed.

As part of the permit applications mentioned above, Thornton and/or the TWP contractors will develop detailed traffic control plans that include adequate levels of service and safety measures for construction. Sample road closure types that may be implemented, as required, are shown in

Figure 8.d-3S. 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. **Figure 8.d-3S** sample road closures show closures that could be implemented at water pipeline road crossings to maintain access to local area residents and emergency responders. Water pipeline could be constructed with full road closure and construction of a temporary diversion or partial closures (with or within diversion) with pipeline construction occurring in one lane at a time.



(A) (B) (C)

FIGURE 8.d-4S
(A) Road Closure with Diversion, (B) Partial Road Closure with Flaggers, (C) Road Closure with Diversion

Mitigation Measures

Thornton and/or the TWP contractors will implement traffic strategies to minimize or mitigate traffic disruption from construction activities that could include the following:

- To minimize impacts to public roads or bridges directly affected by the TWP, Thornton may provide maintenance as needed.
- To minimize conflicts between TWP traffic and local traffic, transport of materials could occur during off-peak hours when practicable. Movements of normal heavy trucks (not oversized) could also be minimized during peak hours to the extent possible. Delivery truck personnel and construction workers may be notified of potential height restrictions and overhead obstructions. Vehicles used for material transport will comply with *Larimer County Code of Ordinances Sec. 58-105* regarding the height, width, and length of vehicles, when practicable. If at any time vehicles of excess size or weight are required on Larimer County roads or bridges, permits will be obtained per the guidance of *the Larimer County Code of Ordinances.* Moving of any heavy

equipment across railroad lines will comply with *Larimer County Code of Ordinances Sec. 58-53*. Further detailed delivery routes and concerns will be addressed during the detailed design phase of the TWP, including verification that bridge crossings on the delivery route have adequate strength and capacity.

- Thornton will adhere to Larimer County limitations on road closures and construction during peak traffic hours, requirements regarding end-of-day conditions, and mandatory inspections. Whenever possible, the existing number of lanes will be maintained during construction. Temporary road closures or traffic control flaggers will be coordinated with Larimer County and local law enforcement. If speed limit reduction is required, such reduction will be in accordance with CDOT Form 586, *Authorization and Declaration of Temporary Speed Limits*. Traffic control measures such as traffic control flaggers, warning signs, lights, and/or barriers will be implemented to provide safety and efficient progression of traffic. Particular emphasis will be given to construction site access locations along Larimer County Road 1 near County Road 58 where there is a large amount of existing truck traffic in the area and possibly a reduced sight distance at the access location.
- To minimize the impacts of construction on the local community, Thornton will coordinate with Poudre School District regarding construction and haul routes and school bus traffic. However, the only buses operating along the Alternative 3 (Option C) Corridor are demand service responsive and are not anticipated to be adversely affected by the TWP construction.
- Construction within Larimer County ROW will conform to the *Larimer County Right-of-Way Permit Application and Construction Guidelines*.
- TWP contractors will use water trucks to control dust as necessary and will implement required dust control mitigation treatments. Post-construction, disturbed areas will be restored to their pre-construction condition and further dust control mitigation is not expected to be necessary.
- Stabilized construction entrances/exits will be installed, as necessary, at the intersections of the TWP temporary access roads with paved roads. Significant soil transferred onto paved roads will be removed as necessary to maintain the quality of county roads and state highways.
- 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.

Section 8 Technical Reports

8.e Drainage and Erosion Control Report and Plan

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.e, and the criteria and standards described in LUC Sections 8.1, 8.12, 14.10.D.3, 14.10.D.4, 14.10.D.6, 14.10.D.8, and 14.10.D.11.

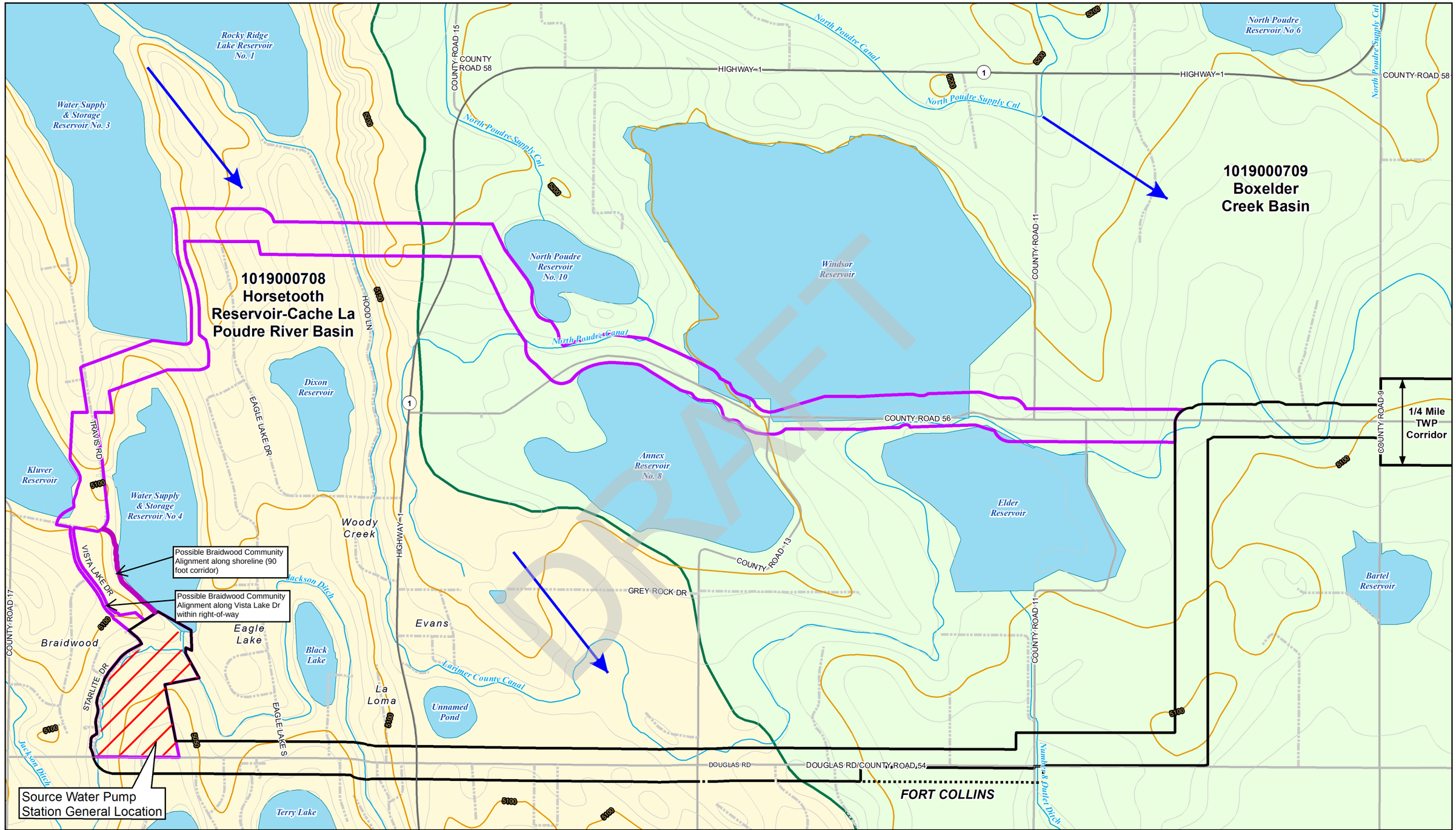
As discussed during the Pre-Application Conference with Larimer County Planning staff on May 26, 2016, submission of a simplified drainage narrative would be sufficient with the application because the majority of the TWP site will be restored to pre-construction conditions and the TWP does not include many impervious areas.

Corridor and Existing Site Drainage

The Alternative 3 (Option C) Corridor is typically 500-feet wide for TWP components in unincorporated Larimer County. The final water pipeline alignment within a 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 ROW. The Alternative 3 (Option C) Corridor width allows for flexibility when developing the final water pipeline alignment and location of appurtenances as described in Section 2: Project Description. The Alternative 3 (Option C) Corridor spans two 10-digit hydrologic unit code (HUC) watersheds, as shown in **Figure 8.e-1S**, HUC Watersheds. A Site Plan Review that will include the required drainage and erosion control plan will be submitted to Larimer County after design has progressed for the source water pump station. This narrative focuses on the Alternative 3 (Option C) Corridor for the water pipeline and appurtenances.

The western-most portion of the Alternative 3 (Option C) Corridor near the connection to WSSC Reservoir No. 4 and west of State Highway 1 is located in the HUC 1019000708 watershed, the Horsetooth Reservoir-Cache la Poudre River Basin. Land in this portion of the Alternative 3 (Option C) Corridor generally drains from north to south On average, topography slopes in this reach generally range from approximately 1 percent to approximately 8 percent. This portion of the Alternative 3 (Option C) Corridor crosses Jackson Ditch, WSSC Reservoir inlet/outlet ditches, Larimer County Ditch, and potentially other ditches, tributaries, and drainageways.

The majority of the eastern-most portion of the Alternative 3 (Option C) Corridor east of Highway 1 is located in the HUC 1019000709 watershed, the Boxelder Creek Basin. Topography in this portion of the Alternative 3 (Option C) Corridor generally drains from west to east. On average, topography slopes in this portion of the Alternative 3 (Option C) Corridor range from less than 1 percent to approximately 8 percent. This portion of the Alternative 3 (Option C) Corridor crosses North Poudre Canal, No. 8 Outlet Ditch, Larimer County Ditch, and potentially other ditches, tributaries, and drainageways.



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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- 100ft Contour
- 20ft Contour
- HUC 10 Boundary
- Boxelder Creek
- Horsetooth Reservoir - Cache La Poudre River
- Flow Direction

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.e-1S
Alternative 3 (Option C) Corridor
Drainage and Erosion Control

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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Construction Water Quality Management

Development of the final alignment will consider water pipeline construction locations that minimize impacts to historical surface and subsurface water flows in the TWP area. Water pipeline crossings of jurisdictional waters, including wetlands, will be constructed utilizing trenchless construction methods.

Prior to construction, Thornton and/or the TWP contractors will obtain a Stormwater Discharge Associated with Construction Activity - General Permits from the Colorado Department of Public Health and Environment (CDPHE). Construction Stormwater Management Plan(s) (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. The SWMP(s) will detail the potential pollutants to stormwater anticipated to be associated with construction, and the associated construction stormwater best management practices (BMPs) to be implemented to protect the quality of stormwater runoff from TWP areas during construction. The SWMP will describe the inspection and maintenance procedures implemented on the site to maintain erosion and sediment control practices. Site inspections will be conducted to meet the requirements and schedules stipulated under the permit.

Construction wastewater associated with the potential dewatering of trenches will be handled in accordance with CDPHE permit discharge requirements. Prior to construction, Thornton and/or the TWP contractors will obtain a General Permit for Construction Dewatering Activities from CDPHE and specify the management measures to capture and manage any generated discharge.

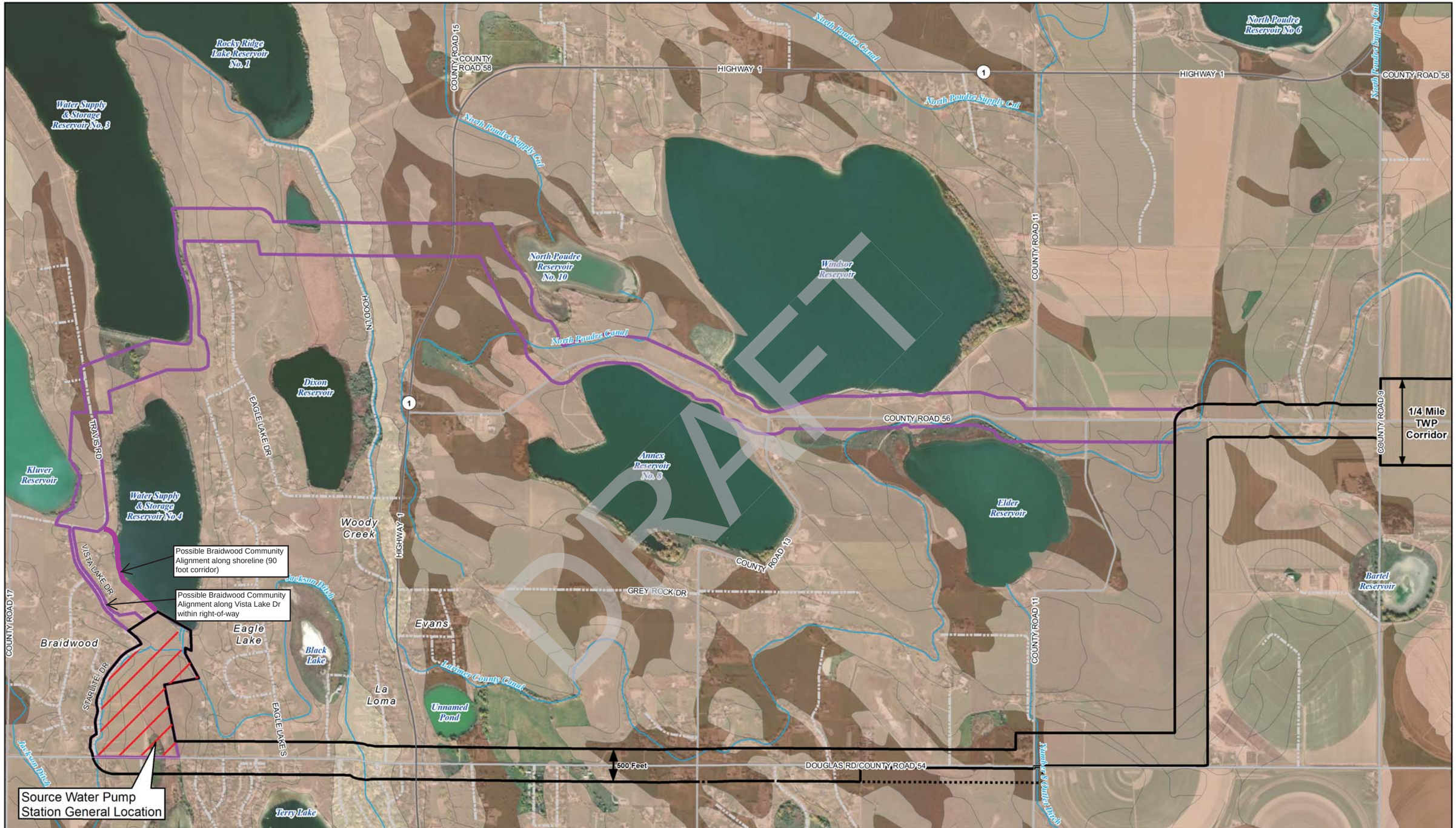
The TWP will be hydrostatically tested prior to operation start up. Before discharge of hydrostatic test water from the water pipeline, Thornton and/or the TWP contractor will obtain a General Permit for Discharges from Hydrostatic Testing of Pipelines, Tanks, and Similar Vessels from CDPHE. Sampling and effluent limits will be in accordance with permit requirements.

Construction BMPs

Appropriate criteria manuals and standards will be used for the development of the SWMPs and selection of BMPs. Manuals may include the *Urban Storm Drainage Criteria Manual* (USDCM) *Volume 3*, *the City of Greeley's BMPs for Utility Planning and Construction Through Rural, Wetland, and Riparian Lands*, and/or other state and local guidance documents. Example descriptions of common construction BMPs that could be used on the project are provided for reference in the **Application, Appendix D**.

BMPs will also be deployed for construction dewatering activities, pursuant to the Construction Stormwater Discharge Permit and/or the Construction Dewatering Discharge Permit as appropriate for the site conditions and soil erodibility, to protect the quality of stormwater, surface water, and groundwater in the TWP corridor. *See* Section 8. in this Supplement 3 for descriptions of groundwater protection practices that could be used during construction.

BMPs will be implemented under the SWMP to minimize or mitigate soil erosion and revegetate disturbed areas. Soil erodibility along the Alternative 3 (Option C) Corridor is shown in **Figure 8.e-2S.** The soil erodibility figure shows the Natural Resources Conservation Service (NRCS) K factor values. K factor values represent the susceptibility of soil erosion, transportability of the sediment, and the amount and rate of runoff given a particular rainfall event. The majority of the Alternative 3 (Option C) Corridor is located within the medium soil erodibility range. A medium soil erodibility factor indicates that slight to moderate erosion is likely and that erosion-control measures may be needed.



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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- River/Stream/Canal/Ditch
- *Source Water Pump Station General Location

Soil Erodibility (K Factor)

- No Value
- Low (<0.20)
- Medium (0.20 - 0.40)
- High (>0.40)

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.e-2S
Alternative 3 (Option C) Corridor
Soil Erodibility Map

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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A limited portion of the Alternative 3 (Option C) Corridor is located within the high soil erodibility range. High soil erodibility indicates that erosion is very likely and that erosion-control measures are advised, including revegetation of bare areas. Disturbed areas will be restored to pre-construction grades and 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 and regulatory requirements. Disturbed mature vegetation will be replaced, per a property owner's reasonable request, with a like species.

BMPs will be maintained and inspected. Failed BMPs will be replaced as required. After work is complete and final stabilization has been achieved, temporary BMPs will be removed. Final stabilization will be reached as defined in the Stormwater Discharge Associated with Construction Activity - General Permit.

Post-Construction Stormwater Runoff

The Alternative 3 (Option C) Corridor will be restored following construction to pre-construction grades and vegetation conditions with few exceptions. An example of an exception would be minor grading necessary following construction to restore a stable slope. In general, following TWP construction, the restored Alternative 3 Option C Corridor will drain in the same manner and at generally the same rate as it did prior to 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 easement areas will be temporary and mostly associated with construction. Potential future repairs and maintenance could affect discrete areas of vegetation so that the water pipeline and appurtenances may be accessed in a particular location. Any vegetated areas disturbed during maintenance or any required repairs will be restored by the methods used during construction.

Water pipeline crossings 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.

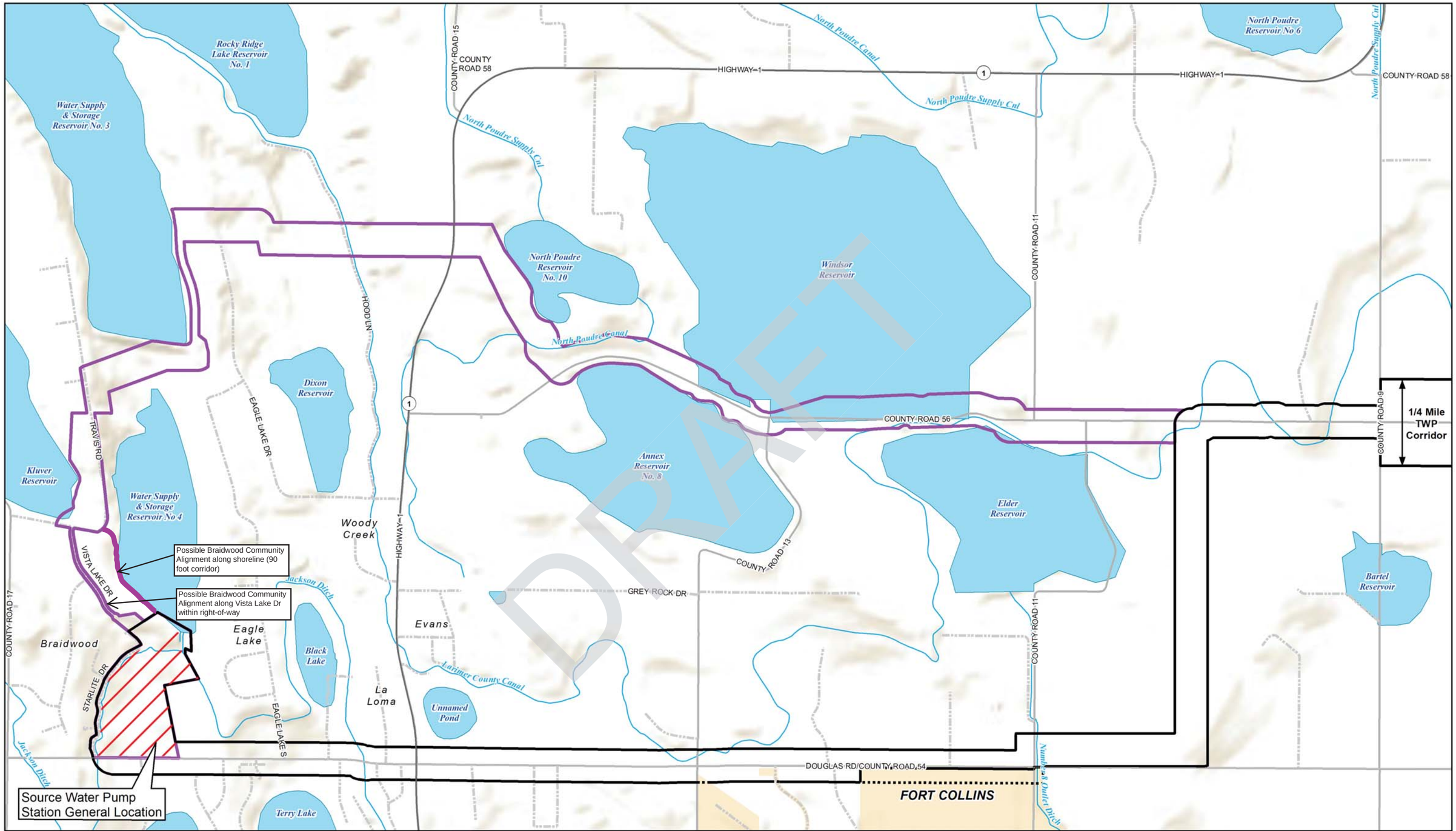
Within urbanized areas subject to National Pollutant Discharge Elimination System (NPDES) and Colorado Discharge Permit System (CDPS) municipal separate storm sewer system (MS4) regulations, project components will be designed to address post-construction stormwater in a manner that complies with applicable requirements of the local MS4, including *Larimer County Stormwater Design Standards*. The Alternative 3 (Option C) Corridor is not located within the boundaries of MS4 permitted areas in Larimer County.

Section 8 Technical Reports

8.f Floodplain Hydraulic/Hydrologic Modeling Report

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.f, and the criteria and standards described in LUC Sections 4.2.2, 14.10.D.3, 14.10.D.4, 14.10.D.6, 14.10.D.7, and 14.10.D.11.

The Alternative 3 (Option C) Corridor does not cross any designated 100-year floodplain as shown on **Figure 8.fS**, 100-Year Floodplains.



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- Alternative 3 (Option C) Corridor
- TWP Corridor in Unincorporated Larimer County
- TWP Corridor outside Unincorporated Larimer County
- *Source Water Pump Station General Location
- Lake/Reservoir
- River/Stream/Canal/Ditch
- 100-yr Flood Fringe
- 100-yr Floodway
- Outside Floodway

* Final location of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure 8.fS
Alternative 3 (Option C) Corridor
100-yr Floodplain

Sources: NHD, CDWR, Larimer County, CDOT, ESRI

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Section 8 Technical Reports

8.g Groundwater Modeling Report

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.g, and the criteria and standards described in LUC Sections 8.2, 8.12, 14.10.D.3, 14.10.D.4, and 14.10.D.11.

Information for this section was provided in the Application and does not need to be supplemented.

Section 8 Technical Reports

8.h Non-Subdivision Water Supply Inquiry

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.h, and the criteria and standards described in LUC Sections 8.1 and 14.10.D.8.

Information for this section was provided in the Application and does not need to be supplemented.

Section 8 Technical Reports

8.i Simulation of the Appearance of the Facility

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.i.

The Alternative 3 (Option C) Corridor appurtenances also include an approximate 40-million gallon per day (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.

The final siting of the source water pump station will be completed during final design. The preferred location is adjacent to Douglas Road. **Figure 8.iS** shows an example rendering of the source water pump station adjacent to Douglas Road. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station that reduce the visual impacts of the facility.

FIGURE 8.iS
Example Pump Station Rendering Adjacent to Douglas Road

8.j Computer Modeled Electromagnetic Field Measurements

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.j.

Information for this section was provided in the Application and does not need to be supplemented.

Section 8 Technical Reports

8.k Noise Analysis

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 8.k, and the criteria and standards described in LUC Sections 14.10.D.6 and 14.10.D.11.

The Application addressed how the TWP would comply with Larimer County's then-existing Noise Level Ordinance (currently Ordinance No. 97-03) during construction of the South 2 alternative selected as the preferred alternative and shown on **Figure 5.1.12.2-11** of **Application Appendix A,** *Technical Memorandum, Thornton Water Project, Larimer County Alternative Configurations Analysis – WSSC Reservoir Area to Larimer County Road 9,* October 2017 (Alternative Configurations Analysis). That same information is equally applicable to construction of the Alternative 3 (Option C) Corridor identified herein as the preferred alternative. Accordingly, that information is incorporated herein by reference.

No noises related to the water pipeline is anticipated.

Source Water Pump Station

Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Section 8 Technical Reports

8.l Air Quality Impact and Mitigation Report

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 8.l, and the criteria and standards described in LUC Sections 8.11, 14.10.D.3, 14.10.D.4, 14.10.D.6, and 14.10.D.11.

The Application addressed how Thornton and/or the TWP contractors would control fugitive dust emissions during construction of the South 2 alternative selected as the preferred alternative and shown on **Figure 5.1.12.2-11** of **Application Appendix A,** *Technical Memorandum, Thornton Water Project, Larimer County Alternative Configurations Analysis – WSSC Reservoir Area to Larimer County Road 9,* October 2017 (Alternative Configurations Analysis). That same information is equally applicable to construction of the Alternative 3 (Option C) Corridor identified herein as the preferred alternative. Accordingly, that information is incorporated herein by reference.

Thornton heard community concerns that the diesel-powered backup generator associated with the source water pump station as proposed in the Application would be noisy and have emissions detrimental to nearby residents and the community as a whole. In response, Thornton was able to confirm with PVREA that it is possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power; therefore, an emergency diesel powered backup generator will not be required. Accordingly, Thornton proposes as a condition of approval, that it not place a permanent emergency diesel powered backup generator at the source water pump station site.

Section 9 Adjacent Property Owner List

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 9.

Information for this section was provided in the Application and does not need to be supplemented.

Section 10 Application Fee

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 10, and the criteria and standards in LUC Section 12.1.C.

Information for this section was provided in the Application and does not need to be supplemented.

Section 11 Signed Pre-Application Conference Form and Submittal Checklist

This section addresses *Larimer County Procedural Guide for 1041 Permits,* Item 11.

Information for this section was provided in the Application and does not need to be supplemented.

Section 12 Additional Information

12.a Benefits to Larimer County Associated with the Water Pipeline

Emergency Raw Water Interconnects:

The TWP water pipeline will be constructed in proximity to the raw water collection infrastructure of other municipal water supply agencies in Larimer County. Thornton is willing to enter into agreements with other municipal water supply agencies in Larimer County to provide an interconnect with the TWP water pipeline to deliver short-term raw water supplies in the case of emergencies such that the raw water supply for those agencies is temporarily impacted due to circumstances such as infrastructure failure.

Transportation Mitigation and Improvement:

Through Working Group meetings, associated Open House meetings and discussions with Larimer County staff, Thornton has heard interests related to transportation infrastructure, including both mitigation of traffic impacts and degradation of transportation assets associated with TWP construction, as well as enhancements to area roadways to improve mobility. Thornton will return roadways and rights of way where the TWP is installed to as good or better condition as they were before construction. In addition, separate from the roadways or right of way where the TWP is installed, Thornton has heard concerns regarding impacts to east-west mobility related to construction of the TWP, as well as potential impacts to roadways, bridges, intersections or other transportation assets that might become alternate routes for the traveling public as a result of TWP construction. Thornton has also heard interests regarding general mobility concerns in the area of Larimer County from County Road 56 south, and from Shields to County Line Road. As mitigation for impacts to transportation assets affected by TWP construction, as well as providing additional community benefit, Thornton proposes contributing $1,000,000 to Larimer County for use at its discretion for mitigation of "off-site" impacts of TWP construction on transportation assets, or for transportation improvements that are important to the community.

12.b Additional Benefits to Larimer County

At the August 1, 2018 hearing on Thornton's 1041 Application, the Larimer County Board of County Commissioners made several comments suggesting that Thornton identify broader community benefits as a part of its Application. While this Supplemental 3 addresses impacts, minimization of impacts, and benefits directly associated with Thornton's water pipeline construction, this section identifies proposed commitments to broader community benefits that go above and beyond direct mitigation of the pipeline impacts. Because these benefits are not directly related to the pipeline project, Thornton proposes to memorialize these community benefits in a separate Intergovernmental Agreement (Community Benefits IGA) to be entered into between Larimer County and Thornton upon issuance of a 1041 Permit to Thornton for the TWP corridor with Alternative 3 (Option C) Corridor with terms and conditions as agreed to by Thornton.

Thornton has collected input regarding community interests and enhanced benefits from a broad range of sources, including Planning Commission and public comments made during the May 16, 2018 Larimer County Planning Commission hearing; BOCC and public comments made during the July 6, 23 and August 1, 2018 BOCC hearings; the water working group meetings and associated open house meetings; discussions with Larimer County staff; and discussions with project stakeholders.

Based on this input, Thornton's objective in proposing these additional benefits is to provide enhancements to the following areas of community interests and concern: Cache la Poudre River health and community planning and infrastructure. The total project cost for the TWP is estimated at $450 million dollars. The total estimated value to the Larimer County community of the proposals described herein are approximately $60 million dollars. As a part of the Community Benefits IGA, and upon approval of a 1041 permit to Thornton, Thornton proposes the following:

Cache la Poudre River Health

Over 150 years of human development along the Cache la Poudre River has resulted in significant changes to the river. Agricultural, industrial and municipal diversions physically remove water from the river; this reduces flows and alters river morphology, resulting in impacts to the overall health of the Cache la Poudre River. In order to prevent against injury to existing water rights, efforts to preserve and improve Cache la Poudre River flows: must conform to Colorado water law; will necessitate cooperative agreements among water rights holders; and will require infrastructure improvements to existing river diversions and other structures. Through the Community Benefits IGA, Thornton proposes to improve Cache la Poudre River health by providing river flow enhancements, making physical river modifications to provide better river administration and improve aquatic and riparian habitats, and funding innovative strategies for enhancing Cache la Poudre River health and addressing other local water supply challenges.

Adding Flows to the Cache la Poudre River

Thornton is working with the Colorado Water Conservation Board (CWCB), the Colorado Division of Parks and Wildlife (CPW), the Colorado Water Trust, the cities of Fort Collins and Greeley, the Northern Water Conservation District (Northern Water), and the Cache la Poudre Water Users Association on an effort called Poudre Flows. Because current Colorado water law does not permit entities other than the CWCB to hold water rights for environmental purposes (instream flow rights), there is currently no mechanism for water rights holders to add water to the river and protect that water through any stretch of river. Poudre Flows, therefore, seeks to establish the legal framework necessary to protect and improve flows in a 50-mile reach of the Cache la Poudre River from the canyon mouth to its confluence with the South Platte River. The current Poudre Flows approach involves obtaining approval from the CWCB, the water court and other authorities, if necessary, to obtain an Instream Flow Augmentation Plan for the Poudre River (Poudre Flows Augmentation Plan). The Poudre Flows Augmentation Plan would establish minimum seasonal flows in specific reaches of the Poudre River to protect and improve the natural environment. These minimum flow designations are recognized by Colorado law, established by the CWCB in conjunction with CPW, and the water dedicated to these reaches is then administered within Colorado's water rights priority system by the State and Division Engineers. Cache la Poudre River water rights holders could then temporarily or permanently convey water to the CWCB that would be used to meet these minimum flow designations, resulting in additional water to the river that is protected through the river reach by Colorado water law.

In addition to its efforts to help establish the legal and transactional mechanisms to protect and improve Cache la Poudre River flows, and as a broader community benefit, Thornton proposes to dedicate and deliver up to 3,000 acre-feet a year of water to the CWCB for use in the Poudre Flows Augmentation Plan. This 3,000 acre-feet of water Thornton will deliver consists of approximately 2,250 acre-feet for other water rights holders on the Poudre River and South Platte River, plus approximately 750 acre-feet of additional water necessary to account for stream losses. Under the Poudre Flows Augmentation Plan, Thornton will make this water available to the

CWCB to release to the Poudre River upstream of the locations where Thornton is required to deliver the water. This water will be released at specific times and locations upstream of critical river reaches to help meet the flow targets identified in the Poudre Flows Augmentation Plan, and will be protected from diversion or exchange as it flows through the protected reaches. As noted above, this is not something that Thornton can legally accomplish on its own. The ultimate average annual delivery of water from the Thornton Water Project is approximately 14,000 acre-feet; therefore, Thornton is proposing to provide the equivalent of over 20% of the total project yield to upstream locations on the Cache la Poudre River to meet flow targets. It would cost about $45 million dollars to acquire 3,000 acre feet of comparable Poudre River water on the open market.

Thornton has additional Cache la Poudre River supplies that it may voluntarily lease to the CWCB for use in Poudre Flows on a temporary or permanent basis. Thornton will continue to explore ways to utilize its water rights in ways that are beneficial to multiple uses as allowed by law.

Thornton proposes to provide the Commissioners a verbal report annually at a regularly scheduled public meeting concerning the status of the approval processes of the Poudre Flows Augmentation Plan with the CWCB and the water court. After CWB and water court approvals have been obtained and as part of its annual report, Thornton will provide the Commissioners with a written accounting of the amount of water has been added to the Cache la Poudre River in the previous year via Poudre Flows.

If the Poudre Flows Augmentation Plan cannot be implemented as described above, Thornton intends to continue to coordinate with Poudre Flows in pursuing other legal options, as necessary, to establish a mechanism for Cache la Poudre River flow protection and enhancement, and to protect Thornton's flow additions identified herein.

Physical Improvement to the Cache la Poudre River

Physical modifications to various diversion structures on the Cache la Poudre River will be necessary in order to maximize the benefits of added flows from the Poudre Flows Augmentation Plan and other flow enhancement efforts. Several irrigation diversion dams create dry-up points on the river which restrict river connectivity; these dry-up points inhibit fish passage, impact the aquatic and riparian environments, and would prevent added flows from being shepherded and administered down the river. Anticipated modification of these structures would be made to allow the structures to serve the multiple functions of water delivery, water rights administration, and river connectivity. Improvements to these structures will require engineering, construction, agreements with structure owners, other water rights holders, and administrative approvals.

Additional streamflow measurement may be required to administer the added flows from the Poudre Flows Augmentation Plan and other flow enhancement efforts. This may entail the installation of new stream gages in the river, or the modification of existing structures to provide better measurements.

Additional physical improvements may be helpful in improving stream habitat, including construction of in-channel structures made of natural materials to create riffles and pools with a defined low-flow channel. Strategic placement of these improvements would result in increased channel depth, especially during low-flows, which would enhance river connectivity.

Many parties including Northern Water, the Poudre Runs Through It, the city of Fort Collins, the city of Greeley, and the Coalition for the Poudre River are actively pursuing these and other efforts to improve the health of the Cache la Poudre River. Thornton commits to partnering with these

and other entities, and proposes contributing $750,000 toward the study, implementation and evaluation of efforts related to improving Cache la Poudre River connectivity, aquatic and environmental health, and water rights administration.

Water Innovation Fund

As a community with both urban and rural landscapes, Larimer County is center stage when it comes to balancing the opportunities that come with a thriving urban economy, active recreational community, and an agricultural heritage. Colorado's Water Plan identifies viable and productive agriculture as one of the State's core water values. Agriculture is the largest user of water in the state, and is a critical component to the state's economy. In addition, the Water Plan also anticipates that by 2050, Colorado's population will double, and municipal and industrial demand for water will increase with that population growth. Demands on the Cache la Poudre River are diverse and significant, and will likely continue to intensify into the future.

The water supply challenges on the Cache la Poudre River are complex, and are just one factor of many that influence overall Cache la Poudre River health. No single entity or project can restore and protect the vitality of the Cache la Poudre River; progress and improvement will be incremental and will require the cooperation and commitment of a large and diverse stakeholder group. To help address these challenges, Thornton proposes to contribute $1,000,000 toward the establishment of a Water Innovation Fund which could be used to fund creative strategies to enhance Cache la Poudre River health and address local water supply challenges. Examples of possible uses of this fund include: acquisition and development of additional water supplies to add to the Cache la Poudre River; development of strategies for water sharing arrangements between agricultural, municipal, recreational and environmental uses; facilitation of regional planning efforts to cultivate water supply resiliency across all uses.

Community Planning and Infrastructure

There are opportunities for Thornton to utilize its project and its land ownership in Larimer County to help further County objectives. Through the Community Benefits IGA, Thornton proposes to partner with Larimer County in the following ways:

Regional Trail Connectivity

The Boxelder Creek Regional Trail is a highly valued community project which will provide a recreational trail corridor along Boxelder Creek. Boxelder Creek flows through two of Thornton's farms east of I-25. As a broad community benefit, Thornton proposes providing Larimer County with approximately 1.25 miles of 50 foot wide easement across Thornton-owned properties along Boxelder Creek for connectivity of this regional trail. This easement has an approximate value of $65,000.

Broadband Services via Thornton Water Project

Infrastructure for broadband services is extremely valuable and difficult to come by for many communities, particularly in rural areas where data speeds and reliability are typically a challenge. As part of the TWP, a fiber optic conduit will be installed throughout the length of the water pipeline to provide for communication and operability of the many mechanisms needed to transmit and monitor the water supply. As an enhanced community benefit, where legally possible, Thornton will provide Larimer County with 12 strands of fiber-optic cable in the TWP corridor Alternative 3 (Option C) Corridor within Larimer County for the County to use for

institutional services or its residents. This much fiber has the capability of providing up to 115 terabits per second of throughput. Access to this fiber is conservatively valued at $12 million dollars.

Future Use of Thornton's Larimer County Farms

In 2019, Thornton will begin a community-based planning process to evaluate and identify future land uses for the properties that Thornton owns in Larimer and Weld Counties. As a part of this process, Thornton will coordinate with Larimer County and other local stakeholders to identify the interests of the community, and to develop Thornton's properties in a manner in which both Thornton's water interests and the communities' vision are preserved.

Voluntary Payments in Lieu of Taxes

Since 1987, Thornton has made voluntarily payments in lieu of taxes on the farms that Thornton owns in Larimer County, even though as a governmental entity Thornton is exempt from taxation on those properties. Total payments to Larimer County taxing districts since 1987 have exceeded $800,000. Thornton proposes that as long as Thornton is the fee owner of farms in Larimer County, Thornton pay the assessed valuation of those farms as agricultural property as a voluntary payment in lieu of taxes.

Thornton has listened to the Board of County Commissioners, County staff, the water stakeholder group, and community members and other stakeholders in order to gain a better understanding of what is important to Larimer County and its residents. The enhanced community benefits described here are direct response to this input and represent approximately $60 million dollars worth of value to Larimer County and its residents.

References

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Larimer County Open Lands Master Plan (Larimer County June 2015)

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Larimer County Road Information Maps, 2016 - 2018

Urban Storm Drainage Criteria Manual Volume 3, the City of Greeley's BMPs for Utility Planning and Construction