



City of Broomfield

City Council Study Session

Tuesday, February 20, 2024,
6:00 PM

Council Chambers
One Descombes Dr
Broomfield, CO 80020

**** Revised ****

1: Concept Review

1A. Memo for QuikTrip Gas Station Concept Review - Planning

2: Study Session

2A. Residential Development Update: Future Projections and Financial Impacts

The purpose of this communication is to provide the City Council with an update regarding current and projected future development in Broomfield.

2B. Water Update and Drought Plan

Broomfield's Updated Drought Response Plan and Request for Council's Direction on Code Changes.



Date Posted: February 14, 2024



City of Broomfield

City Council Study Session Memorandum

Memo for QuikTrip Gas Station Concept Review - Planning

Meeting	Agenda Group
Tuesday, February 20, 2024, 6:00 PM	Concept Review Item: 1A
Presented By	
Anna Bertanzetti	
Community Goals	

Overview

[View Correspondence](#) and visit BroomfieldVoice.com

The QuikTrip Corporation has submitted a conceptual proposal for a new gas station to be located at the northeast corner of Colorado 7 and County Road 7, in the Palisade Park subdivision. The address of this proposal is 16801 Galapago St. The parcel of land at this address is 3.84 acres in size, and the land is currently undeveloped. The developer anticipates subdividing the existing parcel into at least two smaller parcels. The conceptual proposal includes a 5,312 square foot, single-story convenience store and gas station with 14 detached fuel pumps.

Attachments

Memo for QuikTrip Gas Station Concept Review-Planning.pdf

Summary

[View Correspondence](#) and visit BroomfieldVoice.com

The QuikTrip Corporation has submitted a conceptual proposal for a new gas station located at the northeast corner of Colorado 7 (CO 7) and County Road 7 (CR 7), in the Palisade Park subdivision. The address of this proposal is 16801 Galapago Place. The parcel of land at this address is 3.84 acres in size, and the land is currently undeveloped. The developer anticipates subdividing the existing parcel into at least two smaller parcels for this proposal.

The conceptual proposal includes a 5,312 square foot, single-story convenience store and gas station with 14 detached fuel pumps.

The property is zoned PUD and is located in the Palisade Park Planned Unit Development (PUD) Plan area. The parcel is within the Mixed-Use Commercial area of the Palisade Park PUD. The PUD allows gas stations as a permitted commercial land use in this location.

Staff has identified the inclusion of electric vehicle (EV) Charging Stations, as required by the building code, as a key issue for this concept plan. This proposal will need to add EV charging stations to comply with Ordinance 2216 establishing the new Chapter 15-33 of the Broomfield Municipal Code (titled "Colorado Model Electric Ready and Solar Ready Code"). As currently proposed, the development would require 1 EV Installed Space, 3 EV Ready Spaces, and 8 EV Capable Spaces.

Broomfield requires a minimum distance of 1,000 feet between new gas stations. This is currently the only active gas station proposal within a 1,000 foot distance of this site.

Council is invited to provide direction to the applicant and staff regarding this proposal. Staff will use this direction to guide the review of a formal development review application for this proposal.

Financial Considerations

The proposed use is consistent with the land use assumptions for the financial modeling for the property, within the fiscal sustainability plan.

Prior Council or Other Entity Actions

[October 22, 2019](#) - City Council approved the Palisade Park Filing No. 1 Replat C Final Plat and the Palisade Park Filing No. 1 Replat C Lots 4 and 6-110 and Tract A Site Development Plan/Urban Renewal Site Plan (Brownstones at Palisade Park).

[October 9, 2007](#) - City Council approved the Palisade Park Filing No. 1 Site Development Plan and Final Plat.

[February 14, 2006](#) - City Council approved the Palisade Park Planned Unit Development (PUD) and Comprehensive Plan Land Use Map Amendment.

Board and Commissions Prior Actions and Recommendations

N/A.

Proposed Actions / Recommendations

Hold concept review discussion. There are no formal actions required.

Alternatives

No official action taken at concept review.

Discuss any concerns regarding the proposed use of this property such as the proposed siting, architecture, landscaping, signage, impacts on adjacent properties, pedestrian access, and/or vehicular access.

Project Website

<https://www.broomfieldvoice.com/quicktrip-palisade-park>

Public Comment

https://drive.google.com/drive/folders/1L8EVJqMvHD_3lhLOkm_u_RFOd1hszeb-

Sustainability

This proposal will ultimately need to incorporate the following sustainability elements to help further the City and County of Broomfield's goals in more environmentally friendly development as listed below:

- EV Parking will be included, in compliance with the approved [Ordinance 2216](#) establishing the new Chapter 15-33 of the Broomfield Municipal Code (this chapter is titled "Colorado Model Electric Ready and Solar Ready Code").
- Landscaping will be reviewed in accordance with the approved [Ordinance 2215](#), which includes requirements for low-water plant alternatives with efficient irrigation systems in new development.

Key Issues Identified By Staff

Staff has identified the following key issue with the subject proposal:

- EV Parking - The concept plan that was submitted with this application does not include any EV charging stations. This proposal will need to add EV charging stations to be in compliance with [Ordinance 2216](#) establishing the new Chapter 15-33 of the Broomfield Municipal Code (this chapter is titled "Colorado Model Electric Ready and Solar Ready Code"). As currently proposed, the development would require one (1) EVSE Installed Spaces, three (3) EV Ready Spaces, eight (8) EV Capable Spaces, and zero (0) EV Capable Light Spaces. Although not required, adding an EV fast charger in place of one of the required EVSE Installed Spaces could provide an additional service to customers and this would be an appropriate location given proximity to Interstate 25.

Links to Application Materials

- [Narrative / Project Description](#)
- [Concept Site Plan](#)
- [Concept Color Landscape Plan](#)
- [Color Building and Canopy Elevations](#)

Supplemental Documents

- Not Applicable

How to Submit Public Comments on this Proposal

Email directly to Planning@broomfield.org

Property Owner and Applicant

The property owner is Kevarma LLC. The applicant is The QuikTrip Corporation.

Broomfield Process

The concept review is the first step in Broomfield's development process, and allows the applicant to receive comments and direction from City Council, the Land Use Review Commission (LURC), and other advisory boards and commissions, and the public. The applicant should use the feedback received during concept review to make changes to the concept plan, if necessary.

If the project proceeds to a formal development application, it will need a Final Plat, Site Development Plan/Urban Renewal Site Plan, and Subdivision Improvement Agreement. Because this site is less than seven (7) acres in size, the application(s) will need a public hearing with the Land Use Review Commission. City Council will have the option to call-up the application for a second public hearing and final decision.

Zoning, Previously Approved Development Plans, and Status of Development

Zoning

The zoning for this parcel is PUD. It is located in the Palisade Park Planned Unit Development (PUD) Plan Area. The parcel is within the Mixed-Use Commercial area of the Palisade Park PUD. The PUD allows gas stations as a permitted commercial land use in this location.

The municipal code requires a minimum distance of 1,000 feet between new gas stations. This is currently the only active gas station proposal within a 1,000 foot distance of this site.

Previously Approved Development Plans

The Broomfield City Council approved the Palisade Park PUD in February, 2006. At that time, Council also approved a Comprehensive Plan Land Use Map Amendment to change the property designation from “Mixed-Use Commercial” to “Mixed Use.”

In October of 2007, City Council approved the Palisade Park Filing No. 1 Site Development Plan/Urban Renewal Site Plan (SDP/URSP) and Final Plat. This SDP/URSP and Plat established the locations of West 169th Avenue and Palisade Parkway and subdivided the original PUD Plan area into five (5) lots.

In October of 2019, City Council approved the Palisade Park Filing No. 1 Replat C Final Plat and the Palisade Park Filing No. 1 Replat C Lots 4 and 6-110 and Tract A Site Development Plan/Urban Renewal Site Plan (Brownstones at Palisade Park). The approval in 2019 includes the Brownstones buildings that are now under construction. These are located to the south of West 169th Avenue, and are between CR 7 and Palisade Parkway. This SDP/URSP and Plat further established a private park in the center of Filing No. 1 Replat C, and four (4) lots around the east, west, and south sides of the subdivision. Please see the graphic depiction of the layout of Palisade Park Filing No. 1 Replat C below.



Palisade Park Filing No. 1 Replat C Site Plan

The proposed QuikTrip gas station is on the southwest corner of Lot 1 at the northeast corner of CO 7 and CR 7 (the southwest corner of the graphic above).

In 2023, the Broomfield Marijuana Business License Selection Committee selected this property – 16801 Galapago Place – to proceed in the licensing process for a retail marijuana establishment. The selection committee mentioned in their report that this location is on undeveloped land, so this development will need to complete the full development process. This proposed establishment would be on the eastern portion of the lot. This future development will need a Site Development Plan/Urban Renewal Site Plan. A subdivision plat will be required to divide the current lot into two lots (one for the proposed marijuana establishment and the other for the proposed gas station). Unique addresses will be assigned to each lot. Staff has not heard any updates about the retail marijuana store and is unsure of its anticipated timeframe for development.

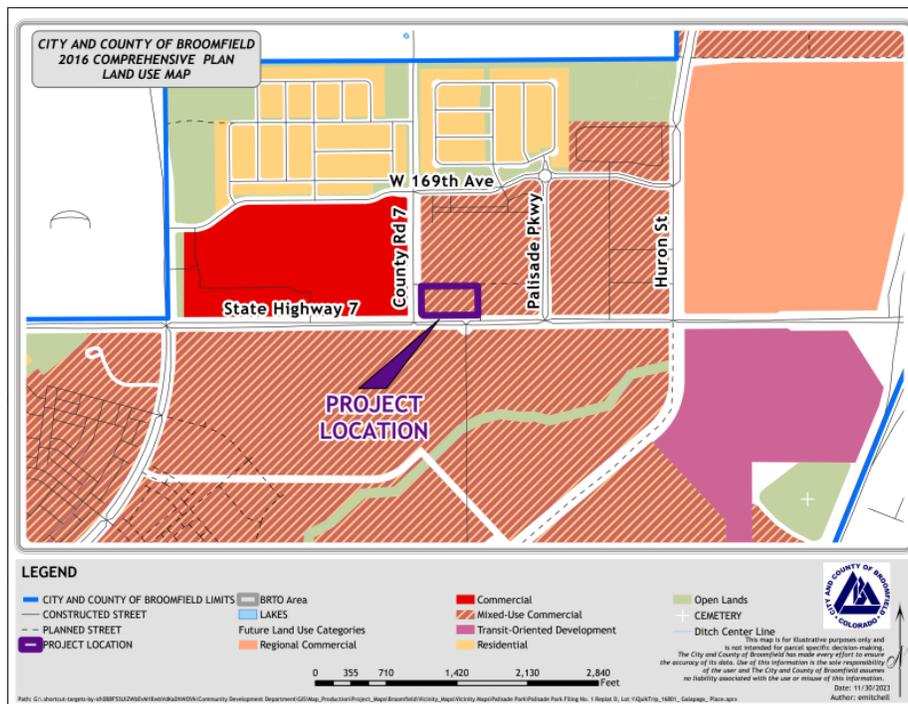
Status of the Development

The subject parcel is currently vacant.

Applicable City and County of Broomfield Plans

Broomfield Comprehensive Plan

The 2016 Broomfield Comprehensive Plan land use designation for this property is “Mixed-Use Commercial.” The following map shows the project location within a portion of the land use map for the surrounding area.



A Portion of the 2016 Comprehensive Plan Land Use Map

The Comprehensive Plan describes the primary uses within Mixed-Use Commercial areas as including commercial, employment and multifamily or single-family attached residential uses.

The comprehensive plan identifies “travel commercial uses,” including gas stations, as a land use appropriate for areas designated as Regional Commercial.

Goals and Policies

Elements of the proposed project could help meet the following Comprehensive Plan goals:

Policy ED-A.4: Ensure an adequate supply of appropriately zoned land for a diversified mix of manufacturing, services, and business support services.

Goal ED-B: Commercial Vitality, Maintain and enhance the vitality of commercial, industrial, and retail sectors in order to provide employment and tax base.

Goal ED-G: Adequate Tax Base, Ensure an adequate property and sales tax base to support quality community services, facilities, and amenities as identified within the Long-Range Financial Plan, and without placing an undue tax burden on citizens.

North Park West Urban Renewal Plan

The property is within the North Park West Urban Renewal Plan area and subject to the Urban Renewal Plan authorized in April of 2004. The purpose of the plan is to implement the provisions of the Comprehensive Plan and the I-25 Sub-Area Plan that apply to the Urban Renewal Area. Broomfield requires an urban renewal site plan for development in the area, meaning that any formal development proposal will need to be co-titled as a Site Development Plan/Urban Renewal Site Plan and consider applicable review criteria from the URP.

Neighborhood / Area Plan

The property is within the I-25 Sub-Area Plan. Broomfield adopted this plan in 1999. The plan aims to establish a balance of complementary land uses, ensure the City’s economic stability through value-creation and value-retention, and provide a coordinated approach to infrastructure planning.

Financial Plan

The proposal is consistent with the allowable existing planned use and activity for development at this site.

Broomfield’s strategic vision and plan for the corridor and surrounding area is for a multi-modal, mixed-use community - and encouraging a higher level of density and active street-facing environment. The community and neighborhood communities are committed to the CO-7 corridor to have and support Bus-Rapid Transit (BRT) and other multi-modal travel options. The proposed site plan, orientation, and scale will not contribute to furthering this shared vision. The application may consider adjustments to the “traditional” convenience/fuel store with a more forward approach such as increasing food and consumer

services and future energy mix of gasoline/diesel pumps and EV fast chargers incorporated as part of this site. EVD staff would welcome the opportunity to engage in a conversation bringing the marketplace, the company's future and new energy opportunities, and community strategic vision.

Area Context and Property Location

The project area for this proposal is north of CO 7 and east of CR 7. The property at 16801 Galapago Place is 3.84 acres. The project is proposed in a mixed use development. The site will be approximately 120 feet from the park approved in Palisade Park to the northeast and approximately 640 feet to the closest residences (the brownstones north of the park). The uses along the north side of CO 7 include a hospital, medical building, quick serve restaurants, and similar commercial uses. The south side of CO 7 includes undeveloped land in the Baseline development.



Project Location Map

Current Application - Detailed Description and Staff Review

Description

This proposal is for a new gas station including a 5,312 square foot, single-story convenience store and 14 detached fuel pumps. The proposed development includes a canopy structure located over the gas pumps. This proposal also includes 39 parking stalls.

Background/Base Data

Property Owner	Kevarma LLC.
Applicant	QuikTrip
Property Location	North of CO 7 and East of CR 7, Palisade Park
Property Size	Approximately 3.84 acres
Current Zoning	PUD
Proposed Zoning	PUD
Current Land Use	Vacant
Proposed Land Use	Commercial
Comprehensive Plan Designation	Mixed-Use Commercial

Site Layout

The formal development proposal will include a final plat to subdivide the existing parcel at 16801 Galapago Place into a lot for this gas station, as well as lots for the intended development of the remainder of the parcel (including the planned retail marijuana establishment). The planned layout for the site shows a convenience store at the northwest corner of the property. The gas pumps are planned to be in the middle of the lower part of the lot.



Conceptual Site Plan Layout

Vehicular Access, Parking, and Circulation

The conceptual site plan includes one (1) vehicular access point from West 168th Place on the north and 39 parking stalls distributed across the site.

Broomfield's new parking code, which became effective on January 1st, 2024, requires 6 parking spaces for every 1,000 square feet of gross floor area for a Gas station, service center, or convenience store. This proposed convenience store would be 5,312 square feet, requiring 32 parking spaces. The "Parking Maximum" (equal to 125% of the parking minimum) for a convenience store of this size would be 40 parking spaces. The property is located within a Parking Reduction Area, however a *gas station, service center, or convenience store* is not eligible for a parking reduction, meaning that Broomfield's standard parking requirements would apply. The site therefore complies with the new parking requirements for Broomfield.

The proposal will need to add EV charging stations to be in compliance with Ordinance 2216 establishing the new Chapter 15-33 of the Broomfield Municipal Code titled "Colorado Model Electric Ready and Solar Ready Code" - as amended by Broomfield. As currently proposed, the development would require one (1) EVSE (Electric Vehicle Supply Equipment) Installed Space, three (3) EV Ready Spaces, eight (8) EV Capable Spaces, and zero (0) EV Capable Light Spaces. It should be noted that since the EV parking requirements are now enforced as part of the Building Code, there is no opportunity for a developer to request a variance from these requirements through a PUD plan amendment or SDP.

North Metro Fire Rescue District has indicated they will require two (2) approved vehicular access points to the site. This access requirement will need to be established as part of the formal development review. Traffic Engineering has indicated that access will not be allowed from CO 7 or CR 7, and so a second access point will need to be considered via a cross access through the adjacent parcel.

Roadway Improvements

Several roadway and traffic signal improvements in this part of Broomfield are planned to be phased over time. Between Palisade Parkway and CR 7, the developer will widen the highway on the north side to the planned cross section. This widening will include the new intersection of CO 7 and Galapago Place. The developer is coordinating final design elements with CDOT.

The eastern half of CR 7 is also under construction by the developer and includes an intersection with West 168th Place. The western half of CR 7 is already completed.

Huron Street, which currently terminates into CO 7 just south of this project site, will be realigned by the developer of the Baseline Development (McWhinney) to connect to Huron St North (east of Palisade Parkway). That developer expects construction to occur after 2025.

Planned traffic signal improvements include a future signal to be added by the developer once Huron Street south of CO 7 has been realigned (the existing signal at CO 7 and Huron south will be removed). A new traffic signal at the intersection of CO 7 and Huron North will take place with the adjacent roadway improvements.

An additional traffic signal and roadway connection to the south is planned at the intersection of CO 7 and CR 7 in the future. There is likely also to be an access onto CO 7 from the proposed Center St between CR 7 and Sheridan Blvd.

Transit Access and Walkability

The conceptual site plan includes pedestrian connections from the planned convenience store to sidewalks along CR 7 (to the west of the site) and West 168th Place (to the north of the site). The planned connection to CR 7 is a staircase, which would not be ADA accessible. There is currently no pedestrian connection planned through the site from CO 7 to the convenience store.

The I-25 Sub-Area Plan encourages the arrangement of buildings, roads, and pedestrian and bicycle facilities in a way that facilitates travel without requiring an automobile. The applicant should consider this in the design of pedestrian connections into the site from off site, particularly how to accommodate convenient, ADA accessible access to future transit stop locations.

CO 7 is a key east-west transportation corridor between Brighton to Boulder. Communities and agency partners have been planning for new fixed route transit service and future BRT on CO 7 for a number of years. Funding has been secured to begin limited fixed route transit service on CO 7 in 2026. Through this planning process a transit stop location has been identified in the vicinity of the CO 7/CR 7 intersection. It is a Broomfield priority that development in this area supports convenient pedestrian access to future transit stops to support transit usage. In addition, CDOT, RTD and local municipalities have been working to plan for and construct transit improvements at the the I-25/CO 7 interchange that will create a new transit stop, PnR, and ped bridge over I-25. The interim improvements are planned to begin construction in 2024 and once completed, will provide new transit options in this area.

Staff has communicated to the applicant that there is a desire to see direct, ADA accessible pedestrian connections between the sidewalk along CO 7 to the convenience store, and to neighboring future developments.

Lighting, Landscaping, and Signage

The applicant is required to submit a photometrics plan with their formal application. This is to make sure lighting sources from this development do not cause any light spill onto adjacent properties.

The plan shows limited detail about landscaping and signage at this stage. The formal application will need to follow the new landscape and sign codes now in effect.

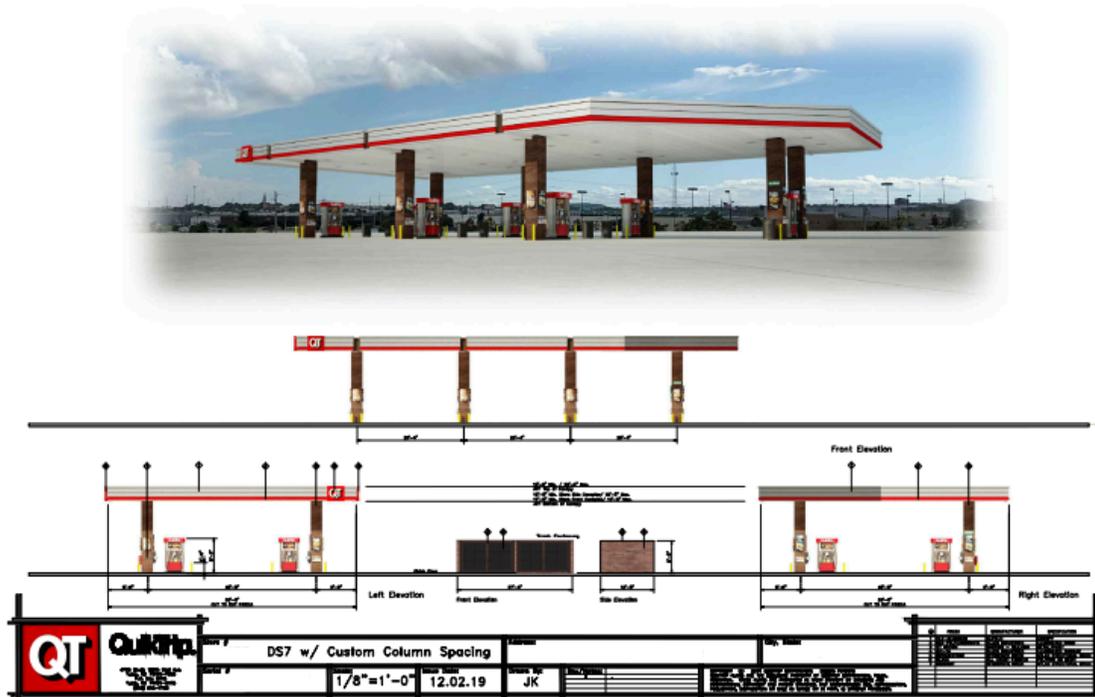
Architecture

The applicant has provided a rendering of the proposed convenience store. The design is consistent with other convenience stores operated by QuikTrip.



Exterior Rendering of Convenience Store

The applicant has also provided a rendering of the canopy located over the gas pumps. The proposed canopy is 18' 6" in height, less than the 180-foot maximum established for commercial development by the Palisade Park PUD.



Rendering of Gas Pump Canopy Structure

Stakeholder And Public Outreach

The City and County of Broomfield standard public notice requirements have been met for this case. These requirements include:

Concept Review Meeting:

- Sign(s) were posted on the property a minimum of ten days in advance of this meeting
- Mail notice to property owners located within 1,000 feet of the parcel boundaries (or such additional distance deemed necessary by the city and county manager based on the proposed size, density, and intensity of the proposed development), mailed a minimum of ten days in advance of the meeting
 - The radius notice was extended to 1,300 feet to reach single-family residential homeowners within the residential subdivision north of 169th Avenue. In addition, the applicant reached out to the Brownstones property manager to provide notice to residents within the apartment units.
- The concept review has a project website on the Broomfield Voice

On January 24, 2024, the applicant held the required neighborhood meeting for this proposal. No members of the public attended this meeting. The applicant will be required to submit notes regarding the meeting along with their formal PUD and SDP application.

Staff Review Of Key Issues

Staff has identified the following key issue for this concept plan.

- EV Charging - The proposal submitted for this concept review does not specify the EV charging stations. The proposal will need to add EV charging stations to comply with Ordinance 2216 establishing the new Chapter 15-33 of the Broomfield Municipal Code (titled "Colorado Model Electric Ready and Solar Ready Code" - as amended by Broomfield). As currently proposed, the development would require one (1) EVSE Installed Spaces, three (3) EV Ready Spaces, eight (8) EV Capable Spaces, and zero (0) EV Capable Light Spaces. Although not required, adding an EV fast charger in place of one of the required EVSE Installed Spaces could provide an additional service to customers and this would be an appropriate location given proximity to Interstate 25.

Next Steps

If the project proceeds to a formal development application, it will need a Final Plat, Site Development Plan/Urban Renewal Site Plan, and Subdivision Improvement Agreement. Because this site is less than seven (7) acres in size, the application(s) would require a public hearing with the Land Use Review Commission with the option for a call-up by the City Council.



City of Broomfield

City Council Study Session Memorandum

Residential Development Update: Future Projections and Financial Impacts

The purpose of this communication is to provide the City Council with an update regarding current and projected future development in Broomfield.

Meeting	Agenda Group
Tuesday, February 20, 2024, 6:00 PM	Study Session Item: 2A
Presented By	
Anna Bertanzetti	
Community Goals	

Overview

[View Correspondence](#)

The purpose of this communication is to provide the City Council with an update regarding current and projected future development in Broomfield. The memorandum will also provide information regarding how the updated projections impact Broomfield financially.

Attachments

Residential Development Update Memo.pdf

Summary

[View Correspondence](#)

The purpose of this memorandum is to provide the City Council with an update regarding current and projected future development in Broomfield. The memorandum will also provide information regarding how the updated projections impact Broomfield financially.

Staff from Planning, Economic Vitality, and Building update development projections regularly. To update projections, staff gathers and considers market conditions and information, seeks direct updates and input from the development community, gathers information provided by builders actively working in Broomfield, and tracks development review inquiries/activity along with other factors.

A number of factors outside of Broomfield's control can influence whether developers and builders move forward with anticipated development projects including market demand, availability of materials and labor, interest rates, availability in and access to equity and investment financing (e.g. bank loans, investment funds, equity investors, and other sources), and the demand and alignment to governmental funding programs (e.g. Colorado Housing and Finance Authority' (CHFA) Low Income Housing Tax Credits (LIHTC) and Colorado's Prop 123 funding). Over the past five years, each of these investment and cost factors have directly impacted anticipated development projects in Broomfield, resulting in slowing or evolving various projects.

Additionally, builders may also modify anticipated schedules based on changes Broomfield may make in regard to development fees or regulations. In some cases, this may mean a project moves forward more rapidly due to the regulatory changes in order to capital. In other cases, projects slowed by market demand and other exogenous factors are impacted by the resulting additional costs or requirements to meet the regulatory changes.

This memorandum will cover the updated residential development projections for 2024, 2025, and 2026 as well as anticipated impacts to revenue projections.

Economic and Financial Considerations

Broomfield continues to be a strong commercial and residential development market for developers, businesses and residents. Even with the strong economic foundations, the development and real estate market demand is impacted by international, national and state conditions and changes. As noted, recent increases in the interest rate have both dampened business expansion and investment and slowed the residential housing markets, especially new single family and townhome development. At the same time, other factors such as building material availability and labor cost increases have softened during the past 12-18 months. Leading experts are suggesting a growing optimism of a return to a paced, normal market activity level. However, as the evidence shows and is noted within, Broomfield

development was below the anticipated level for 2023, will be slowed and impacted in 2024, and will grow toward a normal rate in 2025 and 2026. In some cases, development projects anticipated to move forward in 2023 or 2024 are now anticipated to do so in 2025. In other cases, some projects have been placed on hold waiting for either cost pressure to further subside or for market demand to increase to warrant the capital investment risk.

Development activity impacts Broomfield's annual budgets in two ways. Initially, the impact is from revenues collected from fees and use tax collected and associated costs related to the plans, building and infrastructure for the developments. These development revenues impact the general fund (e.g. permit and review fees) and the Enterprise Funds (e.g. license fees). These budgets are developed with revenue projections based in part on anticipated permit activity. When development does not follow projections, there will be a difference in actual revenue versus projected revenue. This memorandum will provide an overview of how the current development trends are anticipated to impact revenue forecasts for the adopted 2024 original budget and potential implications for the proposed 2025 budget.

The second manner of impact is through the revenues that result from increasing the number and value of residential properties. Increases in revenue are the result of spending of residents as well as new and expanded businesses and the associated activities. This is balanced against the increased demand and costs resulting from meeting the program and services demands for additional residents added to Broomfield's population through new residential developments. The revenue, and associated program and services costs, resulting from the slowed 2023 and 2024 development activity will be experienced two or three years in the future, due to the time required from design and plans to construction, and can be anticipated in the budgeting of revenues.

This update is focused on the budget and fiscal impacts of the market-slowed development activity in the immediate years, which are the adjustments and impacts on the 2024 and anticipated 2025 budgets from the anticipated lower fee and use tax collection. Most of the development projects are still anticipated to be built, just delayed, but projects having a longer anticipated timeframe for development will have a similar longer term impact on the community's financial sustainability and resilience.

Prior Council or Other Entity Actions

[April 19, 2022](#) - City Council held a Study Session providing an Update on Broomfield Development: Growing a Sustainable Broomfield - Socially, Economically, and Environmentally. This provided a general overview of development in Broomfield particularly projects within the development pipeline and anticipated in the future.

[May 17, 2022](#) - City Council held another Study Session as part of the Growing a Sustainable Broomfield series that focused on residential development tools and impacts on public infrastructure.

[June 21, 2022](#) - City Council held a third Study Session in the Growing a Sustainable Broomfield series that focused on commercial development and the resulting fiscal impacts on Broomfield.

[August 30, 2022](#) - City Council held a study session for an economic and fiscal update which included highlights from the 2022 and 2023 budgets.

[September 20, 2022](#) - City Council held a study session related to the inclusionary housing regulations and possible amendments to the BMC.

Boards and Commissions Prior Actions and Recommendations

None at this time.

Proposed Actions / Recommendations

N/A

Alternatives

N/A

Background

On [April 19, 2022](#), staff provided an update to City Council regarding development in Broomfield.

The purpose of this current memorandum is to provide the City Council with an update regarding current and projected future development in Broomfield. Staff from Planning, Economic Vitality, and Building update development projections regularly. To update projections, staff gathers and considers market conditions and information, seeks direct updates and input from the development community, gathers information provided by builders actively working in Broomfield, and tracks development review inquiries/activity along with other factors. The projected development activity includes project type, size, and timing through 2050. The work includes land conditions (readiness and infrastructure timing), nearby development activity, market demand and supply (immediate, community, and broader area), project scale and phasing, development type, and other factors. These projections are used to inform plans, strategies and long term investment decisions.

The table below provides a comparison of what had been presented as staff's projections in April 2022 versus what year-end totals were for the years of 2022 and 2023.

		Projected in 2022	Actual	Difference
2022	Single Family	155	117	-38
	Multi Family	2,363	1,562	-801
2023	Single Family	156	46	-110
	Multi Family	1,974	1,317	-657

A number of factors outside of Broomfield’s control can influence whether developers and builders move forward with anticipated development projects including market demand, availability of materials and labor, interest rates, access to equity and investment financing (e.g. bank loans, investment funds, equity investors, and other sources), and the demand and alignment to governmental funding programs (e.g. the Colorado Housing and Finance Authority’ (CHFA) Low Income Housing Tax Credits (LIHTC) and Colorado’s Prop 123 funding). Over the past five years, each of these investment and cost factors have directly impacted anticipated development projects in Broomfield, resulting in slowing or evolving each project.

Additionally, builders may also modify anticipated schedules based on changes Broomfield may make in regard to development fees or regulations. In some cases, moving the project forward more rapidly due to these changes. While in other cases, projects slowed by market demand and other exogenous factors are then impacted by the resulting additional costs or requirement to meet the regulatory changes.

Some examples of unforeseen permit activity and changes to projections that impacted the 2023 permit activity and are anticipated to impact future years:

- In December 2023, 101 building permits were issued for construction of single-family, townhomes or paired homes. This represented one quarter of the permits issued in 2023. These permits were largely requested to allow the homes to be constructed under the codes in effect in 2023 rather than the new codes that went into effect January 1, 2024. As a result, staff is expecting to see a significant drop in the number of single-family and townhome permits in the first quarter of 2024 as builders work to update house plans to meet current codes and begin construction on the large number of home permits acquired in December 2023.
- At the end of 2023, the Flatiron Marketplace Phase II project informed staff that although their permits had been reviewed and were ready for issuance, they had made the decision to pause the project and would be waiting for more favorable market conditions. Since the project is a large apartment complex, it will take significant time and investment to redesign the building plans to meet the building code updates that went into effect January 1, 2024 and therefore staff is projecting at least a 15 to 24 month delay in the project construction timeline to allow time for the market to

become more favorable, the architect to revise all necessary plans, and time for staff to review the updated plans.

- During 2023, Fairfield at Highlands communicated with staff regarding unanticipated expenses with the project. The memorandum from [August 8, 2023](#), requesting a change to the income aligned housing agreement for the development included information regarding the [financial challenges](#) the development was facing at the time due to building code updates, construction labor and material inflation, and site conditions. The developer has submitted an updated building plan and anticipates a building permit later this spring.
- The interest rate for 30 year mortgages increased from approximately 3.85% to nearly 8% between March 2022 and the end of 2023. This impacted sales of new single-family and townhome units resulting in far fewer residential permits in late 2022 and continuing through 2023.
- In 2022, when staff was working on development projections, the Broomfield Town Square was anticipated to move forward to building permits in 2023. Due to changes in the developer's anticipated schedule, the developer is now anticipating horizontal (infrastructure) improvements to begin in late 2024. Since significant infrastructure improvements are necessary, the building permits for the new residential buildings are not anticipated until 2025.

Broomfield's experience with a slow down in residential development is consistent with other communities along the front range. The Home Builders Association published their [year end summary](#) and it illustrates an overall 26% decline in the number of residential units built in cities along the front range.

Recently, Broomfield staff adjusted residential growth projections to reflect the slowing in residential development in the next few years. This memorandum provides an overview of what is currently in the development pipeline and an update regarding anticipated revenue from new development in 2024 and 2025. At this time, staff is not certain how recent changes in building code/development requirements will impact projects that are in an early phase of deciding whether to develop in Broomfield. Costs associated with requirements related to fire sprinkler systems, electric ready, solar ready, and electric ready requirements paired with increases to costs associated with utility licenses and Broomfield's existing requirements related to public land dedication and income aligned housing may influence the ability for some projects to move forward and this impact is not yet know since the ordinances have only recently been put into effect.

Current Development Pipeline

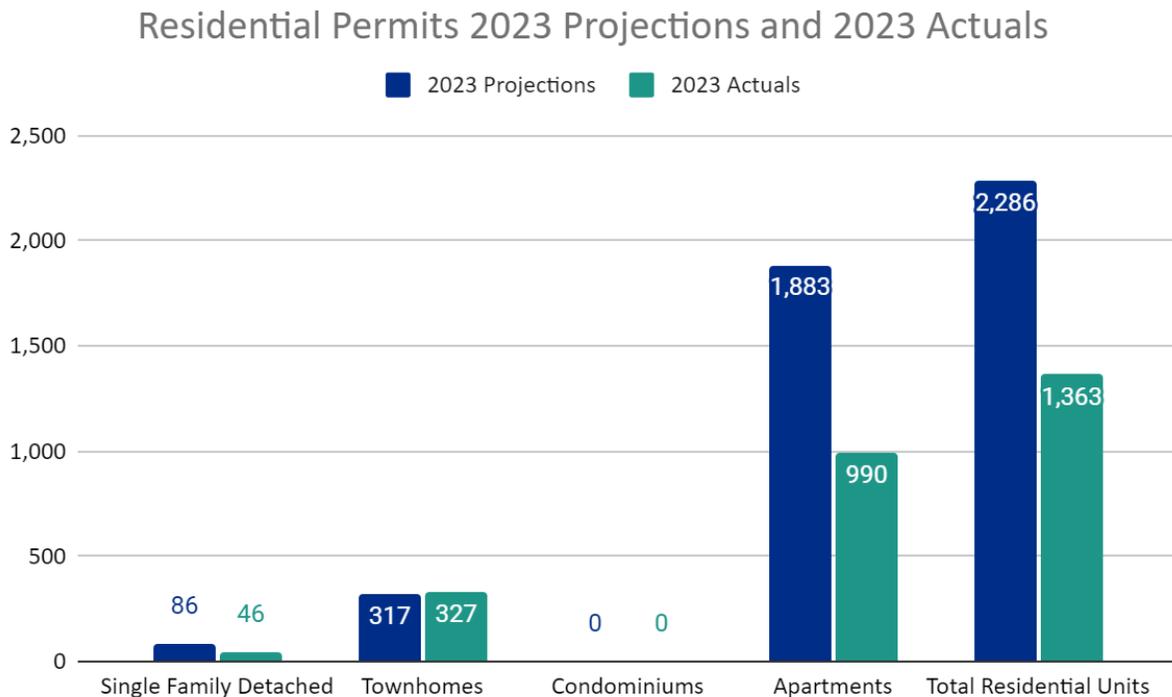
Staff continues to anticipate the majority of residential development will be multi-family units (apartments and townhomes) versus single-family detached residential development. Between 2024 and 2026, approximately 3,361 residential units are projected with only 5.5% being developed as single-family detached units.

Although residential development continues, it is moving forward at a slower pace than originally anticipated. As previously stated, staff continues to monitor development trends and update projections regularly.

When the budget is completed, staff provides a projection for the next year to inform anticipated revenue from new development. Although staff works closely with developers to understand their anticipated development timeframes and factors in a number of outside factors, anticipated development doesn't always come forward as the developer anticipated and planned.

Based on experience and knowledge, three factors increase the variance between the developers planned timeline and the observed, actual timelines - location, scale, and character of the development. The location of the development impacts the predictability of the development in that land conditions and infrastructure can impact the amount of investment and time needed to allow for development to occur in a specific location. Larger scale projects, and the associated costs and financing, increases the risks and challenges. The increased complexity of a project, such as mixed use projects or new concepts not already in place within the market, can create additional challenges.

The graph below shows a comparison between the 2023 projections for residential development that were created based on information known in mid-2022 as compared to the actual number of permits obtained in 2023.

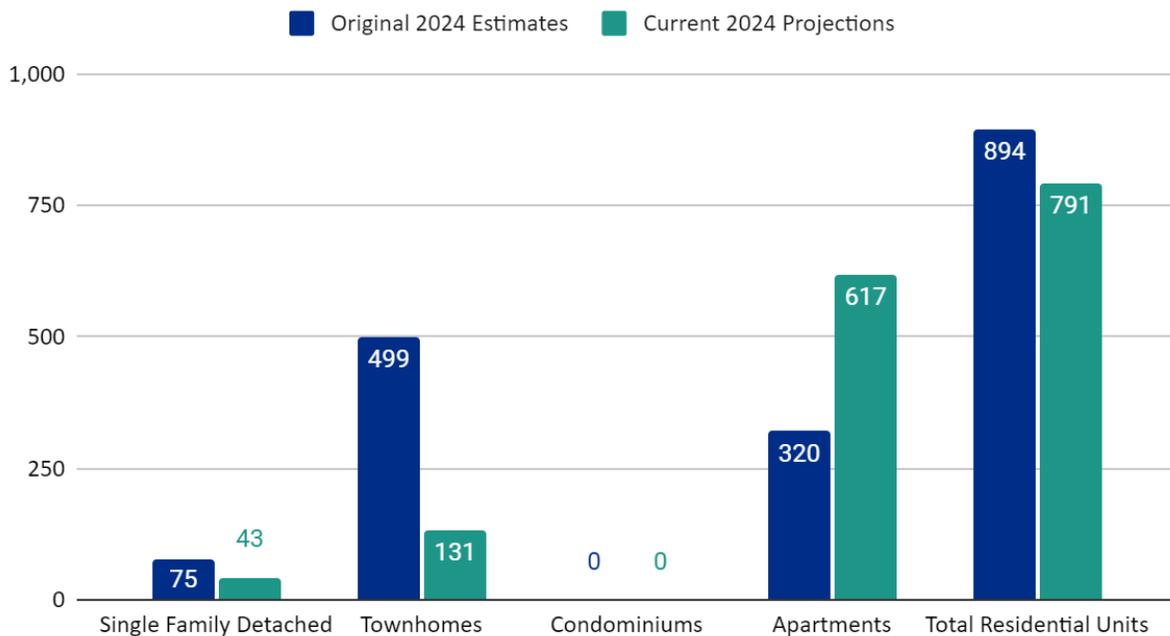


Some of the reasons for the difference between the projections and the actual number of permit are:

- In mid-2022, staff anticipated that Flatiron Crossing, Brownstone Phase II in Palisade Park, Flatiron Marketplace Redevelopment Phase II, and Broomfield Town Square would receive permits in 2023. These projects, for various reasons, had changes to their anticipated timeframes resulting in significant shifts in residential permit projections.
- Fairfield at Arista and Grand Vue at Interlocken (Century Communities) were expected to receive building permits in late 2022, but both delayed pulling permits until 2023.
- Increases in interest rates resulted in fewer single-family detached residential home permits being requested in 2023.

Following our standard process, in mid-2023 staff created projections for residential permit activity anticipated in 2024. Since mid-2023, there have been a number of changes with various projects and a revision to the permit projections is now anticipated to result in fewer residential permits in 2024.

2024 Residential Permits: Original Estimates vs Current Projections



Some of the reasons for these changes include:

- Permit activity for single-family detached continues to be slower due to higher interest rates than had been seen in some of the recent years
- McWhinney has not moved forward with the next phase of townhome and single-family detached development in the area east of Sheridan Parkway as quickly as anticipated resulting in a lowering in the anticipated number of permits for the Baseline development.

- The Fairfield Highlands project originally was anticipated to obtain a building permit in 2023, but is now anticipated to obtain building permits in mid 2024. Additional time was needed to revise the plans to meet new building code requirements and to address issues that were identified during the construction plan phase.

Similar to 2024, staff estimates for 2025 and 2026 will reflect a continued cooling of the residential development compared to our original projections.

Commercial Development Update

Broomfield is a strong, vibrant commercial development market, including office, flex/innovation, warehouse/logistics and retail and hospitality. In a similar manner to residential markets, commercial real estate and development has been impacted by rapid increases in building material costs and wage levels, challenges in the availability of skill construction and trade labor, interest rates, market demand (including changes in company/employee work patterns), and access to equity and investment financing (e.g. bank loans, investment funds, equity investors, and other sources).

Currently, based on feedback from metro real estate market experts, Broomfield is considered a stable, growing market. The strengths of the commercial market include retail and hospitality (restaurant and lodging), flex and innovation space, and light industrial (manufacturing, logistics). The office market is considered, similar to most markets across the country and the entire Denver metro area, to be stable with cautious optimism. The retail market has recovered and is strong due to higher income and spending patterns, sustained residential growth (even with the recent slowing), continued business strength in key growing business sectors, and easy access to metro residential areas.

The office market has experienced an increase in vacancy primarily due to business space consolidation and metro office relocations. Metro real estate experts have shared that the increase in vacancy is offset by the stable, growing lease rates in Broomfield's office space. They have attributed the positive office rents to the existing quality, reinvestment by owners in their properties, and a growing return of employees to the office, growth in Broomfield's business sectors, and access to highways, market and airports (DEN and Rocky Mountain Metropolitan Airport) Additionally experts have noted recent leasing activity patterns show a movement of firms and leases to suburban areas from the urban core - a reversal of the pattern experienced over the last decade or two.

Commercial development is different from residential development activity. Commercial projects occur in significant steps and phases as compared to residential which is typically in a continuous pace, through slowing or accelerating in a given one to three year period. As examples, the Simms Technology Park (112th and Simms) development, which broke ground in the fall 2023, will include thirteen (13) buildings and about 600,000 square feet, and four retail/restaurant sites. Additionally, Connect 25 Flex/logistic buildings, formerly known as the Sun Cap project, (Huron and Colorado 7) includes 4 buildings with nearly 500,000 square feet.

Currently, Broomfield has commercial development underway with total build-out of building and space about 2.0M square feet - with locations across the community.

The Innovation Park, a planned project including flex/research space in the Interlocken area, was anticipated to move toward review and permitting in 2023 and 2024, but has been delayed due to the change in current space demand and higher interest rates. The developer of the project plans to move forward, but has delayed the project one to two years.

Catalytic Development Update

Three catalytic development projects, including Baseline, Broomfield Town Square and Flatiron Crossing (reinvestment) continue to progress. Each of these development projects is led by a private sector developer, and each team is in communication and works with Broomfield staff to advance their project. Each development project team is being scheduled to provide an update to the City Council. These updates will include milestones and timing, development plans, and other key aspects of each development.

Baseline, the large mixed-use development in northeast Broomfield, is working on finalizing the Center Street District plans, including layout, infrastructure, and buildings. These plans will include both residential and commercial development, and are based on anticipated business tenant needs and requirements. The developer has indicated formal plan submission in late 2024, however, staff does not anticipate issuance of building permits in 2024 for Baseline Center Street District.

Broomfield Town Square, located at 1st and Spader, plans to move through the financing elements of the pre-development beginning in late summer and early fall 2024. This stage of their work includes approvals of agreements related to tax increment financing (TIF) with various governments, including the school district and Broomfield Urban Renewal Authority. This timeline creates an opportunity for the developer to seek development bond sales in late 2024 or 2025. Staff does not anticipate issuance for building permits in 2024 for the BTS development.

The reinvestment in the Flatiron Crossing property, with new tenants and tenant movement within the building and investments in key infrastructure, and the redevelopment of the property to the southwest of the mall. This mall improvement and tenant changes represents a multi-million dollar investment, by tenants and the owner (Macerich and their partners). The demolition work has progressed to the south of the main mall building where new mixed-use development will occur, and the beginning of both horizontal and vertical work is starting. The developer, and their residential partner, expected to submit for building permits in late 2023 for a 300+ resident building, but this permit along with the permits associated with the public amenity space are now anticipated in 2024.

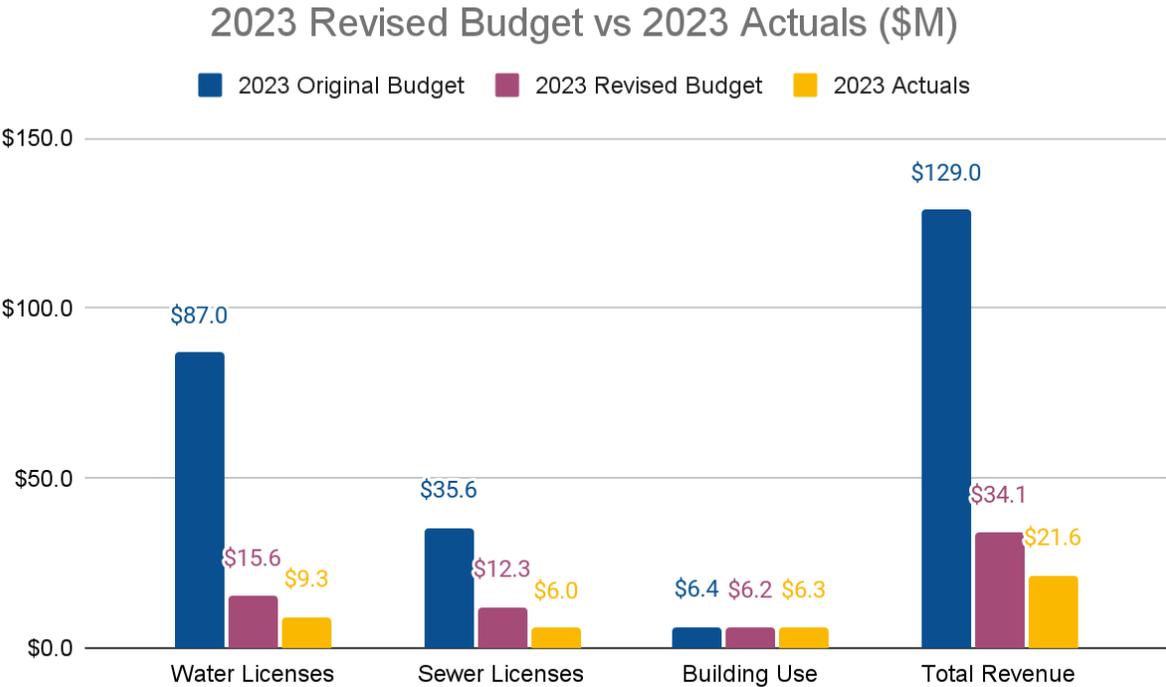
Budget Implications

The slowed pace of development has direct impacts on the general fund and enterprise fund budgets, primarily through a reduced amount of revenue from plan review and building permit fees, enterprise license fees, and use taxes resulting from construction and development.

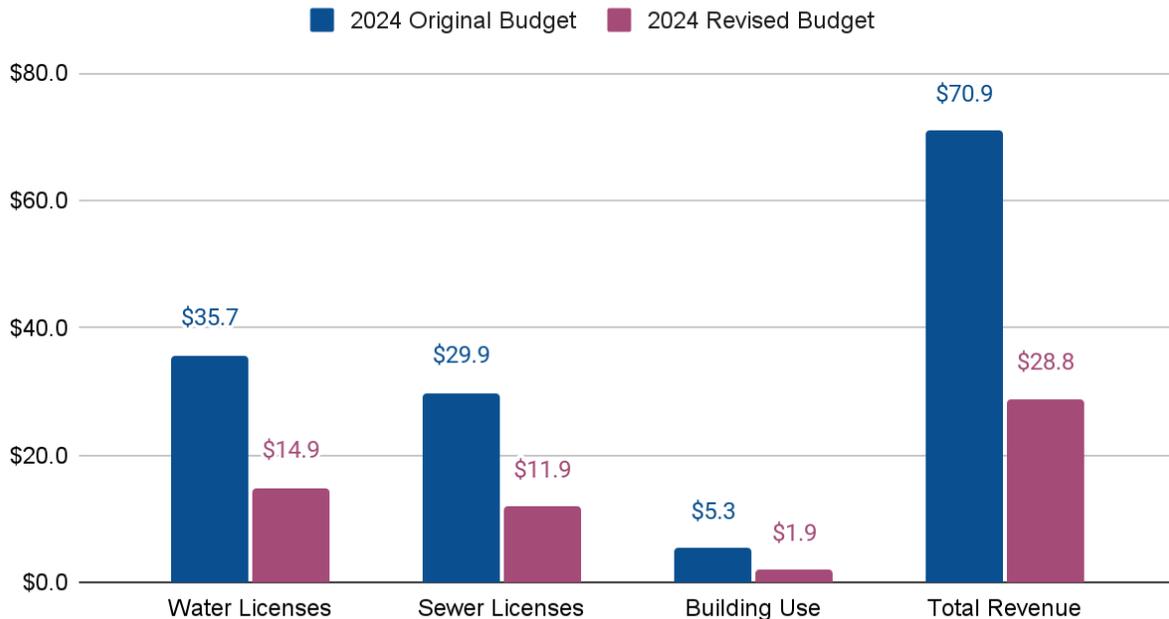
The anticipated unaudited 2023 revenue reduction is \$12.5M. The 2023 Revised budget presented to the City Council on October 24, 2023 was \$34.1M, while the unaudited 2023 actuals reflect revenues closer to \$21.6M across the general and enterprise funds. Additionally, due to the slowed development, the 2024 Original budget was also impacted by approximately \$42.1M. The 2024 Original budget reflected \$70.9M and is now currently projected to be revised to a budget of \$28.8M in the upcoming First Budget Amendment for the City and County of Broomfield in March 2024.

The largest share of reduction is directly due to the water and sewer license fees in the Enterprise Fund. The enterprise license fees are used to support the new infrastructure required by development. The water and sewer usage revenues are not as affected by slowed development, because those revenues are received once development has occurred.

The following charts illustrate the changes in revenue as a result of the development impacts.



2024 Original Budget vs 2024 Revised Budget (\$M)



The slowed development, as described within, does have an impact on revenue projections but Broomfield’s fiscal policy approach continues to evaluate and determine the potential impact, in order to provide sound decisions. Staff continues to analyze the license revenue and will make recommendations for adjustments to the license fee, as well as the usage rates, to ensure and maintain the financial sustainability and reliance for revenues to withstand the development market impacts.

The fiscal impact from slowed development on the City and County’s general and enterprise fund budgets, 2023 year ending, 2024 approved, and the development of the 2025 budget, has resulted in a tightening of the revenue estimates and further limitations to absorb cost changes and/or any budget expenditure increase.

In short, the 2024 budget is tighter and the ability to add or expand programs, services, or make significant project changes is very limited. Careful consideration of any increase in expenses should include where reductions and/or reallocations need to be made in approved or existing services and program costs.

A budget is a living, strategic planning tool; financial and economic staff currently do not expect positive changes to other budgeted fund source revenues (i.e. sales/use taxes, governmental transfers, or other charges/fees) to offset the now-expected lower level of development revenues. The 2024 budget was developed in alignment with the community goal of financial sustainability and resiliency and the information available at the time of the budget development process. However, slowing development fees, use tax, and other

associated revenues are considered when determining which costs can and should move forward.

Next Steps

Staff will continue to monitor development projects and trends and coordinate the timing of the projections to both revise the 2024 budget and as part of the development of the 2025 budget.



City of Broomfield

City Council Study Session Memorandum

Water Update and Drought Plan

Broomfield's Updated Drought Response Plan and Request for Council's Direction on Code Changes.

Meeting	Agenda Group
Tuesday, February 20, 2024, 6:00 PM	Study Session Item: 2C
Presented By	
Ken Rutt, Director of Public Works	
Community Goals	
<input checked="" type="checkbox"/> Financial Sustainability and Resilience	

Overview

[View Correspondence](#)

The purpose of this memorandum is to provide an update to Council on the 2024 Drought Response Plan, an update on Broomfield's drought preparedness and to request Council's direction on proposed changes to Broomfield Municipal Code.

Attachments

Study Session Memo Drought Response Plan.pdf

Drought Response Plan 2024.pdf

Summary

The purpose of this memorandum is to provide an update to Council on the 2024 Drought Response Plan, an update on Broomfield's drought preparedness and to request Council's direction on proposed changes to Broomfield Municipal Code.

Prior to the 2024 update, the latest version of Broomfield's Drought Response Plan was completed in 2012. The 2024 updated Drought Response Plan (Plan) is essential to better planning for and responding to drought and other potential future water shortages. Other factors for updating the Plan include: Broomfield's continuing growth (~34% increase in population since 2012), changing water use patterns (average per capita water use has declined by about 16%), and ongoing drought conditions in the Colorado River basin.

Staff utilized 2020 Guidance from the Colorado Water Conservation Board and specific ideas and methods drawn from drought plans adopted by other communities in the region (e.g., Aurora, Denver, Erie, Ft. Collins, Thornton) when updating the Plan. Staff from Public Works, Parks, Emergency Management, and Communications also identified the following priorities for the Plan: (1) utilize current raw water supply and demand projections to thoroughly evaluate Broomfield's vulnerability to drought and other emergency water shortages, while also accounting for the effects of future climate change; (2) assess risks associated with the ongoing Colorado River drought; (3) develop monitoring and enforcement strategies for mandatory water use restrictions; (4) enhance communication/education about drought and water conservation; and (5) identify separate drought monitoring and response measures for the reuse water system. The updated Plan identifies several new Drought Severity Indicators that staff will use to monitor drought and overall water supply conditions in Broomfield, a new communications plan which will be used to help guide public education and outreach in times of drought, and slight changes to the response actions, or short-term, temporary measures that will help to increase supply and/or reduce demand during a drought.

As part of the Plan update, Staff completed a vulnerability assessment to quantify Broomfield's risk to future drought. The assessment included: (1) a repeat of the 2002 drought, (2) droughts exacerbated by climate change, (3) risks under the Colorado River Compact, (4) and short-term water shortage due to infrastructure failure. Initial findings from the vulnerability assessment include: (1) the potable water system may require additional drought-year water supply in the future, and will require additional local storage to meet peak season demands (e.g. Siena and Broomfield Reservoirs); (2) increased investments in water conservation help reduce the potential of shortages under extreme levels of drought; (3) water restrictions may need to be in effect for several months, and possibly years during more extreme droughts; and (4) the Chimney Hollow Reservoir project, scheduled for completion in 2025, will greatly improve the reliability of existing water supplies by firming the yield Broomfield's Windy Gap units. As part of the vulnerability assessment, staff updated their methodology for forecasting future potable water demands which resulted in an overall reduction of approximately 13% at buildout, as compared to forecasts previously presented to Council.

Staff is **not** recommending any changes to the overall approach for declaring drought stages (i.e., staff will continue to monitor conditions and make recommendations to the City Council; the City Council will decide when to move into Drought Stages per Chapter 13-36 of the BMC, which may impose mandatory water use restrictions on residents and businesses).

Staff is requesting Council's direction on certain changes to municipal code related to enforcing future mandatory drought restrictions and improving overall drought preparedness, including: (1) the adoption of a standard (i.e. "normal year") watering schedule of 3 days per week between the hours of 6:00 p.m. and 10:00 a.m.; (2) enforcing watering restrictions during declared times of drought, and increasing penalty ranges for non-compliance; and (3) the adoption of an additional drought surcharge which could be applied to customers' monthly water usage charges during times of declared drought. Adoption of a

surcharge would still require future approval by City Council during the recommendation of a Drought Condition I, II, or III, and would be limited as follows:

1. The percentage increase for any individual water use rate would be no more than 50%.
2. There would be no surcharge on the lowest rate tier for residential water use.
3. For non-residential potable water customers, there would be no surcharge for water use up to average winter water consumption in any one month.

Financial Considerations

There are no financial considerations at this time. However, in updating the Plan, staff may recommend certain projects and/or water acquisitions in order to improve Broomfield’s drought resilience and address any water supply shortages projected during a future drought. Additionally, mechanisms to offset the potential revenue loss will be evaluated by staff at that time.

Prior Council or Other Entity Actions

On July 23, 2002, City Council adopted Ordinance 1683 - BMC Chapter 13-36, Drought Watering Restrictions.
On September 28, 2002, City Council adopted Ordinance 1693 amending Chapter 13-36
On May 27, 2003, City Council adopted Resolution 2003-98 - Declaring Stage 1 Drought response, removing mandatory water use restrictions and moving to voluntary conservation
On [June 19, 2012](#), City Council held a Study Session, including an update on the 2012 Draft Drought Response Plan.
On [May 16, 2023](#), City Council held a study session which introduced the updated Drought Response Plan and request for Council’s direction on the associated code changes.
On [July 11, 2023](#), staff presented Ordinance No. 2219 Amending Certain Sections of Title 13 of the Broomfield Municipal Code Regarding Drought Water Use Restrictions. The ordinance was not carried forward to second reading.

Boards and Commissions Prior Actions and Recommendations

N/A

Proposed Actions / Recommendations

Discussion by the Council regarding information in the memo and presentation.

Alternatives

N/A

WATER SUPPLY OVERVIEW

Potable Water Supply

The City and County of Broomfield’s (Broomfield) potable water is supplied from two sources of high quality drinking water: (1) treated water purchased from the Denver Water Board and (2) raw water treated at the city’s water treatment facility. These two treated water systems are blended together in the distribution system. All of Broomfield’s drinking water, whether supplied by Broomfield or Denver Water, comes from surface water sources such as rivers, lakes, and reservoirs that are sustained from winter snowpack. Much of this water originates west of the Continental Divide. For instance, Broomfield’s raw water is supplied by the Northern Water Conservancy District (Northern) from both the Colorado Big Thompson (C-BT) and Windy Gap projects, which originate on the Colorado and Fraser Rivers on the western slope of Colorado. The majority

of Denver Water’s supply comes from the South Platte River, and trans-basin diversions from the Blue and Fraser River basins on the west slope.

Non-Potable Water Supply

The City and County of Broomfield owns, maintains, and operates an extensive non-potable water system that is supplied by advanced treated wastewater effluent (called reclaimed or reuse wastewater) and raw surface water supplies that are blended with the reclaimed wastewater. The non-potable water system is completely separate from the potable water system, and currently provides a supply of about 2,500 acre-feet per year (1 acre-foot = 325,851 gallons), on average, to a total of approximately 940 acres of irrigated parks and 1,500 acres of non-city owned areas (including Arista, Flatirons Mall, Legacy High School, Anthem, and Interlocken Business Park). The reuse system is extremely beneficial as it allows Broomfield to expand its water supplies beyond a single, one-time use and reduces the amount of treated domestic drinking water that would otherwise be needed for these irrigation purposes.

DROUGHT RESPONSE PLAN UPDATE

Current Drought Status

Since April 2023 Broomfield has been in a “normal” drought condition, driven primarily by higher-than-average precipitation and spring runoff across the state last spring. However, dry conditions have started to spread again this fall and early winter, and snowpack in Broomfield’s source watersheds is well below average so far this year (e.g., roughly 64% of normal in the Colorado River Basin, and 56% of normal in the South Platte). If these trends continue, Broomfield and much of Colorado are likely to see some form of drought conditions this summer.

2012 Drought Response Plan

Broomfield’s current [Drought Response Plan](#) (Plan) was developed and discussed with the City Council in 2012. The 2012 Plan includes methods for tracking drought conditions, making recommendations to the City Manager and the City Council for declaring Drought Stages, and a range of mandatory water use restrictions for those Drought Stages. To better prepare Broomfield for evolving drought risks, Water Resource staff began work to update and enhance the Drought Response Plan in the Fall of 2022. The updated Plan is based on the latest guidance from the State, as well as examples from neighboring communities (e.g., Erie, Fort Collins).

Need for a Drought Plan Update

Broomfield has undergone a significant amount of change since the Plan was developed in 2012. Broomfield’s population has grown approximately 34% since 2012, and projections for its ultimate buildout population have also increased by about 30%. Over the same time, average per capita water use in the city has declined by about 16%, driven by increasing adoption of high-efficiency fixtures and appliances, growth in waterwise landscaping, and an overall desire among our residents to conserve water. While these factors have important implications on the city’s long-term water demands, the city’s water supply portfolio has also developed over the last ten years through various water acquisitions and Broomfield’s involvement in the Chimney Hollow Reservoir project. Once complete in 2025, this project will greatly improve the reliability of existing water supplies.

Over the last several years we have seen a persistent, deepening drought within the Colorado River basin (Basin), the source for roughly 80% of Broomfield’s water supply. Addressing Colorado River issues is now a top priority among Colorado state leaders and among all seven states within the Basin. In addition to the Colorado River drought, weather events across the West and the entire U.S., together with improvements in climate science, have focused our attention on climate change impacts on drought risk. Until recent years, we generally considered climate change impacts on water supply to be a long-term risk, but recent events and evidence show that we may face elevated risk within 20 years.

Together these factors - Broomfield's growth and changing water use patterns, new sources of water, and our increasing awareness of climate change impacts on drought - create the need to reevaluate our vulnerability to drought. To help guide development of the new plan, we assembled an internal committee composed of staff from Public Works, Parks, Emergency Management, and Communications. Working with the committee, we have identified the following priorities for the updated Drought Response Plan:

1. Include in our planning the effects of climate change and also consider water system emergencies in addition to those caused by drought (e.g., a temporary disruption to deliveries from Denver or Northern Water);
2. Identify separate drought monitoring and response measures for the reuse water system;
3. Utilize current water supply and demand projections to thoroughly evaluate and describe Broomfield's vulnerability to drought and other emergency water shortages;
4. Qualitatively assess risks associated with the ongoing Colorado River "megadrought";
5. Develop monitoring and enforcement strategies for mandatory water use restrictions; and
6. Update the communication plan for enhancing community outreach, education and communication for drought and water conservation. For example, community events, meeting with homeowner associations (HOAs), reaching out to large commercial users and using social media.

Evaluating Broomfield's Vulnerability to Drought

Staff's goal for the vulnerability assessment was to develop a detailed understanding of how potential future droughts could impact Broomfield, which will then support planning for drought mitigation and response actions. Staff began by researching the impacts from the last severe drought that affected Broomfield, the 2002-2004 drought, which was the last time Broomfield imposed mandatory water use restrictions. To better understand a wide range of potential risks, staff has included multiple scenarios in the vulnerability assessment. The included scenarios are:

1. A repeat of the 2002 drought
2. The 2002 drought exacerbated by climate change.
3. A compact call on the Colorado River.
4. Short-term water shortage due to infrastructure failure.

While the 2002 drought would not literally repeat itself, it is standard practice to use the data from a historical drought to help understand risk. We also know that climate change may make future droughts more severe and/or more frequent. For climate change, staff used information for a "hot and dry" scenario by mid-century, consistent with the Colorado State Water Plan.

Within each of those scenarios, staff considered near-term and long-term future risk. In the near term, staff considered water supply without Chimney Hollow Reservoir and anticipated water demand for the year 2025. For long-term risk, staff included the supply available from Chimney Hollow Reservoir and projected water demand for the year 2040.

Staff completed a draft of the vulnerability assessment for the potable and reuse water system and it shows that droughts similar to the 2002 drought can potentially be addressed through temporary demand restrictions, but would likely require multiple consecutive years of mandatory restrictions and more robust community outreach strategies. Droughts that are possible under a hot and dry climate will be much more severe and potentially cannot be addressed solely through demand restrictions. However, these results are highly uncertain and should not be used to justify large capital investments until more work is done to better understand these risks. Broomfield staff will continue to investigate the feasibility of projects that increase supply (i.e. water rights acquisitions) or reduce demand (i.e. water conservation) to better prepare for severe droughts.

Updated Demand Forecasts

As part of the vulnerability assessment and overall water system planning process, staff has updated their

methodology for forecasting future potable water demands. The updated forecast utilizes population and development projections from Broomfield’s Planning and Economic Vitality Departments in conjunction with estimates of current and future per capita water use across various customer classes (e.g., single-family, multi-family, commercial, industrial, etc.). The updated forecast is approximately 13% lower than past forecasts presented to Council, and indicates about a 16% buffer between supply and average-year demand at buildout.

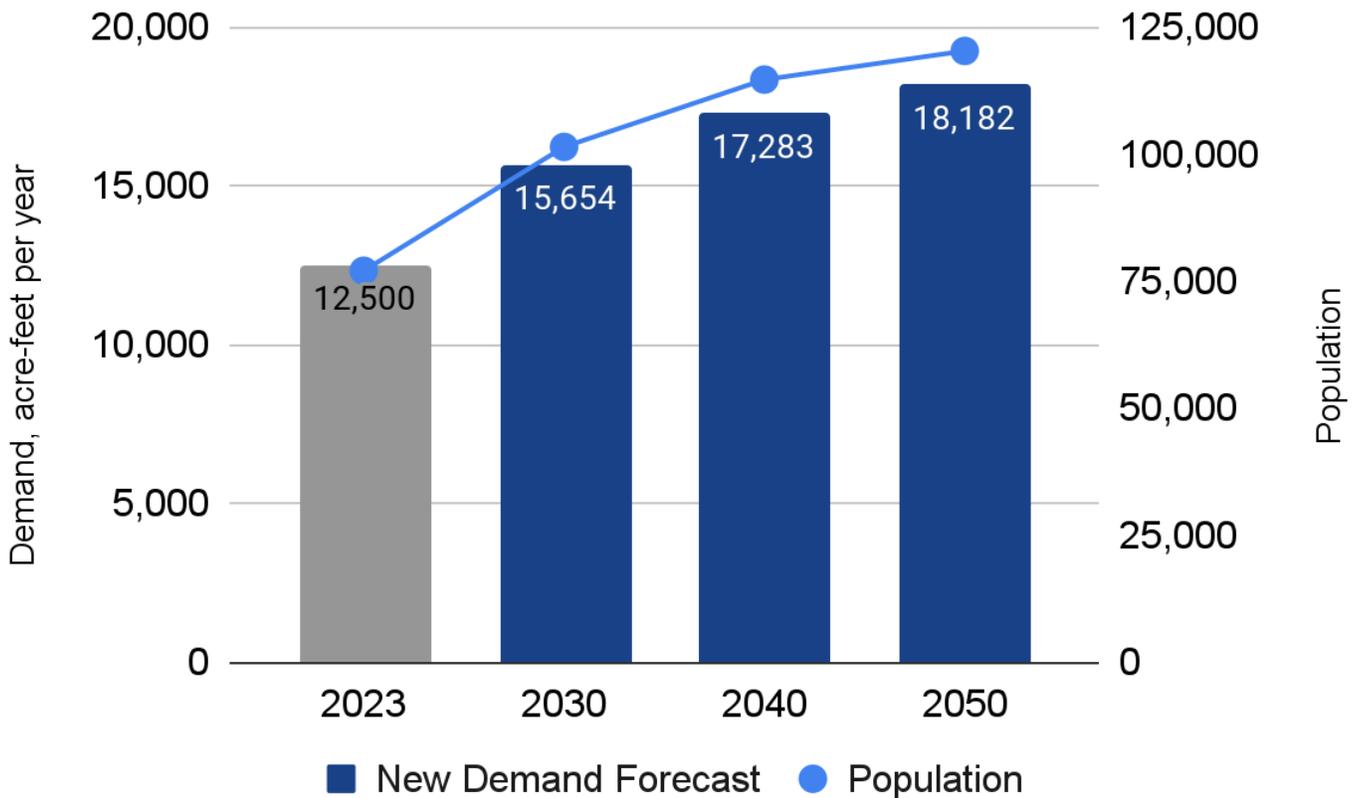


Figure 1. Updated Potable Water Demand Forecast

Drought Response Plan Elements

The updated Drought Response Plan will help guide Broomfield’s decisions and operations during future droughts. The updated plan includes the following key elements:

Drought vulnerability - The Plan summarizes the general impacts that drought may have on Broomfield’s major water sources. A Drought Vulnerability Assessment was conducted to quantify near-term and long-term future risks under four different water supply scenarios.

Drought monitoring - The Plan lays out a process for gathering and analyzing data on hydrologic conditions and water use to determine when we are in a drought that may require management actions.

Drought stages - The current Plan defines four stages of drought which were carried over to the updated Plan. Each drought stage leads to a different set of response actions as is currently defined in Broomfield Municipal Code.

Declaring drought - Under the current Plan, staff determine when to move into a “Drought Watch,” while the City Council must make the declaration of Drought Conditions I, II, and III, since those impose mandatory water use restrictions. This overall approach was not changed for the updated Plan, however, staff is

proposing to separate the process for the potable water and reuse water systems because conditions may warrant different drought stages for those two systems.

Mitigation actions - Drought mitigation refers to long-term investments and other actions that will reduce Broomfield’s vulnerability to future drought. While the updated Plan proposes a range of potential mitigation actions, it will be necessary to further refine the vulnerability analysis and compare the costs of each alternative before staff can determine which strategies are worth pursuing.

Response actions - Drought response includes short-term, temporary measures that will increase supply and/or reduce demand during a drought. We currently call for voluntary water use cuts when in a “Drought Watch” and mandatory water restrictions for each of Drought Conditions I, II, and III. The mandatory water use restrictions are defined in Municipal Code Chapter 13-36 and are more strict with each drought condition. As part of this ordinance, staff is recommending slight changes to these restrictions and associated parts of our Municipal Code.

Drought communications - We know from experience of other communities and from available research that effective communications will be critical to making Broomfield resilient to future drought. Broomfield’s Communications team helped to develop a Drought Communications Plan, which includes a new [website](#) and key messaging about:

- General information about drought in Colorado and how droughts can affect Broomfield
- Key aspects of our Drought Response Plan
- Current drought conditions in Colorado and our current official drought status
- Mandatory water use restrictions (to be disseminated when Drought Conditions I, II, or III are declared).

COUNCIL DIRECTION TO STAFF

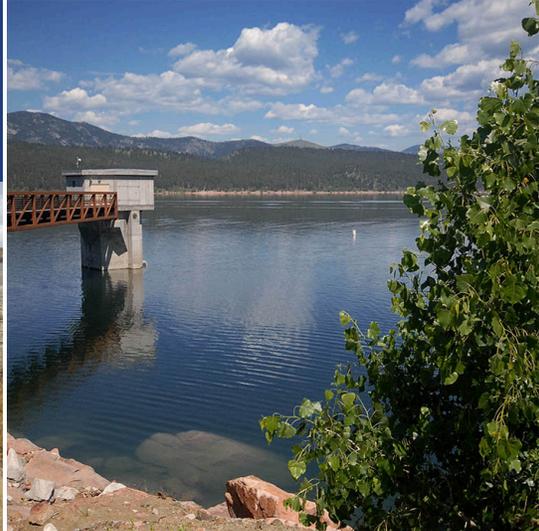
Staff is seeking Council’s direction on certain changes to municipal code related to enforcing future mandatory drought restrictions and improving overall drought preparedness.

1. The adoption of a standard (i.e. “normal year”) watering schedule of 3 days per week between the hours of 6:00 p.m. and 10:00 a.m. The new section of the code is a permanent watering schedule to be followed by Broomfield’s water customers year-round, regardless of drought conditions. Many municipalities throughout the Front Range, including Denver and Aurora, have enacted a similar 3-day-per-week watering requirement. The new watering schedule is intended to further encourage responsible irrigation practices throughout the community in normal years, especially in years leading up to a drought. In general, watering two days a week is sufficient during most of the summer in the Front Range and a third day is only needed during extreme heat or dry periods.
2. Enforcing watering restrictions during declared times of drought, and increasing penalty ranges for non-compliance. Results from the vulnerability assessment highlight the importance of mandatory watering restrictions in meeting demands during extreme drought. The only way to achieve these demand reduction targets is through proper enforcement (e.g., the enforcement of penalties for violating mandatory water use restrictions), and penalty amounts that are consistent with the severity of the offense.
3. The adoption of an additional drought surcharge which could be applied to customers’ monthly water usage charges during times of declared drought. Such a surcharge would help recover the lost revenue associated with mandatory water use restrictions and further promote water conservation amongst customers during a drought by specifically targeting outdoor water consumption. Adoption of a surcharge would still require future approval by City Council during the recommendation of a Drought Condition I, II, or III, and would be limited as follows:
 1. The percentage increase for any individual water use rate would be no more than 50%.
 2. There would be no surcharge on the lowest rate tier for residential water use.

3. For non-residential potable water customers, there would be no surcharge for water use up to average winter water consumption in any one month.



Broomfield's Response Plan - 2024



Prepared by the Department of Public Works,
Water Resources Division

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Acronyms and abbreviations

ATM - Alternative transfer method

C-BT - Colorado-Big Thompson project

CMO - City Manager's Office

DW - Denver Water

EPA - Environmental Protection Agency

GWR - Great Western Reservoir

HOA - Homeowners association

NOAA - National Oceanic and Atmospheric Agency

NRCS - Natural Resources Conservation Service

SWE - snow water equivalent

SWSP - Southern Water Supply Pipeline

TE - tap equivalent

USDA - US Department of Agriculture

USDM - US Drought Monitor

WEP - Water Efficiency Plan

WG - Windy Gap project

1. Introduction and Planning Process

Purpose of the Plan

This Plan describes how the City and County of Broomfield (Broomfield) will manage its water supply and water uses during droughts or other potential water shortages. The Plan documents policies (including those incorporated in Broomfield's Municipal Code), processes, analytical methods, and actions to manage water shortages, as well as goals and principles to guide decision-making during droughts and other events. This Plan will serve as a guide to operations and decisions and is not intended to be followed as a strict set of rules or procedures. Actual decisions will be up to the discretion of Broomfield staff, City Manager, and City Council (as appropriate) relying on the best available information to support those decisions.

This Plan applies to all of Broomfield's water sources and systems, as well as all residential, commercial, institutional, and industrial customers that are served by raw, treated or reclaimed water from Broomfield.

For purposes of this Plan, drought is defined as:

Temporary and relatively infrequent shortage of water in relation to normal levels of water demand that is caused by low precipitation and/or high temperatures and that requires a management response to avoid or minimize impacts.

Temporary water shortages can be caused by other events (e.g., infrastructure failure that interrupts water deliveries from Northern via the Southern Water Supply Pipeline) and would be managed as necessary and appropriate using this Drought Response Plan.

Goals and Priorities

Broomfield's goals in managing drought are to:

- 1) Minimize impacts of drought on Broomfield's residents, businesses and other organizations;
- 2) Ensure that unavoidable impacts of droughts are distributed equitably across demographic groups and customer classes;
- 3) Minimize permanent impacts on Broomfield's public and private landscapes;
- 4) Protect the integrity of Broomfield's water supply infrastructure; and
- 5) Minimize the fiscal impact of drought on Broomfield.

To pursue these goals during droughts and other water shortages, Broomfield has adopted a set of water supply and water use priorities to guide development of this Plan and to guide real-time decisions during water shortage events. The top priority is to secure additional water supply during droughts if feasible. As such, Broomfield will pursue fiscally responsible options to

augment water supply through temporary leases or other measures before imposing mandatory restrictions on water uses. Broomfield's water use priorities for drought response are:

Priority 1: water uses related to health and safety, including indoor residential use, indoor use at schools and important public facilities, indoor use at hospitals, and fire fighting.

Priority 2: indoor water use to support continued operations at Broomfield's businesses and industries

Priority 3: irrigation for trees and shrubs on public and private land

Priority 4: irrigation for functional turf in Broomfield's public parks

Priority 5: residential turf irrigation

Priority 6: irrigation for non-functional turf in public parks and other non-residential areas

Priority 7: water for construction and other miscellaneous uses

Risk Management Policy

In addition to the goals and priorities described above, Broomfield has established a policy of maintaining a buffer of water supply equivalent to 10% of total annual demand. This policy is applied to both the potable and reuse water systems.

2. Broomfield's Water Supply Portfolio

Potable Water Supply

Broomfield's potable water is supplied from two sources of high quality drinking water: (1) treated water purchased from the Denver Water Board and (2) raw water treated at the city's water treatment facility. These two treated water systems are blended together in the distribution system. All of Broomfield's drinking water, whether supplied by Broomfield or Denver Water, comes from surface water sources such as rivers, lakes, and reservoirs that are sustained from winter snowpack.

Broomfield has a perpetual agreement with Denver Water that allows Broomfield to purchase up to 6,500 acre-feet of treated water per year, with a minimum required purchase of 4,700 acre-feet. The supply from Denver Water is delivered to Broomfield through a master meter at Midway Boulevard and Zuni Street.

Broomfield's raw water is supplied by the Northern Colorado Water Conservancy District (Northern) from both the Colorado-Big Thompson (C-BT) and Windy Gap projects, which originate on the Colorado and Fraser Rivers on the western slope of Colorado. The Windy Gap project pumps its water into the C-BT system. Once there, the water from both projects is delivered to Carter Lake then piped through the Southern Water Supply Project Pipeline (also known as the Carter Lake Pipeline) to Broomfield's Water Treatment Facility.

Broomfield currently owns 13,698 units of C-BT. The amount of water available from these units varies from year to year. The Northern Water Board of Directors adopts a quota each year based on the amount of storage in reserves, the projected runoff from snowpack, and anticipated demand, especially for irrigation in eastern Colorado. A typical quota is 70%, providing 0.7 acre-feet per unit, but the quota has ranged from 50% to 100% since 1957.

Broomfield owns 56 of the total 480 Windy Gap Project units. The current annual yield of Broomfield's 56 units is highly variable, ranging from no yield to 5,600 acre-feet. The yield depends upon annual moisture and storage capacity in the C-BT system. Without its own storage reservoir, the Windy Gap water is not considered to be a firm source of supply because there is no storage capacity for Windy Gap water when Lake Granby is full, or when Windy Gap water rights do not come into priority during dry years. To firm the Windy Gap rights, Broomfield is participating in the Windy Gap Firming Project through which Chimney Hollow Reservoir is under construction. Once Chimney Hollow is operational, Broomfield can rely on 5,600 acre-feet of water from the Windy Gap project in most years, including during droughts.

Non-Potable Water Supply

Broomfield owns, maintains, and operates an extensive non-potable water system that is supplied by advanced treated wastewater effluent (called reclaimed or reuse wastewater) and raw surface water that is blended with the reclaimed wastewater. The blended water, called

non-potable water, is used for outdoor irrigation of parks, golf courses, commercial areas, and other landscaped areas within the service area boundaries of Broomfield.

Broomfield's primary source of non-potable water is Windy Gap effluent (or Windy Gap water that returns to Broomfield's Wastewater Treatment Facility via the city's sewer system). As described above, the yield of the Windy Gap system currently varies widely from year to year. Because Windy Gap water is fully consumable, while C-BT is not, Northern allows communities to use Windy Gap in lieu of C-BT water. In other words, Broomfield can take delivery of up 5,600 acre-feet of C-BT and use it as though that water is Windy Gap. This provides the fully reusable effluent for the non-potable system. Once Chimney Hollow Reservoir is operational, Broomfield will have access to 5,600 acre-feet of Windy Gap water each year and will be much less likely to use the in-lieu policy. In future, Broomfield will be able to reuse a portion of C-BT effluent by replacing return flows on the South Platte River. Heit Pit, which is currently in development, will allow Broomfield to replace the C-BT return flows.

Broomfield also owns 61 inches (i.e, shares) in Church Ditch, which provides raw water for the non-potable system. This raw water is pumped into Great Western Reservoir (GWR).

The non-potable water system is completely separate from the potable water system. It currently provides a supply of about 2,500 acre-feet per year (1 acre-foot = 325,851 gallons), on average, to a total of approximately 940 acres of irrigated parks in the city. There is approximately an additional 1,500 acres of non-city owned areas served by the reuse system, including Arista, Flatirons Mall, Legacy High School, Anthem, and Interlocken Business Park along Highway 36. The reuse system is extremely beneficial because it allows Broomfield to expand its water supplies beyond a single, one-time use and reduces the amount of treated domestic drinking water that would otherwise be needed for these irrigation purposes.

3. Drought Vulnerability

Drought can affect Broomfield’s water supply in multiple ways. Table 1 summarizes the general impacts that drought may have on Broomfield’s major water sources (note that Table 1 includes only major water sources and leaves out a number of other water rights that make only very small contributions to Broomfield’s total supply).

Table1: Potential drought impacts on Broomfield’s major water sources

Source (potable or reuse)	Potential Drought Impacts
C-BT (potable)	Low snowpack or reduced reserve storage in Lake Granby can lead the Northern Board to set lower than normal quota (e.g., in 2003 the quota was 50%); this can also reduce the amount of C-BT that Broomfield is able to carry-over from one year to the next
Windy Gap (potable)	Low snowpack in the Colorado River headwaters means that Windy Gap water rights would not be in priority and would not divert water; Chimney Hollow reservoir will enable storage from wet years
Denver Water (potable)	Low snowpack and low reservoir storage reserves can cause Denver Water to curtail deliveries to Broomfield
C-BT (reuse)	Drought limits yield on the water rights that will be stored in Heit Pit which would limit Broomfield’s ability to reuse C-BT effluent
Windy Gap (reuse)	Reduced yield of Windy Gap water rights can limit reusable effluent
Church Ditch Raw Water (reuse)	Low streamflows in Clear Creek could limit Church Ditch diversions and raw water available to Broomfield

Broomfield evaluated drought vulnerability as part of developing this Drought Response Plan. The evaluation considered drought conditions under observed and documented drought events, climate change, Colorado River management issues, and potential short-term water shortages that could be caused by infrastructure outages. The evaluation compared potential reductions in supply under different scenarios and projections of future total water demand, including near-term demand (~2025) and build-out demand (~2040). Evaluation of build-out conditions included new supply projects that will become operational before then (e.g., Chimney Hollow Reservoir). The analysis incorporated the policy of maintaining a 10% buffer over and above estimates of future demand.

The evaluation showed that Broomfield could be vulnerable to severe multi-year droughts, like the one that occurred from 2002 to 2004. Without restrictions on water use or additional water supply, Broomfield could experience water shortages under such a drought both in the near term and at build out. There is the potential for shortages in both the potable and reuse water systems, though shortages would likely be more severe for potable water. More severe

droughts, like those that are possible under severe climate change, would create the potential for larger shortages.

Available research and data suggests that shortages under conditions like those experienced in the 2002 drought could potentially be addressed entirely through mandatory water use restrictions, though it would require more stringent restrictions than any implemented by Broomfield in past droughts. Further, it will be critical for Broomfield to implement robust communications and enforcement to ensure that drought restrictions achieve the desired reductions in water use. As a result, this drought response plan includes robust strategies for implementing mandatory water use restrictions when necessary and for communicating with the Broomfield community about drought and water use restrictions.

Infrastructure outages could create a short-term shortage, but Broomfield can address these shortages through operational adjustments, interconnects with other communities, and short-term emergency implementation of water use restrictions.

4. Drought Monitoring

Introduction

Broomfield aims to make drought stage declarations and decisions about drought response based on indicators of drought risk each year. A robust drought monitoring approach will help Broomfield track hydrologic conditions and assess potential risks using the best available information. In previous versions of Broomfield's drought plan, drought monitoring and triggers focused on storage of potable water sources. That approach involved calculating a drought condition index using available storage, as a percent of capacity, in reservoir systems owned by Denver Water and Northern Water. In practice the storage-based index was not a primary tool for declaring drought conditions. Instead, Broomfield considered actions of neighboring communities to decide when to declare a Drought Watch. Broomfield has not declared a Drought Condition with mandatory water use restrictions since 2002.

Focusing entirely on storage conditions in the systems that provide Broomfield's water will not provide sufficient information to determine drought risk. With this updated drought plan, Broomfield is adopting a drought risk index that accounts for expected supply and projected demand to provide a better indicator of risk. This approach is consistent with the drought monitoring approaches among other water providers in our region.

While the New Drought Condition Index (summarized below) will help Broomfield monitor conditions across all sources of water and determine when drought conditions are present, Broomfield's contract with Denver Water allows them to progressively curtail deliveries of water to Broomfield "during such times as use restrictions are applied to all users furnished with water from the Board's water system." Denver Water's typical use reduction target for each water shortage stage is listed below, but the Board has the flexibility to adopt any percentage it finds appropriate.

- Water Shortage Watch: Use reduction target up to 10%
- Stage 1: Use reduction target up to 30%
- Stage 2: Use reduction target up to 50%
- Stage 3: Use reduction target will depend on the facts and circumstances at that time

Denver Water's drought actions will continue to be a key factor in Broomfield's drought monitoring and response.

Since Denver Water represents only a portion of Broomfield's water supply, there could be situations in which Denver Water's drought response actions would not make sense for Broomfield. For example, if Chimney Hollow reservoir is full and the C-BT quota is at least 70%, even with a curtailment in our Denver Water supply, mandatory water use restrictions for Broomfield may not make sense. Conversely, Broomfield may elect to declare a drought condition that is more severe than Denver Water's declaration if necessary.

Drought Condition Index - Potable Water

Broomfield will use a Drought Condition Index as a key piece of information in making decisions about drought stages and response. The Index includes both expected supply of water and projected demand for the year. The index will be calculated and updated from late winter through spring each year, especially after the spring C-BT quota is set by Northern in early April. The index is defined as follows:

$$\text{Drought Index} = \frac{\text{projected supply}}{\text{projected demand}}$$

The index is calculated on an annual aggregate basis using total annual supplies and total annual demand.

$$\text{Projected supply} = \text{C-BT} + \text{C-BT Carryover} + \text{Windy Gap} + \text{Denver Water}$$

Assumptions and procedures for estimating supply are covered below for each source of water.

C-BT Quota and Supply

Calculated as follows:

$$\text{CBT Supply} = \text{Fixed Shares} \times 0.7 + \text{Variable Shares} \times \text{Quota}$$

- As of 2024, Broomfield owns 5,089 fixed shares and 8,609 variable shares. Updated ownership numbers are kept in accounting files for Northern water sources.
- Fixed shares always yield at 70% and the annual quota does not affect them.
- For variable shares, the baseline assumption is that the final quota will be 70%, and the November initial quota will be 50%.
- If the final quota has been set by the Northern Board, we will use the actual quota.
- If the November quota is less than 50% and the final quota has not yet been set, then deduct the difference from 50% from the projected quota for the year.
 - E.g., if the November quota is 40%, assume the final quota will be 60% instead of 70%.
- If November quota is 50% (i.e., normal) AND final quota has not yet been set and if we need to project drought conditions, we will assume the final quota will be 60% (i.e., less than normal) if the following conditions are met:
 - Lake Granby is less than 50% capacity
 - Snow water equivalent in the Colorado River Headwaters Basin is less than 100% of the median annual maximum for the period of record
 - If Lake Granby is less than 30% capacity, assume a 50% quota

C-BT Carryover

- Carry-over amount is known by the beginning of the C-BT water year on November 1st.

- If an estimate is needed earlier in the year (i.e., well before November 1st), staff can project carry-over by about mid-summer.
- Note that carryover will be less each year as we approach build-out demand (unless Broomfield acquires more C-BT shares).

Windy Gap Supply

- Supply before Chimney Hollow is complete will be difficult to forecast because it depends on Windy Gap water rights being in priority and available storage space in Lake Granby. Available documents (e.g., the Chimney Hollow EIS) suggest that Windy Gap water rights did not yield in 2002. As a result, to be conservative, since Windy Gap tends not to yield in bad droughts and the system does not yet have reliable storage, Windy Gap supply is assumed to be zero for purposes of drought monitoring.
- After Chimney Hollow is complete, the Windy Gap system will have reliable yield for Broomfield of 5,600 acre-feet per year. If Broomfield's storage in Chimney Hollow is depleted below 5,600 acre-feet (e.g., in a persistent multi-year drought), assume yield is limited to the amount of water in storage and that the project will not divert/pump any additional water that year (since the Windy Gap water rights tend not to be in priority in droughts).

Denver Water Supply

$$\text{Denver Water Supply} = \text{Max}(4,700 \text{ AF}, \text{Prior Year's Delivery}) \times (1 - \text{Curtailment})$$

- If Denver Water has declared a Drought Stage, they will communicate any required curtailment in deliveries. If they have not yet communicated the curtailment, assume the following under DW's drought stages:
 - Drought Watch - 10% curtailment
 - Stage I - 30% curtailment
 - Stage II - 30% to 50% curtailment
 - Stage III - at least 50% curtailment
- The percent curtailment is applied to either our minimum required delivery of 4,700 acre-feet or the prior year's total delivery, whichever is greater
- If DW has not declared a drought but conditions suggest they might, we will use forecast storage conditions in Denver Water's system (if released yet for the current water year) or Snow Water Equivalent relative to 30-year median in the South Platte and Colorado River Headwaters to project whether they will declare a drought.

Projected demand

We have two potential methods for estimating total water demand for the coming year. To be conservative, staff will generally use the higher value in calculating the drought index.

With the first method, average total production over the last five years is inflated by the expected percent growth in TEs for the current year. Total production can be found in the water

treatment plant’s monthly reports. Total production is the amount ordered from Denver Water plus total produced at the water treatment plant. Growth in TEs can be obtained from Community Development. Table 2 below provides an example:

Table 2: Projecting growth based on past production

Year	Production, acre-feet
2018	12,157
2019	11,265
2020	12,609
2021	11,994
2022	12,348
5-year average	12,075
TE growth percentage for 2022 to 2023	9%
Estimated 2023 demand	13,162

Under the second approach, demand for the year can be estimated by combining the current number of Tap Equivalents (TEs) and data on average use per TE. This can be done by customer category.

$$Demand = TE_i \times D_i$$

TE_i represents the current number of TEs for customer group *i*.

D_i represents the water use per TE for customer group *i*.

The customer groups are:

- 1) Residential
- 2) Commercial/industrial
- 3) Church/public/other
- 4) Irrigation (potable, not reuse)

Average use per TE as of 2023 is shown in Table 3; these estimates should be updated every year. For the estimates shown below, TE and annual water use for the years 2017-2019 and 2022 were used (to avoid years that may have been affected by pandemic shutdowns). This yields annual water use, which can be used above with annual water supply to calculate the index.

Table 3: Average use per TE for four aggregate customer groups

Customer Group	User per TE per year (acre-feet)	TEs as of 2023
Residential	0.336	22,821.510
Commercial & Industrial	0.545	6,392.090
Irrigation (not including reuse)	0.754	3,147.563
Church, Public & all others	0.662	236.030

Drought Condition Index - Reuse

Supply for the reuse system is highly variable due to 1) uncertain raw water deliveries to Great Western Reservoir (GWR) from Church Ditch and 2) variation in how and when we order Windy Gap and C-BT. As a result, a drought index that takes into account supply and demand is not feasible for the reuse system.

Instead of a drought index, Broomfield will track and project storage in GWR throughout the irrigation season. Storage projections will take into account expected demands, anticipated Windy Gap orders, expected raw water deliveries to GWR and other key factors.

We will project the minimum expected storage at GWR for the on-going irrigation season. The assumption is that Windy Gap and C-BT (once Heit Pit is operational) will be fully used before the end of the irrigation season and that remaining storage in GWR represents the primary buffer against shortage.

Additional Data Sources

Additional data sources can supplement the drought index and projection of GWR Storage.

Snowpack

The SNOTEL system from USDA/NRCS provides data on current snowpack conditions and comparisons to historical statistics. In addition, NRCS provide basin-wide snowpack conditions.

We will use two different basin-wide averages for drought monitoring.

1. Colorado Headwaters Sub-basin (HUC8):
https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assoc_HUC8/14010001_Colorado_Headwaters.html
2. Blue River Sub-basin (HUC8):
https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assoc_HUC8/14010002_Blue.html

3. South Platte Basin (HUC6):
https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assoc/HUC6/101900_South_Platte.html
4. Clear Creek Sub-basin (HUC8):
https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assoc/HUC8/10190004_Clear.html

The SNOTEL links above provide a chart and table showing current snow-water-equivalent (SWE) across each basin relative to the median value from 1991 to 2020. If conditions are evaluated before the median peak date for the basin, we will use the current day's SWE relative to the median. The SNOTEL report provides this as a percentage. If conditions are evaluated beyond the median peak date, we will use the peak SWE for this season relative to the median peak. Note that the report does not provide this value and it will have to be estimated separately from values on the chart.

US Drought Monitor

The US Drought Monitor (USDM) is updated once a week and is based on a combination of multiple datasets ([Drought Classification | U.S. Drought Monitor](#)).

The current USDM for Colorado: [Colorado | U.S. Drought Monitor](#)

Other Drought Indicators

Other datasets that may be useful to support drought decisions are listed below. Note that the US Drought Monitor incorporates each of these datasets, but they may be helpful separately in some cases.

Palmer Drought Severity Index [Climate Prediction Center - Monitoring & Data: Drought Monitoring](#)

Standardized Precipitation Index
<https://www.ncei.noaa.gov/access/monitoring/nadm/indices/spi/div>

Soil Moisture

The National Weather Service maintains a daily dataset on current soil moisture conditions. This can help understand how well snowmelt and runoff will translate to streamflow.

https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

5. Drought Stages and Triggers

Drought stages allow us to set appropriate response actions, including water use restrictions, for the severity of drought conditions and potential risks. With each stage we increase our target

reduction in water use and the actions we take to achieve that target. The characteristics of Broomfield’s four drought stages are summarized in Table 4. Details on the exact water use restrictions are presented later and are in Broomfield Municipal Code, Title 13, Chapter 36.

Table 4: Broomfield’s drought stages and water use reduction targets for both potable and reclaimed water

Stage	Water use reduction target		General characteristics
	Summer outdoor water use	Annual total water use	
Drought Watch	5%	2.5%	Declared by staff Voluntary water use reductions
Drought Condition I - Moderate Drought	30%	16%	Requires City Council approval Mandatory water use restrictions on all customers Lawn irrigation restricted to two days per week Target 33% reduction for large non-residential customers, including parks
Drought Condition II - Severe Drought	50%	30%	Requires City Council approval Increased mandatory water use restrictions on all customers Lawn irrigation restricted to one day per week Target 50% reduction for large non-residential customers, including parks
Drought Condition III - Drought Emergency	50 to 75%, or more as needed	30% to 45% or more if needed	Requires City Council approval Increased mandatory water use restrictions on all customers Lawn irrigation is prohibited for most customers Target at least 75% reduction for parks and schools, limiting irrigation to actively used athletic fields Target at least 75% cut for golf courses, limiting irrigation to tees and greens

Emergency Declaration Due to Infrastructure Outage

An infrastructure outage, such as a temporary outage to the Southern Water Supply Pipeline that delivers C-BT and Windy Gap water, would create a unique situation. In this case, instead of a drought stage from Table 4, Broomfield’s City Manager could declare an emergency (BMC 8-32-020) and Water Resources staff would coordinate with the City Manager’s Office (CMO) and Emergency Management staff to manage the situation.

Drought Triggers - Potable Water System

The Drought Condition Index will inform decisions about declaring a Drought Watch or for making recommendations to the City Council about declaring Drought Conditions I, II, or III.

Table 5 shows how the Drought Condition Index will be used to help determine drought stages. While Table 5 shows a direct relationship between the drought condition index and drought conditions, in practice the index would not be used strictly as a single determinant of declared drought conditions. Other factors will be considered, such as trends in demand (i.e., if there is evidence that Broomfield residents are voluntarily using less water), expected pumping of Windy Gap (especially relevant before Chimney Hollow is complete), snowpack conditions and other factors. These other factors will be particularly important when the index value is near a threshold between one condition and another (e.g., Index =0.89).

Drought Triggers - Reuse Water System

Since reuse drought conditions will be tracked using projected storage drawdown at GWR, we will use a separate set of triggers to determine when drought conditions should be declared for the reuse system. Drought watches for reuse will coincide with drought watches for potable water (i.e., when a watch is declared for potable water, it will also apply to reuse). This is due to the fact that drought watches will typically be declared in the early Spring before we know anything specific about GWR drawdown for that year. Drought conditions I, II, and III will be declared according to the guidelines in Table 6.

Table 5: Broomfield's drought triggers for potable water

Drought Condition Index Value	Interpretation	Drought Condition
$1.0 \leq \textit{index} < 1.10$	Expected supplies are sufficient to meet anticipated demand for the year, but not sufficient to meet the 10% safety factor	Drought Watch
$0.85 \leq \textit{index} < 1.0$	Expected supplies are insufficient to meet anticipated demand for the year, with a shortage relative to unrestricted demand of up to 15% Water use reduction of up to 15% for the year will be required to avoid shortages	Drought Condition I <i>Moderate Drought</i>
$0.70 \leq \textit{index} < 0.85$	Expected supplies are insufficient to meet anticipated demand for the year, with a shortage relative to unrestricted demand of 15% to 30% Water use reduction of up to 30% for the year will be required to avoid shortages	Drought Condition II <i>Severe Drought</i>
$\textit{index} < 0.70$	Expected supplies are insufficient to meet anticipated demand for the year, with a shortage relative to unrestricted in excess of 30% or more. Water use reduction of more than 30% for the year will be required to avoid shortages	Drought Condition III <i>Drought Emergency</i>

Table 6: Broomfield's drought triggers for the reuse system

Projected minimum GWR Storage, acre-feet (% capacity) and timing	Interpretation	Drought Condition
<i>Potable System is in Drought Watch</i>	<i>Drought Watch is triggered by conditions in the potable system but applies to both potable and reuse</i>	<i>Drought Watch</i>
Varies (410 acre-feet as of 2024)	Active storage within GWR is expected to drop below the 10% buffer threshold (i.e., 10% of total reuse demand) before the end of the irrigation season	Drought Condition I
245 acre-feet (10.1%)	GWR is expected to drop to within 3 feet of the lower gate before the end of the irrigation season	Drought Condition II
150 acre-feet (6.2%)	GWR is expected to drop to lower gate or below, leaving only dead storage, before the end of the irrigation season	Drought Condition III

6. Drought Mitigation and Response Actions

Broomfield considers a range of options to increase drought resilience. Some options would increase supply, while others would reduce demand. Both types of measures are described in this section.

Drought Mitigation Actions

Drought mitigation refers to long-term investments and other actions that will reduce Broomfield's vulnerability to future drought. Drought mitigation can include conservation measures that permanently reduce water demand (e.g., conversion of turf grass landscaping to waterwise landscaping) or supply measures that increase the amount of water available to Broomfield.

Conservation Measures

Broomfield has numerous conservation programs that will increasingly slow the growth of potable and reuse water demand on a permanent basis (these measures are distinct from drought water use restrictions, which generally reduce demand on a temporary basis). All water providers who annually supply over 2,000 acre-feet of water to retail customers are required by the state to develop a water efficiency plan (WEP). Broomfield's current WEP was approved by the City Council through the adoption of Resolution 2020-31 on January 28, 2020. The 2020 WEP evaluated and ranked specific conservation activities based on estimated water savings, compliance with established water conservation goals and policies, benefit/cost ratio, ease of implementation, and public acceptance. Overall the WEP sets a goal of reducing total water demand by 10% by 2040.

Broomfield offers a number of rebate programs to residential and non-residential customers. Below is a brief description of each program:

- EPA WaterSense certified high efficiency toilets (up to a \$75 rebate for 3 toilets per residence)
- Rotary nozzles (\$2 rebate per nozzle, minimum 10, maximum 100)
- WaterSense certified weather based smart irrigation controller (up to \$100 rebate, 1 per residence)
- Rain barrels (up to \$50 rebate, two 55 gallon barrels per residence)
- Graywater systems (a \$200 rebate)
- Commercial and industrial water account holders can apply for a rebate for 25% of the purchase price of WaterSense certified irrigation controllers, flush-o-meters, toilets and rotary nozzles
- Large area turf replacement program. Multi-family and non-residential water customers can receive \$1.20 per square foot to convert areas of high-water, cool-season turf grass (such as Kentucky Bluegrass) into native and waterwise landscapes.

In addition, Broomfield partners with Resource Central to offer three programs including:

- Free outdoor water audits for both residential and non-residential water customers
- \$25 discount on Garden-in-a-Box kits
- Lawn Replacement Program. Broomfield residents may qualify to receive \$500 to apply toward lawn removal services (Broomfield pays \$1.25/sq ft up to \$500 per project; residents pay the remaining \$1/sq ft.) and/or complimentary Garden-in-a-Box kits (up to 300 sq. ft.)

Broomfield's graywater Ordinance No. 2158, passed September 2021, legalized the use of graywater within Broomfield. Graywater sources include water discharged from bathroom and laundry-room sinks, bathtubs, showers, and laundry machines. Graywater sources do not include water discharged from toilets, urinals, kitchen sinks, dishwashers, and non-laundry utility sinks. Broomfield residents are authorized to reuse graywater for both outdoor irrigation and indoor toilet and urinal flushing.

Broomfield is also participating as a partner community in a large-scale non-functional turf replacement pilot project to investigate the costs and benefits of implementing a large-scale turf replacement program (focusing primarily on city-owned parcels). "Non-functional turf" broadly refers to areas of irrigated, cool season grass that receive little, if any, practical use. Water Resources staff are also coordinating with the Planning Department on a new waterwise landscaping ordinance which would limit the installation of turfgrass and promote more efficient landscaping and irrigation practices in new development. This ordinance will be presented to Broomfield's City Council concurrently with this Drought Response Plan update.

Measures to Increase Water Supply

In addition to reducing demand, Broomfield will consider cost-effective options to augment supply. Several large projects to increase supply are already in development (e.g., Chimney Hollow Reservoir and Heit Pit) or are incorporated in Broomfield's capital improvement plans for future implementation. Chimney Hollow will firm the Windy Gap supply and enable Broomfield to rely on 5,600 acre-feet of additional supply each year. Heit Pit will enable Broomfield to reuse a portion of C-BT effluent by providing a source of water for replacing C-BT return flows on the South Platte River (per an existing agreement with Northern).

Broomfield is evaluating additional supply options. Acquisition of additional C-BT or FRICO-Marshall shares would add to supply, but acquisition of new water can be very expensive and financially impractical. Broomfield is currently studying the potential for implementing indirect potable reuse of wastewater. This could enable an option under which reusable Windy Gap and/or C-BT effluent would be used for potable drinking water rather than outdoor irrigation on a temporary, emergency basis. The indirect potable concept is under study and results are not expected before this Drought Response Plan is finalized.

Drought Response Actions

Drought response includes short-term, temporary measures that will increase supply and/or reduce demand.

Temporary Measures to Increase Supply

Broomfield has two options to temporarily increase supply during a drought. Broomfield has an agreement with Larimer County for 80 alternative transfer method (ATM) C-BT units. Larimer County uses the 80 ATM units in most years for irrigation of a county-owned farm. Broomfield has the option to use the 80 ATM units in up to 3 out of every 10 years. Broomfield must notify Larimer County by January 31st and pay at least \$38,000 for use of the 80 units for a single year. The price for use of the ATM units escalates each year based on the market price for water. Also, notification can come later but would require reimbursing Larimer County for any farming costs incurred after January 31st. The yield of the 80 ATM units would depend on the quota set by Northern. Under a typical quota of 70%, the 80 units would provide 56 acre-feet of water.

In some years, there are C-BT units available to lease. For example, in 2022 Broomfield leased 1,000 acre-feet of C-BT water to a farmer near Longmont. If staff anticipate needing additional water during a drought, we will evaluate the C-BT lease market. It is possible that C-BT shares to lease would not be widely available during drought conditions.

Demand restrictions

Without reducing water demands, Broomfield faces the risk of potential shortages in future droughts. On-going conservation programs will help reduce baseline demand to some degree, but the risk of shortages in droughts may still exist. Under a repeat of the 2002 drought and using conservative assumptions about demand (see Section 3 on Drought Vulnerability), Broomfield could face as much as an 18% shortage in the near term future, and a 19% shortage at buildout. Permanent conservation measures and short-term demand restrictions during a drought could make up some or all of the potential shortage.

This section summarizes the demand restrictions Broomfield will adopt for each drought condition.

Drought Watch - Voluntary Demand Reductions

The primary goal of a Drought Watch is to serve as a warning to the Broomfield community that more severe drought conditions could develop and to begin setting a foundation for response if a more severe drought does develop. Anticipated water use reductions under a Drought Watch are small. Communications about drought conditions and strategies to reduce water use will ramp up during a drought watch, especially if monitoring efforts suggest that conditions are worsening.

A Drought Watch will apply to both potable water and reuse systems and communications efforts will target customers on both systems.

Drought Condition I - Moderate Drought - Mandatory Water Use Restrictions

Under Drought Condition I, water use reductions become mandatory. If Condition I is declared for the reuse system, mandatory water use restrictions apply to all reuse customers. For the potable system, mandatory water use restrictions apply to nearly all outdoor water uses. Specific restrictions by customer type and water use category are summarized below.

Mandatory Water Use Restrictions, Drought Condition I, Potable Water Customers

1. Turf irrigation on residential and other small parcels (includes Single Family Homes, Townhouses, Duplexes, and small commercial parcels)

Water use reduction targets:

- 33% reduction from normal daily summer average use
- 1.0 inch of total turf irrigation per week

Restriction: Limit turf irrigation to no more than two times per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

- Single family homes, townhouses, and duplexes with addresses ending in odd numbers shall irrigate on Wednesdays and Saturdays
- Single family homes, townhouses, and duplexes with addresses ending in even numbers shall irrigate on Sundays and Thursdays
- Small commercial parcels shall irrigate on Tuesdays and Fridays; small parcels are those with less than 100,000 square feet (or 2.3 acres) of irrigated turf
- There shall be no irrigation of turf on these parcels on Mondays
- Property owners will be allowed to follow an alternative irrigation schedule if they can demonstrate to city staff that they do not exceed the quantitative irrigation target of no more than 1.0 inch per week.

Guidance: Small parcels are those with less than 100,000 square feet (or 2.3 acres) of irrigated turf. Irrigation of small parcels shall follow the normal zone schedule on permitted days following best irrigation practices. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

2. Turf irrigation on large parcels (including public areas within Homeowner Associations and large commercial parcels)

Water use reduction targets:

- 33% reduction from normal daily summer average use
- 1.0 inch of total turf irrigation per week

Restriction: Limit turf irrigation to no more than 1.0 inch of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Large parcels are those with more than 100,000 square feet (or approximately 2.3 acres) of irrigated turf. Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 1.0 inch. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

3. Turf irrigation for Parks and Athletic Fields, including those owned by schools

Water use reduction targets:

- 33% reduction from normal daily summer average use
- 1.0 inch of total turf irrigation per week

Restriction: Limit turf irrigation to no more than 1.0 inch of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 1.0 inch. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

Broomfield owned parks will be irrigated according to the Parks Department Drought Standard Operating Procedure.

4. Turf irrigation for public and private golf courses

Water use reduction targets:

- 33% reduction from normal daily summer average use

Restriction: Limit turf irrigation to no more than 1.0 inch of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 1.0 inch. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

5. Installation and irrigation of new sod and seed

Restriction: During Drought Condition I, newly sodded, seeded, or re-seeded turf areas in the city must be registered with the Department of Public Works. New sod, seed or re-seed shall not be installed between the dates of June 1st and September 15th. Once registered with the Department of Public Works, newly sodded, seeded, or reseeded turf areas are subject to the following limitations:

- Total irrigation is limited to 2.0 inches per week for up two weeks from initial installation; this will allow new sod or seed to become established
- No irrigation of new sod or seed or re-seeded areas is allowed between the hours of 10:00 a.m. and 6:00 p.m.
- After the first two weeks of establishment irrigation, newly sodded, seeded, or re-seeded turf areas are subject to the same requirements under 1-4 above, depending on the location of the new sod or seed.

6. Irrigation of trees, shrubs and gardens on any parcel in the city

Restriction: irrigation of trees, shrubs and gardens is allowed at any time and on any day if done by hand, with a drip irrigation system, a bubbler irrigation system, or a soaker hose.

Guidance: Hand watering means holding in the hand a hose with an attached positive shutoff nozzle, and does not include operating a hose with a sprinkler or manually operating an irrigation controller.

7. Irrigation system maintenance

Restriction: An irrigation system may be operated at any time for the purpose of repair or regular maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

8. Swimming pools

Restrictions: The city shall not issue building permits for new swimming pools. Existing swimming pools may be filled once a year and the water level maintained in the swimming pool throughout the year.

9. Washing of vehicles

Restriction: Personal vehicles may be washed no more often than once each week using a hose with a positive shutoff mechanism. Vehicles in government or commercial operations or fleets may be washed no more often than once a week. Vehicles may be washed at a commercial car wash at any time.

10. Washing impervious surfaces

Restriction: Impervious surfaces, such as sidewalks, driveways, or patios, may not be washed by hoses, except when necessary for public health or safety reasons.

11. Building maintenance

Restriction: Buildings may be washed by a pressure washer to clean the surface in preparation for maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

12. Outdoor water features (including fountains and misting systems)

Restriction: no restrictions in Drought Condition I

Drought Condition II - Severe Drought - Mandatory Water Use Restrictions

Drought Condition II is a severe drought with growing concern about potential shortages. Under Condition II, Broomfield increases mandatory water use restrictions. If Condition II is declared for the reuse system, mandatory water use restrictions apply to all reuse customers. For the potable system, mandatory water use restrictions apply to nearly all outdoor water uses. Specific restrictions by customer type and water use category are summarized below.

Mandatory Water Use Restrictions, Drought Condition II, Potable Water Customers

1. Turf Irrigation on residential and other small parcels (includes Single Family Homes, Townhouses, Duplexes, and small commercial parcels)

Water use reduction targets:

- At least 50% reduction from normal daily summer average use
- 0.75 inches of total turf irrigation per week

Restriction: Limit turf irrigation to no more than one time per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

- Single family homes, townhouses, and duplexes with addresses ending in odd numbers shall irrigate on Wednesdays
- Single family homes, townhouses, and duplexes with addresses ending in even numbers shall irrigate on Sundays
- Small commercial parcels shall irrigate on Fridays; small parcels are those with less than 100,000 square feet (or 2.3 acres) of irrigated turf
- There shall be no irrigation of turf on these parcels on Mondays, Tuesdays, Thursdays, or Saturdays

- Property owners will be allowed to follow an alternative irrigation schedule if they can demonstrate to city staff that they do not exceed the quantitative irrigation target of no more than 0.75 inches per week.

Guidance: Small parcels are those with less than 100,000 square feet (or 2.3 acres) of irrigated turf. Irrigation of small parcels shall follow the normal zone schedule on permitted days following best irrigation practices. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

2. Turf irrigation on large parcels (including public areas within Homeowner Associations and large commercial parcels)

Water use reduction targets:

- At least 50% reduction from normal daily summer average use

Restriction: Limit turf irrigation to no more than 0.75 inches of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Large parcels are those with more than 100,000 square feet (or approximately 2.3 acres) of irrigated turf. Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 0.75 inches. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

3. Turf irrigation for Parks and Athletic Fields, including those owned by schools

Water use reduction targets:

- At least 50% reduction from normal daily summer average use

Restriction: Limit turf irrigation to no more than 0.75 inches of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 0.75 inches. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

Broomfield owned parks will be irrigated according to the Parks Department Drought Standard Operating Procedure.

4. Turf irrigation for public and private golf courses

Water use reduction targets:

- At least 50% reduction from normal daily summer average use

Restriction: Limit turf irrigation to no more than 0.75 inches of water per week. No watering of roughs. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 0.75 inches. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

5. Installation and irrigation of new sod and seed

Restriction: Installation of new sod or seed, or re-seeding existing turf is prohibited during drought Condition II.

6. Irrigation of trees, shrubs and gardens on any parcel in the city

Restriction: irrigation of trees, shrubs and gardens is allowed at any time and on any day if done by hand, with a drip irrigation system, a bubbler irrigation system, or a soaker hose.

Guidance: Hand watering means holding in the hand a hose with an attached positive shutoff nozzle, and does not include operating a hose with a sprinkler or manually operating an irrigation controller.

7. Irrigation system maintenance

Restriction: An irrigation system may be operated at any time for the purpose of repair or regular maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

8. Swimming pools

Restrictions: The city shall not issue building permits for new swimming pools. Existing swimming pools may be filled once a year and the water level maintained in the swimming pool throughout the year.

9. Washing of vehicles

Restriction: Personal vehicles may be washed no more often than once each week using a hose with a positive shutoff mechanism. Vehicles in government or commercial operations or fleets may be washed no more often than once a week. Vehicles may be washed at a commercial car wash at any time.

10. Washing impervious surfaces

Restriction: Impervious surfaces, such as sidewalks, driveways, or patios, may not be washed by hoses, except when necessary for public health or safety reasons.

11. Building maintenance

Restriction: Buildings may be washed by a pressure washer to clean the surface in preparation for maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

12. Outdoor water features (including fountains and misting systems)

Restriction: Operation of outside water features, such as fountains or outdoor misting systems, is prohibited, except if such features or systems are used to sustain aquatic life or maintain water quality.

Drought Condition III - Drought Emergency - Mandatory Water Use Restrictions

Drought Condition III is an emergency state under which Broomfield will take all necessary actions to prevent shortages and system failures. Under Condition III, Broomfield increases mandatory water use restrictions. If Condition III is declared for either the potable or reuse system, turf irrigation will be prohibited, with the only potential exception being actively used athletic fields and tees and greens on golf courses. Other mandatory water use restrictions will increase. Specific restrictions by customer type and water use category are summarized below.

In the event that the restrictions described below are deemed insufficient by staff to prevent shortages or other system failures in a persistent or worsening drought emergency, Broomfield Municipal Code chapter 8-32 (Water Emergencies) grants authority to the City Manager and City Council to take additional measures. In the unlikely event of a Drought Emergency that threatens the safety of Broomfield's water supply, the City Manager may declare a temporary water emergency and, according to the procedures outlined in section 8-32-040 of code, may restrict water uses beyond the specific restrictions described below.

Mandatory Water Use Restrictions, Drought Condition III, Potable Water Customers

1. Turf Irrigation on residential and other small parcels (includes Single Family Homes, Townhouses, Duplexes, and small commercial parcels)

Restriction: Turf irrigation is prohibited

2. Turf irrigation on large parcels (including public areas within Homeowner Associations and large commercial parcels)

Restriction: Turf irrigation is prohibited

3. Turf irrigation for Parks and Athletic Fields, including those owned by schools

Water use reduction targets:

- At least 75% reduction from normal daily summer average use

Restriction: Turf irrigation is prohibited except for athletic fields. Actively used athletic fields may be irrigated no more than 0.75 inches of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day. The City Manager and City Council may further restrict irrigation of athletic fields if drought conditions persist or worsen.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation does not exceed 0.75 inches and only on actively used athletic fields. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

Athletic fields in Broomfield owned parks will be irrigated according to the Parks Department Drought Standard Operating Procedure.

4. Turf irrigation for public and private golf courses

Water use reduction targets:

- At least 75% reduction from normal daily summer average use

Restriction: Only tees and greens may be irrigated. Limit turf irrigation of tees and greens to no more than 0.75 inches of water per week. No turf irrigation is allowed between the hours of 10:00 a.m. and 6:00 p.m. on any day. The City Manager and City Council may further restrict irrigation of golf courses if drought conditions persist or worsen.

Guidance: Property managers will be expected to adjust irrigation schedules so that total weekly irrigation on tees and greens does not exceed 0.75 inches. Broomfield will develop a best practices guide on its water resources website so that it is available to all customers. The guide will include best practices for normal conditions and for drought.

5. Installation and irrigation of new sod and seed

Restriction: Installation of new sod or seed, or re-seeding existing turf is prohibited during drought Condition III.

6. Irrigation of trees, shrubs and gardens on any parcel in the city

Restriction: Irrigation of trees, shrubs and gardens is allowed at any time and on any day if done by hand, with a drip irrigation system, a bubbler irrigation system, or a soaker hose.

Guidance: Hand watering means holding in the hand a hose with an attached positive shutoff nozzle, and does not include operating a hose with a sprinkler or manually operating an irrigation controller.

7. Irrigation system maintenance

Restriction: An irrigation system may be operated at any time for the purpose of repair or regular maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

8. Swimming pools

Restrictions: The city shall not issue building permits for new swimming pools. Private swimming pools may not be filled. Public swimming pools, private club swimming pools, and homeowner's association swimming pools may be filled once per year and levels maintained.

9. Washing of vehicles

Restriction: Personal vehicles may be washed no more often than once each week using a hose with a positive shutoff mechanism. Vehicles in government or commercial operations or fleets may be washed no more often than once a week. Vehicles may be washed at a commercial car wash at any time.

10. Washing impervious surfaces

Restriction: Impervious surfaces, such as sidewalks, driveways, or patios, may not be washed by hoses, except when necessary for public health or safety reasons.

11. Building maintenance

Restriction: Buildings may be washed by a pressure washer to clean the surface in preparation for maintenance, provided that misuse or waste of water does not occur in violation of section 13-24-010, B.M.C.

12. Outdoor water features (including fountains and misting systems)

Restriction: Operation of outside water features, such as fountains or outdoor misting systems, is prohibited, except if such features or systems are used to sustain aquatic life or maintain water quality.

Table 7: Summary of water use restrictions for each drought condition

Drought Condition	Reduction target	Summary of water use restrictions
Drought Watch	5%	Voluntary water use reductions. Request that customers voluntarily limit outdoor irrigation to two days per week and not irrigate between 10:00 a.m. and 6:00 p.m.
Drought Condition I Moderate drought, mandatory restrictions	30%	<ul style="list-style-type: none"> ● Private turf irrigation is limited to two days per week, and allowed only before 10:00 a.m. or after 6:00 p.m., targeting no more than 1.0 inch of irrigation per week ● Parks, golf courses, and school athletic fields must limit irrigation to no more than 1.0 inch per week ● New sod/seed must be installed before June 1 or after September 15th; total irrigation of up to 2 inches per week for two weeks to establish the new turf; after two weeks follow normal turf irrigation limits ● Trees, shrubs, and gardens may be irrigated by hand, drip, bubbler or soaker hose at any time ● No new permits for pools; existing pools may be filled once per year ● Some restrictions on vehicle washing; no restrictions on commercial car washes ● No restrictions on irrigation system maintenance or building washing for maintenance purposes ● No washing of sidewalks or driveways with hoses
Drought Condition II Severe drought, mandatory restrictions	50%	<ul style="list-style-type: none"> ● Private turf irrigation is limited to one day per week, and allowed only before 10:00 a.m. or after 6:00 p.m., targeting no more than 0.75 inches of irrigation per week ● Parks, golf courses, and school athletic fields must limit irrigation to no more than 0.75 inches per week ● Installation of new sod/seed is prohibited; if feasible, golf courses shall not irrigate roughs ● Trees, shrubs, and gardens may be irrigated by hand, drip, bubbler or soaker hose at any time ● No new permits for pools; existing pools may be filled once per year ● Some restrictions on vehicle washing; no restrictions on commercial car washes ● No restrictions on irrigation system maintenance or building washing for maintenance purposes ● No washing of sidewalks or driveways with hoses ● Operation of outdoor water features (e.g., fountains, misters) is prohibited
Drought Condition III Drought emergency, mandatory restrictions	50% to 75% or more	<ul style="list-style-type: none"> ● Turf irrigation is prohibited except parks, golf courses and athletic fields, as described below ● Park and school athletic fields may be irrigate no more than 0.75 inches per week ● Golf courses may irrigate only tees and greens and no more than 0.75 inches per week ● Installation of new sod/seed is prohibited ● Trees, shrubs, and gardens may be irrigated by hand, drip, bubbler or soaker hose at any time ● No new permits for pools; private pools may not be filled; public, club or HOA pools may be filled once per year ● Some restrictions on vehicle washing; no restrictions on commercial car washes ● No restrictions on irrigation system maintenance or building washing for maintenance purposes ● No washing of sidewalks or driveways with hoses

7. Operational and Administrative Framework

This section describes operational and administrative procedures for implementing the drought response plan.

Roles and Responsibilities

Ultimate responsibility for implementing this Plan rests with the Director of Public Works and the Water Resources Manager. The Director of Public Works and Water Resources Manager, supported by other water resources staff, will be responsible for all of the technical and administrative tasks necessary to implement this Plan, including:

- Collecting and monitoring water resources data to assess and describe potential drought conditions
- Tracking water use and conservation to estimate demand each year
- Calculating the Drought Condition Index each spring (or as needed)
- Projecting GWR storage throughout the irrigation season
- Making determinations about drought risk each year
- Formulating Drought Condition recommendations supported by available data and the Drought Condition Index
- Communicating with the Drought Operations Committee (see below) and convening meetings of that committee to review drought condition recommendations
- Administering the process to bring drought recommendations to the City Council for review and approval
- Executing supply augmentation actions summarized in Section 6
- Managing, monitoring and evaluating demand management actions summarized in Section 6
- Managing enforcement and communication tasks for demand restrictions
- Evaluating and updating this plan, especially after drought events

An advisory committee with representatives from across Broomfield's Departments was formed to help guide development of this Plan. Similarly, a Drought Operations Committee has been formed to support implementation of the Plan (see Table 8). The Operations Committee will have the following responsibilities:

- Review and discuss information on drought conditions
- Review and discuss recommendations about declaring official Drought Conditions (including a Drought Watch) and provide input and feedback about whether to proceed with those recommendations
- Coordinate regularly about operational decisions and any necessary deviations from the details of this plan during times when Drought Conditions I, II, or III are in place.
- Communicate as necessary with staff in relevant departments and/or with the City Manager's Office about drought conditions and response actions

Table 8: Members of the Drought Operations Committee

Director of Public Works	Director of Operations and Emerg. Mgmt.
Water Resources Manager	Superintendent of Wastewater
Superintendent of Parks	Director of Communications
Superintendent of Water Treatment	

Monitoring and Coordination Procedures

Water Resources Staff will engage with the Drought Operations Committee each Spring to review conditions and potential drought recommendations. Staff should schedule an April meeting of the committee 1-2 months in advance. The meeting should take place before or after the final C-BT Quota is announced by Northern. If hydrologic conditions and the Drought Index suggest that no drought declaration is necessary, water resources staff can cancel the meeting and update the committee via email. If Water Resources staff conclude that a drought declaration will be necessary (including maintaining an existing drought condition or changing from an existing drought condition), they will proceed with the meeting to present information on drought conditions and recommendations and to gather feedback from the Committee.

As conditions evolve throughout the Winter, Water Resources Staff may have sufficient information to begin coordinating with CMO about potential need for the City Council to consider a declaration of Drought Condition I, II, or III. If a drought declaration becomes necessary, the goal is to have the City Council approve the declaration no later than May 1st, so that communication about restrictions can go out early in the irrigation season.

For the potable water system, several events after May 1st could justify re-evaluating Broomfield's drought status and may require additional coordination with the Drought Operations Committee and the CMO. These events could include:

- New declaration of drought or a change in drought status from Denver Water, especially if Denver Water changes curtailment of deliveries to Broomfield
- A supplemental quota declaration by the Northern Water Board
- Unanticipated pumping of Windy Gap water into Lake Granby adding to Broomfield's total supply (this is particularly relevant before Chimney Hollow Reservoir is operational)

If staff declare a drought watch, it will apply to potable and reuse. If Council declares Drought Condition I, II, or III in the Spring, it may apply only to potable water, but in some cases staff may recommend that the declaration apply to reuse as well. This may occur if conditions in Spring suggest reuse may face shortages during the year as well (e.g., if Chimney Hollow storage is depleted or if Clear Creek snowpack suggests limited raw water from Church Ditch).

If a declaration is not made for the reuse system in the Spring, staff will monitor conditions and GWR storage throughout the summer to determine if and when a drought condition should be declared.

The general timeline and procedure is summarized in Table 9 for the potable system, and in Table 10 for the reuse system.

Drought Communications

Successful implementation of this Drought Response Plan, especially the mandatory water use restrictions in Section 6, will require robust communications to Broomfield's residents and businesses. A standalone communications strategy was developed to guide our communications. That strategy will be a living document, updated each year to reflect new lessons and observations about how best to engage with the Broomfield community. The goals behind Broomfield's drought communications include:

- Communication to help us realize demand reductions as needed to get through severe droughts.
- Increase knowledge and understanding among customers about drought and drought impacts and how Broomfield prepares for and responds to droughts.
- Increase awareness of real-time drought conditions.
- Increase awareness of drought restrictions and enforcement actions during Council-declared drought stages.
- Align with other Broomfield communications about water resources and water conservation.
- Align with other cities and organizations (Northern, Denver Water etc.).
- Measure the effectiveness of our communications actions to determine if we are reaching intended audiences and if we are having the desired impacts.

The communications strategy includes the following major elements:

- Assignment of roles among the water resources and communications staff
- A new drought information section of the Broomfield water resources webpage, with a simple URL of broomfield.org/drought
- Graphics that can be used for a drought watch and each of the Drought Conditions (see sample below). The graphics are tailored to each of several different communication channels, including REACH, Facebook, Instagram and others.
- Segmentation and description of different audiences, including single-family homeowners and commercial property managers.
- Drought communications timeline that lays out key communications tasks from winter through summer.

After the Drought Response Plan is finalized, the team will develop additional communications materials (text, graphics, etc.) to support communication about drought water use restrictions and other drought responses.



Emergency Conditions

Unforeseen infrastructure outages create an immediate emergency situation. Broomfield Code chapter 8-32 provides authority for declaring water emergencies. The associated procedures related to outage or failure of major water supply infrastructure are covered in this section.

Outages that create an emergency situation for the potable or reuse water systems include, but are not limited to, the following:

- Conduit 81, which delivers treated water from Denver Water
- The Southern Water Supply Pipeline, which delivers water from the C-BT and Windy Gap projects
- The wastewater reclamation facility at the wastewater treatment plant, which treats reusable effluent and pumps it to GWR and/or into the reuse distribution system.
- GWR outlet works, which supplies stored reuse water from the reservoir into the reuse distribution system

Upon any infrastructure or system failure associated with the facilities listed above, or any other infrastructure or system failure that threatens Broomfield's ability to meet unrestricted water demand, the Director of Public Works will recommend to CMO that a "temporary water emergency" be declared. The Director will recommend a temporary water emergency if any infrastructure or system failure reduces available water supply such that Broomfield may be unable to meet on-going water demand in either the potable or reuse water systems (failure of other water systems could also lead to a water emergency). According to code, the temporary

water emergency remains in place until the next meeting of the City Council, at which time the Council will decide whether to continue the water emergency.

Broomfield municipal code, section 8-32-040 states that the City Manager (during a temporary emergency) and City Council may invoke the following water use restrictions:

- Class C. Prohibits or restricts watering of lawns, washing of vehicles, ornamental or decorative uses (including, but not limited to display fountains or pools).
- Class B. Prohibits or restricts use of water for commercial or industrial purposes, unless necessary to prevent damage to equipment or injury to people.
- Class A. Prohibits or restricts any use of treated water except for drinking and eating purposes.

When a water emergency is declared due to an outage of major water supply infrastructure, water resource staff will evaluate available supplies (including local storage, if appropriate, and interconnects, if available) and on-going demands to determine whether demand restrictions are necessary. If demand restrictions are necessary, staff will evaluate the provisions of code shown above and the drought restrictions described in this plan to recommend an approach to CMO and City Council. That recommendation will include specific restrictions that the City Manager and City Council can approve to reduce demand to the extent necessary. The goal is to implement water use restrictions only if necessary and with minimal impact to Broomfield's residents and businesses, while avoiding risk of water shortages that may lead to losses of system pressure or other failures.

Table 9: Annual Drought Operations Timeline for Potable Water

Timeframe	Task	Purpose
Ongoing throughout the year	Drought monitoring	Track hydrologic conditions and demand, and calculate the Drought Condition Index to support drought declaration recommendations
February	Schedule Operations Committee Meeting	In case there is a need to review drought conditions and recommendations, find a time on committee members' calendars after expected quota announcement from Northern
By March 15	Preliminary Drought Condition Index	Using all available information and best estimates of the C-BT quota, calculate a range of preliminary Index values to determine if a drought declaration may be needed
By March 15	Drought on City Council Agenda (if needed)	If staff conclude that a drought declaration may be necessary, schedule a time in late April for City Council to consider drought declaration
By March 31	Enforcement training	Conduct 1-hour training with enforcement teams on drought restrictions and monitoring and enforcement practices; can be canceled if no drought declaration is expected
April (immediately after final C-BT Quota)	Drought Condition Index	After Northern sets the C-BT Quota, calculate the Drought Condition Index (including with a potential supplemental Quota)
April (immediately after final C-BT Quota)	Drought Recommendations	Based on updated Drought Condition Index, formulate recommendations for drought declarations; consider delaying this step if a supplemental C-BT quota is expected
April (immediately after final C-BT Quota)	Operations Committee Meeting	Review the drought declaration recommendation and determine whether to proceed. If no drought declaration is planned, the meeting can be canceled
By May 1st	City Council Drought Review	City Council reviews staff recommendation and decides whether to declare Drought Condition I, II, or III
By May 1st	Launch Drought Communications Plan	If and when City Council decides to declare Drought Condition I, II, or III, launch the communications plan to get the message out about mandatory restrictions
By May 15th	Mobilize Enforcement Teams	Communicate with enforcement team; schedule training and coordination meetings

Table 10: Annual Drought Operations Timeline for Reuse Water

Timeframe	Task	Purpose
By June 1st	Update GWR projection tool for the current year	The tool may need updates to incorporate new data on demands or other inputs. Any modifications should be made by June 1st
Weekly after June 1st	Update GWR storage projection	Using updated data on current storage, demand, and raw water pumping project end of season storage and determine whether it will drop below any of the trigger threshold values
Within 1 business day of GWR storage projection	Coordinate with Drought Operations Committee	If staff determine that projected GWR storage will drop below one of the trigger values in Table 6, formulate drought declaration recommendations and share the recommendations with the Drought Operations Committee.
Within 5 business days of GWR storage projection	Meet with the Drought Operations Committee	If staff determine that projected GWR storage will drop below one of the trigger values in Table 6, hold a meeting of the Drought Operations Committee to review projections and drought recommendations.
Within 1 day of Committee meeting	Schedule drought agenda item for City Council Meeting	If the Drought Operations Committee agrees that a drought declaration is warranted, staff will work with CMO to get the drought topic on an upcoming City Council agenda.
Within 1 day of Committee meeting	Ramp up parks irrigation SOP	If the Drought Operations Committee agrees that a drought declaration is warranted, staff will coordinate with Parks to begin reducing irrigation on city owned property irrigated by reuse, per the demand restrictions schedule and parks SOP
Within 14 days of Committee meeting	City Council reviews drought recommendations	City Council reviews staff recommendation to declare Drought Condition I, II, or III for the reuse system and makes final decision
Within 1 day of Drought Declaration	Launch Drought Communications Plan	If and when City Council decides to declare Drought Condition I, II, or III, launch the communications plan to get the message out about mandatory restrictions
Within 3 days of Drought Declaration	Mobilize Enforcement Teams	Communicate with enforcement team; schedule training and coordination meetings

Monitoring and Enforcement of Water Use Restrictions

In addition to effective communications with Broomfield water customers, enforcement of mandatory water use restrictions and prohibition of water waste will be critical for successfully managing a drought and preventing water shortages. Broomfield's primary goal is to encourage compliance through effective communications and setting a positive example on City-owned property. However, available research shows that both communications and enforcement will be necessary for reducing water use.

Monitoring

Broomfield staff will monitor water use during Drought Conditions I, II, and III. In conditions II and III monitoring and enforcement will require additional staff resources (either seasonal hires, or partially re-assigning staff from their normal roles to focus on drought monitoring). The goal is to have Broomfield staff dedicated to monitoring outdoor water use across the city each day of the week when Conditions I, II and III are in place.

Monitoring teams will consist of the following city personnel:

- All staff within the Water Resources Division, including any seasonal hires
- Utilities, Streets, and Parks staff who are regularly out in the field as part of their normal duties
- Other city staff as necessary (e.g., seasonal hires, Open Space staff)

Each year, the Water Resources Division will organize a brief training on water use restrictions and enforcement procedures. Staff who may be part of the enforcement team for that year should participate in the training. If no drought declaration is expected that year the training can be canceled.

During Drought Conditions I, II, or III, staff from the Water Resources Division will go out in the field to monitor water use every business day and as much as feasible on weekends and holidays. Water Resources staff will aim to have at least one person out patrolling for up to two hours each day.

During Drought Conditions II or III, monitoring and enforcement will require staff from other divisions and departments to assist with monitoring. Members of the enforcement team will be asked to observe water use during their normal duties and record violations of restrictions that are in place at the time. If necessary, the Director of Public Works and CMO may formally assign monitoring and enforcement duties to some staff (i.e., make monitoring and enforcement of water use restrictions part of their normal daily duties and temporarily reduce or eliminate other duties).

Violations should be recorded as follows:

1. If staff observe a property irrigating on a day or during a time that is prohibited, or if staff observe another prohibited water use (e.g., cleaning sidewalks with a hose), or if staff

observe clear water waste (such as large volumes of water running off irrigated landscapes onto sidewalks and streets), staff should photograph the violation and address with their phone and record the address, day, time and nature of the violation on paper or electronically.

2. Staff may engage with property owners, tenants or staff managing the property if they are present; such engagement shall be limited to notifying the owner, tenant, or other individuals that mandatory restrictions are in place, provide handouts, and that the property may be in violation. Staff will not communicate or indicate any potential penalty for the specific violation they have observed.
3. Staff who have observed violations and recorded necessary information will provide their documentation to Water Resources Staff.
4. Water Resources Staff will maintain a database of violations, tracking the number of violations by water service account.
5. Every two to three weeks, staff will compile a list of violations and necessary enforcement actions (e.g., notice of first violation, or charges that should be added for subsequent violations). The list will be shared with Utility Billing staff for distribution with monthly invoices.

Penalties for Violations

Broomfield Municipal Code establishes penalties for water waste (13-24-010, 13-24-020) and for violating mandatory water use restrictions (13-36-070). The penalties for violating mandatory water use restrictions are summarized below.

Under Colorado Statute (Sec. 37-60-126 11(c)(I)), HOA rules about watering and landscape maintenance do not supersede mandatory water restrictions set by the City Manager or City Council. Under this statute, HOAs may not require residents to irrigate in violation of city restrictions.

Penalties established in Broomfield Municipal Code: The customer, owner, or occupant of the licensed premises shall be responsible for complying with the drought water use restrictions. City personnel are authorized to monitor customer water consumption via direct observation or through use of billing data to help enforce drought water use restrictions. City personnel may place information fliers on licensed premises or approach property owners or managers to review drought conditions and water use.

For any violation of mandatory water use restrictions, the following charges shall be added to the monthly water service charges of the owner of the relevant water service account(s):

- A. *For the first violation of any drought watering restriction account owner, or occupant will be notified in writing served personally or with the monthly water service invoice.*
- B. *For the second violation of any drought watering restriction at the same premises, \$200.00 shall be added to the monthly water service charges of the account owner for*

single-family dwellings and duplex dwellings and \$400.00 shall be added to the monthly water service charges of all other customer types.

C. For the third violation of any drought watering restriction at the same premises, \$600.00 shall be added to the monthly service charges of the account owner for single-family dwellings and duplex dwellings and \$1,200.00 shall be added to the monthly water service charges of all other customer types.

D. For the fourth violation of any drought watering restriction at the same premises, \$1,000.00 shall be added to the monthly service charges of the account owner for single-family dwellings and duplex dwellings and \$2,000.00 shall be added to the monthly water service charges of all other customer types.

E. For the fifth and any subsequent violation of any drought watering restriction at the same premises, \$2,000.00 shall be added to the monthly service charges of the account owner for single-family dwellings and duplex dwellings and \$4,000.00 shall be added to the monthly water service charges of all other customer types.

Customers can appeal a penalty charge and the charge may be forgiven if the account owner can demonstrate that the excess water use was caused by a major leak or other malfunction of plumbing or irrigation that has since been repaired.

8. Adopting and Updating the Plan

This Drought Mitigation and Response Plan was officially adopted by the City Council on DATE by resolution ###.

Implementation of this Plan will require development of additional tools and resources, and annual maintenance of those tools and resources. Now that the plan has been approved and adopted by the City Council, staff will work on developing spreadsheets and other tools, standard operating procedures, additional communications materials and other resources.

Drought mitigation and response planning is an ongoing process. Water Resources staff will continue to coordinate with partners in the region to identify and adopt new practices and tools. Each time a drought occurs staff will write an after-action report to summarize the experience and any lessons learned. As needed, staff will recommend changes or updates to this drought response plan based on experience and lessons learned.