NORTH WELD COUNTY WATER DISTRICT

Notice of Special Meeting

Monday, August 28, 2023, at 8:30 AM

32825 Co Rd 39, Lucerne, CO 80646

THE BOARD MEETING WILL BE OPEN TO THE PUBLIC IN PERSON AND BY TELECONFERENCE

Information to join by Phone is below:

Call-In Number: 1(720)707-2699, **Meeting ID**: 873 5785 0771, **Passcode**: 475314

AGENDA

1. **Call to Order**
2. **Confirmation of Disclosures of Conflicts of Interest**
3. **Action: Approve August 28, 2023, NWCWD Board Meeting Agenda**
4. **Discussion: Master Plan, Drought Plan and Proposed Revisions to Water Service Agreements**
5. **Executive Session: The Board reserves the right to enter into Executive Session for the following purposes: Receiving legal advice and discussing matters subject to negotiation and strategy pursuant to § 24-6-402(4)(b) & (e), C.R.S. related to Master Planning and Water Service Agreement Negotiations**

ADJOURN_____ P.M.

MEMORANDUM

TO: **BOARD OF DIRECTORS, NORTH WELD COUNTY WATER DISTRICT**
CC: ZACH WHITE, JAMIE COTTER, SCOTT HOLWICK, GEORGE OMACK, PAUL WEISS, JAN SITTERSON, RICHRAD RAINES, GARRET MICK, BERNIE FRIAS

FROM: ERIC RECKENTINE

DATE: AUGUST 28, 2023

SUBJECT: MASTER PLANNING, DROUGHT PLANNING AND WATER SERVICE AGREEMENTS

The North Weld County Water District (the "District") has faced economic challenges in recent years, and is expected to continue to face challenges due to a number of factors including, but not limited to, changes in the economic climate, water availability, potential changes in treatment sources for wholesale customer accounts, cost of new and replacement infrastructure, cost of raw water supplies, increase in agricultural commercial water usage, residential sector growth within the District and municipal growth expectations. In order to address these and other challenges, it is recommended that the District consider global changes to "Water Service Agreements" that serve separate customer segments, language adjustments to "Letters of Commitment", and modifications to "Water Dedication Agreements".

In preparation of this memorandum and the recommendations herein, the following template documents were reviewed.

1. Wholesale/Town Water Service Agreement
2. Developer Water Service Agreement
3. Commercial Sector Water Service Agreement
4. Letter of Intent and Commitment to Serve for Single Lot and Subdivision
5. Raw Water Dedication Agreement for C-BT and Non-C-BT Supplies

Wholesale/Town Water Service Agreement ("Wholesale WSA")

Several factors that drive the recommendation for language modifications to the District's form of Wholesale WSA's include but are not limited to:

- 2nd treatment plant opportunity for wholesale customers such as Windsor, Severance, and Eaton.
    - Timing of transition from the Soldier Canyon Water Treatment Plant ("SCWTP") to Cobb Lake Treatment Plant is stated by participants as between 2025 to 2027 or beyond.
- Creates a concern about the guarantee of current and future water rate revenue, future Plant Investment revenue, and the impact of such issues on the District's ability to meet debt service requirements.
- Several Towns have expressed a reluctance to transition to Cost of Service rate model as it will cancel the current Wholesale Discount Rate (Letter from Gould Associates, February 2020 can be provided for reference).
- Several Towns have expressed reluctance toward Rate of Return rates.
- Multiple Towns are misusing Maximum Day Demand and Peak Hour Demand provisions within current agreements.
- Five out of the Seven current agreements have errors related to total volume of water per Plant Investment.

The District has implemented policies to control some of these issues that include implementing flow control devices to maintain contract peak flows, modifying exclusion and absorption language, cost of service rate provisions, correcting volume to Plant Investment errors and revised minimum volume language in two of our seven wholesale water service agreements and enforcing storage ratio rate penalties. Additional changes to existing Wholesale WSA's will help reduce risk and add protections to the District and other customer segments. Suggested changes include:

1. Adjust language related to Maximum Annual Delivery Volume and Minimum Annual Delivery Volume to require Town guarantee a minimum annual usage to be provided by the District through the SCWTP and District system to guarantee certain annual revenues to the District.

2. Addition of language limiting the District's obligations and/or liability related to restrictions or delays imposed by third-party jurisdictions on permitting for infrastructure.

3. Clarification regarding the Towns' obligation to use Town stored water between Maximum Day Demand and Peak Hour Demand and the ability to impose fines or penalties for circumventing these requirements.

4. Addition of Rate of Return language recommended in the Honey Creek Cost of Service Rate Report

5. Inclusion of language related to regional mater planning and number of future Plant Investments that will be made available to each Town, and the addition of language to clarify that sale of additional Plant Investments is in the sole discretion of the Board of Directors and more clearly define the process for requesting additional Plant Investments and the Districts response to such requests.

Developer Subdivision Water Service Agreements "Developer WSA"

Several factors that drive the recommendation for language modifications within the District's Developer WSAs include but are not limited to:

- Timing of new development start and completion.
    - The District has been holding capacity for some developments for decades prior to start.
    - Holding capacity for phases within existing subdivisions and concerns over reliance claims.
    - Large Subdivisions are being proposed with multiple large phases that require language related to timing of service and sales commitment guarantees, prior to new phases receiving commitment letters or new agreements.
    - Future offsite infrastructure requirements for extended projects or phases within development.
- Force Majure language modifications and protections related to contract compliance.

The District has implemented policies to control some of these issues, including updated design criteria, formal development review policies, raw water dedication policies, transitioning from 100% cash in lieu to 100% water dedication policy adjustments, and the elimination of residential plant investment deferable policy (conservation blue tap policy). The proposed changes to the Districts form of Developer WSA to help address the bulleted issues are as follows:

1. Addition of language limiting the District liability for an inability to provide service due to third-party land use regulations and/or District imposed moratorium, and the waiver of any developer rights of recourse.

2. Addition of language terminating the Developer WSA if certain milestones are not met to avoid situations of extended periods reserving capacity.

3. Addition of language stating development review policies related to subsequent development phases or new proposed development.

4. Additional language related to assignment of Developer WSAs defining how and when they can be assigned.

5. Addition of language related to approval process for phases within developments.

New Commercial Sector Agreements and Dedication Agreements "Commercial WSA"

The following Factors outlined in the October 3, 2022, Commercial Sector Memo to the Board of Directors, and the March 6, 2023, Commercial Sector Over Usage Memo to Board of Directors provide insight into the usage issues related primarily to nine largest dairy customers. In general, The commercial dairy sector of water users shows increasing consumption without additional water dedications or analysis of infrastructure needs to accommodate the growth. Over the ten-year data availability period water consumption has increased from 850 acre-feet in 2012 to 2,018 acre-feet in 2022, or, put another way, the water usage at the nine dairies reviewed has increased by 100% over the period 2013-2021 and 25% since 2017. The following has been observed but are not limited to the following as of 2022 demands:

- The District's operational water supply is flat with operational demand when the volume of water under a surcharge water estimated above, 1,478 AF, is subtracted from overall supplies. Therefore, the District will be entering into an operational supply deficit due to the current growth of the dairies, illustrated by just nine of the larger operations reviewed.
- Water provided to the District by others will be used to make up for under-allocated dairies, thereby potentially causing shortages for customers in other customer classes, even in average or wet years.
- The District is not keeping-up with the growth in the usage of water for dairies, shown to be increasing nearly 6% per year for the nine dairies reviewed. The remaining District customers are bearing the financial and reliability burden associated with this high operational risk.
- In addition, the nine dairies use 1.3 million gallons per day (MGD) of infrastructure capacity annually since 2021. That usage is beyond their purchased allocations.
- The debt carried by the District in relation to water under allocation and plant investment under allocation, not accounting for lost opportunity cost, is in the range of one quarter to one half billion dollars.

The district has implemented policies to control some of these issues, including a flow control policy, the residential meter overuse policy, and the elimination of the plant investment and water allocation reinvestment policy. The District is considering a max annual use policy that would come into effect in 2024. These policies and proposed policies will provide the economic incentive required for the commercial sector customers to provide appropriate raw water for their operations and secure the correct capacity related to required water usages. These parameters will be determined as part of the analysis related to capacity limitations per pressure zone within the district and determined for each individual water user as required. The objective is to induce and bring each water user starting with the largest nine dairy

customers into formal water service agreements for their respective meter(s), the timing of this transition requires discussion. The proposed changes to Commercial WSAs are as follows:

1. Limiting maximum annual volume usage and imposition of a penalty rate to induce usage changes.

2. Setting flow control and pressure maximums in individual agreements.

3. Water dedication and Plant investment purchase agreements with each customer to come into compliance with agreed upon water dedication and Plant Investment policies, timing of dedication and plant investment purchases to maximum usages set by the District and compliance with current policies after coming into compliance through the amended WSAs.

4. Language requiring development review approvals prior to meter usage increases.

5. Addition of language related to limitations due to third parties and/or District imposed moratorium and limitation on liability of the District and waiver of rights of recourse against the District.

See the following Appendix:

APPENDIX 1 – COST OF SERVICE WATER RATE STUDY REPORT DRAFT - HEADWATERS CORP. MAY 31, 2022
APPENDIX 2 – BASELINE PI FEE USING 2021-31 CIP 2022 UPDATE – HONEY CREEK RESOURCES – DECEMBER 5,2022
APPENDIX 3 – WATER ALLOCATION FEE & SURCHARGE – HONEY CREEK RESOURCES – MARCH 3, 2023
APPENDIX 4 – TECH MEMO– SYSTEM YIELD – WILLIAMS & WEISS CONSULTING LLC – FEBRUARY 2019
APPENDIX 5 – TECH MEMO – DROUGHT MITIGATION – HEADWATERS CORP & WILLIAMS & WEISS CONSULTING LLC – SEPTEMBER 2021
APPENDIX 6 – TECH MEMO – SYSTEMS YIELD 2023 DRAFT – WILLIAMS & WEISS CONSULTING LLC, MAY 2023
APPENDIX 7 – DROUGHT ANALYSIS & WATER SUPPLY MODEL 2020 – WILLIAMS & WEISS CONSULTING LLC – MARCH 2020
APPENDIX 8 – NWCWD DAIRY FARMERS OF AMERICA PRESENTATION – ERIC RECKENTINE - APRIL 26, 2022
APPENDIX 9 – COMMERCIAL MEMO – ERIC RECKENTINE – OCTOBER 3, 2022
APPENDIX 10 – COMMERICIAL SECTOR OVER USAGE v2 –WATER RESOURCES - AUGUST

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APPENDIX 1

Cost-of-Service Water Rate and Fee Study

North Weld County Water District

Confidential Draft for Review

By

Headwaters CORPORATION

September 30, 2021

May 31, 2022 (revised)

Table of Contents

Introduction

This water rate and fee study develops cost-of-service based user charges and a Plant Investment (PI) fee for the North Weld County Water District. The District is rapidly changing from a rural water-oriented provider to a residential and industrial type of provider. The current rate structure is a continuation of the historical rate structure, which charges all District customers the same price for each gallon of water, periodically updated. However, it doesn't cost the same to serve all customers. Customers with high seasonal demands, for instance, require more capacity than those with constant demand.

This analysis uses the base-extra capacity cost allocation method to calculate user charges. This method focuses upon capacity usage and equitably allocating "extra capacity" costs – those costs needed to serve peak demands above average demand, to those who create the demand. This method is discussed in greater detail and applied to the District's user charge revenue requirements in the Cost Allocation below.

User charges are calculated for the period 2022 through 2030. Updating this study prior to 2030 is strongly recommended because capital costs and growth rates could change significantly over this period and because customers may reduce their usage in response to intervening rate increases.

The year 2023 is considered the baseline year in the analysis. Estimated water usage for 2023 is based on an average precipitation year. User charge revenue requirements, which form the basis user charges are considered representative of current trends. Costs are allocated using the base-extra capacity method to determine baseline water rates and the relative differences between the customer classes.

Report Organization

The following describe the development and present the data used to develop the Plant Investment (PI) fee and cost-of-service based user charges

1. Water demand and usage
2. Capital improvements and Plant Investment fee
3. Capital Reserve Fund
4. User Charge Revenue Requirements
5. Cost Allocation
6. Rate Development
7. Rate Scenarios (or Recommendations, depending on Board's discretion)
8. Cash Flow Analysis

Water Demand and Usage

Customers and Customer Usage

The District provides treated water to residents, businesses, farms, and towns in North Weld County. Water usage and demand fall into three major categories, residential, commercial, and wholesale service, with additional subcategories within the residential and commercial sectors.

Residential Usage

Residential usage consists of single-family usage of varying categories primarily based on lot size.

- Standard Full service applies to residential properties with lot sizes greater than 0.33 acres. Allocated annual use for this category is 0.70 acre-feet per unit, or 228,000 gallons, equivalent to one Colorado -Thompson unit (C-BT). This is the largest subcategory in the Residential sector but due to increasing raw water prices and trends towards smaller lot sizes, its rate of increase is dampening over time. Commercial businesses with low water usage could also be placed in this category
- Standard ¾ service applies to properties with lot sizes between 0.20 acres and 0.33 acres. Allocated annual use for this category is 171,000 gallons, equivalent to ¾ of a C-BT unit.
- Standard ½ service applies to properties with lot sizes 0.20 acres and less. Allocated annual use for this category is 114,000 gallons, or about ½ of a C-BT unit. The majority of new single-family construction is in this category.

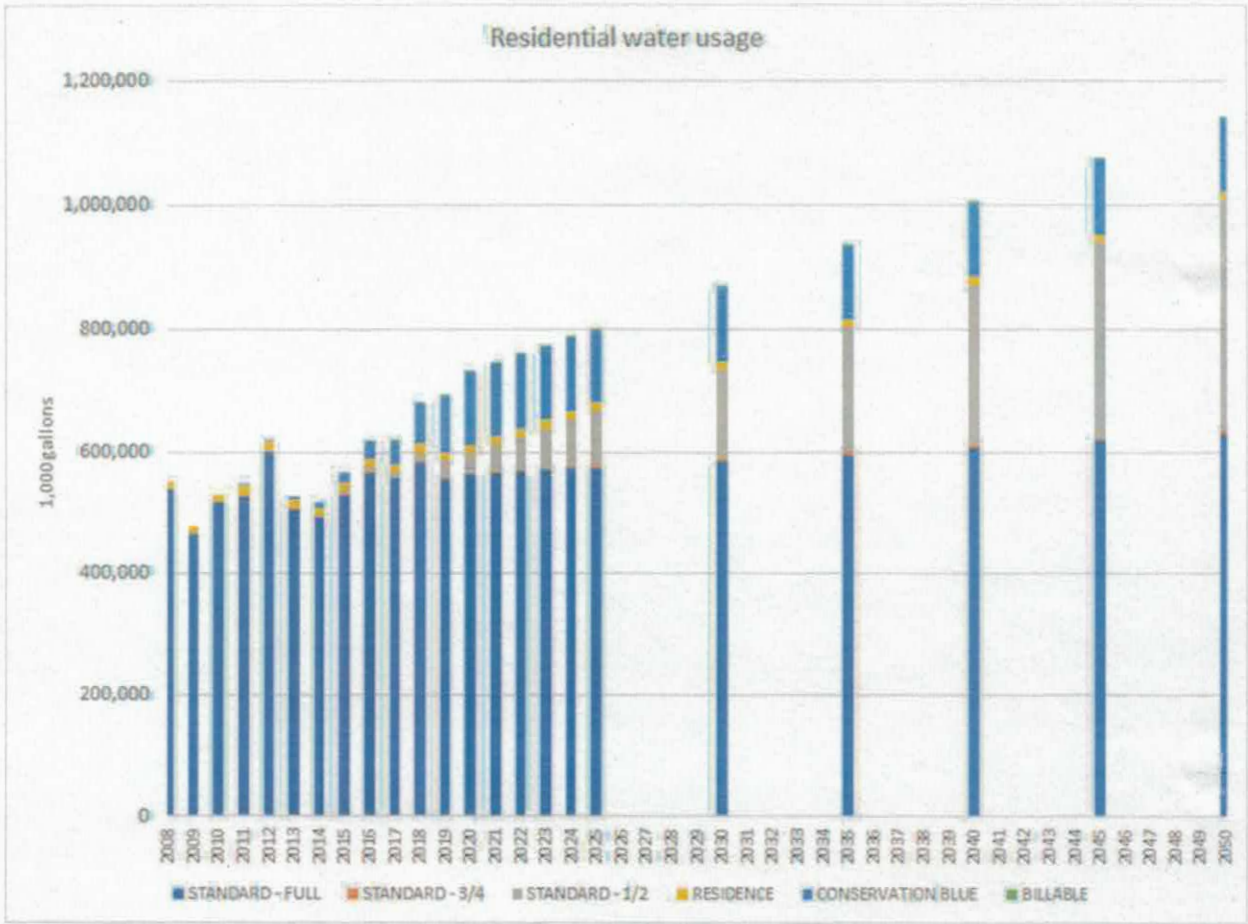
There are three additional smaller categories that evolved due to special circumstances.

- Residence accounts for the Soaring Eagle development, which has its own non-potable system. Since this development is near build-out, no future growth is expected in this category.
- Conservation Blue was past program the District used to develop residential usage, allowing up-front tap fees to be rolled into user charges. This resulted in the District effectively subsidizing residential growth. This program has been terminated and usage under Conservation Blue is effectively capped at its current level.
- Billable usage

Figure 1 summarizes historical billed usage since 2008 and shows estimated future usage through 2050. Future estimates were developed by Providence Infrastructure for planning purposes and continue recent growth trends into the immediate future.[1] Estimates shown in Figure 1 are incorporated into this analysis.

[1] Some distinction should be made between future water usage estimates used for planning purposes and future estimates used for financial purposes. For the same time period, planning estimates are often higher than financial estimates due to analysts' fear of the cost of error. Over-estimating future usage levels generally has fewer negative consequences than under-estimating future levels for facility planning. However, the opposite applies for financial calculations -- over-estimating near term usage may result in rates set at levels too low to generate sufficient revenue. However, for this analysis, it appears that near-term usage estimates continue recent historical trends and contain no systematic upward bias.

Figure 1. Historical and estimated future Residential water usage.



Commercial Usage

Commercial usage is dominated by two major subcategories of usage.

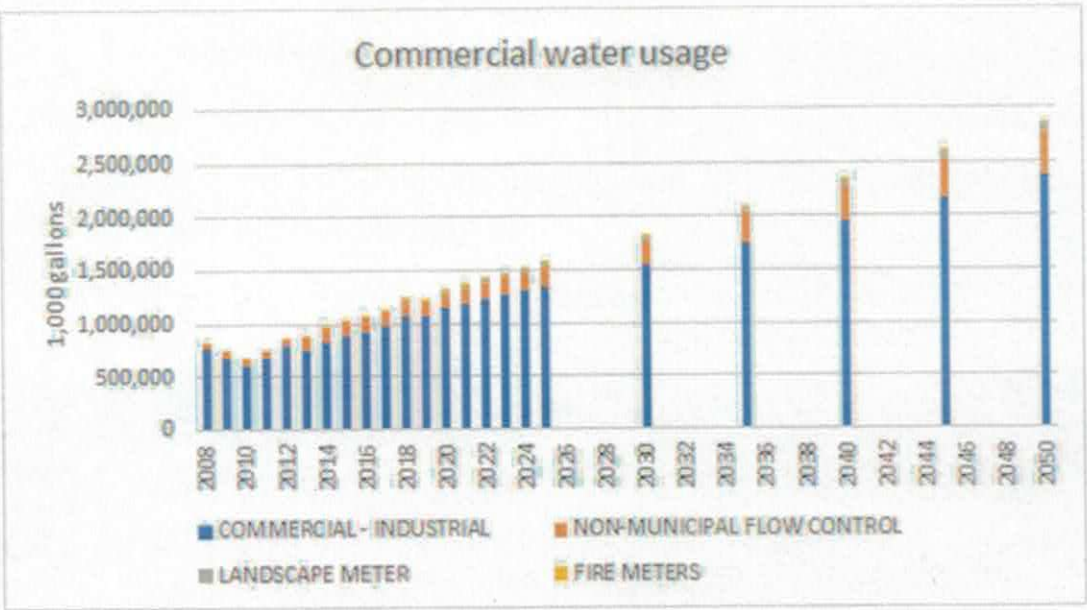
- Commercial-industrial usage encompasses large commercial enterprises with allocations of 3 taps or more. These are generally large dairies with consistent high levels of daily usage and relatively low peaking factors. The number of dairies is not expected to increase significantly but usage per dairy is expected to continue to increase over time as herd expand.
- Non-municipal flow control consists of 4 large dairies under flow control meters.

Two additional subcategories of commercial usage include:

- Landscape meter, which includes existing meters for HOAs. No additional growth is assumed for this category. Future customers desiring this service will be placed in the commercial-industrial category.
- Fire protection, which provides supply for fire suppression systems.

Figure 2 summarizes historical billed usage since 2008 and shows estimated future usage through 2050. Future estimates were developed by Providence Infrastructure for planning purposes and continue recent growth trends into the immediate future. Estimates shown in Figure 2 are incorporated into this analysis.

Figure 2. Historical and estimated future Commercial water usage.

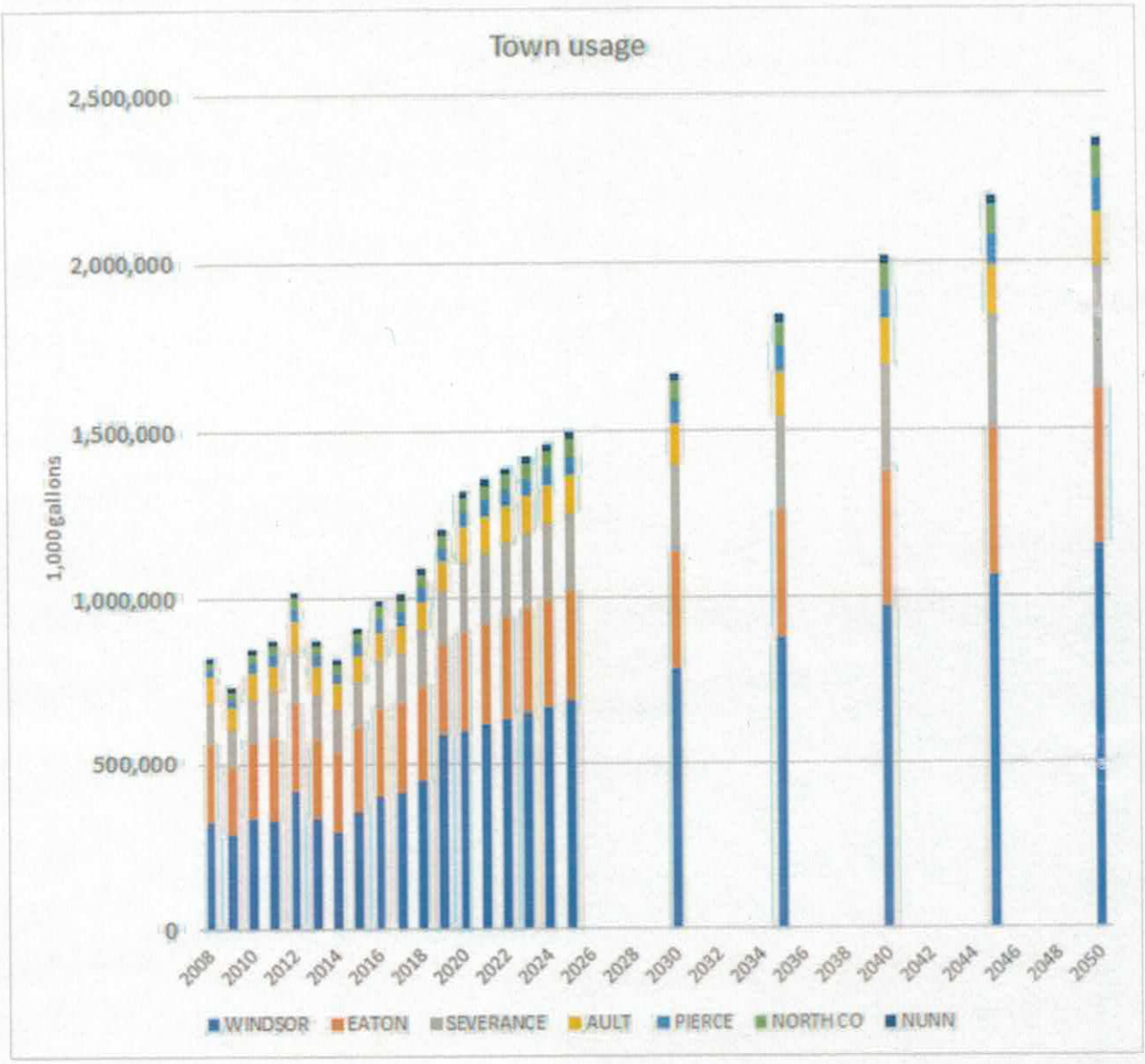


Towns

Wholesale treated water service is provided to the towns of Eaton, Severance, Ault, Pierce, Nunn, Windsor, and to Northern Colorado Water Association No. #A-2110. The towns supply their own raw water and benefit from the District's share of the Soldier Canyon Treatment Plant and from the District's transmission facilities, storage, administrative, engineering, and planning activities. Town demands are primarily residential in nature with corresponding fluctuations in seasonal usage. The District provides infrastructure capacity to meet the towns' maximum daily demands, while local storage to meet peak hourly demands is the towns' responsibilities. Currently, District water charges to the towns, on a dollar per 1,000 gallons basis, are reduced to recognize the latter's contribution of raw water and their local distribution systems. However, this reduction was based on mutual agreement and not necessarily a cost analysis. In addition, since the towns' demand are primarily residential-based, it is reasonable that costs associated with providing service should be derived through a base-extra capacity method of cost allocation. This method equitably allocates system capacity charges across customer classes and is discussed in more detail in sections below.

Figure 3 summarizes historical billed usage since 2008 and shows estimated future usage through 2050. Future estimates were developed by Providence Infrastructure for planning purposes and continue recent growth trends into the immediate future. Estimates shown in Figure 3 are incorporated into this analysis.

Figure 3. Historical and estimated future Town water usage.



Summary of Future Usage Estimates

Table 1 summarizes water usage estimates initially used in this analysis for the years 2020-2030.

Peaking Factors

Water system facilities are built to meet peak daily and peak hourly demands. Peaking factors characterize customers' usage characteristics. For District customers, peaking factors are based on historical demand and shown and shown in Table 2. A peak day, or max day, factor of 2.6, for instance, indicates that maximum day water demand, which occurs during the summer irrigation season, is 2.6 times that of average day demand. A maximum hourly peaking factor indicates that the maximum

Table 1
Estimate of Billed Water Usage, 2020-2030

	Annual usage (1,000 gal)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Standard Full	172.2	563,817	566,055	568,293	570,531	572,769	575,007	577,245	579,483	581,721	583,959	586,197
Standard 3/4	124.0	3,120	3,244	3,368	3,492	3,616	3,740	3,843	3,967	4,091	4,215	4,360
Standard 1/2	95.0	32,316	43,906	55,496	67,086	78,676	90,266	101,856	113,446	125,036	136,626	148,216
Residence	79.2	13,106	13,106	13,106	13,106	13,106	13,106	13,106	13,106	13,106	13,106	13,106
Conservation Blue	92.3	118,968	118,968	118,968	118,968	118,968	118,968	118,968	118,968	118,968	118,968	118,968
Billable	160.0	320	320	320	320	320	320	320	320	320	320	320
Subtotal		731,647	745,599	759,551	773,503	787,455	801,407	815,338	829,290	843,242	857,194	871,167
Commercial-industrial												
Commercial-industrial		1,145,243	1,185,800	1,226,400	1,267,000	1,307,600	1,348,200	1,388,800	1,429,400	1,470,000	1,510,600	1,551,200
Non-municipal flow control		136,107	145,000	153,900	162,800	171,700	180,600	189,500	198,400	207,300	216,200	225,100
Landscape		21,016	23,000	25,000	27,000	29,000	31,000	33,000	35,000	37,000	39,000	41,000
Fire meters		488	540	590	640	690	740	792	844	896	948	1,000
Subtotal		1,302,854	1,354,340	1,405,890	1,457,440	1,508,990	1,560,540	1,612,092	1,663,644	1,715,196	1,766,748	1,818,300
Towns												
Windsor		598,312	616,900	635,500	654,100	672,700	691,300	709,900	728,500	747,100	765,700	784,300
Eaton		294,711	300,500	306,300	312,100	317,900	323,700	329,500	335,300	341,100	346,900	352,700
Severance		216,243	221,000	225,800	230,600	235,400	240,200	245,000	249,800	254,600	259,400	264,200
Ault		103,013	104,700	106,400	108,100	109,800	111,500	113,200	114,900	116,600	118,300	120,000
Pierce		50,243	52,000	53,800	55,600	57,400	59,200	61,000	62,800	64,600	66,400	68,200
North County		41,835	43,500	45,200	46,900	48,600	50,300	52,000	53,700	55,400	57,100	58,800
Nunn		18,700	19,000	19,300	19,600	19,900	20,200	20,460	20,720	20,980	21,240	21,500
Subtotal		1,323,057	1,357,600	1,392,300	1,427,000	1,461,700	1,496,400	1,531,060	1,565,720	1,600,380	1,635,040	1,669,700
Total w/o Towns		2,034,501	2,099,939	2,165,441	2,230,943	2,296,445	2,361,947	2,427,430	2,492,934	2,558,438	2,623,942	2,689,467
Total w/ Towns		3,357,558	3,457,539	3,557,741	3,657,943	3,758,145	3,858,347	3,958,490	4,058,654	4,158,818	4,258,982	4,359,167

Table 2
Peaking Factors by Customer Class

Customer class	Max Day	Max Hour
Commercial-Industrial	1.30	1.75
Non-municipal Flow Control	1.30	1.75
Conservation Blue	2.60	4.00
Residence	2.60	4.00
Standard-1/2	2.60	4.00
Standard-3/4	2.60	4.00
Standard-Full	2.60	4.00
Towns		
Town of Windsor	2.00	2.00
Town of Eaton	2.40	2.40
Town of Severance	2.20	2.20
Town of Ault	2.50	2.50
Town of Pierce	2.00	2.00
N. Colo Water Assoc #A-2110	2.40	2.40
Town of Nunn	2.40	2.40
Landscape	2.60	4.00
Billable	2.60	4.00
Fire Protection	1.55	1.82
Non-Potable		
Unset meters		

hourly demand is 4 times that of average daily demand. The contrast between residential and commercial-industrial peaking factors is significant. Also, it should be noted that, by agreement, the District doesn't provide max hourly demand to the towns. As a result, their max hourly demands are assumed equal to their max daily demand.

From a practical perspective, the above discussion provides rationale for the District's residential water volume charges to be measurably higher than those for commercial and industrial customers. Water charges to towns would be expected to lie somewhere in between because they are supplied water to meet peak day demand but not peak hour.

Taps and Water Allocations

The District uses the concept of taps to measure capacity and allocation. This is equivalent to the use of a meter-equivalent capacity unit used for urban water utilities. For the District, a water tap is set equal to 0.70 acre-feet, which is also equivalent to the average annual yield of one unit of Colorado-Big Thompson (C-BT) water supply. Each customer has an associated tap equivalent. For instance, a single-family residence may be assigned one full tap, ¾ of a tap, or ½ of tap, meaning that the customer is entitled to a respective 0.70 acre-feet, 0.53, or 0.35 acre-feet of water supply without a penalty surcharge. Commercial and industrial customers are assigned taps based on their individual anticipated usage.

Water Allocation and Plant Investment (PI) Surcharges

A substantial number of customers chronically exceed their allocations. These are mostly dairy operations which have grown significantly over time but haven't purchased additional allocations to match their increased demands on the system. As a result, the District has developed surcharges for customers exceeding their allocations. The surcharge was historically $2.00 per 1,000 gallons when the water allocation is exceeded and approximately $3.95 per 1,000 gallons when the PI allocation is exceeded.

When developed, the Water Allocation surcharge of $2.00 per 1,000 gallons was likely based on the cost of raw water. However, with the current cost of a C-BT unit exceeding $65,000, a cost-based surcharge would translate to a level of about $18.50 per 1,000 gallons. Though cost-based, raising the surcharge to this level was considered untenable by the District Board and staff. As a result, the Water Allocation surcharge was increased to $6.00 per 1,000 gallons in the February, 2022 Board meeting, with the possibility of raising it further if customers continue to chronically exceed their allocations.

Also, during drought conditions, when the District declares either a Stage 1 , 2, or 3 situation, the District may establish a lease pool of water to shore-up supplies. This lease pool would be use to satisfy demand of those chronically over-allocated who would otherwise have water unavailable during a drought year. The lease pool is anticipated to work on a cost-based basis when operational. This will add uncertainty to the level of Water Allocation surcharge revenues because in drought years, the volume of leased water will affect the volume of water subject to surcharge.

This increase in the Water Allocation surcharge has implications for the rate study. Surcharges, in general, are a significant component of the District's overall revenue. A three-fold increase in the Water Allocation surcharge could temporarily increase surcharge revenue before the price effects encourage customers to either buy more taps, reduce usage, or find another water source. This analysis assumes that surcharge revenues have increased in 2022 over their previous historical levels, but will dampen

over time as customers and their allocations eventually align. Regardless, it is certain that Water Allocation revenues will decline over time, but their levels over the next several years are uncertain.

Estimating future surcharge revenue involves multiplying the surcharge rates times excess usage. Excess usage estimates, in terms of 1,000 gallons subject to surcharges, for the year 2020 is shown in Table 3. The 2020 value was estimates from The anticipated 2022 value is carried through 2030 with the rationale that commercial-industrial usage may increase over time, but the District will take measures to cap excess usage at current levels.

Tap Moratorium

In late 2021, the District imposed a moratorium on new water taps due to infrastructure constraints and delays getting the NEWT III pipeline project permitted through Fort Collins and Larimer County. In February, 2022, the District Board lifted a portion the moratorium on several zones within the system, primarily on its west side (https://nwcwd.org/news/resolution-20220214-01-and-moratorium-update/). However, the Board has limited new taps to 120 per year until the moratorium is fully lifted. In addition, after that point, there remains concerns about how many new taps the District's infrastructure can accommodate on an annual basis. The demands developed above suggest an increase of about 440 taps per year. District staff has indicated that possibly 200 taps per year is a more realistic rate of increase considering infrastructure constraints.

For purposes of this analysis, the number of new taps per year is fixed at 120 for the years 2022 and 2023 and increased to 200 per year for the years 2024 through 2030. Near-term tap fee revenues have been adjusted to this revised level of growth and, if the moratorium permanently results in a 200 tap per year pace, future water usage estimates shown in Figure 1 will be adjusted accordingly. These revised revenues are shown in Table 9 in the Plant Investment Fee section below.

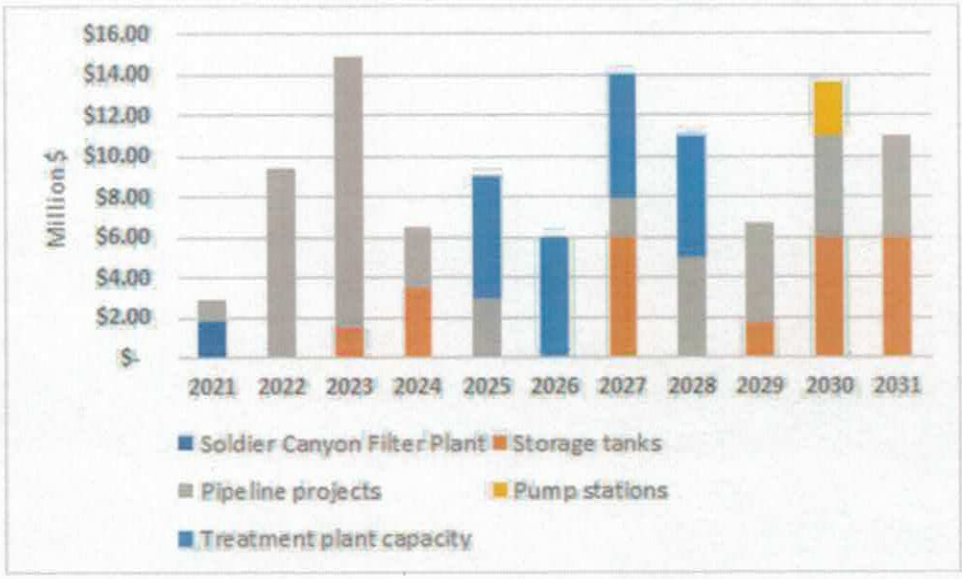
Table 3
Estimated Usage in Excess of User Allocations, Subject to Surcharge (1,000 gallons)

				2023-2030 estimates are based on the following proportion of 2022 estimate:							
				0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Estimated usage in excess of Water Allocation, total	426,929	430,000	430,000	387,000	344,000	301,000	258,000	215,000	172,000	129,000	86,000
Estimated usage in excess of PI allocation, total	287,990	287,990	287,990	259,191	230,392	201,593	172,794	143,995	115,196	86,397	57,598

Capital Improvements and Plant Investment Fee

Providence Infrastructure has developed a capital improvement program (CIP) for the District through 2031. In addition, the District is anticipating spending $6 million per year over 10 years program for purchase of water for drought protection. Figure 4 shows the sum of annual CIP expenditures without water acquisition expenditures in 2022 dollars, before the impacts of inflation. These non-water expenditures total about $105 million.

Figure 4. Estimated future capital improvements, in 2022 dollars



These capital costs can be further categorized:

1. Expenditures allocated to new growth and benefitting new customers. These are sometimes called expansion costs. Throughout the Front Range, new customers are typically expected to cover these costs through development impact fees, or PI fees.
2. Expenditures allocated to upgrading the existing system and benefitting current customers. These are sometimes called upgrade or existing customer costs. Existing customers repay these costs through user charges.

Table 4 shows how these expenditures are allocated between new and existing customers. It shows how the capital costs are allocated between the new District customers and the new customers in the towns served by the District. In general, infrastructure projects are shared equally by the District and towns, with the exception of most storage tanks because the towns are expected to provide their peak hour storage. Storage tank 1c will provide peak day as well as peak hour storage and its cost is shared equally by all. In addition, the towns are expected to provide their own water supply, so any raw water acquisition costs would be exclusively borne by District customers.

The proportions shown in Table 4 are applied to Tables 5, 6, and 7, which show:

- Capital costs allocated to all new customers to be recovered through tap fees, Table 5;

Table 4
Allocation of Capital Costs Between New Customers (Growth) and Existing Customers

	New customers through tap fees	Existing customers through monthly rates	Other dedication?	Proportion of project shared by all (District and Town)	Proportion of project paid by District customers only
Soldier Canyon Filter Plant (SCFP)					
Pleasant Valley Pipeline (PVP)	100%	0%		100%	
Storage Tank Projects					
1C (Proposed) -	100%	0%		100%	
4B (Proposed)	70%	30%			100%
5C (Proposed)	70%	30%			100%
6C (Proposed)	70%	30%			100%
7B (Proposed)	70%	30%			100%
Engineering					
Master Plan (Distribution System)	100%	0%		100%	
Pipeline Projects (New, not incl. O&M, Tap Transfers, Etc.)					
Zone 6 Delivery Pipeline (Tank 1 to Pump Station 6)	70%	30%		100%	
Eaton Pipeline	70%	30%		100%	
Line 1 Replacement (Pump Station 1 to Tank 1)	70%	30%		100%	
NEWT 3 Pipeline (Pre-Construction)	100%	0%		100%	
NEWT 3 Pipeline (Construction) -	100%	0%		100%	
Old Eaton Pipeline Replacement (2021) and flow control devices and other security measures, and interconnect	70%	30%		100%	
Pump Station Projects (New, not incl. O&M)					
Pump Station 1 rehab	70%	30%		100%	
Treatment Plant (New, not incl. O&M)					
Soldier Canyon Filter Plant Expansion	100%			100%	
Source of Supply					
Water acquisition for drought protection		100%			100%

Table 5
Capital Expenditures Recovered through Plant Investment Fees for All New Customers

3.00% = cost escalation rate

	YEAR:	0	1	2	3	4	5	6	7	8	9	10	
	600 - CAPITAL EXPENTITURES	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	2026 BUDGET	2027 BUDGET	2028 BUDGET	2029 BUDGET	2030 BUDGET	2031 BUDGET	TOTALS
Capital Improvements		$ 2,631,984	$ 9,081,716	$ 15,760,306	$ 7,112,088	$ 9,126,458	$ 6,965,978	$ 9,563,275	$ 12,433,132	$ 5,205,741	$ 7,736,847	$ 5,523,284	$ 91,140,809
6100	**Soldier Canyon Filter Plant (SCFP)**	$ 1,851,984	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,851,984
001307	Pleasant Valley Pipeline (PVP)	$ 1,851,984	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,851,984
6200	**Storage Tank Projects (New, not incl. O&M)**	$ -	$ -	$ 1,591,350	$ 3,824,545	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,415,895
	1C (Proposed) -	$ -	$ -	$ 1,591,350	$ 3,824,545	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,415,895
	4B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	5C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	6C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	7B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6505	**Engineering**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
001136	Master Plan (Distribution System)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6510	**Pipeline Projects (New, not incl. O&M, Tap Transfers, Etc.)**	$ 780,000	$ 9,081,716	$ 14,168,956	$ 3,287,543	$ 2,373,405	$ 10,334	$ 2,398,961	$ 5,053,889	$ 5,205,741	$ 5,362,160	$ 5,523,284	$ 53,245,989
	Zone 6 Delivery Pipeline (Tank 1 to Pump Station 6)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Eaton Pipeline	$ -	$ -	$ -	$ -	$ 2,363,569	$ -	$ -	$ 2,582,735	$ 2,660,217	$ 2,740,024	$ 2,822,224	$ 13,168,769
	Line 1 Replacement (Pump Station 1 to Tank 1)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	NEWT 3 Pipeline (Pre-Construction)	$ 80,000	$ 357,616	$ 368,344	$ -	$ -	$ -	$ 2,388,105	$ 2,459,748	$ 2,533,540	$ 2,609,546	$ 2,687,833	$ 13,484,732
	NEWT 3 Pipeline (Construction)	$ -	$ 7,210,000	$ 13,791,700	$ 3,278,181	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 24,279,881
	Old Eaton Pipeline Replacement	$ 700,000	$ 1,514,100	$ 8,912	$ 9,362	$ 9,836	$ 10,334	$ 10,857	$ 11,406	$ 11,983	$ 12,590	$ 13,227	$ 2,312,607
	Pump Station Projects (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,374,687	$ -	$ 2,374,687
	Pump Station 1 Rehab	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,374,687	$ -	$ 2,374,687
	Treatment Plant (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ 6,753,053	$ 6,955,644	$ 7,164,314	$ 7,379,243	$ -	$ -	$ -	$ 28,252,254
	Soldier Canyon Filter Plant Expansion	$ -	$ -	$ -	$ -	$ 6,753,053	$ 6,955,644	$ 7,164,314	$ 7,379,243	$ -	$ -	$ -	$ 28,252,254

Table 6
Additional Capital Expenditures to Serve District Customers

3.00% = cost escalation rate

	YEAR:	0	1	2	3	4	5	6	7	8	9	10	
	600 - CAPITAL EXPENTITURES	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	2026 BUDGET	2027 BUDGET	2028 BUDGET	2029 BUDGET	2030 BUDGET	2031 BUDGET	TOTALS
Capital Improvements		$ -	$ -	$ -	$ -	$ -	$ -	$ 5,015,020	$ -	$ 1,507,456	$ 5,480,047	$ 5,644,449	$17,646,972
6100	**Soldier Canyon Filter Plant (SCFP)**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
00130	Pleasant Valley Pipeline (PVP)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6200	**Storage Tank Projects (New, not incl. O&M)**	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,015,020	$ -	$ 1,507,456	$ 5,480,047	$ 5,644,449	$17,646,972
	1C (Proposed) -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	4B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,015,020	$ -	$ -	$ -	$ -	$ 5,015,020
	5C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,507,456	$ -	$ -	$ 1,507,456
	6C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,644,449	$ 5,644,449
	7B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,480,047	$ -	$ 5,480,047
6505	**Engineering**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
00113	Master Plan (Distribution System)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6510	**Pipeline Projects (New, not incl. O&M, Tap Transfers, Etc.)**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Zone 6 Delivery Pipeline (Tank 1 to Pump Station 6)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Eaton Pipeline	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Line 1 Replacement (Pump Station 1 to Tank 1)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	NEWT 3 Pipeline (Pre-Construction)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	NEWT 3 Pipeline (Construction) - ***BONDED WITH TANK 1C - SEE 700***	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Old Eaton Pipeline Replacement	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Pump Station Projects (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Pump Station 1 Rehab	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Treatment Plant (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Soldier Canyon Filter Plant Expansion	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Table 7
Capital Expenditures to Serve Existing Customers

	YEAR:	3.00% 0	1	2	3	4	5	6	7	8	9	10	
	600 - CAPITAL EXPENTITURES	2021 BUDGET	2022 BUDGET	2023 BUDGET	2024 BUDGET	2025 BUDGET	2026 BUDGET	2027 BUDGET	2028 BUDGET	2029 BUDGET	2030 BUDGET	2031 BUDGET	TOTALS
Capital Improvements		$ 300,000	$ 648,900	$ 3,819	$ 4,012	$ 1,017,173	$ 4,429	$ 2,153,947	$ 1,111,775	$ 1,791,282	$ 4,546,006	$ 3,634,243	$15,215,587
6100	Soldier Canyon Filter Plant (SCFP)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
001307	Pleasant Valley Pipeline (PVP)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6200	Storage Tank Projects (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,149,294	$ -	$ 646,053	$ 2,348,592	$ 2,419,049	$ 7,562,988
	1C (Proposed) -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	4B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,149,294	$ -	$ -	$ -	$ -	$ 2,149,294
	5C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 646,053	$ -	$ -	$ 646,053
	6C (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,419,049	$ 2,419,049
	7B (Proposed)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,348,592	$ -	$ 2,348,592
6505	Engineering	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
001136	Master Plan (Distribution System)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6510	Pipeline Projects (New, not incl. O&M, Tap Transfers, Etc.)	$ 300,000	$ 648,900	$ 3,819	$ 4,012	$ 1,017,173	$ 4,429	$ 4,653	$ 1,111,775	$ 1,145,229	$ 1,179,691	$ 1,215,193	$ 6,634,875
	Zone 6 Delivery Pipeline (Tank 1 to Pump Station 6)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Eaton Pipeline	$ -	$ -	$ -	$ -	$ 1,012,958	$ -	$ -	$ 1,106,886	$ 1,140,093	$ 1,174,296	$ 1,209,525	$ 5,643,758
	Line 1 Replacement (Pump Station 1 to Tank 1)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	NEWT 3 Pipeline (Pre-Construction)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	NEWT 3 Pipeline (Construction)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Old Eaton Pipeline Replacement	$ 300,000	$ 648,900	$ 3,819	$ 4,012	$ 4,216	$ 4,429	$ 4,653	$ 4,888	$ 5,136	$ 5,396	$ 5,669	$ 991,117
	Pump Station Projects (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,017,723	$ -	$ 1,017,723
	Pump Station 1 Rehab	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,017,723	$ -	$ 1,017,723
	Treatment Plant (New, not incl. O&M)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Soldier Canyon Filter Plant Expansion	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

- Additional capital costs added to the paid only by new District customers only (primarily tanks and raw water), also through tap fees, Table 6;
- Capital costs to be recovered from current customers, Table 7.

These tables also apply an assumed 3 percent rate of inflation for all expenditures. The sum of capital costs over the period 2022 through 2031 is approximately $126 million when inflation is considered.

Plant Investment Fees

Plant investment fees, or tap fees, are the result of dividing the total cost of capital improvements benefitting new customers by the number of new taps.

Costs Allocated to Growth for Purposes of Calculating PI Fee

As shown in Table 5, total CIP expenditures allocated to growth are estimated to be $91.1 million through 2031. This figure includes anticipated inflation of 3 percent per year.

For purposes of calculating a current PI fee, cost escalation of capital costs over time due to inflation may or may not be considered. Most often it is not considered for purposes of setting a current fee but the fee itself should be adjusted over time for inflation. Table 8 below shows capital costs allocated to new customers for the period 2020-2031, in 2022 dollars. These costs are shown on an annual basis and a cumulative basis. Since inflation is not considered in the costs in Table 8, they will be lower than the totals shown in Table 4.

It should be noted that the growth costs are also adjusted to recognize that the NEWT3 Pipeline and Tank 1c will have useful lives beyond 2031, most likely 30-year useful lives each. To avoid placing all the costs of these two expensive assets exclusively on the shoulders of new customers joining the system between 2021 and 2031, their costs have been amortized over 30 years (at 3 percent interest) and only the portion of the amortized costs occurring during the 2021-2031 period are included in the cost to be recovered from PI fees.

Number of Taps

Table 9 calculates the number of new taps in the system based on estimated future water usage for purposes of calculating the PI fee. The lower ½ of the table calculated the number of taps to use to calculated PI revenue in light of the recent tap moratorium issues.

Calculated Plant Investment Fees

Table 10 calculates the PI fee under two scenarios

1. Assumes the town customers and District customers pay differing PI fees based on cost allocation of specific assets. This mostly involves storage tanks expenditures from costs allocated to the towns and having the District exclusively pay for those.
2. All customers, District and town alike, pay the same PI fee.

It should be again noted that the fee calculations are based on 2022 dollars and should be adjusted annual with cost inflation.

Currently, all customers pay a $17,650 PI fee. This $17,650 fee is used in the rate analysis.

Table 8
Capital Costs to be Recovered from New Customers Through Plant Investment Fees (2022 dollars)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Growth costs allocated to all customers (in 2022 dollars)											
Growth portion of CIP, benefitting all	$ 2,631,984	$ 8,817,200	$ 14,855,600	$ 6,508,568	$ 8,108,739	$ 6,008,914	$ 8,009,092	$ 10,109,274	$ 4,109,460	$ 5,929,649	$ 4,109,842
Cumulative	$ 2,631,984	$ 11,449,184	$ 26,304,784	$ 32,813,352	$ 40,922,091	$ 46,931,006	$ 54,940,098	$ 65,049,372	$ 69,158,832	$ 75,088,481	$ 79,198,323
Adjusted growth cost allocated to all customers (in 2022 dollars)											
Growth portion of CIP, benefitting all, excluding NEWT3 and Zone 1c Tank	$ 2,631,984	$ 1,817,200	$ 355,600	$ 8,568	$ 8,108,739	$ 6,008,914	$ 8,009,092	$ 10,109,274	$ 4,109,460	$ 5,929,649	$ 4,109,842
Amortized cost of NEWT3 and Zone 1c Tank ($29.7 million over 30 years@3%)		$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272	$ 1,515,272
Total adjusted expenditures for purposes of calculating PI fee	$ 2,631,984	$ 3,332,472	$ 1,870,872	$ 1,523,840	$ 9,624,011	$ 7,524,186	$ 9,524,364	$ 11,624,546	$ 5,624,732	$ 7,444,921	$ 5,625,114
Cumulative adjusted expenditures	*$ 2,631,984*	*$ 5,964,456*	*$ 7,835,328*	*$ 9,359,168*	*$ 18,983,179*	*$ 26,507,366*	*$ 36,031,730*	*$ 47,656,276*	*$ 53,281,008*	*$ 60,725,929*	*$ 66,351,043*
Growth costs allocated to District only (in 2022 dollars)											
Growth portion of CIP, benefitting District customers only	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,200,000	$ -	$ 1,190,000	$ 4,200,000	$ 4,200,000
Cumulative CIP	$ -	$ -	$ -	$ -	$ -	$ -	*$ 4,200,000*	*$ 4,200,000*	*$ 5,390,000*	*$ 9,590,000*	*$ 13,790,000*

Table 9
Derivation of of Taps to Include for Plant Investment Fee

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Proportion of new taps District residential	0.22	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.20	
Proportion of new taps District non-residential	0.39	0.40	0.40	0.40	0.40	0.41	0.41	0.41	0.41	0.42	
Proportion of new taps Towns	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.38	0.38	0.38	
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
New Taps											
Without moratorium, for purposes of calculating tap fee											
Total usage, District and towns (acre-feet)	10,609	10,917	11,224	11,532	11,839	12,146	12,454	12,761	13,068	13,376	
Taps, total without moratorium	15,156	15,595	16,034	16,474	16,913	17,352	17,791	18,230	18,669	19,108	
	439	439	439	439	439	439	439	439	439	439	
Cumulative	439	878	1,317	1,757	2,196	2,635	3,074	3,513	3,952	4,391	
											Cumulatives
District residential	95	94	93	92	91	90	90	89	88	88	910
District non-residential	172	174	175	176	178	179	180	181	182	183	1,780
Towns	172	172	171	171	170	170	169	169	169	168	1,702
	439	439	439	439	439	439	439	439	439	439	4,391
With moratorium for purposes of calculating tap fee revenues											
New taps, adjusted for moratorium and future constraints		120	120	200	200	200	200	200	200	200	
New taps District, residential		26	25	42	42	41	41	41	40	40	
New taps District, non-residential		47	48	80	81	81	82	82	83	83	
Proportion of non-res taps paying a PI fee		*10%*	*20%*	*30%*	*40%*	*50%*	*60%*	*70%*	*80%*	*100%*	
New taps, Towns		47	47	78	78	77	77	77	77	77	
		120	*120*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	

Table 10
Plant Investment Fee Calculations

PI fee based on 2020-2031 new taps and growth, District and Towns calculated separately		
Portion of growth costs all customers, District and Town, share equally:		
Adjusted growth-related expenditures (Table 8)	$ 66,351,043	new taps district and town
Total new taps (Table 9)	4,391	
Calculated PI	*$ 15,110*	
Portion of growth costs only District customers benefit from:		
Growth-related expenditures (Table 8)	$ 13,790,000	New taps just for District
Total new taps (Table 9)	2,690	
Incremental addition to PI for District customers only	$ 5,127	*Additional fee for District customers*
Calculated PI fee for Towns	*$ 15,110*	
Calculated PI fee for District customers	*$ 20,237*	
PI fee based on 2020-2031 new taps and growth, all taps are treated equally		
Total new taps	$ 80,141,043	new taps district and town
Calculated PI fee	4,391	
PI fee if all customers are treated equally	*$ 18,250*	

User Charge Revenue Requirements

User charge revenue requirements determine how much revenue is required from user charges, or rates, after all other revenue sources and expenditures are considered. Specifically, it's what is left over after non-rate sources of revenue are subtracted from all operation, maintenance, and capital expenditures. It should be noted that capital-related revenue sources, including PI fees, Water Allocation fees, Distance fees, and bond proceeds are considered in the capital reserve account and not explicitly included in the revenue requirements.

Components of user charge revenue requirements are shown in Table 11, which includes historical values for 2020 and 2021, and estimated values for 2022 through 2030. Expenditures include:

- Operation and Maintenance (O&M) expenditures for years 2022 and beyond are based on estimated 2022 expenditures escalated over time at 3.0 percent.
- Administrative Expenses for years 2022 and beyond are also based on estimated 2022 expenditures escalated over time at 3.0 percent.
- Capital expenditures allocated to the existing system show the proportion of current and future capital expenditures expected to be reimbursed by current customers. The remainder of capital expenditures are intended to provide service for future customers and are reimbursed through PI and Distance fees. These expenditures were estimated by Providence Infrastructure in 2022 dollars. Their future values are escalated at a 3 percent rate of inflation. It should also be noted there are substantial capital expenditures for water supply within this category, intended to shore-up supplies and drought reserves for existing customers. Capital expenditures also include transfers to the Capital Reserve fund, in the event the latter fund's balance drops below zero.
- Debt service on existing debt is assumed to be recovered from rates.
- Debt service on new debt is also assumed to be recovered through rates on the basis that revenue bond covenants may effectively require it. To the degree that this new debt finances new facilities for new customers, some reimbursement to ratepayers from the capital account should be considered in the future.
- As previously indicated, there is $6 million per year allocated for future water purchases that will be paid for by ratepayers.

Non-rate revenues and non-operating revenues offsetting these expenditures include:

- PI and Water Allocation surcharges. These revenues were initially placed in the Capital Reserve fund but since their intended purpose is to help finance current water acquisitions and plant modifications to benefit existing customers, these revenues are instead used to offset current water charges. Future surcharge revenues are based on the revised Water Allocation surcharge rate of $6.00 per 1,000 gallons and the PI surcharge is assumed to remain at $3.95 per 1,000 gallons, both times usage in excess of customers' allocations. The surcharge rate is set by the Board of Directors and can be changed at their discretion.
- Future values of billing adjustments (+ and -), meter usage, meter rental, rental repair, and non-potable water reimbursements are based on escalating current values at a 3 percent annual inflation rate.

Table 11
User Charge Revenue Requirements

		2022	2023	2024	2025	2026	2027	2028	2029	2030
Assumed inflation for O&M expenditures	3.00%									
Operations and Maintenance			Baseline year							
4000 Operating Expenses										
4100 Water (Treatment)		$ 3,926,692	$ 4,044,492	$ 4,165,827	$ 4,290,802	$ 4,419,526	$ 4,552,112	$ 4,688,675	$ 4,829,335	$ 4,974,216
4200 Personnel Operations		$ 1,297,768	$ 1,336,701	$ 1,376,802	$ 1,418,106	$ 1,460,649	$ 1,504,469	$ 1,549,603	$ 1,596,091	$ 1,643,974
4400 Operation & Maintenance		$ 703,921	$ 725,038	$ 746,789	$ 769,193	$ 792,269	$ 816,037	$ 840,518	$ 865,733	$ 891,705
4500 Engineering		$ 60,117	$ 61,920	$ 63,778	$ 65,691	$ 67,662	$ 69,692	$ 71,783	$ 73,936	$ 76,154
4600 Electricity		$ 180,898	$ 186,325	$ 191,915	$ 197,672	$ 203,602	$ 209,710	$ 216,002	$ 222,482	$ 229,156
4700 Communication		$ 2,186	$ 2,251	$ 2,319	$ 2,388	$ 2,460	$ 2,534	$ 2,610	$ 2,688	$ 2,769
4800 Insurance		$ 83,268	$ 85,766	$ 88,339	$ 90,990	$ 93,719	$ 96,531	$ 99,427	$ 102,409	$ 105,482
4900 Miscellaneous		$ 3,750	$ 3,863	$ 3,979	$ 4,098	$ 4,221	$ 4,348	$ 4,478	$ 4,612	$ 4,751
Transfer to Operating Reserve Fund		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses		$ 6,258,599	$ 6,446,357	$ 6,639,748	$ 6,838,940	$ 7,044,109	$ 7,255,432	$ 7,473,095	$ 7,697,288	$ 7,928,206
5000 Administrative Expense										
5100 Salaries		$ 833,488	$ 858,493	$ 884,248	$ 910,775	$ 938,098	$ 966,241	$ 995,229	$ 1,025,086	$ 1,055,838
5200 Payroll Taxes		$ 108,758	$ 112,020	$ 115,381	$ 118,842	$ 122,408	$ 126,080	$ 129,862	$ 133,758	$ 137,771
5300 Health Insurance		$ 49,843	$ 51,338	$ 52,878	$ 54,464	$ 56,098	$ 57,781	$ 59,515	$ 61,300	$ 63,139
5400 Office Utilities		$ 362,891	$ 373,777	$ 384,991	$ 396,540	$ 408,437	$ 420,690	$ 433,310	$ 446,310	$ 459,699
5500 Office Expense		$ 198,496	$ 204,451	$ 210,585	$ 216,902	$ 223,410	$ 230,112	$ 237,015	$ 244,126	$ 251,449
5600 Professional Fees		$ 203,291	$ 209,390	$ 215,672	$ 222,142	$ 228,806	$ 235,670	$ 242,740	$ 250,022	$ 257,523
5900 Miscellaneous		$ 7,651	$ 7,880	$ 8,117	$ 8,360	$ 8,611	$ 8,869	$ 9,136	$ 9,410	$ 9,692
Total Administrative Expenses		$ 1,764,418	$ 1,817,350	$ 1,871,871	$ 1,928,027	$ 1,985,868	$ 2,045,444	$ 2,106,807	$ 2,170,011	$ 2,235,112
Total Operating and Administration Expense		$ 8,023,017	$ 8,263,708	$ 8,511,619	$ 8,766,967	$ 9,029,976	$ 9,300,876	$ 9,579,902	$ 9,867,299	$ 10,163,318
Capital Expenditures, allocated to existing system										
Pleasant Valley Pipeline		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tanks (exc. Zone 1c, inc. in debt service)		$ -	$ -	$ -	$ -	$ 2,149,294	$ -	$ 646,053	$ 2,348,592	$ 2,419,049
Pipelines		$ 648,900	$ 3,819	$ 4,012	$ 1,017,173	$ 4,429	$ 4,653	$ 1,111,775	$ 1,145,229	$ 1,179,691
Pump Stations		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,017,723	$ -
SCWTP Expansion		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Existing debt service, 2012R		$ 1,530,000	$ 1,590,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt service, 2009 A		$ 477,288	$ 473,288	$ 474,175	$ 474,838	$ 470,275	$ 475,600	$ 475,588	$ 470,350	$ 470,350
Existing debt service Soldier Canyon bond		$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000	$ 1,231,000
New debt service (all allocated to existing customers)		$ 1,071,350	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701
Transfer to Capital Reserve		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Rights, to close existing supply gap		$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
Total capital expenditures allocated to existing system		$ 10,958,538	$ 11,440,808	$ 9,851,888	$ 10,865,712	$ 11,997,699	$ 9,853,953	$ 11,607,116	$ 14,355,594	$ 13,442,792
Total O&M and capital costs		$ 18,981,555	$ 19,704,515	$ 18,363,507	$ 19,632,679	$ 21,027,675	$ 19,154,829	$ 21,187,018	$ 24,222,893	$ 23,606,110
Less non-rate revenues										
Tax levy			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Allocation Surcharge, accrues to Capital Reserve		$2,580,000	$2,322,000	$2,064,000	$1,806,000	$1,548,000	$1,290,000	$1,032,000	$774,000	$516,000
Plant Investment Surcharge, accrues to Capital Reserve		$1,137,559	$1,023,803	$910,047	$796,291	$682,535	$568,779	$455,024	$341,268	$227,512
Transfer from Capital fund		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Adjustments		$ (56,216)	$ (57,903)	$ (47,531)	$ (46,748)	$ (45,500)	$ (50,780)	$ (49,692)	$ (48,050)	$ (48,154)
Construction Meter Usage		$ 207,679	$ 213,909	$ 220,327	$ 226,936	$ 233,744	$ 240,757	$ 247,979	$ 255,419	$ 263,081
Construction Meter Rental		$ 5,465	$ 5,629	$ 5,798	$ 5,972	$ 6,151	$ 6,336	$ 6,526	$ 6,721	$ 6,923
Construction Meter Repair		$ 547	$ 563	$ 580	$ 598	$ 616	$ 634	$ 653	$ 673	$ 693
Non-Potable Reimbursement		$ (42)	$ (43)	$ (41)	$ (41)	$ (42)	$ (42)	$ (42)	$ (41)	$ (42)
Subtotal, Non-Rate Operating Income		$ 3,874,992	$ 3,507,959	$ 3,153,180	$ 2,789,008	$ 2,425,505	$ 2,055,685	$ 1,692,448	$ 1,329,989	$ 966,014
Less Non-operating income										
Interest (Colorado Trust)		$ 174,604	$ 179,842	$ 161,840	$ 162,250	$ 161,784	$ 168,064	$ 166,756	$ 164,139	$ 164,599
Port Partonage Agfinity		$ 482	$ 496	$ 534	$ 552	$ 572	$ 527	$ 536	$ 544	$ 547
Other misc income (Ag rental, farm income, misc)		$ -	$ -	$ 22,400	$ 26,880	$ 32,256	$ 16,307	$ 19,569	$ 23,482	$ 23,699
Subtotal, non-operating income		$ 175,086	$ 180,339	$ 184,774	$ 189,683	$ 194,612	$ 184,899	$ 186,861	$ 188,166	$ 188,844
Total Non-Rate Revenues		$ 4,050,078	$ 3,688,298	$ 3,337,954	$ 2,978,691	$ 2,620,117	$ 2,240,583	$ 1,879,309	$ 1,518,155	$ 1,154,858
Revenue Requirements from Rates		$ 14,931,477	$ 16,016,218	$ 15,025,553	$ 16,653,989	$ 18,407,558	$ 16,914,246	$ 19,307,709	$ 22,704,739	$ 22,451,252

- Non-operating income includes interest, leases, farm income, and other minor sources. These sources are assumed to increase with inflation.

The bottom line of Table 11 summarizes estimated user charge revenue requirements.

Capital Reserve Fund

The Capital Reserve fund is not a fund, per se, but an accounting tool to track capital revenues and capital expenditures. A major benefit of its use is demonstration that growth-related fees such as PI fees, Water Allocation fees, and Distance fees are indeed being used for new capital assets and not being comingled with user charge revenues and O&M expenditures. However, since growth revenues are volatile and capital expenditures can vary significantly from year to year, funds can be transferred back and forth between the Capital Reserve fund and the Operating fund as needed.

The Capital Reserve fund is shown through year 2030 in Table 12. The top portion of the table summarizes the rate of inflation, or cost escalation, used for some of the cost and revenue components. Also summarized are the underlying PI fees used to calculate PI revenues.

Sources of Capital Reserve funds include:

- Beginning year balance, or previous year's carryover. The initial assumption is that the District has $10 million in current capital reserves.
- Transfers in from the Operating Fund. This amount is equal to the Capital Expenditure component of revenue requirements and show how much the ratepayers are contributing to capital assets.
- Plant investment fees from new District customers and new Town customers, based on the PI fees shown at the top of the table.
- Distance fees, based on the current fee of $300 per mile for a full tap and a minimum distance of 5 miles, multiplied by new taps. It is assumed to increase over time with inflation. This fee is subject to change by the Board of Directors.
- Water Allocation fees. Current policy is that new customers will "bring their own water", with the District financing very little water for new growth. However, it may be possible that individual parcels outside of major developments may be allowed to pay a water allocation fee rather than supply water. These revenues are assumed to increase with inflation over time.
- Bond proceeds. The District is anticipating issuing approximately $28 million in bonded indebtedness to fund NEWT3 and Tanks 1c. Debt service associated with the bond(s) is assumed to be over 20 years at 4 percent interest, with 4 percent of proceeds used for bond closing. The payment schedule is shown in Appendix Table B-1.
- Interest earnings. Positive balances in the capital reserve fund earn interest, although the rate of return is limited by arbitrage regulation.

Uses of Capital Reserve funds include:

- Capital improvements, as developed in the "constrained CIP". These are total capital costs, including those intended to upgrade the existing system and those used to grow the system. As previously stated, a 3 percent rate of inflation is applied to these 2021-based cost estimates.
- Potential transfers to the Operating Fund is there is surplus in the Capital fund.

Table 12
Capital Reserve Account Activity

Assumptions									
Inflation	3.00%								
Plant investment fee District	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650
Plant investment fee, Towns	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650	$ 17,650
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Sources of funds									
Beginning year balance	$ 10,000,000	$ 17,185,968	$ 18,429,328	$ 15,157,991	$ 10,440,557	$ 10,129,239	$ (521,064)	$ (6,113,783)	$ (4,657,545)
Transfer in from Operating Fund	$ 10,958,538	$ 11,440,808	$ 9,851,888	$ 10,865,712	$ 11,997,699	$ 9,853,953	$ 11,607,116	$ 14,355,594	$ 13,442,792
Plant investment fees, District	$ 535,873	$ 616,645	$ 1,164,866	$ 1,304,302	$ 1,445,876	$ 1,589,441	$ 1,734,843	$ 1,881,950	$ 2,177,897
Plant investment fees, Towns	$ 828,866	$ 826,253	$ 1,372,965	$ 1,369,056	$ 1,365,329	$ 1,361,779	$ 1,358,401	$ 1,355,181	$ 1,352,103
Water Allocation Surcharge, credited to Revenue Requirements									
Plant Investment Surcharge, credited to Revenue Requirements									
Distance fee	$ 38,429	$ 38,063	$ 62,860	$ 62,312	$ 61,792	$ 61,298	$ 60,828	$ 60,380	$ 59,954
Water allocation fees	$ 600,000	$ 618,000	$ 636,540	$ 655,636	$ 675,305	$ 695,564	$ 716,431	$ 737,924	$ 760,062
Water allocation surcharges (inc. in Revenue Requirements)									
Bond proceeds	$ 14,000,000	$ 14,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest earning									
Subtotal sources	$ 36,961,706	$ 44,725,736	$ 31,518,447	$ 29,415,009	$ 25,986,558	$ 23,691,276	$ 14,956,555	$ 12,277,247	$ 13,135,262
Uses of funds									
Transfer to operating fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capital improvements	$ 9,466,100	$ 14,859,419	$ 6,512,580	$ 9,125,913	$ 6,013,343	$ 14,363,039	$ 11,221,049	$ 7,090,741	$ 14,675,655
Water purchases	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
Debt service, existing debt	$ 3,238,288	$ 3,294,288	$ 1,705,175	$ 1,705,838	$ 1,701,275	$ 1,706,600	$ 1,706,588	$ 1,701,350	$ 1,701,350
Debt service, new issues	$ 1,071,350	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701
Subtotal uses	$ 19,775,738	$ 26,296,408	$ 16,360,456	$ 18,974,451	$ 15,857,319	$ 24,212,340	$ 21,070,338	$ 16,934,792	$ 24,519,706
Net position									
Sources - Uses	$ 17,185,968	$ 18,429,328	$ 15,157,991	$ 10,440,557	$ 10,129,239	$ (521,064)	$ (6,113,783)	$ (4,657,545)	$ (11,384,443)
Additional transfer in from Operating fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
End of year balance	$ 17,185,968	$ 18,429,328	$ 15,157,991	$ 10,440,557	$ 10,129,239	$ (521,064)	$ (6,113,783)	$ (4,657,545)	$ (11,384,443)

- Water purchases. These are District purchases to provide greater system reliability for current customers, currently assumed to be $6,000,000 per year through 2030.
- Debt service on existing debt and new issues.

The fund's net position is the difference between sources and uses. If the fund runs below zero, it is assumed that the Operating fund will cover this shortage in the next year.

Under currently assumed conditions, it is of interest to note that the Capital Reserve Fund will drop below zero in approximately 2027, unless revenue is increased or expenditures decreased.

Allocation of User Charge Revenue Requirements to Customer Classes

The base-extra capacity is used here to equitably allocate user charge revenue requirements across customer classes. This is a widely used industry standard approach endorsed and supported by the American Water Works Association (AWWA), and more fully described in their M1 Manual of Practice.[2]

The benefit of this method is recognition that different customer classes have difference demand characteristics, and place differing loads on the system. From the District's perspective, a comparison of residential customers and commercial customers illustrates this point. Residential customers have high seasonal peaking demands and, on a per unit basis, require more treatment, transmission, and storage capacity than commercial customers, whose demand is relatively constant over the year. As a result, the District's residential customers would be expected to pay relatively more per 1,000 gallons than commercial customers. Determining how much more is the purpose of the base-extra capacity cost allocation method.

The cost allocation is developed in steps:

1. Allocation to function. User charge revenue requirements are divided into the logical activities, or functions, the utility provides, such as source of supply, treatment, transmission, and others.
2. Allocation of functional costs across base and extra capacity components.
3. Allocation of base and extra capacity components to customer classes.

Since the District provides wholesale treated water service to the Towns, steps 2 and 3 are each two-part in nature. For purposes of this analysis, there are both joint costs and specific costs that require steps 2 and 3.

- Joint costs are those that are shared on an equal basis between the towns and the District customers, including water treatment, transmission, storage, and administration.
- Specific costs are those that are borne exclusively by the District for the benefit of their own customers. These would include source of supply (raw water), storage, and distribution costs.

Allocation to District Functions

Annual estimates of revenue requirements were allocated across the six basic functions the District performs for its customers: supply, treatment, transmission, storage, distribution, and administration. Specifically, each cost was allocated either in part or in full to one of the functions using information from the District, standard rate setting assumptions, and/or best professional judgement. As an

[2] American Water Works Association. "Water Rates, Fees, and Charges" M1 Manual, 7th Edition. .

example, pipeline costs were allocated partially to transmission and partially to distribution, while water rights costs were allocated fully to supply. Appendix A, Table A-1, Table A-2, and A-3 show the detailed allocations, as a percentage and by expenditure, for total revenue requirements, joint revenue requirements, and specific revenue requirements.

The total cost of each District's function was determined by summing the individual costs allocated to each function. The total operating and maintenance (O&M) and capital costs are shown in Table 13, along with revenues. Net required income to the District was determined for each function by subtracting the revenues from the O&M and capital costs necessary to perform each function.

Table 13: Allocation of User Charge Revenue Requirements across district functions for year 2023.

	Source of Supply	Treatment	Transmission	Storage	Distribution	Administrative
O&M Expenditures						
Capital Expenditures						
Revenues						
User charge revenue requirement						

Allocations of Functional Costs to Base-Extra Capacity

The functional costs were allocated across three cost components: base, max day and max hour. As was the case when allocating costs to District functions, each functional required revenue was allocated in full or in part to one of the three components using information from the District and/or standard rate setting assumptions and best professional judgment. For example, transmission costs were allocated partially to the base capacity and partially to the max day capacity components, while source of supply costs were allocated fully to the base capacity component. Table 14 and Table 15 show allocations, as dollar amounts, by function and cost component. The total cost for the base, max day and max hour components were determined by summing the individual components from each function.

Table 14: Joint functional costs allocated to base-extra capacity parameters, year 2022.

	Capacity Costs for Select Year						
	Supply	Treatment	Transmission	Storage	Distribution	Administration	Total
Base	$ -	$ 3,792,486	$ 1,834,968	$ 153,530	$ -	$ 1,694,627	$ 7,475,612
Max Day	$ -	$ 2,042,108	$ 988,060	$ 307,061	$ -	$ -	$ 3,337,228
Max Hour	$ -	$ -	$ -	$ 307,061	$ -	$ -	$ 307,061
Fire Flow	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ 5,834,594	$ 2,823,028	$ 767,652	$ -	$ 1,694,627	$ 11,119,901

Table 15: Specific functional costs allocated to base-extra capacity parameters, year 2022.

	Supply	Treatment	Transmission	Storage	Distribution	Administration	Total
Base	$ 468,640	$ -	$ -	$ -	$ 98,551	$ -	$ 567,191
Max Day	$ -	$ -	$ -	$ -	$ 95,652	$ -	$ 95,652
Max Hour	$ -	$ -	$ -	$ -	$ 95,652	$ -	$ 95,652
Fire Flow	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ 468,640	$ -	$ -	$ -	$ 289,855	$ -	$ 758,495

Allocation of Base-Extra Capacity Cost to Customer Class

Customer class usage and peaking factors are used to allocate costs to customer class. Tables 16 and 17 summarize the procedure for joint and specific costs, respectively. Using joint costs as an example, Table 16 shows allocated costs across the top.

- Annual usage, expressed in terms of 1,000 gals per year and in terms of average daily demand (ADD) are shown vertically. The proportions of ADD attributable to each customer class is calculated.
- Max day proportions, or allocations, are calculated as the difference between max day demand and average day demand for each customer class.
- Max hour allocations are calculated as the difference between max hour demand and max day demand for each customer class.

Allocated Costs

Table 18 and Table 19 show the user charge revenue requirements allocated to customer class, for joint and specific costs, respectively. The final column of each table shows the allocated cost per 1,000 gallons for each customer class.

Cost-of-Service User Charge Calculations

User charges per customer class are the sum of the joint and specific costs for each, divided by their usage per 1,000 gallons. Table 20 summarizes calculated user charges for each customer class.

It is important to note that this user charge estimate is specific to estimated costs and non-rate revenues estimated for year 2023, and assumptions made about future growth fees, surcharges, and peaking factors. However, the relative differences in calculated user charges would not be expected to change if different or additional years were considered. The absolute values of the estimates will change with different assumptions but unless the peaking factors are changed, the relative differences between classes will not.

In addition, it has been verified that these calculated user charges will generate near exact sufficient revenue to cover all revenue requirements for the year 2023. Considering that many O&M and capital costs increase over time with inflation, it is unlikely that these charges will generate sufficient revenue to cover all costs through 2030. As a result, recommended user charges should either be sufficient to cover all costs through the planning period or some sort of inflation index should be used to periodically adjust them.

Fees and User Charge Scenario

The District's Board of Directors must ultimately agree on a combination of fees and charges for a range of variables, including:

1. Future user charges, or rates, by customer class
2. Future PI fees, District-wide and for the Towns
3. Distance fees
4. PI and Water Allocation surcharge levels

Table 16
Allocation of Base-Extra Capacity Costs to Customer Class, Joint Costs

			Base		Max Day		Max Hour	
			$ 8,211,953		$ 3,680,025		$ 233,583	
	Annual usage (acre-feet)	Annual usage (1,000 gal)	Average daily demand (ADD), (1,000 gal)	Proportion	Max day (1,000 gal)	Proportion	Max hour	Proportion
Commercial-Industrial	3,763.12	1,226,400	3,357.70	34.47%	1,007.31	11.12%	1,510.97	32.10%
Non-municipal Flow Control	472.23	153,900	421.36	4.33%	126.41	1.40%	189.61	4.03%
Conservation Blue	365.04	118,968	325.72	3.34%	521.15	5.75%	456.00	9.69%
Residence	40.22	13,106	35.88	0.37%	57.41	0.63%	50.24	1.07%
Standard-1/2	170.28	55,496	151.94	1.56%	243.10	2.68%	212.72	4.52%
Standard-3/4	10.33	3,368	9.22	0.09%	14.75	0.16%	12.91	0.27%
Standard-Full	1,743.76	568,293	1,555.90	15.97%	2,489.44	27.49%	2,178.26	46.28%
Towns							-	
Town of Windsor	1,949.98	635,500	1,739.90	17.86%	1,739.90	19.21%	-	0.00%
Town of Eaton	939.86	306,300	838.60	8.61%	1,174.05	12.96%	-	0.00%
Town of Severance	692.85	225,800	618.21	6.35%	741.85	8.19%	-	0.00%
Town of Ault	326.48	106,400	291.31	2.99%	436.96	4.82%	-	0.00%
Town of Pierce	165.08	53,800	147.30	1.51%	147.30	1.63%	-	0.00%
N. Colo Water Assoc #A-2110	138.69	45,200	123.75	1.27%	173.25	1.91%	-	0.00%
Town of Nunn	59.22	19,300	52.84	0.54%	73.98	0.82%	-	0.00%
Landscape	76.71	25,000	68.45	0.70%	109.51	1.21%	95.82	2.04%
Billable		320			-	0.00%	-	0.00%
Fire Protection	1.81	590	1.62	0.02%	0.89	0.01%	0.44	0.01%
Non-Potable		-	-	0.00%	-	0.00%	-	0.00%
Unset meters		-	-	0.00%	-	0.00%	-	0.00%
	10,915.68	3,557,741	9,739.69	99.99%	9,057.26	100.00%	4,706.96	100.00%

Table 18

User Charge Revenue Requirements Allocated to Customer Class, Joint Costs

			Allocated cost					
			Base	Max Day	Max Hour	Fire Flow	Customer	
			$ 8,211,953	$ 3,680,025	$ 233,583	$ -	$ -	$ 12,125,561
	Annual usage (acre-feet)	Annual usage (1,000 gal)	Average daily demand (ADD), (1,000 gal)	Max day	Max hour	Fire flow	Customer	Total	Volume charge
Commercial-Industrial	3,763.12	1,226,400	$ 2,830,767.95	$ 409,276.75	$ 74,981.69	$ -	$ -	$ 3,315,026	$ 2.70
Non-municipal Flow Control	472.23	153,900	$ 355,230.91	$ 51,359.83	$ 9,409.39	$ -	$ -	$ 416,000	$ 2.70
Conservation Blue	365.04	118,968	$ 274,601.05	$ 211,745.27	$ 22,629.17	$ -	$ -	$ 508,975	$ 4.28
Residence	40.22	13,106	$ 30,252.12	$ 23,327.45	$ 2,493.00	$ -	$ -	$ 56,073	$ 4.28
Standard-1/2	170.28	55,496	$ 128,095.10	$ 98,774.32	$ 10,555.99	$ -	$ -	$ 237,425	$ 4.28
Standard-3/4	10.33	3,368	$ 7,773.97	$ 5,994.52	$ 640.63	$ -	$ -	$ 14,409	$ 4.28
Standard-Full	1,743.76	568,293	$ 1,311,729.41	$ 1,011,476.47	$ 108,096.27	$ -	$ -	$ 2,431,302	$ 4.28
Landscape	76.71	25,000	$ 57,704.83	$ 44,496.28	$ 4,755.31	$ -	$ -	$ 106,956	$ 4.28
Billable	0.98	320	$ -	$ -	$ -	$ -	$ -	$ -	
Fire Protection	1.81	590	$ 1,361.83	$ 360.98	$ 21.64	$ -	$ -	$ 1,744	$ 2.96
Non-Potable	-		$ -	$ -	$ -	$ -	$ -	$ -	
Unset meters	-		-	-	-	-	-	$ -	
	6,644.50	2,165,441	$ 4,997,517.16	$ 1,856,811.86	$ 233,583.10	$ -	$ -	$ 7,087,912	$ 3.27
Towns									
Town of Windsor	1,949.98	635,500	$ 1,466,856.68	$ 706,934.59	$ -	$ -	$ -	$ 2,173,791	$ 3.42
Town of Eaton	939.86	306,300	$ 706,999.53	$ 477,022.33	$ -	$ -	$ -	$ 1,184,022	$ 3.87
Town of Severance	692.85	225,800	$ 521,189.99	$ 301,417.77	$ -	$ -	$ -	$ 822,608	$ 3.64
Town of Ault	326.48	106,400	$ 245,591.74	$ 177,540.14	$ -	$ -	$ -	$ 423,132	$ 3.98
Town of Pierce	165.08	53,800	$ 124,180.79	$ 59,847.49	$ -	$ -	$ -	$ 184,028	$ 3.42
N. Colo Water Assoc #A-2110	138.69	45,200	$ 104,330.33	$ 70,393.11	$ -	$ -	$ -	$ 174,723	$ 3.87
Town of Nunn	59.22	19,300	$ 44,548.13	$ 30,057.23	$ -	$ -	$ -	$ 74,605	$ 3.87
	4,272.17	1,392,300	$ 3,213,697.18	$ 1,823,212.67	$ -	$ -	$ -	$ 5,036,910	$ 3.62

Table 17
Allocation of Base-Extra Capacity Costs to Customer Class, Specific Costs

			Base		Max Day		Max Hour	
			$ 567,191		$ 95,652		$ 95,652	
	Annual usage (acre-feet)	Annual usage (1,000 gal)	Average daily demand (ADD), (1,000 gal)	Proportion	Max day	Proportion	Max hour	Proportion
Commercial-Industrial	3,763.12	1,226,400	3,357.70	56.64%	1,007.31	22.04%	1,510.97	32.10%
Non-municipal Flow Control	472.23	153,900	421.36	7.11%	126.41	2.77%	189.61	4.03%
Conservation Blue	365.04	118,968	325.72	5.49%	521.15	11.40%	456.00	9.69%
Residence	40.22	13,106	35.88	0.61%	57.41	1.26%	50.24	1.07%
Standard-1/2	170.28	55,496	151.94	2.56%	243.10	5.32%	212.72	4.52%
Standard-3/4	10.33	3,368	9.22	0.16%	14.75	0.32%	12.91	0.27%
Standard-Full	1,743.76	568,293	1,555.90	26.24%	2,489.44	54.47%	2,178.26	46.28%
Towns							-	
Town of Windsor			-	0.00%	-	0.00%	-	0.00%
Town of Eaton			-	0.00%	-	0.00%	-	0.00%
Town of Severance			-	0.00%	-	0.00%	-	0.00%
Town of Ault			-	0.00%	-	0.00%	-	0.00%
Town of Pierce			-	0.00%	-	0.00%	-	0.00%
N. Colo Water Assoc #A-2110			-	0.00%	-	0.00%	-	0.00%
Town of Nunn			-	0.00%	-	0.00%	-	0.00%
Landscape	76.71	25,000	68.45	1.15%	109.51	2.40%	95.82	2.04%
Billable		320			-	0.00%	-	0.00%
Fire Protection	1.81	590	1.62	0.03%	0.89	0.02%	0.44	0.01%
Non-Potable		-	-	0.00%	-	0.00%	-	0.00%
Unset meters		-	-	0.00%	-	0.00%	-	0.00%
	6,643.51	2,165,441	5,927.78	99.99%	4,569.98	100.00%	4,706.96	100.00%

Table 19
User Charge Revenue Requirements Allocated to Customer Class, Specific Costs

			Base	Max Day	Max Hour	Fire Flow	Customer		
			$ 3,699,353	$ 95,652	$ 95,652	$ -	$ -	$ 3,890,657	
	Annual usage (acre-feet)	Annual usage (1,000 gal)	Average daily demand (ADD), (1,000 gal)	Max day	Max hour	Fire flow	Customer	Total	*Volume charge*
Commercial-Industrial	3,763.12	1,226,400	$ 2,095,133	$ 21,084	$ 30,705	$ -	$ -	$ 2,146,921	$ *1.75*
Non-municipal Flow Control	472.23	153,900	$ 262,917	$ 2,646	$ 3,853	$ -	$ -	$ 269,416	$ *1.75*
Conservation Blue	365.04	118,968	$ 203,240	$ 10,908	$ 9,267	$ -	$ -	$ 223,415	$ *1.88*
Residence	40.22	13,106	$ 22,390	$ 1,202	$ 1,021	$ -	$ -	$ 24,613	$ *1.88*
Standard-1/2	170.28	55,496	$ 94,807	$ 5,088	$ 4,323	$ -	$ -	$ 104,218	$ *1.88*
Standard-3/4	10.33	3,368	$ 5,754	$ 309	$ 262	$ -	$ -	$ 6,325	$ *1.88*
Standard-Full	1,743.76	568,293	$ 970,849	$ 52,105	$ 44,265	$ -	$ -	$ 1,067,219	$ *1.88*
Landscape	76.71	25,000	$ 42,709	$ 2,292	$ 1,947	$ -	$ -	$ 46,948	$ *1.88*
Billable	0.98	320	$ -	$ -	$ -	$ -	$ -	$ -	
Fire Protection	1.81	590	$ 1,008	$ 19	$ 9	$ -	$ -	$ 1,035	$ *1.75*
Non-Potable	-	-	$ -	$ -	$ -	$ -	$ -	$ -	
Unset meters	-	-	$ -	$ -	$ -	-	-	$ -	
	6,644.50	2,165,441	$ 3,698,806	$ 95,652	$ 95,652	$ -	$ -	$ 3,890,111	$ *1.80*
Towns									
Town of Windsor	1,949.98	635,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Town of Eaton	939.86	306,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Town of Severance	692.85	225,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Town of Ault	326.48	106,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Town of Pierce	165.08	53,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N. Colo Water Assoc #A-2110	138.69	45,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Town of Nunn	59.22	19,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	4,272.17	1,392,300	$ -	$ -	$ -	$ -	$ -	$ -	

Table 20
Calculated User Charge by Customer Class, Year 2023

		Calculated rate for 2023, $/1,000 gal
Commercial-Industrial		$ 4.45
Non-municipal Flow Control		$ 4.45
Conservation Blue		$ 6.16
Residence		$ 6.16
Standard-1/2		$ 6.16
Standard-3/4		$ 6.16
Standard-Full		$ 6.16
Towns		
	Town of Windsor	$ 3.42
	Town of Eaton	$ 3.87
	Town of Severance	$ 3.64
	Town of Ault	$ 3.98
	Town of Pierce	$ 3.42
	N. Colo Water Assoc #A-2110	$ 3.87
	Town of Nunn	$ 3.87
	Simple average	$ 3.72
Landscape		
Billable		
Fire Protection		
Non-Potable		
Unset meters		

This analysis was primarily tasked to focus upon future user charges based on base-extra capacity cost of service principles, but user charges are influenced by these other revenue sources. A very preliminary baseline recommendation of user charges is developed to facilitate Board Discussion. However, it is anticipated that the Board and other stakeholders may want to consider a range of issues and alternative combinations of rates and fees, likely resulting in several scenarios to decide upon.

Table 21 shows recommended fees and rates in **blue bold** for the years 2022 through 2030.

Cash Flow Analysis

Table 22 shows a cash flow analysis resulting from the sample scenario.

Conclusions and Recommendations

To be developed after District review and review by Board of Directors

Conclusions

The North Weld District's three major customer categories, residential, commercial/industrial, and wholesale service to towns, are rapidly growing and have changed the nature of the District from a rural water provider to more wide-ranging urban-industrial-wholesale provider. In response to the major capital improvement program these changes have triggered, the District is transitioning to a more explicit cost-of-service approach for setting water rates and charges. These rates and charges include Plant Investment (PI) fees and user charges based on the base-extra capacity method of cost allocation.

This cost allocation method is an industry-standard method and results in equitable rates across customer classes considering the demands placed on the system by each class. This report represents the initial effort in this transition and implementation to base-extra capacity water rates.

This analysis also calculated cost-based PI fees using the most recent CIP and demand estimates. PI fees were calculated for the towns and District customers separately using the principle of "used and useful" assets for each. As an alternative, the analysis also calculated a District-wide PI fee if the Board does not opt to treat the towns separately with respect to these fees.

Major findings include:

- The base-extra cost allocation provides support for charging residential customers significantly more than commercial/industrial customers because of the formers' high peaking factors. Conversely, commercial and industrial usage, primarily dairies, is characterized by steady daily demand over the year with very few peaks. As a result, less conveyance and delivery capacity, is needed. Calculated charges for towns lie between the District's residential customers and commercial/industrial customers because their peaking characteristics lie between these two extremes and because they provide their own water supply and local distribution systems.

- Rates and charges suggested by this analysis are comparable to those of surrounding water providers, especially those providers in high-growth areas of Weld and Larimer Counties (Table 23)

Table 21
Recommended Fee and Charge Levels

	2022	2023	2024	2025	2026	2027	2028	2029	2030
Water Allocation surcharge, $/1,000 over allocation	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00
Plant investment surcharge, $/1,000 over allocation	$ 3.95	$ 3.95	$ 3.95	$ 3.95	$ 3.95	$ 3.95	$ 3.95	$ 3.95	$ 3.95
Rate increase for commercial	0.00%	0.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Rate increase for residential	0.00%	0.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Rate increase for towns									
Rate changes apply to all town equally	0.00%	0.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%

	Calculated rate for 2023, $/1,000 gal	2022	2023	2024	2025	2026	2027	2028	2029	2030
Commercial-Industrial	$ 4.45	$ 4.15	$ 4.45	$ 4.63	$ 4.82	$ 5.01	$ 5.01	$ 5.01	$ 5.01	$ 5.01
Non-municipal Flow Control	$ 4.45	$ 4.15	$ 4.45	$ 4.63	$ 4.82	$ 5.01	$ 5.01	$ 5.01	$ 5.01	$ 5.01
Conservation Blue	$ 6.16	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Residence	$ 6.16	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Standard-1/2	$ 6.16	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Standard-3/4	$ 6.16	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Standard-Full	$ 6.16	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Towns										
Town of Windsor	$ 3.42	$ 2.78	$ 3.42	$ 3.56	$ 3.70	$ 3.85	$ 4.00	$ 4.16	$ 4.33	$ 4.50
Town of Eaton	$ 3.87	$ 2.78	$ 3.87	$ 4.02	$ 4.18	$ 4.35	$ 4.52	$ 4.70	$ 4.89	$ 5.09
Town of Severance	$ 3.64	$ 2.78	$ 3.64	$ 3.79	$ 3.94	$ 4.10	$ 4.26	$ 4.43	$ 4.61	$ 4.79
Town of Ault	$ 3.98	$ 2.78	$ 3.98	$ 4.14	$ 4.30	$ 4.47	$ 4.65	$ 4.84	$ 5.03	$ 5.23
Town of Pierce	$ 3.42	$ 2.78	$ 3.42	$ 3.56	$ 3.70	$ 3.85	$ 4.00	$ 4.16	$ 4.33	$ 4.50
N. Colo Water Assoc #A-2110	$ 3.87	$ 2.78	$ 3.87	$ 4.02	$ 4.18	$ 4.35	$ 4.52	$ 4.70	$ 4.89	$ 5.09
Town of Nunn	$ 3.87	$ 2.78	$ 3.87	$ 4.02	$ 4.18	$ 4.35	$ 4.52	$ 4.70	$ 4.89	$ 5.09
Landscape	$ 4.15	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Billable	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fire Protection	$ 4.15	$ 4.15	$ 6.16	$ 6.40	$ 6.66	$ 6.92	$ 7.20	$ 7.49	$ 7.79	$ 8.10
Non-Potable	$ 4.15	$ 4.15	$ 4.45	$ 4.63	$ 4.82	$ 5.01	$ 5.01	$ 5.01	$ 5.01	$ 5.01
Unset meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Commercial-Industrial	$ 5,461,948	$ 5,089,560	$ 5,642,766	$ 6,056,527	$ 6,494,361	$ 6,957,531	$ 7,160,926	$ 7,364,322	$ 7,567,717	$ 7,771,113
Non-municipal Flow Control	$ 685,416	$ 638,685	$ 725,053	$ 795,278	$ 869,961	$ 949,346	$ 993,933	$ 1,038,520	$ 1,083,106	$ 1,127,693
Conservation Blue	$ 732,390	$ 493,717	$ 732,390	$ 761,686	$ 792,153	$ 823,839	$ 856,793	$ 891,065	$ 926,707	$ 963,775
Residence	$ 80,686	$ 54,392	$ 80,686	$ 83,913	$ 87,270	$ 90,760	$ 94,391	$ 98,166	$ 102,093	$ 106,177
Standard-1/2	$ 341,643	$ 230,308	$ 412,994	$ 503,718	$ 601,039	$ 705,340	$ 817,023	$ 936,513	$ 1,064,254	$ 1,200,716
Standard-3/4	$ 20,734	$ 13,977	$ 21,497	$ 23,151	$ 24,902	$ 26,614	$ 28,571	$ 30,643	$ 32,834	$ 35,319
Standard-Full	$ 3,498,522	$ 2,358,415	$ 3,512,299	$ 3,667,120	$ 3,828,707	$ 3,997,354	$ 4,173,366	$ 4,357,064	$ 4,548,780	$ 4,748,862
Towns										
Town of Windsor	$ 2,173,791	$ 1,766,690	$ 2,237,414	$ 2,393,079	$ 2,557,617	$ 2,731,489	$ 2,915,179	$ 3,109,193	$ 3,314,065	$ 3,530,351
Town of Eaton	$ 1,184,022	$ 851,514	$ 1,206,442	$ 1,278,017	$ 1,353,387	$ 1,432,743	$ 1,516,281	$ 1,604,210	$ 1,696,747	$ 1,794,120
Town of Severance	$ 822,608	$ 627,724	$ 840,095	$ 891,885	$ 946,474	$ 1,004,003	$ 1,064,620	$ 1,128,480	$ 1,195,746	$ 1,266,587
Town of Ault	$ 423,132	$ 295,792	$ 429,892	$ 454,119	$ 479,596	$ 506,385	$ 534,549	$ 564,156	$ 595,277	$ 627,984
Town of Pierce	$ 184,028	$ 149,564	$ 190,185	$ 204,196	$ 219,023	$ 234,710	$ 251,302	$ 268,845	$ 287,389	$ 306,987
N. Colo Water Assoc #A-2110	$ 174,723	$ 125,656	$ 181,295	$ 195,381	$ 210,304	$ 226,108	$ 242,840	$ 260,549	$ 279,286	$ 299,105
Town of Nunn	$ 74,605	$ 53,654	$ 75,765	$ 80,002	$ 84,456	$ 88,965	$ 93,699	$ 98,670	$ 103,888	$ 109,367
Landscape	$ 103,750	$ 103,750	$ 166,217	$ 185,671	$ 206,415	$ 228,521	$ 252,066	$ 277,128	$ 303,793	$ 332,146
Billable	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fire Protection	$ 2,448.50	$ 2,448.50	$ 3,939.97	$ 4,417.69	$ 4,927.32	$ 5,484.51	$ 6,078.39	$ 6,711.00	$ 7,384.50	$ 8,101.13
Non-Potable										
Unset meters										
Total revenue generated	$ 15,954,446	$ 12,855,846	$ 16,458,931	$ 17,578,160	$ 18,760,593	$ 20,009,192	$ 21,001,617	$ 22,034,234	$ 23,109,066	$ 24,228,404
Deviation from revenue requirement	$ 1,032,969	$ (2,075,631)	$ 442,713	$ 2,552,607	$ 2,106,604	$ 1,601,634	$ 4,087,371	$ 2,726,525	$ 404,328	$ 1,777,152

Table 22
Cash Flow Analysis with Recommended Rates and Charges

	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sources									
Carryover from previous year	$ 10,000,000	$ 17,744,152	$ 21,987,270	$ 21,569,362	$ 19,261,410	$ 20,861,997	$ 14,638,481	$ 12,117,770	$ 14,303,422
User charge revenues	$ 12,855,846	$ 16,458,931	$ 17,578,160	$ 18,760,593	$ 20,009,192	$ 21,001,617	$ 22,034,234	$ 23,109,066	$ 24,228,404
Tax assessments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Plant investment fees	$ 535,873	$ 616,645	$ 1,164,866	$ 1,304,302	$ 1,445,876	$ 1,589,441	$ 1,734,843	$ 1,881,950	$ 2,177,897
Plant investment surcharges	$ 1,137,559	$ 1,023,803	$ 910,047	$ 796,291	$ 682,535	$ 568,779	$ 455,024	$ 341,268	$ 227,512
Distance fees	$ 38,429	$ 38,063	$ 62,860	$ 62,312	$ 61,792	$ 61,298	$ 60,828	$ 60,380	$ 59,954
Water allocation fees	$ 600,000	$ 618,000	$ 636,540	$ 655,636	$ 675,305	$ 695,564	$ 716,431	$ 737,924	$ 760,062
Water allocation surcharges	$ 2,580,000	$ 2,322,000	$ 2,064,000	$ 1,806,000	$ 1,548,000	$ 1,290,000	$ 1,032,000	$ 774,000	$ 516,000
Debt proceeds	$ 14,000,000	$ 14,000,000	$ -	$ -	$ -		$ -	$ -	$ -
All other sources	$ 556,913	$ 431,504	$ 332,519	$ 342,495	$ 363,907	$ 376,399	$ 389,582	$ 381,804	$ 392,285
Total sources	$ 42,304,619	$ 53,253,097	$ 44,736,262	$ 45,296,991	$ 44,048,017	$ 46,445,097	$ 41,061,422	$ 39,404,163	$ 42,665,536
Uses									
Operations and maintenance	$ 8,023,017	$ 8,263,708	$ 8,511,619	$ 8,766,967	$ 9,029,976	$ 9,300,876	$ 9,579,902	$ 9,867,299	$ 10,163,318
Capital expenditures	$ 9,466,100	$ 14,859,419	$ 6,512,580	$ 9,125,913	$ 6,013,343	$ 14,363,039	$ 11,221,049	$ 7,090,741	$ 14,675,655
Water purchases	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
Debt Service	$ 1,071,350	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701	$ 2,142,701
All other expenditures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total uses	$ 24,560,467	$ 31,265,827	$ 23,166,900	$ 26,035,581	$ 23,186,020	$ 31,806,616	$ 28,943,652	$ 25,100,741	$ 32,981,674
Net position									
End of year balance	$ 17,744,152	$ 21,987,270	$ 21,569,362	$ 19,261,410	$ 20,861,997	$ 14,638,481	$ 12,117,770	$ 14,303,422	$ 9,683,863

Table 23
Comparison of Regional Water Charges

	NWCWD current	NWCWD, baseline COS scenario	East Larimer County WD	Fort Collins-Loveland WD (residential, outside Fort Collins)	Town of Wellington	City of Loveland (inside City)	City of Greeley (not on Water Budget)	City of Fort Collins
Monthly service charge	$24.90, includes first 6,000 gallons	Residential $36.96; Comm/Indus $26.70 Both include first 6,000 gallons	$14.00	$15.75	$66.00	$18.05	$17.50	$18.30
Volume charge	All users: $4.15 Wholesale service to Towns:	Residential: $6.16 Comm/Indus: $4.45 Wholesale service to Towns: $3.72	Residential: $4.03 Commercial $3.45	Residential: $1.83 (<8,000 gal) $2.60 (<15,000)	$4.56 (<15,000 gal) $5.70 (< 30,000 gal)	Residential: $3.69 Commercial: $4.39	Residential: $5.46 Commercial: $5.45 Industrial: $4.28	$2.834 (<7,000 gal) $3.257 (<13,000 gal)
Excess usage charge	$6.00 plus volume charge for usage greater than allocation	$6.00 plus volume charge for usage greater than allocation	$4.62 plus volume charge for usage greater than allocation	$3.49 for usage greater than 15,000 gal/mo	$7.72 (>30,000 gal)	$1.57 plus volume charge, only for commercial customers	No specific penalty published for non-budget customers.	$3.746 (>13,000 gal)
Monthly average residential bill (0.32 af)	$36.07	$53.59	$54.15	$32.21	$105.63	$50.56	$65.50	$42.70
Monthly average residential bill (0.64 af)	$72.13	$107.07	$84.05	$56.97	$145.26	$82.19	$112.40	$74.59

There are a range of uncertainties that will impact the rates and charges developed in this analysis and will require vigilance by the District's staff and Board to ensure that future rates respond to these uncertainties. These uncertainties include the regional population growth rate, the cost and availability of new raw water supplies, the ability to design and construct new infrastructure projects in a timely manner, construction cost escalation, the response of customers using water in excess of allocations to new Water Allocation surcharge levels, and more.

Recommendations:

... move towards cost of service a little bit every year

Appendix A Base-Extra Capacity Cost Allocations

Table A-1
Allocation of Revenue Requirements to District Functions for 2023

Base year	2023	District Function Allocations							District Function Costs for Select Year						
		Source of Supply	Treatment	Transmission	Storage	Distribution	Administrative	Check	Source of Supply	Treatment	Transmission	Storage	Distribution	Administrative	Check
Operations and Maintenance															
4000 Operating Expenses															
4100 Water (Treatment)	$ 4,044,492.41	0%	100%					100%	$ -	$ 4,044,492.41	$ -	$ -	$ -	$ -	$ 4,044,492
4200 Personnel Operations	$ 1,336,701.11	0%		40%	40%	20%		100%	$ -	$ -	$ 534,680.44	$ 534,680.44	$ 267,340.22	$ -	$ 1,336,701
4400 Operation & Maintenance	$ 725,038.16			40%	40%	20%		100%	$ -	$ -	$ 290,015.26	$ 290,015.26	$ 145,007.63	$ -	$ 725,038
4500 Engineering	$ 61,920.49	20%	20%	20%	20%	20%		100%	$ 12,384.10	$ 12,384.10	$ 12,384.10	$ 12,384.10	$ 12,384.10	$ -	$ 61,920
4600 Electricity	$ 186,324.81			33%	33%	33%		100%	$ -	$ -	$ 62,108.27	$ 62,108.27	$ 62,108.27	$ -	$ 186,325
4700 Communication	$ 2,251.23			20%	20%	20%	40%	100%	$ -	$ -	$ 450.25	$ 450.25	$ 450.25	$ 900.49	$ 2,251
4800 Insurance	$ 85,766.34						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 85,766.34	$ 85,766
4900 Miscellaneous	$ 3,862.74	20%	20%	20%	20%	20%		100%	$ 772.55	$ 772.55	$ 772.55	$ 772.55	$ 772.55	$ -	$ 3,863
Transfer to Operating Reserve Fund	$ -	20%	20%	20%	20%	20%		100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses	**$ 6,446,357.28**														**$ 6,446,357**
5000 Administrative Expense															
5100 Salaries	$ 858,493						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 858,493.01	$ 858,493
5200 Payroll Taxes	$ 112,020						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 112,020.43	$ 112,020
5300 Health Insurance	$ 51,338						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 51,338.01	$ 51,338
5400 Office Utilities	$ 373,777						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 373,777.35	$ 373,777
5500 Office Expense	$ 204,451						100%	100%	$ -	$ -	$ -	$ -	$ -	$ 204,451.34	$ 204,451
5600 Professional Fees	$ 209,390	25%	25%	20%	20%	10%	0%	100%	$ 52,347.46	$ 52,347.46	$ 41,877.97	$ 41,877.97	$ 20,938.98	$ -	$ 209,390
5900 Miscellaneous	$ 7,880	0%	0%	0%	0%	0%	100%	100%	$ -	$ -	$ -	$ -	$ -	$ 7,880.37	$ 7,880
Total Administrative Expenses	**$ 1,817,350**														**$ 1,817,350**
Total Operating and Administration Expense	**$ 8,263,708**														**$ 8,263,708**
Capital Expenditures, allocated to existing system															
Pleasant Valley Pipeline	$ -		100%					100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tanks (exc. Zone 1c, inc. in debt service)	$ -				100%			100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pipelines (exc. NEWT3, inc in debt service)	$ 3,819.24			75%		25%		100%	$ -	$ -	$ 2,864.43	$ -	$ 954.81	$ -	$ 3,819
Pump Stations	$ -			75%		25%		100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCWTP Expansion	$ -		100%	0%				100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Existing debt service, 2012R	$ 1,590,000.00			100%				100%	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,590,000
Debt service, 2009 A	$ 473,288.00	0%	100%					100%	$ -	$ 473,288.00	$ -	$ -	$ -	$ -	$ 473,288
Existing debt service Soldier Canyon bond	$ 1,231,000.00		100%					100%	$ -	$ 1,231,000.00	$ -	$ -	$ -	$ -	$ 1,231,000
Debt service	$ 2,142,700.57	0%	0%	100%	0%			100%	$ -	$ -	$ -	$ 2,142,700.57	$ -	$ -	$ 2,142,701
Transfer to Capital Reserve	$ -		65%	35%				100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Rights, to close existing supply gap	$ 6,000,000.00	100%	0%					100%	$ 6,000,000.00	$ -	$ -	$ -	$ -	$ -	$ 6,000,000
Total capital expenditures allocated to existing system	**$ 11,440,807.81**														**$ 11,440,808**
Total O&M and capital costs	**$ 19,704,515.43**														**$ 19,704,515**
Less non-rate revenues															
Tax levy	$ -	100%						100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Allocation Surcharge	$ 2,322,000	100%						100%	$ 2,322,000.00	$ -	$ -	$ -	$ -	$ -	$ 2,322,000
Plant Investment Surcharge	$ 1,023,803	0%	0%	65%	35%			100%	$ -	$ -	$ 665,471.99	$ 358,331.07	$ -	$ -	$ 1,023,803
Transfer from capital fund	$ -	100%						100%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Adjustments	$ (57,903)	65%	35%					100%	$ (37,636.72)	$ (20,265.92)	$ -	$ -	$ -	$ -	$ (57,903)
Construction Meter Usage	$ 213,909					100%		100%	$ -	$ -	$ -	$ -	$ 213,909.27	$ -	$ 213,909
Construction Meter Rental	$ 5,629					100%		100%	$ -	$ -	$ -	$ -	$ 5,629.14	$ -	$ 5,629
Construction Meter Repair	$ 563					100%		100%	$ -	$ -	$ -	$ -	$ 563.34	$ -	$ 563
Non-Potable Reimbursement	$ (43)		100%					100%	$ -	$ (43.21)	$ -	$ -	$ -	$ -	$ (43)
Subtotal, Non-Rate Operating Income	**$ 3,507,959**														**$ 3,507,959**
Less Non-operating income															
Interest (Colorado Trust)	$ 179,842	100%						100%	$ 179,842.29	$ -	$ -	$ -	$ -	$ -	$ 179,842
Port Partonage Agfinity	$ 496	100%						100%	$ 496.34	$ -	$ -	$ -	$ -	$ -	$ 496
Soldier Canyon Bond Issue Proceeds	$ -		100%					100%		$ -	$ -	$ -	$ -	$ -	$ -
Subtotal, non-operating income	$ 180,338.64														**$ 180,339**
Total Non-Rate Revenues	**$ 3,688,298**														**$ 3,688,298**
Revenue Requirements from Rates	**$ 16,016,217.84**														**$ 16,016,218**

Table A-2
Allocation of Joint Costs Using Base-Extra Capacity

Total District Function Costs for Select Year

	Source of Supply	Treatment	Transmission	Storage	Distribution	Administrative
Total O&M and capital expenditures		$ 5,814,284.51	$ 4,677,853.83	$ 942,288.83		$ 1,694,627.34
Less non-rate revenues		$ (20,309.14)	$ 665,471.99	$ 358,331.07		$ -
Requirement from Rates	$ -	$ 5,834,593.65	$ 4,012,381.84	$ 583,957.76	$ -	$ 1,694,627.34

Capacity Cost Allocations

	Supply	Treatment	Transmission	Storage	Distribution	Administration
Base	100%	65%	65%	20%	34%	100%
Max Day		35%	35%	40%	33%	
Max Hour		0%	0%	40%	33%	
Fire Flow				0%	0%	
Customer					0%	0%
Check	100%	100%	100%	100%	100%	

Capacity Costs for Select Year

	Supply	Treatment	Transmission	Storage	Distribution	Administration	Total
Base	$ -	$ 3,792,486	$ 2,608,048	$ 116,792	$ -	$ 1,694,627	**$ 8,211,953**
Max Day	$ -	$ 2,042,108	$ 1,404,334	$ 233,583	$ -	$ -	**$ 3,680,025**
Max Hour	$ -	$ -	$ -	$ 233,583	$ -	$ -	**$ 233,583**
Fire Flow	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ 5,834,594	$ 4,012,382	$ 583,958	$ -	$ 1,694,627	**$ 12,125,561**
							$ 12,125,561

Table A-3
Allocation of Specific Costs Using Base-Extra Capacity

Total District Function Costs for Select Year

	Source of Supply	Treatment	Transmission	Storage	Distribution	Administrative
Total O&M and capital expenditures	$ 6,065,504.10				$ 509,956.81	
Less non-rate revenues	$ 2,464,701.92				$ 220,101.74	
Requirement from Rates	$ 3,600,802.18				$ 289,855.07	

Capacity Cost Allocations

	Supply	Treatment	Transmission	Storage	Distribution	Administration
Base	100%	65%	65%	20%	34%	100%
Max Day		35%	35%	40%	33%	
Max Hour		0%	0%	40%	33%	
Fire Flow				0%	0%	
Customer					0%	0%
Check	100%	100%	100%	100%	100%	

Capacity Costs for Select Year

	Supply	Treatment	Transmission	Storage	Distribution	Administration	Total
Base	$ 3,600,802	$ -	$ -	$ -	$ 98,551	$ -	**$ 3,699,353**
Max Day	$ -	$ -	$ -	$ -	$ 95,652	$ -	**$ 95,652**
Max Hour	$ -	$ -	$ -	$ -	$ 95,652	$ -	**$ 95,652**
Fire Flow	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Customer	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
	$ 3,600,802	$ -	$ -	$ -	$ 289,855	$ -	**$ 3,890,657**
							$ 3,890,657

Appendix B: New Debt Service Schedule

Table B-1
New Debt Service Schedule

Interest rate	4.000%
Debt term, years	20
Additional cost (% of issue	4.00%

Year issued	Payments> 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
2021	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0			
2022		$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350		
2023			$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	$1,071,350	
2024				$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2025					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2026						$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2027							$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2028								$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2029									$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2030																									
2031																									
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2045																									
2046																									
Total annual debt service	$ -	$ 1,071,350.28	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 2,142,700.57	$ 1,071,350.28	$ -

APPENDIX 2

Honey Creek Resources, Inc.

MEMORANDUM

TO: **ERIC RECKENTINE, NWCWD**

FROM: GEORGE OAMEK

DATE: DECEMBER 2, 2021; UPDATED DECEMBER 5, 2022

SUBJECT: BASELINE PLANT INVESTMENT FEE, UPDATED

Background

This memorandum is an update to a December, 2021 memorandum summarizing calculations behind a baseline Plant Investment (PI) fee for the North Weld County Water District, based on industry standard practices. This update incorporates the most recent Capital Improvement Program (CIP) into the analysis. The term baseline is used because the PI fee has not yet been adjusted to distinguish District retail customers from wholesale town customers. Nor are any measures taken to distinguish customer classes.

Using common and accepted industry practices, the PI fee is calculated as the growth-related costs contained in a utility's long-term Master Plan, or similar document, divided by the number of new units coming on-line during this period. Ideally, the time frame considered would be 20 to 30 years, or through buildout. This was the case prior to 2021, when the District, with assistance from Providence Infrastructure, developed iterations of a 30-year Master Plan, with capital costs allocated to growth and to current customers and long-term. It also had developed demand projections for this same period. However, due to rapid growth pressures, plans for future capital expenditures were updated and accelerated in 2021 for the period 2021-2031 and again in 2022 for the period 2023-2032. At the same time, long-term demand projections were not changed but near-term PI fee revenues may be reduced due to a tap moratorium in parts of the District and until major infrastructure projects such as NEWT3 and Tank 1c can be completed.

Capital Costs

Figure 1 shows CIP cumulative capital expenditures as estimated in 2021 and 2022. It is apparent that the 2022 CIP revision, representing expenditures for the period 2023-32, results in significantly higher spending and will result in a higher PI fee.

Figure 2 shows the portion of cumulative CIP expenditures that form the basis of the PI fee by contributing to additional capacity in the system, benefitting growth and new users. The PI fees were intended to recover about $80 million in growth-related expenditures in 2021, but this has been revised to approximately $110 million for the 2023-2032 period.

It should be noted that all dollar figures shown are expressed at 2022 price levels and do not consider the impacts of probable cost escalations, or inflation, in the future. Therefore, any revisions to PI fees should consider the anticipated impacts of inflation by incorporating an annual cost escalator when implemented. This escalator can be based upon the Consumer or Producer Price Indices (CPI ,PPI), or incorporate an alternative index, such as those provided by the periodical Engineering News Record (ENR) or the Handy-Whitman Index of construction costs.

Figure 1. Estimated cumulative capital expenditures based on 2021-based estimates and 2023-based estimates, excluding water rights purchases (in 2022 dollars).

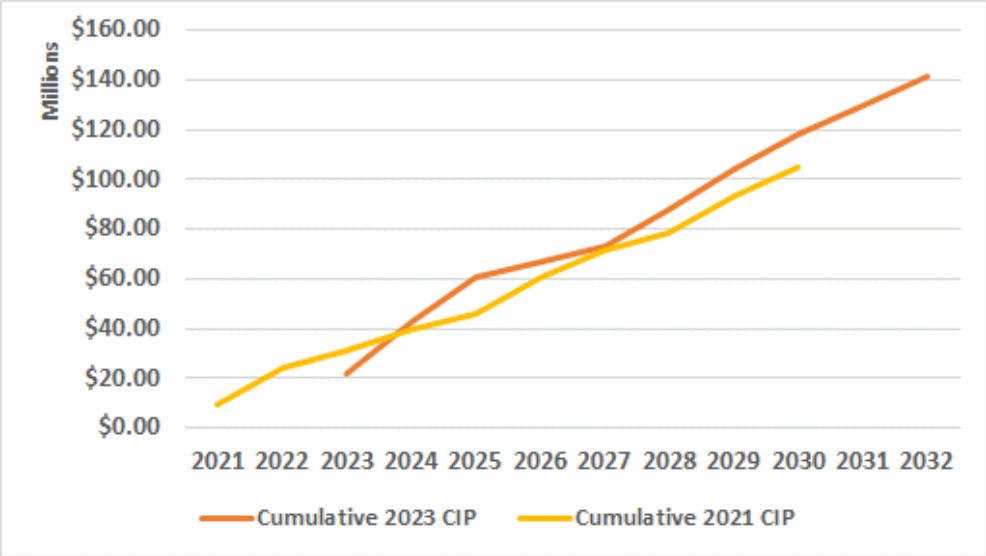
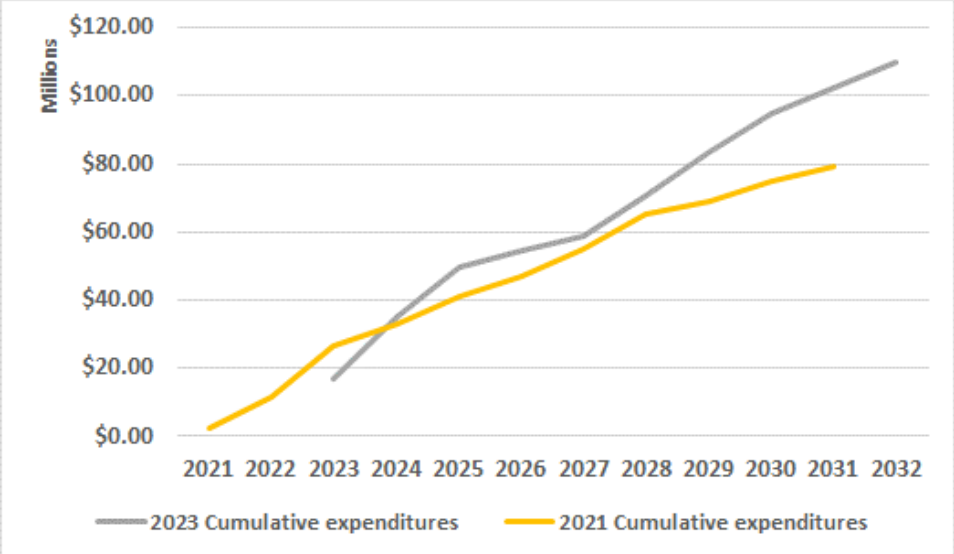


Figure 2. Annual growth-related expenditures based on 2021 and 2022 estimates, cumulative (in 2022 dollars).



Calculation of the PI Fee

As mentioned above, the PI fee is based on the sum of growth-related expenditures divided by the new taps coming on-line. This is generally the case, but some caution is used here because several of the assets in the CIP will have capacity to serve new customers coming into the system beyond the 10 years considered in the fee calculations, such as NEWT 3, Tank 1c, and water treatment plant expansions later

in the CIP's time-frame. Alternatively stated, there will still be some unused capacity that new customers beyond 2032 would not have to pay for if all of the costs of these three major projects are recovered in just 10 years. In response, annual equivalent estimate of growth-related capital costs are developed for these specific assets and divided by the annual average of new taps added during the 2023-32 period.

The annual equivalent growth-related capital cost is calculated as the annual average of growth-costs over the period 2021-31, excluding year 2022, plus the amortized annual cost of year 2022's expenditure if spread over 20 years at 2.5% interest.

- $109.7 mil – $40.0 million (NEWT3, Tank 1c, WTP expansion) = $69.7 million, divided by 10 years, equals $6.97 million annually.
- $40.0 million growth expenditures amortized over 30 years at 3.0%, equals $1.94 million. The amortization terms are intended to represent potential financing terms available to the District.
- The sum of these two components equals $8.91 million.

Previous demand and usage estimates developed by Providence Infrastructure indicated that approximately 440 new taps would be added per year if tap moratoriums were not in place and infrastructure was not constraining. This would include District taps plus town taps. The resulting PI estimate is:

- ***$8.91 million divided by 440 taps = $20,250.***

As previously mentioned, these costs and resulting PI fee estimate is in 2022 dollars and should be adjusted annually with inflation. In addition, when a new Master Plan is completed, this analysis should revisit cost, capacity estimates, and demand estimates.

APPENDIX 3

Honey Creek Resources, Inc.

MEMORANDUM

TO: **ERIC RECKENTINE, NWCWD**

FROM: **GEORGE OAMEK**

DATE: MARCH 3, 2023

SUBJECT: WATER AND PLANT INVESTMENT SURCHARGES (DRAFT)

Introduction and Summary

This memorandum discusses fees and surcharges associated with water allocations and plant investments (PI). Their current levels are discussed, with updates to the Water Allocation surcharge and the PI surcharge presented for the Board's consideration.

To summarize:

- The current Water Allocation Surcharge is $6.00 per 1,000 gallons, but recent C-BT sales would support an increase to $7.50, if the Board desires. These levels are about one-third of the District's actual water acquisition cost.
- A new surcharge is proposed for high-volume commercial users, primarily dairies, who use water in excess of their allocations and in excess of their 2022 levels. A surcharge ranging from $18.51 to $22.52 per 1,000 gallons is proposed for this increment of usage. The range is based on whether the Board assumes the existing "full price" Water Allocation surcharge based on 2021 C-BT prices, or updates the surcharge based on 2023 C-BT prices. The "full price" term refers to whether the surcharge represents the District's actual water acquisition cost.
- A new surcharge is proposed for usage through residential meters in excess of 3 acre-feet. A similar "full price" surcharge in the range of $18.51 to $22.52 is proposed for this misrepresentation of usage.
- Based on the most recent capital improvement schedule and PI Fee, a revised PI Surcharge of $6.25 per 1,000 gallons is presented for consideration.

Water Allocation Fee and Surcharge

Water Allocation Fee

By District policy, the basis for the water allocation fee has been the value of a Colorado-Big Thompson (C-BT) unit, representing 0.70 acre-feet in an average year. This volume of water is equivalent to one NWCWD tap. Since 2021, the value of a C-BT unit has increased from approximately $60,000 to $73,000, or from about $85,700 per acre-foot to $104,300 per acre-foot. The current Water Allocation fee aligns with C-BT's 2021 value but is not frequently collected because of revised District policies requiring new development to contribute water rights themselves rather than depending on the District to provide supply.

Water Allocation Surcharge

Prior to 2022, the Water Allocation surcharge was $2.00 per 1,000 gallons for usage above a customer's allocation. The basis for this level of surcharge was never recorded but is believed to have represented an annualized cost of a C-BT unit when the latter was priced in the $7,000 per unit range, approximately 2010. This surcharge is applied to customers who exceed their water allocation, regardless of the type of use.

There is a logical basis for using the Water Allocation fee to calculate the surcharge because the fee represents water acquisition costs and the surcharge reflects this acquisition cost on an annual basis. Translating the fee to a volume-based surcharge involves expressing the Water Allocation fee on an annual basis by amortizing the fee over a specified period of time and discount, or interest, rate. The time period is assumed to be 20 years and the discount rate is 3.5 percent, consistent with the debt terms the District experienced with State Revolving Loan funds. These assumptions imply that the annual equivalent fee also includes a finance component that users exceeding their allocation pay to the remainder of the customers in return for the risk of allowing excessive usage.

Current Water Allocation Surcharge

In 2021, the surcharge was recalculated based on a C-BT price of $60,000 per unit. This cost amortized over 20 years at 3.5% amounts to $6,031 per year. Dividing this by 325.9 to convert acre-feet to 1,000 gallons results in a volume surcharge of $18.51 per 1,000 gallons. This fee was adopted by the Board to be applied to new customers moving forward.

Despite reflecting current costs, immediately increasing the Water Allocation surcharge from $2.00 to $18.51 per 1,000 gallons for all customers exceeding their allocations represented a very large increase and was considered untenable by the Board. Instead, there was discussion of phasing the increase over several years until it reached the cost-based level. In response, the Board voted to set the surcharge at approximately one-third of this, or $6.00 per 1,000 gallons, with the option of increasing the surcharge if it proved ineffective.

Updated Water Allocation Surcharge

With the current price of a C-BT unit at approximately $73,000 per unit, the corresponding "full price" Water Allocation surcharge under the above assumptions would be $22.52 per $1,000 gallons. One-third of this equates to approximately $7.50. Therefore, if the Board desires to update the Water Allocation surcharge under this transition phase, this $7.50 per 1,000 gallons would be recommended.

Effectiveness of the Water Allocation Surcharge and District Response

Despite a 3-fold increase, the current surcharge of $6.00 appears ineffective because non-commercial usage, specifically usage for the largest of the dairies, has continued to increase at a rapid rate. There have been many complaints from users about their future economic viability with the $6.00 surcharge, so there is evidence that it may be effective for many. However, among the largest of those users exceeding their allocations, growth beyond their water allocations has continued.

In response to chronic use beyond water allocations, the District is proposing limiting future usage by the worst of those exceeding their water allocations to their 2022 levels, or some equally representative level of their current demand. Usage in excess of this historical level will be imposed an additional surcharge.

Surcharge for Usage Beyond Current Demand

For consistency with the concept of tying surcharges to the cost of C-BT acquisition, the surcharge associated with exceeding the previous year's usage is recommended to be the "full price" surcharge. With a C-BT price pegged at $60,000 per unit, this would be $18.51 per 1,000 gallons; with C-BT price at its current level near $73,000 per unit, this would be $22.52 per 1,000 gallons.

Therefore, a large-volume user who exceeds both their allocation and previous year's usage would pay a surcharge of $6.00 per 1,000 gallons for over usage up to the previous year's level, then pay a surcharge of $18.51 per 1,000 gallons for usage beyond the previous year's. If current C-BT price levels are considered, these surcharges increase to $7.50 and $22.52, respectively.

Surcharge for Misrepresented Usage

In addition to the challenge of users exceeding their water usage allocations, there have instances in which commercial users have attempted to gain additional capacity and reduce surcharges by incorporating an adjacent residential tap into their own system. This type of misrepresentation of usage is strongly discouraged and a surcharge for usage beyond 3 acre-feet through a residential tap has been proposed. To the extent that it is highly unlikely a residential tap used for residential purposes would exceed 3 acre-feet, this surcharge appears reasonable. District staff has recommended the surcharge be set at the "full-price" level of C-BT prices -- $18.51 per 1,000 gallons assuming C-BT units at $60,000 or $22.52 per 1,000 gallons assuming C-BT units at $73,000.

Plant Investment Fee and Surcharge

Plant Investment Fee

A Plant Investment (PI) Fee of $20,250 per tap was approved by the NWCWD Board in their January, 2023 meeting. This was based on the most recent schedule of capital improvements through 2031 and the capacity provided by these improvements. The PI fee is paid by new customers and is intended to reimburse the District for the portion of existing and future infrastructure benefitting new customers.

Plant Investment Surcharge

The current PI surcharge is $3.95 per 1,000 gallons and is intended to discourage existing customers from using more infrastructure capacity than they have purchased. However, similar to the Water Allocation surcharge, its origin was not recorded.

Although the PI fee and surcharge address capacity, the same volume measures used to calculate Water Allocation surcharges are used to calculate PI surcharges. In this light, basing the PI surcharge on the PI fee appears reasonable. This would involve calculating the PI surcharge in the same manner as the Water Allocation surcharge, specifically amortizing the PI fee over the same time period, at the same discount rate.

Amortizing $20,250 per tap (or $28,930 per acre-foot assuming one tap equals 0.70 acre-feet) over 20 years at 3.5 percent results in a surcharge of $2,035 per acre-foot, $6.25 per 1,000 gallons.

APPENDIX 4

Williams & Weiss Consulting, LLC

Tech Memo:

To: Eric Reckentine, Manager North Weld County Water District

From: Paul Weiss, WWC

Date: February, 2019

Re: Evaluation of NWCWD System Yields

Overview

Williams & Weiss Consulting (WWC) has developed a spreadsheet model application for the primary purpose of forecasting NWCWD's future water supply during a critical drought period. The supply model provides a mechanism to compare various demand projections and water supply scenarios to evaluate the likelihood of demand shortages, as well as the potential offsetting effects of imposing demand restrictions to customers.

Drought Selection

The water supply for NWCWD originates from the Colorado River basin (C-BT units) and the Cache la Poudre River basin (water rights and converted ag shares). For purposes of identifying and quantifying drought, this analysis uses the "native river flow" approach, in which years with below average native flow are considered a drought. This is a common standard used by municipal water providers for identifying drought and assigning recurrence intervals, or frequency of events. The Cache la Poudre River basin has been studied extensively, and previously developed data can be used to establish recurrence intervals for historical droughts.

The Colorado State University's Department of Civil Engineering used stochastic models to develop synthetic flows representative of annual native flows on the Cache la Poudre. The synthetic data set (50,000 values) can be used to determine the recurrence interval for droughts of specified cumulative deficit, where deficit is calculated as the difference between the observed native flow and the long term average river flows. The recurrence interval is the average amount of years between drought events that have deficits equal to or larger than some threshold value.

The cities of Fort Collins and Greeley use a similar approach for identifying their design droughts for use in planning. Both cities use a 6 year drought with a cumulative deficit of 557,000 AF and has a return interval of approximately 100 years. It should be noted that the deficit and recurrence interval are a function of the long term average native flow. Cumulative deficit alone does not completely describe droughts, as some droughts can be extremely intense (e.g., 2002 drought) while other droughts can be less intense, but span multiple years. In general the cumulative deficit is the most representative metric for describing drought.

The Cache la Poudre River experienced a 10 year drought, from 2000 through 2009. The following table identifies the drought deficits over the course of the 10 years.

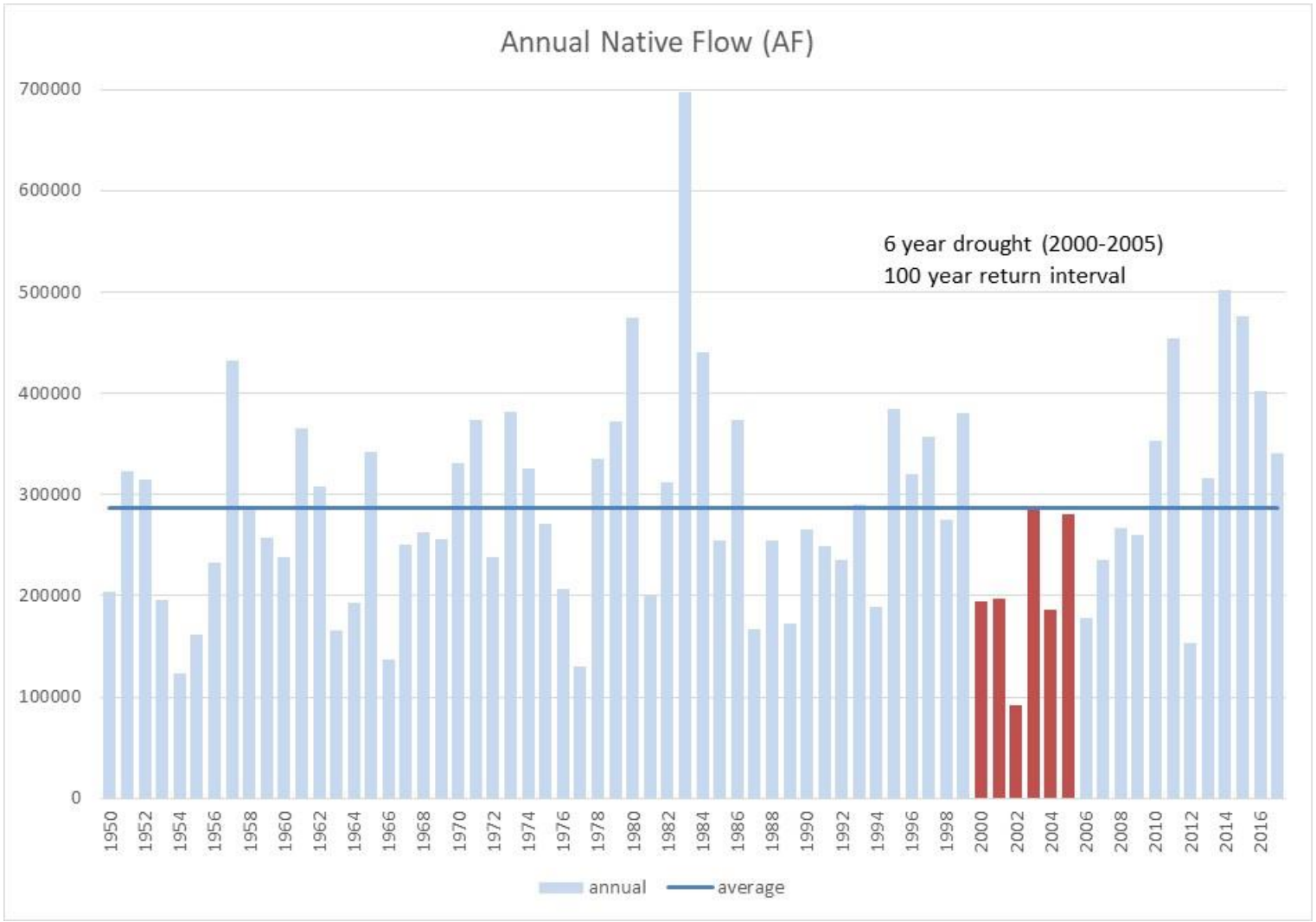
Years	Length	Cumulative Deficit
2000 to 2003	4 years	387,042
2000 to 2004	5 years	489,702
2000 to 2005	6 years	498,724
2000 to 2006	7 years	609,875
2000 to 2007	8 years	663,051
2000 to 2008	9 years	685,002
2000 to 2009	10 years	713,982

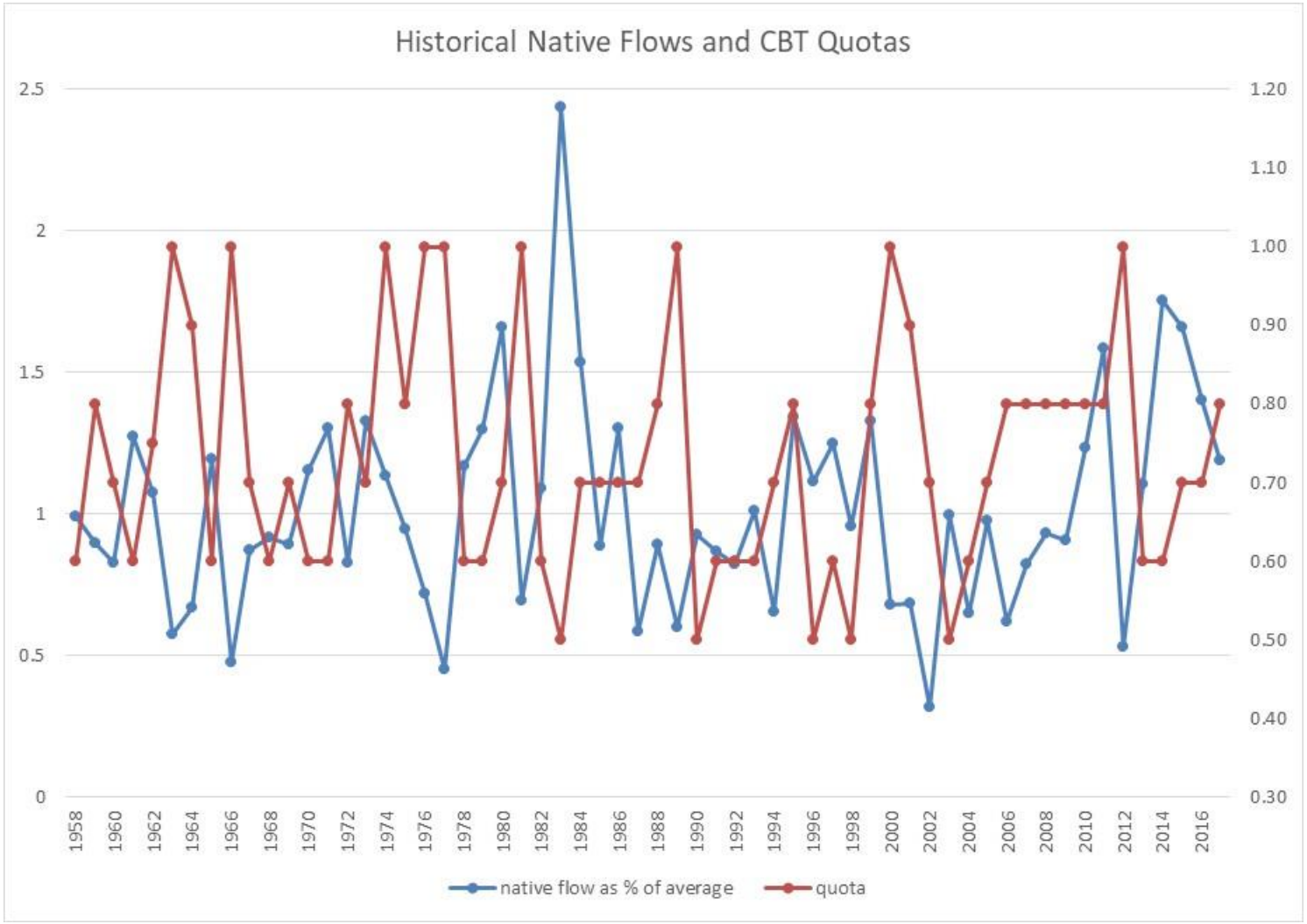
The 2000 to 2003 drought was an intense drought, mainly because of the extreme drought year of 2002. It is uncommon to see such a large deficit in such a short period. But by year 6 (calendar year 2005) the cumulative deficit of the drought is close to the average deficit for a prolonged drought that would be expected to occur, on average, about one time every one hundred years. In other words, the historical drought of 2000 to 2005 is very representative of the statistical 100 year drought. The full 10-year drought (2000 to 2009), with a cumulative deficit of over 700,000 AF would be expected to occur on average only once every 250 years. For comparison, the 1950's drought is statistically quite similar to a 50 year drought, or one that would occur on average once every 50 years.

The historical 2000's drought, and corresponding flow data, provides an ideal period of record for evaluating the resiliency of water supplies in the Cache la Poudre River basin. Using historical flow data and diversion records, the firm yield of NWCWD's native water rights can be established. We recommend that NWCWD use the 2000 to 2005 time frame to establish firm yield values. For example, the average yield of a water right over the 6 years could be used to establish the water right's firm yield.

Besides native rights, the trans-basin supply from C-BT shares provides a significant source of supply for the District. While C-BT yields can vary with hydrology, the system is operated such that higher quotas are set during low flow years and low quotas are set during high flow years. This was the standard mode of operation when the vast majority of C-BT shares were owned by agricultural systems. Today, most C-BT shares are owned by municipal water providers and they require a more constant supply of C-BT. For that reason, the C-BT quota has tended to remain more constant over the last decade or so.

The following charts identify the variability of supplies in the Poudre basin. The first chart shows the annual native flows, highlighting the selected design drought. The second chart compares historical Poudre river flows, as a percentage of average (ranging from 240% in 1983 to 30% in 2002), to the annual C-BT quota (ranging from 1 to 0.5). Generally these two parameters have a negative correlation.


Annual Native Flow (AF)
700000
600000
500000
400000
300000
200000
100000
0
6 year drought (2000-2005)
100 year return interval
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
annual
average


Historical Native Flows and CBT Quotas
2.5
2
1.5
1
0.5
0
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
native flow as % of average
quota

Demand Projections

Annual demand projections for NWCWD have been developed by Providence Infrastructure Consultants. The following chart identifies at-the-plant projections out to the year 2050.

Table x.

Water Use (AFY)
Preliminary: 02/25/2019

	Average Precipitation Year					Drought Year	
YEAR	RESIDENTIAL	COMMERCIAL	TOWNS	Total AFY	Total MGD	Total AFY	Total MGD
2008	1,860	2,760	2,770	7,390	6.60	8,100	7.23
2009	1,610	2,480	2,470	6,560	5.86	7,200	6.43
2010	1,790	2,430	2,860	7,080	6.32	7,800	6.96
2011	1,840	2,490	2,940	7,270	6.49	8,000	7.14
2012	2,100	2,900	3,440	8,440	7.53	9,300	8.30
2013	1,780	2,920	2,950	7,650	6.83	8,400	7.50
2014	1,750	3,280	2,760	7,790	6.95	8,600	7.68
2015	1,920	3,440	3,070	8,430	7.53	9,300	8.30
2016	2,090	3,570	3,360	9,020	8.05	9,900	8.84
2017	2,090	3,780	3,420	9,290	8.29	10,200	9.11
2018	2,300	4,130	3,670	10,100	9.02	11,100	9.91
2019	2,330	3,870	3,800	10,000	8.93	11,000	9.82
2020	2,400	3,970	3,950	10,320	9.21	11,400	10.18
2021	2,460	4,070	4,100	10,630	9.49	11,700	10.45
2022	2,530	4,170	4,250	10,950	9.78	12,000	10.71
2023	2,590	4,270	4,400	11,260	10.05	12,400	11.07
2024	2,650	4,370	4,550	11,570	10.33	12,700	11.34
2025	2,710	4,470	4,700	11,880	10.61	13,100	11.69
2030	3,020	4,970	5,440	13,430	11.99	14,800	13.21
2035	3,320	5,480	6,190	14,990	13.38	16,500	14.73
2040	3,630	5,980	6,930	16,540	14.77	18,200	16.25
2045	3,940	6,480	7,680	18,100	16.16	19,900	17.77
2050	4,250	6,980	8,420	19,650	17.54	21,600	19.28

Based upon observed demands and climate data, Providence has estimated that dry year demands will be 10% greater than average year demands. This is consistent with demand projections for other Front Range municipal water providers and is reflected in the District's historical water use.

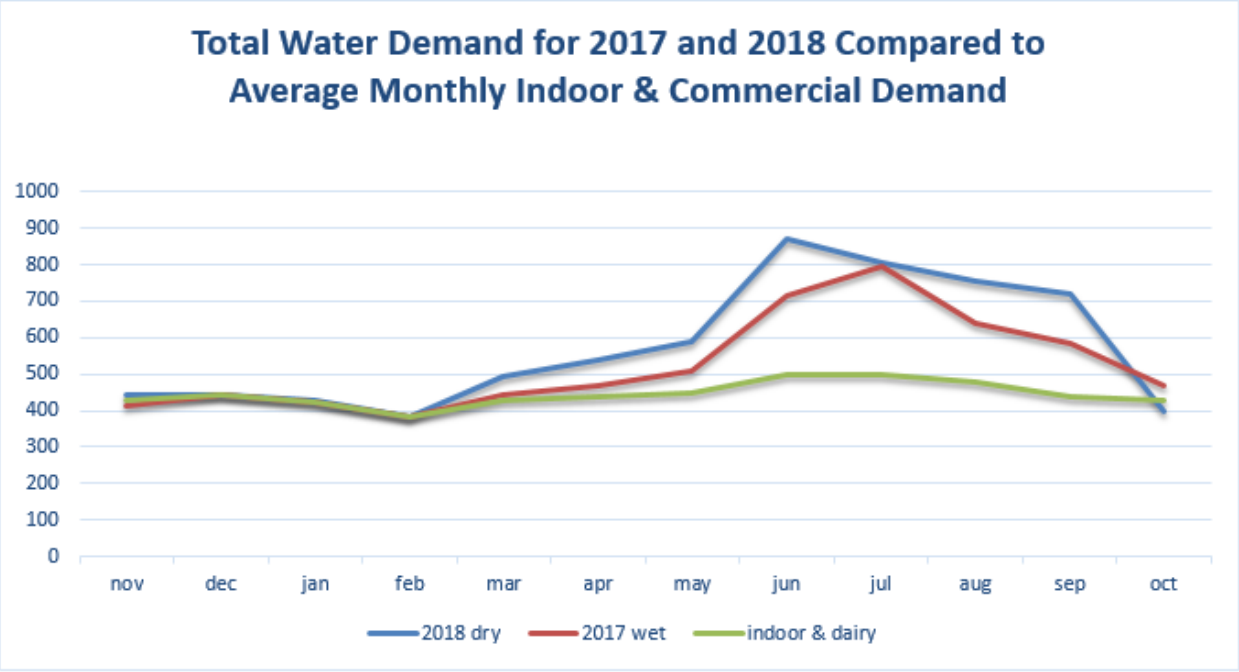
Since the towns provide their own water supplies to the District for treatment, the 'Towns' demand can be subtracted from the total demand to arrive at a District only demand projection.

Table y.

NWCWD Demand Projections

	Average Precipitation Year			Drought Year
YEAR	RESIDENTIAL	COMMERCIAL	Total AFY	Total AFY
2019	2,330	3,870	6,200	6,820
2020	2,400	3,970	6,370	7,007
2021	2,460	4,070	6,530	7,183
2022	2,530	4,170	6,700	7,370
2023	2,590	4,270	6,860	7,546
2024	2,650	4,370	7,020	7,722
2025	2,710	4,470	7,180	7,898
2030	3,020	4,970	7,990	8,789
2035	3,320	5,480	8,800	9,680
2040	3,630	5,980	9,610	10,571
2045	3,940	6,480	10,420	11,462
2050	4,250	6,980	11,230	12,353

For use in the planning model, annual demands must be disaggregated to a monthly value. Monthly production numbers for 2016-2018 were provided by the District and were used to develop monthly demand coefficients for distributing annual to monthly. This dataset was also used to quantify indoor demand and outdoor demand.

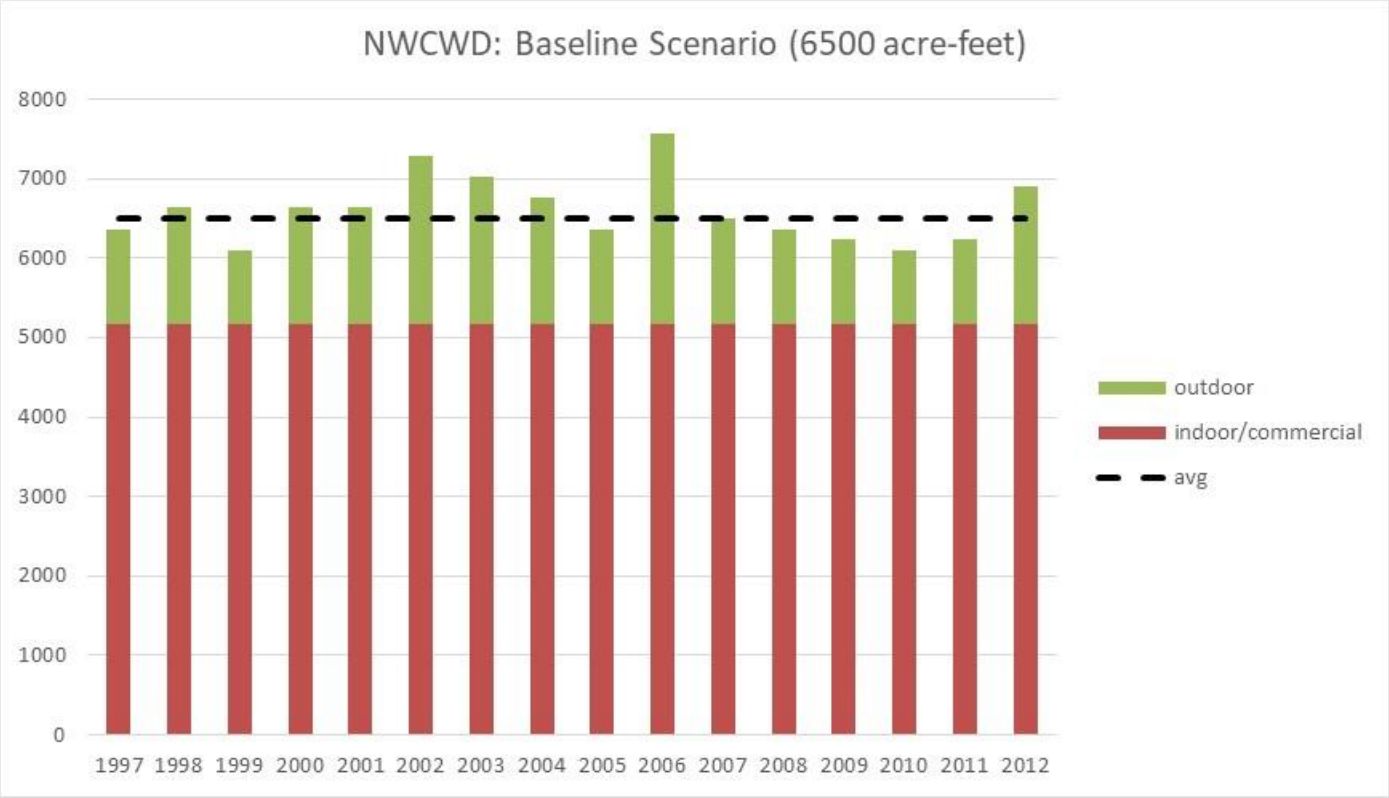


Using this approach, the outdoor demand in 2017 is 908 AF, or 14% of total demand. Outdoor demand in 2018 is 1534 AF, or 22% of total demand. Compared to the Providence table showing average residential use of about 2300 AF for these years, the outdoor demand is between 40% (wet year) and 67% (dry year) of total residential use. Literature on this subject identifies the outdoor demand to typically account for 55% of total residential use[1].

Outdoor demands are dependent upon climate, primarily precipitation and to some extent, temperature. The State's CDSS database was used to acquire monthly precip values for Eaton, using Ault station data to fill any missing data. For each year, March through October precipitation was totaled to arrive at an irrigation season precipitation value. This value was then used to develop demand factors, which are applied to the outdoor component of the annual water demand. The following table identifies precipitation and demand factors for the 1997-2012 period.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Precip in.	10.86	9.4	16.36	9.06	8.81	5.7	6.93	8.26	11.31	4.55	9.79	11.28	13	13.72	12.4	7.67
Factor	0.90	1.10	0.70	1.10	1.10	1.60	1.40	1.20	0.90	1.80	1.00	0.90	0.80	0.70	0.80	1.30

Applying these irrigation factors creates annual variability in demand, ranging from 112% in a dry year (2006) to 95% of average in a wet year (1999, 2008). The following chart shows the annual variability for a base demand on 6500 AF per year.



[1] R.Waskom, CSU Extension Office, 2014

Water Supply Scenarios

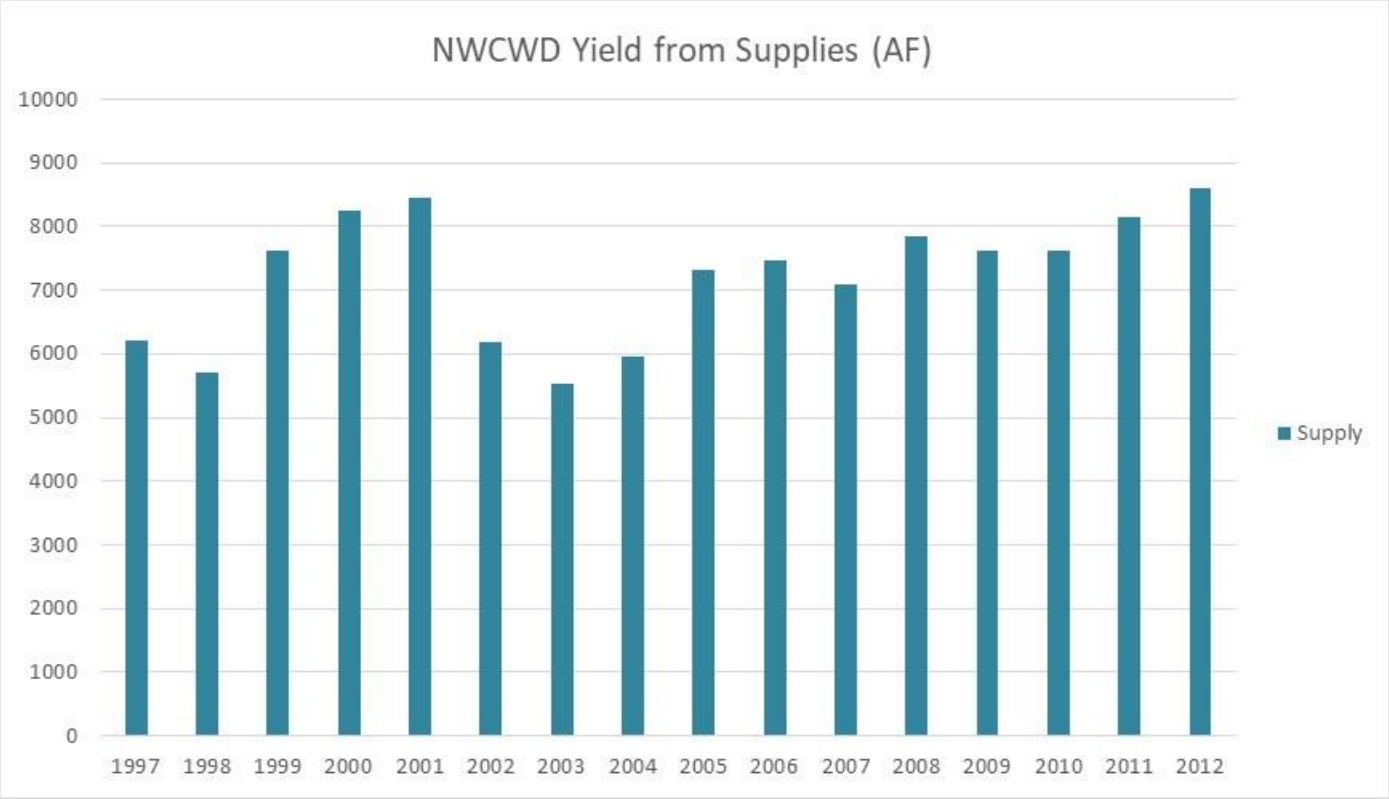
The District's water supply consists of C-BT units and Cache la Poudre water rights. In terms of treated water to meet demand, 75% comes from the C-BT system and 25% from the Poudre. As the District continues to grow, it is expected to acquire the majority of new supplies from the Poudre basin as the market for C-BT continues to tighten. The District's current portfolio consists of the following:

Water Supplies
Decreed or Available
Colorado Big Thompson Project
North Poudre Irrigation Company
NCWA Contract - North Poudre
Divide Canal Company Class A
Water Supply and Storage Company
WSSC native
John R Brown
Divide Canal Company Class B (Sand Creek)
Arthur Ditch
Laramie-Poudre Tunnel
Jackson Ditch

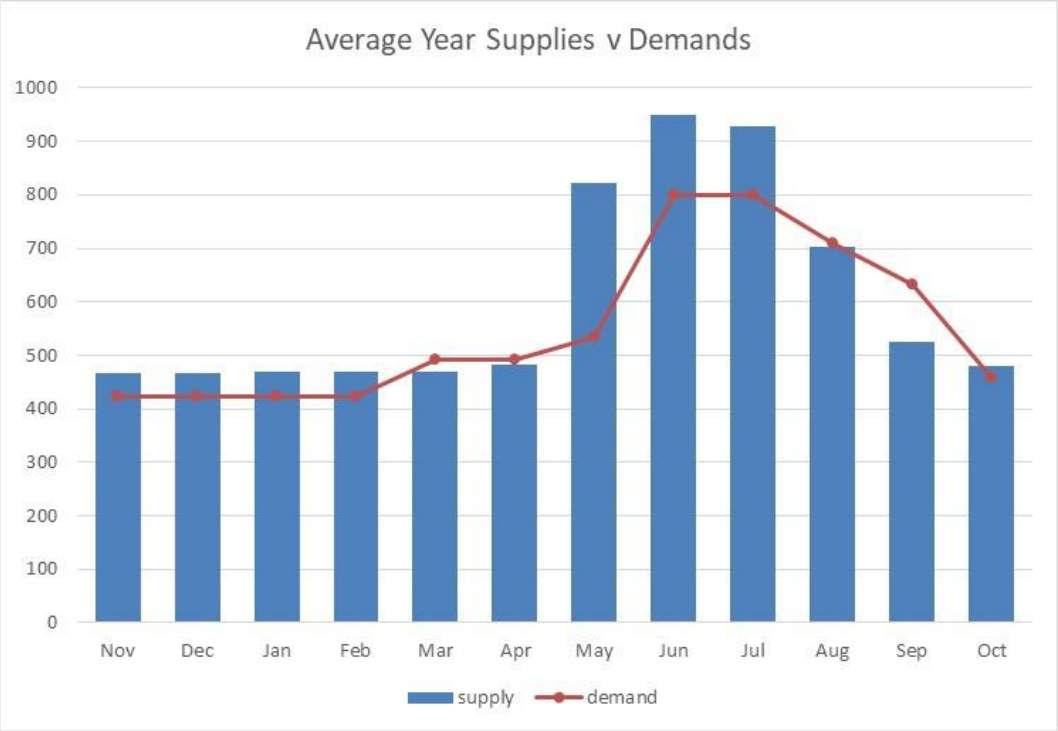
For use in the planning model, water supply yield must be quantified. For C-BT this is very straightforward, as the yield is equal to the number of units multiplied by the quota. For the Poudre basin supplies, yield is a function of the hydrological conditions and the seniority of the water right. The basis for quantification of water rights for this analysis is a Poudre River Point Flow model. The model tracks historical head gate diversions and river flows on a daily time step. Head gate deliveries for the period 1997-2012 have been analyzed and used to develop monthly yield values corresponding to the District's share ownership in the corresponding company. For example, daily diversions at Larimer County Canal were used in combination with the District's share ownership to arrive at monthly "farm head gate deliveries". The farm head gate delivery is representative of the volume of water that the District would have for its use. For those shares that generate return flow obligations, a portion of the farm head gate yield is assumed to be left in the ditch to cover this obligation. For WSSC shares, this works out to be around 28%, which is relatively low. This is due to the fact that a significant portion of the WSSC yield comes from transbasin supplies. Ditch shares with only native sources require a higher percentage to be left in the ditch. For example, Arthur shares must have about 42% of the farm head gate yield left in the system to cover the return flow obligations.

In some instances the yields on ditch shares were scaled to account for operational considerations that may artificially increase or decrease the computed yield. For example, the Larimer County Canal head gate diversions for the study period 1997-2012 reflect the non-usage of supplies owned by Thornton. Many of the

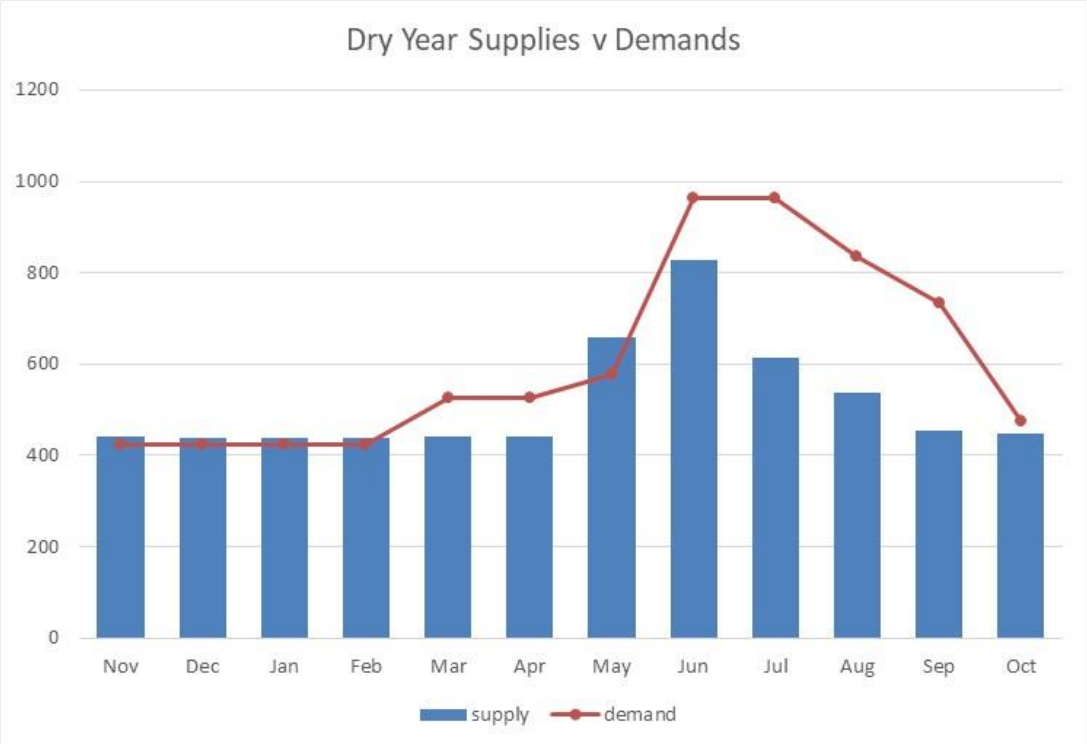
Thornton farms have been dried up and the shares have remained idle for some time. To account for this, the observed head gate diversions were scaled up so as to better represent the per share yield that would be expected from the company. Each ditch was evaluated in this manner, with adjustments applied to historical observations as necessary. Existing water court decrees were also referenced as needed to calibrate yields and return flow obligations for the different water supplies. The following chart shows the variability in annual yield.



For purposes of the yield model, supplies are evaluated on a monthly time-step. This is important, as most Poudre basin supplies have a temporal component and will yield mainly during the runoff period of May through July. C-BT has built in storage (Horsetooth Reservoir), so timing on yield is not an issue. The following chart identifies the average monthly yield on the District's Poudre basin supplies, with C-BT being evenly distributed across the twelve months.



And now the same graph, for the extremely dry year 2002.

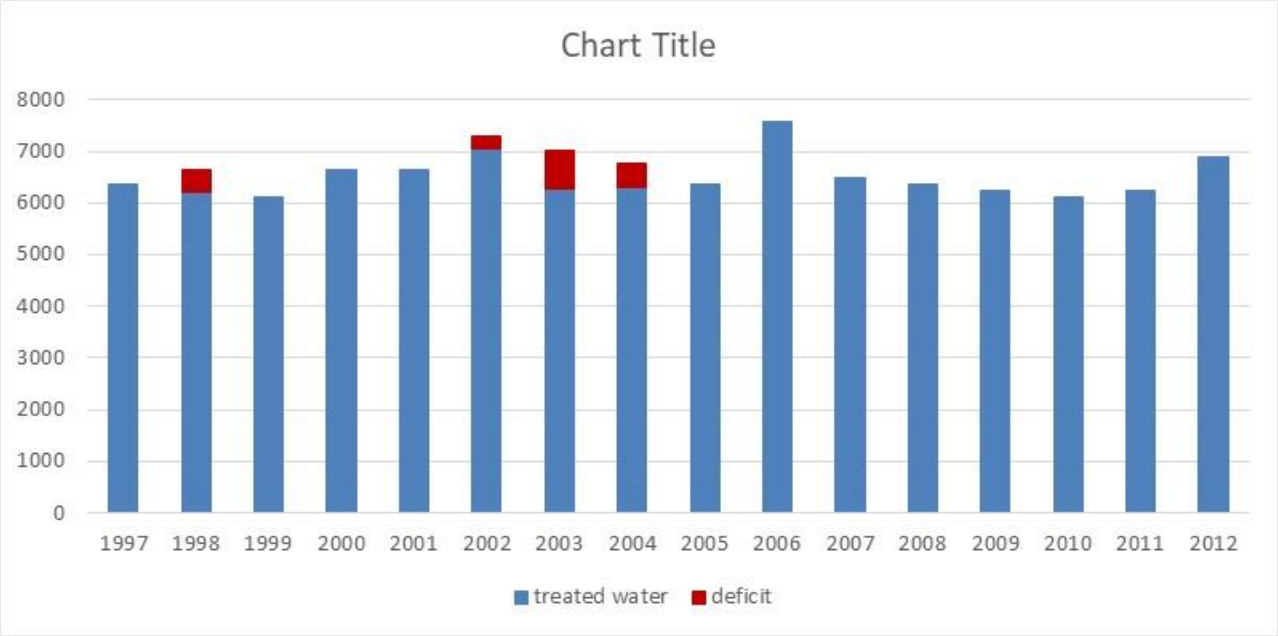


Planning Model

The planning model has been built in Excel. The model operates on a monthly time-step with time-series inputs consisting of supplies and demand. Each source of supply has its own unique monthly value. Demands consist of a single time-series that represents the monthly amount of water that must be treated at the plant to meet customer demands. Other parametric values are assigned by the user, such as local storage volumes (e.g., Overland Trails gravel pits), carryover storage limits in the C-BT system, etc. The user creates a scenario by building a water rights portfolio and selects a base demand level. The model then operates on the 17 years of monthly data (17x12=204 time steps) to evaluate whether the demands can be met based upon spatial and temporal variability in the water supply, within the structural limitations of the system such as conveyance capacities and storage space.

The spatial component of water supplies must be factored into the model, as there may be times when the water cannot be exchanged upstream to the diversion location at the Munroe Pipeline. This would be an issue primarily for supplies originating below the Lincoln Street gage. C-BT supplies, on the other hand, are always physically available for delivery to the Soldier Canyon Treatment Plant.

In meeting demands, the model will first take water that is yielding from the Poudre basin supplies. These supplies are essential direct flow rights and must be utilized by the District as they yield. Normally this would consist of diverting the flows at the Munroe Canal. In the event the Poudre basin supplies exceed the monthly demand at Soldier Canyon, the model will place the supplies into storage if space is available. In months that demand exceeds Poudre basin supplies, C-BT will be releases from Horsetooth and/or supplies will be released from Overland Ponds. Basically, the model operates a direct flow step and then a reservoir release step for each monthly iteration.



APPENDIX 5

Williams & Weiss Consulting, LLC

Tech Memo: draft

To: Eric Reckentine, NWCWD General Manager

From: Paul Weiss, WWC

George Oamek, Headwaters Corporation

Date: September, 2021

Re: Drought Mitigation

Introduction

WWC has developed a computer simulation model to evaluate the North Weld District water supply system. The model simulates the performance of the water supply system over a 50-year period of record, using historical water supply and river flow data derived from 1970 to 2019. This 50-year period contains a wide range of hydrological conditions, most notably the 2000's drought. The model has been updated using the District's latest demand projections and water supply portfolio. During the 2000's drought, the model projects water supply shortages for the District. Under severe drought conditions, the District may need to invoke demand management strategies, such as outdoor watering restrictions. Model output has been evaluated to identify water supply metrics, and threshold values, that may suitable for use as drought mitigation triggers.

Customer characteristics of the North Weld District influence drought plan development. Most water providers in the region primarily serve residential customers who tend to use a large portion of their annual usage for landscape irrigation during the warm months, as much as 50 percent. Residential usage accounts for as much as 90 percent of total demand for many systems in the region. In contrast, traditional residential customers account for about 25 percent of North Weld's usage, with wholesale service to regional communities and commercial customers accounting for 37 percent and 38 percent of usage, respectively. The proportions are significant because these non-residential customers have little discretionary water usage to reduce. Commercial usage is dominated by dairy farms who use the water as part of their production process. Reductions in wholesale municipal usage to the towns would likely take place on the towns' side of the meter, out of the North Weld District's control. As a result, short-term measures will fall primarily upon a relatively small residential sector.

The North Weld District's residential development is rapidly growing and concentrated towards the west and south, in proximity to the larger communities of Fort Collins, Loveland, and Greeley. Residential housing types and lot sizes are similar in these border areas and its follows that some consistency in drought response measures across communities would be beneficial.

Surrounding providers define different stages of drought and implement increasingly aggressive conservation measures as the stage increase in severity. For instance, Fort Collins identifies three stages, plus a Stage 4 "worst case" scenario in which mandatory cutbacks and rationing may be implemented. Outdoor usage and conservation pricing are the main target of the drought stages, with odd-even day watering and time of day restrictions that evolve into single day watering, to no outdoor watering, as the stages progress from Stage 1 to Stage 3. The volume price of water beyond the lower tier also increases with each stage. For Fort Collins, the upper tier prices increase by 20 percent and 30 percent. These conservation measures are available to the North Weld District, although enforcement of landscape restrictions and modifying pricing methods will incrementally increase the District's operating cost.

SECTION 1: DROUGHT TRIGGERS

Water Supply/Demand Background

North Weld District's water supply portfolio consists of native water rights and Colorado-Big Thompson (C-BT) units. The majority of the native water rights are associated with share ownership in various irrigation company ditches located in the Cache la Poudre River basin. The long-term (1970-2019) average, treatable yield for the existing portfolio is 9,610 AF. About 2/3rd of the yields derive from the C-BT system. This consists of North Weld's C-BT unit ownership, the multi-use component of its NPIC shares, and a lease agreement with Colorado State University for approximately 500 AFY. The remaining 1/3rd of its yield comes from native water rights. During extreme drought conditions coupled with a low C-BT quota, as experienced in 2000's drought, North Weld's water supply yield drops to 6,870 AF. A portion of the water supply is lost to system shrink, consisting of river conveyance losses, reservoir evaporation, plant production losses, and pipeline transmission losses. While the computer model explicitly represents the different losses, they may be considered to average, collectively, about 15% of the supply.

North Weld's current annual potable demand is about 6,500 AF. Depending upon climate, and its effect on outdoor irrigation demands, the annual demand can range from 7,300 to 5,900 AFY. These values represent an "at-the-tap" demand. The delivery levels at the treatment plant will be greater, as approximately 9% of the treated supplies are lost due to production and transmission losses. Therefore, the annual average "at-the-plant" demand is about 7,100 AF. Of this amount, about 1,400 AF, on average, goes to meeting outdoor demands. This represents 20% of the total demand. For this region, the percent outdoor demand for most water providers is closer to 40%. North Weld's outdoor component is low as a result of the relatively large commercial demand levels associated with the dairy industry.

During the 2000's drought, the model predicts that North Weld would have a water supply deficit of 1,800 AF, under current conditions for supply and demand. A second scenario was evaluated, in which the lease agreement with CSU was no longer active. Under this reduced supply scenario, the deficit during the 2000's drought increases to 4,000 AF. Chart 1 shows simulated carryover storage levels and annual supply deficits for the two scenarios.

Water Supply Metrics

North Weld evaluates its water supply each spring to assess its ability to fully meet all system demands. There are three metrics used to forecast seasonal water supply; snowpack in the Cache la Poudre basin (or NRCS streamflow forecast), projected C-BT quota, and volume of water carried over from the previous season. The metrics can be determined by North Weld prior to the irrigation season.

The carryover volume is known by mid-winter, the C-BT quota declaration usually occurs in mid-April, and snowpack can be reasonably evaluated by May 1st. (April 1st and May 1st published NRCS streamflow forecast values for 1998-2019 were compared against North Weld's native water rights yields. The April 1st NRCS forecast had a weak correlation of 0.485, while the May 1st NRCS forecast had a stronger correlation of 0.725.) Therefore, by May 1st of each year, North Weld should have adequate information to evaluate the condition of their water supply and to determine whether or not irrigation restrictions will need to be activated for the coming summer.

The three metrics (snowpack, C-BT quota, and carryover storage) are tabulated for the fifty year simulation period (1970-2019) in Table 1. Included are the simulated water shortages for the current conditions scenario (Scen1). Data for the reduced supply scenario (Scen2) is presented in Table 2. After evaluating the metrics against the model results, it is recommended that "trigger" threshold for the metrics be the following:

- C-BT quota less than 80%
- Carryover Storage less than 2,400 AF
- NRCS Streamflow Forecast below average

If all three metrics fall below the threshold, then conditions dictate that the District should implement drought restrictions. These are general guidelines that can be easily translated into operational policy. But the District should continue to evaluate each water year independently based upon its unique set of circumstances and maintain the ability to implement drought restrictions as deemed necessary.

Chart 1. Model Results for Current Conditions Scenario (Scen1) and Reduced Water Supply Scenario (Scen2)

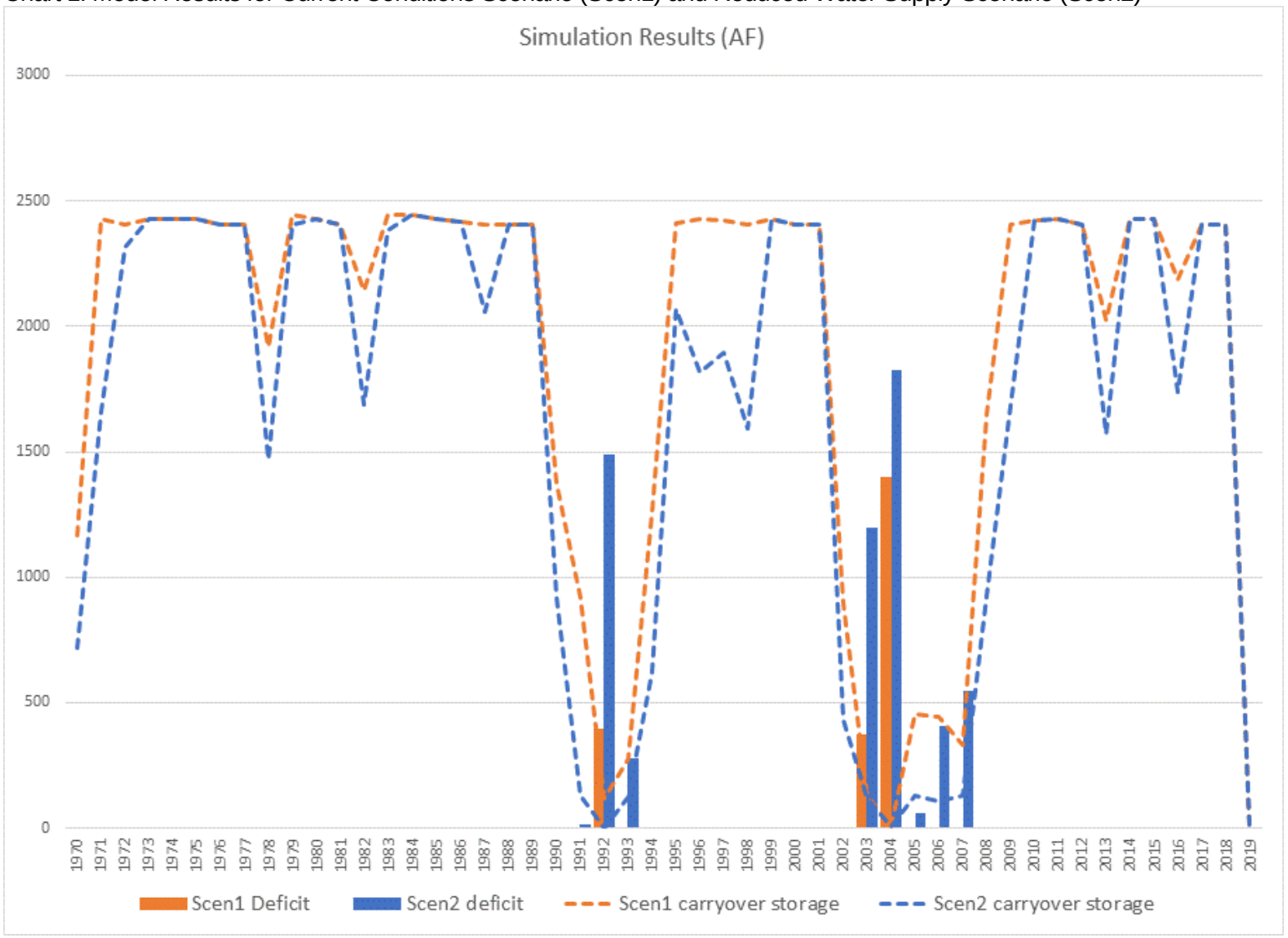


Table 1. Current Conditions Scenario (Scen1)

year	cbt quota	carryover	snowpack	Simulated Deficit	trigger
1970	0.6		1	0	
1971	0.6	717	1	0	
1972	0.8	1660	0	0	
1973	0.7	2317	1	0	
1974	1	2426	1	0	
1975	0.8	2426	1	0	
1976	1	2426	0	0	
1977	1	2403	0	0	
1978	0.6	2404	0	0	
1979	0.6	1469	1	0	
1980	0.7	2403	1	0	
1981	1	2426	0	0	
1982	0.6	2406	0	0	
1983	0.5	1690	1	0	
1984	0.7	2384	1	0	
1985	0.7	2443	1	0	
1986	0.7	2426	1	0	
1987	0.7	2416	0	0	
1988	0.8	2058	0	0	
1989	1	2407	0	0	
1990	0.5	2408	0	0	
1991	0.6	922	0	0	1
1992	0.6	131	0	396	1
1993	0.6	3	0	0	1
1994	0.7	126	0	0	1
1995	0.8	621	1	0	
1996	0.5	2071	1	0	
1997	0.6	1814	1	0	
1998	0.5	1896	1	0	
1999	0.8	1592	1	0	

Table 1. Continued

year	cbt quota	carryover	snowpack	Simulated Deficit	trigger
2000	1	2426	0	0	
2001	0.9	2405	0	0	
2002	0.7	2406	0	0	
2003	0.5	431	0	372	1
2004	0.6	118	0	1397	1
2005	0.7	5	0	0	1
2006	0.8	131	0	0	
2007	0.8	106	0	0	
2008	0.8	129	0	0	
2009	0.8	928	0	0	
2010	0.8	1681	1	0	
2011	0.8	2422	1	0	
2012	1	2426	0	0	
2013	0.6	2404	0	0	
2014	0.6	1572	1	0	
2015	0.7	2426	1	0	
2016	0.7	2426	1	0	
2017	0.8	1739	1	0	
2018	0.8	2408	1	0	
2019	0.7	2408	1	0	

Table 2. Reduced Water Supply Scenario (Scen2)

year	cbt quota	carryover	snowpack	Simulated Deficit	trigger
1970	0.6		1	0	
1971	0.6	717	1	0	
1972	0.8	1660	0	0	
1973	0.7	2317	1	0	
1974	1	2426	1	0	
1975	0.8	2426	1	0	
1976	1	2426	0	0	
1977	1	2403	0	0	
1978	0.6	2404	0	0	
1979	0.6	1469	1	0	
1980	0.7	2403	1	0	
1981	1	2426	0	0	
1982	0.6	2406	0	0	
1983	0.5	1690	1	0	
1984	0.7	2384	1	0	
1985	0.7	2443	1	0	
1986	0.7	2426	1	0	
1987	0.7	2416	0	0	
1988	0.8	2058	0	0	
1989	1	2407	0	0	
1990	0.5	2408	0	0	
1991	0.6	922	0	15	1
1992	0.6	131	0	1491	1
1993	0.6	3	0	278	1
1994	0.7	126	0	0	1
1995	0.8	621	1	0	
1996	0.5	2071	1	0	
1997	0.6	1814	1	0	
1998	0.5	1896	1	0	
1999	0.8	1592	1	0	
2000	1	2426	0	0	
2001	0.9	2405	0	0	
2002	0.7	2406	0	0	

Table 2. Continued

year	cbt quota	carryover	snowpack	Simulated Deficit	trigger
2000	1	2426	0	0	
2001	0.9	2405	0	0	
2002	0.7	2406	0	0	
2003	0.5	431	0	1196	1
2004	0.6	118	0	1823	1
2005	0.7	5	0	57	1
2006	0.8	131	0	407	
2007	0.8	106	0	545	
2008	0.8	129	0	0	
2009	0.8	928	0	0	
2010	0.8	1681	1	0	
2011	0.8	2422	1	0	
2012	1	2426	0	0	
2013	0.6	2404	0	0	
2014	0.6	1572	1	0	
2015	0.7	2426	1	0	
2016	0.7	2426	0	0	
2017	0.8	1739	1	0	
2018	0.8	2408	1	0	
2019	0.7	2408	0	0	

SECTION 2: DROUGHT ACTIONS

Water conservation to mitigate drought will focus upon residential customers' outdoor water usage. This represents the largest volume of discretionary water usage within the North Weld District and provides consistency with other regional water providers' proposed measures. These measures are contained in three stages representing increasing drought severity and are summarized in Table 1.

Table 1. Proposed Measures for the NWCWD Water Shortage Action Plan

Residential customers				
	Days per week outdoor watering	*Surcharge on usage > 6,000 gal/month*	*Estimated % demand reduction in outdoor usage*	*Total reduction in annual system demand*
Stage 1	*2*	*25% -- $3.88/1,000 gal. goes to $4.85/1,000 gal.*	*25%*	*260 acre-feet*
Stage 2	*1*	*50% -- $5.82/1,000 gal.*	*50%*	*520 acre-feet*
Stage 3	*0*	*50% - $5.82/1,000*	*100%*	*1,034 acre-feet*
Non-Residential Customers				
Stage 1	*2*	*NA*	*NA*	
Stage 2	*1*	*NA*	*NA*	
Stage 3	*0*	*NA*	*100%*	*400 acre-feet*

Under the Stage 3 condition, there is no discretionary outdoor watering for landscaping allowed for any District customer, including non-residential customers (with possible exceptions yet to be developed).

It is important to note that the proposed surcharge on usage is on a monthly basis and would be in addition to the Water Allocation surcharge on total annual usage already used by the District. It should also be noted that the total estimated water use reduction is somewhat modest due to a relatively small residential sector, with savings representing less than 10 percent of total usage under Stage 1 and Stage 2 conditions, and about 20 percent under Stage 3 conditions.

Achieving greater savings would require the District to develop conservation measures for non-*residential customers, such as for the large dairies accounting for a major portion of non-residential*

demand. These measures are necessarily industry-specific and are currently being examined by the District as part of larger water supply and infrastructure issues.

SECTION 3: RECOMMENDATIONS

We recommend the North Weld District incorporate the information and findings provided in this tech memo to develop an actionable drought mitigation policy. Drought triggers can be based upon the three water supply metrics (snowpack, C-BT quota, and carryover storage) which are typically known by the end of April. Using the water supply metrics as guides, the District can enact staged drought mitigation measures, as identified in Table 1.

APPENDIX 6

Williams & Weiss Consulting, LLC

Tech Memo: draft

To: Eric Reckentine, NWCWD General Manager

From: Paul Weiss, WWC

Date: May, 2023

Re: Updates to the Water Supply Planning Model

Introduction

WWC has developed a computer simulation model to evaluate the North Weld District water supply system. The model simulates the performance of the water supply system over a 50-year period of record, using historical water supply and river flow data derived from 1970 to 2019. This 50-year period contains a wide range of hydrological conditions, most notably the 2000's drought.

In the fall of 2021 the simulation model was used to evaluate the District's water supply and the system's ability to meet customer demands during a critical drought sequence. For the 2000's drought, the model projected water supply shortages for the District based upon the water rights portfolio and demand levels which existed at that time.

This May 2023 model update incorporates the current demand levels and water rights portfolio. Relative to 2022, the District's demands have shown a slight decrease. This update also evaluates the District's system response to reductions in C-BT quotas during a drought sequence such as the 2000's drought.

Model Updates

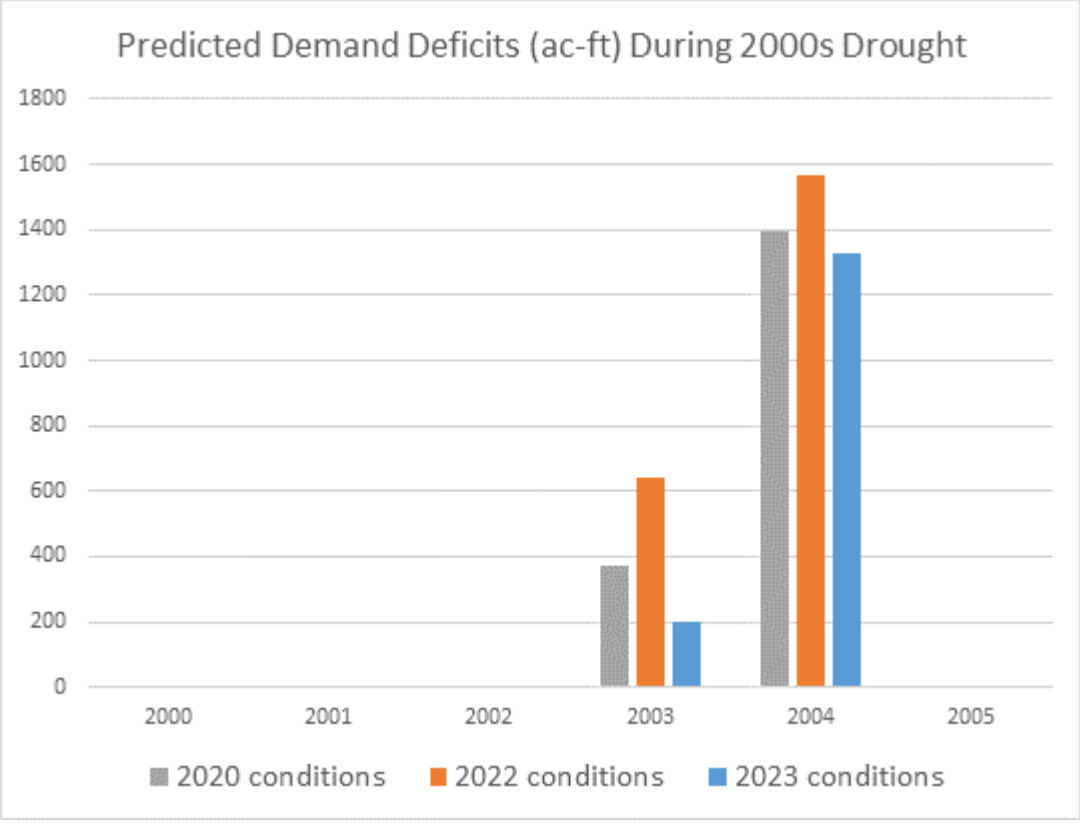
District staff have identified a reduction in demands for the winter of 2023, and using this information the forecasted demand for 2023 is expected to drop by 2.5% compared to 2022.

	Total North Weld Demand only (AF)	Change from Previous Year
2020	7,050.1	5.0%
2021	7,290.8	3.4%
2022	7,223.9	-0.9%
2023 Projected	7,041.4	-2.5%

On the water supply side, the District has acquired additional units of C-BT for a total of 5130 units.

Model Simulation Results

The following graph identifies the projected system deficits which are expected to occur should this region experience a drought identical to the historical 2000's drought. The 2000's drought was a multi-year drought with a recurrence interval of approximately 100 years. Other local water providers (cities of Fort Collins and Greeley) use a drought of this intensity and duration for appraising their water supply systems and evaluate its resilience to drought.



As shown in the graph, the combination of additional supplies and reduced demand has resulted in decreased deficit projections.

Impact of Reduced C-BT System Yields

The drought sequence simulated in the planning model uses historical C-BT quota levels for computing the District's annual C-BT allotments. The actual quota setting by Northern is a function of the projected streamflows for the upcoming year as well as the C-BT reservoir system's carryover conditions from the previous year. It should be noted that prior to the 2000's drought, both the State's river basins and the regional Colorado River Basin had experienced a cycle of good water years in the

late 1990's and reservoir levels were at or above normal operating levels. Today, the C-BT west slope storage facilities (primarily Granby and Green Mountain reservoirs) are only slightly below 1999 storage levels. But the Colorado River Basin reservoir system is at historic low levels. The largest storage facilities (Lake Mead and Lake Powell) are critically low. The two large upper Colorado River Basin storage reservoirs, (Blue Mesa and Flaming Gorge) are nearly 1.5 million acre-feet below their 1999 storage levels. This is important as these facilities are used to make obligated deliveries to lower basin States during drought years. Without these supplemental reservoir releases there is the possibility for water right curtailment within individual states. The C-BT west slope water rights are junior in the Colorado River basin and could potentially be called out.

From a planning perspective, the antecedent conditions which could affect C-BT quotas during a drought sequence should be evaluated to better understand the potential impacts to local water systems. Considering the historic low levels in the Colorado River Basin, it can be assumed that should another severe drought affect Colorado, the C-BT system storage rights may have reduced yields on the west slope and this would lead to reduced C-BT quotas for the east slope participants. To test the impacts to the District, two additional modeling scenarios were considered. One scenario has a moderate reduction (8%) in C-BT quotas, while the other has a more severe reduction (18%). The following table identifies the annual quotas used in the model under the baseline planning scenario, the moderate reduction scenario, and the severe reduction scenario:

CBT QUOTA			
Year	Historical	Moderate	Severe
2000	1	0.8	0.8
2001	0.9	0.7	0.7
2002	0.7	0.6	0.5
2003	0.5	0.5	0.4
2004	0.6	0.6	0.5
2005	0.7	0.7	0.6
2006	0.8	0.8	0.7
2007	0.8	0.8	0.7
total	6	5.5	4.9
% red.		8%	18%

The next table identifies the annual demand deficits under for the three corresponding scenarios:

SYSTEM DEFICITS (acre-feet)			
Year	Historical	Moderate	Severe
2000	0	0	0
2001	0	0	0
2002	0	0	508
2003	199	840	1686
2004	1326	1326	1960
2005	0	0	207
2006	0	0	557
2007	0	0	0
total	1525	2166	4918
% inc.		42%	222%

When simulated through the planning model it is shown that these relatively small reductions in C-BT quotas translate to significant increases in the District's drought deficits. This highlights the exposure that the District has to C-BT quota cuts and is a result of having a water rights portfolio heavily weighted to the C-BT system.

Internal note: all scenarios included a 500 AFY lease with CSU

Conclusion

While the District's water supply system is trending in a good direction with reduced demands and increasing supplies, the drought analysis does raise some concerns on the high dependency of the C-BT system. It is recommended that the District continue to diversify its portfolio, acquiring native water rights (WSSC) and local storage.

APPENDIX 7

Drought Analysis and Water Supply Model

Williams and Weiss Consulting March, 2020

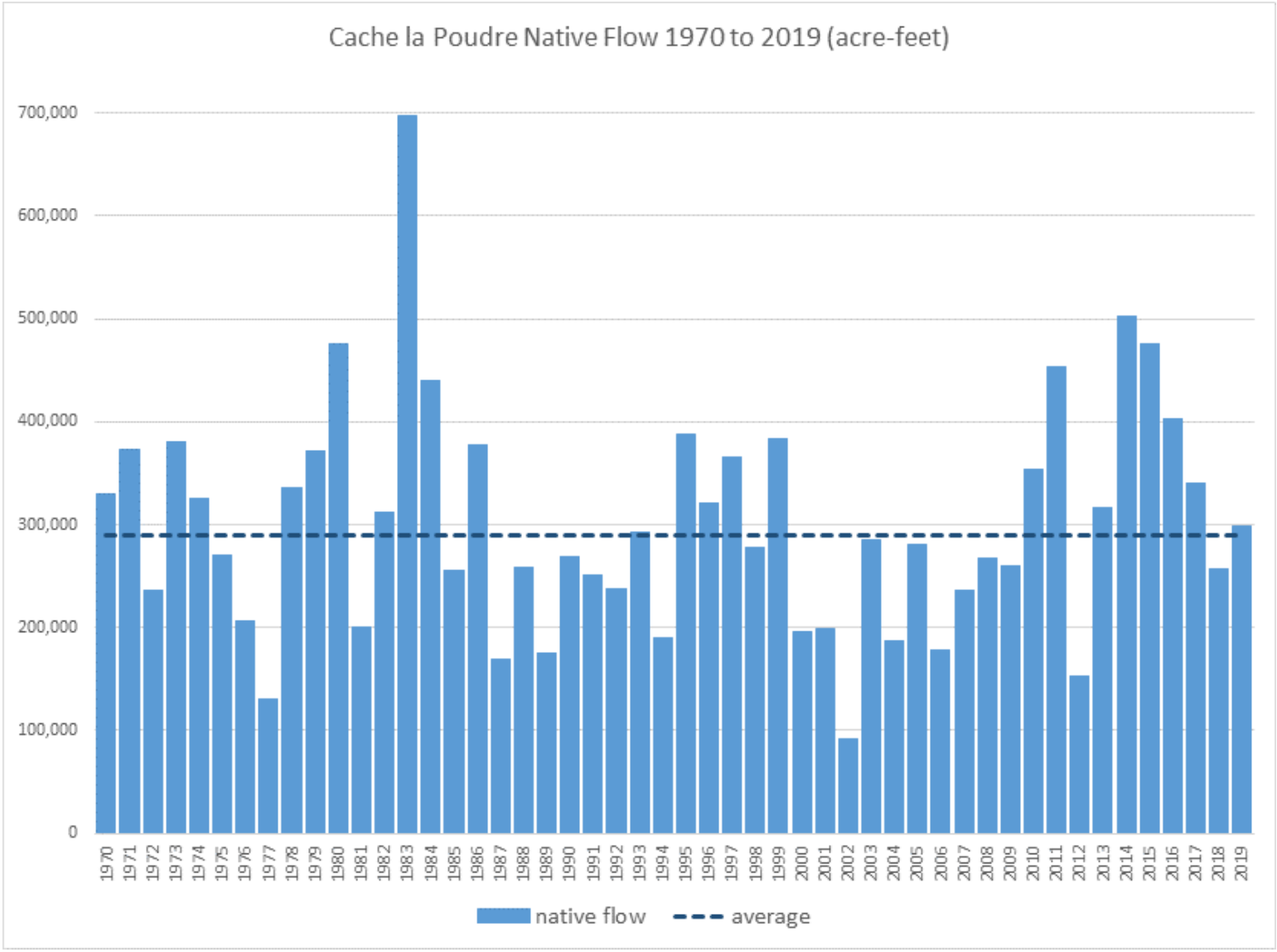
Objectives

- Identify *design drought* using historical hydrology
- Develop a *planning tool* to evaluate performance of the water supply portfolio
- Apply planning tool to inform *Policy Recommendations*
  - Water Rights acquisition and dedication
  - Reservoir storage and pipeline delivery systems
  - Effectiveness of drought management strategies
  - Forecasting future demands and supplies

Design Drought

- 2000's drought recommended for use in planning

-similar to design drought used by Fort Collins and Greeley



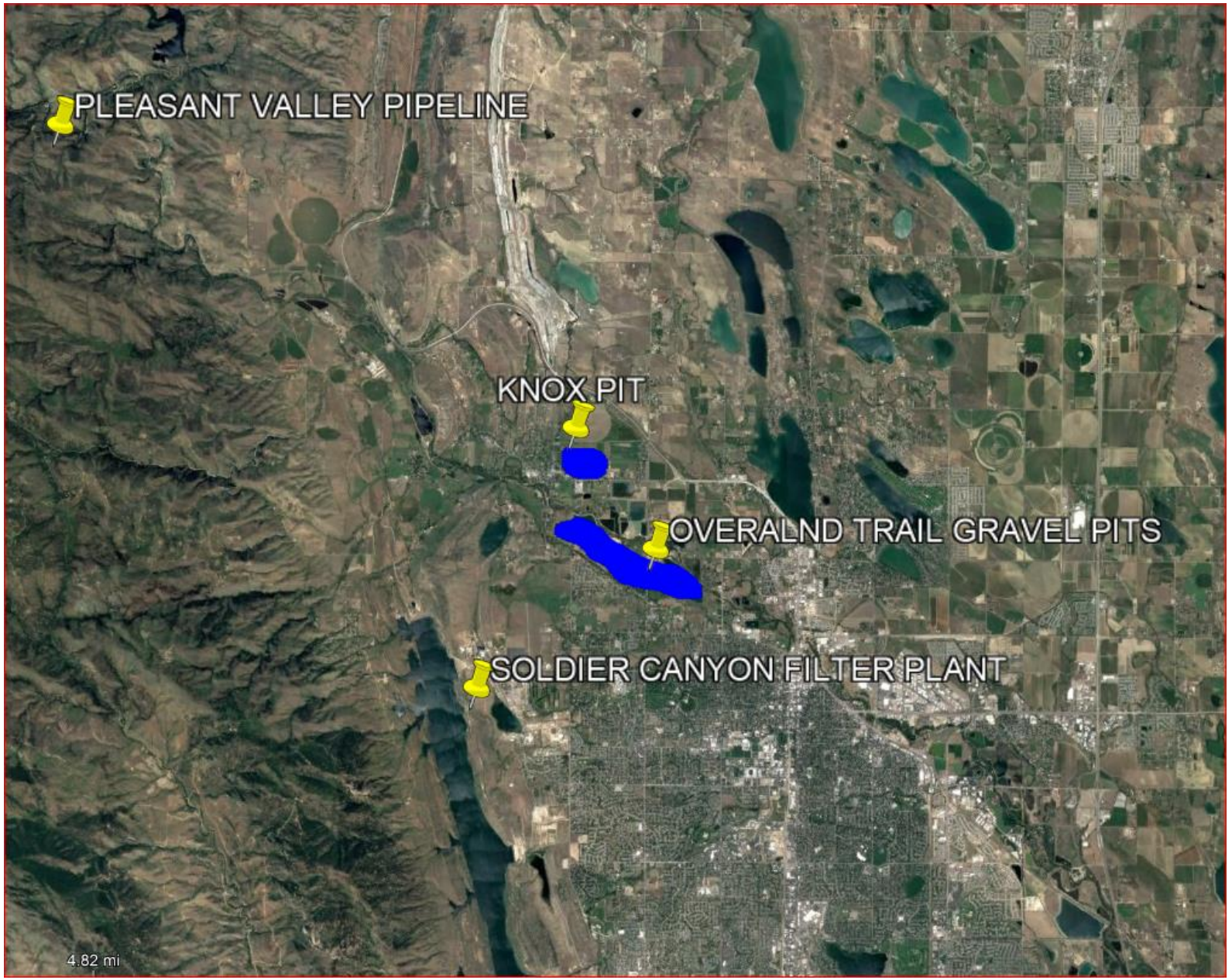
Water Management Planning Tool

- Most basic question
  - how will the water supply system perform during wet, average and dry hydrologic conditions?
- More specific question
  - If we experience the 2000's drought again, will North Weld be able to meet all of its obligated demands?
- Water managers often use simulation models to test their systems raw water operations
  - Develop the most efficient operational plan
  - Identify the system "firm yield"

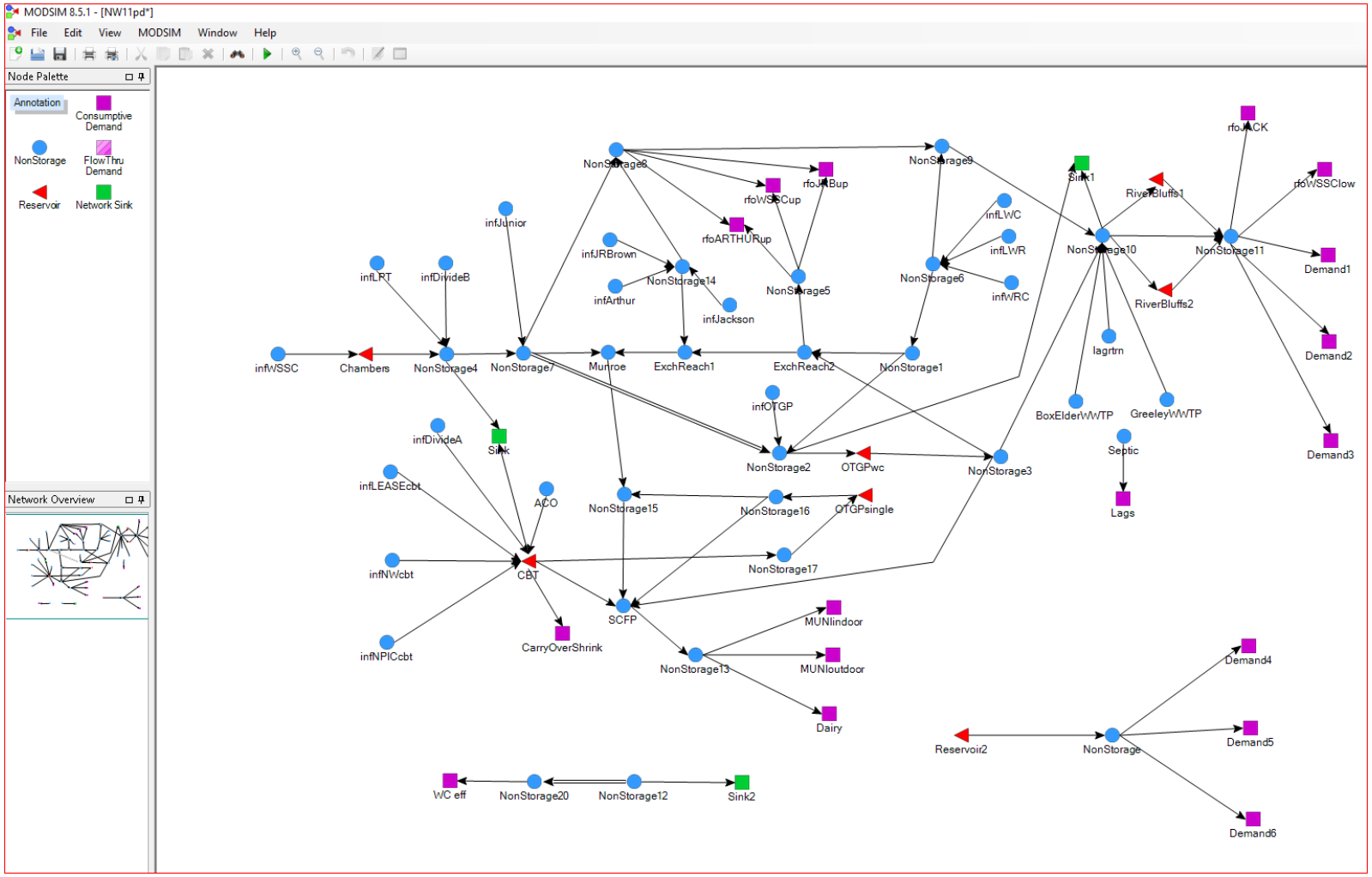
North Weld Planning Model

- Simulates North Weld water supply operations on a monthly time-step for a 50-year period of record (1970-2019)
- Monthly river yields based upon historical river flows and North Weld's water rights portfolio (input to model)
- Monthly potable water demands based upon North Weld's historical indoor and outdoor demand patterns (input to model)
- The model simulates the delivery of raw water supplies, from various sources, to Soldier Canyon Filter Plant
  - Horsetooth C-BT
  - Poudre River water rights
  - Overland trail gravel pits
- The model also simulates the generation of wholly consumable effluent and the requirement to meet Poudre River return flow obligations

Poudre Basin



MODSIM network flow model developed at CSU.
Used by several regional water providers.



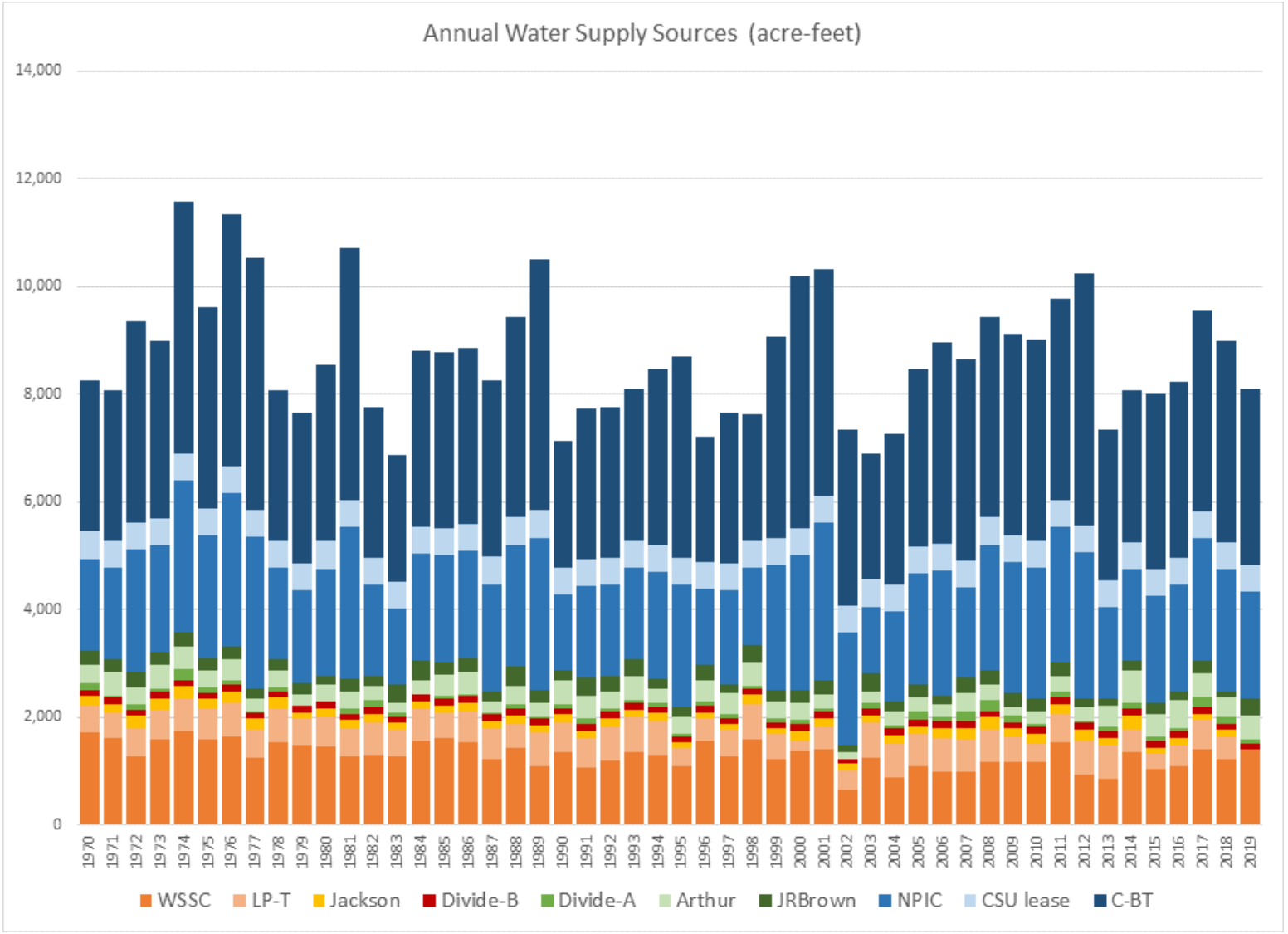
Performing a System Analysis

- Step 1: develop water supply and water demand scenarios
  - Monthly water supply yields for each water right
  - Monthly potable demands
  - Load monthly time-series data into MODSIM
- Step 2: parameterize model
  - Set capacities on pipes/pumps/reservoirs
  - Assign operational protocol
- Step 3: Execute simulation model
- Step 4: Process model output for review

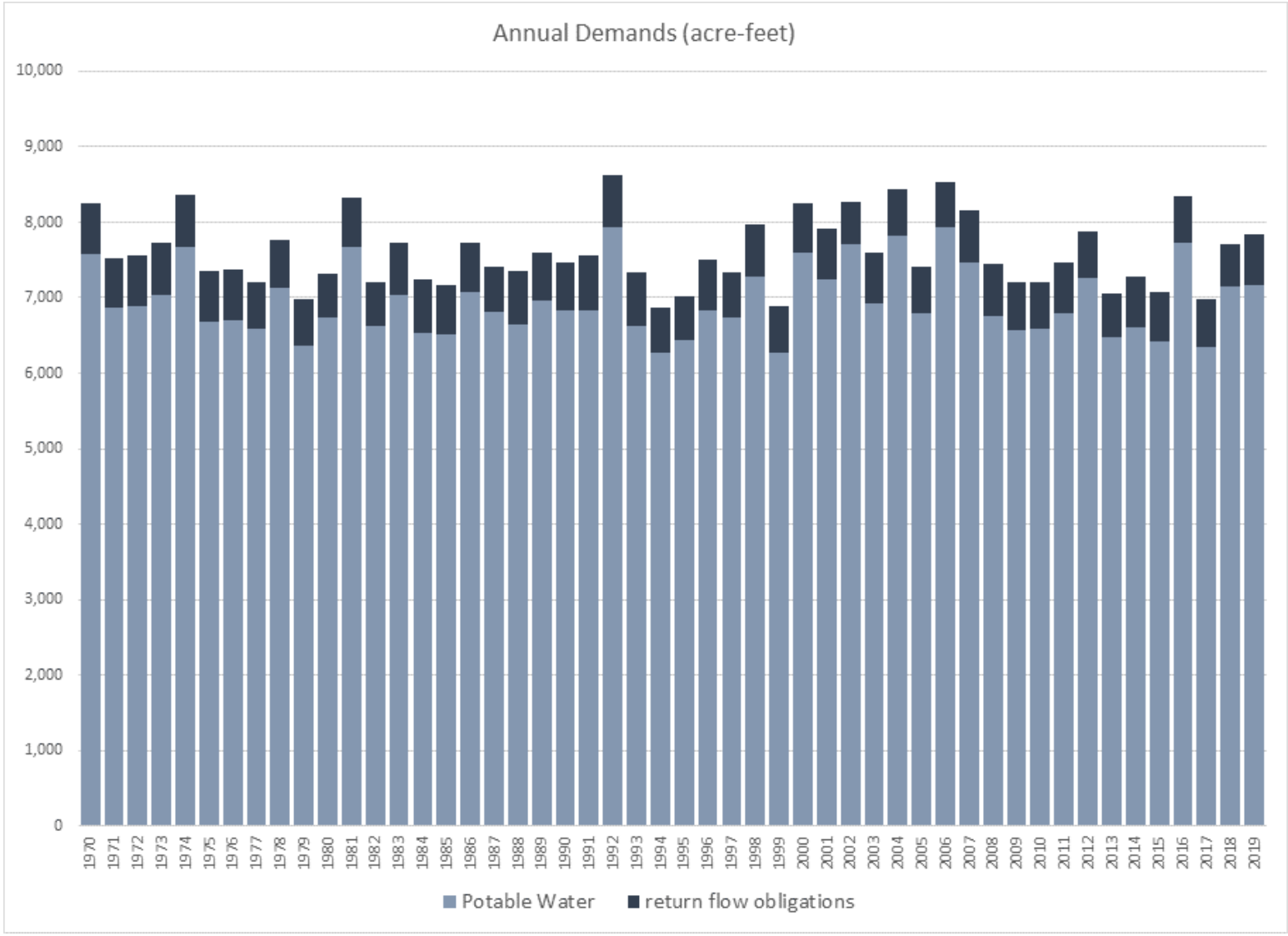
Example: Simulate a current conditions scenario

- Water management question: Given the District's existing water rights portfolio and demand levels, how will the system perform during a hydrologic cycle similar to the 2000's drought?
- Modeling steps: develop inputs, modify network, execute model, summarize output

Historical Yields based upon current (2020) water rights portfolio



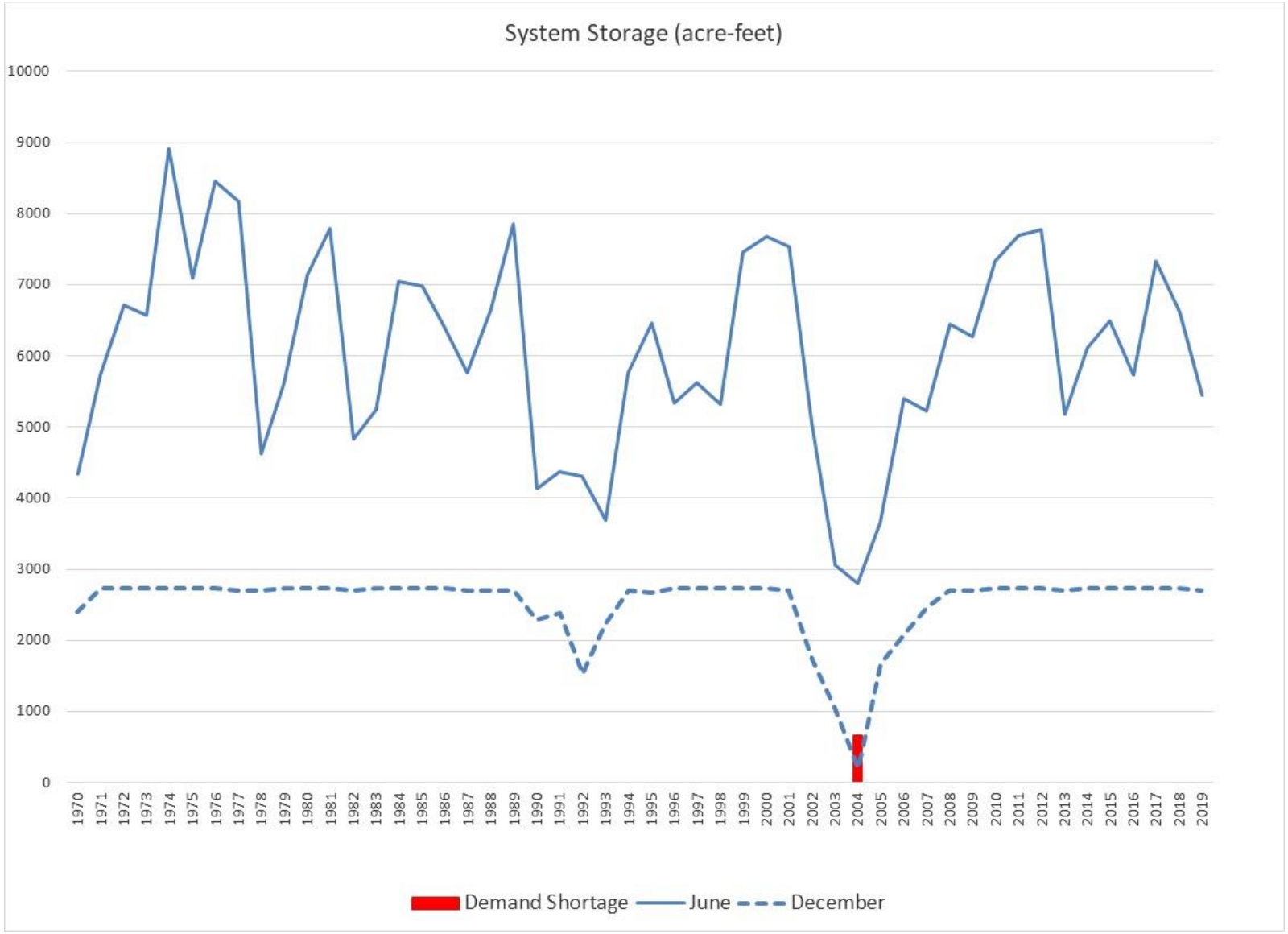
Demands based upon current (2020) customer base. Annual variability due to historical climate.



Summarize model output

Current Conditions

760 AF deficit

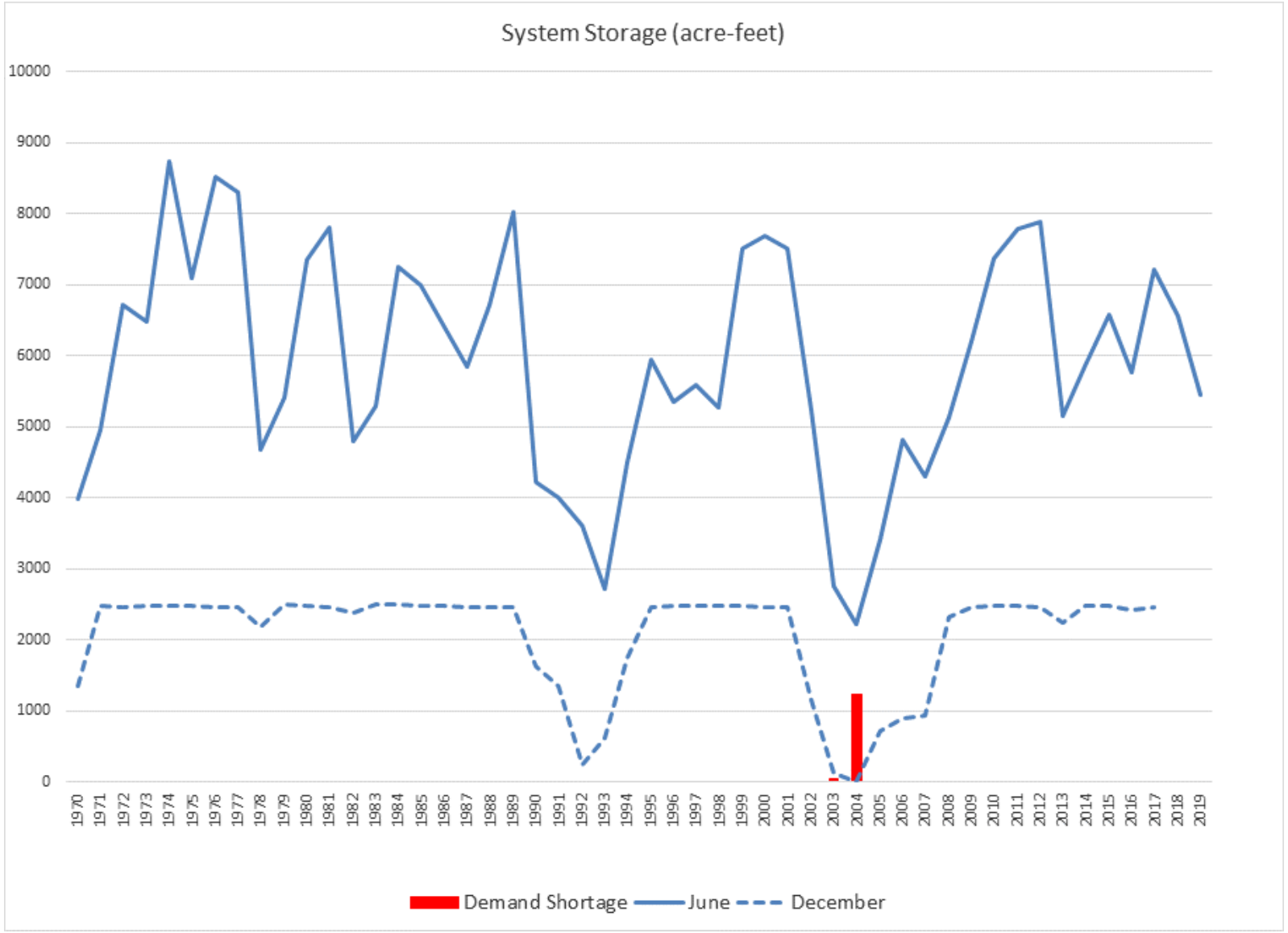


Additional Model Runs

- Obligated demand coming online (225 AF/year, no new supplies)
- Termination of CSU lease (approx. 500 AF/year of CBT)
- Additional system storage provided by Knox Pit (approx. 750 AF)

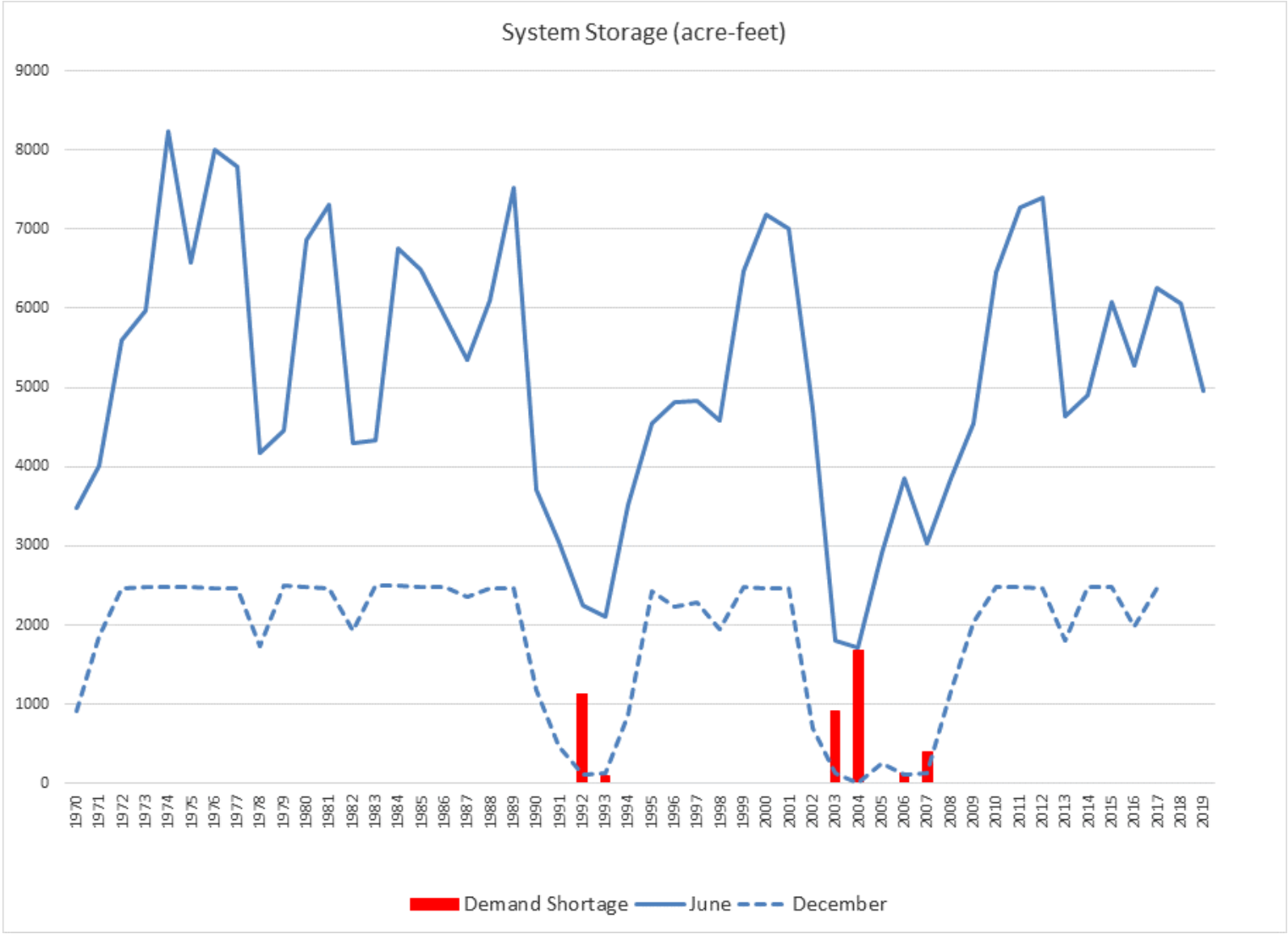
Obligated Demand

Slight increase in deficits



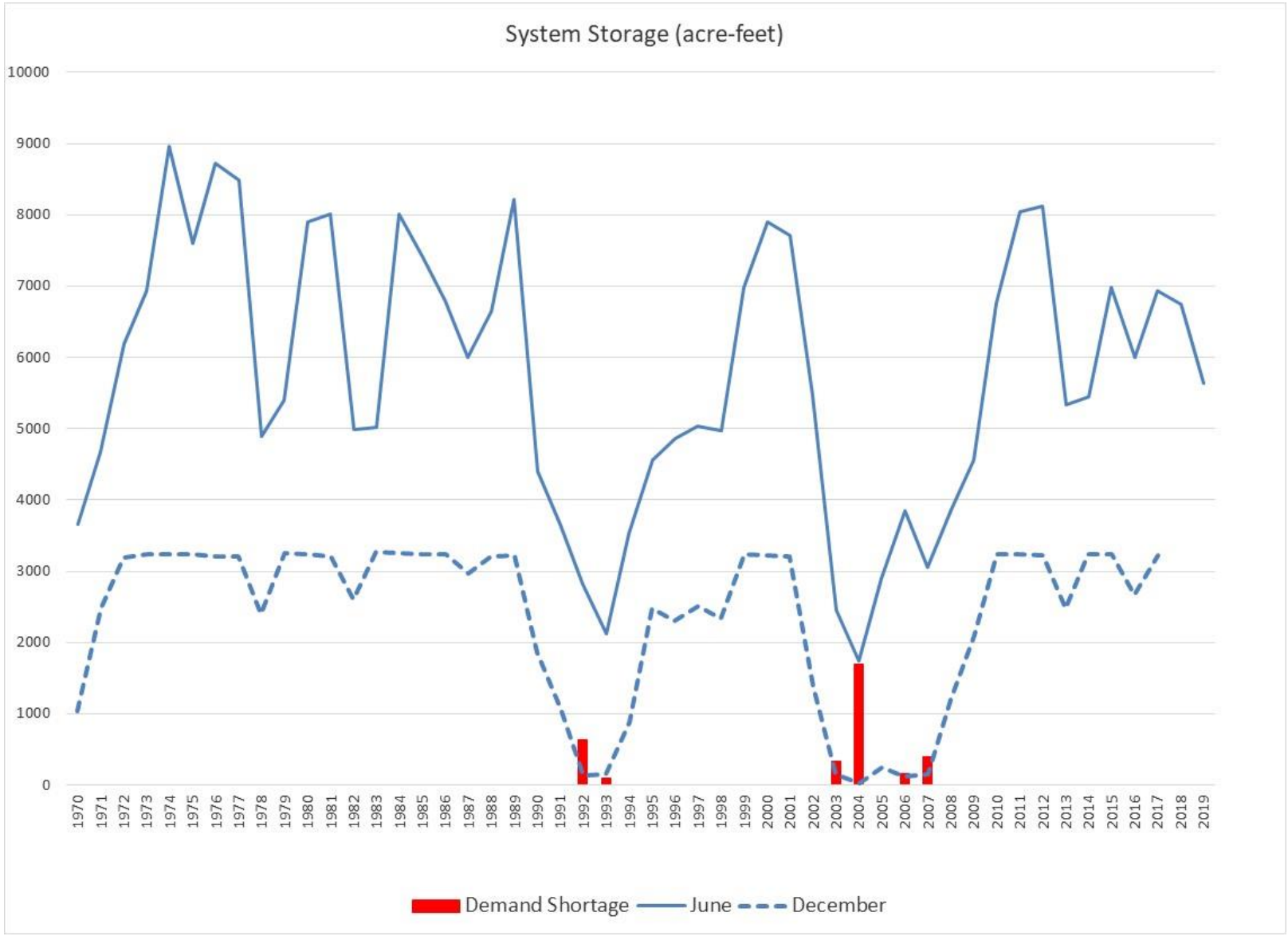
No CSU lease

Significant increase in deficits



Knox Pit

Some deficit reduction at beginning of drought



Tabular Data for Run Comparisons

Annual Deficits (acre-feet)

YEAR	Current Conditions	Obligated Demand	No CSU Lease	Knox Pit
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	1131	629
1993	0	0	94	98
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
2002	0	0	0	0
2003	0	37	906	330
2004	760	1230	1685	1687
2005	0	0	0	0
2006	0	0	128	152
2007	0	0	390	393
2008	0	0	0	0
2009	0	0	0	0
2010	0	0	0	0

Work Plan Moving Forward

- Master Plan Update (summer 2020)
  - Sensitivity to C-BT quota ---→ diversify portfolio
  - Local Storage
  - Future basin development and effects on yields
  - Evaluate effects of exchange potential limitation
- Test the effectiveness of demand restrictions
  - Based upon customer class
- Develop demand and supply projections out to year 2050

APPENDIX 8

Future of Water and Immediate Impacts

April 26, 2022

State of the District

- Aging infrastructure in need of repair and upgrade
- Water supply/storage not adequate for drought protection
- Growth in region exceeding planning projections
- Agreements with Dairy Farms

Current Needs

- Approximately $70M to replace aging infrastructure
- Approximately $70M to upgrade existing/build new infrastructure to serve growth “already on the books”
- Approximately $100M for water supply and storage for drought protection

Response

PREVIOUS

- Asked for voters for a mill levy increase in 2019-2020 to address infrastructure needs – failed at the ballot
  - Raised rates 7% each year
  - Considering Nov. 2022 ballot issue
- Require developers to bring water to the table (no more payment in lieu)
- Doubled Plant Investments
- Moratorium on new taps to discuss how to reduce demand due to new growth (partially lifted)
  - Towns can now move forward with most taps that are currently under review/committed

PENDING

- Continued rate increases at 7% annually
- Revisit town and District growth plans and projections. District needs to Master Plan again – evaluation of what we can and cannot provide (i.e., service caps into the future)
  - Towns
  - Commercial
  - Development within District
- **Create formal service agreements with Dairy Farms**

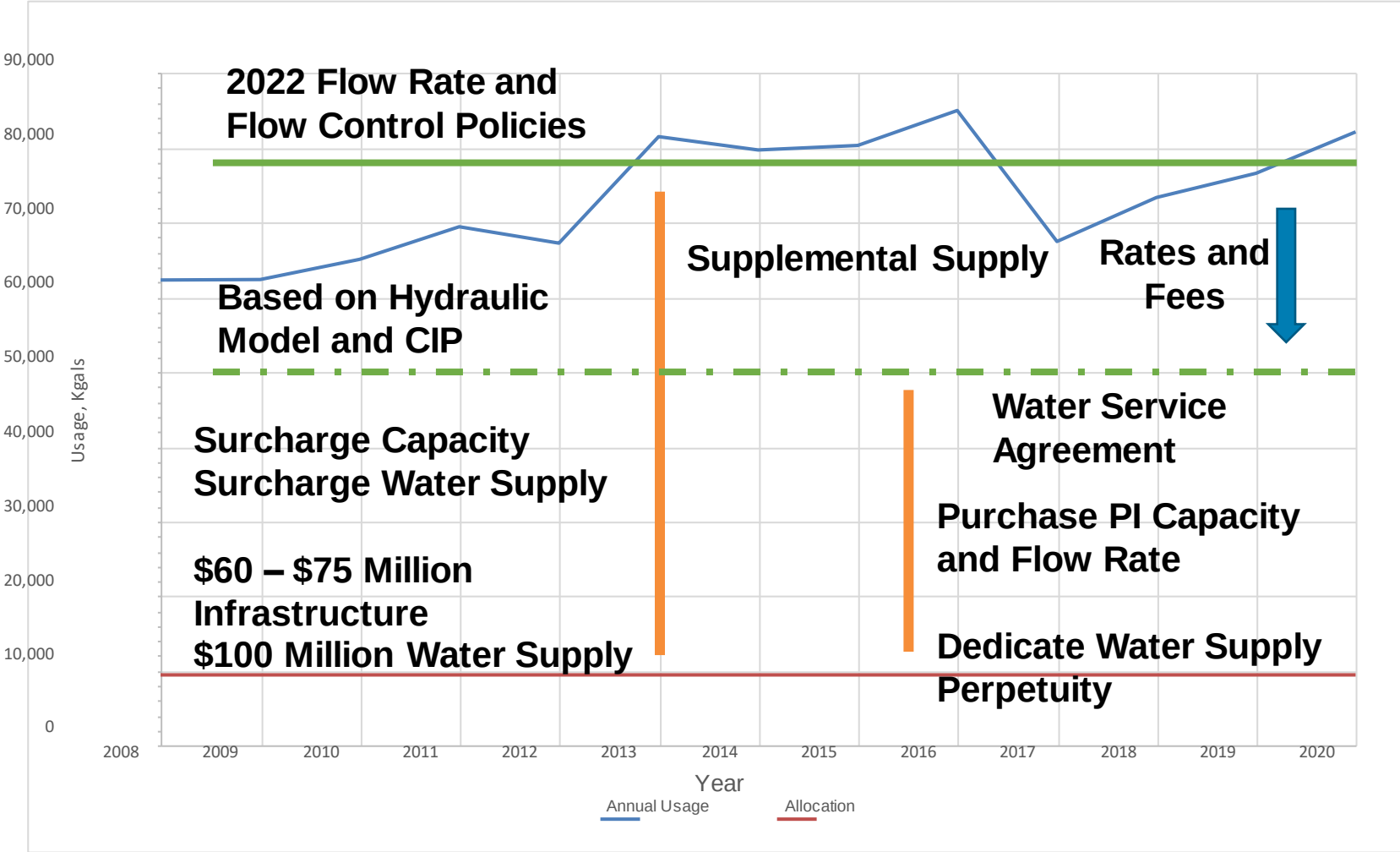
Dairy Farm Agreements

- Long-standing relationships
- Every account has specific water allocation and plant investment allocation
- Majority use more than their allocation with surcharges
- Results in 1,600- acre feet more water usage than supply in drought

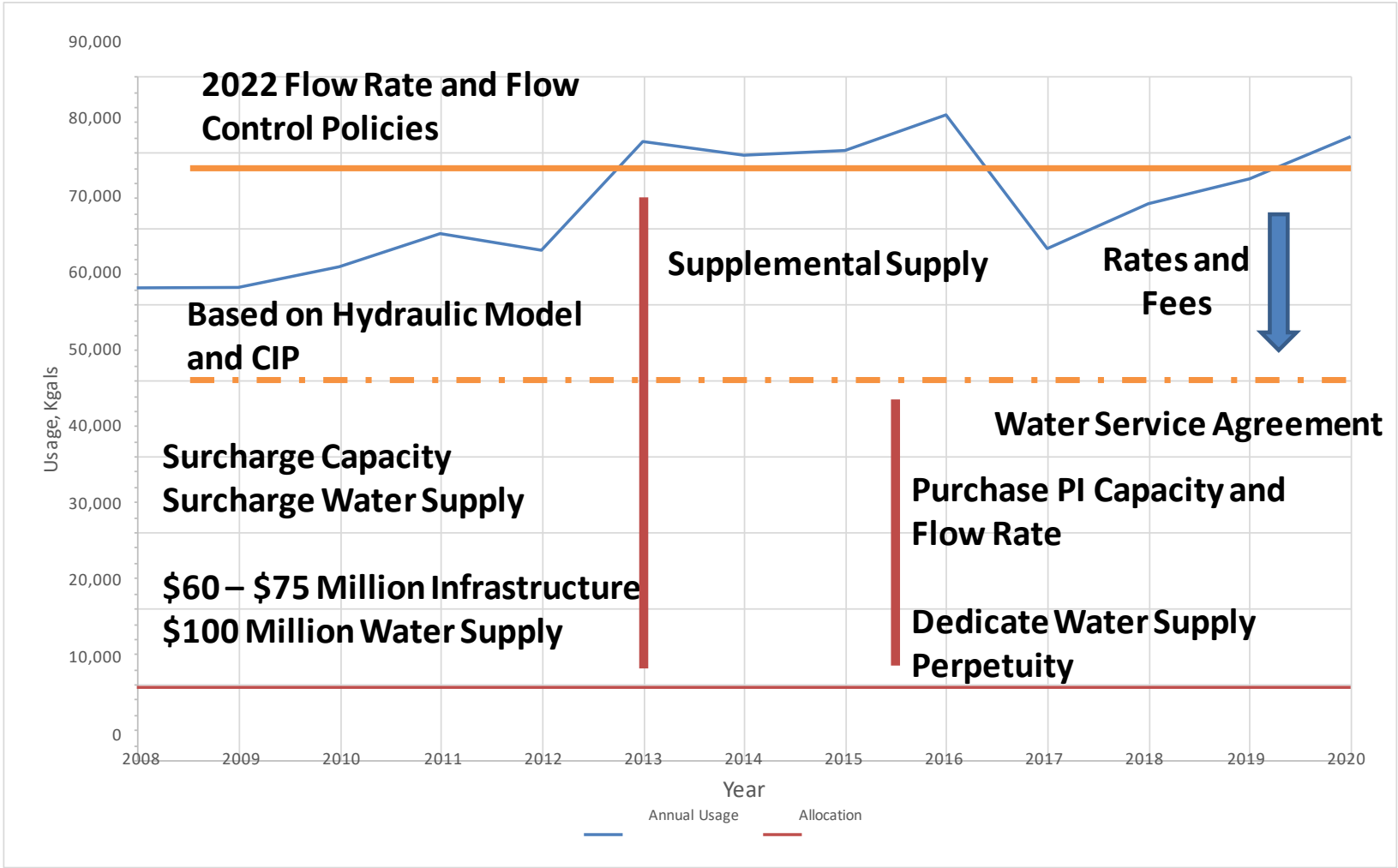
Changes in the District

- You will have access to the water supply that you committed to the District
- Continue surcharges for overuse of water and capacity beyond allocation
- The District cannot guarantee use of surcharge water in times of drought or curtailment
- Currently rolling out Flow Control Program
  - If you're under allocated during drought or curtailment, the District will have to limit use to your original allocation

Usage and Control Levels



Usage and Control Levels



Next Steps

NEW MASTER PLAN

- Determine flows and water supply each customer needs to bring to the District in perpetuity
- Determine caps for all customer classes (commercial, development and Towns)

MORATORIUM

Entire system in moratorium for new taps (not already committed/approved)

CONTINUED INVESTMENT IN CRITICAL INFRASTRUCTURE

- Plant expansion – 2019-2021 (bonds paid back by rate increases)
- New pipeline – 2024 (bonds paid back by rate increases)

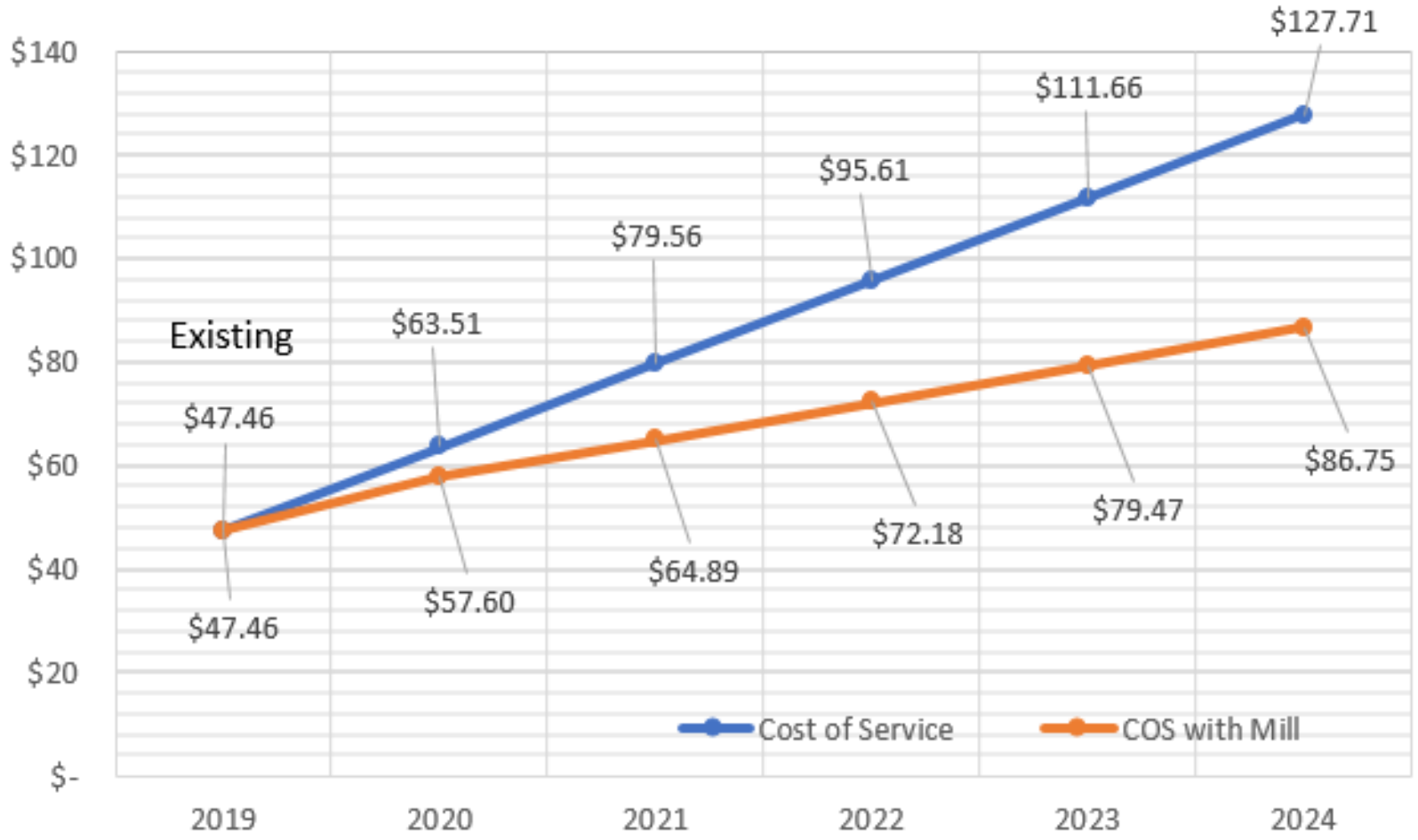
LONG-TERM FUNDING SOURCE

Pay for investments through rate increases or mill levy. Mill levy is cheaper.

WATER SERVICE AGREEMENTS

Revise Water Service Agreements to new capacity and water allocation limits

Rate Increase vs Mill Levy



5 Mill Levy would be an average monthly tax of $5.39 for Residential Customers

If We Do Nothing…

ZERO GROWTH

- District cannot accommodate any growth beyond current contracts.
- Towns and developers must find another provider.

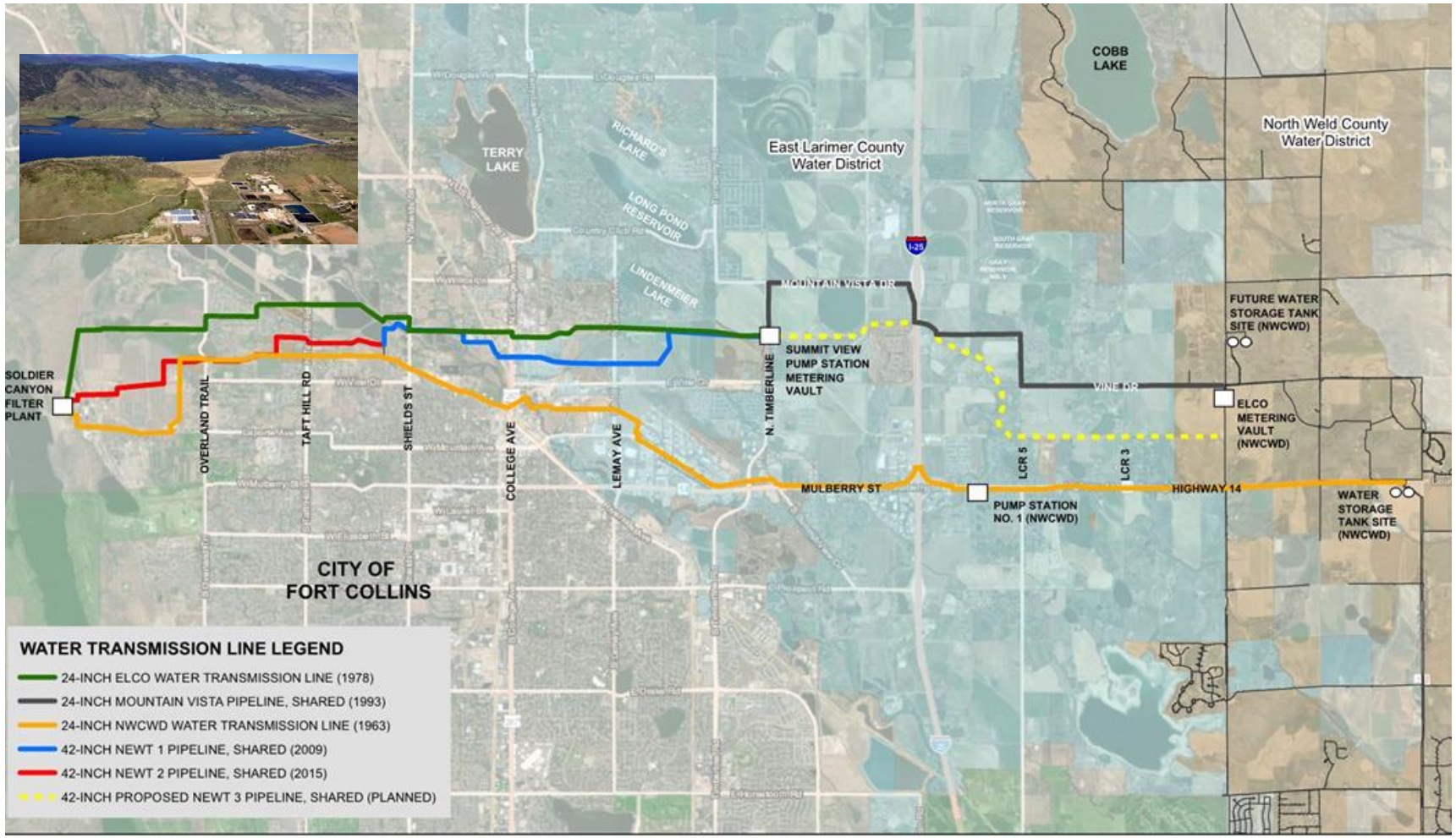
WATER USE RESTRICTIONS

Dairies still need to cut water usage and capacity use in times of drought or curtailment.

CRITICAL INVESTMENTS TO PREVENT FAILURE

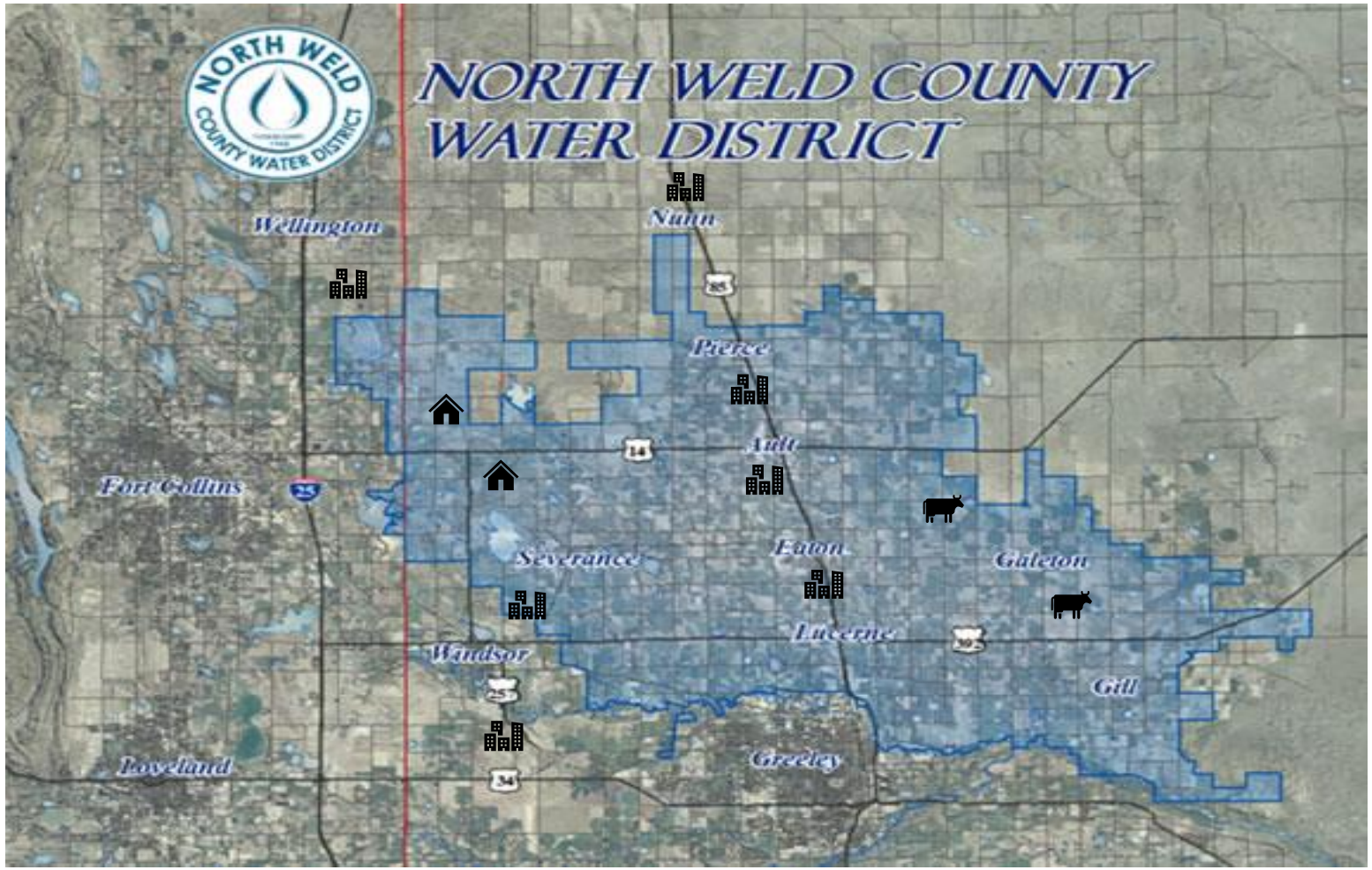
- The District will continue to raise rates to pay for critical infrastructure replacement and water supply only.
- Proposed mill levy increase could offset rates and provide needed funds for additional investments

Questions?



EXISTING TRANSMISSION SYSTEM

Map of Service Area



APPENDIX 9

MEMORANDUM

TO: **NWCWD BOARD**
CC:

FROM: ERIC RECKENTINE

DATE: OCTOBER 3, 2022

SUBJECT: COMMERCIAL SECTOR SURCHARGES, FLOW CONTROL, AND SURCHARGE REINVESTMENT

This memorandum stems from concerns expressed by dairies at the Board of Director's July and August 2022 meetings regarding the levels and policies behind Plant Investment (PI) and Water Allocation surcharges. These concerns were in response to PI fees nearing $4.00 per 1,000 gallons and Water Allocation surcharges being raised by the Board from $2.00 to $6.00 per 1,000 gallons following a recommendation to raise the Water Allocation surcharge to nearly $18.00 per 1,000 gallons.

This limited analysis was conducted by staff, water resources and consulting team at Williams and Weiss, and Honey Creek Resources to provide timely and accurate information related to:

- Dairy sector growth, water allocation shortages, plant investment shortages, rate of return related to surcharge reinvestments, infrastructure costs, and water acquisition costs.
- To assist the Board in making informed decisions on surcharge and allocation policies. This is accomplished by providing information and recommendations from staff and the legal and consulting team in relation to policy decisions and to risks associated with the dairy sector, and risks that the dairy customers place on the District.

The analysis is limited in the sense that the information and resulting conclusions are based on examination of nine of the largest dairies in the system, among the approximately 60 dairies and agricultural businesses the District serves. However, it should be emphasized that the identified issues are likely common to most enterprises in this customer class.

General Information

From 2017 through 2021, the District has performed the following:

- Acquired over 1,200 acre-feet of new water supplies at a cost of approximately $49,000,0000, averaging $41,000 per acre-foot.
- Constructed approximately $41,000,000 of system improvements, averaging about $8.2 million annually. However, this annual average is increasing at an increasing rate each year to serve growth and maintain reliable service.
- Has spent $47,000,000 in operations and maintenance (O&M), or about $9.4 million per year.
- Has received $80,000,000 in operational revenue.
- Has received $65,000,000 in non-operation revenue.
- Has maintained approximately $10,000,000 in operational and replacement reserve funds.

Overall, the District is running flat revenue to costs based on current rates and fees. That is, all current revenues are needed to cover current costs. In addition, the District issued $38,000,000 in bonds for transmission, distribution, and other upgrades, which will need to "cash flow" in order to maintain the District's financial integrity.

Preliminary Findings

The growth rates, cost implications and water shortages reported in these preliminary findings comprise a significant portion of the issue at hand, but it should be reiterated that the customer class is much larger than these nine dairies.

1. Usage at the nine dairies reviewed has increased by 100% over the period 2013-2021 and 25% since 2017. This equates to an annual compound growth rate nearly 6%. It should be emphasized that this growth is on existing meters and does not represent an increase in the number of customers, PI revenues, Water Allocation revenues, or dedicated water supply.
2. The increase in usage of the nine dairies since 2017 equates to 384 AF of additional water or 96 AF of increase growth annually in usage. For water supply alone, the tangible value of this foregone water supply – for nine dairies alone, exceeds $6,000,000 per year, with few signs of slowing down.
3. By coincidence, the District's current CIP budgets $6,000,000 per year for reliability-driven new water acquisitions. This budget expense will be spread over all District customers. In this light, it is apparent that District customers would be subsidizing water supply costs for a significant number of commercial customers who have exceeded their water allocations, with no resulting increase in reliability. In fact, reliability is currently being reduced.
4. The nine dairies examined have historically paid the District about $960,000 per year in water allocation surcharges when the surcharge level was set at $2.00/1,000 gallons. Based on the current prices of raw water, this $2.00/1,000 gallon amounted to about 16% of the actual cost of additional water supply. At a $6.00/1,000 gallons surcharge, these dairy customers are paying about $2,500,000 per year, or 45% of their annual usage increases. At either level, the remaining District customers are effectively paying the difference.
5. With C-BT units currently in the range of $62,500 per unit, and PI levels and Distance Fee levels totaling approximately $18,500 per tap, the following observations are offered:

    - As of the end of 2021, the nine dairies are collectively under-allocated in water at a level of approximately 1,478 acre-feet, representing a financial value of approximately $150,000,000. If these nine dairies were held at their current water usage levels, a significant "if", it would take approximately 140 years to fully reimburse the District at a surcharge of $2.00/1,000 gallons. At a surcharge of $6.00/1,000 gallons, it would take about 50 years. This assumes the District is willing finance this "correction", and also illustrates that incremental measures to bring surcharges and current water costs in line with one another may take a long time.
    - The District operational water supply is flat with operational demand when the volume of water under a surcharge water estimated above, 1,478 AF, is subtracted from overall supplies. Therefore, the District will be, or has already

entered into an operational supply deficit due to the current growth of the dairies, illustrated by just nine of the larger operations reviewed for this memo.

- Water provided to the District by others will be used to make-up for under-allocated dairies, thereby potentially causing shortages for customers in other customer classes, even in average or wet years.
- The District is not keeping-up with the growth in the usage of water for dairies, shown to be increasing nearly 6% per year for the nine dairies reviewed. The remaining District customers are bearing the financial and reliability burden associated with this high operational risk.
- In addition, the nine dairies use 1.3 million gallons per day (MGD) of infrastructure capacity annually since 2021. That usage is beyond their purchased allocations.
- The value of this capacity surcharge usage is estimated at $48,000,000. At current PI surcharge of $3.95/1,000 gallons, it would take the customers 25 years to reimburse the District, assuming their water usage stays at current levels. Note that the previous reinvestment program was voluntary for the dairies, so all ROI is based on maximum participation form the customer at their discretion.
- This infrastructure over-usage equates to lost opportunities for the District because this capacity is currently fixed to these premises.
- To maintain this current capacity the District needs to invest in additional infrastructure that will be financed through new customers' and others' PI fees. No policy required the Dairy's to invest in this used capacity.
- For both the Water Allocation and PI surcharges, the growth has outpaced the reinvestment and the nine dairies' some of them find themselves in more water allocation and PI allocation annually year over year even with the reinvestment program in place.
- With the actual dollar debt to the District increasing annually, along with lost opportunities (and revenues) related to capacity, the increase in additional CIP dollars and water acquisition dollars required will fall upon other ratepayers to and subsidize the growth of the commercial sector.

Next Steps

Use consultant's assistance (Williams and Weiss and Honey Creek Resources) in analyzing entire commercial sector impacts of growth-related water supply and financial obligations, and potentially develop other solutions and recommendations or concerns missed in this preliminary assessment.

Note that Williams and Weiss conducted water studies in 2019 and 2020 indicating that the drought deficit was about 1,400 acre-feet and the surcharge usage by the entire commercial class was also near 1,400 acre-feet. At that point, it was apparent that surcharge usage had eaten-up drought reserves. Since then, it has been determined that nine dairies alone use this much water over their allocations, exacerbating the problem.

Obtain a legal analysis on applying water allocation or PI from surcharge to existing private meters:

a. Why only one sector?

b. How is this funded?

Finally, there may be some benefit of providing information about this issue to customers on a District-wide basis. Possibly, something like a water bill insert could be considered.

Preliminary Recommendations

Several recommendations are offered below:

1. We do not recommend taking legal action to secure these lost revenues described above.
2. Could leave the over-allocation surcharges for PI and water at their current levels, $3.95 and $6.00 per 1,000 gallons, respectively. However, we do not believe at this time it will have a usage reduction we recommend.
3. Do not re-implement the Water Allocation or PI reinvestment program.
4. Continue the flow control program.
5. Re-evaluate the surcharge programs on effectiveness to stop commercial sector growth for overuse surcharge capacity and water allocation and recommend reevaluating and update the PI surcharge fee based on revised CIP estimates.
6. Following the Regional Master Plan study – reduce usage at premises to a sustainable annual usage for both capacity and water usage and allow acquisition to those levels using development PI and water dedication polices.
7. Develop a new policy related limiting use of residential meters for commercial purposes.

APPENDIX 10

Commercial Sector Over Usage & Annual Max Usage

8/2/2023

DRAFT- Internal Use Only

North Weld's water usage reports from 2012 to 2022 were analyzed to determine the annual maximum usage per meter from the Top 9 Dairy Users. It was previously determined that these top 9 dairies are using 425% over their allocated water supply. In order to address this problem, an in-depth analysis was performed by the Water Resources Staff.

For each dairy, and each year, the total usage was added up over all their meters. The highest water consumption was in 2021 (Figure 1). It was noted how the top two dairies influence the total consumption because their lowest consumptive year is the same or more than other dairies highest consumptive year. A line was added to the total usage graph, Figure 1, to show a reduction in usage by 10%. The last five years of usage from 2018 to 2022 was averaged for all meters of the top 9 dairies. In addition, a 10% water reduction per meter from the average of the last five years from each commercial dairy account was also included in the additional column added to Figure 1.

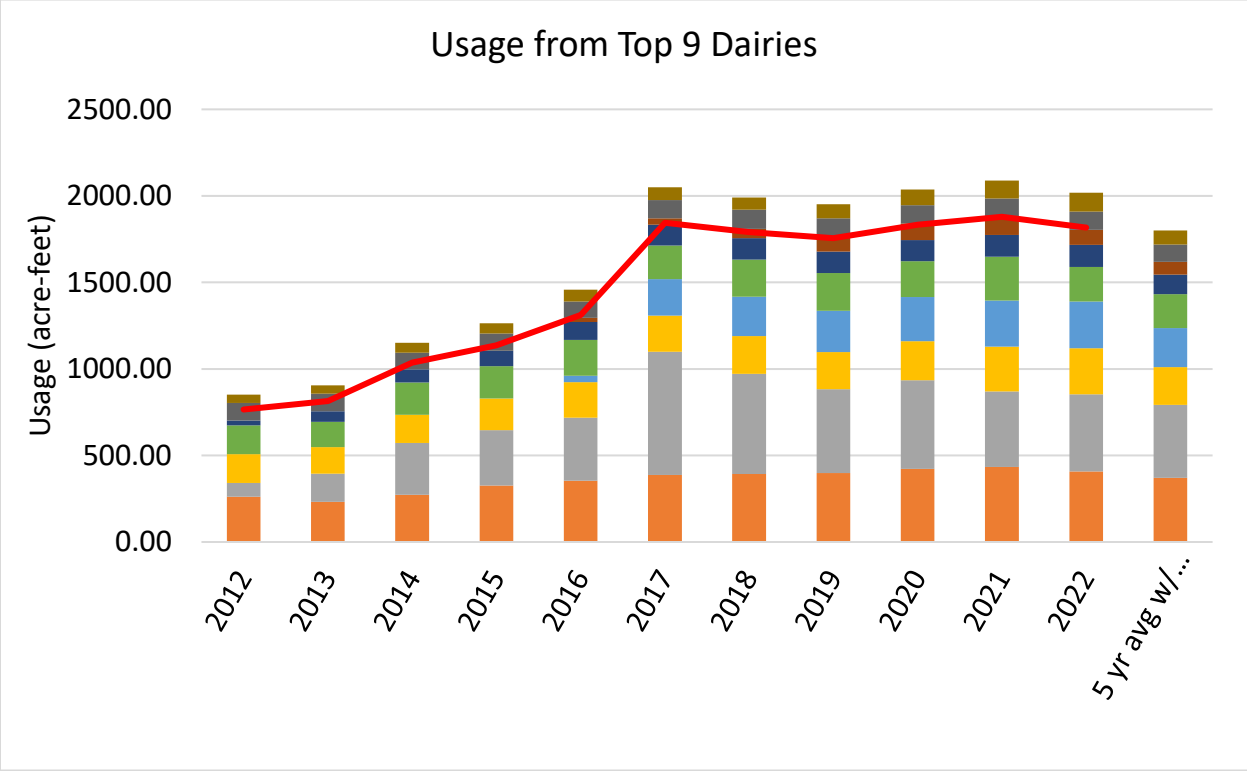


Figure 1. Water usage from the top 9 Dairies from 2012 to 2022 with a line showing what 10% reduction would look like and the last column shows a 10% reduction from the 5-year average water consumption from each meter.

This data was used to project usage and allocation into the future. A linear regression projected out to 5 years was calculated for both total usage from the top 9 dairies and for the allocation units

(Figure 2). Water usage continues to grow linearly while the allocation has not followed the same increasing trend. The Leprino Foods' Greeley Cheese factory location completed their final phase of construction in 2017. This was also the first year of a major increase in water consumption from the dairies.

An additional trendline was created to show a 10% decrease in the 5-year average water consumption from each meter and its' projection out to 2027. This projection shows the magnitude of a suggested change in policy requiring a 10% reduction from the average can achieve.

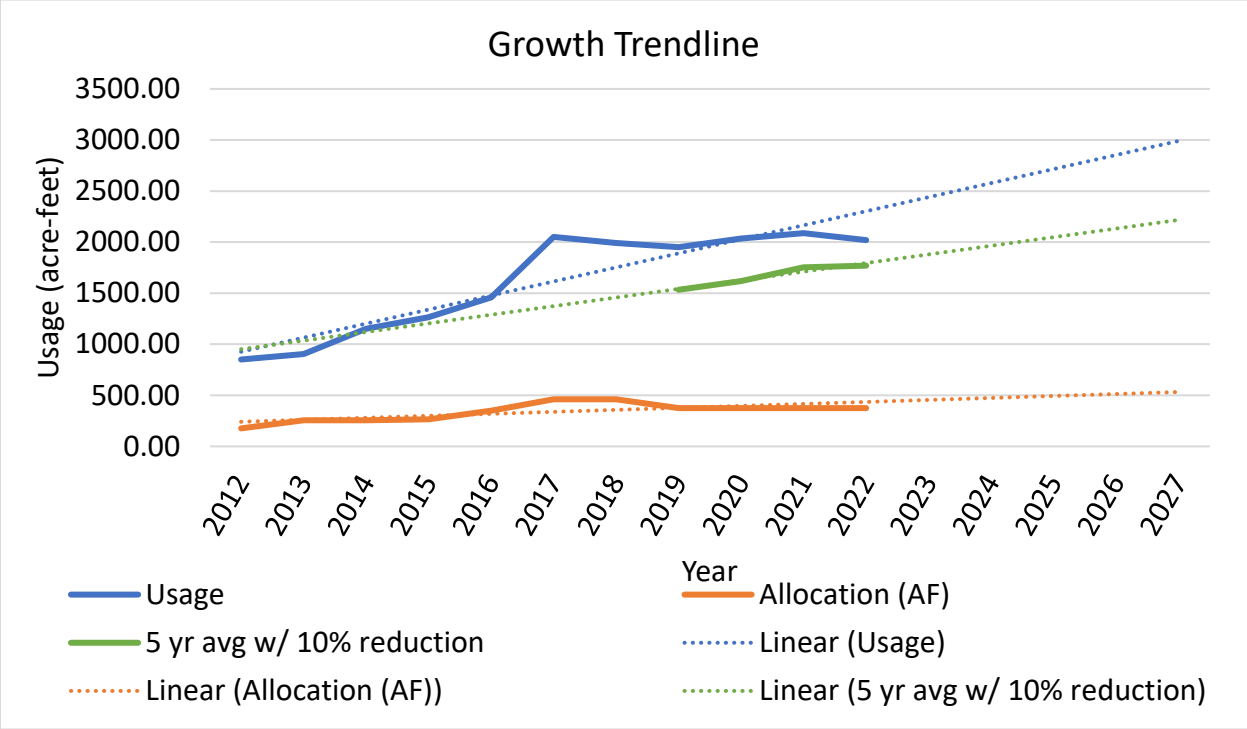


Figure 2. Linear regressions of the total usage from the top 9 dairies and their allocation units with the projected 10% reduction using the 5-year average water usage.

An analysis of each of the account holder's meters provides information on the potential to regulate the over usage of water from the commercial sector. The year of maximum usage per meter is shown in Figure 3, 2022 was the year with the most meters reaching the maximum usage.

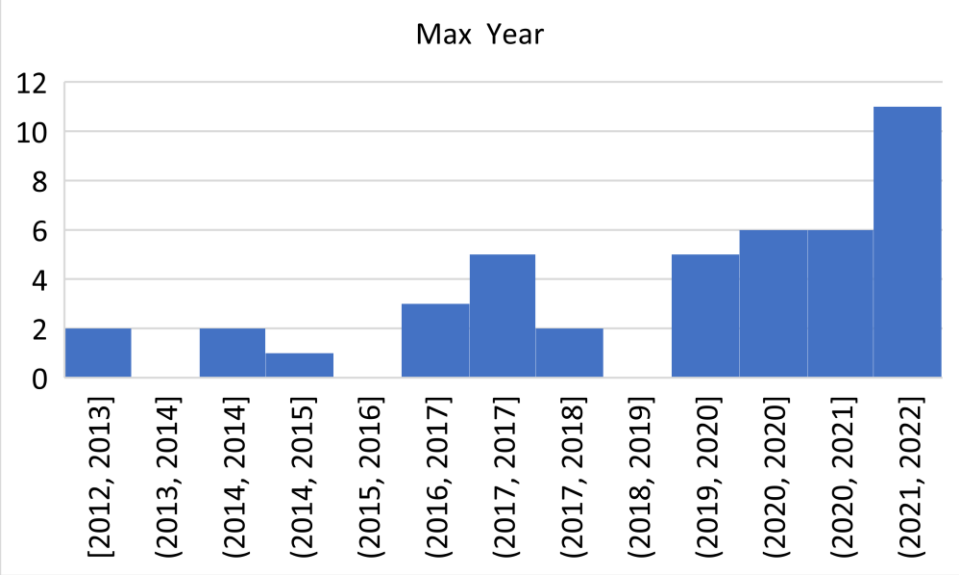


Figure 3. Histogram of the number of meters at their max year.

Summary

The maximum usage of water was 2,088 acre-feet in 2021 from all dairies combined. A 10% reduction in that usage would be a decrease of approximately 208 acre-feet, bringing the total to 1,879 acre-feet which would be slightly lower than the 2019 actual total usage. In Water Year 2022, North Weld's total usage was 7,224 acre-feet. If the proposed decrease is implemented in Water Year 2023, the projected total usage would be approximately 7,000 acre-feet.

For each meter in the account holders' profile, the maximum usage was determined, and which year maximum usage occurred (Appendix 1). On a meter-by-meter analysis, 2022 was the year when the most meters showed maximum usage. The difference between 2021 and 2022 is the top two dairy's usage.

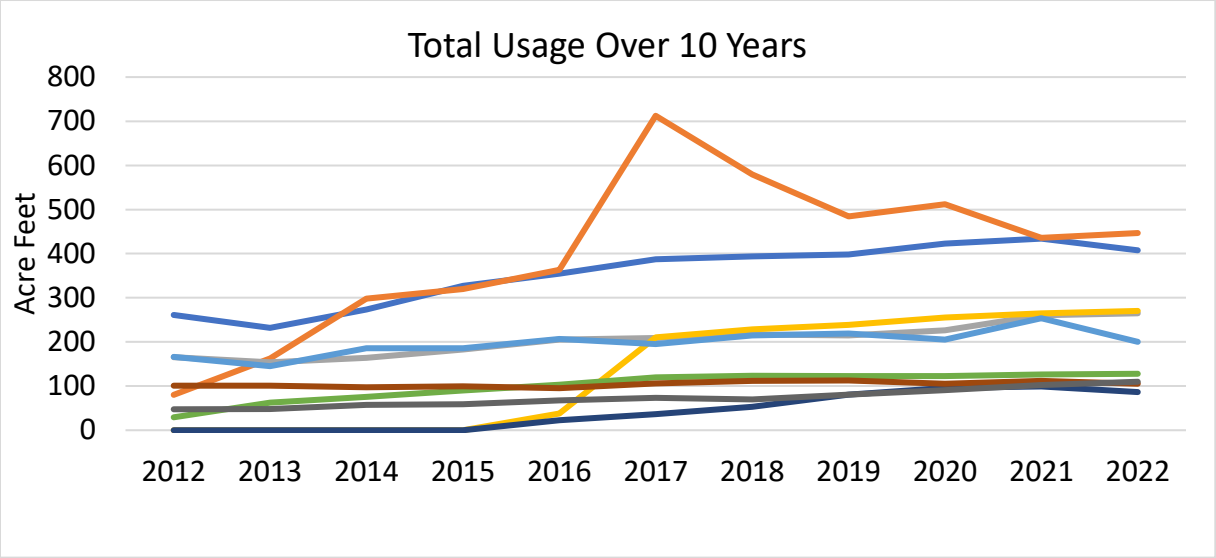
The commercial dairy sector of North Weld's water users shows increasing consumption. Over the ten-year data availability period, water consumption has increased from 850 acre-feet in 2012 to 2,018 acre-feet in 2022. It is significant that 7 of the 9 largest dairies had their highest usage between 2021-2022 with 4 of 9 having their highest usage in 2022 when the flow control program was implemented (Appendix 2). Further comparison and analysis into where flow control meters were installed could aid in the decision making for reduction practices.

Appendix 1. Top 9 Dairy accounts annual max usage per meter and year of maximum usage.

Dairy	Meter	Max (kgal)	Max (AF)	Year of Maximum	Flow Control Valve
1	A	1115	3.45	2022	
	B	125570	389.26	2021	Yes
	C	13506	41.86	2021	Yes
	D	1354	4.19	2022	
2	A	309	0.95	2017	
	B	1734	5.37	2018	
	C	651	2.01	2017	
	D	83	0.25	2017	
	E	327	1.01	2020	
	F	54	0.16	2021	
	G	397	1.23	2020	
	H	15839	49.10	2019	
	I	93978	291.33	2020	Yes
	J	3426	10.62	2016	Yes
	K	12326	38.21	2016	
	L	3851	11.93	2017	
	M	40247	124.76	2020	Yes
3	A	9744	30.20	2019	
	B	85440	264.8	2022	Yes
4	A	156	0.48	2020	
	B	151	0.46	2021	
	C	31673	98.18	2021	
	D	54	0.16	2018	
5	A	78	0.24	2017	
	B	398	1.23	2019	
	C	86883	269.33	2022	Yes
6	A	253	0.78	2022	
	B	2937	9.10	2012	
	C	214	0.66	2012	
	D	818	2.53	2019	
	E	69924	216.76	2021	Yes
	F	8439	26.16	2016	
7	A	2806	8.69	2014	
	B	38597	119.65	2022	Yes
	C	576	1.78	2015	
8	A	859	2.66	2014	
	B	34177	105.94	2022	Yes

	C	120	0.37	2022	
	D	619	1.91	2022	
9	A	29777	92.30	2019	Yes
	B	319	0.98	2022	
	C	444	1.37	2020	
	D	6264	19.41	2022	

Appendix 2. Total usage per year for Top 9 Dairy Farms, all values in acre-feet. Bold indicates maximum usage in data table.



Dairy Number	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	261.42	231.93	273.55	327.16	354.89	387.25	393.51	398.47	422.76	**434.02**	407.50
2	80.13	162.82	298.25	319.74	363.49	**712.37**	579.12	484.41	511.80	435.58	446.69
3	165.78	153.92	164.02	182.79	205.26	209.10	216.91	214.66	226.43	260.16	**264.86**
4					37.85	210.04	228.33	238.64	255.34	264.88	**270.25**
5	165.88	145.18	185.51	185.54	206.53	195.41	214.46	218.76	205.53	**253.70**	200.24
6	29.26	62.25	75.86	89.74	103.43	119.78	123.40	122.36	122.70	126.34	**127.89**
7					23.00	36.20	52.75	80.76	96.22	**99.20**	86.12
8	100.76	100.90	97.01	99.45	95.25	106.12	111.79	**112.71**	105.18	111.92	105.22
9	47.47	48.23	57.62	58.90	67.76	73.18	69.98	80.55	90.72	102.13	**109.81**