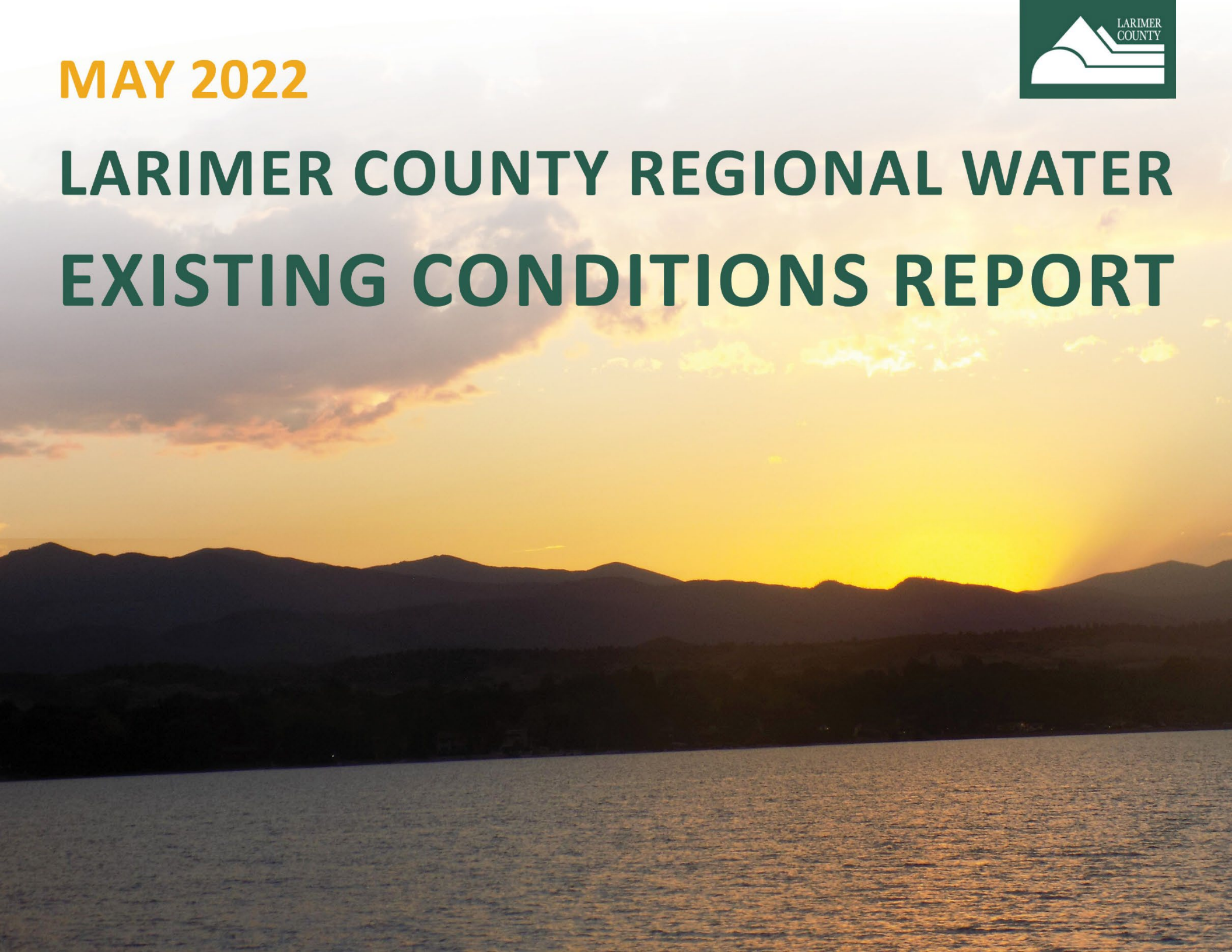
MAY 2022

LARIMER COUNTY REGIONAL WATER EXISTING CONDITIONS REPORT



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INTRODUCTION

Larimer County is committed to planning for current and future water demands and to supporting healthy watersheds, productive agriculture, recreation, and tourism. The County's 2019-2023 Strategic Plan establishes the following goals and objectives (Larimer County, 2019):

Goal 1, Objective 3

Improve long-term planning for water supply in unincorporated areas

Goal 1, Objective 4

Promote water-sharing strategies to preserve agriculture and sustain water supplies

Additionally, a top priority in the 2018 Citizen Survey for Larimer County residents was to initiate "more regional planning to manage growth" (The Center for Research & Public Policy, Inc., 2018). To address these objectives, County staff are exploring options to develop, adopt, and implement a long-range water element. However, Larimer County is not a water service provider and therefore seeks to understand the issues and how best to make water-related decisions that support communities and are collaborative in the region. Larimer County intends to work with water providers and other stakeholders to gather and share information and to define appropriate roles and objectives for the County's regional water planning and collaboration.

REGIONAL WATER CONDITIONS IN LARIMER COUNTY

In 2021, the County initiated a Regional Water Existing Conditions project to assess existing regional water conditions as a foundation for performing the initial visioning and goal-setting activities to guide future work. This assessment focuses specifically on water supply and agricultural land. Sustainable water supply and agricultural land preservation in Larimer County are complex topics. Over the past 30 years, the County has experienced rapid population growth and development that support our economy yet strain our water and land resources. To better understand these impacts and the state of water sustainability in the county, the regional water conditions assessment includes:

- Metrics that quantify the growth drivers and impacts to land and water resources
- Success stories in advancing water supply resiliency
- Notable water-related risks and vulnerabilities

METRICS

It is difficult to succinctly summarize water supplies and demands across Larimer County due to the complex and interconnected systems, which include 124 water providers, 308 diverting structures, 6,229 water rights, and 13,090 water wells. Together, these systems supply water to a rapidly growing population that is expected to exceed more than half a million residents by 2040. While 96% of Larimer County's projected growth is anticipated to occur within municipalities, all of Larimer County's incorporated and unincorporated areas are inextricably linked to water supplies diverted from local watersheds and aquifers as well as the Colorado River. **Table 1** summarizes the water and growth metrics compiled and presented in the report.

TABLE 1. WATER AND GROWTH IN LARIMER COUNTY: BY THE NUMBERS

Population growth (Logan Simpson et. al., 2019)	56%	Projected growth in total population from 2017 to 2040
	343,853	Total population in 2017
	535,756	Projected total population in 2040
	12%	Projected growth in unincorporated areas from 2017 to 2040
	66,639	Unincorporated population in 2017
	74,554	Projected unincorporated population in 2040
	96%	Growth that will be absorbed by municipalities through 2040
Development potential (Logan Simpson et. al., 2019)	39,384 acres	Land designated as urban expansion areas[1]
	23,245 acres	Land designated as urban/rural interface areas[2]
Water supplies	43%	Water supplies that originate from the Colorado River
	57%	Water supplies that originate from local watersheds and aquifers
Water rights and well permits[3]	6,229	Water rights administered under the prior appropriation doctrine (first in time, first in right)
	24,299 cfs	Fully developed direct flow rights (absolute rights)
	32,180 cfs	Direct flow rights under development (conditional rights)
	600,321 ac-ft	Fully developed storage rights (absolute rights)
	521,977 ac-ft	Storage rights under development (conditional rights)
	2,260,405 ac-ft[4]	Water volumes diverted for use in 2020
	308	Structures actively diverting water in 2020
Agricultural land	47%	Decline in irrigated agricultural lands between 1987 and 2020
	104,063 acres	Irrigated agricultural land in 1987
	55,206 acres	Irrigated agricultural land in 2020
	8%	Farmland irrigated by sprinkler technology in 1987
	38%	Farmland irrigated by sprinkler technology in 2020
Water providers	124	Centralized public water systems that provide safe drinking water to residents and businesses
	385,559	People served by centralized public water systems in 2020[5]
	13,090	Water wells
	10,589	Homes reliant on groundwater wells
	47	Irrigation, ditch, and reservoir companies operating in Larimer County that deliver non-potable (raw) water
	9	Community water systems that publish their annual water demands and forecast future water demands
	25-90%	Projected growth in water demands at community buildout

[1] Urban Expansion Areas are areas located within Growth Management Areas where municipal development and services are anticipated (Logan Simpson et. al., 2019).
[2] Urban/Rural Interface areas are areas adjacent to municipal planning boundaries that could be incorporated into Growth Management Areas or developed in unincorporated Larimer County (Logan Simpson et. al., 2019).
[3] Data represent water rights and diversions at structures located in Larimer County, some of which transport water from the Colorado River and other sources.
[4] This value represents all diversions that occur within Larimer County for all source waters (i.e., the Colorado, Laramie, Sand Creek, Cache La Poudre, Big Thompson, and Little Thompson Rivers). Water is diverted, used, and returned multiple times in the watershed system.
[5] Population estimate may include service areas outside of Larimer County.

KEY WATER RISKS AND VULNERABILITIES

While Larimer County has notable water resiliency successes (including excess treatment capacity, water sharing and interconnection agreements among providers, improving irrigation efficiency, and improved consideration of riverine health), this report focuses on important risks and vulnerabilities related to reliable water supplies and preservation of agricultural land that must be considered and mitigated. In no particular order, they include:

- All water supplies are at risk of reduced water availability and poor water quality due to natural hazards such as drought and wildfires.
- Water used in Larimer County that originates from the Colorado River could be curtailed during a compact call[6].
- Non-tributary groundwater wells[7] are generally not monitored and reported, presenting a gap in water use information.
- Direct flow and storage rights in Larimer County are still being developed, putting additional strain on available water resources.
- Weather trends show warming temperatures and periods of low precipitation, which reduce water availability.
- Based on water source alone, the water in Larimer County has relatively low reuse potential, as Colorado-Big Thompson return flows are reserved for agricultural users downstream and native supplies cannot be reused without additional water court actions. Windy Gap and other transmountain water can be reused.
- Agricultural water rights continue to be converted to municipal water rights, diminishing agricultural lands. While water-sharing pilot projects are occurring, water sharing efforts are needed on a larger scale to overcome buy-and-dry.
- Some community water systems are experiencing water delivery limitations. Service pressures are expected to grow as water demands are projected to increase from 25-90% through community buildout.
- There is a trend toward water supply diversification, but some providers remain heavily reliant on Colorado-Big Thompson water.
- Many community water systems report the need for more raw water storage to increase the yield of their water supplies. Many providers are actively participating in new storage reservoir and reservoir expansion projects, which are expensive and take many years to complete the permitting process.
- Community water systems are more connected than may be apparent, given they are legally distinct entities with their own water rights and service areas. These interconnections (including common water sources, joint infrastructure, and intergovernmental agreements) create the potential for both system resiliencies and cascading risks.
- Nearly all community water systems report aging or insufficient infrastructure, underscoring the need for water system infrastructure investment to ensure future water supply reliability.
- Information and planning gaps remain. These gaps include a lack of publicly available water information and missing (or outdated) long-range plans.

[6] On any given day, a river may not have enough water available to satisfy all water rights. Water users then "call" for their water, and water rights are satisfied in order of priority date from most to least senior. The priority date that distinguishes which rights are fulfilled and which are not varies each day based on water availability and water calls (Hobbs Jr., 2004).

[7] Non-tributary wells are groundwater wells (usually wells that are very deep and/or far from rivers) that are deemed not to be hydrologically connected to streams and therefore are exempt from administration under the priority system (Hobbs Jr., 2004).

FUTURE WORK

This regional water existing conditions report presents a profile of growth and water in Larimer County as a starting point to understanding regional water supplies, demands, and issues. Future work could include a broader look at water in the County that may include watershed, stormwater, and wastewater management as these topics are addressed in other plans and policies and as they relate to supporting integrated water resources management (also known as One Water principles) as well as identification of additional stakeholders and related work. The work that Larimer County is exploring can be valuable to help look across individual water providers and better understand systemic risks and vulnerabilities. As future work ensues, the following questions remain to be answered:

- **Defining Larimer County's role** in engaging in different types of water matters. That role is likely to differ for different situations, such as addressing water supply risks for residents who supply their own water, understanding development costs and water supply reliability for developments serviced by a centralized water utility, and engaging with other stakeholders in regional water conversations.
- **Defining desired outcomes** from the County's involvement in water matters, such as what achieving water supply reliability means in Larimer County and quantifying the relationship between water and other issues, such as water costs, development costs, and housing prices.
- **Filling gaps in the County's planning** and understanding of water issues that could be bolstered by development of a long-range water element. The County has done extensive stormwater master planning but has done less formalized work to date on water and wastewater.
- **Defining the implementation levers** the County has available to address water matters, such as educational and other programming, funding streams for projects and incentives, and policy and regulatory tools.
- **Identifying key stakeholders** the County needs to have ongoing and collaborative relationships with to address regional water issues. For example, working with water providers where appropriate in areas of mutual benefit, such as garnering grant and federal funds to Larimer County, improving collective water system resilience, and promoting water sharing to maintain productive agriculture.

ACKNOWLEDGEMENTS

This project was funded by a Sonoran Institute Growing Water Smart Technical Assistance Grant, a Department of Local Affairs (DOLA) Administrative Planning Grant, and local matching funds from the Larimer County General Fund.

Thank you to the following individuals who contributed to the report. The views expressed in this report may not reflect the opinions of those who provided input and feedback.

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  - Amber Kauffman, Little Thompson Water District
  - Frank Kinder, Northern Water
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  - Abbye Neel, Fort Collins Utilities
  - Mark Simpson, Colorado Division of Water Resources
  - Meagan Smith, Town of Wellington
- Consultant team
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  - Gretel Follingstad, PhD, Terra Planning
  - Miriam McGilvray, AICP, Logan Simpson

INTRODUCTION

Larimer County staff and Commissioners endorsed long-range water sustainability as a high priority in the County's 2019-2023 Strategic Plan. The plan's objectives include "**improving long-term planning for water supply…in unincorporated areas**" and "**promoting water sharing strategies to preserve agriculture and sustain water supplies**" (Larimer County, 2019). Residents identified the need for "**more regional planning to manage growth**" as a top community priority in the 2018 Citizen Survey (The Center for Research & Public Policy, Inc., 2018). To address this collective priority, the County is exploring options to develop a long-range water element as a component of Larimer County's Comprehensive Plan (Logan Simpson et. al., 2019). However, Larimer County is not a water service provider and therefore seeks to understand the issues and how best to make water-related decisions that support communities and are collaborative in the region with water providers and other stakeholders.

This regional water existing conditions report presents a profile of growth and water in Larimer County, as a starting point to understand regional water supplies, demands, and issues. The water profile focused specifically on water supplies and agricultural land. There are other water-related topics of importance to the County that were beyond the scope of this project. Those topics include watershed protection, environmental and recreation flows, wildfire impacts, floodplain mapping and regulations, stormwater management, flood warning systems, water quality inspections, and emergency management. Some or all of these topics may be addressed in the future long-range water element.

ABOUT THIS REPORT

Methodology and Outcomes

This section describes the data sources used in the water and growth assessment, the methods used to analyze the data, and the outcomes the County received from the project.

Larimer County Growth Forecast

This section describes high-level growth and development trends in Larimer County.

Larimer County's Water Profile

This section describes water supplies and agricultural land in Larimer County, starting upstream where water originates, and moving downstream to how water is used in the County.

Conclusions

This section summarizes future work that remains for exploration of a long-range water element.

METHODOLOGY AND OUTCOMES

OBJECTIVES

The regional water existing conditions assessment was intended to answer foundational questions about the state of water supplies, agricultural land, and growth in Larimer County:

- How is the population expected to change?
- How is land use expected to change?
- Where does the water come from?
- How is the water used?
- How much water are we diverting?
- What is happening to agricultural land?
- Who provides water?
- Are our water systems sufficient and reliable for current and future needs?
- What are the key risks and vulnerabilities related to reliable water supplies and preservation of agricultural land?

METHODOLOGY

The regional water conditions assessment is based on a significant amount of data that were collected and analyzed, including:

- Population growth and land use projections (Logan Simpson et. al., 2019).
- Service area boundaries and municipal boundaries from the Department of Local Affairs (DOLA), as well as those previously collected for the Larimer County Comprehensive Plan update (Colorado Department of Local Affairs, 2022; Logan Simpson et. al., 2019).
- Water well permit data from the Colorado Division of Water Resources (CDWR) (Colorado Division of Water Resources, 2022a).
- Structures, water rights, diversion volumes, irrigated lands, and spatial data from the State of Colorado's HydroBase database and Colorado Decision Support System (CDSS) modeling framework (Colorado Division of Water Resources, n.d.; Colorado Division of Water Resources, 2022b).
- Transmountain diversions and related characteristics (Open Water Foundation, 2018).
- Water master plans, water efficiency plans, development fees, and billing charges from community water systems (various references included in **References** and **Appendix C: Water Provider Summaries**).
- Weather data collected from the Applied Climate Information System maintained by the National Oceanic and Atmospheric Administration (NOAA) Regional Climate Centers (NOAA Regional Climate Centers, 2017).

All collected data have been shared with County staff for future use.

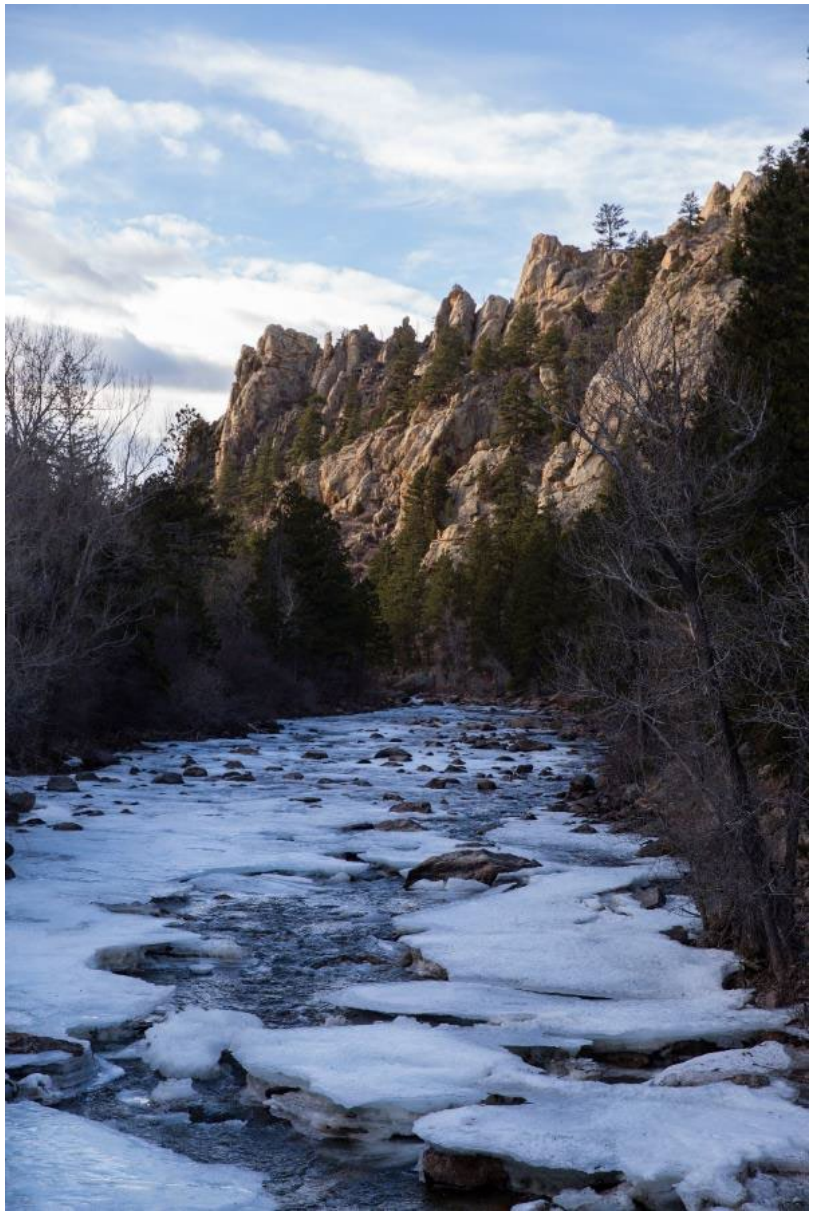
OUTCOMES

Significant data analyses and findings are included in this report. Additional outcomes include:

- A geodatabase of water-related data
- An inventory of water providers, including public water systems, groundwater wells, and irrigation and ditch companies (**Appendix A: Water Provider Inventory**)
- A summary of public water system characteristics and a compilation of annual water use metrics, including historical and forecasted service population, water demands, systemwide per capita water use values, and residential per capita water use values (**Appendix B: Water Provider Overview**)
- Profiles of each community water system with a publicly available long-range water efficiency and/or water master plan (**Appendix C: Water Provider Summaries**)

LARIMER COUNTY GROWTH FORECAST

In 2017, Larimer County was home to 343,853 people with approximately 20% (66,639 people) of the population located in unincorporated areas (Logan Simpson et. al., 2019). By 2040, Larimer County is expected to add 150,000 new residents (Logan Simpson et. al., 2019). Cities and towns are expected to absorb 96% of the County's population growth; the remaining 4% is expected in unincorporated areas. High growth areas include the municipalities of Fort Collins, Timnath, Wellington, and Windsor. Coordination among municipalities, the County, and water service providers will be increasingly necessary given their varying jurisdictions to ensure sufficient and reliable water systems now and into the future[8].



LARIMER COUNTY WATER PROFILE

WHERE DOES OUR WATER COME FROM?

Larimer County's water is diverted and pumped from local surface water and groundwater supplies and is imported from the west slope of the Continental Divide.

Approximately 57% of the water volumes used in Larimer County in 2020 originated from local watersheds and aquifers (Colorado Division of Water Resources, n.d.). Local surface water supplies are diverted out of the Laramie River, Sand Creek, Cache la Poudre, and Big Thompson watersheds (**Figure 1**). The County's groundwater supplies are pumped from aquifers that underlay these watersheds (**Figure 2**) (Colorado Division of Water Resources, 2022a).

[8] Municipalities have jurisdiction over their Growth Management Areas. The Growth Management Area is defined as the area into which urban development and annexation shall be directed and within which urban level services to support urban development will be needed (City of Loveland and Larimer County, 2004). The County has jurisdiction over the growth in unincorporated areas. Water service providers plan for water service in their service areas to supply future growth.

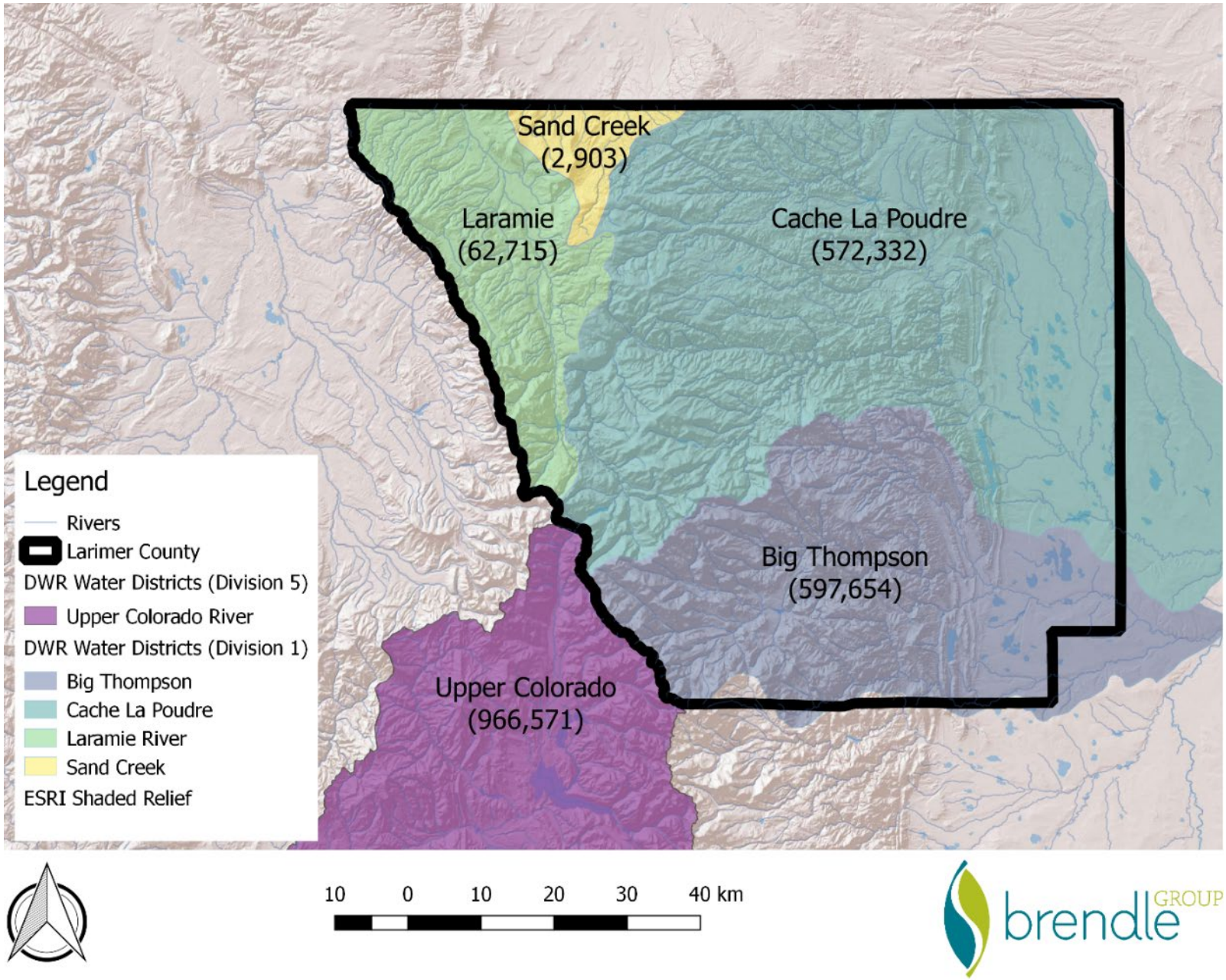


FIGURE 1. SURFACE WATER SUPPLIES WITH MEASURED DIVERSIONS (AC-FT) BY WATER SOURCE (2020)

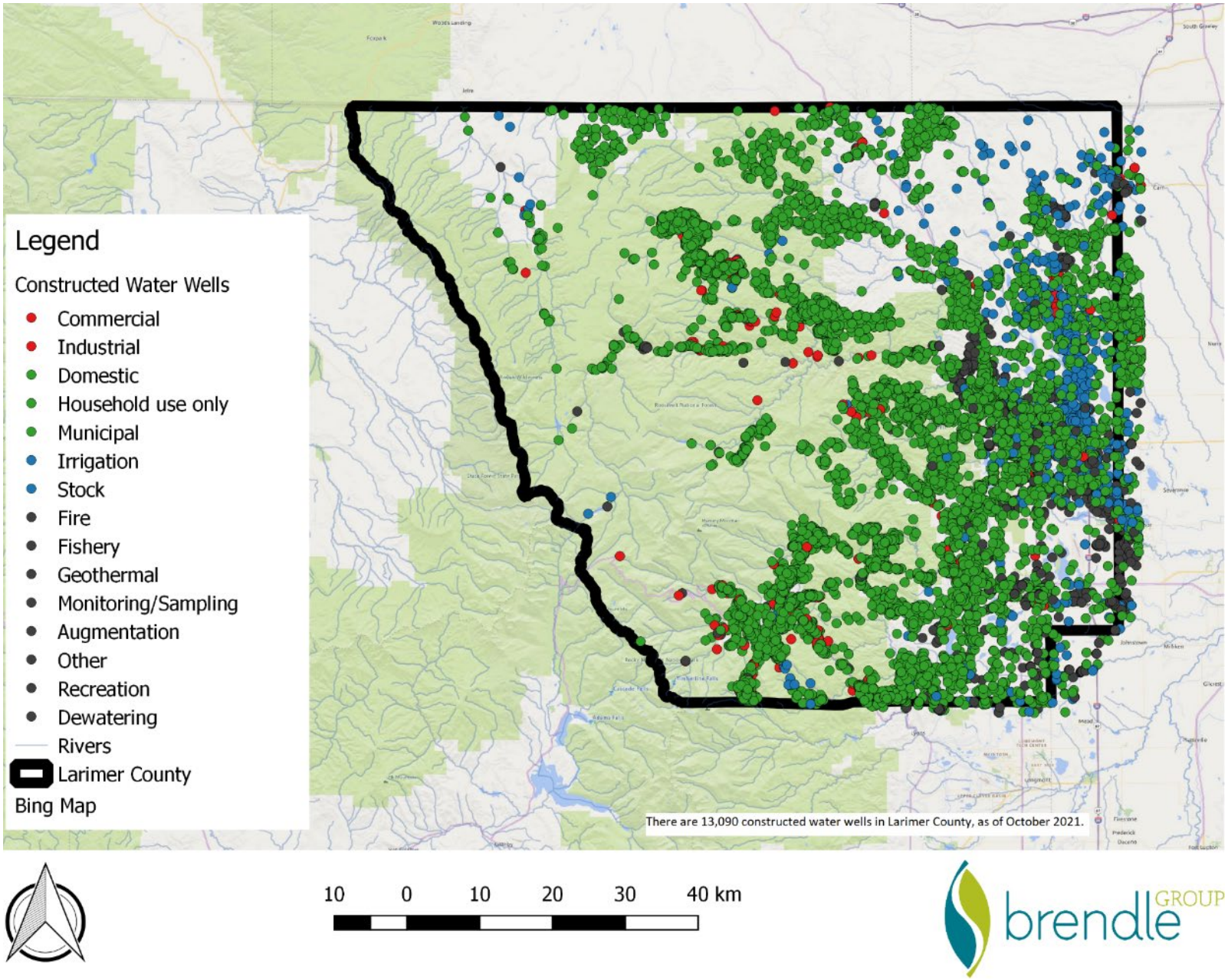


FIGURE 2. GROUNDWATER WELLS IN LARIMER COUNTY (2021)

Transmountain diversions move water from one river basin to another across a mountain range. Transmountain diversions in Colorado typically move water from the west slope of the Continental Divide (where approximately 80% of the State's water resources originate) to the east slope of the Continental Divide (where approximately 80% of the State's population resides). Eight transmountain diversions supply Larimer County (**Figure 3**) (Open Water Foundation, 2016)**:**

- The **Deadman Ditch, Bob Creek Ditch, Laramie Poudre Tunnel, and Skyline Ditch** are transmountain diversion structures included in the Laramie River Agreement between Colorado and Wyoming.
    - Bob Creek Ditch is owned by the City of Greeley.
    - The Laramie Poudre Tunnel is part of the larger Laramie River System of the Tunnel Water Company, a mutual ditch company with two shareholders (the Water Supply and Storage Company and the Windsor Reservoir and Canal Company).
    - Skyline Ditch (also known as the Laramie River Ditch) is owned by the Water Supply and Storage Company.
- The **Wilson Supply** and **Sand Creek Ditch** systems are owned by the Divide Canal and Reservoir Company.
- The **Michigan Ditch** diverts water from the Michigan River into the Cache la Poudre watershed. The ditch is owned by the City of Fort Collins.
- The **Grand River Ditch**, owned by Water Supply and Storage Company, diverts water from the north fork of the Colorado River into the Cache La Poudre watershed.
- The Colorado-Big Thompson (C-BT) Project diverts water from the Upper Colorado river basin into the South Platte basin via the **Alva B. Adams Tunnel**. The C-BT project is jointly owned and operated by the US Bureau of Reclamation and Northern Water.

In total, 43% of the water volumes used in Larimer County in 2020 originated from the Colorado River (**Figure 3**) (Colorado Division of Water Resources, n.d.).

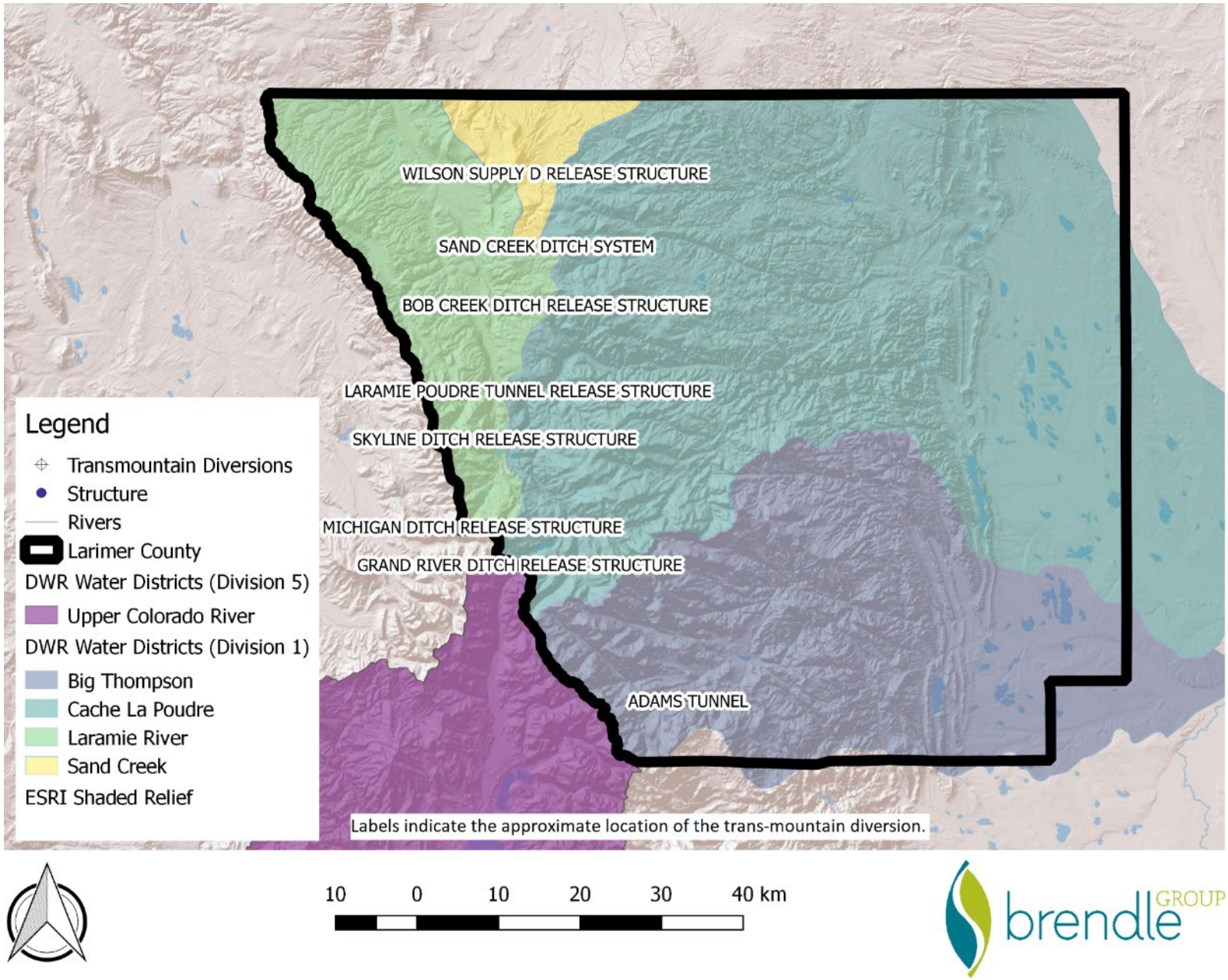


FIGURE 3. TRANSMOUNTAIN DIVERSIONS IN LARIMER COUNTY

Under Colorado Water Law, trans-basin and transmountain diversions are qualified as fully reusable water (i.e., can be used "to extinction"), as the water has already left the source watershed (Hobbs Jr., 2004). The exception to this rule is C-BT water – though C-BT is a transmountain diversion, Northern Water's repayment contract with the Bureau of Reclamation states that return flows are reserved for agricultural users downstream. This requirement is reflected in a Northern Water policy (Northern Water, 2021). Native water supplies (water that originates and is used within the same watershed) cannot be reused without additional water court actions, as the return flows are obligated to more junior water rights holders. Windy Gap and other transmountain water can be reused. For more information about Colorado Water Law and the prior appropriation doctrine, refer to (Hobbs Jr., 2004; Kurath, 2015).

Water supplies are subject to many natural hazards and risks, such as reduced water availability during drought and poor water quality after wildfires, regardless of where they originate. However, transmountain supplies may be subject to additional infrastructure risks (as the water travels farther) and legal risks. For the Front Range, 97% of transmountain water from the Colorado River comes from water rights granted after the Colorado River Compact of 1922, making these rights subject to curtailment during a compact call (Hydros Consulting, Inc., 2018).

HOW IS THE WATER USED?

All surface water use and some groundwater use in Larimer County is associated with a water right. Shallow groundwater wells (also known as alluvial wells) are hydrologically connected to the river system and are therefore administered along with surface water rights. There are 6,229 water rights in Larimer County, of which 4,279 (69%) are associated with surface water and 1,950 (31%) are associated with groundwater (Colorado Division of Water Resources, n.d.).

A water right specifies where the water is diverted (removed from its natural waterway) and the approved beneficial use of the water, with an expectation that water will be used efficiently and not wasted. Direct flow rights represent the flow rate (in cubic feet per second, or cfs) that may be diverted when the water right is in priority. Storage rights represent the volume of water (in acre-feet, or ac-ft) that may be stored in a reservoir for later use (when the storage capacity is available). Examples of beneficial uses include power generation, storage, irrigation, maintaining minimum flow levels, and more. Water rights information is maintained by the Division of Water Resources (Colorado Division of Water Resources, n.d.).

The water rights in Larimer County were summarized by decreed beneficial use. When water rights were associated with more than one beneficial use, they were classified as mixed use for this analysis. In Larimer County, the top beneficial uses for direct flow rights are mixed use, storage, irrigation, power generation, and maintaining minimum streamflows (**Figure 4**). The top beneficial uses for storage rights are mixed use, irrigation, municipal, domestic, and maintaining minimum lake levels (**Figure 5**).

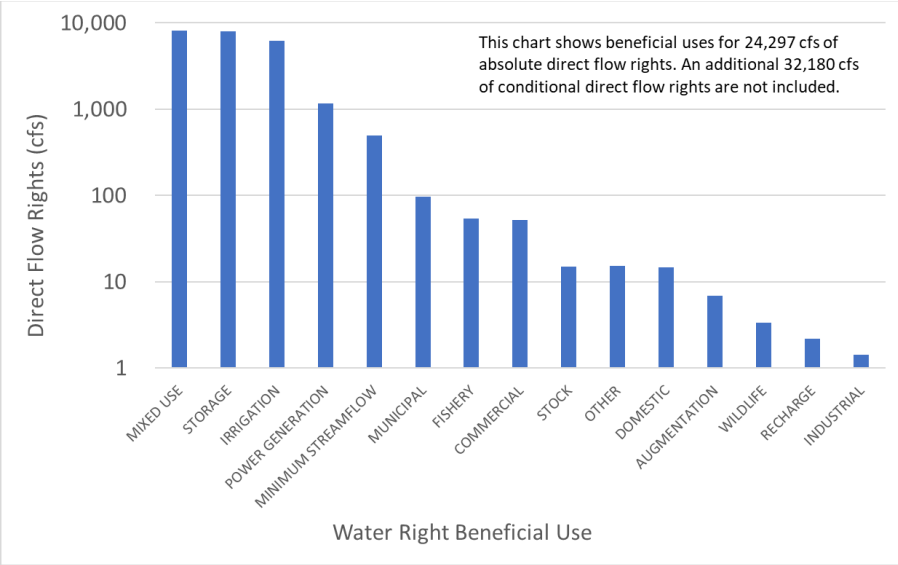


FIGURE 4. ABSOLUTE DIRECT FLOW RIGHTS (CFS) IN LARIMER COUNTY BY BENEFICIAL USE (2022)

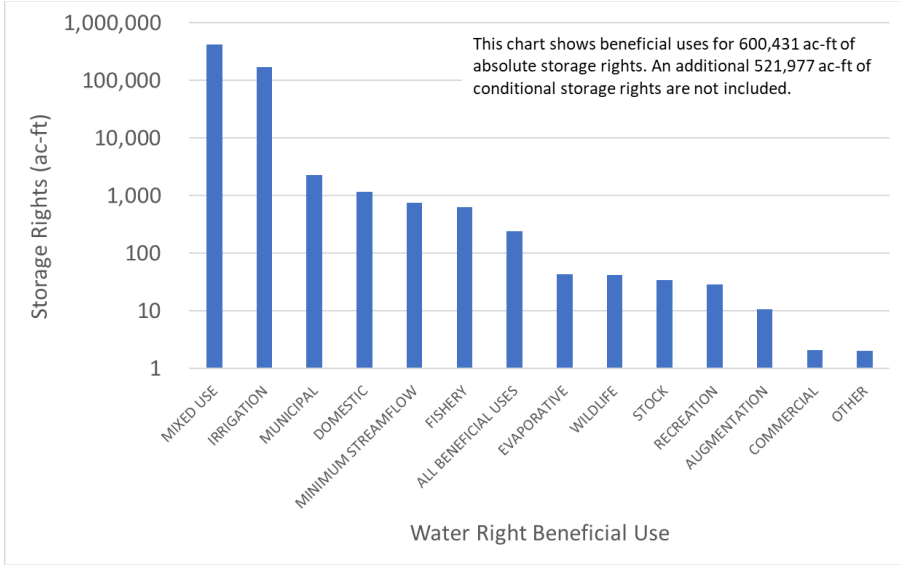


FIGURE 5. ABSOLUTE STORAGE RIGHTS (AC-FT) IN LARIMER COUNTY BY BENEFICIAL USE (2022)

Non-tributary wells, though exempt from administration under the prior appropriation doctrine, do require permits from the Division of Water Resources (Colorado Division of Water Resources, 2020). Like water rights, the well permits specify the authorized use of the water and information is maintained by the Division of Water Resources. Most of the wells are not metered, so the exact water use volumes are not known. Of the 13,090 groundwater wells in Larimer County, 81% are used for domestic or household use[9]. The full summary of well count by beneficial use is shown in **Figure 6** (Colorado Division of Water Resources, 2022a).

[9] Household use provides indoor water for single-family homes on lots less than 35 acres. Domestic use is for residential dwellings on lots greater than 35 acres, and allows for irrigation and stock water use, in addition to indoor use (Colorado Division of Water Resources, 2020).

It is important to understand the beneficial uses of water in Larimer County because they indicate areas of opportunity for water efficiency, the impact water use has on local watersheds and aquifers, and how water rights compare to water supplies. Some beneficial uses, such as storage, power generation, and recreation may affect diurnal and seasonal variations in natural flows but essentially do not affect total water volumes in the environment. Some uses, such as maintaining flow levels and recharge, are environmentally beneficial by keeping and adding water to the environment, respectively. Water use by residents and businesses (e.g., irrigation, municipal, domestic, commercial) have varying degrees of environmental impact. Water that is used indoors typically returns 95% of the water to the environment through sanitary sewer systems[10]; 5% of the water is consumptively used through hot water evaporation. Irrigation varies greatly in impact – anywhere from 0-45% of water is returned to the environment through infiltration and groundwater recharge; 55-100% of water is used consumptively through evapotranspiration of the vegetation being watered (Food and Agriculture Organization of the United Nations, 1989). Augmentation is currently a relatively minor use in Larimer County but is important to track as an indicator of the degree to which water supplies are over-appropriated[11].

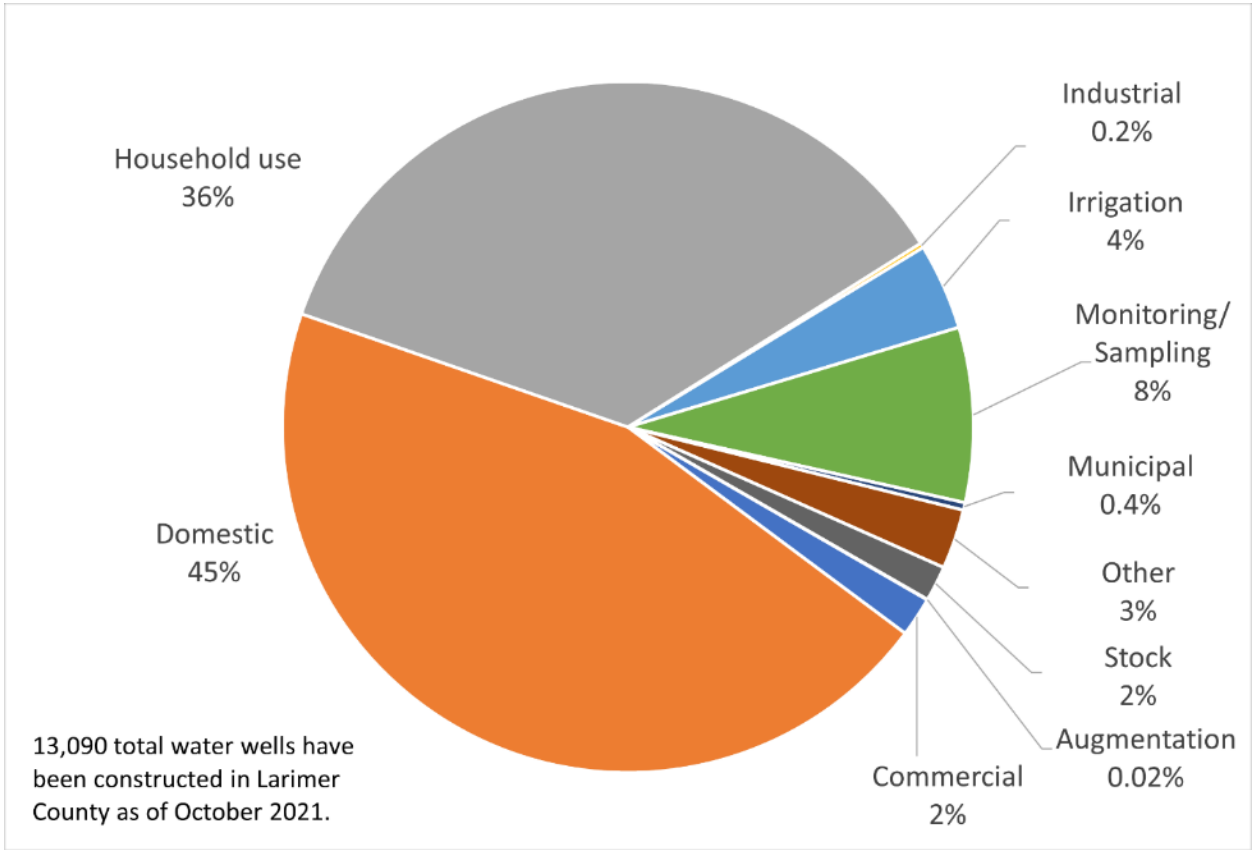


FIGURE 6. GROUNDWATER WELLS IN LARIMER COUNTY BY BENEFICIAL USE (2021)

The surface water rights shown in **Figure 4** and **Figure 5** represent absolute water rights that are fully developed and in use today. Conditional direct flow and storage rights are still being developed and reserve their priority date while being developed (Kurath, 2015). The development of these rights does not guarantee that water will be available to fulfill them, but they do indicate continued growing pressures on the County's water resources. By far

[10] Wastewater captured by evaporative septic systems do not return any water to the environment.

[11] A watershed is over-appropriated if the water court has approved more water rights than there is water available. In over-appropriated watersheds, new rights may be obtained, but water may be available only for a short period of time, or only during wet years. Augmentation plans protect senior water rights while increasing reliability for junior water rights by allowing out-of-priority diversions if the water is replaced. Examples include releasing stored water or using unlined ditches and ponds to recharge groundwater (Hobbs Jr., 2004).

the largest beneficial use associated with conditional direct flow and storage rights is mixed use (31,093 cfs and 419,937 ac-ft, respectively), though municipal and irrigation storage rights are also a priority (64,637 ac-ft and 36,000 ac-ft, respectively) (Colorado Division of Water Resources, n.d.). Organizations are increasingly considering riverine health in their water management plans, including the effects of low flows (which can result in warming waters, higher sediment concentrations, and disruption to aquatic species migration) and reducing peak flows (which are needed for sediment transport sediment, natural channel morphology, and preservation of deep pools) (City of Fort Collins, n.d.).

HOW MUCH WATER ARE WE DIVERTING?

Water rights represent the amount of water a rights holder is entitled to if the water is available based on flow conditions and the administrative priority of the water right. When insufficient water is available to satisfy all water rights, a "call" is placed on the river, and a complex administration process is used to determine the priority date associated with the call. Essentially, senior rights with an earlier priority date may continue to divert water, while junior rights with a later priority date must curtail their use until more water becomes available. The water right alone is not enough to determine the water yield associated with the water right.

Actual diversions are tracked by the Colorado Division of Water Resources (Colorado Division of Water Resources, n.d.). There are 3,586 structures in Larimer County classified as active points of diversion. Diversion records are maintained for 340 of the structures. Almost 80% of structures that do not have diversion records are groundwater wells, seeps, and springs that are not measured. The remainder of structures include monitoring gauges, recharge areas, and other structure types.

Over the period 1980-2020, the number of measured active structures has increased from 150 to more than 300 (**Figure 10**). This increase in measured diversion points is likely attributable to change-in-use cases associated with the water rights. Measured annual diversions have increased from 991,000 ac-ft/yr to 2,260,000 ac-ft/yr (**Figure 9**). These diversion values represent all diversions that occur within Larimer County for all source waters (i.e., the Colorado, Laramie, Sand Creek, Cache La Poudre, Big Thompson, and Little Thompson Rivers). Additionally, water is diverted, used, and returned multiple times in the watershed system. A comparison of annual diversion volumes to annual streamflow volumes shows that water is reused on average twice in the Laramie River watershed, three times in the Poudre watershed, and six times in the Big Thompson watershed.

Weather conditions over the period 1980-2020 have been changing in ways that reduce water availability (NOAA Regional Climate Centers, 2017). Average temperatures increased 2.6 °F over that period (**Figure 8**). Annual precipitation has been 1.6 inch/yr lower on average over the 2002-2020 period compared to the 1980-2001 period (**Figure 7**). Rising temperatures contribute to longer growing seasons and higher evapotranspiration demands, both of which increase irrigation demands. Higher temperatures also result in a higher proportion of precipitation falling as rain instead of snow, which reduces the duration of the runoff season. Reduced precipitation directly reduces water availability, regardless of whether it falls as rain or snow. These trends are troubling indicators of reduced water availability.

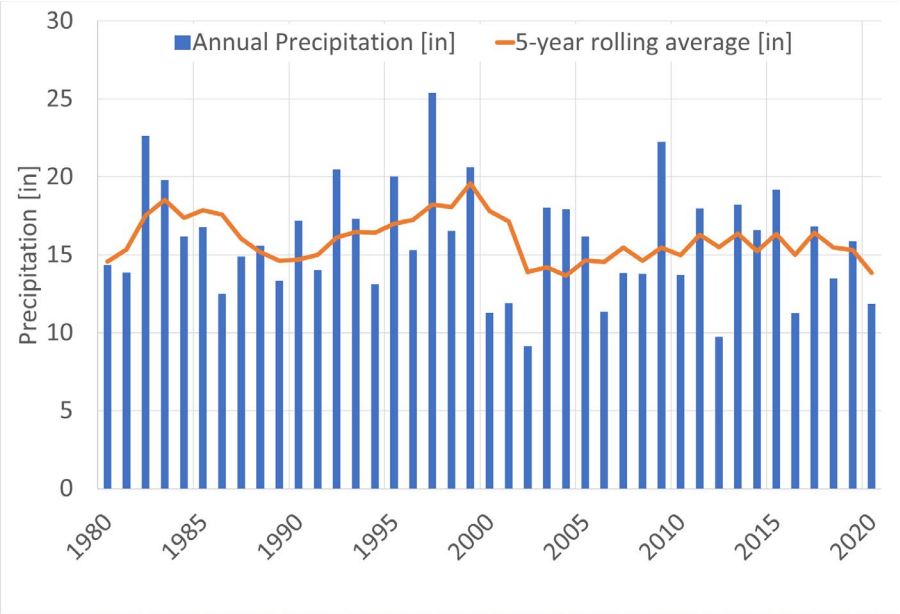


FIGURE 7. ANNUAL PRECIPITATION IN FORT COLLINS, COLORADO

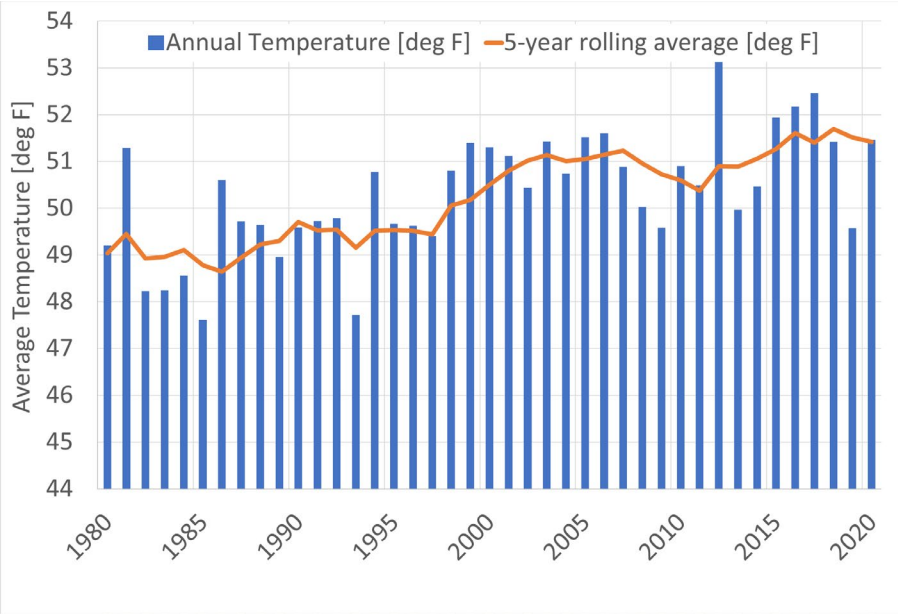


FIGURE 8. AVERAGE TEMPERATURE IN FORT COLLINS, COLORADO

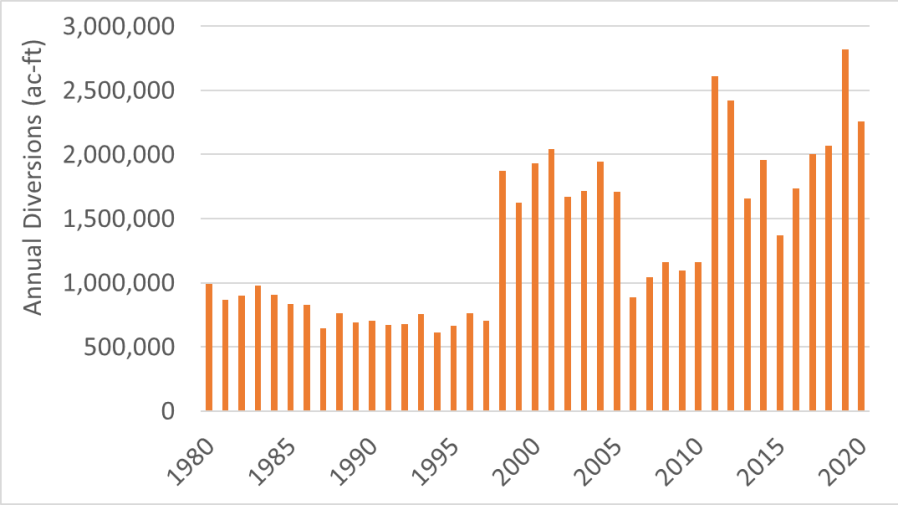


FIGURE 9. MEASURED WATER DIVERSIONS (AC-FT) IN LARIMER COUNTY

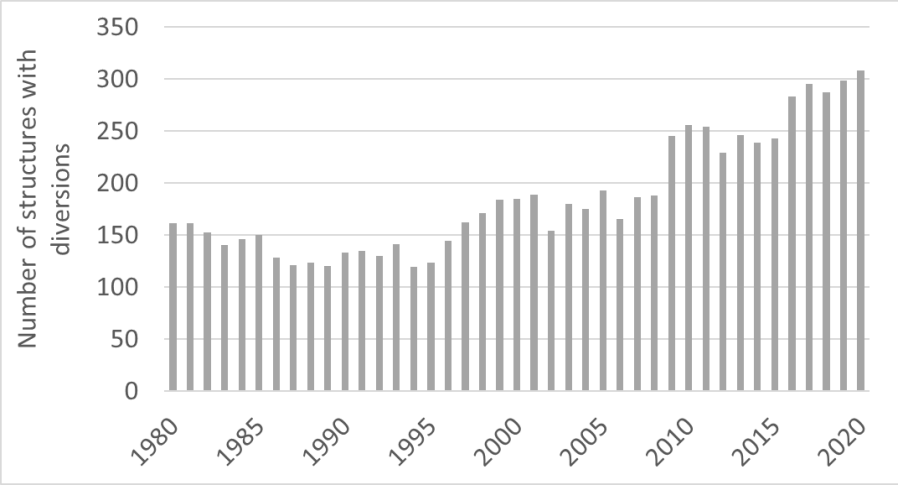


FIGURE 10. NUMBER OF STRUCTURES WITH MEASURED WATER DIVERSIONS IN LARIMER COUNTY

Because most groundwater wells are not measured, the total pumping volumes can only be estimated using a rule of thumb that one household uses 1-2 ac-ft/yr of water. With this rule of thumb, groundwater use is estimated to be 10,600-21,200 ac-ft/yr, though this estimate does not specifically account for commercial, industrial, or irrigation use.

WHAT IS HAPPENING TO AGRICULTURAL LAND?

The importance of agricultural land to Larimer County's heritage and economy was established as a foundational concept in the 1997 Master Plan and was affirmed in the 2019 Comprehensive Plan (Logan Simpson et. al., 2019). Like many Front Range communities, Larimer County has experienced a conversion of agricultural lands to municipal development for several decades. The effect has been a net transfer of land and water rights that is often referred to as "buy-and-dry." From 1987 to 2020, Larimer County has experienced a 47% decline in irrigated agricultural lands, from 104,063 acres to 55,206 acres (**Figure 11, 12, 13, 14, 15**) (Colorado Division of Water Resources, 2022b). The competition between growing communities and agricultural land has led to both a scarcity of available water supply and soaring water rights acquisition costs.

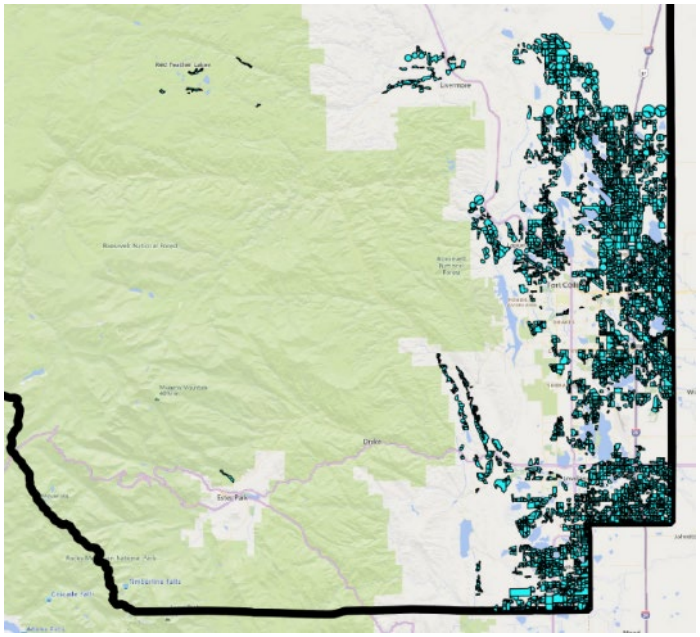


FIGURE 11. IRRIGATED LANDS IN LARIMER COUNTY (1987)

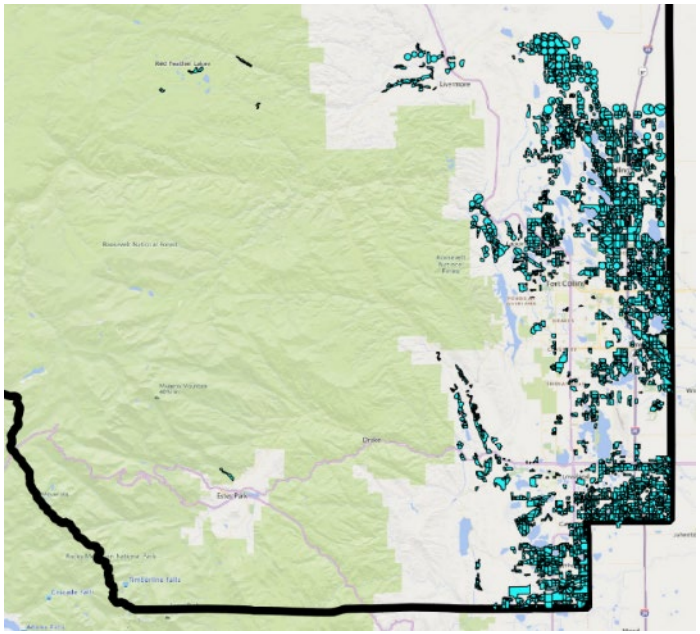


FIGURE 12. IRRIGATED LANDS IN LARIMER COUNTY (2001)

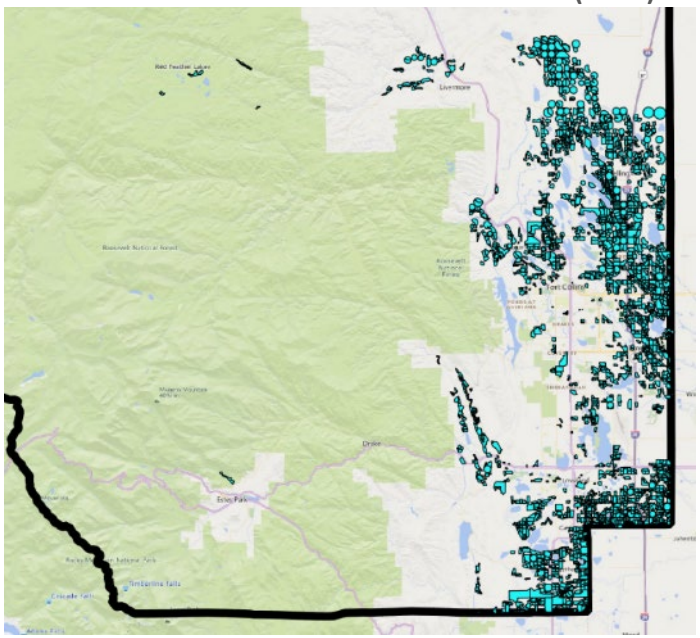


FIGURE 13. IRRIGATED LANDS IN LARIMER COUNTY (2010)

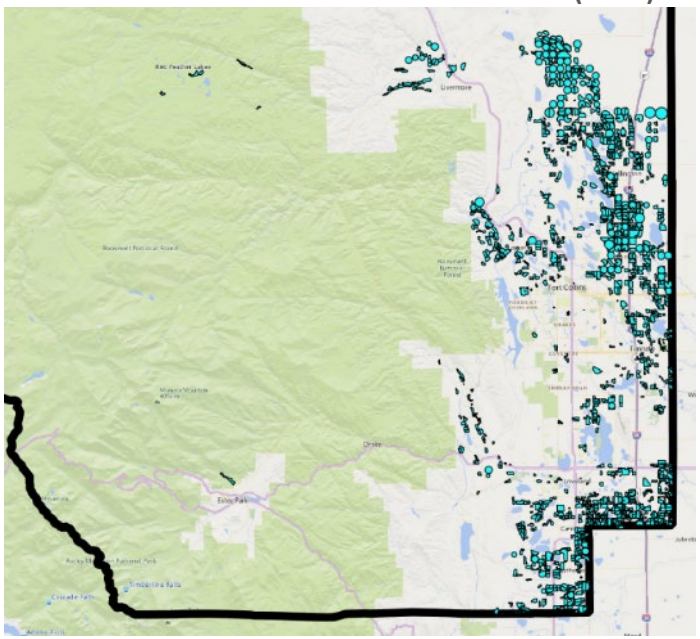


FIGURE 14. IRRIGATED LANDS IN LARIMER COUNTY (2020)

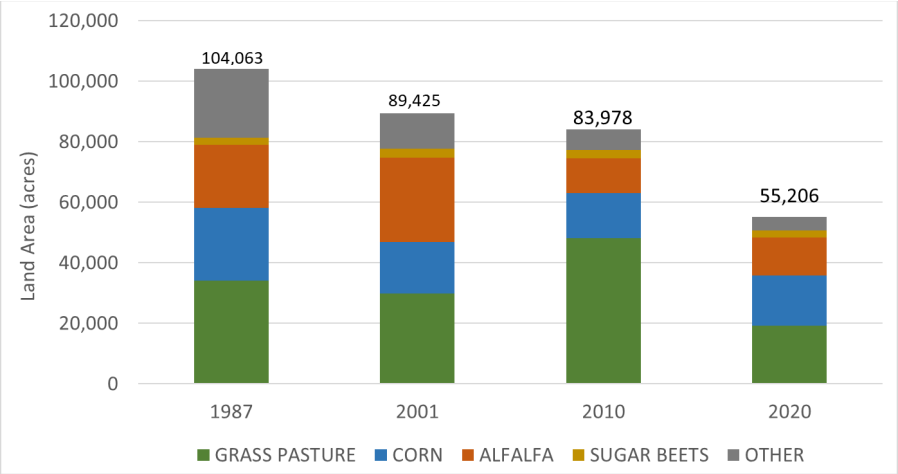


FIGURE 15. IRRIGATED AGRICULTURAL LAND IN LARIMER COUNTY

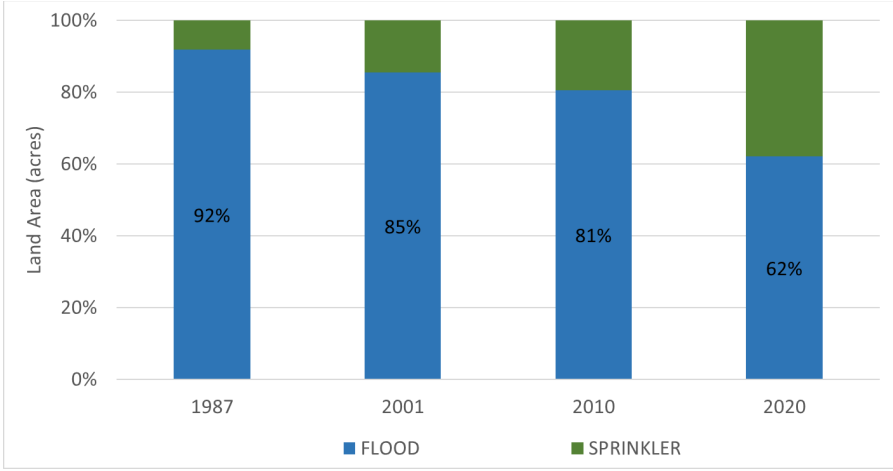


FIGURE 16. IRRIGATION METHODS FOR AGRICULTURAL LANDS IN LARIMER COUNTY

The methods used to irrigate agricultural land in Larimer County have become more efficient in the past 30 years (**Figure 16)** (Colorado Division of Water Resources, 2022b). In 1987, 92% of agricultural land was irrigated using flood irrigation, which is 40-60% efficient. In 2020, that percentage has been reduced to 62%, leaving 38% of agricultural land to be irrigated by sprinkler technology, which is 75% efficient (Food and Agriculture Organization of the United Nations, 1989).

WHO PROVIDES WATER?

Water delivery is a highly distributed service compared to other utility services such as electricity and natural gas. Water in Larimer County is provided by a combination of the following:

- **Public water systems are centralized utilities that deliver potable water** to their customers (typically residents and businesses). Potable water is water that has been treated to drinking water standards under the Safe Drinking Water Act.
- **Self-supplied users are residents and businesses that are not connected to public water systems**. In Larimer County, self-supplied users mostly rely on groundwater wells, though some may also purchase water from private haulers or otherwise truck in water. This water must be treated to the water quality standards associated with the water's beneficial use. For example, households that rely on wells for indoor use often chlorinate the groundwater, at a minimum.
- **Irrigation and ditch companies sell non-potable (raw) water** to their customers (typically public water systems, farmers and ranchers, and large industrial customers). Original shareholders represented the agricultural sector, and the water was used for irrigation and stock water. As development in Northern Colorado has rapidly progressed, more and more of the shareholders represent the municipal sector, where water is commingled with other sources for treatment and distribution.

Appendix A: Water Provider Inventory contains a complete inventory of the public water systems, groundwater wells, and irrigation and ditch companies in Larimer County.

PUBLIC WATER SYSTEMS

The Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) is a regulatory body responsible for water monitoring, pollution prevention, and safe drinking water. As such, the WQCD maintains a public water system database for the State of Colorado (Colorado Department of Public Health and Environment, 2021a). This database includes 124 public water systems (PWS) in Larimer County. Public water systems are classified into one of three categories:

- **Community systems** supply drinking water to the same population year-round. Community systems represent the largest water utilities in Larimer County, serving an estimated combined population of 356,462 people (**Table 2**). Twenty-eight community systems supply water to a large portion of the County's population, plus 3 systems located in Weld County serve a small portion of Larimer County (**Figure 17**).
- **Transient, non-community systems** serve at least 25 people or 15 connections, are open at least 60 days a year, but the population is flow-through traffic. There are 90 of these systems in Larimer County that serve temporary populations such as campgrounds and lodging facilities (**Table 2)**.
- **Non-transient, non-community systems** serve at least 25 of the same people at least six months each year. There are 6 non-transient, non-community water systems in Larimer County, including entities like Colorado State University's Foothills and South campuses and Platte River Power Authority (**Table 2**).

TABLE 2. PUBLIC WATER SYSTEMS IN LARIMER COUNTY (COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, 2021A)

PWS Type	Description	Number of PWS	Total Estimated Service Population	Notes / Example Systems
Community	Supplies water to the same population year-round.	31[12]	356,462	Includes municipal and Title 32 special district providers
Non-Transient, Non-Community	Regularly serves at least 25 of the same people at least 6 months each year	6	10,183	CSU Foothills & South Campuses, Platte River Power Authority
Transient, Non-Community	Serves at least 25 people or 15 connections, open at least 60 days a year, but the population is characterized as flow-through traffic	90	18,914	Grocery stores, campgrounds, lodging

[12] Includes three community water systems in Weld County that serve a small portion of Larimer County.

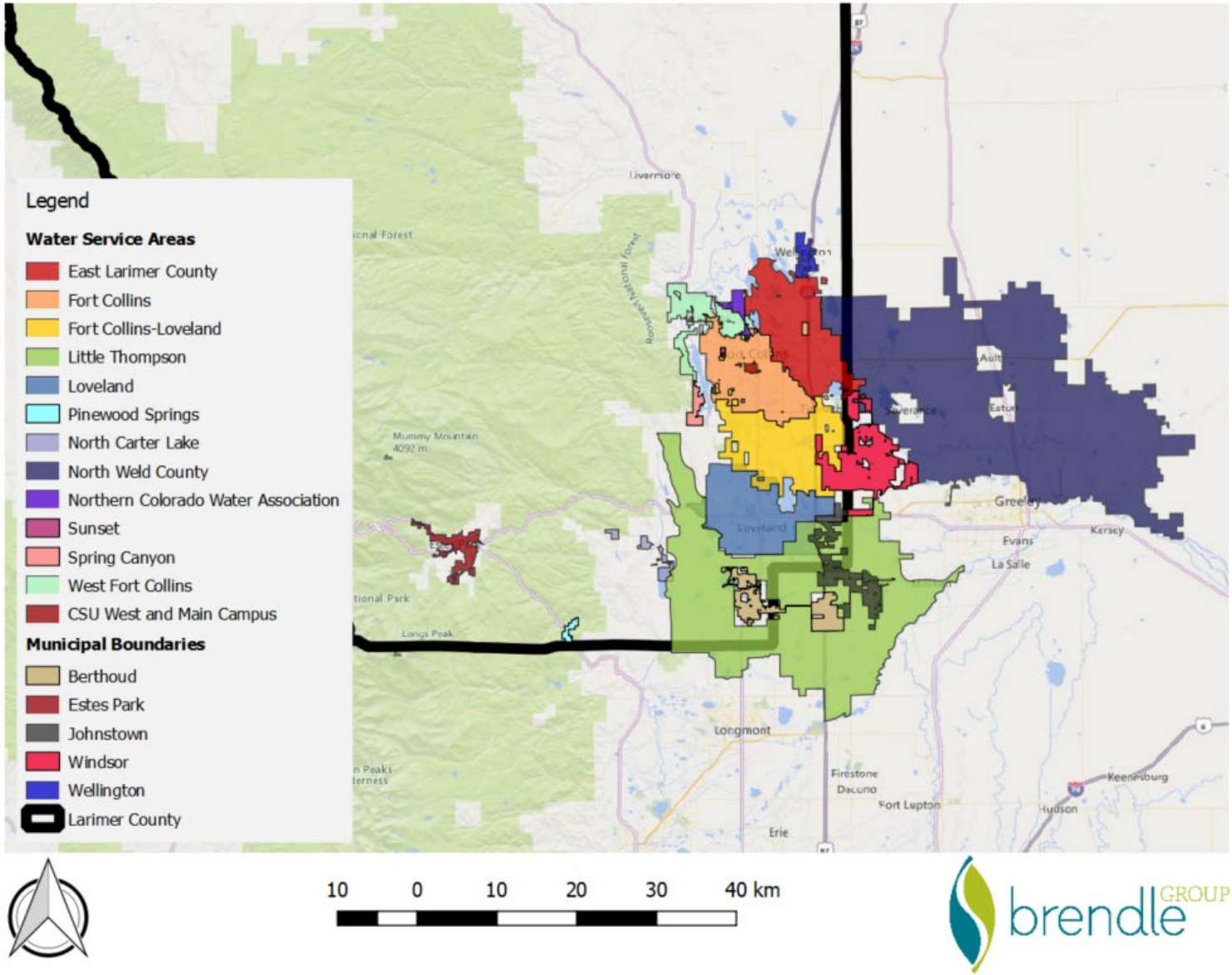


FIGURE 17. COMMUNITY WATER SYSTEMS SERVING LARIMER COUNTY

Public water systems rely on complex systems of raw water supplies and storage, water treatment and distribution infrastructure, and treated water storage to meet water demands (**Figure 18**). Ideally, public water systems hold a diverse portfolio of water rights and avoid overreliance on a single water source. In Colorado, where the runoff season typically lasts from April through September, raw water storage is crucial to satisfy demands at other times of the year. It is common for public water systems to provide water to other systems - under contractual agreements as part of daily business, or for short periods of time in response to emergency situations. Almost all water delivered by public water systems is treated to drinking water standards; though increasingly, public water systems are constructing dual distribution systems to deliver potable and non-potable (raw or reclaimed) water separately. Water used indoors is collected and treated through the sanitary sewer system and treated effluent is discharged to downstream waterways. A portion of the water used for irrigation infiltrates into the ground and makes its way back to the river system as subsurface flow, though that process is slow. Flows returned to the river are then available for downstream water systems.

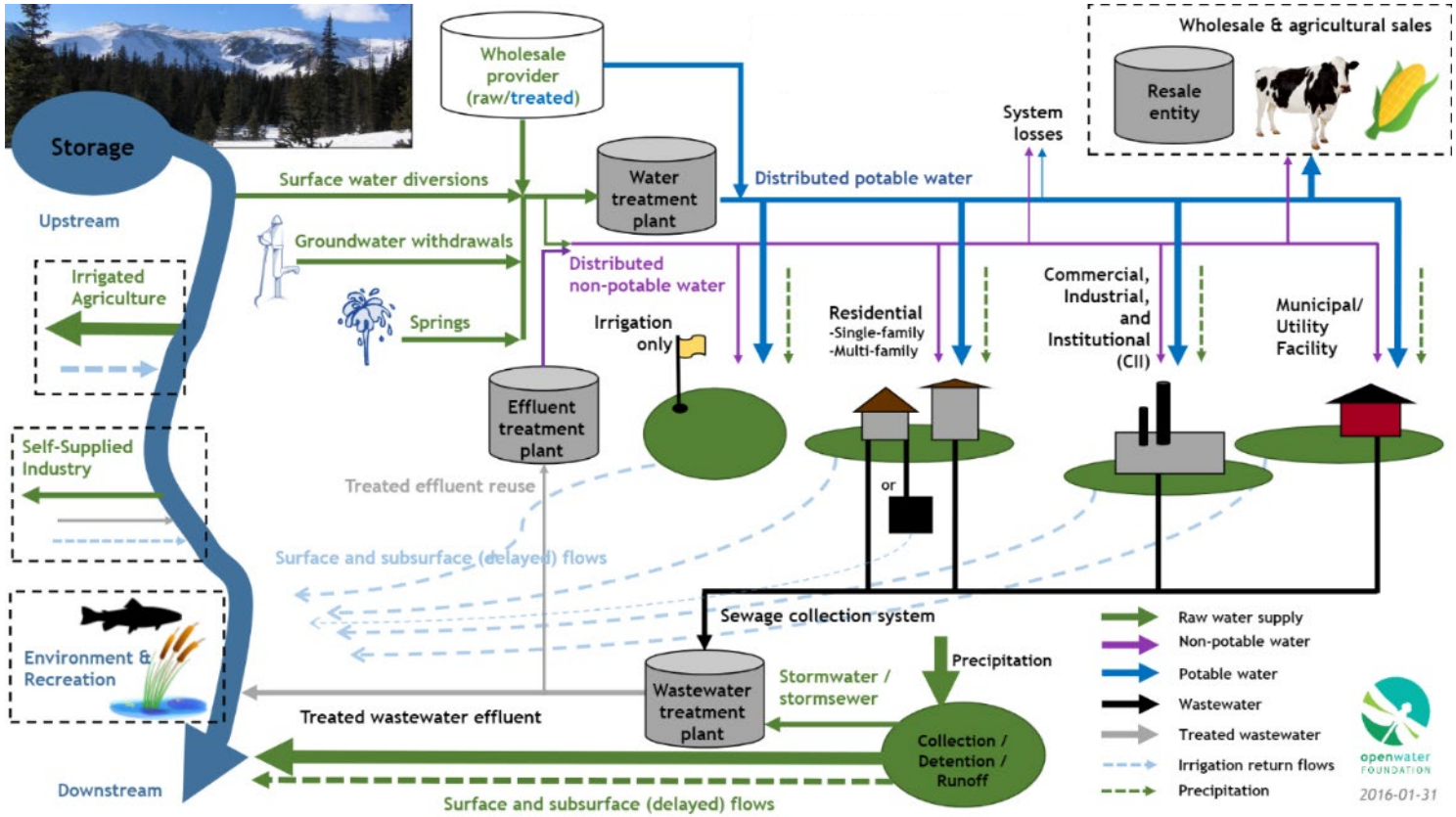


FIGURE 18. PUBLIC WATER SYSTEM SCHEMATIC (OPEN WATER FOUNDATION, 2016)

Though not a frequent occurrence, new public water systems can be created under the Colorado Revised Statutes, Title 32 Special Districts Act (Colorado Revised Statutes, 2016). Special districts are "created to fill the gaps that may exist in the services counties provide and the services the residents may desire" (Colorado Department of Local Affairs, n.d.). Special districts can provide one service (such as water), or if providing multiple services, may be referred to as "metropolitan districts." Larimer County is currently conducting a feasibility assessment for a new centralized water system for Red Feather Lakes (Colorado Department of Public Health and Environment, 2021b). Some municipalities, including Fort Collins and Loveland, have adopted policies and criteria to inform the creation of new special districts and metropolitan districts within their jurisdictional areas. Special districts and metropolitan districts are legally distinct entities, so the creation of new districts expands the number of organizations that should be collaborating on water and land use issues.

SELF-SUPPLIED USERS

Limited information is available for the 13,090 groundwater wells in Larimer County. Using an assumption of 2.2 people per household, an estimated 23,300 people in Larimer County are self-supplied water users. Almost all groundwater wells are limited to pumping 15 gallons per minute (Hobbs Jr., 2004). Most (95%) of the wells are exempt from administration, which means their use is unaffected by a call on the river.

Self-supplied users can sometimes be connected to centralized service when public water systems expand their service boundaries or new utilities are created.

IRRIGATION AND DITCH COMPANIES

Ditch companies are regulated under Colorado Revised Statutes §7-42-101 (Colorado Revised Statutes, 2022a). In Larimer County, 47 ditch companies purvey raw water for irrigation and other purposes (Larimer County, 2021). These companies operate ditches, canals, and reservoirs to store and distribute water. Many of the ditches and canals originate in the mountainous portions of the County, cross urban areas, and deliver water to municipal and agricultural land within and east of Larimer County (**Figure 19**). As described previously, shares in these companies are increasingly represented by municipal shareholders, who must go through water court to convert their shares from agriculture to municipal use. Depending on the ditch company, water may be limited by season and only available for 6-8 weeks in summer. When municipal shareholders purchase rights for future water security, they sometimes offer water rental programs to agricultural users in the meanwhile.

A review of irrigation and ditch companies was beyond the scope of the current project. However, information about public water systems that own ditch shares and that have water rental programs is included in **Appendix C: Water Provider Summaries**.

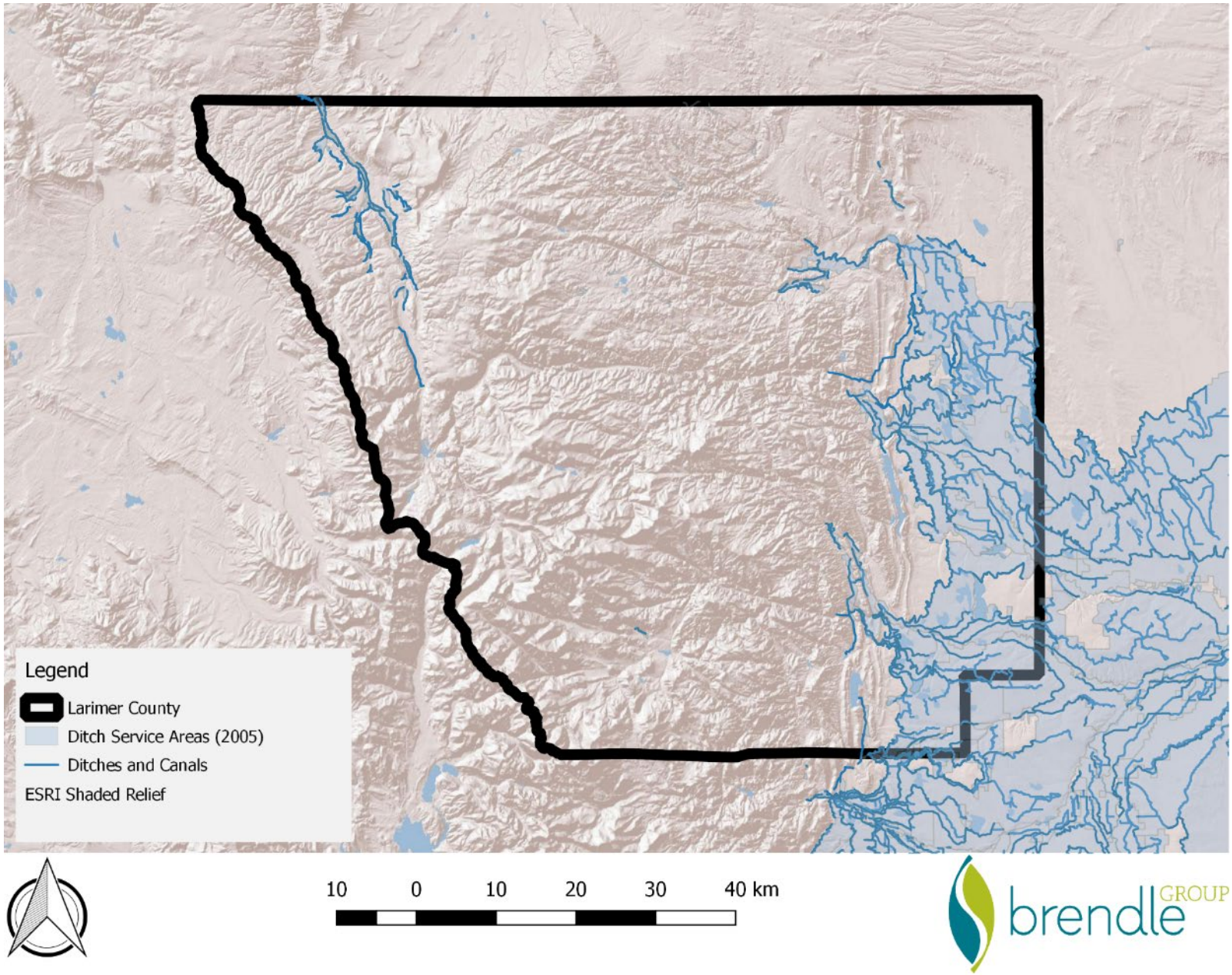


FIGURE 19. DITCHES AND CANALS IN LARIMER COUNTY

ARE OUR WATER SYSTEMS SUFFICIENT AND RELIABLE FOR CURRENT AND FUTURE NEEDS?

The 31 community water systems in and around Larimer County were reviewed to summarize basic utility characteristics, compile annual water use data, and identify risks and vulnerabilities. Twelve (12) systems had at least one publicly available plan to draw from. Basic characteristics for all systems were available from the CDPHE Public Water System database (Colorado Department of Public Health and Environment, 2021a). **Appendix B: Water Provider Overview** contains the provider summary and compiled water data. **Appendix C: Water Provider Summaries** contains 12 water provider profiles based on the publicly available plans. **Table 3** summarizes each community water system, the primary county it serves, total service population, notable system information, and whether a more detailed provider profile is contained in **Appendix C: Water Provider Summaries**.

TABLE 3. SUMMARY OF COMMUNITY WATER SYSTEMS IN LARIMER COUNTY

Community Water System	County	Estimated Service Population[13]	About this Community Water System and Publicly Available Information	Profile in Appendix D?
Annunciation Heights	Larimer	320	Catholic Youth and Family Camp and Retreat Center located in Estes Park. Limited publicly available information.	N
Berthoud Town of (Berthoud)	Larimer	7,540	Municipal provider. Limited publicly available information.	Y
Big Elk Meadows Water Association	Larimer	351	Community located between Boulder and Estes Park, neighboring Roosevelt National Forest. Limited publicly available information.	N
Carter Lake Filter Plant	Larimer	-	Water treatment plant jointly owned by Little Thompson Water District and North Carter Lake Water District. Carter Lake is second largest reservoir in East Slope distribution system of C-BT water.	N (see LTWD profile)
CSU Main And West Housing Campus	Larimer	27,375	Higher education campus. Purchases water from Fort Collins Utilities. Limited publicly available information.	N (see FCU profile)
East Larimer County Water District (ELCO)	Larimer	18,870	Special district provider. Potential high growth area for unincorporated Larimer County. Working to address the needs of newer/denser development types. Participating in project to quantify water demands by land use type. Has a water efficiency plan (2017).	Y
Eden Valley Institute	Larimer	91	Wellness campus in Loveland area. Limited publicly available information.	N

[13] Reported values are from a water efficiency plan, water master plan, or website if available; otherwise, data are taken from the CDPHE Public Water System database (Colorado Department of Public Health and Environment, 2021a). Service population for providers represents total service population; service population specifically in Larimer County is unknown. Service population values may overlap where systems are interconnected through wholesale and contractual arrangements.

Community Water System	County	Estimated Service Population[13]	About this Community Water System and Publicly Available Information	Profile in Appendix D?
Estes Park Town of (Estes Park)	Larimer	12,245 (Permanent) 26,971 (Transient)	Municipal provider. Tourism and seasonal population important to accurately forecast demand. Biggest vulnerability around water treatment is being addressed. Has a water efficiency plan (2012) and a water master plan (2015).	Y
Fort Collins City of (FCU)	Larimer	130,200	Municipal provider. Seeking improved understanding of relationship between land use/zoning and water use and use of raw water in community. Participating in project to quantify water demands by land use type. Has a water efficiency plan (2012) and a water supply and demand management policy (2015).	Y
Ft Collins-Loveland Water District (FCLWD)	Larimer	42,490	Special district provider. Potential high growth area for unincorporated Larimer County. Participating in project to quantify water demands by land use type. Has a water efficiency plan (2015) that is slated for update in 2022.	Y
Glacier View Meadows Water & Sewer Association	Larimer	395	Community in Livermore. Water comes from seven groundwater wells. Limited publicly available information.	N
Johnstown Town of (Johnstown)	Weld	17,322	Municipal provider. Purchases water from Little Thompson Water District, Greeley, Central Weld, and takes water from Johnstown Reservoir. Limited publicly available information.	N
Little Thompson Water District (LTWD)	Larimer	21,000	Special district provider. Potential high growth area for unincorporated Larimer County. Service area is evolving into denser development and retail properties. Needs to add storage and convert rights to meet future demands. Has a water efficiency plan (2019) and a raw water master plan (2018).	Y
Loveland City of (Loveland)	Larimer	77,262	Municipal provider. Water and wastewater treatment plants will need expansion to meet increasing demands. Has a water efficiency plan (2020) and a water master plan (2020).	Y
Newell Warnock Water Association	Larimer	160	Homeowner's association. Limited publicly available information.	N
North Carter Lake Water District (NCLWD)	Larimer	293	Special district provider. Purchases water from LTWD. Limited publicly available information.	N

Community Water System	County	Estimated Service Population[13]	About this Community Water System and Publicly Available Information	Profile in Appendix D?
North Weld County Water District (NWCWD)	Weld	44,487 (North Weld plus master meter areas)	Special district provider. Potential high growth area but only 3% of service territory is in Larimer County. Need to supply additional water, including ensuring an adequate raw water supply, constructing additional filtration facilities, and providing distribution system that supplies adequate pressures. Has a water efficiency plan (2018).	Y
Northern Colorado Water Association (NCWA)	Larimer	4,550	Special district provider. Current water tap moratorium. Limited publicly available information.	N
Pinewood Springs Water District	Larimer	1,000	Special district provider. Nearly built out. Water hauling and/or restrictions may be necessary in the event of severe drought. System information shared via personal communication.	Y
Riverview Campground	Larimer	450	RV Park and Campground. Water system run by a private company (AWWS). Limited publicly available information.	N
Rocky Mountain National Park (RMNP) Headquarters East	Larimer	900	National Park near Estes Park. Limited publicly available information.	N
Shambhala Mountain Center	Larimer	288	Retreat/spiritual center. Limited publicly available information.	N
Soldier Canyon Filter Plant (SCFP)	Larimer	-	Water treatment facility owned by the Tri-Districts (ELCO, FCLWD & NWCWD).	N (See ELCO, FCLWD & NWCWD profiles)
Spring Canyon Water & Sanitation District (SCWSD)	Larimer	2,120	Special district provider. Many capital improvement projects planned/needed to address aging infrastructure and water quality. Has a 2019-2021 capital improvement plan.	Y
Sunrise Ranch	Larimer	75	Retreat/spiritual center. Limited publicly available information.	N
Sunset Water District	Larimer	425	Special district provider serving northwest of Fort Collins. Limited publicly available information.	N
Wellington Town of (Wellington)	Larimer	11,040	Municipal provider. Potential high growth area; land anticipated to be annexed from county into municipal boundary. Upgrades to water treatment plant and wastewater treatment plants underway. Potential high growth area but building permit cap in place until plant expansions are complete. Has a water efficiency plan (2018).	Y

Community Water System	County	Estimated Service Population[13]	About this Community Water System and Publicly Available Information	Profile in Appendix D?
West Fort Collins Water District (WFCWD)	Larimer	4,000	Special district provider serving the Laporte and Bellvue areas. Purchases water from FCU. Limited publicly available information.	N (see FCU profile)
Windcliff Property Owners Association	Larimer	337	Homeowner's association that purchases water from Estes Park. Limited publicly available information.	N (See Estes Park profile)
Windsor Town of (Windsor)	Weld	14,883	Municipal provider. Relies on FCLWD, NWCWD, and City of Greeley for water treatment. Potable service area is fully in Weld County. Maintains a separate non-potable system for irrigation. Has a water master plan (2009) and a water efficiency plan (2016).	Y
YMCA Rockies Wind River	Larimer	3,730	Retreat/spiritual center. Limited publicly available information. As of Apr 2022, is transferring C-BT shares to Estes Park in exchange for a perpetual water treatment contract (Smith, 2022).	N

By reviewing information across providers, systemic resiliencies, risks, and vulnerabilities were illuminated. Water resiliency successes include treatment plants with excess capacity, water sharing across providers through system interconnects, and shared infrastructure projects. The following sections summarize risks and vulnerabilities highlighted in the providers' plans.

CURRENT AND IMMINENT SERVICE LIMITATIONS

As Northern Colorado grows and pressures on water supply and infrastructure increase, some of the community water systems are facing current or imminent service limitations (**Table 4**).

TABLE 4. COMMUNITY WATER SYSTEMS: CURRENT OR IMMINENT SERVICE LIMITATIONS

Community Water System	Service Limitation Notes
Estes Park	Neither water treatment plant alone can meet the Town's demand year-round (HDR, 2012).
Little Thompson Water District	Will need to develop Windy Gap and native rights to meet demands beyond 2021. Will need to add storage and convert rights to have firm yields[14] meet demands beyond 2028 (Little Thompson Water District, 2019; Little Thompson Water District, 2018).
Loveland	The water and wastewater treatment plants will need to be expanded to meet increases in peak day demands and average annual demands (estimated in 2041 and 2044 respectively; subject to actual population growth and efficacy of conservation programs in reducing summer peak demands) (City of Loveland, 2020a).
North Weld County Water District	Moratorium on the sale of new taps and plant investments until at least May 31, 2022 (North Weld County Water District, 2021).
Northern Colorado Water Association	Tap moratorium initiated on July 1, 2020 has been extended indefinitely. Has experienced record high summer peak demands that cannot be met; negotiating with ELCO and NWCWD to purchase additional water (Northern Colorado Water Association, 2021) but NWCWD has its own tap moratorium.
Pinewood Springs Water District	As part of a State of Colorado augmentation plan requirement, each household is strictly restricted to 6,000 gallons or less per month and fines are imposed if the limit is exceeded (Benson, 2021). No outdoor use of treated water is allowed.
Wellington	The Town is working with developers to limit the number of residential building permits to 100 per year until the completion of the water treatment and wastewater treatment expansion projects in 2024 (Coloradoan, 2021).

Service pressures are expected to grow, as profiled providers report that they expect between 25-90% growth in water demand between now and when their service area is fully built out (**Appendix B: Water Provider Overview**).

[14] Firm yield is the amount of water that can be dependably supplied from the raw water sources of a given water supply system (Colorado State University, 2022). Typically, this term is used to describe the amount of water that will be yielded during a drought of record or other drought planning criterion established by the water provider. Different planning criteria are used by different providers.

LACK OF DIVERSITY IN WATER SOURCES

Each community water system is responsible for its own water supply planning. Providers seek to diversify their water supply portfolios to reduce vulnerability in the event of drought, poor water quality, infrastructure failure, or other challenges. All but one of the profiled community water systems holds water rights associated with multiple water sources. Spring Canyon WSD purchases water from FCLWD and is dependent on that provider as its sole water source.

The C-BT system was originally designed as a seasonal irrigation supply to supplement native water rights, but C-BT water is increasingly supporting population growth. FCU and Loveland hold a balanced mixture of senior native rights, C-BT shares, and ditch rights, but many of the special district providers rely heavily on C-BT water and have been working to diversify their water portfolios. Where providers remain heavily reliant on C-BT water alone, they assume the risks of that water supply.

ADDITIONAL STORAGE CAPACITY

Water storage is necessary to capture water during the runoff season and to meet demands at other times of year. Providers that identified additional storage capacity as a need include Estes Park, FCU, FCLWD, Johnstown, LTWD, Loveland, NWCWD, Wellington, and Windsor (**Appendix C: Water Provider Summaries**).

FCLWD, NWCWD, and Windsor specifically identified a need for additional storage capacity on the east slope to store and maximize yield from their C-BT storage supplies. Some providers in Northern Colorado have banded together to support Northern Water's proposed Northern Integrated Supply Project (NISP) which when fully approved would include two new water storage reservoirs – Glade Reservoir (170,000 ac-ft storage capacity) in Larimer County and Galeton Reservoir (45,600 ac-ft storage capacity) in Weld County (Northern Water, 2022b). FCLWD and Windsor are participating in NISP (Northern Water, 2022a). NWCWD is not a NISP participant but three of its wholesale customers are – Eaton, Severance, and Windsor (Clear Water Solutions, 2018b).

Northern Water's proposed Windy Gap Firming Project would similarly benefit participating providers by adding water storage on the east slope to store additional water when Lake Granby is full and therefore increasing the project's yield (Northern Water, 2022c; Northern Water, 2022d). The proposed storage reservoir is Chimney Hollow (90,000 ac-ft storage capacity), to be located west of Carter Lake in Larimer County. LTWD, for example, will be able to store Windy Gap shares it has acquired through the dedication process for the Brookfield development in Chimney Hollow (Little Thompson Water District, 2019).

FCU's Halligan Water Supply Project, if approved, would enlarge Halligan Reservoir by 8,100 ac-ft to meet future water demands, improve FCU's system reliability during times of drought and emergencies, and restore environmental flows to portions of the North Fork of the Poudre River (City of Fort Collins, 2021c).

Water storage projects are complex projects that cross community and service provider boundaries and take decades to plan, permit, fund, and construct. Larimer County regulations apply to water storage and distribution projects in unincorporated areas; municipal regulations apply in incorporated areas.

HIGHLY INTERCONNECTED SYSTEMS

The provider profiles show that the region's communities and water providers form a highly interconnected system that rely on common water supplies (such as C-BT and Poudre River), shared infrastructure (such as the Soldier Canyon Filtration Plant), and intergovernmental agreements that move water between systems (such as between Spring Canyon WSD and FCLWD, among many others).

This interconnected system leads to a complex web of agreements, system benefits, and system vulnerabilities. As one example, three water providers (ELCO, FCLWD, and NWCWD) jointly own the Soldier Canyon Filtration Plant. The costs to construct the treatment plant were shared among the providers, who also benefit from the operational and maintenance efficiencies of a shared plant. At the same time, if the plant were unable to treat water, water service could be disrupted for a large share of the region's water customers.

This interconnected system makes regional assessment and collaboration necessary to identify and address systemic risks and vulnerabilities.

INFRASTRUCTURE NEEDS

Nearly all of the profiled providers identified aging and/or insufficient infrastructure. Infrastructure improvement needs for Larimer County's providers include:

- Upgrading treatment plants to meet EPA regulations
- Reducing pipeline leaks that result in system losses
- Repairing and replacing storage tanks and pipelines to avoid service disruptions
- Ensuring adequate water pressure for fire protection

Wellington's infrastructure is relatively new compared to other providers in the region, so while aging infrastructure is not a constraint for its water system, it does face water delivery limitations until existing infrastructure is expanded (Clear Water Solutions, 2018a).

WATER QUALITY ISSUES

Wildfire is a major threat to water quality. Ash and contaminants end up in surface water bodies while a fire is burning. Even after wildfires are fully contained, flooding and erosion events create pulses of pollution to waterways for several years following the fire (United States Environmental Protection Agency, 2019). FCLWD, NWCWD, Wellington, and Windsor in particular report system risks from poor water quality from wildfires affecting Lake Granby, an important west slope reservoir where C-BT water is stored (**Appendix C: Water Provider Summaries**). All providers relying on C-BT and Windy Gap water are affected by this risk.

Other water quality issues include algal blooms due to agricultural and municipal stormwater runoff. Wellington's residents complain of taste and odor issues attributable to algal blooms in their terminal supply reservoir (Town of Wellington, 2021). Surface water in Larimer County is at increasing risk for cyanobacteria growth caused by climate change-induced warmer temperatures and increased carbon dioxide absorption (United States Environmental Protection Agency, N.D.).

INFORMATION GAPS

Twelve (12) of the 31 community water systems in Larimer County had at least 1 publicly available plan. The 9 largest providers report historical and forecasted water demands. While this report summarizes available information, there are information gaps:

- 19 providers had no publicly available plans, and 22 providers do not share historical and forecasted water demands.
- 2 providers have outdated water efficiency plans – Estes Park (2012) and FCU (2012). The State of Colorado's Water Conservation Act of 2004 (HB04-1365) requires all covered entities[15] to have an approved water efficiency plan that is updated at least every seven years on file with the State (Colorado Revised Statutes, 2022b). The planning horizon for a water efficiency plan is typically 7-10 years, so they don't necessarily provide a long-term forecast of supplies and demands through buildout. Routine updates to water efficiency plans help establish a more complete water planning picture across Larimer County.
- The State of Colorado does not require providers to complete a Water Master Plan, though providers prepare these plans to guide their system growth and investments. Given the rapid growth that is changing development conditions (e.g., locations, densities, and costs) in Larimer County, many of the existing Water Master Plans are outdated or inconsistent with communities' future development plans.
- Periods of prolonged drought and increasing temperatures are putting pressure on available water supplies. Water Shortage Action Plans (traditionally known as drought management plans) should be developed for all providers to establish drought triggers and responses, including a prioritization of water use.

Each water provider is responsible for its own water supply planning. Unless system projections, risks, and vulnerabilities are considered across the system, the true risks and vulnerabilities of water in Larimer County remain uncertain. Only a limited systemwide analysis can currently be done, due to differing planning horizons and plan update schedules.

[15] Covered entities are retail water providers that sell 2,000 ac-ft/yr or more of water (Colorado Revised Statutes, 2022b).

SUMMARY OF LARIMER COUNTY'S KEY WATER RISKS AND VULNERABILITIES

In summary, while Larimer County has notable water resiliency successes (including excess treatment capacity, water sharing and interconnection agreements among providers, improving irrigation efficiency, and improved consideration of riverine health), this regional water existing conditions report discusses the following water-related risks and vulnerabilities in Larimer County (in no particular order):

- All water supplies are at risk of reduced water availability and poor water quality due to natural hazards such as drought and wildfires.
- Water used in Larimer County that originates from the Colorado River could be curtailed during a compact call.
- Non-tributary groundwater wells are generally not monitored and reported, presenting a gap in water use information.
- Direct flow and storage rights in Larimer County are still being developed, putting additional strain on available water resources.
- Weather trends show warming temperatures and periods of low precipitation, which reduce water availability.
- Based on water source alone, the water in Larimer County has relatively low reuse potential, as C-BT return flows are reserved for downstream agricultural users and native supplies cannot be reused without additional water court actions. Windy Gap and other transmountain water can be reused.
- Agricultural water rights continue to be converted to municipal water rights, diminishing agricultural lands. While water-sharing pilot projects are occurring, water sharing efforts are needed on a larger scale to overcome buy-and-dry.
- Some community water systems are experiencing water delivery limitations. Service pressures are expected to grow since water demands are projected to increase by 25-90% from now through community buildout.
- There is a trend toward water supply diversification, but some providers remain heavily reliant on C-BT water.
- Many community water systems report the need for more raw water storage to increase the yield of their water supplies. Many providers are actively participating in new storage reservoir and reservoir expansion projects, which are expensive and take many years to complete the permitting process.
- Community water systems are more connected than may be apparent given that they are legally distinct entities with their own water rights and service areas. These interconnections (including common water sources, joint infrastructure, and intergovernmental agreements) create the potential for both system resiliencies and cascading risks.
- Nearly all community water systems report aging or insufficient infrastructure, underscoring the need for water system infrastructure investments to ensure future water supply reliability.
- Information and planning gaps remain. These gaps include a lack of publicly available water information and missing (or outdated) long-range plans.

The work that Larimer County is initiating will be an important mechanism to look across individual water providers and better understand regional, systemic risks and vulnerabilities.

FUTURE WORK

This regional water existing conditions report presents a profile of growth and water in Larimer County as a starting point to understanding regional water supplies, demands, and issues. Future work could include a broader look at water in the County that may include watershed, stormwater, and wastewater management as these topics are addressed in other plans and policies and as they relate to supporting integrated water resources management (also known as One Water principles) as well as identification of additional stakeholders and related work. The work that Larimer County is exploring can be valuable to help look across individual water providers and better understand systemic risks and vulnerabilities. As future work ensues, the following questions remain to be answered:

- **Defining Larimer County's role** in engaging in different types of water matters. That role is likely to differ for different situations, such as addressing water supply risks for residents who supply their own water, understanding development costs and water supply reliability for developments serviced by a centralized water utility, and engaging with other stakeholders in regional water conversations.
- **Defining desired outcomes** from the County's involvement in water matters, such as what achieving water supply reliability means in Larimer County and quantifying the relationship between water and other issues, such as water costs, development costs, and housing prices.
- **Filling gaps in the County's planning** and understanding of water issues that could be bolstered by development of a long-range water element. The County has done extensive stormwater master planning but has done less formalized work to date on water and wastewater.
- **Defining the implementation levers** the County has available to address water matters, such as educational and other programming, funding streams for projects and incentives, and policy and regulatory tools.
- **Identifying key stakeholders** the County needs to have ongoing and collaborative relationships with to address regional water issues. For example, working with water providers where appropriate in areas of mutual benefit, such as garnering grant and federal funds to Larimer County, improving collective water system resilience, and promoting water sharing to maintain productive agriculture.

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KEY TERMINOLOGY

Note: Unless otherwise referenced, definitions are taken from the Colorado Water Plan (Colorado Water Conservation Board, 2019).

Augmentation Plan – A water court decree that protects senior water rights while increasing reliability for junior water rights by allowing out-of-priority diversions if the water is replaced. Examples include releasing stored water or using unlined ditches and ponds to recharge groundwater (Hobbs Jr., 2004).

Buy and Dry – The process of buying agricultural water rights and subsequently using the water rights for another purpose (typically for municipal or industrial use). The formerly irrigated agricultural land is "dried up" and no longer irrigated by virtue of the water transfer.

Call – On any given day, a river may not have enough water available to satisfy all water rights. Water users then "call" for their water, and water rights are satisfied in order of priority date from most to least senior. The priority date that distinguishes which rights are fulfilled and which are not varies each day based on water availability and water calls (Hobbs Jr., 2004).

Colorado's Decision Support Systems (CDSS) – Colorado's Decisions Support Systems is a water management system developed by the Colorado Water Conservation Board (CWCB) and the Division of Water Resources (DWR) for each of Colorado's major river basins. The CDSS includes water-focused data sets, models, geographic information system (GIS) layers, and other tools including StateMod, StateCU, HydroBase and others, to assist with surface water and groundwater management in Colorado.

Covered Entities – Covered entities are retail water providers that sell 2,000 ac-ft/yr or more of water (Colorado Revised Statutes, 2022b).

Domestic Use – Some parcels of land in the state that are 35 acres or greater in size may obtain a limited supply of water for residential dwellings, some lawn/garden irrigation, and watering of domestic animals/livestock. Depending on which provisions the well permit is issued under, the well may be able to serve up to three single-family dwellings, irrigate one acre or less of lawn and garden, and provide water for the individual's domestic animals and livestock. (Colorado Division of Water Resources, 2020)

Firm Yield – The amount of water that can be dependably supplied from the raw water sources of a given water supply system (Colorado State University, 2022).

Growth Management Area – The Growth Management Area is the area into which urban development and annexation shall be directed and within which urban level services to support urban development will be needed (City of Loveland and Larimer County, 2004).

Household Use – These types of well permits are issued for ordinary household uses in one single-family dwelling on parcels of land less than 35 acres and do not allow for outside water use (irrigation) or livestock watering. There can only be one exempt well on the parcel. (Colorado Division of Water Resources, 2020)

Municipal Demand – The portion of distributed water attributable to uses typical of municipal systems, including residential, commercial, light industrial, non-agricultural irrigation, firefighting, and non-revenue water. Demands for self-supplied households not connected to a public water supply are also included in the municipal demand category.

M&I Demands – This refers to municipal and industrial water demands inclusive of the self-supplied industrial (SSI) demands.

Municipal Water Efficiency Plans (WEP) – The Water Conservation Act of 2004 (HB04-1365) requires all covered entities (i.e., retail water providers that sell 2,000 acre-feet or more on an annual basis) to have a state-approved water efficiency plan that contains certain required minimum plan elements (Colorado Revised Statutes, 2022b).

Non-Revenue Water – The calculated difference between distributed water and authorized metered water use. Non-revenue water thus represents system water loss.

Non-Tributary Wells – Groundwater wells (usually wells that are very deep and/or far from rivers) that are deemed not to be hydrologically connected to streams and therefore are exempt from administration under the priority system (Hobbs Jr., 2004).

Over-Appropriated Watershed – A watershed is over-appropriated if the water court has approved more water rights than there is water available. In over-appropriated watersheds, new rights may be obtained, but water may be available only for a short period of time during the year, or only during wet years (Hobbs Jr., 2004).

Resiliency – The ability of water systems to adapt and continue providing adequate levels of service in the face of changing circumstances and drivers.

Tributary Wells – Groundwater wells (usually shallow wells proximate to rivers) that are deemed hydrologically connected to streams and are administered under the priority system (Hobbs Jr., 2004).

Urban Expansion Areas – Areas located within Growth Management Areas where municipal development is anticipated (Logan Simpson et. al., 2019).

Urban/Rural Interface – Areas adjacent to municipal planning boundaries that could be incorporated into Growth Management Areas or developed in unincorporated Larimer County (Logan Simpson et. al., 2019).

APPENDIX A: WATER PROVIDER INVENTORY

This appendix is contained in a Microsoft Excel file separate from this report document.

APPENDIX B: WATER PROVIDER OVERVIEW

This appendix is contained in a Microsoft Excel file separate from this report document.

APPENDIX C: WATER PROVIDER SUMMARIES

TOWN OF BERTHOUD (BERTHOUD)

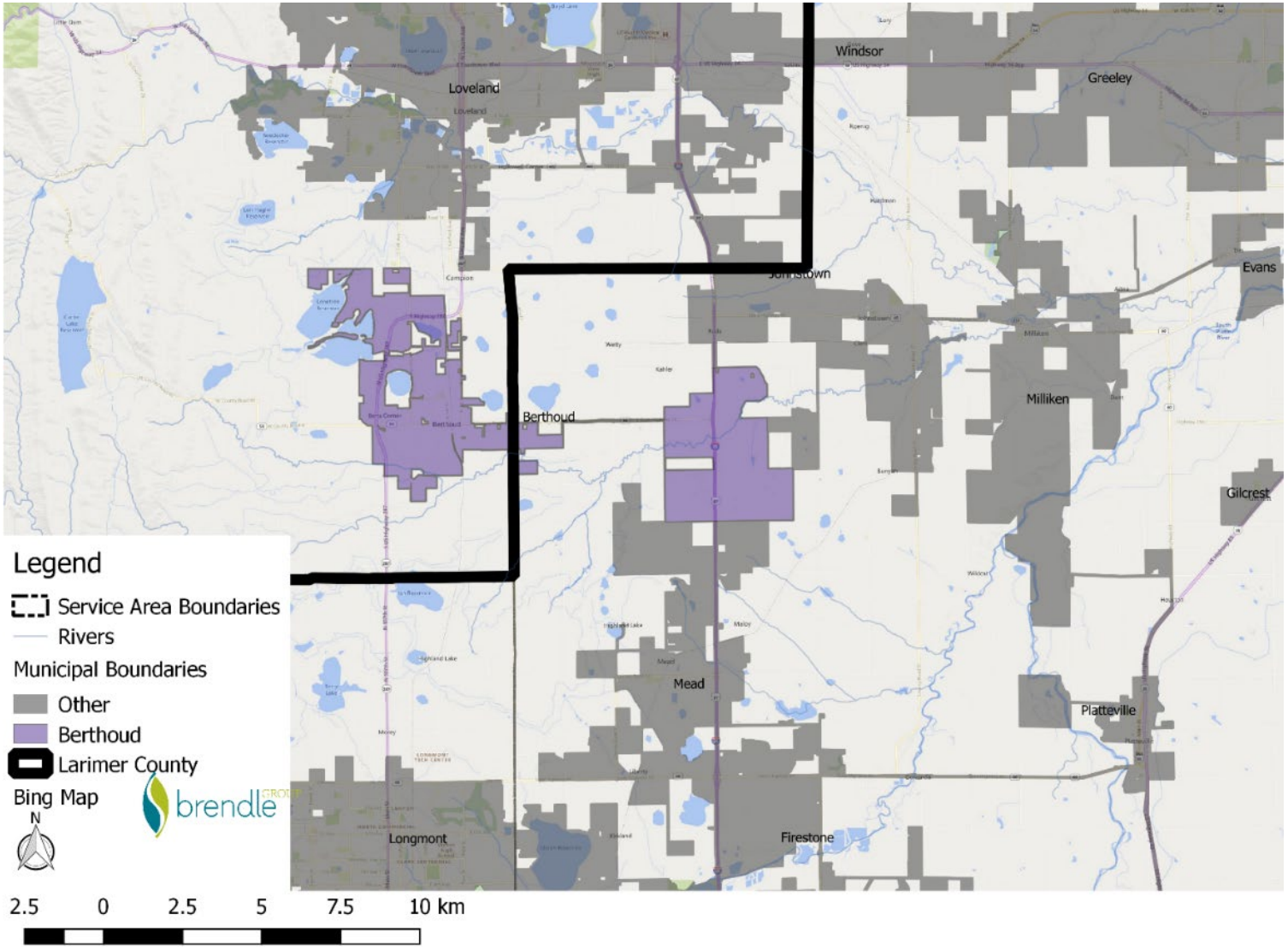

FIGURE 20. BERTHOUD SERVICE AREA

TABLE 5. BERTHOUD PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Town of Berthoud (**Figure 20**)
Major Wholesale and Contract Customers	• No information found
Service Population	• 7,540 from CDPHE Public Water System database
Service Connections	• More than 5,000 (Town of Berthoud, 2021a)
Buildout Estimates	• No information found

Water Supplies	• From (Town of Berthoud, 2021a):
	  ○ Transmountain: Colorado-Big Thompson (C-BT)
	  ○ Native: Big Thompson River
	  ○ Purchases water from Little Thompson Water District

Water Yields (ac-ft/yr)	• No information found
Assessment of Reuse Potential	• No information found
Notable Information Regarding Water Treatment, Storage, and Distribution	• Raw water is stored primarily in Berthoud Reservoir. Water purchased from Little Thompson is stored in Carter Lake before treatment. • The Town has 3 MG of potable water storage (Town of Berthoud, 2021a).
System Reliability Information	• No information found
System Vulnerability Information	• No information found
Major Planned Capital Projects	• No information found
Potable Annual Water Sales (ac-ft/yr)	• 0.6 – 1.2 MGD (Town of Berthoud, 2021a)
Raw Annual Water Sales (ac-ft/yr)	• No information found
Water Metrics and Goals	• No information found
Water Shortage Plans and Drought Criteria	• No information found
Wastewater Providers	• Town of Berthoud provides wastewater collection and treatment for all town residents and some of unincorporated Larimer County (Town of Berthoud, 2021e).
Development Fees	• Latest system development fees can be accessed at (Town of Berthoud, 2021d).
Monthly Billing Charges	• Latest billing rates are at (Town of Berthoud, 2021c).
Connections to Agricultural Sector	• No information found

EAST LARIMER COUNTY WATER DISTRICT (ELCO)

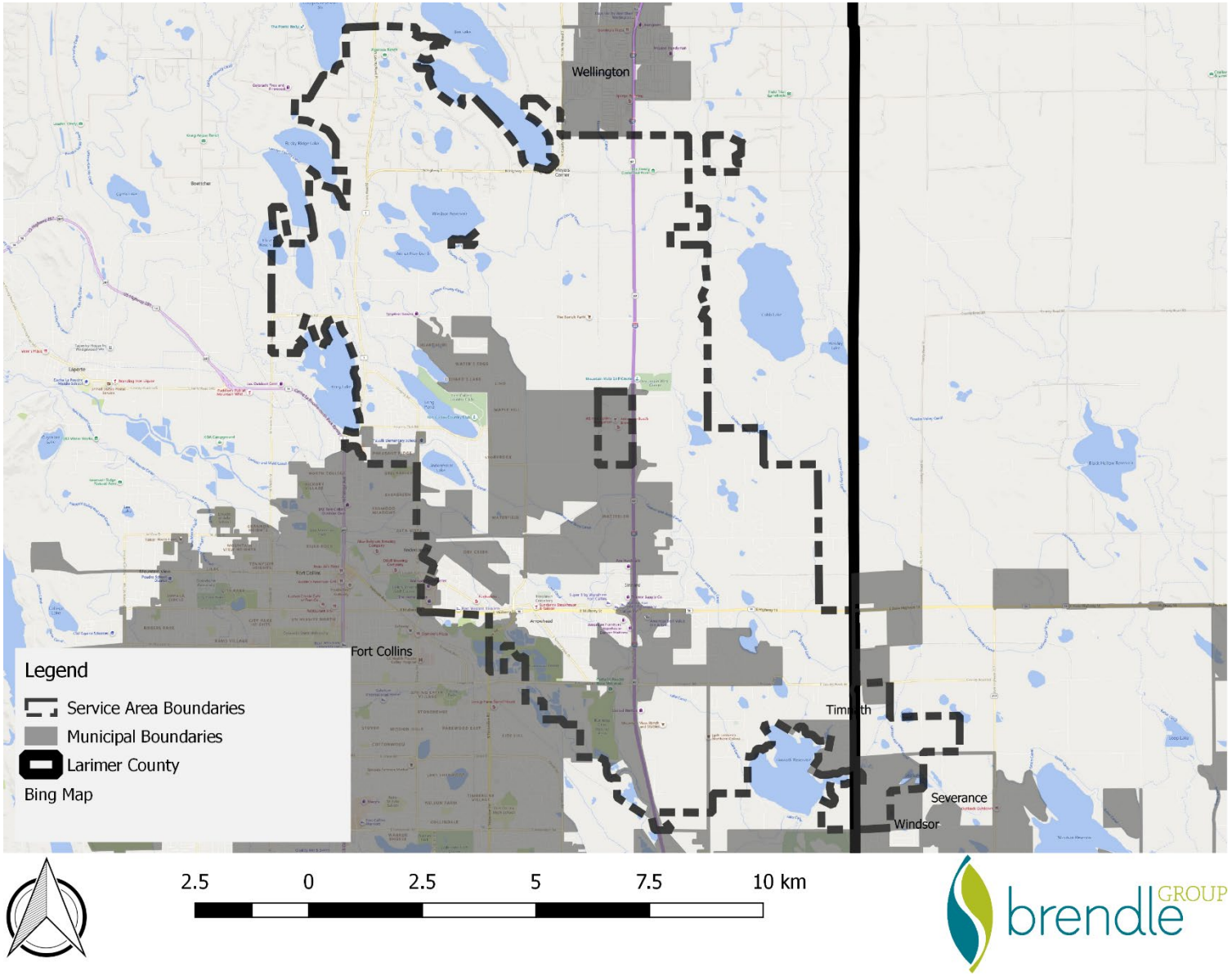

FIGURE 21. ELCO SERVICE AREA

TABLE 6. ELCO PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Northeast Fort Collins, unincorporated Larimer County northeast of Fort Collins, and the Towns of Wellington and Timnath (**Figure 21**). • Approximately 40% of the District's service area is within the City of Fort Collins or its Growth Management Area (GMA) (**Figure 22**) **(Element Water Consulting, 2016)**.
Major Wholesale and Contract Customers	• Through connections with the three Districts that own the Soldier Canyon Filter Plant (SCFP), water is supplied pursuant to wholesale agreements to the Towns of Windsor, Timnath, Severance, Eaton, Ault, and Nunn as well as the Northern Colorado Water Association and Sunset Water District, which are supplied through ELCO's water system (Element Water Consulting, 2016).
Service Population	• 18,870 residents (Element Water Consulting, 2016)
Service Connections	• 6,865 (Element Water Consulting, 2016)

Buildout Estimates	• From (Element Water Consulting, 2016):
	  ○ Year: 2035 (planning period)
	  ○ Service population: 28,195
	  ○ Future treated water demands at SCFP:
	  ▪ 5,980 ac-ft/year (baseline forecast)
	  ▪ 5,600 ac-ft/year (passive conservation forecast)
	  ▪ 4,860 ac-ft/year (active conservation forecast)

Water Supplies	• From (Element Water Consulting, 2016):
	  ○ Approximately 2,400 ac-ft/year or 47% of ELCO's average year supply is provided by Colorado-Big Thompson Project (C-BT) units.
	  ○ ELCO currently owns shares in many of the Poudre River ditch companies. Change of use decrees allow these supplies to be diverted to the SCFP through the Pleasant Valley Pipeline. ELCO's use of the Pleasant Valley Pipeline is limited to April through October.

Water Yields (ac-ft/yr)	• 4,300 ac-ft/yr firm yield (Element Water Consulting, 2016) • 5,100 ac-ft/yr average yield (Element Water Consulting, 2016)

Assessment of Reuse Potential	• Low
	  ○ C-BT cannot be reused, as return flows are reserved for downstream agricultural users
	  ○ ELCO does not currently have a non-potable reuse program; all reuse of its water rights are by exchange (Element Water Consulting, 2016).

Notable Information Regarding Water Treatment, Storage, and Distribution	• From (Element Water Consulting, 2016):
	  ○ **All of ELCO's water supplies are treated at SCFP,** a regional water treatment facility owned by ELCO, NWCWD, and FCLWD, collectively referred to as the "Tri-Districts." SCFP is operated under an Amended IGA between the Tri-Districts that own the plant, which establishes SCFP as a separate governmental entity created under the provisions of C.R.S. §29-1-203. The IGA confirms an undivided one-third ownership in the facility by each District and establishes the method of payment for capital improvements and treated water.
	  ○ The peak day demand at SCFP has averaged 38.6 MGD over the last 5 years with a maximum daily flow of 40.4 MGD, **leaving a modest amount of excess treatment capacity,** as SCFP has a capacity of 50 MGD (combined total for the Tri-Districts and all wholesale connections).
	  ○ SCFP is equipped to recycle backwash water—equal to approximately 5% of the total water production.

System Reliability Information	• ELCO's Rules and Regulations require developers and other property owners requiring two or more new water taps on separate lots, tracts, or parcels to furnish water rights or the equivalent of water rights (e.g., C-BT units, Jackson Ditch Company, Water Supply & Storage, New Mercer Ditch, Larimer Canal #2, Arthur Ditch or Pleasant Valley Lake & Canal Co. (East Larimer County Water District, 2021b)) to the District to satisfy the raw water requirements. The dedication requirements ensure that growth will not occur unless adequate supplies are provided; **therefore, ELCO is not expected to experience any supply shortages** (Element Water Consulting, 2016). • **Diversifying source water supplies:** Most of the water treated at the Soldier Canyon Filter Plant comes directly out of Horsetooth Reservoir through an outlet in the Soldier Canyon dam. At this time, approximately 10% of the water treated at the Soldier Canyon Filter Plant originates in the Poudre River. The percentage of Poudre River water treated and delivered to ELCO customers will increase over time. By the year 2030, it is expected that **equal amounts of Horsetooth and Poudre River water will be treated at SCFP**. (East Larimer County Water District, n.d.)

System Vulnerability Information	• From (Element Water Consulting, 2016):
	  ○ Land use regulations adopted by the City of Fort Collins create **very different types of developments (typically denser) than the County-approved developments** historically served by ELCO.
	  ○ **ELCO's long-term water demands** are affected by changes and uncertainty in proposed development plans for communities in the ELCO service territory.
	  ○ There is a relatively **limited amount of surplus capacity currently available at SCFP**. The capacity of SCFP can be expanded to meet increased demands; however, the exact timing also depends on the demands from North Weld County Water District and Fort Collins-Loveland Water District.
	  ○ **System losses have increased** in recent years and it is difficult to promptly identify and repair leaks with no surface indicators.

Major Planned Capital Projects	• Per the 2016 Water Efficiency Plan, SCFP, Tri-Districts, and the City of Greeley obtained conditional storage water rights for the Overland Trail Reservoirs in Case No. 00CW251. The reservoirs will be a series of lined gravel pits to be located adjacent to the Poudre River near North Taft Hill Road. Four points of diversion are currently decreed for filling the Overland Trail Reservoirs - the New Mercer Ditch, Larimer County Canal No. 2, Overland Trail Diversion structure, and Munroe Gravity Canal via the Pleasant Valley Pipeline. • Four-mile pipeline extension project (NEWT) – affects Larimer County and east – to resolve delayed water delivery to Timnath customers due to 1041 regulations (L. Ellis, personal communication, Dec 2021).

Potable Annual Water Sales (ac-ft/yr)	• 3,555 (2015)
	  ○ Single family: 2,048 (58%)
	  ○ Multi-family: 107 (3%)
	• Commercial: 484 (14%)
	  ○ Irrigation: 116 (3%)
	  ○ Mobile home: 217 (6%)
	  ○ Wholesale: 365 (10%)
	  ○ Bulk/hydrant: 217 (6%)

Raw Annual Water Sales (ac-ft/yr)	• 1,545 (estimated; average yield minus average sales in 2015)

Water Metrics and Goals	• From (Element Water Consulting, 2016):
	  ○ Reduce treated demands by 740 ac-ft/year in 2035
	  ○ Reduce water system losses to be consistently less than or equal to 10%

Water Shortage Plans and Drought Criteria	• ELCO's Rules and Regulations allow for the implementation of outdoor water use restrictions to reduce demands in the event of drought conditions (Element Water Consulting, 2016).
Wastewater Providers	• Boxelder Sanitation District • Cherry Hills Sanitation District
Development Fees	• (East Larimer County Water District, 2021b)
Monthly Billing Charges	• (East Larimer County Water District, 2021a)
Connections to Agricultural Sector	• ELCO has acquired very little water from the C-BT system since completion of the Pleasant Valley Pipeline and has instead secured senior agricultural water rights that have been or will be the subject of change-of-use applications in Water Court (Element Water Consulting, 2016).
Other Information	• There is a high percentage of customers (approximately 20%) within the ELCO service area estimated to be using non-potable/raw water for irrigation (Element Water Consulting, 2016). • Contract with FCU for the residential sprinkler check-up program.

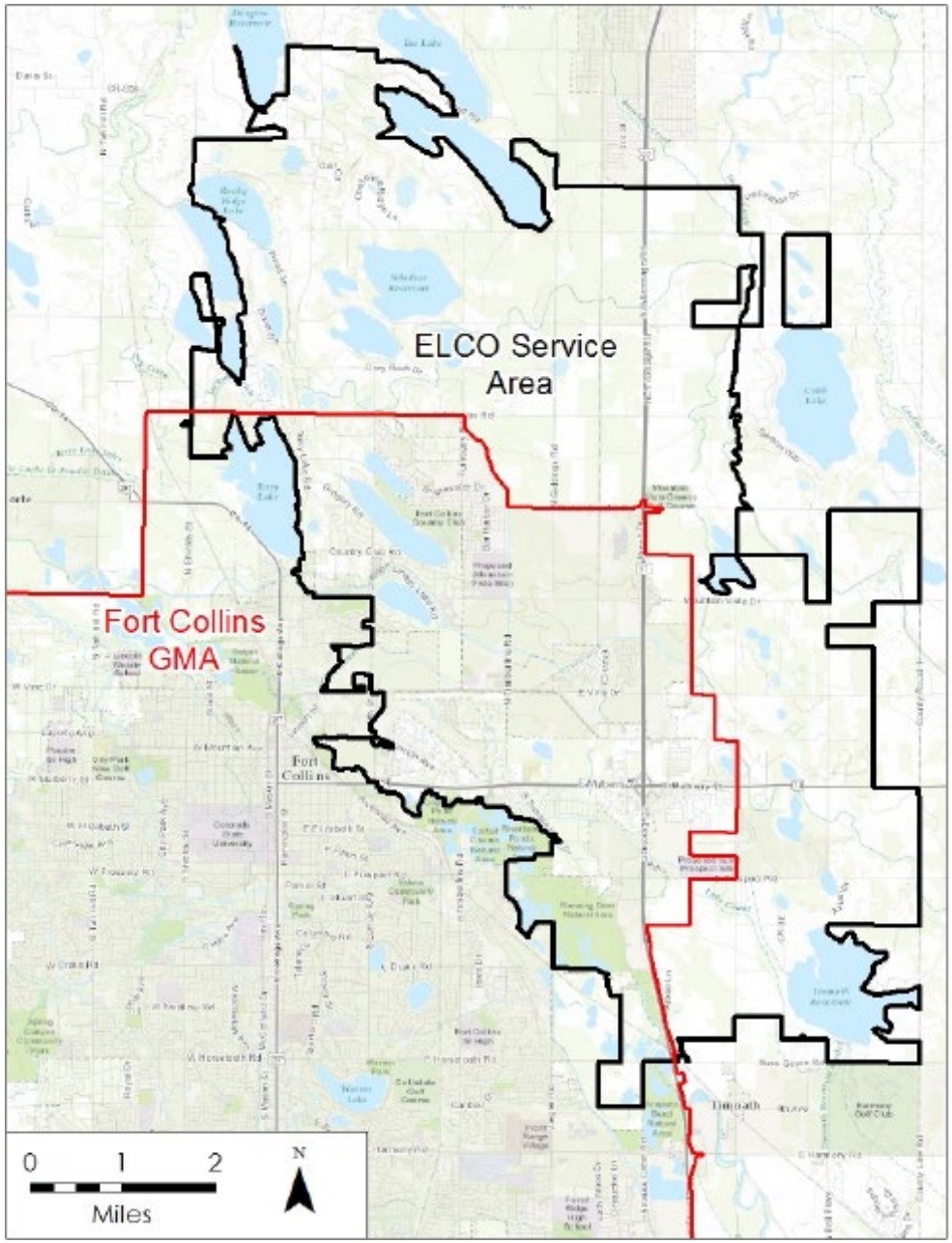

FIGURE 22. ELCO SERVICE AREA AND FORT COLLINS GROWTH MANAGEMENT AREA (ELEMENT WATER CONSULTING, 2016)

TOWN OF ESTES PARK (ESTES PARK)

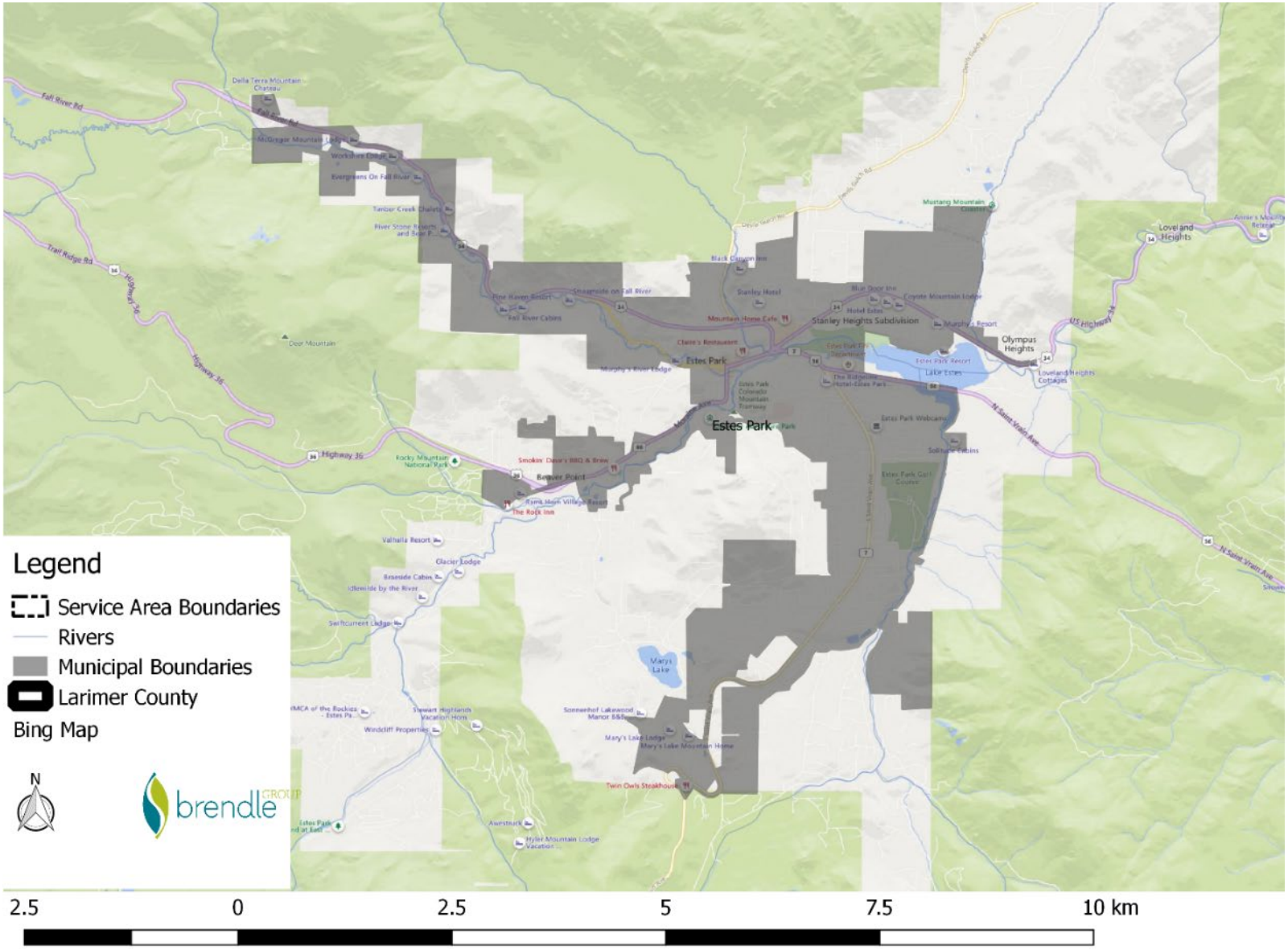

FIGURE 23. ESTES PARK SERVICE AREA

TABLE 7. ESTES PARK PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Town of Estes Park and unincorporated Larimer County (**Figure 23**). The boundary of the Town's water system service area roughly coincides with the boundary of the Estes Valley **(HDR, 2012)**.

Major Wholesale and Contract Customers	• The Town provides water to bulk/wholesale customers (FEI Engineers, 2015):
	  ○ Windcliff Property Owners Association
	  ○ Hondius Water Users Association
	  ○ Park Entrance Mutual Pipeline Water Company
	  ○ John Timothy Stone Cliff Association
	  ○ Spruce Lake RV Park
	• The Town estimates that the existing wholesale bulk water customers were at 80% of buildout in 2012 with no future plans for expansion (HDR, 2012).
	• Rural customers can get water at a dispenser located in Town (HDR, 2012).
	• Rocky Mountain National Park headquarters may have been connected to the Town's water system as a wholesale customer (HDR, 2012).
	• The Town leases 18 ac-ft of water to (FEI Engineers, 2015)
	  ○ Cheley Colorado Camps, Inc.
	  ○ Continental Water Bank, Inc.
	  ○ Glacier View Water System Inc.
	  ○ Mary's Lake Campground Well

Service Population	• Numbers represent peak daily values from (FEI Engineers, 2015)
	  ○ 12,245 (Permanent)
	  ○ 26,971 (Transient)
	  ○ 567 (Non-Transient)
	  ○ 929 (Bulk)

Service Connections	• From (FEI Engineers, 2015; HDR, 2012)
	  ○ 4,850 total connections
	  ○ 4,000 residential connections
	  ○ 850 commercial connections

Buildout Estimates	• Numbers represent peak daily values from (FEI Engineers, 2015)
	• Year: 2034
	• Service population:
	  ○ 13,480-17,823 (Permanent)
	  ○ 29,848 (Transient)
	  ○ 658-839 (Non-Transient)
	  ○ 1,487 (Bulk)
	○ Future water demands:
	  ○ 2,348 ac-ft (HDR, 2012)
	  ○ Average Demand (MGD): 2.5-2.7
	  ○ Peak Demand (MGD): 4.4-5.1
	• A total water treatment plant capacity of 5.0 MGD would be able to supply the Town's peak potable water demands in 2034 for all scenarios except the highest scenario, which includes no conservation, the YMCA emergency supply agreement, and the highest per capita demand value.

Water Supplies	• The town owns transmountain water and native water rights (HDR, 2012).
	• From (FEI Engineers, 2015)
	  ○ Transmountain water
	  ▪ Bureau of Reclamation (USBR) Contract: 500 ac-ft
	  ▪ Colorado Big Thompson (C-BT) Allotment: 1,217 units (1,217 ac-ft max yield at 100% quota)
	  ▪ Windy Gap Allotment: 3 units (300 ac-ft max yield)
	  ○ Native water (all of which are tributary to the Big Thompson River and relatively junior)
	  ▪ Glacier Creek Pipeline: 2 cfs
	  ▪ Estes Park Cascade Diversion: 1.55 cfs
	  ▪ Estes Park Town Company Pipeline and Estes Park Water Company Pipeline Extension: limited to 2 cfs total

Water Yields (ac-ft/yr)	• Firm yield: 4,304.5 ac-ft (assumes all rights are firmed except Estes Park Cascade Diversion which must move through water court)
	• Average yield:
	  ○ Transmountain water: 1,552 ac-ft
	  ▪ 500 ac-ft for Bureau Water
	  ▪ 200 ac-ft for Windy Gap
	  ▪ 852 ac-ft for CBT supply
	• Firm yield if all owned rights were developed: 5,426.5 ac-ft (FEI Engineers, 2015)
	  ○ 500 ac-ft for Bureau Water
	  ○ 300 ac-ft for Windy Gap
	  ○ 608 ac-ft for C-BT supply
	  ○ 1,448 ac-ft for Glacier Creek Pipeline
	  ○ 1,448 ac-ft for Estes Park Town Company and Estes Park Water Company Pipelines
	  ○ 1,122 ac-ft for Estes Park Cascade Diversion4

Assessment of Reuse Potential	• Low - the Town's water rights are largely constrained by an obligation to return flows to the river. The USBR and C-BT water cannot be reused, as return flows are reserved for downstream agricultural users. Windy Gap water can be reused (FEI Engineers, 2015; HDR, 2012).
Notable Information Regarding Water Treatment, Storage, and Distribution	• The existing water system is composed of two water treatment plants, nine storage tanks, two clear wells, and more than 100 miles of pipeline (HDR, 2012). • Mary's Lake Water Treatment Plant (MLWTP) has a treatment capacity of 4.0 MGD and runs Apr-Oct. • Glacier Creek Water Treatment Plant (GCWTP) has a design capacity of 4.0 MGD but produces a maximum of 3.6 MGD for very short periods of time and 2.65 MGD during peak season in reality (FEI Engineers, 2015). It is run Jan-Apr and Jul-Dec. • The drinking water storage tanks provide a total storage capacity of 3.7 MG (HDR, 2012).
System Reliability Information	• The system has sufficient storage capacity and water rights to meet current and future demands if both treatment plants are operational. • The Town has an emergency agreement with the YMCA of the Rockies to provide up to 0.43 MGD (HDR, 2012). • Prospect Mountain Water Company filed bankruptcy and is now owned by the Town (Town of Estes Park, 2021b).

System Vulnerability Information	• **A major renovation project is needed at GCWTP** to replace aging infrastructure, upgrade treatment processes, and meet EPA regulations (HDR, 2012). In May 2021, Town Council approved the WTP upgrade, which is being financed with a grant and low-interest loan through USDA (Estes Park Trail Gazette, 2021).
	• **Neither WTP alone can meet demands year-round.** It would be greatly beneficial to the Town to have a WTP that can be run year-round, which would require securing a second water source to one of the WTPs.
	  ○ MLWTP cannot be operated at full capacity year-round due to USBR water rights and wastewater discharge constraints.
	  ○ GCWTP cannot be operated at maximum flow year-round due to water rights limitations on Glacier Creek (HDR, 2012).
	• The Town continues to firm and develop water rights.
	  ○ The Town's three units (300 ac-ft maximum yield on an annual basis) of supply of Windy Gap water are not firm until Chimney Hollow Reservoir is built.
	  ○ The water right for Glacier Creek Pipeline is relatively junior. To maximize the use of this water right as a source of water for the Town, the water right was included in the Town Augmentation Plan.
	• **Four pressure zones need additional treated water storage to provide adequate storage and fire flows** under current demands (HDR, 2012).

Major Planned Capital Projects	• 10-year pipeline replacement program (FEI Engineers, 2015)
	  ○ Priority 1: Water quality and reliability, line leaks, and high maintenance costs – for example, some pipelines that experience high velocities and pressures and need to be replaced to avoid distribution disruptions.
	  ○ Priority 2: Service quality: low pressure/volume; inadequate sizing for fire protection.
	  ○ Priority 3: Main transmission supply, capacity increase, master planning.
	• 10-year WTP CIP (FEI Engineers, 2015)
	  ○ Expanded wastewater discharge at both WTPs (HDR, 2012). For MLWTP, that entails purchasing additional discharge capacity from Upper Thompson Sanitation District at a cost of $870,000 and $250/d, and would increase MLWTP production to 4 MGD. For GCWTP, that entails purchasing additional discharge capacity from Upper Thompson Sanitation District at a cost of $1,740,000 and $250/d, and would increase GCWTP production to 4 MGD.
	  ○ Upgrade GCWTP to a two-staged membrane plant similar to MLWTP. This upgrade as well as other improvements is expected to cost about $3 million.
	  ○ Add a new point of delivery off the Big Thompson River that would allow water traditionally treated at GCWTP to be treated at MLWTP and vice versa.

Potable Annual Water Sales (ac-ft/yr)	• 1,618.0 ac-ft (FEI Engineers, 2015)
	  ○ Sales were split approximately 50-50 between residential and commercial customers as of 2006 (HDR, 2012).
	  ○ Since the primary industry of Estes Park is tourism, many of the commercial customers include lodging and restaurants. The top 10 water users represent about 15% of water demands: 7 are lodging, 2 are schools/school districts, and 1 is a medical center (HDR, 2012).

Raw Annual Water Sales (ac-ft/yr)	• None found

Water Metrics and Goals	• Given the nature of Estes Park as a tourist destination, primarily in the summer, the Town operates almost entirely in terms of "peak" demand, population, etc.
	• From (FEI Engineers, 2015)
	  ○ Average Potable Water Demand (1993-2013): 1.7-2.2 MGD
	  ○ Peak Potable Water Demand (1993-2013): 2.5-4.3 MGD
	  ○ Projected 2034 Water Demand MGD (2034): 2.5-5.1 MGD
	  ○ There was a 34 percent reduction in per capita demand from 2003-2015 despite population growth.
	  ○ The Town aims to achieve 10% reduction in per capita demand by 2034.
	• From (HDR, 2012)
	  ○ Water use was 93 gpcd in 2006. Per capita water usage is relatively low given that there is negligible irrigation water usage and the number of tourists, who use significantly less water than the permanent population.
	  ○ The Town aims to reduce annual treated water production volumes by 3%.

Water Shortage Plans and Drought Criteria	• The Town has a three-stage drought plan that depends on which WTPs are operating; water use restrictions increase as one or both water sources and WTPs lose function (HDR, 2012). • The Town has considered but not implemented drought rate structures (Appendix to (FEI Engineers, 2015)).
Wastewater Providers	• Upper Thompson Sanitation District (HDR, 2012) • Estes Park Sanitation District (CDPS# CO-0020290) provides wastewater treatment to an estimated 3,200 full-time residents. During the peak summer season, the customer base increases by a factor of two to three (Town of Estes Park, 2021a; HDR, 2012).
Development Fees	• Latest fees are at (Town of Estes Park, 2021a)
Monthly Billing Charges	• Latest rates are at (Town of Estes Park, 2021a) • The Town has considered but not implemented seasonal conservation-oriented rates, which would increase water rates and revenues during the summer to better reflect higher demands and operating costs during the tourism season.
Connections to Agricultural Sector	• None identified
Other Information	• Very little water demand in Estes Park is attributable to irrigation. Landscape plantings are at high risk of survival due to the grazing of natural wildlife (elk and deer) so typical landscaping throughout the Estes Valley is natural vegetation (HDR, 2012). • A portion of surplus C-BT and Windy Gap water is sold to smaller water users that have agreements with the Town (HDR, 2012).

FORT COLLINS-LOVELAND WATER DISTRICT (FCLWD)

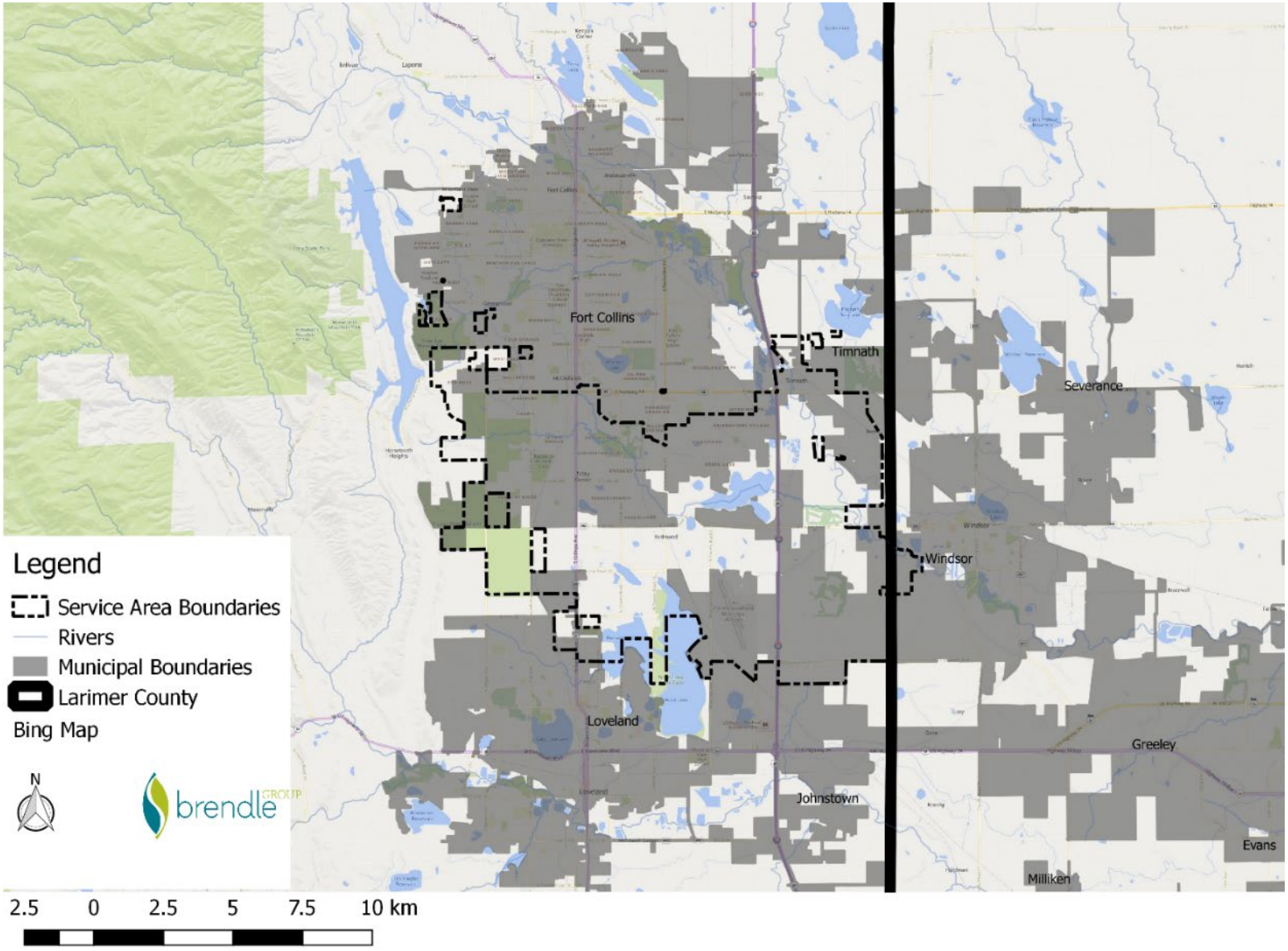

FIGURE 24. FCLWD SERVICE AREA

TABLE 8. FCLWD PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Fort Collins (generally south of Harmony Road); Loveland (generally north of 37th Street); and the unincorporated areas in between extending east to the Larimer-Weld County Border, and west to the foothills (**Figure 24**) **(Clear Water Solutions, 2015a)**.
Major Wholesale and Contract Customers	• The Town of Windsor is a **wholesale account** responsible for acquiring its own raw water supplies which are **transferred to FCLWD** on an annual basis for treatment and delivery (Clear Water Solutions, 2015a)
Service Population	• 42,490 (Clear Water Solutions, 2015a)
Service Connections	• 16,343 (Clear Water Solutions, 2015a)

Buildout Estimates	• From (Clear Water Solutions, 2015a):
	  ○ Year: 2024 (planning period)
	  ○ Service population: 52,725
	  ○ Future water demands: 14,204 ac-ft/year
	  ▪ Residential: 9,366 ac-ft/year
	  ▪ Residential Multiuse: 320 ac-ft/year
	  ▪ Non-residential: 1,739 ac-ft/year
	  ▪ Irrigation: 1,589 ac-ft/yr
	  ▪ Other: 520 ac-ft/yr

Water Supplies	• From (Clear Water Solutions, 2015a):
	  ○ Colorado Big Thompson (C-BT Project): 11,294 units
	  ○ Agricultural water rights that divert water from the Cache la Poudre River (includes shares in several ditch and reservoir companies):
	  ▪ North Poudre Irrigation Company (NPIC) shares: 1,168 shares
	  ▪ Josh Ames Certificates: 175 ac-ft
	  ▪ Windsor Reservoir & Canal Co: 37.5 shares
	  ▪ Jackson Ditch Company: 1.04 shares
	  ▪ John R Brown Private Ditch: 42%
	  ▪ Pleasant Valley Pipeline Junior Water Right: 42%
	  ▪ Larimer Co Canal No. 2 (non-potable): 0.42 shares
	  ▪ Divide Canal & Reservoir Co Class A: 1,238 shares
	  ▪ Divide Canal & Reservoir Co Class B: 41.5 shares
	  ▪ New Mercer Canal: 0.063 shares
	• FCU provides about 1,000 ac-ft/yr to FCLWD from a now defunct agreement where developers met FCU water requirements and FCU provides treated water to FCLWD (D. Dustin, personal communication).

Water Yields (ac-ft/yr)	• From (Clear Water Solutions, 2015a):
	  ○ 10,675 ac-ft/yr firm yield
	  ○ 14,886 ac-ft/yr average yield

Assessment of Reuse Potential	• Low
	  ○ CB-T cannot be reused, as return flows are reserved for downstream agricultural users
	  ○ Local Poudre supplies cannot be reused unless exchange rights are acquired

Notable Information Regarding Water Treatment, Storage, and Distribution	• From (Clear Water Solutions, 2015a):
	  • The District receives its **treated water from the SCFP** which is jointly owned by the Tri-Districts (FCLWD, North Weld County Water District, and East Larimer County Water District).
	  • Water is delivered to the SCFP plant from Horsetooth Reservoir which is part of the Colorado-Big Thompson Project.
	  • The District can also bring water to the plant through the jointly owned Pleasant Valley Pipeline. The District's distribution system includes storage capacity at SCFP as well as four other storage facilities throughout the water system.
	  • SCFP has a treatment capacity of 50 MGD, and there is a total of 9.25 MG of treated water storage at the other storage facilities throughout the system.
	  • The FCLWD system includes eight pump stations and 400 miles of pipeline.
	• The City of Fort Collins and FCLWD have various intergovernmental agreements that relate to water sales, treatment capacity, and pipeline capacity (D. Dustin, personal communication).

System Reliability Information	• From (Clear Water Solutions, 2015a):
	  ○ In anticipation of the gradual disappearance of new available C-BT water, the District committed funds to participate in the Pleasant Valley Pipeline to help diversify source water supplies.
	  ○ Approximately 90 percent of the District's customers' meters are equipped with Automatic Meter Infrastructure (AMI) capabilities, which is highly beneficial in researching potential leaks.

System Vulnerability Information	• From (Clear Water Solutions, 2015a):
	  ○ The C-BT system was originally designed as a supplemental supply to native water rights.
	  ○ Because the SCFP is the sole source of treated water for the District, the District is currently limited to where it can obtain future supplies. **Only water that can be treated by the SCFP can be acquired unless FCLWD is a part of constructing future water treatment facilities**.
	  ○ C-BT supplies are stored in Lake Granby on the western slope of Colorado. Should a fire occur in the area, water quality would be a major issue for FCLWD and other C-BT Allottees. There is a tremendous amount of beetle kill damage to trees surrounding Lake Granby, Grand Lake, and the other C-BT storage facilities. The debris from beetle kill damage poses a potential increased fire risk. FCLWD would be vulnerable to SCFP's abilities to treat the degraded water quality.
	  ○ The District currently has **limited raw water storage** beyond that associated with the C-BT system. According to a 2005 raw water storage needs assessment, FCLWD would need 6,640 ac-ft of total storage at build-out.
	  ○ Since the majority of the original pipelines from the SCFP to the District were installed between 1962 and 1963 and consist mostly of steel and asbestos concrete, **they may need to be replaced in the near future.**

Major Planned Capital Projects	• From (Clear Water Solutions, 2015a):
	  ○ FCLWD plans to obtain storage capacity at several locations along the Poudre River.
	  ○ When completed, the Overland Trail Ponds project will store approximately 4,700 ac-ft. Existing and future gravel pits on land owned by the water providers will continue to be sealed and configured to divert water from the Poudre River when it is available. Water stored in the Overland Trail Ponds will be released back to the Poudre to meet return flow obligations, exchanged for water diverted at the Pleasant Valley Pipeline, or pumped to SCFP for treatment. Work on lining the existing gravel pits and installing the necessary infrastructure began in 2008. It will take approximately 20 years before all of the property is mined and the gravel pits are sealed.
	  ○ Northern Water is acting on behalf of FCLWD and 14 other northern Colorado communities and water providers to apply for a federal permit to build the Northern Integrated Supply Project (NISP). NISP is a regional water supply and storage project that will provide the participants with 40,000 ac-ft of new municipal water storage and supply. The planned facilities include Glade Reservoir, Galeton Reservoir, a pumping facility, a pipeline to deliver water for exchange with two irrigation companies and needed improvements to an existing canal to fill Glade Reservoir.
	• From (Fort Collins-Loveland Water District, 2018):
	  ○ FCLWD projects $320.8 million in capital improvement plan expenditures from 2018-2030 (including raw water, source of supply, treatment, pumps, and transmission mains).

Potable Annual Water Sales (ac-ft/yr)	• 8,417 (Clear Water Solutions, 2015a):
	  ○ Residential: 5,719
	  ○ Residential Multiuse: 229
	  ○ Non-Residential: 1,156
	  ○ Irrigation: 971
	  ○ Other: 342

Raw Annual Water Sales (ac-ft/yr)	• No information found

Water Metrics and Goals	• From (Clear Water Solutions, 2015a):
	  ○ Lower total water use by 10% over the 10-year planning period (through 2024)
	  ○ Targeted ten-year water savings goal for customer categories (through 2024)
	  ▪ Residential: 12%
	  ▪ Residential Multiuse: 5%
	  ▪ Non-Residential: 3%
	  ▪ Irrigation: 11%
	  ▪ Other: 1%
	  ▪ Non-Revenue Water: 10% (10% reduction of current 4.7%)
	  ○ Develop a water efficiency program that can be implemented within District staffing constraints and with Staff approval

Water Shortage Plans and Drought Criteria	• FCLWD introduced **drought rates** in 2003, is continuously evaluating its rate structure, and may add additional rate tiers for high usage customers (Clear Water Solutions, 2015a) • FCLWD's staff continuously monitors streamflow conditions, snowpack, and water right yields, and ensures there is sufficient supply in storage (in anticipation of the next drought) (Fort Collins-Loveland Water District, 2019)
Wastewater Providers	• South Fort Collins Sanitation District
Development Fees	• (Fort Collins-Loveland Water District, 2021)
Monthly Billing Charges	• (Fort Collins-Loveland Water District, 2021)

Connections to Agricultural Sector	• From (Clear Water Solutions, 2015a):
	  ○ The District owns agricultural water rights that divert water from the Cache la Poudre River including shares in several ditch and reservoir companies. Many of these water rights are decreed for agricultural use only, so are exchanged on an annual basis for C-BT water when possible. When no C-BT water is available for exchange, **the water rights are rented for agricultural use and not available for FCLWD supply**.
	  ○ North Poudre Irrigation Company (NPIC) owns 40,000 C-BT units, so its shares include both C-BT and native flows. The C-BT water is delivered equally to the 10,000 shares within the NPIC system for agricultural, municipal, and industrial use.

Other Information	• FCLWD participates in FCU's residential sprinkler check-up program.

FORT COLLINS UTILITIES (FCU)

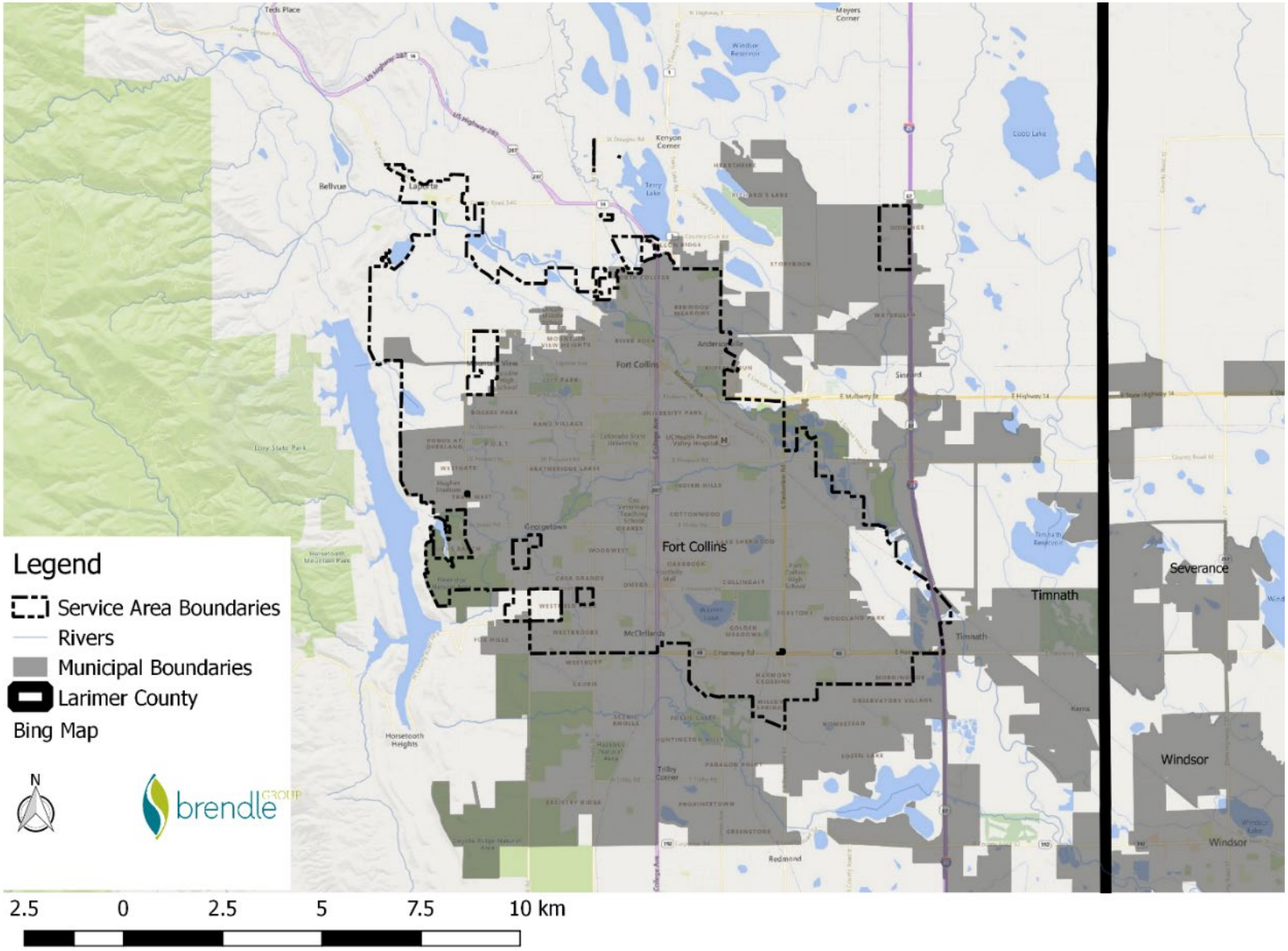

FIGURE 25. FORT COLLINS UTILITIES SERVICE AREA

TABLE 9. FORT COLLINS UTILITIES PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Fort Collins (75% of residences and businesses) • Unincorporated Larimer County primarily northwest of Fort Collins. Small unincorporated pockets west and east of Fort Collins (**Figure 25**)
Major Wholesale and Contract Customers	• West Fort Collins Water District (WFCWD) • CSU's system purchases water from Fort Collins (C. Dollard, personal communication) • FCU has other wholesale and contract customers that are not listed publicly (A. Neel, personal communication). • FCU provides about 1,000 ac-ft/yr to FCLWD from a now defunct agreement where developers met FCU water requirements and FCU provides treated water to FCLWD (D. Dustin, personal communication).
Service Population	• 130,200 residents (City of Fort Collins, 2015)
Service Connections	• 34,298 (City of Fort Collins, 2015)

Buildout Estimates	• From (AMEC Environment & Infrastructure, 2014)
	  ○ Year: 2050 (not specified as buildout year – longest planning horizon found used by FCU)
	  ○ Service population: 165,000 residents
	  ○ Future water demands
	  ▪ Metered use, treated: 37,400 ac-ft/yr
	  ▪ Large contractual use, treated: 8,500 ac-ft/yr
	  ▪ Raw water: Growth is not quantified City assumes that any growth will be accompanied by additional water rights.

Water Supplies	• Surface water from the Cache la Poudre River watershed, the North Platte River watershed (i.e., Michigan River), and transmountain water from the Colorado-Big Thompson (C-BT) project • 18,855 shares of C-BT as of 2011 (AMEC Environment & Infrastructure, 2014)

Water Yields (ac-ft/yr)

- From (AMEC Environment & Infrastructure, 2014)
  - 31,000 ac-ft/yr firm field (based on a 1-in-50 year drought)
  - 55,000 ac-ft/yr on average now
- **Table 10** presents a summary of water yield by source.
  - The Southside ditches refer to Arthur, Larimer No. 2, New Mercer, and Warren Lake irrigation companies.
  - The miscellaneous category includes relatively small contributors including shares in Chaffee Ditch, Boxelder Irrigation Ditch Company, Lake Canal Company, Louden Irrigating Canal and Reservoir Company.

TABLE 10. 2014 RAW WATER YIELD (CITY OF FORT COLLINS, 2015)

Source	acre-feet
Poudre River Direct Flow	11,300
Joe Wright-Michigan Ditch	5,500
Northern Water (C-BT)	14,330
North Poudre Irrigation Company	19,850
Pleasant Valley & Lake Canal Company	7,760
PRPA Reuse Plan	2,310
Southside Ditches	10,760
Water Supply and Storage Company	2,240
Miscellaneous	1,195
Total	**75,245**

Assessment of Reuse Potential

- From (City of Fort Collins, 2015)
  - Much of the Michigan Ditch and Joe Wright Reservoir water and portions of the Southside Ditches water that has been converted from agricultural use to municipal use can be reused.
  - A sizeable portion of the Utilities treated water supplies are reusable. Much of this is used as part of a Reuse Plan which involves the City, Water Supply and Storage Company (WSSC) and Platte River Power Authority (PRPA). Reusable sources owned by the City and WSSC are used by Utilities' customers and the reusable effluent is used by PRPA at their Rawhide Power Plant facility. In turn, PRPA provides Windy Gap water to the City.
- City council established greywater as a 2022 council priority (A. Neel, personal communication).

Notable Information Regarding Water Treatment, Storage, and Distribution

- One water treatment plant (87 MGD)
- Major raw water storage reservoirs: Joe Wright (7,400 ac-ft), Rigden (1,900 ac-ft) plus reservoirs under the WTP can store 37 MG (City of Fort Collins, 2021c). Although FCU owns Halligan Reservoir, NPIC owns the water in it. FCU will get storage capacity if the Halligan Water Supply Project is built (D. Dustin, personal communication).

System Reliability Information	• FCU has **excess treatment capacity at the Water Treatment Plant** - treatment capacity of 87 MGD versus summer peak demand of 50 MGD (City of Fort Collins, 2021c). FCU currently treats up to 5 MGD for Fort Collins-Loveland Water District. • FCU has **emergency interconnects with six other water systems** (AMEC Environment & Infrastructure, 2014).

System Vulnerability Information	• The major identified risk is **additional water storage capacity** (AMEC Environment & Infrastructure, 2014), both long-term storage for carryover and better utilization of existing water rights as well as short-term storage for operational flexibility and meeting return flow obligations. Fort Collins has the lowest amount of storage per capita among surveyed peer providers.
	• No easy solutions remain to increase firm yields. Although the City has an abundance of converted agricultural rights that yield more than needed in most years, these **rights yield very little in dry years.** These rights do not provide a sufficient yield during the shoulder months nor do they increase firm yield (AMEC Environment & Infrastructure, 2014).
	• FCU has modeled the impacts of climate, demand, and system risks on water supply availability (Stantec and RTI International, 2019). Table ES-1 contains a detailed list of risks and uncertainties. In addition to additional storage, the other 3 major identified risks are:
	  ○ Change to reuse plan
	  ○ Increase in demands above expected levels
	  ○ Long-term reduction in C-BT quota
	• Need for meeting return flow obligations and increased accounting complexity associated with water rights that have been converted from agricultural to municipal use.
	• Aging infrastructure. At a recent City Council work session, FCU staff highlighted the following (City of Fort Collins, 2021c):
	  ○ The pipe network that conveys Poudre River Water through the Canyon and ultimately to the Water Treatment Facility is between 70-100 years old and **needs to be maintained and/or replaced to avoid flow interruptions and pipe failures**.
	  ○ The utility (0.5%) is **not meeting industry benchmarks (1%) for replacement of distribution lines.** Much of the distribution system in Downtown Fort Collins is the original cast iron pipe, with some of it exceeding 130 years in service. The typical expected life is 50-70 years for metal pipe systems and 100 years for PVC pipe.

Major Planned Capital Projects	• Halligan Reservoir expansion - increased utilization of Poudre water by adding 8,100 ac-ft of storage (City of Fort Collins, 2021c) • Northern Integrated Supply Project (increased utilization C-BT water) – FCU is not participating in it, but parts of the City served by FCLWD would benefit from this project (City of Fort Collins, 2021d).

Potable Annual Water Sales (ac-ft/yr)	• 24,807 Total
	  ○ Single-family: 32%
	  ○ Duplex: 2%
	  ○ Multi-family: 14%
	  ○ Commercial: 44%
	  ○ City government: 2%
	  ○ WFCWD: 2%
	  ○ Outside city customers: 4%

Raw Annual Water Sales (ac-ft/yr)	• 7,500 Total (AMEC Environment & Infrastructure, 2014)
	  ○ City parks and golf courses: 53%
	  ○ Contract: 47%

Water Metrics and Goals	• 138 gpcd for 2020 (City of Fort Collins, 2021a) • Water supply planning level: 150 gpcd (City of Fort Collins, 2012; AMEC Environment & Infrastructure, 2014) • Conservation target: 130 gpcd by 2030 (City of Fort Collins, 2015)
Water Shortage Plans and Drought Criteria	• Planning target: 1-in-50-year drought (City of Fort Collins, 2012; AMEC Environment & Infrastructure, 2014) • Storage reserve factor: Maintain 20% of annual demands in storage through a 1-in-50-year drought (City of Fort Collins, 2012; AMEC Environment & Infrastructure, 2014) • Has a water shortage action plan (City of Fort Collins, 2020) • Has a water waste ordinance (A. Neel, personal communication)
Wastewater Providers	• Primarily Fort Collins Utilities. Drake Water Reclamation Facility (23 MGD) effluent is sent to Rawhide Power Plant; Mulberry Reclamation Facility (6 MGD) effluent is discharged to Poudre • Possibly very small areas of Boxelder Sanitation District and South Fort Collins Sanitation District
Development Fees	• (City of Fort Collins, n.d.)
Monthly Billing Charges	• (City of Fort Collins, 2020)

Connections to Agricultural Sector	• Purchases water rights decreed for agricultural use.
	• Has a **policy to refrain from converting these rights to municipal use as long as other water sources remain adequate** (City of Fort Collins, 2012; AMEC Environment & Infrastructure, 2014)
	• Has a raw water rental program that leases about 25,500 ac-ft/yr, primarily for irrigation (City of Fort Collins, 2021b; AMEC Environment & Infrastructure, 2014)
	  ○ Major sources include:
	  ▪ North Poudre Irrigation Company (NPIC)
	  ▪ Water Supply and Storage Company (WSSC)
	  ▪ Colorado-Big Thompson (CBT)
	  ○ Minor sources include:
	  ▪ Southside Ditches
	  ▪ Pleasant Valley and Lake Canal Company
	  ▪ Fully consumable supplies

LITTLE THOMPSON WATER DISTRICT (LTWD)

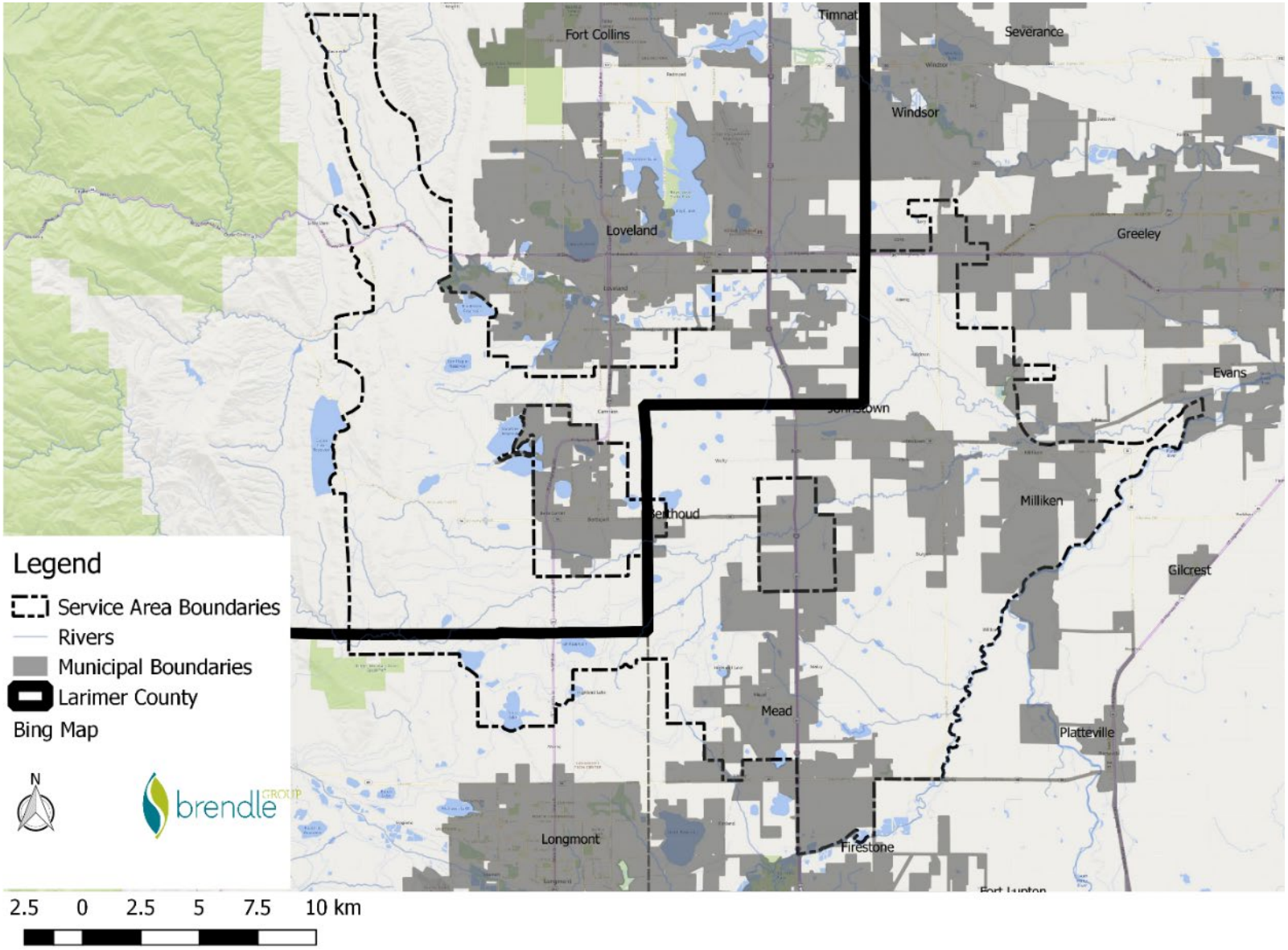

FIGURE 26. LTWD SERVICE AREA

TABLE 11. LTWD PROVIDER CHARACTERISTICS

Land Use Authorities Served	• LTWD is a special district water provider serving 300 sq-mi area within Larimer, Weld, and Boulder Counties. The service area is generally bounded by the City of Loveland on the north; the City of Longmont on the south; the City of Greeley, the South Platte River and the St. Vrain River on the east; and the foothills of the Front Range on the west **(Little Thompson Water District, 2019)**. • The District serves ten municipalities, nine fire districts, and three counties. The service area includes unincorporated Larimer County, unincorporated Weld County, Mead, Johnstown, and Milliken, as well as small portions of Berthoud, Evans, Firestone, Greeley, Loveland, Longmont, Windsor, and unincorporated Boulder County (**Figure 26**).
Major Wholesale and Contract Customers	• Wholesale customers include the Town of Berthoud, Longs Peak Water District (LPWD), and North Carter Lake Water District (NCLWD). These entities transfer raw water to the District monthly for treatment and delivery (Little Thompson Water District, 2019).
Service Population	• Approximately 21,000 people – the service population is difficult to determine precisely because service is provided to many different governing entities (Little Thompson Water District, 2019)

Service Connections	• 8,268 total taps (Little Thompson Water District, 2019)
	  ○ 7,621 residential
	  ○ 296 non-residential
	  ○ 12 wholesale taps
	  ○ 363 inactive/intermittent

Buildout Estimates	• From (Little Thompson Water District, 2019)
	  ○ Year: 2040
	  ○ Demands: 10,350 ac-ft (conserved water was not included in these projections).
	  ○ Service population: 38,000
	  ○ Population & water demand growth projections:
	  ○ 2020 – 2% – 6,675 ac-ft
	  ○ 2025 – 2.6% – 7,591 ac-ft
	  ○ 2030 – 3.4% – 11,543 ac-ft
	  ○ 2040 – 1.4% – 10,350 ac-ft

Water Supplies	• From (Little Thompson Water District, 2019)
	  ○ Transmountain water
	  ▪ District relies on Colorado-Big Thompson (C-BT) water as its main water supply source. Each unit yields a max of 1 ac-ft/yr. LTWD owns 10,345 units of C-BT (5,274 fixed quota, 4,971 variable quota, 100 Griep Farm)
	  ▪ District owns 19 units (max yield 100 ac-ft/yr per unit) of Windy Gap water, which are based upon a moderately junior water right on the Fraser and Upper Colorado Rivers. 12 of the units were dedicated by and will serve the Brookfield development. 7 of the units were acquired by LTWD.
	  ○ Native water
	  ▪ District owns shares in local ditch companies (Big Thompson Ditch and Manufacturing Company, Consolidated Home Supply Ditch Company, Handy Ditch Company, and Boulder and Larimer Ditch) but currently cannot use this supply as the rights are decreed for agricultural use (Little Thompson Water District, 2019).

Water Yields (ac-ft/yr)	• From (Little Thompson Water District, 2019; Little Thompson Water District, 2018)
	• Current values
	  ○ Firm yield = 6,167-6,228 (all from C-BT supplies)
	  ○ Average yield = 7,343 (all from C-BT supplies)
	  ○ 2018 actual yield = 7,799 (mostly from C-BT, a little from Windy Gap)
	• Potential to increase firm yield once fully developed
	  ○ Windy Gap units +1,900
	  ○ Native water shares +358.9
	• Potential to increase average yield once fully developed
	  ○ Windy Gap units +1,900
	  ○ Native water shares +1,125

Assessment of Reuse Potential	• Low/Medium. C-BT water cannot be reused, as return flows are reserved for downstream agricultural users. Windy Gap water can be reused. Native water cannot be reused without exchange and augmentation. • Approximately 1% of the total water production is recycled filter backwash water that has been treated (Little Thompson Water District, 2019).

Notable Information Regarding Water Treatment, Storage, and Distribution	• To provide potable water service, the District jointly owns and operates the Carter Lake Filter Plant (CLFP) and Dry Creek Reservoir with the Central Weld County Water District (CWCWD). The water treatment plant and reservoir are both located west of Berthoud, Colorado. CWCWD and the District also jointly own transmission pipelines that originate at the CLFP. • CLFP consists of a North Plant (30 MGD, dated 1962) and a South Plant (20 MGD, dated 1995-2001) with a combined capacity of approximately 50 MGD. • LTWD is a participant in the St. Vrain Water Authority, a treatment authority on the St. Vrain River. This facility is nearing completion of construction and will eventually be the location of treatment for the reuse of the District's Windy Gap units. LTWD has a reserved capacity of 0.25 MGD but expects its use of the facility to grow significantly from that (A. Kauffman, personal communication). • District owns one half of Dry Creek Reservoir storage equating to approximately 5,000 ac-ft. Dry Creek Reservoir is primarily used for drought storage. • The District owns and maintains multiple treated water storage tanks and pumping stations, as well as over 600 miles of transmission and distribution pipelines throughout its service area. There are approximately 50 pressure zones. • The 12 Windy Gap units dedicated by the Brookfield development will be stored at Chimney Hollow Reservoir when that project is complete. The remaining 7 units will be stored in Dry Creek Reservoir, as the District is not directly participating in the Windy Gap Firming Project.
System Reliability Information	• Currently the District r**elies solely on C-BT water**, but since 2003 the District has been diversifying its water rights portfolio to make it more resilient to drought conditions and a potential call on the Colorado River. The District **started accepting local ditch shares** for water dedication and acquiring Windy Gap units. These water rights will diversify LTWD's supplies as they are brought online.
System Vulnerability Information	• The District is **experiencing unprecedented growth.** It is difficult for developers to acquire acceptable, affordable water supplies to accommodate new demand, but these supplies are necessary to ensure the District maintains its system reliability and drought protection. Although the District has sufficient water to meet the needs of its customers in the near term, it **must begin acquiring new supplies and firming existing supplies now** as it takes time and resources to make water supplies available to meet demands. The District estimated in its Master Plan that there would be sufficient yield to meet estimated demands until approximately 2021. If all water rights firming and storage projects are completed as planned, LTWD anticipates average yields would satisfy demands through 2040; firm yields would satisfy demands until 2028 (Little Thompson Water District, 2019; Little Thompson Water District, 2018).

Major Planned Capital Projects	• The highest priority projects are (Little Thompson Water District, 2018):
	  ○ Allocate sufficient Dry Creek Storage to firm the District's Windy Gap units
	  ○ Change of use of the District's Home Supply shares
	  ○ Quantify and reuse Windy Gap units
	  ○ Pursue options for additional storage in the Big Thompson and Lower St. Vrain basin.
	  ○ Change of use of the District's Handy Ditch shares.
	• The District **needs more raw water storage**, which would allow the District to retain water not needed in one year for use in a drought year as well as increase the yield of the District's other water supplies, which would allow the District to be more prepared for drought years.
	  ○ Barefoot Lakes Development (5,000 residential units) includes two linked and lined gravel pits with 900 ac-ft of storage. The District has a decree to fill the lakes to be used as an amenity for the development, or a source of non-potable water, or storage of Windy Gap reuse water.
	• The District is incrementally replacing all customer meters with AMR meters (Little Thompson Water District, 2019).

Potable Annual Water Sales (ac-ft/yr)	• Total: 6,728 ac-ft in 2018 (Little Thompson Water District, 2019)
	  ○ Residential: 3,996
	  ○ Non-residential: 1,370
	  ○ Bulk water: 289
	  ○ Wholesale: 1,073

Raw Annual Water Sales (ac-ft/yr)	• None. The District has been meeting with developers interested in non-potable systems but no specific plans for a non-potable system have been presented (Little Thompson Water District, 2019).

Water Metrics and Goals	• From (Little Thompson Water District, 2019)
	  ○ Residential per capita water use: 180 gpcd in 2018
	  ○ Water efficiency goals:
	  ▪ Keep water losses under 600 ac-ft annually
	  ▪ Reduce real losses by 200 ac-ft, or 10%
	  ▪ Reduce residential use by 150 ac-ft, or 5%
	  ▪ Reduce non-residential use by 25 ac-ft, or 2%.

Water Shortage Plans and Drought Criteria	• Dry Creek Reservoir is currently used for drought storage. • LTWD first developed a water shortage contingency plan in response to the 2002 drought. The plan was last updated in Nov 2021 (Little Thompson Water District, 2021c). ○ There are 3 action levels that are triggered based on C-BT quotas, storage levels, or demands exceeding supplies.

Wastewater Providers	• City of Loveland • St. Vrain Sanitation District • Town of Berthoud • Town of Johnstown • Town of Mead • Town of Milliken
Development Fees	• LTWD offers non-residential and three types of residential taps (indoor use only, conservation a.k.a. urban, standard). Current fees are located at (Little Thompson Water District, 2021b).
Monthly Billing Charges	• LTWD offers non-residential and three types of residential rate structures (indoor use only, conservation a.k.a. urban, standard). Current rates are located at (Little Thompson Water District, 2020).
Connections to Agricultural Sector	• The majority of early customers included agricultural users that needed water for operations including feedlots and dairies. The District added residential and non-residential accounts starting in the 1960s. • Although the majority of the District's service area is still zoned for agriculture, the trend of increasing residential and commercial zoning is expected to continue. • The District has filed a change of use application to the Water Court so it can use Consolidated Home Supply shares to meet future potable demands (A. Kauffman, personal communication). Until then, the ditch shares are rented for agricultural use (Little Thompson Water District, 2019).

CITY OF LOVELAND (LOVELAND)

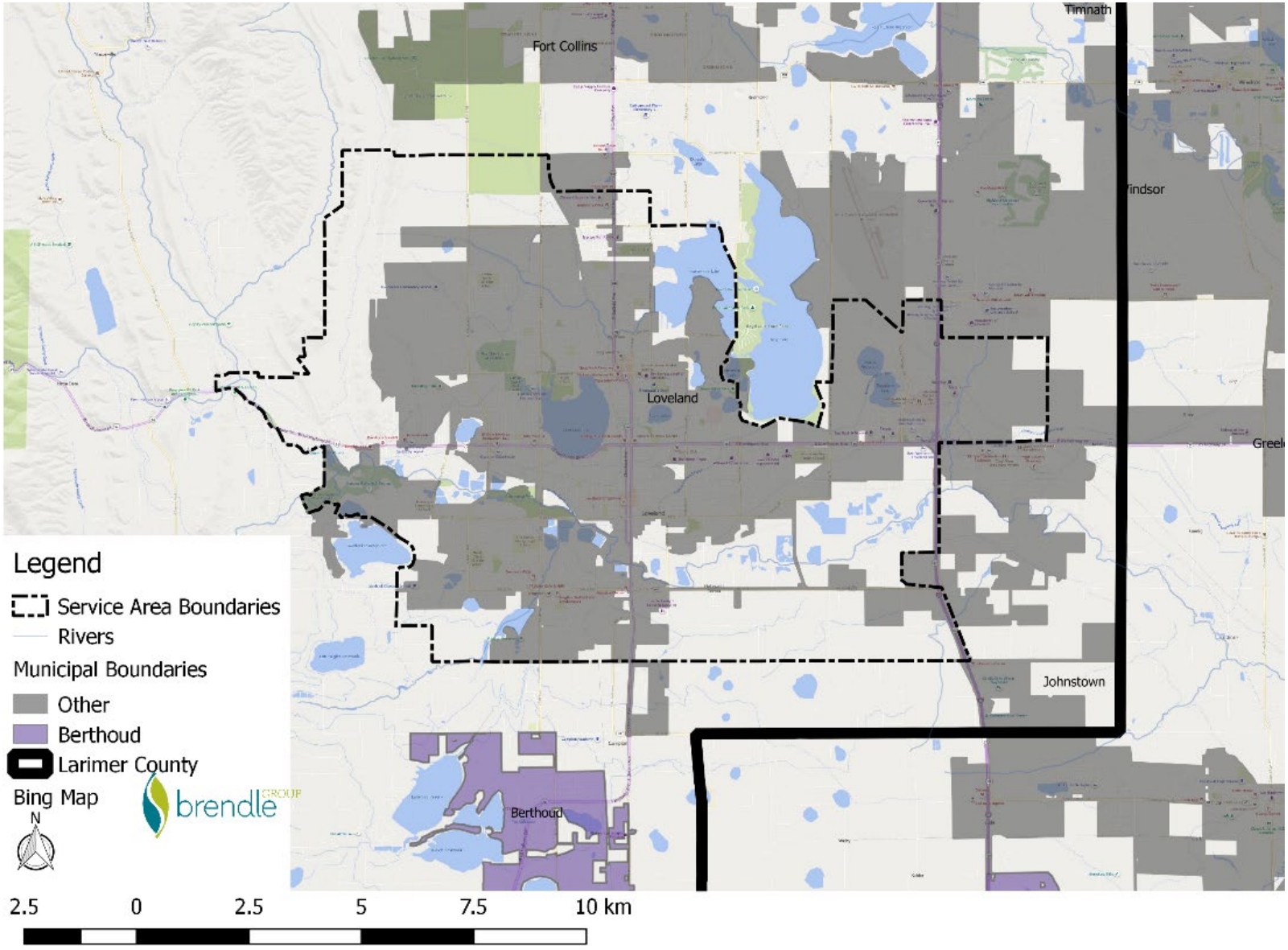

FIGURE 27. LOVELAND WATER SERVICE AREA CIRCA 2021 (CITY OF LOVELAND, PERSONAL COMMUNICATION, JANUARY 2022)

TABLE 12. LOVELAND PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Most of City of Loveland, a tiny portion of Johnstown, and unincorporated area in all directions around the City of Loveland (**Figure 27**, Error! Reference source not found.**). The service areas northwest of Loveland are outside of Loveland's Growth Management Area.**

Major Wholesale and Contract Customers	• From (City of Loveland, 2020a), wholesale water represents less than 1% of treated water demands, and is sold to:
	  ○ Little Thompson Water District
	  ○ Fort Collins-Loveland Water District
	  ○ City of Greeley

Service Population	• 77,262 (City of Loveland, 2020a)

Service Connections	• 26,968 (City of Loveland, 2020a)
	  ○ Single Family Residential 23,914
	  ○ Multi-Family Residential 1,383
	  ○ Irrigation Only 397
	  ○ Commercial 1,200
	  ○ City Uses 74

Buildout Estimates	• From (City of Loveland, 2020a)
	  ○ Year: 2060 (planning horizon)
	  ○ Service population: 137,366
	  ○ Future water demands: 26,179 ac-ft
	  ▪ 25,589 ac-ft to satisfy municipal demands (potable)
	  ▪ 590 ac-ft to satisfy augmentation and irrigation requirements (non-potable)

Water Supplies	• From (City of Loveland, 2020a; City of Loveland, 2020b)
	  ○ Native (tributary to Big Thompson River)
	  ▪ Various existing and pending water court applications – see Table 3-A in (City of Loveland, 2020b)
	  ▪ For ownership in ditch companies, see Table 3-B in (City of Loveland, 2020b)
	  ○ Transmountain
	  ▪ Colorado-Big Thompson (C-BT): 12,190-12,210 units (max yield of 1 ac-ft per unit)
	  ▪ Windy Gap project: 40 units (max yield of 100 ac-ft per unit)
	  ▪ Eureka Ditch 180 ac-ft

Water Yields (ac-ft/yr)	• From (City of Loveland, 2020a; City of Loveland, 2020b)
	  ○ Firm yield
	  ▪ 24,870-25,120 (now)
	  ▪ 28,600-29,080 pending Windy Gap firming project
	  ▪ 30,740-30,890 pending Windy Gap firming project and Great Western Reservoir (estimated by 2031)
	  ▪ Transfer of native ditch shares +537 ac-ft

Assessment of Reuse Potential	• Portions of Loveland's water portfolio includes reusable supplies originating under specific terms and conditions described in its decrees. In addition, the City's Windy Gap water is reusable. Reusing these water sources increases overall firm yield, making reuse an important component of its current and future raw water supplies (City of Loveland, 2020a). • The City uses non-potable water to irrigate the 23-acre grounds of Loveland's Water Reclamation Facility. In addition, approximately 60,000 gallons of non-potable water is sprayed on the primary and secondary clarifiers annually to help with defoaming. This reduces the amount of treated water demand by an estimated 20.1 MG per year (City of Loveland, 2020a).

Notable Information Regarding Water Treatment, Storage, and Distribution	• From (City of Loveland, 2020a)
	  ○ Storage reservoirs
	  ▪ Green Ridge Glade (6,835 ac-ft)
	  ▪ C-BT and Windy Gap storage
	  ○ One water treatment plant with treatment capacity of 38 MGD (last expansion was in 2016)
	  ○ Distribution system: 463.4 miles of water lines, 3,171 hydrants, 8 pump stations and 20.3 MG of treated water storage.

System Reliability Information	• Loveland has interconnects with Little Thompson Water District, Fort Collins-Loveland Water District, and the City of Greeley (City of Loveland, 2020a; City of Loveland, 2020b). • Some of the Big Thompson River rights are very senior (City of Loveland, 2020b).

System Vulnerability Information	• From (City of Loveland, 2020a)
	  ○ The **water and wastewater treatment plants will need to be expanded** to meet increases in peak day demands and average annual demands (estimated in 2041 and 2044 respectively; subject to actual population growth and efficacy of conservation programs in reducing summer peak demands)
	  ○ Climate variability may increase or decrease streamflows; is expected to shift snowmelt runoff earlier in the season; and is expected to reduce snowmelt runoff.
	  ○ Aging Infrastructure
	  ▪ Many parts of the City's water distribution system are **reaching the end of their expected useful life and require continued investment** through rehabilitation or replacement projects. The City has focused its efforts on addressing the worst performing water lines in the distribution system. The City has also invested in leak detection technology and hired additional operations staff to perform leak detection work. Over $17 million is budgeted in the Water Utility's 10-year capital improvement plan for water line replacement and rehabilitation projects.
	  ○ Escalating cost of water rights, specifically new C-BT shares

Major Planned Capital Projects	• From (City of Loveland, 2020a; City of Loveland, 2020b)
	  ○ The City maintains a 5-year capital improvement plan. Current projects include water line replacements, water storage tank construction, meter upgrades and replacements, treatment plant upgrades and improvements, water resources projects, vehicle purchases, and various O&M projects.
	  ○ Windy Gap Firming Project with Northern Water (2020-2024, pending legislation) – would firm transmountain water rights by storing water in Chimney Hollow.
	  ○ Add 3.5 MG storage tank in 2024-2025.
	  ○ 2030: Great Western Reservoir (1,300-1,600 ac-ft storage) – would firm in-basin water rights. Loveland is also looking into if Chimney Hollow can be used to store native water (City of Loveland, 2020b).
	  ○ Raise spillway by 3' at Green Ridge Glade Reservoir
	  ○ Add additional treatment capacity at WTP around 2041.

Potable Annual Water Sales (ac-ft/yr)	• 14,312 (City of Loveland, 2020a)
	  ○ Single Family: 6,401
	  ○ Commercial: 2,067
	  ○ Irrigation: 1,568
	  ○ Multifamily: 1,414
	  ○ City Use: 240
	  ○ Hydrant Meter: 67
	  ○ Wholesale Water: 222
	  ○ Ranch Water: 15
	  ○ Non-revenue Water: 2,391

Raw Annual Water Sales (ac-ft/yr)	• In addition to treated water production, 590 ac-ft/yr are used to satisfy augmentation and irrigation demands (City of Loveland, 2020a).

Water Metrics and Goals	• From (City of Loveland, 2020a)
	  ○ Planning level: 30,000 ac-ft of total annual demands
	  ○ Residential gpcd: 110 (2008)
	  ○ Residential gpcd: 84 (2019)
	  ○ Non-revenue water: 756 MG (16% of produced water)

Water Shortage Plans and Drought Criteria	• From (City of Loveland, 2020a)
	  ○ Loveland's drought plan originally dates to 1986 and established a drought planning criterion of being able to meet full demands during a drought event with a recurrence of 1 in 100 years without curtailment. This goal was last affirmed in the 2013 Drought Management Plan and 2018 update to the City's Raw Water Master Plan (City of Loveland, 2013; City of Loveland, 2020b).
	  ○ In 2013, the City published a Drought Management Plan to handle droughts more severe than a 1-in-100-year drought. The Drought Management Plan includes four increasingly restrictive drought response levels linked to the severity of the projected water supply shortage, to reduce customer water usage and lower the overall demand on Loveland's water system (City of Loveland, 2013).

Wastewater Providers	• Mostly City of Loveland. The water reclamation facility was from 10 to 12 MGD in 2019. The wastewater collection system consists of 453 miles of wastewater lines, 8,917 manholes, and 18 lift stations (City of Loveland, 2020a).
	  ○ The City's wastewater treatment plant capacity limit could eventually limit current treated water deliveries or future developments, since indoor water use requires wastewater treatment to capture grey and black water for cleansing before it is returned to local receiving waters (City of Loveland, 2020a).
	  ○ Based on 2018 projections, the City anticipates needing an additional solids treatment plant expansion project around the year 2044 (City of Loveland, 2020a).
	• The northeast portion of the City of Loveland is treated by South Fort Collins Sanitation District.

Development Fees	• Latest development fees are at (City of Loveland, 2021). Loveland allows cash-in-lieu fee or water rights dedication for new developments.
Monthly Billing Charges	• Latest billing structures are at (City of Loveland, 2021).
Connections to Agricultural Sector	• Water supplies not needed by the City of Loveland customers on an annual basis are available for agricultural use through water rentals. • If agricultural deliveries of C-BT water in the Big Thompson River continue to decline, so does Loveland's ability to exchange water on the river (City of Loveland, 2020a; City of Loveland, 2020b). • Native ditch shares must be converted from agricultural to municipal use in water court.

Other Information

- In 1960, the City began formally requiring dedication of water rights prior to development. The City accepts native ditch water rights (in units of shares/inches), C-BT water, cash credits, and cash-in-lieu of water rights to satisfy raw water requirements for development (City of Loveland, 2020a; City of Loveland, 2020b). At least half of every payment must be C-BT, cash-in-lieu, or cash credits in a water bank.
- Loveland is completing a Lawn Irrigation Return Flow water court case to help firm in-basin water rights (City of Loveland, 2020a).
- Excess water is used as follows (City of Loveland, 2020a)
    - Filling Green Ridge Glade Reservoir by the end of the water year
    - Augmentation leases
    - Applied toward Northern Water's C-BT carryover program
    - Placed into Northern Water's regional pool in exchange for reimbursement
    - Offered at discounted rates to the City's Parks and Recreation Department for either C-BT leases or to top off their irrigation reservoirs.

NORTH WELD COUNTY WATER DISTRICT (NWCWD)

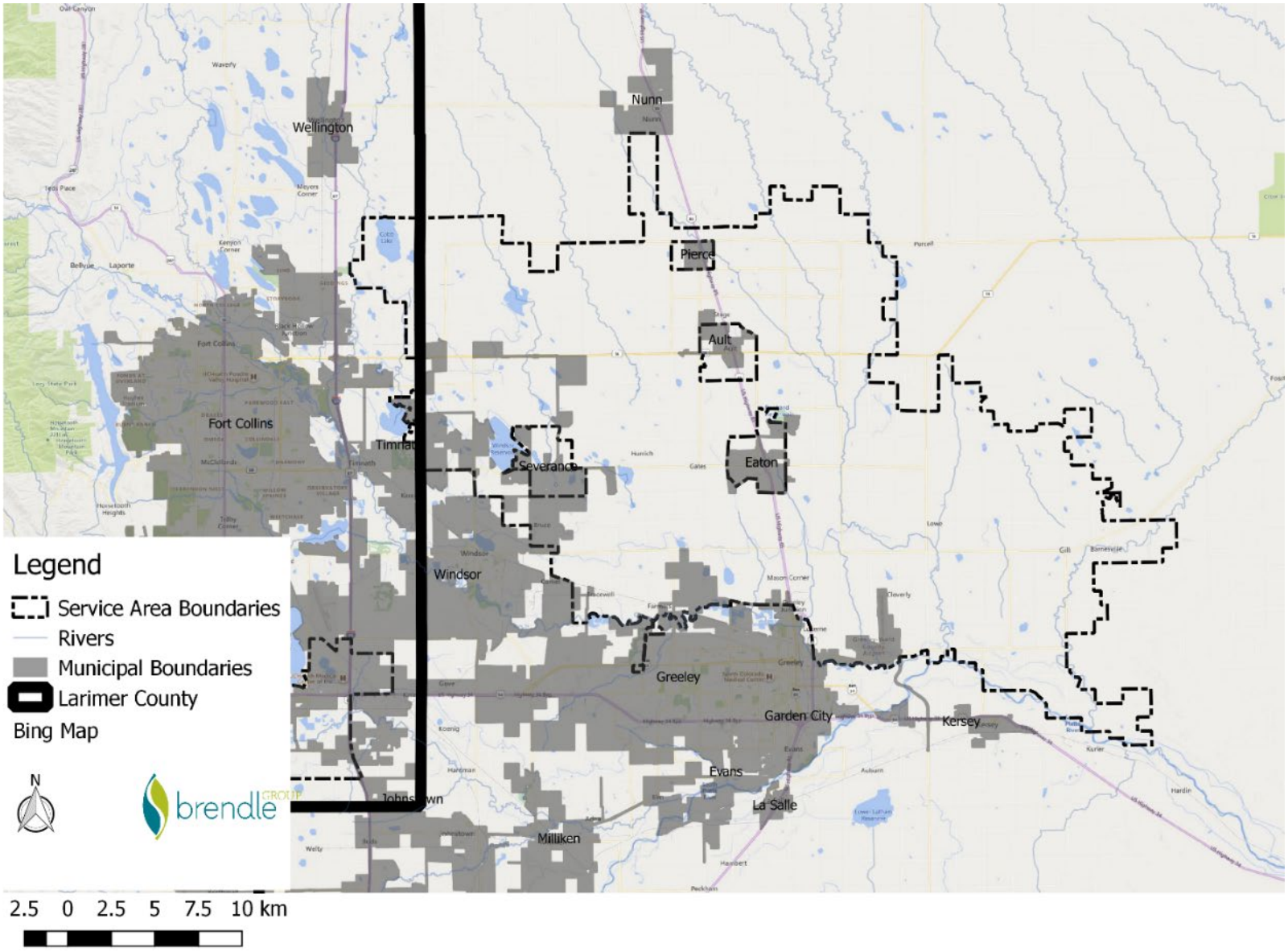

FIGURE 28. NWCWD SERVICE AREA

TABLE 13. NWCWD PROVIDER CHARACTERISTICS

Land Use Authorities Served	From **(Clear Water Solutions, 2018b)**: The NWCWD service area encompasses 325 square miles in mostly unincorporated Weld County, with a portion (~3%) in Larimer County (**Figure 28**). • NWCWD delivers water to all or part of ten communities including Ault, Eaton, Galeton, Gill, Lucerne, Nunn, Pierce, Timnath, Severance, and Windsor as well as unincorporated Weld and Larimer Counties. • A few small developments in northern Greeley and eastern Fort Collins are served by NWCWD.
Major Wholesale and Contract Customers	From (Clear Water Solutions, 2018b): • Six towns are served by NWCWD through master meters: Ault, Eaton, Nunn, Pierce, Severance, and a portion of Windsor. These Towns plan for and acquire their own water supplies, then turn their water over to NWCWD for treatment and delivery. • The District also has a **master meter for water supplies to the Northern Colorado Water Association (NCWA),** which provides potable water to customers around Wellington.
Service Population	• 44,487 (Clear Water Solutions, 2018b): this estimate includes service populations within the master metered communities and NCWA service area.
Service Connections	• 4,838 (Clear Water Solutions, 2018b)
Buildout Estimates	From (Clear Water Solutions, 2018b): • Year: 2027 (planning horizon) • Service population: 55,800 • Future water demands: 11,812
Water Supplies	From (Clear Water Solutions, 2018b): • Colorado-Big Thompson units (4,039 units) • Native water rights from diversions from the Cache la Poudre River (including shares in several ditch and reservoir companies)

Water Yields (ac-ft/yr)	From (Clear Water Solutions, 2018b):
	• Potable water
	  ○ 5,725 ac-ft/yr firm yield (currently decreed and available)
	  ▪ +94 ac-ft/yr pending
	  ▪ +93 ac-ft/yr from additional changes of use
	  ○ 7,475 ac-ft/yr average yield (currently decreed and available)
	  ▪ +94 ac-ft/yr pending
	  ▪ +116 ac-ft/yr from additional changes of use
	• Non-potable water
	  ○ 892 ac-ft/yr firm yield
	  ○ 1,441 ac-ft/yr average yield

Assessment of Reuse Potential	• Low: C-BT cannot be reused, as return flows are reserved for downstream agricultural users
Notable Information Regarding Water Treatment, Storage, and Distribution	From (Clear Water Solutions, 2018b): • NWCWD receives its treated water from the Soldier Canyon Water Treatment Authority (SCWTA), which is jointly owned by the Tri-Districts (NWCWD, Fort Collins-Loveland Water District, and East Larimer County Water District). • Water is delivered to the SCWTA plant from Horsetooth Reservoir, which is part of the C-BT project. The SCWTA can treat up to 50 MGD. • The Tri-Districts can also bring water to the plant through the jointly owned Pleasant Valley Pipeline. • The District's distribution system includes storage capacity at SCWTA as well as five treated water storage facilities. There is a total of 8.75 MG of treated water storage at the five facilities. • The District has over 730 miles of pipeline.
System Reliability Information	From (Clear Water Solutions, 2018b): • Current supplies are sufficient to meet NWCWD's water demands. To date, there have not been any potable supply shortages. • Water is exchanged year-round between the City of Fort Collins water treatment facility and SCWTA.
System Vulnerability Information	From (Clear Water Solutions, 2018b): • The Board of Directors voted in October to place a **moratorium on the sale of new taps and plant investments until at least February 15, 2022.** This action results from proposed new regulatory language changes being considered by Larimer County that could affect the permitting process for essential pipelines needed to meet growing demand within the NWCWD service area. This action will not affect current customers with taps issued. However, those who are going through the process to have a new tap approved will not be issued a tap during the moratorium period. Those working through the tap application process will not be issued a tap during the moratorium period, nor will developers who have received a signed letter of intent to issue a tap (North Weld County Water District, 2021). **The moratorium has been extended until May 31, 2022, causing building permit moratoria in Severance and Eaton** (BizWest, 2022). • The C-BT system was originally designed as a supplemental supply to native water rights. C-BT water is in great demand and is converting from agricultural ownership to municipal/industrial ownership rapidly. It is projected that few (if any) C-BT units will be available by the year 2040. In anticipation of the gradual disappearance of available C-BT water, NWCWD committed funds to participate in the Pleasant Valley Pipeline. • **The District currently has limited raw water storage beyond that which is contained within the C-BT system.** The C-BT supplies are stored in Lake Granby on the western slope of Colorado. Should a fire occur in the area, water quality would be a major issue for NWCWD as well as other C-BT Allottees. There is still a tremendous amount of beetle kill damage affecting trees surrounding Lake Granby, Grand Lake, and the other storage facilities of C-BT water. This debris from this beetle kill damage poses a potential increased fire risk. NWCWD would be vulnerable to SCWTA's abilities to treat degraded water quality. NWCWD's water supplies would also be vulnerable in an extended drought. The District currently maximizes its carryover each year through Northern Water, but a multi-year drought would likely decrease or eliminate NWCWD's carryover account.

	• Because the SCWTA is the only WTP to treat water for the District, the District is currently limited on where it can acquire future supplies. **Only water that can be treated by the SCWTA can be acquired** unless NWCWD participates in the construction of future water treatment facilities. • Since the majority of the original pipelines from the SCWTA to the District were installed between 1962 and 1965 and consist mostly of steel and asbestos concrete, they **may need to be replaced in the near future.** • NWCWD's 2007 Master Plan (source document not available) identified needs to supply additional water, including ensuring an adequate raw water supply, constructing additional facilities for the filtration of such water to meet or exceed the current water quality, providing a distribution system to supply adequate pressures for the additional demands including fire flows, and maintaining the quality of the finished water throughout the distribution system. These difficulties remain today.
Major Planned Capital Projects	From (Clear Water Solutions, 2018b): • Although NWCWD does not participate directly in the Northern Integrated Supply Project (NISP), currently at least three of the Towns within its system do - Eaton, Severance, and Windsor. • When completed, the Overland Trail Ponds project will store approximately 4,700 AF. Existing and future gravel pits on land owned by the water providers will continue to be sealed and configured to divert water from the Poudre River when it is available. Water stored in the Overland Trail Ponds will be released back to the Poudre River to meet return flow obligations, exchanged for water diverted at the PVP, or pumped to SCWTA for treatment. Work on lining the existing gravel pits and installing the necessary infrastructure began in 2008. It will take approximately 20 years before all of the property is completely mined and the gravel pits are sealed.

Potable Annual Water Sales (ac-ft/yr)	• 9,413 ac-ft (2017)
	  ○ Towns Use: (communities the District serves through its master meters, including Ault, Eaton, Nunn, Pierce, Severance, a portion of Windsor, and NCWA): 3,103
	  ○ North Weld Only
	  ▪ Wholesale/Non-Municipal: 416 (primarily large dairies)
	  ▪ Commercial/Industrial: 2,991 (farms, dairies, ranches, and other agricultural operations)
	  ▪ Residential: 1,781
	  ▪ Bulk Water: 809 (construction, oil and gas)
	  ○ Non-Revenue Water: 313 ac-ft

Raw Annual Water Sales (ac-ft/yr)	• No information found, though a non-potable water rate is in place with the comment "usage through the non-potable systems in limited, specific subdivisions (North Weld County Water District, 2022)."

Water Metrics and Goals	From (Clear Water Solutions, 2018b):
	• Lower per capita water use by 10% over the ten-year planning period, by customer categories as follows:
	  ○ Wholesale/Non-Municipal: 5%
	  ○ Commercial/Industrial: 10%
	  ○ Residential: 16%
	  ○ Bulk Water: 2%
	  ○ Non-Revenue Water: 15% (i.e., a 15% reduction of current 6% average)

	• Develop a water efficiency program that can be implemented within District staffing constraints and with Staff approval.
Water Shortage Plans and Drought Criteria	• None identified
Wastewater Providers	• Most master meter communities have their own wastewater treatment. Other customers have septic systems (Clear Water Solutions, 2018b).
Development Fees	• See (North Weld County Water District, 2021)
Monthly Billing Charges	• See (North Weld County Water District, 2022)
Connections to Agricultural Sector	From (Clear Water Solutions, 2018b): • Many of the agricultural water rights that divert water from the Poudre River are decreed for agricultural uses only, so they are exchanged on an annual basis for C-BT water when possible. When no C-BT water is available for exchange, the water rights are rented for agricultural use. • Most of the commercial and industrial customers in the area are dairies or agriculture in nature. Although some may be able to benefit from some general water efficiency activities, each dairy and business is unique in size and operation therefore it is difficult to address their needs through a single program.
Other Information	• One subdivision within the District offers a non-potable irrigation system managed by the Homeowner's Association (Clear Water Solutions, 2018b).

PINEWOOD SPRINGS WATER DISTRICT (PINEWOOD SPRINGS)

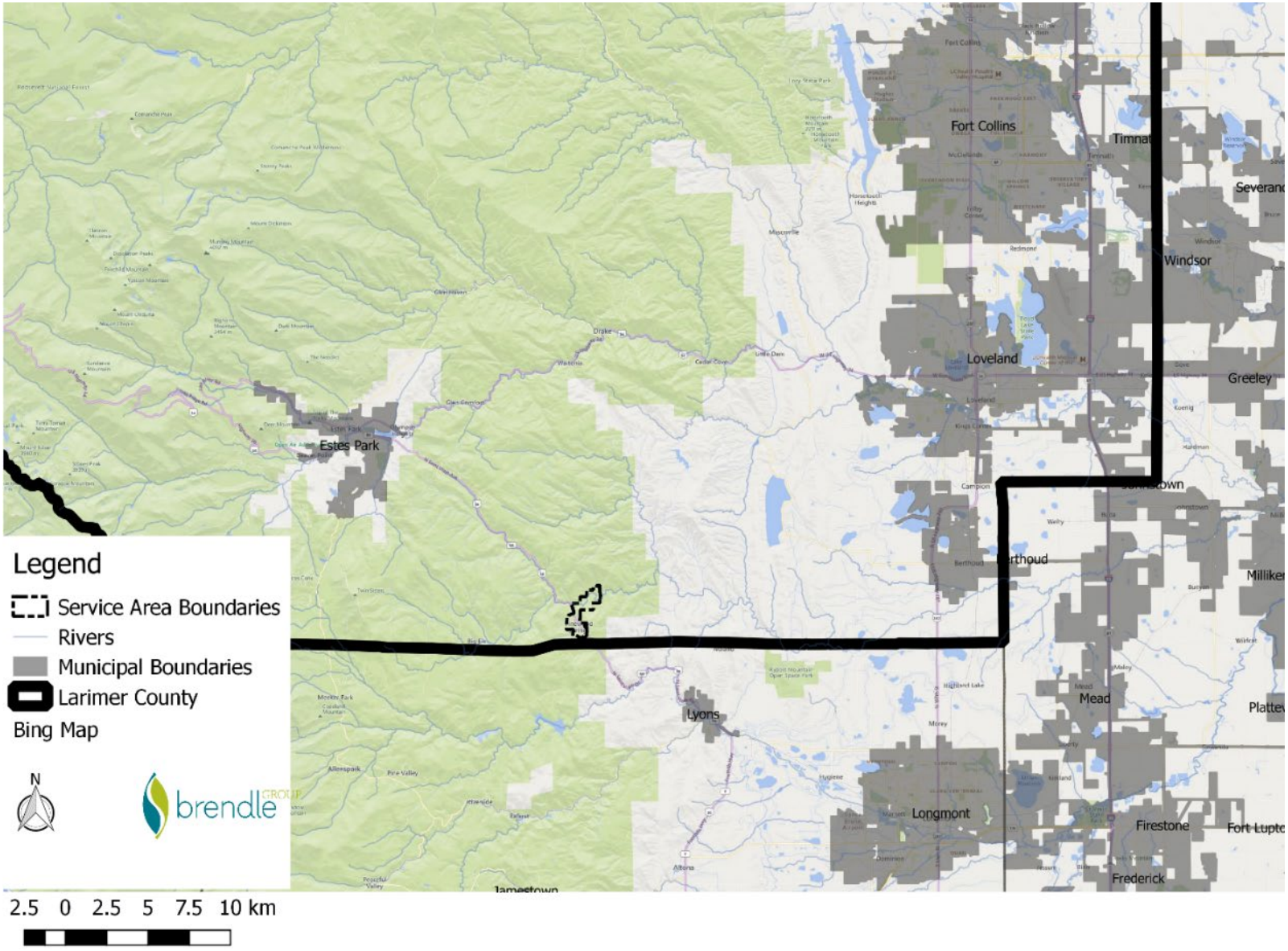

FIGURE 29. PINEWOOD SPRINGS SERVICE AREA

TABLE 14. PINEWOOD SPRINGS PROVIDER CHARACTERISTICS

All of the following information is from (Benson, 2021) unless otherwise noted.

Land Use Authorities Served	• Unincorporated Larimer County between Estes Park and Lyons (**Figure 29**)
Major Wholesale and Contract Customers	• None
Service Population	• 900-1,000
Service Connections	• 302 taps serving 289 homes and 2 businesses

Buildout Estimates	• Almost at build out; do not expect demand for water to change
	  ○ Six lots with paid taps that are vacant (three with construction pending; three are not anticipated to build any time soon)
	  ○ Three vacant lots that need taps (two have been paid for)

Water Supplies	• Little Thompson River (direct flow and storage rights) • Culver Ditch Rights (rarely used)
Water Yields (ac-ft/yr)	• Not found
Assessment of Reuse Potential	• Low due to predominantly native rights. No water is currently reused.
Notable Information Regarding Water Treatment, Storage, and Distribution	• The Crow Lane raw water storage reservoir holds 30-acre feet of non-potable water and is fed by seasonal runoff. • One water treatment plant with two filtration units that can run singularly or concurrently. • Potable storage capacity is 1.22 MG, and there is capacity to increase storage.
System Reliability Information	• Each household is restricted to 6,000 gallons or less per month (fines imposed if over limit). This has resulted in relatively constant water demand in recent years.
System Vulnerability Information	• May resort to hauling water and further restrictions of water use in the event of a severe drought (if reservoir and tank storage are insufficient).
Major Planned Capital Projects	• Ongoing, systematic replacement of old waterlines • Refurbishing of second oldest storage tank in 2022
Potable Annual Water Sales (ac-ft/yr)	• Not found
Raw Annual Water Sales (ac-ft/yr)	• Not found
Water Metrics and Goals	• Not found
Water Shortage Plans and Drought Criteria	• PSWD built a raw water storage reservoir in 2009 as an alternative to hauling water purchased from the City of Longmont. • **Water hauling and additional water use restrictions are identified as potential measures** in periods of prolonged drought.
Wastewater Providers	• None • All of the properties in the water district and Pinewood Valley have either a septic system with leach fields or a vault.

Development Fees	• Current tap fee is $45,830.75. It increases yearly by about $3,000.00 (a formula is used to calculate exact fee).
Monthly Billing Charges	• Base rate in 2021 was $88.00 plus $0.70 cents per 100 gallons for the first 3,000 gallons used. • An additional $1.40 for the next 3000 gallons used, up to 6,000 gallons total. • Any usage over 6,000 gallons is billed at $6.00 per 100 gallons, with fines in place. • Fine amounts are $100.00, $250.00 and 500.00 and are multiplied by the number of times that customer has gone over 6,000 gallons.
Connections to Agricultural Sector	• None

SPRING CANYON WATER & SANITATION DISTRICT (SPRING CANYON WSD)

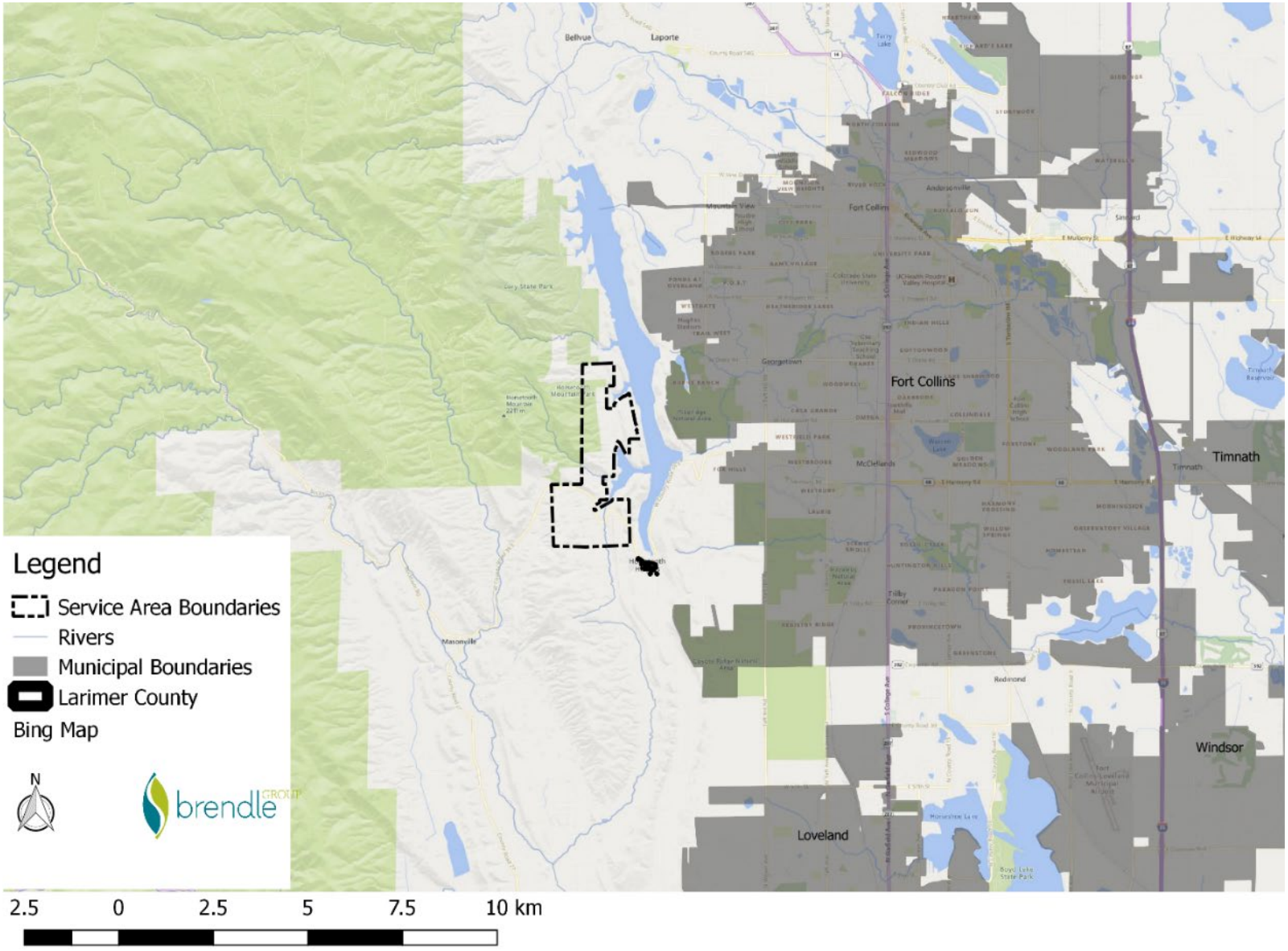

FIGURE 30. SPRING CANYON WSD SERVICE AREA

TABLE 15. SPRING CANYON WSD PROVIDER CHARACTERISTICS

Land Use Authorities Served	Unincorporated Larimer County in the area immediately west of Horsetooth Reservoir (**Figure 30**)
Major Wholesale and Contract Customers	• None found
Service Population	• No information found from provider
Service Connections	• 585 (Spring Canyon Water and Sanitation District, 2019)
Buildout Estimates	• No information found from provider
Water Supplies	• Purchased from Fort Collins-Loveland Water District (Spring Canyon Water and Sanitation District, 2021b)
Water Yields (ac-ft/yr)	• No information found
Assessment of Reuse Potential	• No information found from provider
Notable Information Regarding Water Treatment, Storage, and Distribution	• No information found from provider
System Reliability Information	• No information found from provider
System Vulnerability Information	• No information found from provider

Major Planned Capital Projects	• From (Spring Canyon Water and Sanitation District, 2019):
	  ○ The Central Transmission Corridor Pipe Replacement includes replacing pipe, upgrading pipeline sizes, and creating additional loops in the system for redundancy and stability.
	  ○ The Water Meter Replacement projects will replace meters with digital meters.
	  ○ Other planned projects include pipe upsizing, replacement, tank coating, tank replacement, and system air relief.

Potable Annual Water Sales (ac-ft/yr)	• No information was available
Raw Annual Water Sales (ac-ft/yr)	• None found
Water Metrics and Goals	• None found
Water Shortage Plans and Drought Criteria	• None found
Wastewater Providers	• Spring Canyon Water and Sanitation District through an IGA with South Fort Collins Sanitation District
Development Fees	• (Spring Canyon Water and Sanitation District, 2021b)
Monthly Billing Charges	• (Spring Canyon Water and Sanitation District, 2021b)
Connections to Agricultural Sector	• None found

TOWN OF WELLINGTON (WELLINGTON)

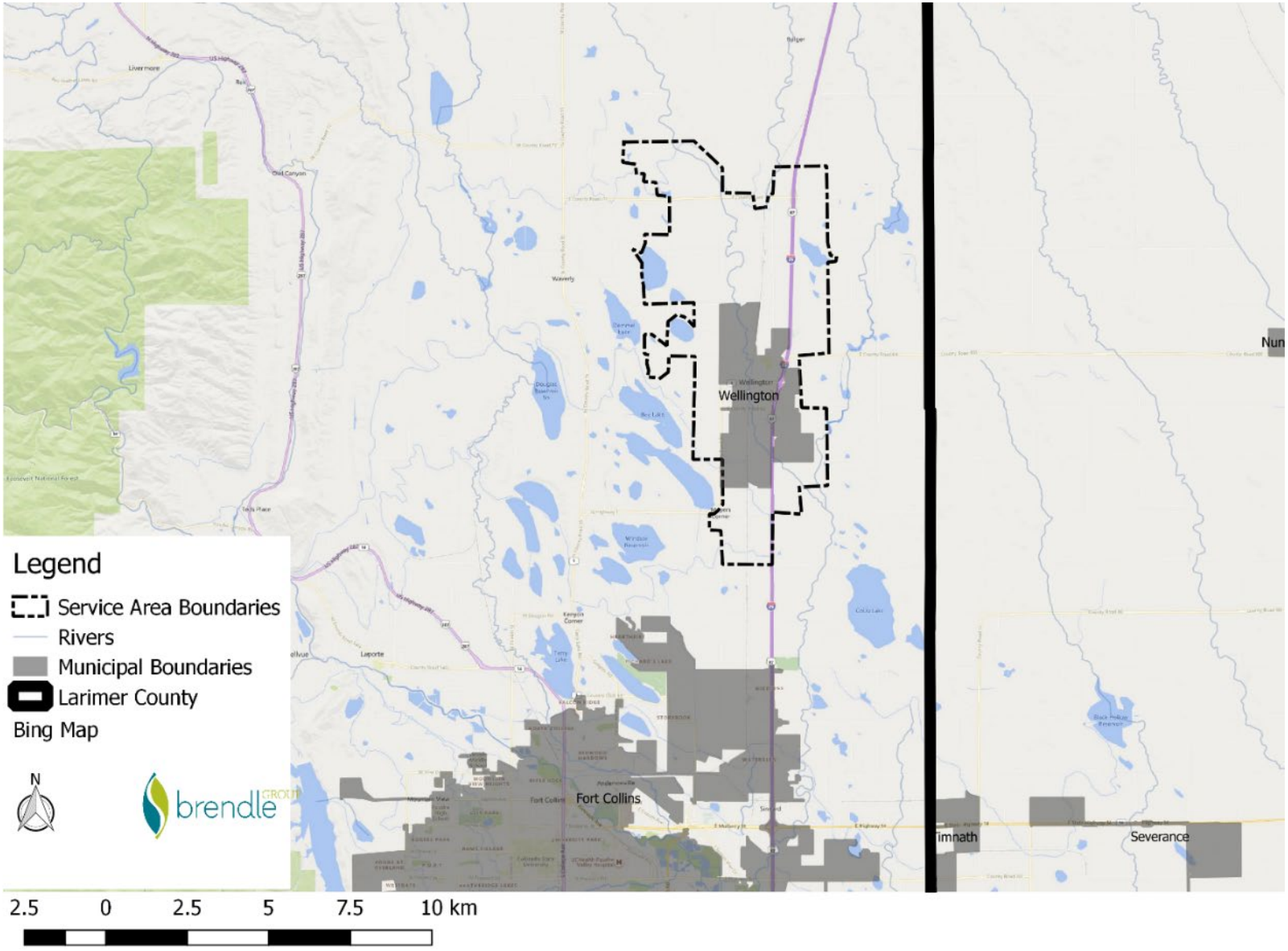

FIGURE 31. WELLINGTON SERVICE AREA

TABLE 16. WELLINGTON PROVIDER CHARACTERISTICS

Land Use Authorities Served	• Town of Wellington and the surrounding Growth Management Area (**Figure 31**)
Major Wholesale and Contract Customers	• The Town offers a bulk water station to serve local agriculture and residents to purchase potable water (Town of Wellington, 2022a)
Service Population	• 11,040 (2020, M. Smith, personal communication)
Service Connections	• Approximately 4,200 (M. Smith, personal communication) • Only 34 residential units in Wellington are not served by the Town's water supply (Clear Water Solutions, 2018a)
Buildout Estimates	From (Clear Water Solutions, 2018a): • Year: 2038 • Service population: 18,245 • Future water demands: 1,683 ac-ft/yr (in 2027, last year of demand forecasting)
Water Supplies	From (Clear Water Solutions, 2018a): • North Poudre Irrigation Company (NPIC): up to 2,000 ac-ft/yr. A flat volume of 275 ac-ft/yr is provided to Wellington each year for its transfer of 53 shares of stock to the NPIC; this volume is not subject to change even when annual share allocations fluctuate from year to year. The remaining water up to 2,000 ac-ft is at a per-ac ft cost to Wellington. • Three municipal wells augmented under the Cache la Poudre Water User Association Plan: 375 ac-ft/yr • Series of wells predominantly owned by HOAs for non-potable outdoor irrigation.
Water Yields (ac-ft/yr)	• 2,375 average yield (Clear Water Solutions, 2018a)
Assessment of Reuse Potential	• Low – NPIC and municipal well reuse potential is low
Notable Information Regarding Water Treatment, Storage, and Distribution	From (Clear Water Solutions, 2018a): • The Town has two water treatment plants (WTPs), three municipal wells, two treated water storage tanks, and a water distribution system. • NPIC water is stored in the NPIC's Reservoir No. 3, treated at the Town's WTP and delivered via gravity to the Town. The NPIC's water supply is dependent on streamflow conditions in the Cache la Poudre River Basin and the C-BT quota. The WTP located near the NPIC's Reservoir No. 3 treats raw water to serve the town. It has a design capacity of 3 MGD, though it realistically produces approximately 1.6 MGD. Treated NPIC water is delivered to storage tanks (one 2 MG tank and one 1 MG tank) equipped with meters and delivered via gravity to the Town through either a 16-inch or 18-inch water line for distribution to customers. The storage tanks are only used to store NPIC water and do not store any of the municipal well water. • The municipal wells are located in the town. The second WTP treats 0.5 MGD of municipal well water. Treated water is directly distributed after treatment.
System Reliability Information	• The WEP states that the Town's agreement with NPIC is generally a stable and adequate water supply for the Town (Clear Water Solutions, 2018a).

System Vulnerability Information	From (Clear Water Solutions, 2018a): • **NPIC Water:** NPIC is a mutual ditch company delivering water its stockholders, serving over 250,000 people and 23,000 acres of agricultural land. The system includes 19 reservoirs and approximately 200 miles of canals. Municipal ownership in NPIC has increased over the years, and as of 2015, the company is approximately 75% municipal with the remaining 25% in agricultural uses. NPIC receives water from two main sources: natural streamflow originating in the North Fork of the Cache la Poudre River and ownership of 40,000 Colorado-Big Thompson Project (C-BT) units. Each NPIC share includes a native portion and a C-BT portion. • NPIC's C-BT units are stored in Lake Granby on the western slope of Colorado. Should a fire ever occur in that area, water quality and water availability would be a major issue for the NPIC and other C-BT allottees. • Major construction requiring draining of Reservoir No. 3, failure of Reservoir No. 3, or contamination exceeding what can be treated at the WTP would impact Wellington's main water source. **NPIC water is currently the only water source that can be used to meet all of the Town's water demands and is available for use in all areas of the Town's limits.** This poses water supply issues if an emergency occurred at Reservoir No. 3. • **Municipal Well Water:** Due to the location of the municipal wells in town and the increasing population demand, **the wells are insufficient to serve the entire community in an emergency situation.** Contamination or failure of the NPIC-related facilities would remove a large portion of the Town's current and future water supply.
Major Planned Capital Projects	• **A new 4.2 MGD WTP project** will increase production (Clear Water Solutions, 2018a). Project completion is targeted for 2024 (Town of Wellington, 2022b). The wastewater treatment plant is also being expanded in the same timeframe. **The Town is working with developers to limit the number of residential building permits to 100 per year until the completion of the water treatment and wastewater treatment expansion projects in 2024** (Coloradoan, 2021). • The Town is in the process of working with NPIC and its water engineers to purchase additional water rights to support long-term water adequacy for the Town's residents beyond the 2028 planning horizon (Clear Water Solutions, 2018a).

Potable Annual Water Sales (ac-ft/yr)	• 1,091 (2017) (Clear Water Solutions, 2018a)
	  ○ Residential: 855
	  ○ Commercial: 98
	  ○ Irrigation: 29
	  ○ Non-revenue: 109 (estimated)

Raw Annual Water Sales (ac-ft/yr)	• 29 (2017) (Clear Water Solutions, 2018a) • Note that the value above includes School District use and a portion of the Town's use; the actual value is higher as the majority of non-potable irrigation is not metered
Water Metrics and Goals	From (Clear Water Solutions, 2018a): • Lower total per capita water use by 5% over five years

	• Lower total per capita water use by 10% over the ten-year planning horizon, by customer categories as follows:
	  ○ Residential: 12%
	  ○ Commercial: 5%
	  ○ Irrigation: 3%
	  ○ Non-revenue: 1%

Water Shortage Plans and Drought Criteria	• Wellington has implemented mandatory and voluntary outdoor watering restrictions in some years (Clear Water Solutions, 2018a).
Wastewater Providers	• Town of Wellington. Wastewater usage rates were last updated in March 2022 (Town of Wellington, 2022d).
Development Fees	• Water and Wastewater Impact fees were last updated in 2021 (Town of Wellington, 2022c).
Monthly Billing Charges	• Water usage rates were last updated in January 2021 (Town of Wellington, 2022d).
Connections to Agricultural Sector	• All of Wellington's water is provided by a mutual ditch company. Wellington is in the middle of the North Poudre Irrigation Company service area and is flanked by dairies and crop fields (M. Smith, personal communication).

TOWN OF WINDSOR (WINDSOR)

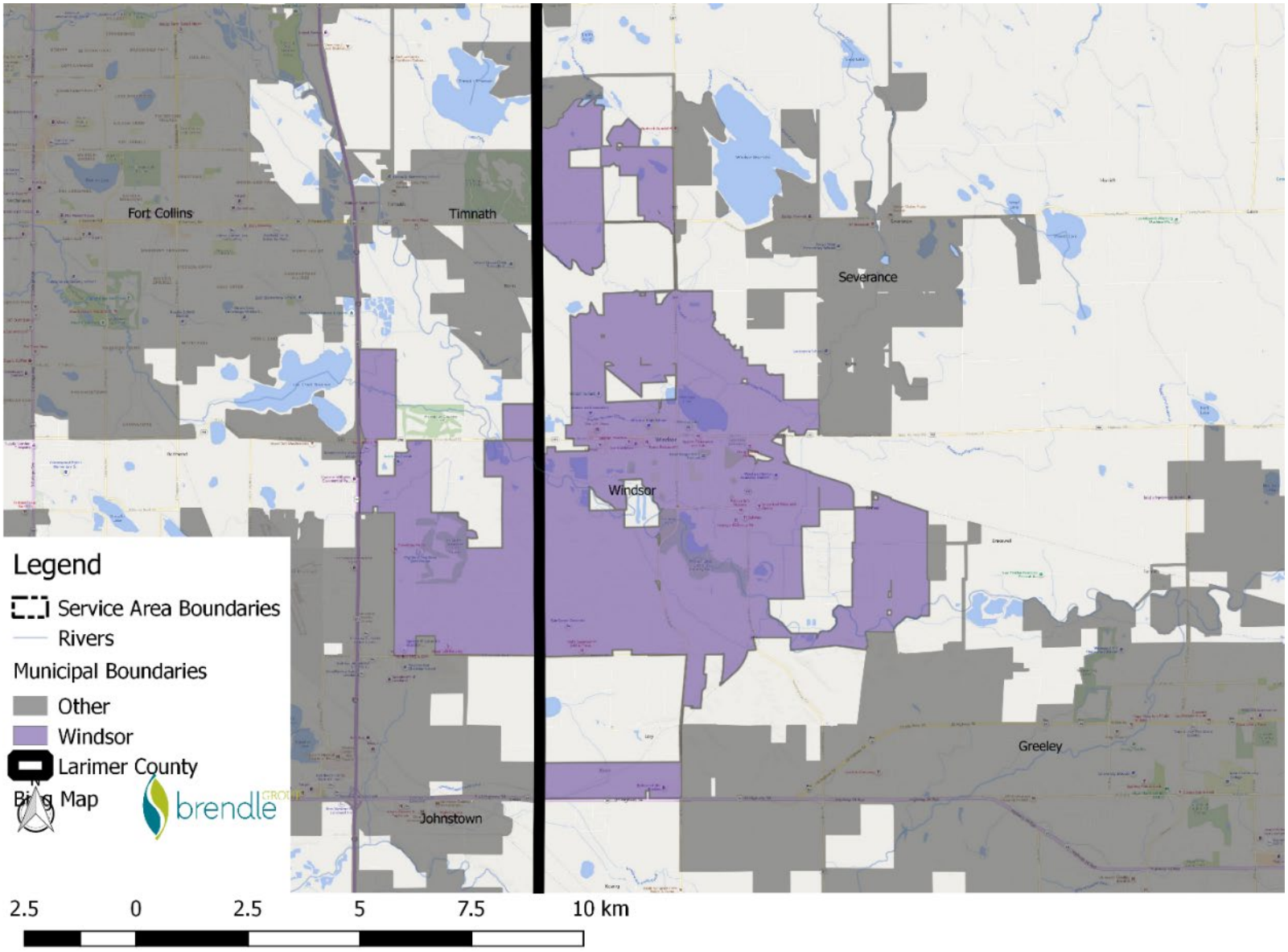

FIGURE 32. WINDSOR SERVICE AREA

TABLE 17. WINDSOR PROVIDER CHARACTERISTICS

Land Use Authorities Served	From **(Clear Water Solutions, 2015b)**: • Town of Windsor's water service area is approximately 28.9 square miles **(Figure 32).** Although the Town's western boundaries extend into Larimer County, Windsor's potable water service area is located entirely within Weld County. • Town of Windsor has water service jurisdiction for 65-70% of the Town's population. Potable water for this population comes from master meter agreements with FCLWD, NWCWD, and City of Greeley. • Water for the remaining 30-35% of the Town's population is directly served by other providers. Residents in Larimer County are served by FCLWD, and residents in the north and future growth area are served by NWCWD.
Major Wholesale and Contract Customers	None identified
Service Population	14,883 in 2015 (Clear Water Solutions, 2015b)
Service Connections	5,884 in 2015 (Clear Water Solutions, 2015b)
Buildout Estimates	From (Clear Water Solutions, 2015b) • Year: 2024 (planning horizon) • Service population: 18,587 • Service connections: 7,348 • Future water demands: 2,754 ac-ft

Water Supplies	From (Clear Water Solutions, 2015b)
	• Potable supplies
	  ○ C-BT: 2,101 shares fixed quota, 1,568 shares variable quota
	  ○ North Poudre Irrigation Company (NPIC): 383.5 shares
	• Non-potable supplies
	  ○ B.H. Eaton Ditch Company*: 2 units
	  ○ Whitney Ditch Company*: 2 units
	  ○ Alluvial wells
	  ○ Agricultural component of NPIC*: 350.5 units (not available for use; rented to shareholders)
	  ○ Kern Reservoir & Ditch Company: 100 units (Town owns all available units)
	  ○ Louden Irrigating Canal & Reservoir Company*: 3 units
	  ○ New Cache La Poudre Irrigating Company: 3.25 units
	  ○ Cache La Poudre Reservoir Company: 3.5 units
	
	* These are agricultural rights used for irrigation of the Town's parks and open spaces. Excess water is rented for agricultural use.

Water Yields (ac-ft/yr)	From (Clear Water Solutions, 2015b)
	• Firm yield: 2,758.3 (potable)
	• Average yield:
	  ○ 3,488.7 ac-ft (potable)
	  ○ 1,428.5 ac-ft (non-potable)

Assessment of Reuse Potential	Low – C-BT water cannot be reused as return flows are reserved for downstream agricultural users.

Notable Information Regarding Water Treatment, Storage, and Distribution	• Windsor is a **wholesale purchaser of treated water** from three separate water providers, Fort Collins-Loveland Water District (FCLWD), North Weld County Water District (NWCWD), and the City of Greeley. Windsor is responsible for acquiring its own raw water supplies, which it transfers to the water suppliers on an annual basis for treatment and delivery (Clear Water Solutions, 2015b). The annual contracted flows are:
	  ○ FCLWD: 110 MG/yr
	  ○ NWCWD (existing): 120-368 MG/yr
	  ○ NWCWD (future): 120-1,800 MG/yr
	  ○ Greeley: 130-197 MG/yr
	• Windsor has two treated-water storage tanks with a total capacity of 5 MG and a booster pump station. The existing water storage tanks provide water for fire protection, daily operating levels, and emergency water storage. (Clear Water Solutions, 2015b)
	• 125.7 miles of distribution system pipeline for potable water
	• The Town irrigates most Parks and Open Spaces with a separate system of meters, wells, reservoirs, and pipelines. This non-potable system consists of over 21 meters. Since 2008, the Town has made continuous efforts to improve non-potable water use tracking.

System Reliability Information	From (Clear Water Solutions, 2015b) • The Town's water supplies currently meet the needs of its customers during times of stress.

System Vulnerability Information	From (Clear Water Solutions, 2015b) • C-BT supplies are stored in Lake Granby on the west slope. Should a fire ever occur in that area, water quality would be a major issue for Windsor and other C-BT Allottees. East slope storage is not enough storage to meet demands, particularly in a drought. • A key limitation to C-BT water is the inability for the water to be reused, as return flows are reserved for downstream agricultural users. This limitation curtails the possibility for efficiency activities that might help stretch the existing water supplies by reusing C-BT water for irrigation or other non-potable uses. • **Windsor's water supplies are vulnerable to extended drought.** The Town currently maximizes its carryover each year through Northern Water, but a multi-year drought would likely decrease or eliminate Windsor's carryover account. • **Windsor is vulnerable to FCLWD's, NWCWD's, and Greeley's abilities to treat and deliver water.** • The southern portions of the town sit on the Poudre River which can easily flood, causing infrastructure damage. • The pipelines in the system consist of cast iron in the older part of the system and PVC in the newer part. The cast-iron mains are slowly being replaced with PVC as their lifespan reaches their end.
Major Planned Capital Projects	The Town shares information about capital projects at (Town of Windsor, 2022c). Windsor is currently participating in NISP, which is in the final stages of a 16-year permitting process (City of Fort Collins, 2021). Once the project makes it through the permitting process, the Town will be obligated to pay for its share of the design and construction costs; these are currently estimated at approximately $12,500 per ac-ft. This will involve a large capital outlay in the short term but will provide water supply well past 2025 for Windsor (Clear Water Solutions, 2015b). The Town added a 3 MG storage tank (2013) and is planning to add a new water line from NWCWD (Clear Water Solutions, 2015b).
Potable Annual Water Sales (ac-ft/yr)	From (Clear Water Solutions, 2015b) Total sales – 1,844 (2010-2014 avg) – excludes non-revenue water o Residential – 1,317.5 o Business – 157.4 o Industrial – 202 o School – 18 o Church – 6.4 o Landscape Only Unbilled water production (2010-2014 avg) o Non-revenue water – 141 o Parks and Open Space Water Use – 110.7

Raw Annual Water Sales (ac-ft/yr)	From (Clear Water Solutions, 2015b) Non-potable raw water used for parks and open space – 304 (2010-2014 avg)

Water Metrics and Goals	From (Clear Water Solutions, 2015b):
	Cumulative ten-year water reduction goal over the period 2015-2024 is 2,401 ac-ft across the following customer categories as percent reduction in demand:
	• In Town
	  ○ Residential: 12.0%
	  ○ Business: 5.0%
	  ○ Industrial: 5.0%
	  ○ School: 5.0%
	  ○ Church: 5.0%
	• Out of Town
	  ○ Residential: 12.0%
	  ○ Business: 3.0%
	  ○ Church: 3.0%
	• Dual System:
	  ○ Residential: 12.0%
	  ○ Business: 5.0%
	• Landscape Only: 10.0%
	• Non-Revenue Water: 1.0%

Water Shortage Plans and Drought Criteria	• A water waste ordinance was adopted in 2003; time-of-day watering restrictions were adopted in 2007 (Clear Water Solutions, 2015b).
Wastewater Providers	The Town operates and maintains a wastewater treatment facility that has a capacity of 2.8 MGD and over 90 miles of sewer line (Town of Windsor, 2022a).
Development Fees	The latest information can be found at (Town of Windsor, 2022b).
Monthly Billing Charges	The latest information can be found at (Town of Windsor, 2022b).
Connections to Agricultural Sector	From (Clear Water Solutions, 2015b) • If there is any excess above the Town's non-potable water demands, the water rights may be rented for agricultural use. The NPIC native portion cannot be physically delivered to Windsor and is therefore always rented back to shareholders within that system. • It is Windsor's policy for new developments in certain areas to build dual systems using the agricultural water that was historically used on that same land. Dual systems like these have several benefits; one of the greatest benefits is that the cost and energy to treat and deliver potable water is greatly reduced since less potable water is needed for irrigation purposes.

APPENDIX D: IRRIGATION DITCH INVENTORY

LARIMER COUNTY DITCH COMPANY INDEX

Ditch Company	Ditches	Address	Phone
Arthur Irrigation Co.	Pitkin Lateral, Sherwood Reservoir	207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
Baker Lateral Co.		207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
B. H. Eaton Ditch Co.		304 Teal Court, Windsor, CO 80550	(970) 686-5828
Big Lateral Ditch Co.		6664 N. County Road 13, Loveland, CO 80538	(970) 667-1883
Big Thompson Ditch and Manufacturing Co.	Big Thompson Irrigation	914 S. Railroad Ave, Loveland, CO 80537	(970) 667-1029
Boulder and Larimer Manufacturing and Irrigation Ditch Co.	Ish Ditch	PO Box 582, Berthoud, CO 80513	(970) 532-2349
Box Elder Ditch Co.		207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
Buckingham Irrigation Co.		1931 S. County Road 19, Loveland, CO 80537	
Cache La Poudre Reservoir Co.	Cache La Poudre Reservoir Inlet, Timnath Reservoir	PO Box 104, Lucerne, CO 80646	(970) 352-0222
Christian Lateral Ditch Co.		2932 S. County Road 7, Loveland, CO 80537	(970) 667-0398
Connor Lateral Ditch Co.		2307 S. County Road 7, Loveland, CO 80537	(970) 667-1029
Consolidated Hillsborough Ditch Co.		6835 Weld CR 52-1/4, Johnstown, CO 80534	(970) 587-2124
Consolidated Home Supply Ditch and Reservoir Co.		2464 Weld CR 46, Berthoud, CO 80513	(970) 667-1029
Culver Irrigation and Reservoir Co.		PO Box 1826, Longmont, CO 80502	(303) 776-8146
Dixon Canyon Reservoir Co.		281 N. College Ave., PO Box 580, Fort Collins, CO 80524	(970) 221-6365
Farmers Ditch		26442 W. County Road 15, Loveland, CO 80537	(970) 669-4976
Farmers Reservoir and Irrigation Co.		26442 W. County Road 15, Loveland, CO 80537	(970) 669-4976
Gard Lateral Ditch Co.		707 N. Carter Lake Rd, Loveland, CO 80537	(970) 663-6444
Greeley-Loveland Irrigation Co.	Barnes Ditch, Loveland and Greeley Canal	803 23rd Avenue, Greeley, CO 80631	(970) 353-6121
Handy Ditch Co.		PO Box 569, Berthoud, CO 80513	(970) 532-9991
Hanson Supply and Feeder Canals	Hanson Supply and Feeder Canals	PO Box 679, Loveland, CO 80539	(970) 667-2437

LARIMER COUNTY DITCH COMPANY INDEX

Ditch Company	Ditches	Address	Phone
Harry Lateral Ditch Co.		PO Box 642, Loveland, CO 80539	(970) 667-1029
Highland Ditch Co.	Baugh Lateral, Farmer's Extension, Ish Reservoir, No. 3 Outlet, Sandborn Reservoir	4309 Highway 66, Longmont, CO 80504	(970) 535-4531
Home Supply Extension Ditch Co.		6681 Weld CR 50, Johnstown, CO 80534	(970) 667-1029
Lake Canal Reservoir Co.		207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
Larimer and Weld Reservoir Co.	Eaton Ditch (Johnstown), Larimer & Weld Canal, Larimer County Canal & Flood Ditch	106 Elm, Box 206, Eaton, CO 80615	(970) 454-3377
Larimer County Canal No. 2 Irrigating Co.	Larimer County Canal No. 2	207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
Little Cache La Poudre Irrigating Co.	Taylor & Gill Ditch	106 Elm Ave, Eaton, CO 80615	(970) 454-3377
Louden Extension Canal and Reservoir Co.		4009 E County Road 30, Fort Collins, CO 80528	(970) 226-1322
Louden Irrigating Canal and Reservoir Co.	Louden Extension Ditch	8109 S County Road 9, Fort Collins, CO 80525	(970) 373-7267
Loveland Lake and Ditch Co.	Loveland Reservoir	524 E County Road 8, Berthoud, CO 80513	(970) 567-3421
New Cache La Poudre Irrigating Co.		PO Box 104, Lucerne, CO 80646	(970) 352-0222
New Mercer Ditch Co.		207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
North Louden Ditch and Reservoir Co.		7029 S. College Ave, Fort Collins, CO 80525	(970) 226-4924
North Poudre Irrigation Co.	Clark Lake, Cowan Lateral, Fossil Creek Inlet and Outlet, Monroe Gravity Ditch, North Poudre Canal, Park Creek Lateral	PO Box 100 / 3729 Cleveland Ave, Wellington, CO 80549	(970) 568-3612
Pleasant Valley and Lake Canal Co.	Highline Ditch	160 W. Mountain Ave, PO Box 421, Fort Collins, CO 80522	(970) 482-3683
Rockwell Irrigation Co.		20116 Weld CR 3, Berthoud, CO 80513	(970) 532-2479
Ryan Gulch Reservoir Co.		1841 Hillrose Dr, Loveland, CO 80538	(970) 667-7647

LARIMER COUNTY DITCH COMPANY INDEX

Ditch Company	Ditches	Address	Phone
Sherwood Reservoir and Irrigation		207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
South Side Extension Ditch Co.		1612 West 1st St, Loveland, CO 80537	(970) 581-8588
South Side Irrigation and Reservoir Co.	South Side Extension Ditch	1612 West 1 st St, Loveland, CO 80537	(970) 581-8588
Taylor and Gill Ditch Co.	Taylor & Gill Ditch	2305 N. Taft Hill, Fort Collins, CO 80524	(970) 482-8569
Terry Lake Inlet		PO Box 206, Eaton, CO 80615	(970) 454-3911
Warren Lake Reservoir Co.	Warren Lake Reservoir	207 Windflower Way, Severance, CO 80550	(970) 686-7126 (970) 420-7019
Water Supply and Storage Company	Jackson Ditch, Larimer County Canal & Flood Ditch	PO Box 1584, Fort Collins, CO 80522	(970) 482-3433
Whitney Irrigation Co.		12406 Weld CR 64-1/2, Greeley, CO 80631	(970) 396-8183
Windsor Reservoir and Canal Co.	Annex 8, Cobb Lake, Douglas Reservoir, Eaton Ditch (Larimer-Weld Canal), Elder Reservoir, No. 8, Poudre Valley Canal	PO Box 206, Eaton, CO 80613	(970) 454-3377