TOWN OF MILLIKEN
TOWN BOARD
AGENDA MEMORANDUM

To: Mayor Tokunaga and Town Trustees From: Kent Brown, Town Administrator	Meeting Date: Wednesday, May 13, 2015

Agenda Item #	Action:	Discussion:	Information:
	x		
Agenda Title: Approve the Water & Sanitary Sewer Master Plan Update.			
Attachments: Draft Water & Sanitary Sewer Master Plan Update			

PURPOSE

To review and adopt the Water and Sewer Master Plan Update 2014 as completed by Ketterling, Butherus, & Norton Engineers, LLC (KBN) as reviewed and recommended by the Milliken Water, Wastewater and Drainage Utility Advisory Commission.

BACKGROUND

A contract was initiated with KBN in December, 2012 to update the 2006 Milliken Water/Wastewater Master Plan. KBN completed the Water & Sanitary Sewer Master Plan Update in 2014. The draft was presented to the Water, Wastewater & Drainage Utility Advisory Commission and also to the Town Board in a work session. Although there have been some recent adjustments to the priority of projects, (as a result of an amendment to the Central Weld water treatment contract and potential modifications to, or alternative treatment options for, the Town's reverse osmosis plant), the plan provides the basis for projecting population estimates and the implications for future water use, water sources, water treatment systems, water distribution system and the wastewater collection system. The plan also includes the identification of significant geographic and distribution system problem areas and identifies both current and future projects that could address them.

BUDGET IMPLICATIONS

There are no additional budget implications for the plan update itself.

STAFF RECOMMENDATION

Staff recommends that the Board approve the Water and Sewer Master Plan Update in order to complete the contract with KBN and provide a sound foundation for future projects and updates to the overall plan.

SUGGESTED MOTION

"I move to approve the Water and Sewer Master Plan Update of 2014 produced by Ketterling, Butherus, & Norton Engineers, LLC (KBN) and recommended by the Water, Wastewater & Drainage Utility Advisory Commission."

MILLIKEN WATER & SANITARY SEWER MASTER PLAN UPDATE

DRAFT

June 16, 2014

KBN ENGINEERS

KETTERLING, BUTHERUS AND NORTON ENGINEERS, LLC.
820 8th Street
Greeley, Colorado 80631

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Executive Summary

Master Plan Update

The Milliken Water/Wastewater Master Plan prepared by Rothberg, Tamburini & Winsor, Inc. (RTW) in January, 2006, provided guidance to meet the ultimate (long-term) build-out of the Town up to a population of 65,000 residents.

This Master Plan Update is an addendum to the 2006 RTW document and will focus on the improvements required/requested within the time horizon of 2013 to 2035.

Our objective is to create a document that will assist the Town in making decisions regarding their current water assets and use, potential raw water acquisition alternatives, treated water supplies and service providers, update the water system model for the year 2035 population growth, review the wastewater treatment plant's current operation and prepare a 5-year capital improvements plan for the water and sanitary sewer systems.

2035 Growth

Since 2000, the Town has experienced a significant rate of growth, with a majority of the growth occurring through 2007. The 2000 census reported the Town had a population of 2,888 residents. The 2010 census reported that the Town had a population of 5,610 residents[1]. The number of taps has increased from 941 in 2000 to 1,981 at the end of 2012. The Town's population increased an average of 7.5 percent per year from 2000 to 2012 and includes the period of high growth experienced in the early 2000s. The high growth rate in the early 2000s was not sustained. A more realistic future annual growth rate of approximately 4 to 5 percent is to be expected. The 2035 planning population is estimated to be 17,568 and 6,121 taps which corresponds to an average growth rate of 5 percent from 2013 through 2035.

Historical Water Use

Current water demand is predominantly comprised of single family residential use. This will continue to be the predominant type of use based on the proposed land use areas as shown in Figure . While the majority of the demand is single family residential use, there is also anticipated to be a demand for commercial and light industrial use as shown in Figure . In order to estimate future water and sewer demands, historical water usage is evaluated and quantified by use type. These historical demands by use type, when combined with projected populations and corresponding projected land use development provides an estimate of the overall water and sewer demand at maximum build-out population and projected population densities in 2035.

[1] 2010 Census Summary File 1, U.S. Census Bureau, 2011.

Water Use by Supply

Milliken has three sources of potable water, two from independent water providers and the third from the alluvial aquifer via wells that provide raw water to a reverse osmosis (RO) treatment plant. Since 2004, when the RO wells came on line, the City of Greeley (COG) has provided 45 percent of the Town's total treated water supply, Central Weld County Water District (CWCWD) and the Reverse Osmosis (RO) wells each provide 27 percent and 28 percent respectively[2].

The 2006 Milliken Water and Sewer Master Plan, RTW originally estimated a single-family residential annual water demand of 0.50 acre-feet based on metered water usage from 2000 – 2004. The annual water demand per tap and Average Daily Demand (ADD) per tap were revised to include metered water usage through 2012. The average yearly water consumption per tap was 0.43 acre-feet from 2000 to 2012. The 2000 – 2012 non-irrigation season usage per tap averaged 6,068 gallons per tap per month or 199 gallons per tap per day. The 2000 - 2012 irrigation season usage averaged 15,810 gallons per tap per month or 520 gallons per tap per day. Because of the significant difference between the irrigated and non-irrigated monthly averages, the yearly average daily demand of 446 gallons per tap per day will be used for estimating future demands.

Since the majority of the taps in the Town provide residential service based on the 2006 RTW assumptions, review of historical water usage, as seen in Table 4, shows an average yearly volume of 0.50 acre-feet per tap for a single family residence is a sound value for future planning purposes.

Irrigation

Milliken currently uses non-potable water from the alluvial aquifer and its shares of Consolidated Hillsborough Ditch to irrigate parks, open space and greenbelts. The Town has actively promoted the integration of non-potable irrigation systems in new developments. The historical non-potable supply provided by four alluvial irrigation wells and pumping of Consolidated Hillsborough Ditch shares directly from Centennial Pond North have averaged 114 acre-feet per year.

2035 Water Demand

As previously discussed, the projected 2035 population is 17,568 consisting of 6,121 domestic taps for anticipated fully developed or partially developed lands. The average daily demand, maximum daily demand and peak hour demand, which includes commercial/industrial use, are 2,653 gallons per minute (gpm), 6,066 gpm and 8,608 gpm respectively, as shown in Table 9.

[2] The Little Thompson Water District services a few residential taps inside of the Town limits but the volume provided is insignificant.

Currently the Town is served through four pressure zones: the North Highlands, North, Central and South Zones. The North Highlands and the North Zone can only obtain water from the City of Greeley via gravity service. The Central Zone accepts water from the RO treatment plant via pumping and both CWCWD and the City of Greeley through gravity service. The RO treatment plant and the CWCWD serve the South Zone.

Existing Raw Water Status

The Town owns water rights that include Colorado-Big Thompson (CBT) units, Consolidated Hillsborough shares, Greeley & Loveland Irrigation Company (which are collectively referenced as GLIC and include the Greeley & Loveland and Seven Lake shares and Lake Loveland rights) water rights and numerous alluvial groundwater water rights. The Town's diverse water supply sources translates into a variety of options regarding the purchase of future water sources from area senior water rights in addition to CBT units.

Presently there are two distinctions to be made relative to the use of the Town's water rights: (1) water used to directly or indirectly provide treated water and non-potable irrigation water, and (2) water not presently used to provide a water supply for the Town but may be used in the future as a treated water and/or non-potable irrigation water supply.

Presently, the Town uses its CBT units to provide water to its residents via assignment to CWCWD and the COG. The CBT is treated and delivered to the Town's potable water distribution network by these local water providers. The RO wells pump water into the Town's RO treatment plant for delivery to the Town's potable water distribution network. The irrigation wells provide non-potable irrigation water for the irrigation of the Town's parks, open space and greenbelts.

The Central Colorado Water Conservancy District (CCWCD) water, termed the "CCWCD First Use" is a contract water right that can only be used through the COG treated water system and is not presently being used as water supply. The Platte River Trust Storage is a future storage water right option that has not been fully constructed.

Based on current treatment and supply operations from the Town's local water providers, the supply of CBT exceeds the demand by an average of 182 to 890 acre-feet annually depending on the use of the Town's GLIC water rights and the CCWCD First Use contract water right. In addition, there are 398 acre-feet under 02CW339 which are available to cover future increased production from the groundwater resources in the area. It is important to note that the physical capacity of the two existing RO wells has been reached as these two wells are located on the southern and west edge of the producing alluvium. Additional wells would have to be developed to the east and north adjacent to the South Platte and Big Thompson rivers in order to expand the Town's alluvial groundwater supply.

The Town's current operational water supply excess of 585 acre-feet annually (without the CCWCD First Use contract right) enables the Town to satisfy immediate future growth of approximate 1,170 single family residential units for the next 6 years[3] (based on 0.5 acre-feet per unit). However the total obligation from un-redeemed water certificates totals 522 acre-feet, thereby effectively eliminating any supply excess.

2035 Raw Water Requirements

The 2035 residential water demand for the Town of Milliken is estimated to be 3,061 acre-feet based on 0.50 acre-feet per single family residential units and 6,121 units. The 2035 water demand for the 1,360 acres of Commercial and Industrial development is estimated to be 1,219 acre-feet (assuming 800 gallons per acre per day water demand). Due to various water supplies that include both treated, potable water and non-potable water for irrigation, there are several viable water sources for the Town to build its water infrastructure upon. It is important to understand that the two water providers, the COG and CWCWD are limited to specific water sources. The COG uses two water treatment facilities to provide water to Milliken. The continued expansion of alluvial water as a supply as both a potable and non-potable supply affords the Town the ability to purchase numerous water rights that can be used to augment the resulting alluvial well depletions.

The 2035 projected treated water supply needed to satisfy a population of 17,568 (including commercial/industrial) is 4,279 acre-feet. Based on the projected 2035 developed area and the location of the supply connections the following potable water blend has been proposed: 12 percent from the COG (to maintain the 442 acre-feet annual treatment delivery per the existing agreement), 13 percent from CWCWD and 76 percent from alluvial supplies augmented by area senior surface water rights.

Because of system losses associated with conveyance, treatment and irrigation requirements, the 2035 potable water demand of 4,279 acre-feet requires 5,044 acre-feet of raw water supplies.

In addition to the potable demand, a non-potable demand of 347 acres is anticipated. This demand can be satisfied by the Consolidated Hillsborough Ditch and alluvial groundwater supplies.

The total consumptive use raw water requirement needed satisfy the projected 2035 population is 5,391 acre-feet, an increase of 3,419 acre-feet from the 2013 existing water supply owned by the Town.

[3] Anticipated growth of 180 units per year, based on 1% capture rate – Milliken 2010 Comprehensive Plan.

Economic Consideration

Future acquisitions of raw water rights to satisfy the 2035 projected growth and for ultimate build-out should be a high priority. The Town must also have a clear understanding of how to treat the raw water for the most cost effective rate. Milliken has numerous options, (1) purchase more capacity from the COG and CWCWD, (2) construct additional treatment for alluvial groundwater & surface water from senior ditch water rights, and (3) to develop an additional water source from the Northern Water Regional Transmission & Treatment (RT2) facilities.

Annual treatment volume limits per these agreements are 292 acre-feet at a maximum withdraw of 600 gpm from CWCWD and 442 acre-feet from the COG with no maximum withdraw rate. Both agreements were established in 1999 with 20-year terms. As Milliken grows, the Town may pay a System Development Charge (SDC) for the treated water in excess of the previous year's delivery to automatically increase and reset the base volume designated in the COG agreement.

The agreement with CWCWD does not have the same automatic expansion capabilities and thus no provision for SDC. Any additional treated water from CWCWD requires a new agreement and subsequent SDC for capacity in excess of 292 acre-feet. Alternate sources presently include alluvial water via alluvial wells with water treatment.

The unstated assumption is that the Town will only treat water from groundwater wells through the RO plant. It must be cautioned that the current RO plant, designed to treat 0.70 million gallons per day, cannot reach this level of treated volume due to the physical limitations of the alluvial aquifer and the two existing wells (estimated annual safe yield volume of 400 to 500 acre-feet per year – 0.36 million gallons per day).

It should also be noted that due to limited and currently exploited yield of the aquifer in the vicinity of the existing RO treatment plant, pipeline infrastructure would need to be constructed from new alluvial wells developed to the east and north adjacent to the South Platte and Big Thompson rivers in order to expand the Town's alluvial groundwater supply.

With the projected growth of 180 residential units per year, the Town will exceed its consumptive use water supply of 1,762 acre-feet by 2020. Furthermore, the existing contractual treatment limit of 292 acre-feet from CWCWD will be exceeded by 2017. In addition, the capacity of the existing alluvial well field will be exceeded by 2015 and the existing RO treatment capacity of 784 acre-feet will be exceeded by 2018. Therefore, the Town's ability to meet the projected water demand must include investment in additional treatment capacity from CWCWD no later than 2016, the expansion of the alluvial wells by 2015, and subsequent alluvial treatment facilities by 2015.

Capital Improvements Recommendations

Based on the results of this study and recommendations from staff and the Utility Advisory Commission, Capital Improvements Recommendations for 2014 through 2018 have been completed and are included below:

Table E-1: Town of Milliken Water Fund, Water Capital Expenditure Recommendations (2014-2018)

Description	CONCEPTUAL PROJECT COSTS Quantity	Unit	Unit Cost	Total Cost	RECOMMENDED SCHEDULE 2014 (6,719 people)	2015 (7,235 people)	2016 (7,752 people)	2017 (8,268 people)	2018 (8,785 people)
Purchase Raw Water Rights									
CBT	25	af	34,286	857,150	171,430	171,430	171,430	171,430	171,430
Consolidated Hillsborough Ditch, BTPRD	100	af	10,000	1,000,000	200,000	200,000	200,000	200,000	200,000
Total Water Purchases				1,857,150	371,430	371,430	371,430	371,430	371,430
Capital Improvements									
Cross Connection	1		8,000	8,000	8,000	-	-	-	-
Refresh Well No. 2 - Settlers Village	1		200,000	200,000	200,000	-	-	-	-
Augmentation By-Pass Line - 02CW339	3,700	feet	82	302,000	302,000	-	-	-	-
Westside Irrigation System									
Alluvial Well	1		50,000	50,000	-	50,000	-	-	-
Distribution Pipeline	2,500	feet	50	125,000	-	125,000	-	-	-
New Potable Wells and Treatment									
New Alluvial Wells[1]	1		100,000	100,000	-	50,000	-	-	50,000
New Water Treatment & Pipeline to Distribution	1		11,000,000	11,000,000	-	-	1,105,000	-	-
CWCWD System Development (109 af)	109	af	12,993	1,416,237	-	-	-	714,615	701,622
Storage Tank South/Central Zone: 1 Million Gallons	1		1,175,000	1,175,000	-	-	-	-	1,175,000
Pump Station - South Zone	1		578,000	578,000	-	-	-	-	578,000
Water Line Replacement - Old Town									
Hwy 60: 6" to 12"	3,050	feet	200	610,000	-	610,000	-	-	-
2" Poly to 6" PVC 990 L.F.	990	feet	85	84,150	84,150	-	-	-	-
Looping - Phase 1 : East Side: 16" PVC	12,240	feet	164	2,007,360	1,003,680	1,003,680	-	-	-
Looping - Phase 2 - Water Tank: 16" PVC	12,770	feet	164	2,094,280	-	-	-	2,094,280	-
Total Capital Improvements				19,750,027	1,597,830	1,838,680	1,105,000	2,808,895	2,504,622
Total Project Costs				**$ 21,607,177**	**$ 1,969,260**	**$ 2,210,110**	**$ 1,476,430**	**$ 3,180,325**	**$ 2,876,052**

[1] **New well required as capacity of aquifer is exceed by 2015, treatment capacity expansion and pipeline required as exisitng RO treatement capacity is exceeded by 2018.**

Table E-1: Town of Milliken Water Fund, Sanitary Sewer Capital Expenditure Recommendations (2014-2018)

	CONCEPTUAL PROJECT COSTS				RECOMMENDED SCHEDULE				
Description	Quantity	Unit	Unit Cost	Total Cost	2014 (5,719 people)	2015 (7,235 people)	2016 (7,752 people)	2017 (8,268 people)	2018 (8,785 people)
Replace Infrastructure									
Sewer Line Replacement - Old Town:									
North Broad - 12" Clay to 12" PVC	3,330	feet	187	622,710	622,710	-	-	-	-
Other - 9 Blocks of 6" Clay to 8" PVC (400 lf/block)	9	Block	82,000	738,000	147,600	147,600	147,600	147,600	147,600
New Projects									
Sewer Extension in WCR 46 East of Alice (w/ underdrain)	5,800	feet	136	788,800	788,800	-	-	-	-
Total Project Costs				**$ 2,149,510**	**$ 1,559,110**	**$ 147,600**	**$ 147,600**	**$ 147,600**	**$ 147,600**

Planned Growth

Ultimate Population

The purpose of a Master Plan is to enable a municipality to plan for future infrastructure needs based on anticipated growth and subsequent residential, commercial and industrial demands associated with the growth. The planned growth limit for the Town of Milliken is represented through the Urban Growth Area (UGA) and Land Use Map, shown in Figure . The previous UGA of 25,850 acres was defined in the 2006 Milliken Water and Sewer Master Plan document and has been revised to 22,605 acres and 9,624 developed lots as shown in Figure . Figure is based on the 2010 Comprehensive Plan Framework Plan Map Figure 1.1-1, which was revised by staff to contain the location and land use of development at ultimate build-out. The UGA established the build-out population within the Town's UGA. The build-out population is used to determine the demand for water and sewer utilities (see Ultimate Demand Table A-1, Appendix A).

The 2006 Water and Sewer Master Plan determined that 65,000 was the ultimate build-out population for the Town using the UGA and the 2004 Comprehensive Plan for the Town of Milliken. Based on the revised UGA and developed lots, the amended build-out population is estimated to be 26,467 as calculated in Table A-1, Appendix A. The revised maximum build-out population of 26,467 (9,624 taps) was used to develop planning densities contained in Table 1.

This planning revision will focus on a projected population for a given year rather than the maximum build-out population. While the Town must consider the maximum build-out population in sizing water and wastewater infrastructure, it only needs to have in place the appropriately sized operational infrastructure that will service additional growth into the future.

Discussions with Town staff resulted in an agreement that this Master Plan document would establish water and sewer planning through 2035 as contained in the 2010 Comprehensive Plan. The 2035 planning population was determined from UGA and land use densities revised by staff with adjustments made to the zoning densities based on the UGA at ultimate build-out, Table A-1.

2013 WATER/SEWER MASTER PLAN

ULTIMATE BUILDOUT

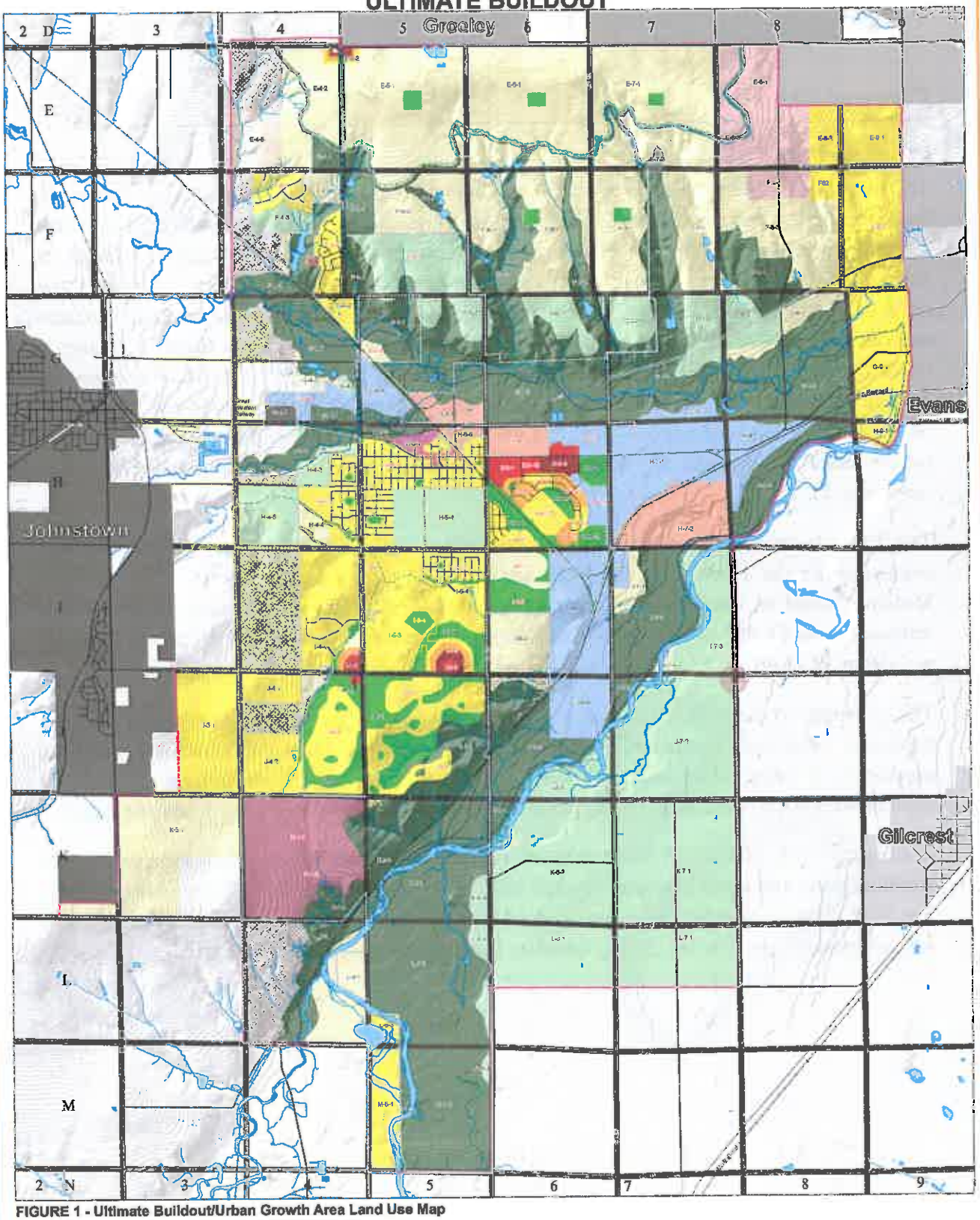


FIGURE 1 - Ultimate Buildout/Urban Growth Area Land Use Map

Legend

- Cities
- Urban Growth Boundary
- Neighborhood Trail
- River Trail
- BusRoute
- Agriculture
- Greenways
- Open Space Area
- Commercial
- Commercial/Mixed Use
- Business/Industrial
- Mixed Use
- Downtown
- Town Residential
- Estate Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial/Mixed Use/Estate Residential
- Buffer Parcel
- Weld County Urban Development Node

N

0 0.5 1 2 3 4 Miles

1 inch = 1,800 feet

THE HUB Milliken OF NORTHERN CO

Town of Milliken

Adapted from the 2010 Envision Milliken Comprehensive Plan

May 21, 2013

Table 1: Milliken Planning Land Use Densities

Land Use	Zoning Density [A] (units/acre)	Zoning Density [B] (units/acre)
Commercial/Mixed Use	1-3	0.26 - 0.77
Commercial [C]	N/A	N/A
Zone CD/Conservation	0	0
Open Space Area (includes Parks and Schools)	0	0
Agricultural	0	0
Preservation Area	0	0
Business/Industrial [C]	N/A	N/A
Estate Residential	0.1 - 0.4	0.01-0.10
Low Density Residential	1 - 5	0.26 - 1.28
Hillside Residential	1 - 3	0.26 -0.77
Town Residential	3 - 6	0.77 - 1.53
Medium Density Residential	5 - 10	1.28 - 2.55
High Density Residential	10 - 25	2.55 - 6.38

[A] Based on Table 2-1, 2006 Milliken Water and Sewer Master Plan

[B] Adjusted based on 2006 Master Plan 65,000 ultimate population and UGA

[C] Commercial, Business, and Industrial designation do not have zoning densities since they do not contribute to the overall population count. These areas were assigned a base day water demand equal to 800 gal/acre/day to account for non-resident water usage

Rate of Growth

Since 2000 the Town has experienced a significant rate of growth, with most of the growth occurring through 2007. The 2000 census reported the Town had a population of 2,888 residents. The 2010 census reported that the Town had a population of 5,610 residents[4]. The number of taps has increased from 941 in 2000 to 1,981 at the end of 2012. Table 2 shows the yearly population, number of taps and calculated population growth rate from January 1, 2000 through December 31, 2012. The 2000 and 2010 population contained in Table 2 is based on reported census data. The 2001 through 2009 population are calculated based on the number of taps and assuming 2.87 persons per tap based on the 2010 taps and census population.

Table 2 shows that the Town's population increased an average of 7.5 percent per year from 2000 to 2012 and includes the period of high growth experienced in the early 2000s. The high growth rate in the early 2000s was not sustained in the latter part of the decade, as shown in Table 2. A more realistic future annual growth rate of approximately 4 to 5 percent would be expected. Based on the planning densities contained in Table 1, the 2010 Comprehensive Plan projected annual growth of 180 units per year, the 2035 planning population is estimated to be

[4] 2010 Census Summary File 1, U.S. Census Bureau, 2011.

17,568 and 6,121 taps which corresponds to an average growth of 5 percent from 2013 through 2035.

Table 2: Milliken Historical Growth

Year	Population [D]	Number of Taps	Calculated Growth Rate
2000	2,888	941	
2001	3,105	1,082	7.5%
2002	3,633	1,266	17.0%
2003	4,426	1,542	21.8%
2004	5,011	1,746	13.2%
2005	5,241	1,826	4.6%
2006	5,390	1,878	2.8%
2007	5,502	1,917	2.1%
2008	5,562	1,938	1.1%
2009	5,591	1,948	0.5%
2010	5,610	1,958	0.3%
2011	5,628	1,961	0.3%
2012	5,685	1,981	1.0%

2000-2012 Cumulative Rate = 7.5%

2003-2012 Cumulative Rate = 2.8%

[D] 2001-2009 and 2011 population estimated as 2.87 persons/tap

Water Use

Historical Water Use

Current water demand is comprised of predominantly single family residential use. This will continue to be the predominant type of use based on the areas shown in Figure . While the majority of the demand is single family residential use, there is anticipated to be a demand for commercial and light industrial use as shown in Figure . In order to estimate future water and sewer demands, historical water usage is evaluated and quantified by use type. These historical demands by use type, when combined with projected populations and corresponding projected land use development in Figure provides an estimate of the overall water and sewer demand at maximum build-out population and projected population densities in 2035.

Use by Supply

Milliken has three sources of potable water, two from independent water providers and the third from the alluvial aquifer via wells that provide raw water to a reverse osmosis (RO) treatment plant. Table 3 presents the annual treated water consumption by supply. Table 3 shows that since 2004, when the RO wells came on line, the City of Greeley (COG) provides 45 percent of

the total treated water supply, and the Central Weld County Water District (CWCWD) and Reverse Osmosis (RO) wells each provide 27 percent and 28 percent respectively[5].

Table 3: Milliken Water Supply by Source

(all values in acre-feet)

	Greeley		Central Weld		RO Wells		
Year	Volume (acre-feet)	Percent of Total Supply	Volume (acre-feet)	Percent of Total Supply	Volume (acre-feet)	Percent of Total Supply	Total Supply (acre-feet)
2000	251	56%	198	44%	---	---	449
2001	185	36%	329	64%	---	---	514
2002	300	44%	376	56%	---	---	676
2003	389	58%	278	42%	---	---	667
2004	222	32%	211	31%	252	37%	685
2005	341	45%	263	35%	155	20%	759
2006	413	46%	213	24%	268	30%	894
2007	440	53%	241	29%	144	17%	825
2008	375	44%	231	27%	256	30%	862
2009	356	47%	193	26%	202	27%	751
2010	397	46%	230	27%	234	27%	861
2011	271	40%	132	20%	270	40%	673
2012	324	48%	189	28%	161	24%	674
2004 - 2012 Average	349	45%	211	27%	216	28%	776

Water Usage Factors

In order to accurately estimate the size of the water infrastructure, peak demands must be estimated for the selected build-out population. This is accomplished by calculating the maximum day demand (MDD) and peak hour demand (PHD) within the existing water system. The MDD is the peak demand over a 24 hour period recorded in a year. The MDD is used to size the water supply infrastructure (transmission mains, distribution mains, reservoirs and pump stations). The PHD is the highest hourly demand metered in a single day and is used to size pump stations for the service of demands that do not have the benefit of storage to maintain sufficient water volume within the system. Fire flow demand (FFD) is used with MDD to determine the ability of the system to provide sufficient water to respond to fires. The average day demand (ADD) is the average daily water consumption and is typically used to determine the volume of water needed to satisfy demands from future growth. The ADD is developed from historical water use.

In the 2006 Milliken Water and Sewer Master Plan, Rothberg, Tamburini & Winsor, Inc. (RTW) indirectly derived the MDD and PHD water system components from the available historical

[5] The Little Thompson Water District services a few residential taps inside of the Town limits but the volume provided is insignificant.

data using peaking factors consistent with other local municipalities. To facilitate the water system component derivations, the following assumptions were made:

- The majority of the users are single family residences.
- All existing water use records refer to residential consumption only.
- Each tap serves a single domestic unit with three residents.
- Commercial, Business, and Industrial water consumption shall be developed based on actual usage in similar Front Range communities.
- Water usage for the community follows a typical diurnal curve (See description in text below).
- Peaking factors for calibrating individual water usage from historical data are consistent with other Front Range communities.

The same assumptions were used to update the MDD and PHD except each tap is assumed to serve 2.87 residents, as determined in Table 2.

In the 2006 Milliken Water and Sewer Master Plan, RTW originally estimated a single-family residential annual water demand of 0.50 acre-feet based on metered water usage from 2000 – 2004. The annual water demand per tap and ADD per tap were revised to include metered water usage through 2012. Table 4 shows the monthly total treated water volumes from 2000 – 2012 with an average per tap water consumption of 0.43 acre-feet. Table 4 also shows that while the annual per tap use remains fairly constant from year to year, the monthly usage varies substantially between the irrigation season (April – October) and the non-irrigation season, or base use (November – March). The 2000 – 2012 non-irrigation season usage per tap averaged 6,068 gallons per tap per month or 199 gallons per day per tap. The 2000 - 2012 irrigation season usage averaged 15,810 gallons per tap per month or 520 gallons per day per tap.

0.50 acre-feet per tap per year (446 gallons per day) for a single family residence is a sound value for future planning purposes due to the following three reasons: (1) 0.5 acre-feet is approximately the same as the historical yearly average of 0.46 acre-feet. (2) There is a significant difference between the irrigated and non-irrigated monthly averages. (3) The majority of the taps in the Town provide residential service (based on the RTW assumptions).

The ratio of the irrigation season ADD and the non-irrigation season ADD (15,810 gal/tap/month ÷ 6,068 gal/tap/month) represents the maximum day peaking factor. A comparison of the average non-irrigation and irrigation demands from 2000 to 2012 can be found in Table 4. Table 4 also shows the average yearly demand from 2000 to 2012. This comparison shows the maximum use during irrigation is 2.6 times the average non-irrigation season usage. The factors that will be used for residential and commercial have been tabulated in Table 5 and the residential peaking factors have been shown to compare favorably to other Front Range communities, as listed in Table 6.

Table 4: Water Use - Non-Irrigation, Irrigation and Yearly Demand

Year	Average Daily Non-Irrigation Season Demand (gal/tap/day)	Average Daily Irrigation Season Demand (gal/tap/day)	Non-Irrigation to Irrigation Ratio	Average Yearly Demand Volume (acre-feet/tap)
2000	219	573	2.61	0.48
2001	226	493	2.19	0.43
2002	246	624	2.53	0.52
2003	222	550	2.48	0.46
2004	185	493	2.66	0.41
2005	188	541	2.88	0.44
2006	174	617	3.54	0.48
2007	186	527	2.84	0.43
2008	192	552	2.87	0.45
2009	201	454	2.26	0.39
2010	213	523	2.45	0.44
2011	177	402	2.26	0.35
2012	164	408	2.49	0.34
Average:	199	520	2.62	0.43

Table 5: Residential and Commercial Water Usage Rate and Peaking Factors

Land Use Type	Usage Rate		Peaking Factor Max Day	Peaking Factor Peak Day
Resedential	446	Gal/Tap/Day	2.6	3.9
Commercial/Industral	800	Gal/Acre/Day	1.5	1.6
Composite*	-		2.3	1.4

*Composite values based on areas of residential, commercial/industrial

Table 6: Water Usage Peaking Factors for Front Range Communities

Town	Maximum Day Usage Factor [E]	Peak Hour Usage Factor [F]
City of Fort Collins [G]	2.4	3.7
Fort Collins/Loveland Water District [G]	2.6	4.2
Central Weld County Water District [G]	2.5	3.8
North Weld County Water District [G]	2.6	3.5

[E] MDD = ADD * factor

[F] PHD = ADD * factor

[G] from Table 3-3, 2006 Milliken Water and Sewer Master Plan, RTW

Typical residential demands vary throughout the day with demand peaking in the late morning, ebbing and peaking again in the late evening, which can be represented in a dimensionless graph called a Diurnal Curve. This Diurnal Curve correlates directly to the ADD and the PHD. Figure 2 shows the Diurnal Curve for the Town developed from hourly sanitary sewer inflows for 28 days in December 2012. The PHD occurs in the 12th hour with a demand of 1.47 (assume 1.5)

times the ADD, which can be seen in Figure 2. Based on the historical data (Table 4) and the calculated MDD usage factor of 1.5, the peak hour usage factor for Milliken is 3.9 (1.5 x 2.6 = 3.9). Table 6 contains peak hour usage factors reported by local Front Range communities and water providers.

MDD and peak hour usage factors for commercial, industrial and business properties are different because they have more constant demands throughout the business day. Due to the lack of specific historical data from these types of demands, a maximum daily flow of 1.5 times the non-irrigation season ADD and a peak hourly flow of 1.6 times the non-irrigation season ADD are assumed. These factors are consistent with area Front Range communities (2006 Milliken Water and Sewer Master Plan, RTW).

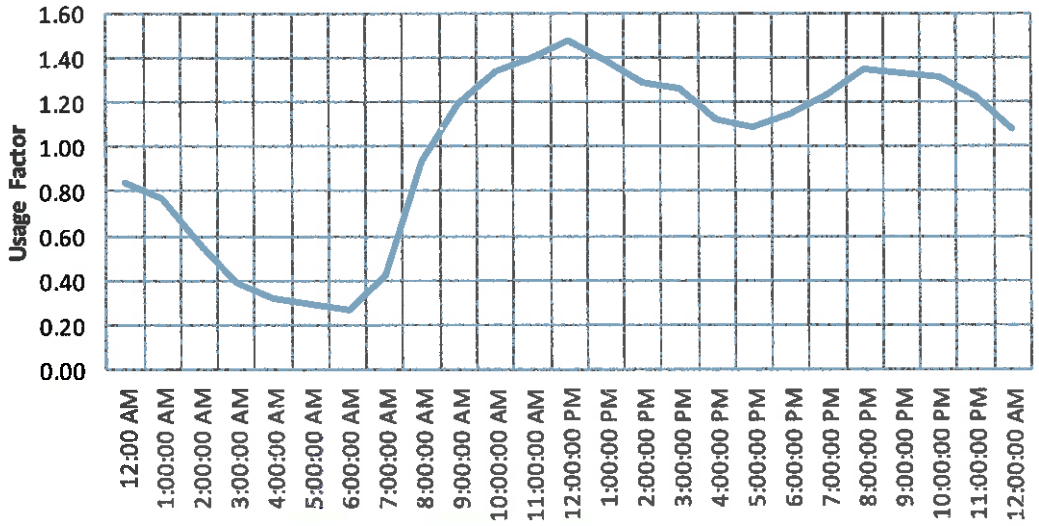


Figure 2: Town of Milliken Water Usage Diurnal Curve

Irrigation

Milliken currently uses non-potable water from the alluvial aquifer and its shares of Consolidated Hillsborough Ditch to irrigate parks, open space and greenbelts as shown in Table 7. The Town has actively promoted the integration of non-potable irrigation systems in new developments. Presently open space, greenbelts and parks in the Centennial Farms, Wal Mar, Settler's Village, Colony Pointe, Las Tiendas, Hacienda Villas, Traders Junction, Highway 60 and the Town parks are irrigated with non-potable water provided pursuant to 02CW339 Division I Water Court Decree, Table 7.

Table 7: Milliken Irrigated Areas Using Non-Potable Water

Location	Area (acres)
Centennial Farms	23.0
Colony Pointe	4.1
Settler's Village	4.5
Hacienda Villas	2.5
Las Tiendas	1.5
Traders Junction	4.1
Highway 60	8.2
Wal Mar	4.6
Town Parks	11.5
Total	64.0

Table 8 shows the historical non-potable supply provided by four alluvial irrigation wells and pumping of Consolidated Hillsborough Ditch shares directly from Centennial Pond North for the years in which there is a complete metered record of pumping.

Table 8: Milliken Total Pumping to Irrigation

(all values in acre-feet)

Year	March	April	May	June	July	August	September	October	Total
2005		4.4	14.3	24.0	23.0	25.2	16.0	6.7	113.5
2006	0.7	5.8	15.3	24.9	21.6	20.0	11.4	3.5	103.3
2011		0.9	3.9	5.5	33.8	32.7	27.2	12.3	116.4
2012		0.9	10.2	23.3	33.1	29.6	23.6	3.3	124.0
Average:	0.7	3.0	10.9	19.4	27.9	26.9	19.6	6.4	114.3

2035 Water Demand

Milliken's ultimate build-out population was revised down from the 2006 Milliken Water and Sewer Master Plan of 65,000. The 2010 Comprehensive Plan Framework Plan Map, Figure 1.1-1 was revised to identify specific developed parcels by land use at the ultimate build-out population of 26,467 and the extent of development anticipated in 2035. Figure 3 was developed by staff to show the land use and areas of development in 2035. As previously discussed, the projected 2035 population is 17,568 consisting of 6,121 domestic taps for anticipated fully developed or partially developed lands based on the areas shown in Figure 3.

2013 WATER/SEWER MASTER PLAN

2035 BUILDOUT

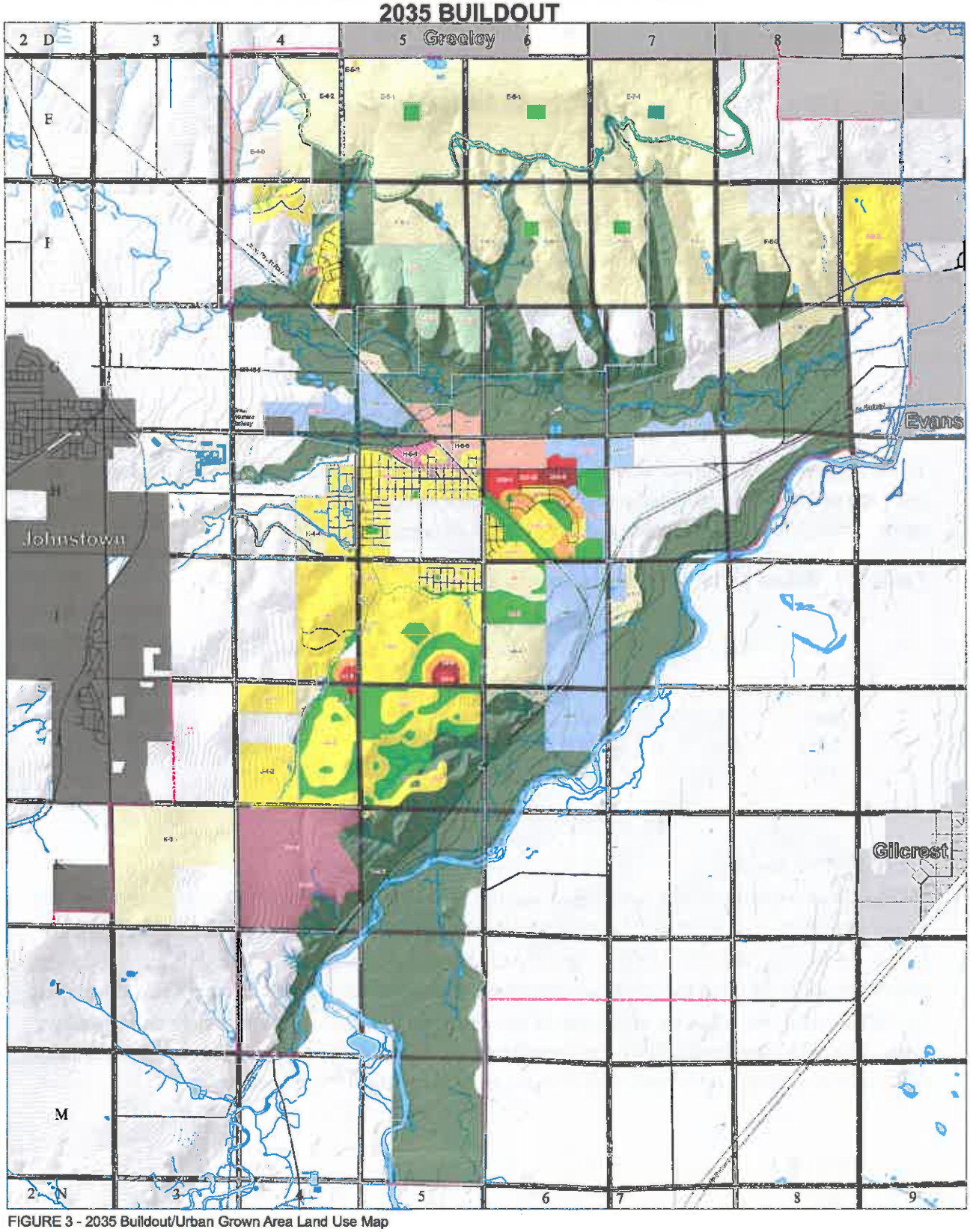


FIGURE 3 - 2035 Buildout/Urban Grown Area Land Use Map

Town of Milliken

Adapted from the 2010 Envision Milliken Comprehensive Plan

N

Cities	Greenways	Downtown	Commercial/Mixed Use/Estate Residential
Urban Growth Boundary	Open Space Area	Town Residential	Buffer Parcel
Neighborhood Trail	Commercial	Estate Residential	Weld County Urban Development Node
River Trail	Commercial/Mixed Use	Low Density Residential	
BusRoute	Business/Industrial	Medium Density Residential	
Agriculture	Mixed Use	High Density Residential	

0 0.45 0.9 1.8 2.7 3.6 Miles

1 inch = 1,800 feet

May 21, 2013

Table 9: 2035 Water Demand Based on Land Use

Location Map ID	Land Use	Density (taps/acre)	Area (acres)	Taps	Average Daily Demand (gal/min)	Max Day (gal/min)	Peak Hour (gal/min)	Pressure Zone
[redacted]	Estate Residential	0.01	209	3	0.5	1.3	1.9	North
[redacted]	Estate Residential	0.01	604	8	1.4	3.6	5.4	North Highlands
[redacted]	Low Density Residential	0.26	36	9	1.7	4.3	6.4	North
[redacted]	Estate Residential	0.01	597	8	1.4	3.6	5.4	North Highlands
[redacted]	Estate Residential	0.26	610	155	28.1	73.1	109.6	North Highlands
F-4-2	Low Density Residential (Mill Iron 5: 29 Residence)	0.33	88	29	9.0	23.4	35.1	North
[redacted]	Low Density Residential	0.26	62	16	2.8	7.4	11.1	North
[redacted]	Commercial/Mixed Use	0.77	10	8	1.5	4.0	6.0	North
F-4-9	Low Density Residential (Mad Russian: 231 Residence)	2.21	105	231	71.6	186.2	279.2	North
[redacted]	Estate Residential	0.01	234	3	0.5	1.4	2.1	North
[redacted]	Agricultural (Saddle Horn Rock Ranch: 3 unit/acre)	3.00	254	762	153.5	399.2	598.7	North
[redacted]	Estate Residential	0.01	380	5	0.9	2.3	3.4	North
[redacted]	Estate Residential	0.01	440	6	1.0	2.6	4.0	North
[redacted]	Estate Residential	0.01	380	5	0.9	2.3	3.4	North
[redacted]	Estate Residential (Ashton Estates: 171 Units)	2.51	68	171	34.5	89.6	134.4	North
[redacted]	Industrial	-	80	-	44.4	66.7	71.1	Central
[redacted]	Low Density Residential (Saddle Horn Rock Ranch: 3 Units/Acre)	2.97	24	72	14.5	37.7	56.6	Central
[redacted]	Agricultural (Saddle Horn Rock Ranch: 3 Units/Acre)	2.96	14	42	8.5	22.0	33.0	Central
[redacted]	Low Density Residential (Saddle Horn Rock Ranch: 3 Units/Acre)	2.98	43	129	26.0	67.6	101.4	Central
[redacted]	Industrial	-	80	-	44.4	66.7	71.1	Central
[redacted]	Town Residential/Commercial	0.50	80	40	7.2	18.8	28.2	Central
[redacted]	Commercial/Mixed Use	0.26	70	18	3.2	8.4	12.6	Central
[redacted]	Estate Residential	[redacted]	100	1	0.2	0.6	0.9	Central
[redacted]	Low Density Residential	0.26	300	77	13.8	35.9	53.9	Central
[redacted]	Low Density Residential (Frank Farms: 227 Residents)	2.30	99	227	70.4	182.9	274.4	Central
[redacted]	Estate Residential	0.01	50	1	0.1	0.3	0.4	Central
[redacted]	Town Residential	0.77	30	23	4.1	10.8	16.2	Central
[redacted]	Town Residential/ Commercial Mixed Use (Old Town: 570 Residence)	0.83	96	80	24.8	64.5	96.7	Central
[redacted]	Low Density Residential (Wal Mar: 250 Residence)	0.90	277	250	77.5	201.5	302.2	Central
[redacted]	Commercial (Frontier Corporate Center)	-	100	-	55.6	83.3	88.9	Central
[redacted]	Business Industrial (Milliken Corporate Center)	-	42	-	23.3	35.0	37.3	Central
[redacted]	Commercial (Trader's Junction)	-	51	-	28.6	42.8	45.7	Central
H-6-9 *	Medium Density Residential (Settler's Village: 801 Residence)	5.44	29	160	32.2	83.8	125.7	Central
H-6-9 *	Low Density Residential (Settler's Village: 801 Residence)	5.04	15	75	15.1	39.3	58.9	Central
H-6-10 *	Medium Density Residential (Settler's Village: 801 Residence)	5.93	23	137	27.6	71.8	107.6	Central
[redacted]	Business Industrial (Fossil Park)	-	38	-	21.3	31.9	34.1	Central
H-6-13 *	Low Density Residential (Settler's Village: 801 Residence)	3.97	47	185	37.3	96.9	145.4	Central
H-6-14 *	Low Density Residential (Settler's Village: 801 Residence)	3.36	15	50	10.1	26.2	39.3	Central
H-6-15 *	Medium Density Residential (Settler's Village: 801 Residence)	11.76	16	194	39.1	101.6	152.4	Central
H-6-17	Low Density Residential (Colony Pointe: 237 Residence)	3.85	62	237	47.7	124.1	186.2	Central
H-6-18	Town Residential (Las Tiendas: 6 Residence)	0.45	13	6	1.2	3.1	4.7	Central
[redacted]	Business/Industrial	-	320	-	177.8	266.7	284.4	Central
J-4-1	Estate Residential (Pheasant Hills: 838 Units)	2.73	159	433	87.2	226.8	340.2	Central
J-4-1	Estate Residential (Wildcat Acres: 40 Units)	0.59	68	40	12.4	32.2	48.4	Central
[redacted]	Commercial/Mixed Use	0.26	14	4	0.6	1.7	2.5	Central
J-4-2	High Density Residential (Trapper's Village: 106 Residence)	9.73	8	75	15.1	39.3	58.9	Central
J-4-2	Medium Density Residential (Trapper's Village: 106 Residence)	9.72	3	31	6.2	16.2	24.4	Central
J-5-1	Low Density Residential (Pheasant Hills: 838 Residence)	1.67	243	405	81.6	212.2	318.2	Central
J-5-3	Low Density Residential (The Meadows: 776 Residence)	3.70	166	615	123.9	322.2	483.2	Central
J-5-2	Low Density Residential (Centennial Farms: 288 Residence)	3.60	80	288	58.0	150.9	226.3	Central
J-5-3	Low Density Residential (The Meadows: 776 Residence)	2.86	18	51	10.3	26.7	40.1	Central
J-5-3	Medium Density Residential (The Meadows: 776 Residence)	5.49	20	110	22.2	57.6	86.4	Central
J-5-3	High Density Residential (Fairfield Acres: 115 Residence)	6.57	18	115	23.2	60.2	90.4	Central
[redacted]	Commercial (Fairfield Acres: 115 Residence)	-	8	-	4.7	7.1	7.5	Central
J-6-1	Low Density Residential (Sunfield: 361 Residents)	3.61	100	361	72.7	189.1	283.7	Central
J-6-2	Low Density Residential (Indian Run: 140 Residents)	2.80	50	140	28.2	73.3	110.0	Central
[redacted]	Industrial	-	115	-	63.7	95.6	102.0	Central
[redacted]	Estate Residential	[redacted]	369	5	0.9	2.2	3.3	Central
[redacted]	Industrial	-	320	-	177.8	266.7	284.4	Central
[redacted]	Estate Residential	[redacted]	55	1	0.1	0.3	0.5	Central
[redacted]	Industrial	-	40	-	22.2	33.3	35.6	Central
J-4-1	Low Density Residential	0.50	80	40	8.1	21.0	31.4	South
[redacted]	Estate Residential (Summerlee)	0.01	160	2	0.4	1.0	1.4	South
J-4-3	Low Density Residential (Homestead Hills: 688 Residence)	4.15	137	568	114.4	297.5	446.3	South
J-4-3	Low Density Residential (Homestead Hills: 688 Residence)	4.05	30	120	24.2	62.9	94.3	South
[redacted]	Commercial	-	5	-	2.9	4.4	4.7	South
J-5-2	Low Density Residential (Orchard Mesa: 1016 Residence)	6.96	146	1016	204.7	532.2	798.3	South
J-5-2	Low Density Residential (Range View Heights: 673 Residence)	6.80	97	657	132.4	344.2	516.2	South
J-5-6	Estate Residential (Range View Heights: 673 Residence)	0.26	61	16	3.2	8.4	12.6	South
[redacted]	Estate Residential	0.01	65	[redacted]	0.1	0.4	0.6	Central
[redacted]	Commercial	-	160	-	88.9	133.3	142.2	Central
[redacted]	Estate Residential (Summerlee)	0.10	480	49	8.8	23.0	34.5	South
[redacted]	Low Density Residential (Somerset Ridge Estates: 436 Residents)	0.82	523	429	86.4	224.7	337.1	South
[redacted]	Estate Residential (Somerset Ridge Estates: 436 Residents)	0.54	13	7	1.4	3.7	5.5	South
[redacted]	Low Density Residential	0.26	7	2	0.3	0.8	1.3	South
[redacted]	Low Density Residential	0.26	4	1	0.2	0.5	0.7	South
Total Residential Demand:		-	-	-	1,897	4,933	7,399	
Total Demand:		-	-	-	**2,653**	**6,066**	**8,608**	

	Percent Developed	Area (acres)	Taps	2035 Developed Taps
[redacted]	100.0	732	857	857
[redacted]	65.0	2,584	7,265	5,008
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total				6,121
				x 2.87
Population Total				**17,568**

* Settler's Village: All areas limited to 801 single family residential units

Table 9 shows the 2035 average daily demand (including commercial taps) totals 2,653 gallons per minute and the maximum daily demand is 6,066 gallons per minute.

Currently the Town is served through four pressure zones; the North Highlands, the North, South and Central Zones. The North Highlands and the North Zone can obtain water only from the City of Greeley via gravity service. The Central Zone accepts water from the RO treatment plant via pumping and both CWCWD and the City of Greeley through gravity service. The South Zone receives treated water only from CWCWD. The RO treatment plant and the City of Greeley serve the South Zone.

Table 10 shows the spatial distribution of 2035 developed units summarized from Figure 3 and Table 9. This spatial distribution provides insight as to the location of the water demands for both current water supply zones and future water zones.

Table 10: Development Areas Within Each Pressure Zone in 2035

Zone	Developed Area (acres)	Percent Distribution	Developed Taps	Percent Distribution	Required Raw Water Supply (acre-feet)	Required Treated Water Supply (acre-feet)	Treated Water Percent of Raw Water
North Highlands Zone	1,056	15%	100	2%	71	50	70
North Zone	1,424	21%	898	15%	642	449	70
Central Zone[1]	3,313	48%	3,238	53%	3,153	2,838	90
South Zone	1,090	16%	1,886	31%	1,179	943	80
Total	6,882	100%	6,121	100%	5,044	4,279	

[1] Central Zone includes 854 acre-feet of water demand for Industrial/Commercial demands

Since the increase in development in the late 1990s, the Town has been obligated to single family water certificate credits for undeveloped lots. In 2001, the Town and Water Resources, LLC executed an agreement whereby Water Resources, LLC received credit for 1,103 water certificates and then transferred 960 water certificate credits back to Lot Holding Investments, LLC. The use of the 1,103 certificates can only be redeemed for use within Settler's Village, Colony Pointe and Centennial Farms subdivisions. In addition, to the 1,103 water certificate credits issued in 2001, the Town issued an additional 501 water certificate credits and 48 acres of irrigation credit for 7.5 shares of Consolidated Hillsborough Ditch shares conveyed by Water Resources, LLC (March 2004 agreement). The agreements are contained in Appendix B. Table 11 presents a summary of the water certificate and irrigation acre credits issued with the number of credits still outstanding and future water supply obligation to the Town.

Table 11: Milliken Future Water Certificate Obligation

	Number of Taps or Acres Issued[H]	Annual Demand Volume (acre-feet)
Certificates Issued	1,604	802
Certificates Redeemed by Town	-612	-306
Outstanding Certificates	992	496
Acres Issued	48	101
Acres Redeemed by Town	-36	-75
Outstanding Acres	12	26
Total		522

[H] Annual tap volume = # taps x 0.5 acre-feet/tap/yr
Irrigation volume = # acres x 2.1 acre-feet/ac/yr

Water Sources

Existing Raw Water Status

The Town owns water rights that include Colorado-Big Thompson (CBT) units, Consolidated Hillsborough shares, Greeley & Loveland Irrigation Company (which are collectively referenced as GLIC and include the Greeley & Loveland and Seven Lake shares and Lake Loveland rights) water rights and numerous alluvial groundwater water rights. The Town's diverse water supply sources translates into a variety of options regarding the purchase of future water sources from area senior water rights in addition to CBT units.

Presently there are two distinctions to be made relative to the use of the Town's water rights: (1) water used to directly or indirectly provide treated water and non-potable irrigation water, and (2) water not presently used to provide a water supply for the Town but may be used in the future as a treated water and/or non-potable irrigation water supply. Table 12 contains a complete list of all of the Town's water rights and estimated consumptive use[6] (CU) yield.

[6] Consumptive use is the portion of total water either physically consumed or that is deemed wholly consumable after all legal replacement and loss obligations have been satisfied.

Table 12: Summary of Milliken's Current Raw Water Rights

Description	Quantity		CU Yield (acre-feet)
CBT [I]	1067.0	Units	747
Consolidated Hillsborough Ditch [J]	14.0	Shares	711
Hillsborough Extension Ditch [K]	11.5	Shares	
Extension Irrigating Ditch [K]	46.0	Shares	
Recharge Water Right per 02CW339			
Greeley Loveland Irrigation Company [L]	1.0	Shares	9
Seven Lakes Reservoir Company [L]	5.0	Shares	44
Lake Loveland [L]	0.5	Shares	8
Sub-total			1519
CCWCD First Use [M]			
Greeley Loveland Irrigation Company	26.2	Shares	151
Seven Lakes Reservoir Company	9.0	Shares	48
Lake Loveland	16.0	Shares	159
Sub-total			357
Platte River Trust Storage [N]	1250.0	acre-feet	
Alluvial Wells			
RO Well 59961-F			
RO Well 63813-F			
Seele Irrigation Well 11676			
Oster Irrigation Well 13787-R			
Irrigation Well 15032R			
Irrigation Well #15031			
Oster Commercial Well 65727F			
Colony Point Recharge Well			
Settler Village Recharge Well			

[I] *Per unit yield of 1 af at 0.70 (historic avg annual quota) and 10% system loss*

[J] *Average CU decreed in 02CW339*

[K] *Carrier shares -- no yield*

[L] *CU calculated as 57% after 22% system loss and 45 year average of yields*

[M] *Includes reduction of 5% for treatment & Boyd Lake loss of 22% and 10% additonal water to CCWCD*

[N] *Option to participate in storage capacity*

Presently, the Town uses the CBT units to provide water to its residences via assignment to CWCWD and the COG. The CBT water is treated and delivered to the Town's potable water distribution network by these local water providers. The RO wells (Well 59961-F and Well 63813-F) pump water into the Town's RO treatment plant for delivery to the Town's potable water distribution network. The irrigation wells (Seele Well 11676, Oster Well 13787-R, Well

15032R, and Well 15031) provide non-potable irrigation water for the irrigation of the Town's parks, open space and greenbelts. The Oster Commercial Well 65727F is a commercial well that provides water for a car wash facility. The two recharge wells are decreed but do not physically exist at this time. The irrigation wells and commercial well operate via a decreed Plan for Augmentation 02CW339 which uses 14 shares of the Consolidated Hillsborough Ditch water as the replacement supply. Currently, 11.5 shares are presently actively used as a replacement supply, with the remaining 2.5 shares not diverted and not operationally included in the Plan for Augmentation at this time.

Currently the CBT and 11.5 shares of Consolidated Hillsborough Ditch water rights satisfy the first classification of use previously discussed - *water used to directly or indirectly provide treated water and non-potable irrigation water.* These water rights are rights used to meet the current water demands of the Town's residences.

The remaining water rights not used include the GLIC water rights and 2.5 shares of the Consolidated Hillsborough Ditch. The whole of these water rights are presently deemed as excess supply to the Town and available for annual short term lease.

The Central Colorado Water Conservancy District (CCWCD) water, termed the "CCWCD First Use" is a contract water right that can only be used through the COG treated water system and is not presently being used as water supply. The Platte River Trust Storage is future storage water right option that has not been fully constructed. Appendix B contains the Intergovernmental agreements for treated water service with the COG and CWCWD, the CCWCD First Use agreement, and 02CW339.

Table 13 presents a summary of the Hillsborough Ditch operations for the past several years pursuant to the 02CW339 Plan for Augmentation. The water rights decreed in 02CW339 include 14 shares of Consolidated Hillsborough Ditch (at present only 11.5 shares are actively used as a replacement water supply) and junior recharge water rights (yet to be developed) as the replacement supplies for the RO, irrigation and commercial wells. Table 13 shows the gross delivery of the Hillsborough shares in recent years, in addition to the net CU yield of the overall replacement water rights decreed in 02CW339.

Table 13: Milliken 02CW339 Consolidated Hillsborough Ditch Operations

(all values in acre-feet)

		Volume to				Volume of CU to	
Year	Total Volume	Recharge and Replacement	Irrigation	Return Flow Obligation	CU Yield	Irrigaiton	RO Wells
2011	800	702	98	-564	236	83	153
2012	888	789	99	-428	460	84	376
Avg	844	746	99	-496	348	84	264

Current replacement operations only use 11.5 shares

Table 14 provides a summary of the current CU supply and demand for all of Milliken's water rights. Based on current treatment and supply operations from the Town's local water providers, the supply of CBT exceeds the demand by an average of 182 to 890 acre-feet annually depending on the use of the Town's GLIC water rights and the CCWCD First Use contract water right. In addition, there is an additional 398 acre-feet of water under 02CW339 which is available to cover future increased production from the groundwater resources in the area. It is important to note that the physical capacity of the two existing RO wells has been reached as these two wells are located on the southern and west edge of the producing alluvium. Additional wells would have to be developed to the east and north adjacent to the South Platte and Big Thompson rivers in order to expand the Town's alluvial groundwater supply.

Table 14 shows the Town's current operational water supply excess of 585 acre-feet annually (without the CCWCD First Use contract right) enables the Town to satisfy immediate future growth of approximate 1,170 single family residential units for the next 6 years[7] (based on 0.5 acre-feet per unit). However, Table 11 shows the total obligation from un-redeemed water certificates totals 522 acre-feet, thereby effectively eliminating any supply excess.

Table 14: Current Milliken Water Demand, Consumptive Use (CU) Supply and Excess

Provider	Description	Volume (acre-feet)
Local Water	Available CBT CU[O]	747
	CBT Treated Water Demand[P]	-560
	GLIC & GLIC First Use CU[O]	418
Sub-Total w/out GLIC First Use		*187*
Sub-Total with GLIC First Use		*605*
Town	Available non CBT CU[Q]	711
	RO Treated Water Demand[P]	-216
	Irrigation CU Demand[R]	-97
Sub-Total		*398*
Total Excess w/out GLIC First Use		**585**
Total Excess with GLIC First Use		**1,003**

[O] from Table 11 - CBT CU yield
[P] from Table 3 2004 - 2012 Avg
[Q] from Table 11 - Hillsborough, GLIC
[R] from Table 7 reduced by 15% for irrigation returns

[7] Anticipated growth of 180 units per year, based on 1% capture rate – Milliken 2010 Comprehensive Plan.

2035 Raw Water Requirements

The 2035 residential water demand for the Town of Milliken is estimated to be 3,061 acre-feet based on 0.50 acre-feet per single family residential unit and 6,121 units. The 2035 water demand for the 1,360 acres of Commercial and Industrial development is estimated to be 1,219 acre-feet (assuming 800 gallons per acre per day water demand). Due to various water supplies that include both treated potable water and non-potable water for irrigation, there are several viable water sources for the Town to build its water infrastructure upon. It is important to understand that the two water providers, the COG and CWCWD are limited to specific water sources. The COG uses two water treatment facilities to provide water to Milliken. The Bellevue treatment plan, the primary treatment facility, treats CBT and the Boyd Lake treatment plant typically provides water to meet peak demands during the summer months and can treat CBT and GLIC water rights. The CWCWD provides water from the south via CBT storage in Carter Lake. However, the continued expansion of alluvial water as a supply as both a potable and non-potable supply affords the Town the ability to purchase numerous water rights that can be used to augment the resulting alluvial well depletions.

Other viable future potable supplies include the Northern Colorado Water Conservancy District Regional Treatment facility. The Town is a participant in the preliminary location of this facility that will treat CBT, Windy Gap and Northern Integrated Supply Plan (NISP) sources all controlled and operated by the Northern Colorado Water Conservancy District. However, this regional treatment facility may also treat local raw water sources such as GLIC, Consolidated Hillsborough, and Consolidated Home Supply water rights all of which are located in the lower Big Thompson basin.

Table 3 shows that from 2004, the COG has provided approximately 45 percent of the Town's overall potable water supply; CWCWD and the RO wells each providing approximately 27 percent and 28 percent respectively of the overall potable water supply. While this has been the past historical water mix, this blend has been somewhat historically controlled by the physical limits of the existing potable distribution that will be discussed in more detail in subsequent sections of this report. To accommodate future 2035 projected water demands both temporally and spatially, consideration must be given to the location of supply connections into the Town's potable distribution system from the COG, CWCWD and the alluvial wells.

The 2035 projected treated water supply needed to satisfy a population of 17,568 is estimated to be 4,279 acre-feet. Based on the projected 2035 developed area and the location of the supply connections the following potable water blend has been proposed: 588 percent from the COG (to maintain the 442 acre-feet annual treatment delivery per the existing agreement), 640 percent from CWCWD and 3816 percent from alluvial supplies augmented by area senior surface water rights.

Because of system losses associated with conveyance, treatment and irrigation requirements, the 2035 potable water demand of acre-feet requires acre-feet of raw water supplies. Future

demand of acre-feet of raw water must be provided to supply the North and North Highlands Zone's 2035 treated water demand. Due to limitations in supply from COG, any water in excess of 631 acre-feet will require a dedicated water line and booster station. acre-feet of raw water is required to be provided to CWCWD, which is the amount needed to supply the South Zone's 2035 treated water demand. Similarly, acre-feet of consumptive use water from area ditch systems are needed to satisfy the projected 2035 water demand from alluvial sources, which is an increase of 3,598 acre-feet from 2013 supplies.

Table 15: Summary of Milliken's 2035 Potable Raw Water Rights

Source	Description	2035 Quantity		2013 CU[A] (acre-feet)	2035 CU (acre-feet)	
City of Greeley	CBT[W]	604	Units	373	423	
	Greeley Loveland Irrigation Company[X]		Shares	9	9	
	Seven Lakes Reservoir Company[X]		Shares	44	44	
	Lake Loveland[X]		Shares	8	8	
	CCWCD First Use[Y]			357	229	
Sub-total				*792*	*713*	AC
Central Weld County Water District	CBT[W]	463	Units	373	324	
	NISP	855	Units	-	855	
Sub-total				*373*	*1,179*	
Alluvial Wells	Consolidated Hillsborough Ditch[Z]	48	Shares	597	2,458	
	Big Thompson & Platte River Ditch[AA]	29	Shares	-	638	
	Bee Line Ditch[AB]	14	Shares	-	56	
Sub-total				*597*	*3,152*	
Total				**1,762**	**5,044**	

[A] *from Table 10*
[W] *Per unit yield of 1 af at 0.70 (historic avg annual quota)*
[X] *CU calculated as 57% after 22% system loss*
[Y] *Yield based on net system delivery with 10% additional water per agreement*
[Z] *Average CU in 02CW339 (2013 CU reduced for 2013 irrigated acres, Table 16)*
[AA] *CU Yield of Big Thompson & Platte River Ditch = 22 af/sh*
[AB] *CU Yield of Bee Line Ditch = 4 af/sh*
[AC] *Exceedes agreement with COG*

While Table 15 specifically identifies the COG and CWCWD as the provider for the CBT, GLIC water rights and the NISP water rights, a portion of these supplies could also be provided by the Northern Colorado Water Conservancy District Regional Treatment facility, however, the location of the treatment facility has not been identified as of the preparation of this report.

Currently 64 acres are irrigated with non-potable water supplies provided by the Consolidated Hillsborough Ditch and alluvial groundwater. The 2035 non-potable irrigated acres is estimated to total 195 acres based on 64 acres of non-potable and a population of 5,610 (1.1%). Table 16

shows the 2013 and projected 2035 irrigation consumptive use demand for the 195 irrigated acres.

Table 16: Milliken's 2035 Non-Potable Raw Water Rights for 195 Acres

Source	Description	2035 Quantity		2013 CU[b] (acre-feet)	2035 CU (acre-feet)
Alluvial Wells	Consolidated Hillsborough Ditch	6.8	Shares	114	347
Total				114	347

[b] *Irrigation demand from Table 8*

The total consumptive use raw water requirement needed satisfy the projected 2035 population is acre-feet (5,044+347 Table 15 and Table 16), an increase of 3,401 acre-feet from the 2013 existing water supply owned by the Town of 1990 acre-feet (1519+357+114 from Table 12 and Table 16).

In addition to the acquisition of additional raw water supplies, lined storage such as the Platte River Trust Storage site or other area lined gravel storage in the lower Big Thompson River should be developed in order to maximize the consumptive use of the senior ditch water rights (Hillsborough, GLIC, etc.) via a river exchange. The lined storage site typically consists of lined gravel mines that prevent infiltration and exfiltration of alluvial groundwater from the river alluvium. Administratively, water generated from the Town's Consolidated Hillsborough (or other senior water purchased in the future) not directly required to cover daily well depletions from the Town's potable and non-potable wells can be diverted and stored directly into a lined gravel storage site located in the lower Big Thompson River or exchanged at the confluence of the South Platte River and the Big Thompson River, upstream for diversion and storage in the 1,250 acre-feet Platte River Trust lined storage site. This type of administrative efficiency will be necessary to achieve the projected firm yield of the water rights shown in Table 15, particularly the GLIC CCWCD First Use contract right. The First Use agreement requires the Town to replace the volume of GLIC water treated by Milliken through the COG's Boyd Lake water treatment facility. The replacement obligation will not necessarily be at times that are concurrent with the actual treatment of the water at Boyd lake; thus requiring a delayed release and subsequent storage of wholly consumable waste water treatment effluent discharged into the Big Thompson River for later release as required by the CCWCD First Use agreement.

Economic Consideration

Future acquisitions of raw water rights to satisfy the 2035 projected growth and for ultimate build-out should be a high priority. The Town must also have a clear understanding of how to treat the raw water for the most cost effective rate. Milliken has numerous options, (1) purchase more capacity from the COG and CWCWD, (2) construct additional treatment for alluvial groundwater and surface water from senior ditch water rights, and (3) to develop an additional

water source from the Northern Colorado Water Conservancy District Regional Treatment facility.

Currently, Milliken has individual intergovernmental agreements with the COG and CWCWD to provide treated water at a cost of $1.80 and $1.20 per 1,000 gallons of treated water, respectively. Annual treatment volume limits per these agreements are 292 acre-feet at a maximum withdraw of 600 gpm from CWCWD and 442 acre-feet from the COG with no maximum withdraw rate. Both agreements were established in 1999 with 20-year terms. As Milliken grows, the Town may pay a System Development Charge (SDC) for the treated water in excess of the previous year's delivery to automatically increase and reset the base volume designated in the COG agreement. This SDC is a onetime non-refundable fee that purchases capacity in the Greeley system, but does not include the cost of raw water rights for the additional treated water. To utilize the excess capacity purchased, Milliken must purchase the additional raw water shares for transfer to the COG. The COG SDC for additional capacity is determined as 75% of the current inside-Greeley Plant Investment Fee for a ¾" tap. Presently the SDC is $12,993 per acre-foot.

The agreement with CWCWD does not have the same automatic expansion capabilities and thus no provision for SDC. Any additional treated water from CWCWD requires a new agreement and subsequent SDC for capacity in excess of 292 acre-feet.

Alternate sources presently include alluvial water via alluvial wells with RO or alternative treatment. The RO plant can treat up to 450 gallons per minute of raw water at a historical cost of $1.90 per 1,000 gallons.

The unstated assumption is that the Town will only treat water from groundwater wells through the RO plant. It must be cautioned that the current RO plant, designed to treat 0.70 million gallons per day, cannot reach this level of treated volume due to the physical limitations of the alluvial aquifer and the two existing wells (estimated annual safe yield volume of 400 to 500 acre-feet per year – 0.36 million gallons per day).

Milliken will need to reconsider the current roll of their water treatment facilities to treat water supplied to the Town through local rivers and/or ditch companies. By reallocating funds the Town currently spends for SDC's to the COG and CWCWD, Milliken could fund internal water treatment projects, and gain a higher control over its water supplies and operations. To date, Milliken has a significant amount invested in their relationship with the COG and CWCWD for supplying treated water. The intergovernmental agreement with the COG expires July 20, 2019, and requires renewal negotiations two years prior to the expiration of the contract. Similarly, the intergovernmental agreement with CCWCD expires August 19, 2019. Given the amount of treated water that both entities have provided in the past, and are anticipated to provide in the future pursuant to this planning document, it is recommended that the Town of Milliken initiate negotiations in late 2014 with both providers to ensure continued potable water service.

Based on the raw water acquisition model presented in Table 17 (treated potable water blend of 12 percent from the COG, 24 percent from CWCWD and 64 percent from alluvial supplies) no additional water would need to be provided to the COG. However, 701 acre-feet of additional water provided to CWCWD. A SDC would be required for the additional 701 acre-feet to CWCWD (633 acre-feet of treated volume) because essentially all of the existing capacity of 292 acre-feet from CWCWD is being used in present day operations. The estimated cost of the SDC in 2014 dollars, based on the COG current SDC of $12,993 per acre-foot, is in excess of $9.1 million. However, SDC will likely increase due to inflation and newly negotiated contracts for water service from the COG and CWCWD.

The current capacity of the RO treatment plan is 0.7 million gallons per day or 784 acre-feet annually. As of 2012, 216 acre-feet (Table 3) are treated with the RO plant, resulting in excess treatment capacity of approximately 568 acre-feet annually (not requiring additional RO treatment capacity). Based on Table 15, the projected 3,152 acre-feet of CU supply, which is a 2,555 acre-feet (3,152-597) increase in CU supply, would require the development of additional treatment capacity.

Additional treatment capacity will be required to meet the 2035 additional supply from the alluvial aquifer. It should be noted that due to limited and currently exploited yield of the aquifer in the vicinity of the existing RO treatment plant, pipeline infrastructure would need to be constructed from new alluvial wells developed to the east and north adjacent to the South Platte and Big Thompson rivers in order to expand the Town's alluvial groundwater supply.

Figure 4 presents a graphical representation of Milliken's treated water demand and projected supply by source. Note that Figure 4 shows that at the projected growth of 180 residential units per year, the Town will exceed its' consumptive use water supplies of 1,762 acre-feet (Table 15 2013 CU supplies) by 2020. Furthermore, the existing contractual treatment limit of 292 acre-feet from CWCWD will be exceeded by 2017. In addition, Figure 4 shows that the capacity of the existing alluvial well field will be exceeded by 2015 and the existing RO treatment capacity of 784 acre-feet will be exceeded by 2018. Therefore, the Town's ability to meet the projected water demand must include investment in additional treatment capacity from CWCWD and COG no later than 2016, the expansion of the alluvial wells by 2014, and subsequent alluvial treatment facilities by 2015.

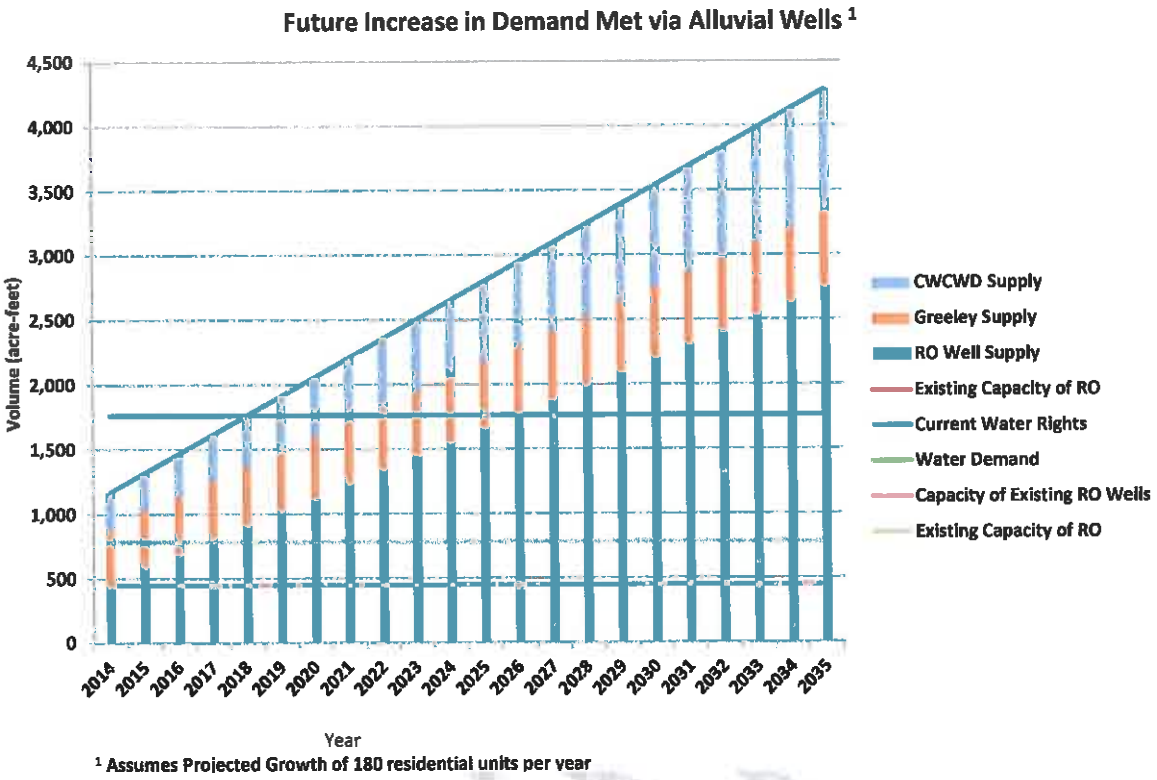


Figure 4: Milliken Projected Treated Water Supply

Water System

The existing master plan identifies water system improvements to serve the ultimate service area. This report examines the existing water system and identifies improvements to serve the projected 20-year population of 17,568. Furthermore a five-year Capital Improvements project list was formulated along with cost estimates to guide the Town of Milliken's short term expenditures on the water system.

Quantity and Location of Demands

The guiding document used for all water system analysis was the Urban Growth Area Land Use Map (Figure 3) provided by Milliken Town staff. This map identifies the type, location and area of potential development within the study area.

As shown on Figure 3, each planning area is associated with a three digit alphanumeric combination such as H-4-4. The first identifier locates the grid in the north-south direction; the second identifier locates the grid in the east-west direction; the third identifier designates a portion or planning sub-area within the identified section. Each specific planning area has an identified type of land use and development percentage, which was then evaluated to determine water demand requirements. These water demand requirements are shown on Table 5. The sum

of the water demand from all planning areas provides the overall estimated water demand for the Town of Milliken in the year 2035. Table 9 shows the Average Daily Demand (ADD), the Maximum Daily Demand (MDD) and Peak Hourly Demand (PHD) for each planning area based on Figure 3.

Using EPANET, a water model of the existing distribution system (12" diameter pipes and larger) was then created. The water demands shown on Table 9 were then applied at the appropriate location within the model to simulate the system in operation.

Existing Water Distribution System

The Town's water distribution system is provided water by the City of Greeley, Central Weld County Water District and Milliken's reverse osmosis (RO) facility. The Central Weld Water is delivered through a master meter and a 10-inch pipe from the south. Greeley water is delivered through a master meter and 16-inch line north of Town.

The RTW report identified areas of system deficiencies due to small and dead end waterlines. The Milliken Fire Department performed fire hydrant flow tests in November 2012 at several different locations. These test results are shown in Table A-2, Appendix A. Failures (lack of required fire flow) occurred in Centennial Farms, Commercial Center, Mini Mall Shopping area, Peregrine Creek, Settler's Village, several locations in the downtown area and Wildcat Acres.

To resolve most of these issues the Town must provide additional looping capabilities to the existing system. These waterlines must be large enough to serve the estimated growth as shown on Figure 3. The problem at Wildcat Acres will not be resolved until a storage tank and south booster station are constructed. In the meantime, the Town should negotiate an agreement with Central Weld to allow the Town to pull additional water through the master meter should a fire occur in Wildcat Acres. A 12-inch waterline is proposed in Broad Street from Alice Avenue to Highway 257. This will help the downtown area but there will still be issues due to small lines in the adjacent side streets.

Potable Water Source Capacities and Locations

As mentioned earlier, the Town of Milliken gets treated water from three sources. Greeley provides up to 450 acre-feet/year, Central Weld 373 acre-feet/year and the RO plant 216 acre-feet per year. Based on these numbers the Town can receive 1,039 acre-feet of treated water per year. For this report it was determined that water provided by Greeley would be increased to support development in the North and North Highlands pressure zones and the volume of water from Central Weld would be increased to provide the ADD of the developed South pressure zone. All additional water will come from the Town. The additional water would come from a new well field and, based on the water quality, may need to be treated in a new water plant and the treated water pressure raised in a booster station to match the pressure in the distribution system.

It has been estimated that the future treated water demand for Milliken will be 4,279 acre-feet/year. In order to supply the ADD demand of the South zone, the Town will need a total of 968 acre-feet/year from Central Weld. In order to supply the North and North Highland zones, the Town will need a total of 495 acre-feet/year of water from Greeley. If the existing RO plant continues to deliver 216 acre-feet/year, the new well field must supply the remaining 2,600 acre-feet/year. This averages 1,612 gallons/minute (gpm).

Pressure Zones

The Town of Milliken has four pressures zones. Three of the four zones have maximum static pressures exceeding 100 psi. The RTW Master Plan recommended modifying the Hydraulic Grade Line to reduce these maximum pressures. This report is following those modified pressures. The proposed pressure zones and water sources are show on Table 17.

Table 17: Proposed Pressure Zones

Zone	Hydraulic Grade Line Elevation	Maximum Service Elevation	Minimum Static Pressure (PSI)	Minimum Service Elevation	Maximum Static Pressure (PSI)
North Highlands	5210	5050	69	4966	106
North	5070	4966	45	4840	100
Central	4945	4840	46	4690	111
South	5070	5003	29	4840	100

Based on Figure 3 the 2035 water demands for each pressure zone are shown on Table 18.

Table 18: Water Demand per Pressure Zone

	(all values in gallons/min)			
Description	North Highlands	North	Central	South
Average Daily Demand	31	278	1,756	587
Maximum Daily Demand	80	724	3,738	1,524
Peak Hour Demand	120	1,086	5,118	2,284

South Zone

This zone is currently served completely from Central Weld. As development occurs, additional water will need to be secured from Central Weld. In 2035, the Average Daily Demand in the South Zone will be 587 gpm, the Maximum Day Demand will be 1,524 and Peak Hour Demand will be 2,284 gpm. The ADD will be met by the flow from Central Weld. In order to meet the MDD and PHD the Central Weld water will be supplemented by water from the new well field. This will be done through the proposed 16-inch diameter pipe looping system, the proposed initial 1.0 million gallon (MG) storage tank and the proposed South Booster Station. These proposed improvements are shown on Figure A-.

Central Zone

The central pressure zone contains the majority of the development and therefore the largest water demand of all four zones. The Central Zone currently receives water from all three sources. As the south area and the north area develop, the CentralZzone will receive less and less water from Greeley and Central Weld until they reach a point where it receives all it water from the existing RO plant and the new well field.

In 2035 the ADD will be 1,756 gpm, the MDD will be 3,738 and the PHD will be 5,118 gpm. The MDD will be met by the existing RO plant and the new well field. The PHD will be met by flows from the proposed storage tank. The new well field must be able to provide the MDD for the Central Zone minus the water supplied by the existing RO plant and the MDD for the South Zone minus the water from Central Weld. That amount is 3,738 gpm – 135 gpm + 1,524 gpm – 600 gpm = 4,527 gpm.

North Zone

The North pressure zone is mostly undeveloped at this time. The North Zone is low enough in elevation so it receives good pressure from the City of Greeley. Greeley is the only source of water for the North Zone.

In 2035, the ADD will be 278 gpm, the MDD will be 724 gpm and the PHD will be 1,086 gpm. The ADD, MDD and PHD can be met by the existing flows from Greeley.

North Highlands Zone

This zone is completely undeveloped at present. When development occurs within this zone it will most likely be served by Greeley. If Greeley serves this zone then a storage tank and booster station will be required. The pressure from Greeley within this zone is not adequate without boosting the pressure. It is estimated that the North Highlands zone would require a storage tank of approximately 0.25 MG with a booster station capable of delivering 80 gpm to 1,600 gpm.

In order to serve both the developed North zone and the North Highlands Zone the Town would need to increase COG supplies from 442 acre-feet to approximately 500 acre-feet. Because it is assumed that no additional water would be provided by Greeley, service these to these two zones would be from the proposed storage tank and South Booster station. This would require a dedicated waterline from the booster station to the North and North Highlands pressure zone. The new well fields would also need to be increased in size to account for the extra demand and the storage facility enlarged as well.

Pipeline Sizing

Pipelines within this plan fall into two categories, transmission or distribution mains. Transmission mains carry the bulk of the water to distribution system. Per the RTW Master Plan, pipelines 16-inch in diameter or larger are transmission lines and pipelines smaller are distribution mains. This study follows that lead. The transmission mains carry water at a velocity of 1 to 3 feet per second during maximum day plus fire flow events. This lower velocity

minimizes friction losses to help maintain pressure. The velocity of water in distribution mains is in the range of 3 to 7 feet per second during maximum day plus fire flow event. All pipes for the proposed system we designed to adhere to these requirements.

Domestic Water Storage

For a typical system, distribution system storage provides three advantages: system equalization, emergency storage and fire storage.

Equalization storage allows distribution systems to supply water at a constant rate despite varying demands. For example a system needs to provide enough water for a maximum day demand. During the maximum day, the system demand will fluctuate to a much higher demand during the morning and early evening hours, and then less during other times. During the peak demand period water is released from the storage tank into the system. During lower demand times, the tank should be filling. The amount of storage for equalization amounts to approximately 1/3 of the MDD for the area served by the tank.

Emergency storage is equal to an average day reserve. This provides system backup to allow water providers an opportunity to fix system failures. This storage component is critical when water is provided from only one source.

The Town's system must also be capable of meeting required fire flows. RTW allowed 180,000 gallons for fire storage and this report uses the same value.

Milliken has three sources of water, two of which require negotiation of an intergovernmental agreement for rate and quantity. Greeley limits the total volume of water that can be delivered to Milliken on a yearly basis but does not limit the rate. Therefore the central pressure zone has a second source of supply during emergency conditions.

Central Weld Water District has a restriction on the rate and quantity. Once the new 16-inch waterlines are installed and the storage tank and south booster station constructed, a second source of water will be available to the South Zone as well.

Based on the needs of the storage tank for the south and central zones should be sized as follows:

1. 2 hours of storage for fire flow at a rate of 1,500 gpm = 180,000 gallons
2. 1/3 of MDD for central and south zone for equalization storage = 2,525,951 gallons

Table 19 shows the storage requirements for the South and Central basin combined and for the North Highlands when it develops. The five-year Capital Improvements Plan is recommending the Town initially build a 1.0 MG storage tank. When the Town begins having trouble filling the tank overnight, planning should begin on an additional storage tank.

No storage will be required for the North Zone as Greeley will be able to deliver both the MDD, PHD and fire flows.

Table 19: Storage Requirements

Description	(all values in gallons) North Highlands	North	Central and South*
Fire (2hr @ 1,500 gal/min)	180,000	-	180,000
Storage (1 Ave. Day)	44,444	-	-
Equalization (1/3 Max. Day)	38,518	-	2,525,951
Total	**262,961**	-	**2,705,951**

* Central and South Zones will both utilize a single storage tank

Pump Station Requirements

Milliken needs two water booster stations: a South pressure zone pump station and a North Highlands pressure zone pump station.

The South pressure zone pump station boosts pressure from the storage tank that is filled with water from the Central zone. The booster station will need to be able to deliver from near zero flows up to 2,500 gpm to provide 1,500 gpm fire flows during MDD.

The North Highlands zone pump station boosts pressure from the City of Greeley source. This station would also need to be able to deliver from near zero flows up to approximately 1,600 gpm to provide fire flows during MDD.

Water System Summary

The Town of Milliken water distribution system requires several upgrades in order to meet the projected growth and development as shown on the Land Use Map. These improvements include additional water sources, large transmission looping pipelines, storage tanks and booster pump stations.

With the assumption that the rate of supply from Central Weld will not increase, the existing 10-inch from the south is adequate. The Town will need to augment this South Zone water with water from the new well field. The well field water will be pumped to the new storage tank farm located in the South Zone. The water from the tanks will be boosted and delivered to the South Zone to supply the necessary MMD, PHD and fire flows that will be required as the South Zone develops.

The majority of the water for the Central pressure zone must come from the new well field. At this time the water quality from this new field is not known, however for the purposes of this report we have included the cost to construct a treatment facility for this water. The new well field and the existing RO plant will provide all the water to the Central Zone. These sources will also provide water to the new storage facility and the storage tank will provide equalization and fire storage for the Central Zone. The Central Zone will be gravity fed from the new storage tank.

The North zone development could be completely served with the existing water from Greeley. This zone has sufficient pressure from the Greeley feed alone. Also since there is no limit on the rate of flow, Greeley can supply MDD, PHD and fire flows to the North pressure zone.

The North Highlands pressure zone will require both a storage facility and a booster station. Development in this zone will require negotiation with Greeley for additional water. If additional water cannot be negotiated, then the only way the North Highlands zone can be served would be from the booster station in the South Zone. This would require a dedicated line from the booster station to the North Highlands Zone and dedicated booster pumps as well.

Wastewater System

Wastewater Treatment Plant

The 2006 Milliken Water and Sewer Master Plan identified the location of trunk sewers (larger than 8" in diameter), proposed lift stations, wastewater treatment plant expansion potential and phased development recommendations. It is not within the scope of this study to revise or update this information.

Since 2006, the Town's wastewater treatment plant (WWTP) has been upgraded. The current facility has a daily treatment capacity of 0.7 million gallons per day (MGD).

To determine the future wastewater demand the Colorado Department of Public Health and Environment (CDPHE) recommends using 70 to 100 gallons per person (capita) per day. The 2006 Milliken Water and Sewer Master Plan used 70 gallons per capita per day. It is advisable to compare this value to historical wastewater generated to determine its accuracy. Table 1 shows the historical wastewater influent from July 2012 to March 2013. This data has been used to determine the average daily wastewater contribution, which is 0.38 MGD and equates to approximately 66 gallons per person per day. The Milliken historical demand compares favorably to the recommended demand of 70 gallons per capita per day. Using the per capita demand and 2035 population of 17,568 the average 2035 wastewater treatment demand is 1.23 MGD.

Table 20: Historical Wastewater Treatment Plant Influent

Year	Month	Influent Rate (million gal/day)
2012	July	0.46
2012	August	0.48
2012	September	0.54
2012	October	0.36
2012	November	0.41
2012	December	0.28
2013	January	0.29
2013	February	0.29
2013	March	0.28
Average (2012-2013):		0.38
		÷ 5,685 people
Average (gal/capita/day)		66

Because the future treatment demand exceeds the existing wastewater treatment capacity, steps should be taken to implement treatment plant upgrades. Proposed wastewater treatment plant capacity improvements should be completed in phases in accordance with the following schedule:

A. Begin planning process when the existing WWTP capacity reaches 80%;
B. Submit a Site Application to the CDPHE when the WWTP capacity reaches 85%;
C. Begin construction of required WWTP upgrades when existing capacity reaches 95%.

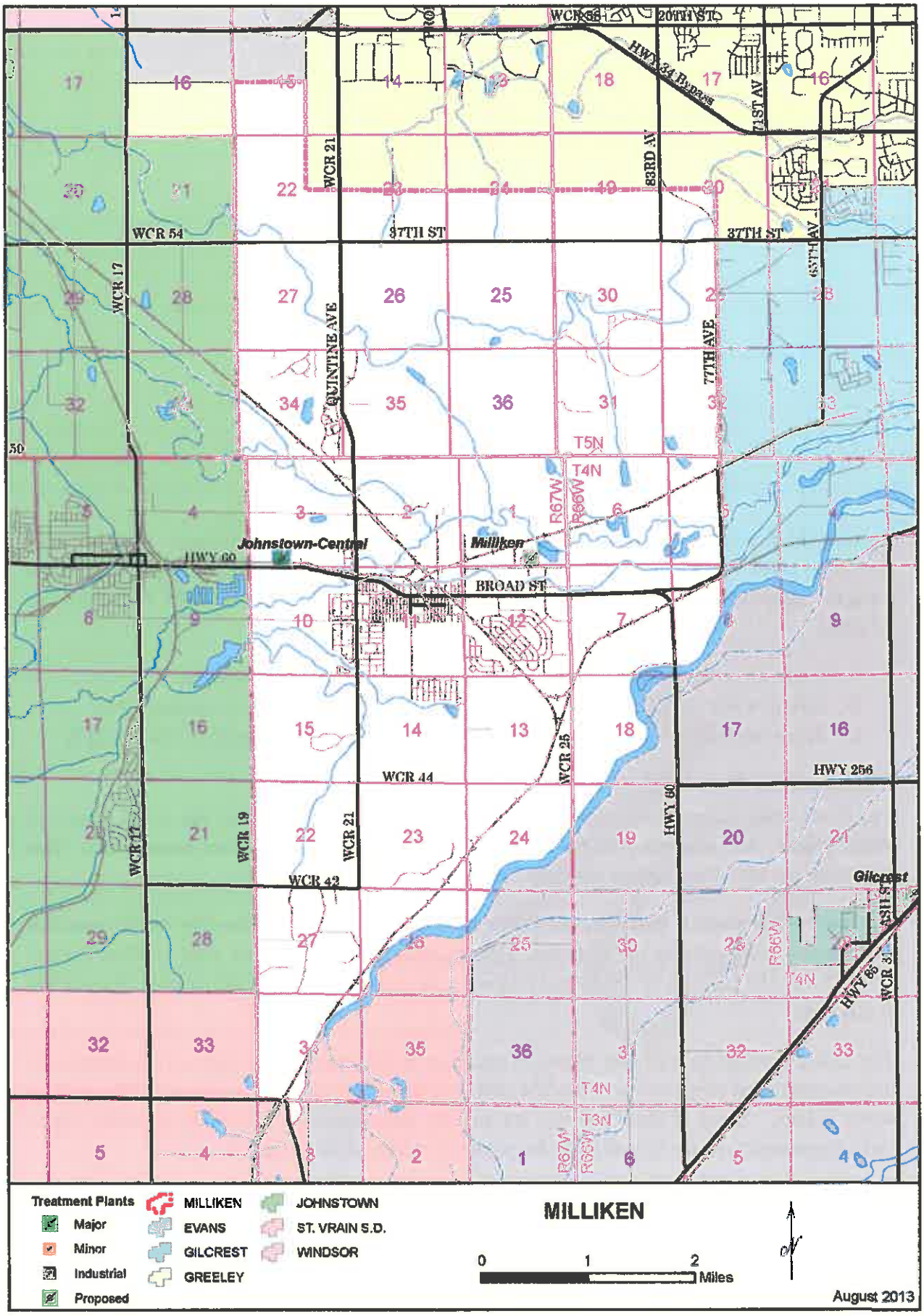
Milliken 208 Plan Map

The North Front Range Water Quality Planning Association (NFRWQPA) has a 208 Areawide Water Quality Management Plan that identifies each Town's sanitary sewer service area. This map from the 2013 Plan Update has been included as Figure 5.

For planning purposes it should be noted that there are areas outside of the 208 service area that may require sewer service in the future. This includes any development west of West County Road (WCR) 19 between WCR 44 and Highway 60, which Milliken is not capable of servicing at this time.

The Town, through its staff and Water, Wastewater & Drainage Utility Advisory Commission, has recommended projects that would be desirable and appropriate to complete to the sanitary sewer system. Some of these projects are smaller maintenance & operation upgrades; others include providing service to new areas for potential industrial development.

These recommended projects are listed in the Executive Summary under "Sanitary Sewer Fund – Capital Expenditures Recommendations – 2014 to 2018."


WCR 54
37TH ST
WCR 21
83RD AV
71ST AV
HWY 34 Bypass
WCR 17
QUINTINE AVE
77TH AVE
T5N
T4N
R67W
R66W
Johnstown-Central
Milliken
HWY 60
BROAD ST
WCR 44
WCR 25
HWY 256
WCR 19
WCR 42
Gilcrest
HWY 85
WCR 31
T3N
Treatment Plants
Major
Minor
Industrial
Proposed
MILLIKEN
EVANS
GILCREST
GREELEY
JOHNSTOWN
ST. VRAIN S.D.
WINDSOR
MILLIKEN
0
1
2
Miles
August 2013

Appendix A:

Table A-1, Table A-2, Figure A-1 and Figure A-2 (revised by staff)

Table A-1: Ultimate Build-Out Land Use Table

Location Map ID	Land Use	Density Units/Acre		Area Acres	Units Original		Usage Rate Gal/Unit/Day (Winter)	Usage Rate Gal/Acre/Day	Base Demand Gal/Min	Max Day Peaking Factor	Max Day Gal/Min	Peak Hour Peaking Factor	Peak Hour Gal/Min
		Min.	Max.		Min.	Max.							
C-4-2	Estate Residential	0.05	0.10	209.37	3		200		0.37	2.6	1	3.8	2
E-4-4	Greenways/R-1	0.00	0.00	33.80	0				0.00	2.6	0	3.8	0
F-5-1	Estate Residential	0.01	0.10	691.19	9		270		1.07	2.6	3	3.8	5
F-5-2	Low Density Residential	0.25	1.00	15.81	9		200		1.27	2.6	3	3.8	5
F-6-1	Estate Residential	0.01	0.10	596.87	8		270		1.06	5.5	3	3.8	5
F-6-2	Greenways	0.00	0.00	90.00	0		200		0.00	2.6	0	3.8	0
F-7-1	Estate Residential	0.25	0.75	609.73	153		200		21.59	2.6	56	3.8	83
F-7-2	Greenways	0.00	0.00	20.00	0		200		0.00	2.6	0	3.8	0
F-8-1	Commercial/Mixed Use	0.25	0.75	389.00	97		200		13.46	2.6	35	3.8	52
F-8-2	Low Density Residential	0.25	0.75	80.70	20		200		2.83	2.6	7	3.8	11
F-8-3	Greenways	0.00	0.00	25	0		200		0.00	2.6	0	3.8	0
F-9-1	Low Density Residential	0.25	1.00	161.00	40		200		5.67	2.6	15	3.8	22
F-9-1	Greenways	0.00	0.00	140.00	0	0	200		0.00	2.6	0	0.0	0
F-4-3	Golf Course/Agricultural	0.00	0.00	71.63		0			0.00	0.0	0	0.0	0
F-4-6	Commercial	0.00	0.00	5.63		0		2,750	12.20	1.5	18	1.6	20
F-4-7	Low Density Residential	0.25	1.00	61.15	16		200		2.15	2.6	6	3.8	8
F-5-1	Agricultural Estate	0.00	0.00	189.07	0		200		0.00	2.6	0	3.8	0
F-5-2	Estate Residential	0.01	0.10	294.60	3		200		0.41	2.6	1	3.8	2
F-5-4	Greenways	0.00	0.00	45.91	0		200		0.00	2.6	0	3.8	0
F-5-5	Greenways	0.00	0.00	11.94	0		200		0.00	2.6	0	3.8	0
F-6-1	Estate Residential	0.01	0.10	391.09	5		270		0.67	2.6	2	3.8	3
F-6-2	Greenways	0.00	0.00	260.00	0		200		0.00	2.6	0	3.8	0
F-7-1	Estate Residential	0.01	0.10	440	5		200		0.78	2.6	2	3.8	3
F-7-2	Greenways	0.00	0.00	200.00	0		200		0.00	2.6	0	3.8	0
F-8-1	Commercial/Mixed Use	0.25	0.75	83.00	20		200		2.83	2.6	7	3.8	11
F-8-2	Low Density Residential	0.25	1.00	40.00	10		200		1.42	2.6	4	3.8	5
F-8-3	Estate Residential	0.01	0.10	380.00	4		200		0.67	2.6	2	3.8	3
F-8-4	Greenways	0.00	0.00	140.00	0		200		0.00	2.6	0	3.8	0
F-9-2	Low Density Residential	0.25	1.00	332.00	64		200		8.93	2.6	23	3.8	34
G-4-1	Greenways	0.00	0.00	300.00	0		200		0.00	2.6	0	3.8	0
G-4-2	Low Density Residential	0.25	1.00	80.00	20		200		2.83	2.6	7	3.8	11
G-4-3	Estate Residential	0.01	0.10	73.00	0		200		0.00	2.6	0	3.8	0
G-4-4	Agriculture	0.00	0.00	15.00	0	0	200		0.00	2.6	0	3.8	0
G-4-5	Greenways	0.00	0.00	50.00	0	0	200		0.00	2.6	0	3.8	0
G-4-7	Robinstown Waste Water Plant	0.00	0.00	40.00	0	0	200		0.00	2.6	0	3.8	0
									194.52				
G-5-1	Greenways	0.00	0.00	279.00	0	0	200		0.00	2.6	0	3.8	0
G-5-2	Agriculture	0.00	0.00	100.00	0	0	200		0.00	2.6	0	3.8	0
G-5-4	Business/Industrial	0.00	0.00	100.00				2750	190.97	2.6	497	3.8	726
G-5-5	Retail/Residential/Commercial	0.50	1.00	80.00	40		200		5.56	2.6	14	3.8	22
H-5-1	Agricultural	0.00	0.00	169.00	0	0	200		0.00	2.6	0	3.8	0
G-6-2	Greenways	0.00	0.00	480.00	0	0	200		0.00	2.6	0	3.8	0
G-7-3	Agriculture	0.00	0.00	240.00	0		200		0.00	2.6	0	3.8	0
G-7-2	Greenways	0.00	0.00	332.00	0		200		0.00	2.6	0	3.8	0
G-7-1	Commercial/Office Park	0.25	0.75	69.84	18		200		2.47	2.6	6	3.8	10
G-8-1	Estate Residential	0.01	0.10	190.00	2		200		0.18	2.6	0	3.8	1
G-8-2	Agriculture	0.00	0.00	140.00	0		200		0.00	2.6	0	3.8	0
G-8-3	Greenways	0.00	0.00	400.00	0		200		0.00	2.6	0	3.8	0
G-8-4	Low Density Residential	0.25	1.00	300.00	75		200		10.63	2.6	28	3.8	41
H-4-1	Greenways	0.00	0.00	110.00	0	0	200		0.00	2.6	0	3.8	0
H-4-2	Agriculture	0.00	0.00	60.00	0	0	200		0.00	2.6	0	3.8	0
H-4-6	Estate Residential	0.01	0.10	90.00	1		200		0.09	2.6	0	3.8	1
H-4-5	Agricultural	0.00	0.00	160.00	0	0	200		0.00	2.6	0	3.8	0
H-5-7	Town Residential	0.25	1.00	30.00	8		200		3.19	2.6	8	3.8	13
H-5-1	Town Residential/Commercial Mixed Use (20% Total)	0.77	1.53	96.00		80	200		11.11	2.6	29	3.8	43
H-3-2	Greenways	0.00	0.00	20.00	0	0	200		0.00	2.6	0	3.8	0
H-3-4	Agriculture	0.00	0.00	220.00	0	0	200		0.00	2.6	0	3.8	0
H-6-6	Open Space	0.00	0.00	32.93	0	0	200		0.00	2.6	0	3.8	0
H-6-7	Open Space	0.00	0.00	37.64	0	0	200		0.00	2.6	0	3.8	0
H-6-12	Open Space	0.00	0.00	20.37	0	0	200		0.00	2.6	0	3.8	0
H-6-15	Open Space	0.00	0.00	24.62	0	0	200		0.00	2.6	0	3.8	0
I-7-1	[illegible]	0.00	0.00	[illegible]				2750	611.11	2.6	1589	3.8	2323
H-7-2	Commercial/Mixed Use	0.25	0.50	269.00	67		200		9.92	2.6	26	3.8	38
I-8-1	[illegible]	0.00	0.00	[illegible]			200	2750	305.56	2.6	794	3.8	1162
H-8-2	Greenways	0.00	0.00	160.00	0	0	200		0.00	2.6	0	0.0	0
H-9-1	Low Density Residential	0.25	1.00	50.00	25		200		1.77	2.6	5	3.8	7
I-8-3	Commercial/Mixed Use	0.25	0.77	13.95	4		200		0.49	2.6	1	3.8	2
I-4-4	Open Space	0.00	0.00	20.00	0	0	200		0.00	2.6	0	3.8	0
I-5-4	Open Space	0.00	0.00	6.30	0	0	200		0.00	2.6	0	3.8	0
I-5-4	Open Space	0.00	0.00	16.10	0	0	200		0.00	2.6	0	3.8	0
I-5-4	Open Space	0.00	0.00	50.16	0	0	200		0.00	2.6	0	3.8	0
I-6-1	[illegible]	0.00	0.00	[illegible]	0	0	200	2750	219.08	2.6	570	3.8	853
I-6-1	Estate Residential	0.01	0.10	389.14	5		200		0.68	2.6	2	3.8	3
I-6-2	Greenways	0.00	0.00	30.00	0	0	200		0.00	2.6	0	3.8	0
I-6-3	[illegible]	0.00	0.00	[illegible]	0	0	200	2750	611.11	2.6	1589	3.8	2323
I-7-1	Estate Residential	0.01	0.10	35.00	0	0	200		0.49	2.6	0	3.8	1
I-7-2	Greenways	0.00	0.00	30.00	0	0	200		0.00	2.6	0	3.8	0
I-7-3	Agriculture	0.00	0.00	140.00	0	0	200		0.00	2.6	0	3.8	0
I-7-4	Estate Residential	0.01	0.10	4.61	0	0	200		0.01	2.6	0	3.8	0
I-8-1	[illegible]	0.00	0.00	[illegible]	0	0	200	2750	76.39	2.6	199	3.8	291
I-8-1	Estate Residential (Greenville)	0.01	0.10	150.00	2	13	200		0.37	2.6	1	3.8	1
I-9-1	Low Density Residential	0.25	1.00	40.00	10	40	200		2.55	2.6	14	3.8	22
I-9-3	Estate Residential (Greenville)	0.01	0.10	180.00	2		200		0.28	2.6	1	3.8	2
I-4-4	Open Space	0.00	0.00	157.62	0	0	200		0.00	2.6	0	3.8	0
I-4-5	[illegible]	0.00	0.00	[illegible]				2750	10.08	2.6	26	3.8	39
I-5-1	Open Space	0.00	0.00	104.57	0	0	200		0.00	2.6	0	3.8	0
I-5-3	Greenways	0.00	0.00	231.00	0	0	200		0.00	2.6	0	3.8	0
I-6-1	Estate Residential	0.01	0.10	64.86	1		270		0.12	2.6	0	3.8	1
I-6-2	Greenways	0.00	0.00	458.56	0	0	200		0.00	2.6	0	3.8	0
I-6-3	Agriculture	0.00	0.00	140.00	0	0	200		0.00	2.6	0	3.8	0
I-6-4	[illegible]	0.00	0.00	[illegible]				2750	305.56	2.6	794	3.8	1162
I-7-1	Greenways	0.00	0.00	60.00	0	0	200		0.00	2.6	0	3.8	0
I-7-2	Agriculture	0.00	0.00	580.00	0	0	200		0.00	2.6	0	3.8	0
K-3-1	Estate Residential (Greenville)	0.01	0.10	485.00	5		200		0.00	2.6	0	3.8	0
K-4-3	Greenways	0.00	0.00	89.82	0	0	200		0.00	2.6	0	3.8	0
K-5-1	Low Density Residential	0.25	1.00	6.00	2		200		0.25	2.6	1	3.8	1
K-5-2	Low Density Residential	0.25	1.00	4.00	1		200		0.14	2.6	0	3.8	1
K-5-3	Greenways	0.00	0.00	597.00	0	0	200		0.00	2.6	0	3.8	0
K-5-4	Agriculture	0.00	0.00	31.44	0	0	200		0.00	2.6	0	3.8	0
K-6-2	Agriculture	0.00	0.00	600.78	0	0	200		0.00	2.6	0	3.8	0
K-6-1	Greenways	0.00	0.00	36.23	0	0	200		0.00	2.6	0	3.8	0
K-7-1	Agriculture	0.00	0.00	640.87	0	0	200		0.00	2.6	0	3.8	0
L-4-7	Estate Residential	0.01	0.10	240.00	3		200		0.53	2.6	1	3.8	2
L-4-2	Greenways	0.00	0.00	150.00	0				0.00	2.6	0	3.8	0
L-5-1	Agriculture	0.00	0.00	45.00	0	0	200		0.00	2.6	0	3.8	0
L-5-2	Greenways	0.00	0.00	552.90	0	0	200		0.00	2.6	0	3.8	0
L-5-5	Low Density Residential	0.25	1.00	32.50	8		200		0.00	2.6	0	3.8	0
L-6-1	Agriculture	0.00	0.00	320.00	0	0	200		0.00	2.6	0	3.8	0
L-7-1	Agriculture	0.00	0.00	320.00	0	0	200		0.00	2.6	0	3.8	0
M-3-1	Low Density Residential	0.25	0.77	160.00	41		200		5.67	2.6	15	3.8	22
M-5-2	Greenways	0.00	0.00	468.00	0	0	200		0.00	2.6	0	3.8	0
M-6-3	Agriculture	0.00	0.00	12.00	0	0	200		0.00	2.6	0	3.8	0
	Total Demand			21,000	811	8,813			4125.29		10,514		15,019

Estimated Population (developed units x 2.75 persons per lot) = 26,465

622845.71 gpd 15,139,890 gpd 21,627,360

Milliken Fire Department

Milliken, CO

This report was generated on 11/7/2012 1:06:17 PM

Hydrants Flow Tested for Date Range

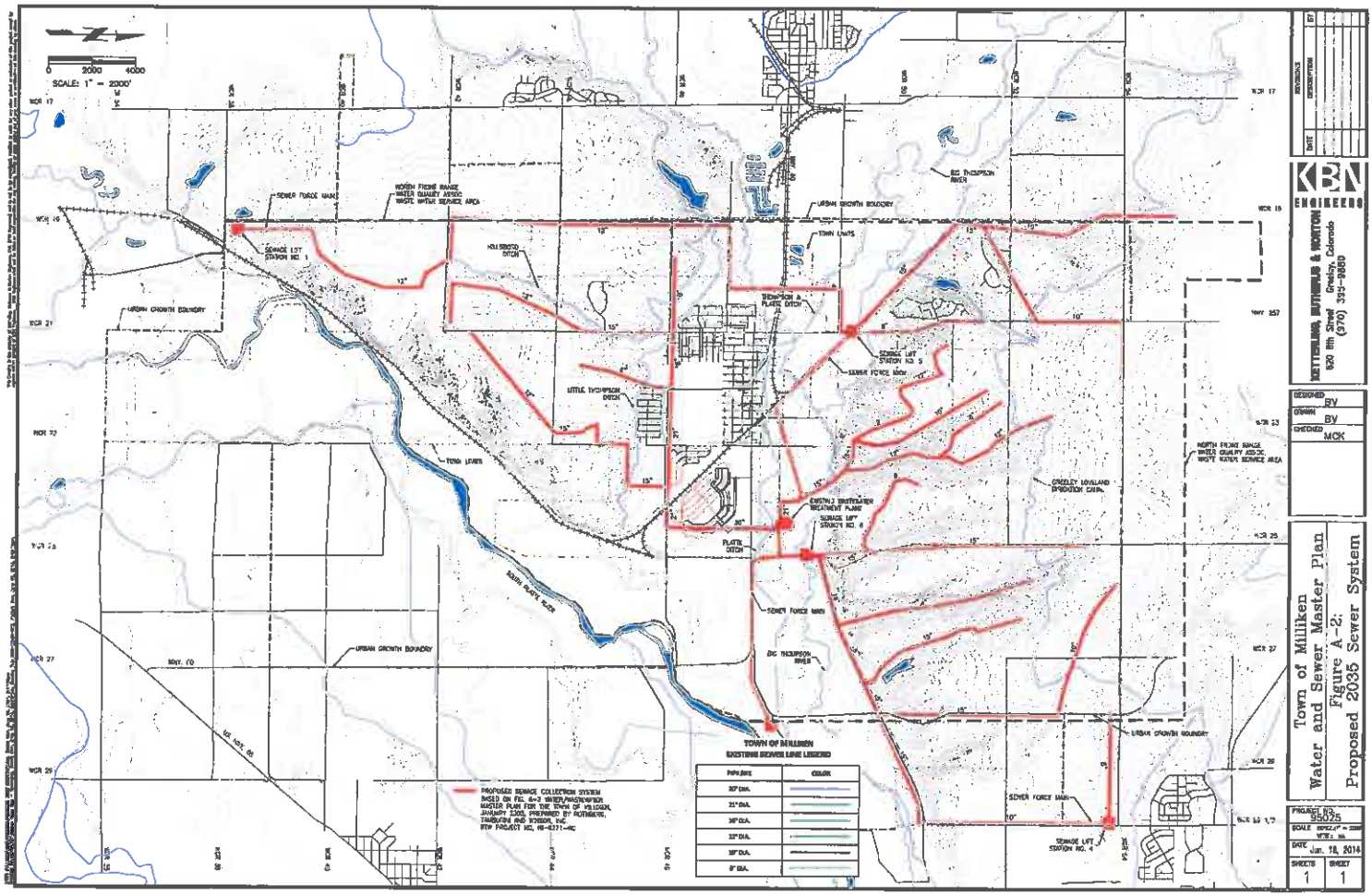
Start Date: 01/01/2012 | End Date: 12/31/2012

HYD. ID	ADDRESS	LOCATION	TEST DATE	START TIME	END TIME	STATIC	RESIDUAL	DOWNSTREAM (HYD. ID)	FLOW @ DES. PRESS	DISTRICT
Zone Centennial Farms										
LB11	1433 Cora AVE at Rancher DR Milliken, CO 80543		11/07/2012	10:41	10:42	90 PSI	52 PSI	603 GPM (LB11)	838 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for commercial areas						**TESTED BY:** Prather, Dean		
LB17	1360 Haymaker DR at Plowers DR Milliken, CO 80543		11/07/2012	10:40	10:40	88 PSI	52 PSI	588 GPM (LB17)	828 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas						**TESTED BY:** Prather, Dean		
Zone Commercial Center										
HM17	2800 Ash ST Milliken, CO 80543		11/01/2012	15:00	15:00	110 PSI	80 PSI	751 GPM (HM17)	1359 @ 20 PSI	4
Flow Test Results: Fail		Remarks: 1500 GPM needed for commercial areas						**TESTED BY:** Prather, Dean		
JJ03	Center DR Milliken, CO 80543	N side of Center Dr - near entrance to 3333 Center Dr	11/01/2012	15:00	15:00	92 PSI	72 PSI	701 GPM (JJ03)	1399 @ 20 PSI	4
Flow Test Results: Fail		Remarks: 1500 GPM needed for commercial areas						**TESTED BY:** Prather, Dean		
Zone Dove Valley										
GR27	266 Lark Bunting LN Milliken, CO 80543		11/06/2012	10:26	10:27	80 PSI	58 PSI	618 GPM (GR27)	1062 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						**TESTED BY:** Prather, Dean		
Zone Mad Russian										
DR04	101 Bogey CT at Double Eagle DR Milliken, CO 80543		11/01/2012	15:00	0:00	88 PSI	80 PSI	739 GPM (DR04)	2347 @ 20 PSI	6
Flow Test Results: Pass		Remarks:						**TESTED BY:** Prather, Dean		
DR12	2200 Birdie WAY Milliken, CO 80543		11/01/2012	15:00	15:00	115 PSI	98 PSI	798 GPM (DR12)	2020 @ 20 PSI	6
Flow Test Results: Pass		Remarks:						**TESTED BY:** Prather, Dean		
Zone Mill Iron										
DM02	3180 Branding Iron CT		11/01/2012	15:00	15:00	90 PSI	80 PSI	751 GPM (DM02)	2147 @ 20 PSI	6
Flow Test Results: Pass		Remarks:						**TESTED BY:** Prather, Dean		
Zone Mini Mall Shopping Area										
HL13	1760 Broad ST Milliken, CO 80543	East of North entrance	11/07/2012	10:25	10:26	96 PSI	70 PSI	688 GPM (HL13)	1227 @ 20 PSI	4

HYD. ID	ADDRESS	LOCATION	TEST DATE	START TIME	END TIME	STATIC	RESIDUAL	DOWNSTREAM (HYD. ID)	FLOW @ DES. PRESS	DISTRICT
Flow Test Results: Fail		Remarks: 1500 GPM needed in commercial areas						TESTED BY: Prather, Dean		
Zone Peregrine Creek										
KH11	650 Falcon CT Milliken, CO 80543		11/06/2012	10:48	10:49	64 PSI	34 PSI	447 GPM (KH11)	549 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas						TESTED BY: Prather, Dean		
Zone Settlers Village										
HL08	S Traders LN at Village DR Milliken, CO 80543		11/01/2012	15:00	15:00	100 PSI	70 PSI	675 GPM (HL08)	1146 @ 20 PSI	4
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HM08	S Centennial DR at Trailblazer DR Milliken, CO 80543		11/01/2012	15:00	15:00	104 PSI	70 PSI	688 GPM (HM08)	1121 @ 20 PSI	4
Flow Test Results: Fail		Remarks: 1500 GPM needed for commercial areas						TESTED BY: Prather, Dean		
HR18	841 Village DR Milliken, CO 80543		11/01/2012	15:00	15:00	100 PSI	60 PSI	633 GPM (HR13)	920 @ 20 PSI	4
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas Static pressure varied from 90 to 110, 100 PSI used for test						TESTED BY: Prather, Dean		
HR21	822 Carriage DR Milliken, CO 80543		11/01/2012	15:00	0:00	100 PSI	64 PSI	633 GPM (HR21)	974 @ 20 PSI	4
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas Static pressure varied from 90-110, 100 PSI used for test						TESTED BY: Prather, Dean		
Zone Town of Milliken										
2011-1	1201 Broad ST Milliken, CO 80543	East side of Police Station	11/07/2012	9:27	9:29	96 PSI	44 PSI	540 GPM (2011-1)	662 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1500 GPM needed for commercial areas						TESTED BY: Prather, Dean		
GM02	35 S Tamera AVE at Cottonwood ST Milliken, CO 80543		11/06/2012	12:00	12:00	88 PSI	74 PSI	739 GPM (GM02)	1734 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
GR12	670 S Rachel AVE Milliken, CO 80543		11/06/2012	10:08	10:07	90 PSI	18 PSI	330 GPM (GR12)	325 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas. Valve might be off in the area.						TESTED BY: Prather, Dean		
GR22	995 Lilac ST Milliken, CO 80543		11/06/2012	10:17	10:18	84 PSI	70 PSI	701 GPM (GR22)	1592 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HJ02	103 N Josephine AVE #23Milliken, CO 80543		11/06/2012	11:48	11:49	100 PSI	12 PSI	270 GPM (HJ02)	256 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas						TESTED BY: Prather, Dean		
HJ16	200 S Norma AVE Milliken, CO 80543		11/06/2012	11:27	11:28	90 PSI	66 PSI	688 GPM (HJ16)	1226 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HJ21	225 S Josephine AVE at Forest ST Milliken, CO 80543		11/06/2012	11:38	11:39	92 PSI	74 PSI	739 GPM (HJ21)	1562 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		

HYD. ID	ADDRESS	LOCATION	TEST DATE	START TIME	END TIME	STATIC	RESIDUAL	DOWNSTREAM (HYD. ID)	FLOW @ DES. PRESS	DISTRICT
HJ34	300 S Pauline AVE Milliken, CO 80543		11/06/2012	11:18	11:18	90 PSI	38 PSI	523 GPM (HJ34)	614 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas						TESTED BY: Prather, Dean		
HK02	119 N Grace AVE at Cherry ST Milliken, CO 80543		11/07/2012	9:03	9:04	100 PSI	10 PSI	190 GPM (HK02)	178 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 GPM needed for residential areas. Valve may be shut of.						TESTED BY: Prather, Dean		
HK06	109 N Beaulah AVE at Cherry ST Milliken, CO 80543		11/07/2012	10:10	10:11	102 PSI	64 PSI	661 GPM (HK06)	1001 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HK20	119 Aragon CT Milliken, CO 80543		11/07/2012	9:36	9:36	98 PSI	64 PSI	701 GPM (HK20)	1097 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HK22	302 S Beaulah AVE at Forest ST Milliken, CO 80543		11/07/2012	9:52	9:52	98 PSI	72 PSI	688 GPM (HK22)	1245 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HK31	307 S Ethel AVE Milliken, CO 80543		11/07/2012	9:15	9:16	94 PSI	74 PSI	714 GPM (HK31)	1447 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
HK38	1300 Broad ST at S Dorothy AVE Milliken, CO 80543		11/07/2012	10:02	10:03	94 PSI	64 PSI	661 GPM (HK38)	1076 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1500 GPM needed for commercial area						TESTED BY: Prather, Dean		
HN07	180 Ilex CT at S Olive AVE Milliken, CO 80543		11/06/2012	11:08	11:09	90 PSI	74 PSI	701 GPM (HN07)	1555 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
LA03	Inez BLVD Milliken, CO 80543	Norma block of Inez	11/06/2012	10:59	11:00	82 PSI	78 PSI	688 GPM (LA03)	3022 @ 20 PSI	3
Flow Test Results: Pass		Remarks:						TESTED BY: Prather, Dean		
Zone Wildcat Acres										
KH02	441 Puma LN Milliken, CO 80543		11/06/2012	10:38	10:38	56 PSI	38 PSI	523 GPM (KH02)	760 @ 20 PSI	3
Flow Test Results: Fail		Remarks: 1000 PM needed for residential areas. Static varied from 48 to 70 initially						TESTED BY: Prather, Dean		

SOUTH PRESSURE ZONE
NORTH PRESSURE ZONE
NORTH HIGHLANDS PRESSURE ZONE
CENTRAL PRESSURE ZONE
PROPOSED MILLIKEN WATER SYSTEM - 2013
TOWN OF MILLIKEN
PROPOSED WATER LINE LEGEND
TOWN OF MILLIKEN
EXISTING WATER LINE LEGEND
KBN ENGINEERS
KEITHLINE, BUTHERUS & NORTON
820 8th Street Greeley, Colorado
(970) 395-9880
Town of Milliken
Water and Sewer Master Plan
Figure A-1
Proposed 2035 Water System


N
0 2000 4000
SCALE: 1" = 2000'
SEWER FORCE MAIN
NORTH FRONT RANGE WATER QUALITY 208 PLAN WWTF WITHIN SERVICE AREA
SEWAGE LIFT STATION NO. 3
URBAN GROWTH BOUNDARY
HOLLENBECK DITCH
TOWN LIMITS
BIG THOMPSON RIVER
THOMPSON & PLATTE DITCH
SEWAGE LIFT STATION NO. 5
SEWER FORCE MAIN
LITTLE THOMPSON DITCH
TOWN LIMITS
NORTH FRONT RANGE WATER QUALITY 208 PLAN WWTF WITHIN SERVICE AREA
GREELEY LOVELAND DIVERSION CANAL
EASTERN WASTEWATER TREATMENT PLANT
SEWAGE LIFT STATION NO. 6
PLATTE DITCH
SEWER FORCE MAIN
BIG THOMPSON RIVER
URBAN GROWTH BOUNDARY
SEWER FORCE MAIN
SEWAGE LIFT STATION NO. 4
TOWN OF MILLIKEN
EXISTING SEWER LINE LEGEND
PIPE SIZE
COLOR
30" DIA.
21" DIA.
18" DIA.
12" DIA.
10" DIA.
8" DIA.
PROPOSED SEWAGE COLLECTION SYSTEM BASED ON FIG. 4-2 WATER/WASTEWATER MASTER PLAN FOR THE TOWN OF MILLIKEN, JANUARY 2005, PREPARED BY NORTHERN, TANSUFER AND BOSSER, INC. WTH PROJECT NO. 98-4271-WC
KBN ENGINEERS
KETTERLING, BUTENHOLZ & NORTON
620 6th Street
Greeley, Colorado
(970) 395-8880
DESIGNED RV
DRAWN BV
CHECKED MCK
Town of Milliken
Water and Sewer Master Plan
Figure A-2:
Proposed 2035 Sewer System
PROJECT NO. 95025
SCALE 1" = 2000'
DATE Jan. 18, 2014
SHEETS 1
SHEET 1

Appendix B: Milliken Water Agreements

City of Greeley Intergovernmental Agreement, Central Weld County Water District Water Service Agreement, Central Colorado Water Conservancy District First Use Agreement, 02CW339 Decree, Water Certificate Agreements

WATER SERVICE AGREEMENT

This Water Service Agreement ("the Agreement") is made and entered into as of the 19th day of August, 1999, between CENTRAL WELD COUNTY WATER DISTRICT, a Colorado quasi-municipal corporation ("District"), and the TOWN OF MILLIKEN, COLORADO, a Colorado municipal corporation ("Town"), the District and the Town being jointly referred to as "parties" is upon the following terms and conditions:

The following recitals are a material part of the Agreement:

A. §29-1-203, C.R.S. provides that the District and the Town may enter into contracts and agreements with one another to provide intergovernmental services; and,

B. The District owns, maintains and operates a system for the storage and distribution of potable water within Weld County, Colorado; and,

C. The Town owns, maintains and operates a system for the storage and distribution of potable water to the inhabitants of the Town; and,

D. The Town desires to secure from the District, and the District desires to provide to the Town, a reliable supply of potable water, in terms of both quantity and quality, at a reasonable rate, for use by the Town's inhabitants; and,

E. The parties desire that the District shall not be the sole and exclusive potable water provider to the Town; and

F. It is the intent of the Town to serve treated water to property that is annexed to the Town that is not within the boundaries of the District or within the boundaries of Little Thompson Water District.

ARTICLE I
PROVISION OF POTABLE WATER

1.01 The District shall sell and deliver to the Town, and the Town shall purchase and receive from the District, potable water for the use in the Town's municipal water system, in the annual amount, peak demand and at the operating pressures provided on Schedule A, attached hereto.

1.02 Water furnished by the District to the Town shall meet applicable state and federal requirements for domestic drinking water.

1.03 The operating pressure shown on Schedule A shall be provided at the Delivery Point (s) specified on Schedule B; and the Town shall be responsible for all minimum and maximum pressure rates within its water system on the Town's side of the point(s) of delivery of potable water ["Delivery Point(s)"] specified in Schedule B.

1.04 The point(s) of delivery of potable water by the District to the Town set forth in Schedule B attached hereto may be amended from time-to-time as mutually agreed upon by the parties. Nothing in the prior sentence shall be construed to require the parties to agree upon additional, new or moved Delivery Point(s).

1.05 The District shall use reasonable diligence to provide a constant and uninterrupted supply of water except for interruptions or reductions due to: (1) Uncontrollable Forces; (2) operations of devices installed for water system protection; and (3) maintenance, repair, replacement, installation of equipment, or investigation and inspection of the water system, which interruption or reductions are temporary, and in the opinion of the District, necessary. Excepting cases of emergency, the Town will be given reasonable advance notice of such interruptions or reductions. The District shall remove the cause thereof with diligence.

ARTICLE II
FACILITIES

2.01 The Town shall pay for and the District shall install, own and operate a flow restricting valve, telemetry equipment, and other facilities designed and required by the District at each Delivery Point at a cost not to exceed $55,000.00.

2.02 The Town agrees to pay to the District the District's cost for moving of Pressure Reducing Station at a cost not to exceed $50,000.00.

ARTICLE III
RAW WATER

3.01 The Town shall annually, each calendar year, provide to the District for use by the District, raw (untreated) water for treatment and delivery by the District, in the amount of 110% multiplied by the sum of the total measured potable water actually delivered at the Delivery Point(s). Raw water provided to the District shall be provided based on an actual gallon basis.

3.02 The Raw Water Requirements shall be provided for use by District from the Colorado-Big Thompson Project ("CBT") or the Windy Gap Project ("WG).

3.03 The Town shall retain ownership of the raw water rights annually transferred to the District, and the Town shall retain the rights to reuse of such water, if any.

3.04 The Town shall purchase, own and make available to the District for treatment and delivery no less than all of its Raw Water Requirement.

3.05 The District shall not be required to acquire any additional raw water necessary to meet the Town's Raw Water Requirements.

3.06 In the event the Town does not provide sufficient raw water to the District to meet its Raw Water Requirements, the District shall give the Town notice of such insufficiency, as nearly as possibly thirty (30) days prior to the time when such additional raw water will be necessary.

3.07 The Town shall pay for all costs associated with acquisition of raw water by the Town and annual transfer of the same to the District, and any periodic charges or assessments related to such raw water.

ARTICLE IV
OWNERSHIP AND MAINTENANCE OF FACILITIES

4.01 The Town shall own, operate and maintain, and shall be responsible for the construction, operation, and maintenance of its water distribution lines and other water system facilities on the downstream side of the Deliver Point(s). The Town shall undertake all proper steps under American Water Works Association ("AWWA") standards to prevent or disconnect, or both, connections to the Town's water system which would in any way permit water in the Town's water distribution system to enter the District's water distribution system by backflow, back-pressure or otherwise, so as to prevent the quality of water in the District's water distribution system from being detrimentally affected by water in the Town's water distribution system.

4.02 The District shall own, operate and maintain, and shall be responsible for the construction, operation and maintenance of the District's water distribution lines and other water system facilities, including any interconnection facilities, master meter and meter vault, flow and pressure control facilities, water line, and treatment plant facilities necessary to serve the Town as required by this Agreement, ending at the Delivery Point(s). For the purpose of determining repair, replacement, operation and maintenance responsibility, the District shall own all facilities at each Delivery Point to a point five feet on the downstream side of the master meter vault. From the point five feet on the downstream side of the master meter vault continuing on the downstream side of the vault, the Town shall own all such water facilities.

4.03 The District shall allow the Town to have connections with the District, the Little Thompson Water District, and the City of Greeley for emergency purposes.

ARTICLE V
MASTER METER(S)

5.01 A master meter shall be installed, owned, operated and maintained by the District at each Delivery Point. Such meter(s) shall be read by the District at monthly intervals, under its own meter reading schedule. If requested by the Town, the District shall give the Town advance notice of the time and date of any master meter reading and allow a Town representative to be present. The Town shall have access to the meter reading data at any time.

5.02 The District shall test and calibrate the master meter(s), at the District's cost according to the District's schedule and the AWWA standards. At any time during the term of the Agreement, and upon the Town's written request, the District shall make or cause to be made a special meter test at the Town's cost. If the meter is tested and found to be inaccurate, the District shall pay for the cost of the special meter test.

5.03 The readings of any master meter which shall have been disclosed by tests, conducted pursuant to AWWA standards, to be inaccurate as such term is defined by AWWA, shall be corrected from the beginning of the monthly billing period immediately preceding the billing period during which the tests are made, in accordance with the percentage of inaccuracy found by such tests, provided that no correction shall be made for a longer period than such inaccuracy has actually existed.

5.04 If any meter shall fail to register for any period, the Town and the District shall attempt in good faith to reach agreement as to the amount of water furnished during such period based upon all reasonable criteria and indicia of use for the period at issue. If no agreement can be reached, the District shall issue a billing to the Town which shall be based upon historical average annual usage data; and the Town shall pay such bill issued by the District.

ARTICLE VI
WATER RATES

6.01 The Town shall pay the District a charge for potable water delivered to the Town at the Delivery Point(s) during the previous month. The initial billing determinates shall be as specified on Schedule C. Schedule C may be revised from time to time by the District as provided in this Agreement.

6.02 The District shall at least once in each calendar year, review the rates for potable water furnished hereunder, and if the District determines that it is necessary, the District shall revise such rates. Any revised water sale rates established by the District after the date of this Agreement shall be deemed to be substituted for the original rates herein provided in Schedule C; and the Town agrees to pay such revised rates for potable water delivered after the effective date of such rate revisions.

6.03 In order to provide sufficient notice to the Town for budgeting, the District shall provide preliminary notice to the Town by August 31 of any expected rate change for the ensuing year, or any projected capital improvement that will, in the opinion of the District, benefit the Town and substantially affect the rates to be paid by the Town. The District shall provide final notice of any rate changes to the Town by February 1, of every year. All rate changes for which the Town receives such notice shall become effective March 1 of the year in which final notice was given.

6.04 Billing for each calendar month shall be made by the District to the Town on or about the last day of the month, and payment made by the Town to the District on or before the 20th day of the following month. Any bill not paid by the twentieth (20th) day of the month following the month for which the billing was issued shall be delinquent. The Town shall pay, in addition to the amount stated on the monthly billing, an additional 18% annual percentage rate as an additional fee for such delinquency. If any billing issued by the District to the Town is not fully paid by the due date, the District may discontinue delivery of potable water after the District has given the Town thirty days written notice to the Town of its intention to so do. The Town shall have an opportunity for a hearing before the District's Board of Directors before any proposed discontinuance of water delivery, if a hearing is requested by the Town in writing delivered to the District not less than fourteen days prior to the proposed date of discontinuance of water delivery. The hearing shall not delay the proposed date of discontinuance of water delivery.

6.05 Special Additional Delivery during 1999 The Town may temporarily exceed the volumetric limit on the amount of water capable of being received by the Town under the Agreement as shown on Schedule A for the calendar year 1999, provided that the Town will pay to the District a commodity charge of $2.60 per thousand gallons for each thousand gallons of water delivered to the Town in excess of the volumetric limit shown on Schedule A. The Town shall not be able to exceed the volumetric limit delineated on Schedule A in any calendar year of the Agreement except for 1999 without the prior written agreement of the District; and the District shall be entitled to charge a rate for such use in excess of such volumetric limit as determined by the District.

ARTICLE VII
LIABILITY AND INDEMNIFICATION

7.01 . To the extent allowed by law, each party shall indemnify and hold the other party harmless from and against any and all liability, loss, damages, costs and expenses, including reasonable attorney's fees, arising from the indemnifying party's negligence. By such agreement to indemnify and hold each other harmless, neither party waives any defenses or immunities, or both, to claims of third parties to which it would otherwise be entitled under sovereign immunity or The Colorado Governmental Immunity Act or otherwise.

ARTICLE VIII
TERM

8.01 In the interest of reliability and security, this Agreement shall be for a term of twenty years from the date of its execution, and shall terminate at the end of the term unless renewed by mutual written agreement. Both parties hereby agree to meet at least two (2) years before the end of the term to review the agreement for possible renewal and/or modification.

ARTICLE IX
MISCELLANEOUS PROVISIONS

9.01 Neither party shall be considered in default under this Agreement if prevented from fulfilling any obligations by reason of Uncontrollable Forces. The term "Uncontrollable Forces" shall mean any cause beyond the control of the obligated party, including, but not limited to, failure of facilities, flood, earthquake, storm, lightning, fire, epidemic, riot, civil disturbance, labor disturbance, sabotage, breach of construction contract by a third party or restraint by court or public authority. Uncontrollable forces do not include causes, which by due diligence and foresight, such party could reasonably be expected to avoid. A party rendered unable to fulfill its obligation by reason of Uncontrollable Forces shall exercise due diligence to remove such inability with all reasonable dispatch.

9.02 The District, from time to time as it sees fit, has promulgated and may promulgate such new or amended rules, regulations, and bylaws, and the Town agrees to abide by such under the terms of this Agreement.

9.03 The parties shall assist each other in acquiring any easements and other permits or approvals necessary to accomplish and place into effect this Agreement, and for the construction of any necessary facilities.

9.04 The invalidity or unenforceability of any provision of this Agreement shall not affect or impair any other provision unless material to the performance or either party.

9.05 The parties agree that, in addition to any other remedies allowed by law, the provisions of this Agreement may be specifically enforced in a Court of competent jurisdiction and, in any judicial action, the unsuccessful party agrees to pay all costs of such action as actually incurred by the successful party, including reasonable attorney fees as assessed by such court

9.06 Except as otherwise provided herein, if either party shall be in default or breach in performance of any term, covenant, or condition of this Agreement, the party not in default or breach shall give the defaulting or breaching party prompt written notice of such default or breach. If the default or breach is not cured within thirty (30) days following notice, the party that is not in default or breach may seek remedies provided for herein.

9.07 The waiver by either party of any default or breach of any term, covenant or condition of this Agreement shall not operate as a waiver of any default or breach of any other term, covenant or condition, or subsequent default or breach of the same.

9.08 Neither party may assign or transfer all or any part of this Agreement without the prior written consent of the nonassigning party, although such consent shall not be unreasonably withheld. Little Thompson is a third party beneficiary of this Agreement.

9.09 Any notice, demand, or request delivered by mail in accordance with this section shall be deemed given seventy-two hours after the same is deposited, certified mail, in any post office or postal box regularly maintained by the United States Postal Service addressed to the District at 2235 2nd Avenue, Greeley, Colorado 80631 and to the Town at Town of Milliken, Colorado, 1101 Broad Street, Milliken, CO 80543. The Addresses may be changed at any time by similar notice.

9.10 Neither party shall, by reason of any provision of this Agreement, or the use of water thereunder, or otherwise, acquire vested or adverse right or future right, in law or equity, in the water rights owned by the other party.

9.11 The Town shall not impose or collect any occupancy or license taxes or any other special taxes, assessments or excises upon the facilities, lines or other property of the District either designated as a franchise fee or tax, occupancy tax, license tax, permit charge, or inspection charge, for property or business of the District or otherwise. The District is granted the right to excavate in, occupy and use any and all streets, alleys, easements, viaducts, bridges, roads, lanes, and other public ways and places under the supervision of properly constituted authority for the purpose of laying and maintaining District water facilities within the boundaries of the Town as now constituted, or as the boundaries of the Town may hereafter be constituted in accordance with the rules and regulations of the Town.

9.12 This Agreement prospectively supersedes as of the date of this Agreement the existing "Agreement Between Town Of Milliken And Central Weld County Water District Concerning Domestic Potable Water Service" dated April 21, 1976, as amended by the "Addendum To Agreement Between Town Of Milliken And Central Weld County Water District Concerning Domestic Potable Water Service" dated May 10, 1978. The prior sentence notwithstanding, the Town agrees to pay for all water usage from the District until the date of this Agreement under the terms of such prior agreement; and the Town shall pay $254,700.00 to the District upon the date of execution of this Agreement representing the unpaid amount due by the Town to the District under the provisions of paragraph 3 of the prior agreement. Further the Town agrees to pay to the District the District's cost for moving of a Pressure Reducing Station estimated to be $50,000.00; and the Town shall pay such amount upon billing by the District to the Town.

IN WITNESS WHEREOF, the District and the Town have hereunto executed this Agreement the day and year first above written.

CENTRAL WELD COUNTY WATER DISTRICT

By: _____
President

ATTEST:

_____
Secretary

TOWN OF MILLIKEN, COLORADO

By: _____
Mayor

ATTEST:

_____
Town Clerk

INTERGOVERNMENTAL AGREEMENT FOR TREATED WATER SERVICE

BETWEEN THE CITY OF GREELEY, COLORADO AND THE TOWN OF MILLIKEN, COLORADO

THIS AGREEMENT is made this 2nd day of September, 1999, by and between **THE CITY OF GREELEY**, Colorado, a home rule municipality ("Greeley") and **THE TOWN OF MILLIKEN**, Colorado, a home rule municipality ("Milliken"), for the treatment and delivery of potable water to the Town of Milliken by and through the supply, treatment facilities, and transmission lines of the City of Greeley, Colorado.

WHEREAS, pursuant to § 29-1-203, C.R.S., governments may cooperate or contract with one another to provide any function, service or facility lawfully authorized to each of the cooperating or contracting units of government; and

WHEREAS, the Town of Milliken and the City of Greeley are neighboring municipalities which have a common interest in obtaining high-quality water in sufficient quantity to meet present and future needs; and

WHEREAS, the citizens of Milliken desire long-term reliability in treated water; and

WHEREAS, Milliken and Greeley can cost-effectively combine their demand for treated water through one system of supply, treatment, transmission, and treated water storage thereby achieving economies of scale; and

WHEREAS, in addition to its own needs and demand, Greeley has the capacity and the facilities to meet the needs of Milliken for water treatment and transmission as are more fully set forth herein; and

WHEREAS, Milliken will receive treated water from additional wholesale providers; and

WHEREAS, Greeley intends to develop the Highway 34 corridor and is not willing to provide water to Milliken to support competing growth by Milliken adjacent to Highway 34; and

WHEREAS, Milliken and Greeley shall and will continue to own their water rights individually and separately, each municipality relying upon the yield of its own water rights to provide the raw water necessary for treatment proposed under this agreement; and

WHEREAS, Greeley and Milliken are agreeable to entering into a long-term contract for the treatment and delivery of potable water to Milliken through an intergovernmental agreement; and

WHEREAS, the parties are desirous of reducing the understandings, terms, and conditions of said agreement to writing.

NOW THEREFORE, IN CONSIDERATION of the mutual covenants, undertakings, terms and conditions contained herein, the parties agree as follows:

1. DEFINITIONS. The terms used herein are defined as follows:

1.1 "Greeley" shall refer to the City of Greeley and any authorized representative thereof.

1.2 "Greeley water system" or "Greeley water system enterprise" shall refer to Greeley's water treatment plants, treated water conveyance and storage systems, pump stations and related appurtenances for the collection, distribution, and measurement of water.

1.3 "Peak daily demand" means the greatest rate of treated water delivered by Greeley to Milliken over a twenty-four hour period, beginning at midnight, in a given day.

1.4 "Peak hourly demand" means the greatest rate of treated water delivered by Greeley to Milliken over sixty consecutive minutes for any given day of the calendar year.

1.5 "Milliken" shall refer to the Town of Milliken and any authorized representative thereof.

1.6 "Milliken system" or "Milliken water system enterprise" shall refer to Milliken' treated water conveyance and storage systems, pump stations, and related appurtenances for the distribution of water downstream of master meters gauging Greeley's delivery to Milliken.

1.7 "Year" means a calendar water year beginning on January 1 unless otherwise noted.

1.8 "Milliken Bellvue Demand" is Milliken' total water use in December, January, and February multiplied by four and represents the portion of Milliken' annual demand satisfied by the Bellvue treatment plant.

2. USE. Pursuant to the terms of this intergovernmental agreement, Greeley agrees to treat water, usable in the Greeley water system and approved for municipal use in Milliken system under Colorado law, for Milliken in the manner and in such amounts as are more fully set forth herein.

2.1 It is understood and agreed that in anticipation upon providing water to Milliken, the Town has appropriated certain funds for the construction of a transmission line capable of receiving and transporting such water from Greeley. The parties acknowledge that the construction of this transmission line is a condition precedent to delivery of water to Milliken. Water shall be made available to Milliken upon the completion of the transmission line. Commencing with the first full year that this agreement is in effect and continuing annually for the term of this agreement Greeley shall make available not less than 30 million gallons of treated water. During each full year that this

agreement is in effect Milliken shall take a minimum of 20 million gallons of treated water. If in any year treated water is available to Milliken and Milliken fails to take and use 20 million gallons of treated water, Milliken shall nonetheless pay for this minimum allotment of treated water.

2.2 The parties further acknowledge that the initial year of this agreement will likely not be a full year. In this event, Milliken will be relieved of the 20 million gallons minimum requirement and will be required to pay only for the treated water actually delivered in this first year.

2.3 Nothing herein shall limit Milliken from taking treated water in excess of 20 million gallons subject to the availability thereof. All treated water in excess of 20 million gallons shall be expressly conditioned upon Greeley having the excess capacity to provide such water, and Milliken shall pay for the same.

3. POINT OF DELIVERY.

3.1 Treated water from the Greeley water system shall be delivered to Milliken through multiple master meters, the location of which will be mutually established and agreed upon in writing by both municipalities. Unless specifically authorized by Greeley, no water from Milliken's system shall flow into Greeley's system.

3.2 Unless otherwise agreed upon between the parties, Greeley shall construct, own and maintain treated water meter vaults, meters, back-flow prevention devices and all associated facilities located at the delivery points. All of the costs of the metering facilities attributable to service to Milliken shall be paid by Milliken by and through inclusion in the Milliken rate base charged by Greeley and more fully described in paragraph seven of this agreement. Greeley agrees to design, construct and maintain all metering facilities in a prudent and cost effective manner. Milliken agrees to secure and provide such easements as may be required by Greeley for metering facilities, and to guarantee access to metering facilities for Greeley. Each water meter shall be operated and maintained so as to record both cumulative flow and, as needed, maximum hourly and maximum daily flow within the accuracy prescribed by current American Water Works Standards. Each municipality will give the other seven calendar days notice prior to any routine or independent meter test. Milliken shall have access to all metering facilities herein contemplated to read meters as Milliken may deem necessary. Milliken shall own, operate, maintain, and have the ability to valve the line downstream of the master meter for operation, maintenance, and repair purposes.

3.3 The master meter shall be located at or near the intersection of Weld County Road 54 and State Highway 257. Transmission pipeline north of this point will be constructed by Milliken and dedicated to the City of Greeley. To the extent that Greeley uses the infrastructure installed by Milliken, such usage shall be subject to reimbursement for oversizing in accordance with Greeley's current ordinance.

4. POTABLE WATER PROJECTIONS AND SYSTEM CAPACITY

4.1 No later than April 1 of each year, Milliken shall provide written notice to Greeley of its projected treated water requirements for the current calendar year and the five consecutive years following the year in which such notice is given. The projections in the notice shall include, at a minimum: estimated total annual consumption, estimated maximum day, estimated maximum hourly usage, planned system facility changes, and additional points of delivery to Milliken from Greeley. Any actual usage in excess of projected peak or total demands which has a cost impact, excepting fire flow or other emergencies, shall result in supplemental demand charges as determined by the cost-of-service rate study and approved by the Greeley Water and Sewer Board.

4.2 If Greeley determines the Greeley water system will be unable to meet Milliken's projected demands, Greeley will give Milliken notice two years prior to the projected capacity limitation. Milliken shall have authority to obtain water beyond the capacity limitation from other sources. Greeley will use its best efforts to avoid a capacity limitation.

4.3 It is understood and agreed that as of the date of this agreement Milliken is receiving treated water from Central Weld County Water District. Nothing in this agreement shall be construed as limiting Milliken from continuing to receive treated water from sources other than Greeley during the term of this agreement, in whatever amounts Milliken deems appropriate.

5. RAW WATER REQUIREMENTS. Milliken shall acquire sufficient water rights which shall be usable in the Greeley water system and approved for municipal use in the Milliken system under Colorado law in order to satisfy the treated water requirements of Milliken, expressly subject to the following conditions:

5.1 On or before April 15 of each year, Milliken shall transfer to Greeley sufficient Colorado-Big Thompson (CBT) water to satisfy Milliken demand for the full year including a 5% shrink. Failure of Milliken water rights to yield sufficient raw water during a drought could result in curtailed delivery of potable water to Milliken.

5.2 Milliken shall pay all assessment costs and running charges on any of the water provided for treatment by Greeley under this agreement. Water other than Milliken's Bellvue demand will be treated by the Boyd Lake plant and will be subject to Greeley and Loveland Irrigation Company shrink and carryover water. Presently those losses are 28% and 11% respectively.

5.3 Milliken shall be responsible for meeting any monthly return flow requirements of the raw water provided to Greeley for treatment, state decree accounting, and other requirements of State or Federal law. While Milliken retains dominion and control over its water, Greeley shall maintain complete and unilateral control over Greeley's system operations. Greeley's raw water supply system may be used by Greeley to move Milliken' water rights to the appropriate location for treatment. This necessary flexibility of operations may result in less than optimal yield of Milliken water rights, but will be in proportion to Greeley's own operations..

5.4 Greeley shall be obligated to treat for Milliken only that water delivered for treatment under this Section 5. If metered usage by Milliken exceeds the amount delivered less losses, Greeley shall notify Milliken of the shortage. Upon written notification, Milliken will have 20 days to transfer additional raw water to Greeley for treatment. Greeley may, at its sole discretion, agree to lease additional raw water to Milliken at the then raw water surcharge rate established by the Greeley Water and Sewer Board and adopted in accordance with section 17-4 of the Greeley City Charter. If Greeley has additional raw water available to lease, Milliken shall be given first priority to lease it on an equal basis with the other municipalities to whom Greeley leases raw water.

6. EMERGENCY OPERATIONS. In the event of a shortage of treated water, caused by the inability of a component of the Greeley water system to function, Milliken and Greeley shall share proportionally in water use reductions. Greeley shall develop a schedule and method of reducing water demand, with initial emphasis on reducing all nonessential uses such as lawn and parks irrigation. If a shortage persists, Milliken and Greeley agree to impose emergency rates, developed by Greeley, which may be different for each customer category and which are intended to reduce discretionary consumption of treated water. The impact of the emergency rates shall be fairly and equally distributed among both Milliken and Greeley water customers. In a prolonged shortage, Milliken and Greeley agree to adopt a uniform set of enforcement tools and penalties to curtail usage. In any such event, Greeley will make every effort feasible to continue to meet both Milliken's and Greeley's water demand, including obtaining treated water from other providers. In the event of a shortage, nothing shall prevent Milliken from independently using an alternate source of treated water in whatever amount Milliken deems necessary, until Greeley can again bring its facilities on line.

7. RATES. The rates for treated water delivered to Milliken shall be based upon the water rate cost-of-service model developed by Greeley's water rate consultant, Black and Veatch, and or modified from time to time and accepted by the Greeley Water and Sewer Board. Milliken agrees to pay the rate of cost-of-service plus ten percent. The cost-of-service rates shall be reviewed annually and adjusted in accordance with section 17-4 of the Greeley City Charter. Milliken shall be given 90-days notice of rate changes. Cost-of-service includes a cost to provide peak demands.

8. BILLING. Bills shall be paid within thirty days of the date due, after which time interest penalties shall begin to accrue at the rate of one percent per month, or fraction thereof, during the period in which the bill remains unpaid.

9. NO ACQUIRED RIGHTS OR VESTING IN WATER RIGHTS OR IN WATER SYSTEM.

9.1 As contained in section 17-1 of the Greeley City Charter, the Greeley water system is an Enterprise, as that term is defined pursuant to article X, section 20 of the Colorado Constitution. The Greeley water system Enterprise is owned by the citizens of Greeley. Similarly, the Milliken system is an Enterprise, owned by the citizens of Milliken.

9.2 Milliken specifically acknowledges and agrees that no rights or ownership of the Greeley water system shall become vested as a result of such service. Neither Greeley nor Milliken shall, by reason of any provision of this agreement or the use of water hereunder or otherwise, acquire any vested or adverse right, in law or in equity, in the water rights or water system owned by the other municipality. Neither the assignment, use, rental, or license of water or water rights nor the payment of system development charges shall be deemed to initiate, create, or vest any rights or ownership by either Greeley or Milliken in the other's water rights or water system. Further, Milliken shall not assert or claim any vested rights to continued service, other than as established by the terms and conditions of this agreement.

10. POTABLE WATER. The treated water delivered by Greeley to the Milliken master meters shall be potable water which complies with applicable potable water law.

11. PEAK DEMAND MEASUREMENTS AND DETERMINATION. Each year either Milliken or Greeley or both may register and record peak daily and peak hourly demands. Milliken's peak daily and peak hourly demand factors will either be flow-weighted averages of the several master meters, or it shall be derived from simultaneous readings from the several master meters, whichever method generates the highest demand factor. Peaking factors will be calculated based upon the average of the previous two years actual recorded peak flows. If the average of the peak hourly or the peak daily demand factors for the two immediately preceding years differs from the factors used in the most current water rate study, then the next rate study will use the highest recorded peak daily or peak hourly factor from those two preceding years. If peak daily or peak hourly demands are not registered in any given year, then the measurements used in the prior year's rate study will be used for the next rate study. In no case will past year's or current year's water bills be adjusted for changes in peak demand factors. Until such time as actual peaking factors are determined, Milliken peaking factors shall be assumed to be equal to Greeley's factors which are estimated by Black & Veatch for use in their rate model.

12. SYSTEM DEVELOPMENT CHARGE.

12.1 A system development charge (SDC) shall be due to Greeley when the metered water delivered to Milliken in any year exceeds the acre-feet delivered in the base year. Payment of system development charges will create a new base year delivery. No system development charges will be due in subsequent years for metered delivery equal to or less than the new base year delivery. Payments of the system development charge will occur in twelve monthly increments following the calendar year in which the exceedance occurs. In no case shall system development charges be refunded. The initial base year allowance is zero acre-feet.

12.2 The SDC due is a percentage of the then current inside-Greeley 3/4-inch tap plant investment fee (expressed in $/acre-feet) and multiplied by Milliken' consumption in acre-feet of water metered in excess of the base year delivery. The SDC percentage is calculated as follows: the typical Milliken single-family customer benefits from 75% of Greeley water system, as determined by the rate model. To express Greeley's plant investment fee in terms of $/acre-feet, the average

annual residential demand (190,000 gallons or 0.583 AF per 3/4-inch tap) is divided into the plant investment fee; for example:

Greeley's current PIF is	($2,920) / (0.583 AF/year) = $5,009 per AF/year
Milliken 1998 SDC is	(75%)*($5,009/AF/yr) = $3,756 per AF/yr

Example: if Milliken's year 2001 metered flow were 102 AF, exceeding a base of 92 AF, a SDC of $37,560 would be due:

(102 - 92)*($3,756) = $37,560. The new base year would become 102 AF.

12.3 Milliken's initial SDC for the first full year shall be for a base of 61 acre feet (20 million gallons) at $3,756/AF equaling $229,116. The initial SDC shall be paid before service begins.

13. RELEASE, HOLD HARMLESS, INDEMNIFICATION.

13.1 Both Milliken and Greeley are public entities, as that term is defined pursuant to the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, et seq. The parties to this agreement have the benefits and responsibility enumerated in the Colorado Governmental Immunity Act. Each party shall defend any and all claims for injuries or damages pursuant to and in accordance with the requirements and limitations of the Colorado Governmental Immunity Act occurring as a result of negligent or intentional acts or omissions of the parties, their agents, employees and assigns.

13.2 In addition, Greeley shall be responsible for any and all liability for injuries or damages caused by any negligent acts or omissions of Greeley, its officers, employees and agents, performing functions or activities upon the property of Milliken. Greeley shall provide adequate workmen's compensation insurance for all of its employees, agents and assigns engaged in activities and functions upon the property of Milliken.

13.3 Milliken shall be responsible for any and all liability for injuries or damages caused by any negligent acts or omissions of Milliken, its officers, employees and agents, performing functions or activities upon the property of Greeley. Milliken shall provide adequate workmen's compensation insurance for all of its employees, agents and assigns engaged in activities and functions upon the property of Greeley.

13.4 Each party shall furnish the other party current certificates of insurance stating the coverages outlined above are in full force and effect.

14. NO PUBLIC UTILITIES COMMISSION CONTROL. Milliken, its employees and elected or appointed officials, agree neither to assert nor support any statement, policy, petition, rule making, or legislation attempting to place the Greeley water system under the rate making authority or jurisdiction of the Colorado Public Utilities Commission by virtue of this intergovernmental agreement or otherwise.

15. THIS AGREEMENT CONTROLS AND SUPERSEDES PREVIOUS AGREEMENTS. This agreement shall supersede any and all terms and conditions of water supply agreements previously existing between Greeley and Milliken.

16. TERM. In the interest of reliability and security, this agreement shall be for a term of twenty years from the date of its execution, and shall terminate at the end of the term unless renewed by mutual written agreement. Both parties hereby agree to meet at least two years before the end of the term to review their agreement for possible renewal and /or modification.

17. DEFAULT AND TERMINATION.

17.1 In the event either party fails to meet the terms and conditions of this agreement, such failure shall constitute a default of this agreement and the non-defaulting party may give notice of the perceived default. Notice shall be either to the Milliken Town Administrator or the Greeley City Manager. Either party may cure any default during the ninety days following the notice. Upon cure of any default, this agreement shall remain in full force and effect. Upon receipt of notice of perceived default, the defaulting party may invoke dispute resolution as provided in Paragraph 20.

17.2 If after the cure period above or after mutually agreed extensions, the non-defaulting party determines the default has not been cured, they may give two years notice of termination of this agreement. Nothing herein shall limit either party from collecting damages and amounts due from the other party upon termination of this agreement by default.

17.3 The agreement may be terminated by either party by giving written notice to the other party at least two years before the end of the agreement term or renewals thereof.

17.4 Milliken agrees that annexation by Milliken of land north of Weld County Road 54 shall be approved by Greeley in writing prior to the annexation. Violation of this provision shall be grounds for termination of this agreement.

17.5 Milliken agrees not to oppose any annexation by Greeley of property north of Weld County Road 54 and Greeley agrees not to oppose any annexation by Milliken of property south of Weld County Road 54. Both cities acknowledge the value of annexation in conformance with natural, man-made, or political boundries.

18. JURISDICTION AND VENUE. This agreement shall be interpreted pursuant to the laws of the State of Colorado. Venue to enforce this agreement shall be in Weld County.

19. AMENDMENT. This agreement shall be amended only in writing with the approval of the governing bodies of each municipality. No amendment or modification shall be effective unless in writing signed by the aforesaid persons. This agreement shall be governed by, construed and enforced in accordance with Colorado law.

20. DISPUTE RESOLUTION. Should disagreements arise regarding the interpretation of any portion of this agreement the parties agree to make efforts to resolve such disputes through negotiation; first, at the staff level; and second, with the respective Water Boards and/or City Councils. Procedures for such negotiations shall be established by mutual agreement at the time and may, with the concurrence of the parties, involve the use of qualified outside mediators. Any negotiations and resolution agreements reached therefrom must be within the legal authority granted to the parties by appropriate City Charters and/or State statutes, or shall be null and void. Notwithstanding anything to the contrary in this agreement, it is expressly agreed between the parties that this provision for dispute resolution does not apply to the authority granted the Greeley Water and Sewer Board pursuant to § 17-4 of the Greeley City Charter, including but not limited to, the establishment of minimum water rates.

(The remainder of this page is intentionally blank)

IN WITNESS WHEREOF, the parties have executed this agreement the day and year first above written.

ATTEST:

By: _____
City Clerk

THE CITY OF GREELEY, COLORADO

By: _____
Mayor

Approved as to Substance:

By: _____
City Manager

Approved as to Legal Form:

By: _____
City Attorney

As to Availability of Funds:

By: _____
Director of Finance

GREELEY WATER AND SEWER BOARD

By: _____
Vice Chairman

ATTEST:

By: _____
City Clerk

THE TOWN OF MILLIKEN, COLORADO

By: _____
Mayor

AGREEMENT

THIS AGREEMENT, entered this 24th day of April, 2001 by and between the Town of Milliken, hereinafter "Milliken" and Water Resources, LLC hereinafter "Water Resources."

WHEREAS, Water Resources owns 6.51 shares of the Hillsborough Consolidated Ditch Company (the "Hillsborough Water Rights"), plus 60 shares of the Jones Ditch(together, the "Jones Ditch Water Rights"); and

WHEREAS, Water Resources is willing to sell the Jones Ditch Water Rights and the Hillsborough Water Rights to Milliken under the terms and conditions set forth herein (the Jones Ditch Water Rights and the Hillsborough Water Rights are together sometimes hereafter known as the "Jones/Hillsborough Water Rights").

NOW, THEREFORE, in consideration of the premises and the mutual promises and covenants of the parties hereto, it is agreed as follows:

1. Milliken hereby agrees to buy from Water Resources and Water Resources agrees to sell to Milliken the Jones/Hillsborough Water Rights on the terms and conditions set forth in this Agreement.

2. In exchange for the Jones/Hillsborough Water Rights, Milliken shall convey to Water Resources eleven hundred and three (1103) fully paid raw water fee credits, which are defined as one credit for each raw water fee required by Milliken to satisfy the contribution, or fee in lieu thereof for the construction of a single family residence (the "Credits"). The Credits include the following:

   a. The Credits shall be used only in the Centennial Farms, Settler's Village and Colony Pointe subdivisions. Within such subdivisions however, Water Resources and its assigns may freely assign, transfer and retransfer the Credits, collectively or individually, to any other developer, subdivider, builder or seller of lots within such subdivisions.

   b. The Credits shall completely satisfy Milliken's requirements for transferring water, or fees in lieu of raw water, to the Town as a precondition for issuance of a water tap or the issuance of a single family building permit, or equivalent thereof, including, without limitation, the requirements of Milliken's Ordinance No. 423, Section 1. A (11) will not expire and are not chargeable or subject to any further requirements or adjustments.

   c. Milliken shall document the Credits in any form requested by Water Resources.

3. Title shall be merchantable in Water Resources and Water Resources shall provide a copy of the stock certificates for the shares upon execution of this Agreement. Water Resources shall execute and deliver an assignment of water stock and a Special Warranty Deed conveying free and clear title to Milliken at Closing. Any transfer fees shall be paid by Milliken. Closing shall occur at the Law offices of Fred L. Otis, Otis, Coan & Stewart, LLC on May 14, 2001(the "Closing Date").

4. Water Resources warrants that title to the water rights and water stock will be conveyed free and clear of all lien encumbrances, assessments and leases of any kind. All assessments due, or made by the companies prior to the date of closing, shall be paid by Water Resources.

5. This Agreement is contingent on the successful purchase by Water Resources of the Jones/Hillsborough Water Rights from a third party on or before the Closing Date, under terms and conditions that are satisfactory to Water Resources.

6. This document represents the complete agreement of the parties hereto and no oral modification shall be recognized. Any amendments or additions shall be made in writing signed by the parties.

7. This agreement is binding upon the parties, their successors and assigns.

TOWN OF MILLIKEN

Linda L Monsees

By: Mayor

WATER RESOURCES, LLC

By: BRET HALL, MANAGER

ASSIGNMENT OF RAW WATER FEE CREDITS

THIS AGREEMENT is made and entered into this 15 day of May, 2001, by and between Water Resources, LLC, 3026 4th Avenue, PO Box 2150, Greeley, Colorado, 80632 (hereinafter called "Assignor") and Lot Holding Investments, LLC, 3026 4th Avenue, PO Box 2150, Greeley, Colorado, 80632 (hereinafter called "Assignee") and the consenting party, Town of Milliken (the "Town").

Background Information. The following background information is provided to assist in understanding the purposes and objectives sought to be attained by the parties to this Assignment.

A. On or about May 15, 2001, Assignor, received 1103 Raw Water Fee Credits (the "Credits") from the Town in exchange for certain water that was transferred to the Town.

B. Assignee and Assignor have agreed that Assignor will transfer 960 of the Credits to Assignee, and the Town has consented to such transfer.

Now, Therefore, in consideration of the mutual promises of the parties and other good and valuable consideration, Assignor hereby assigns, transfers, and conveys 960 Credits to Assignee. Town consents to the transfer of such Credits.

IN WITNESS WHEREOF, the parties have executed this Assignment as their free and voluntary act and deed.

ASSIGNOR:
Water Resources, LLC

By _____
Bret Hall, Manager

ASSIGNEE:
Lot Holding Investments, LLC

By _____
Bret Hall, Manager

CONSENT TO ASSIGNMENT
Town of Milliken

By _____
Its _____

CLOSING AGREEMENT AND RECEIPT

This Closing Agreement and Receipt is made May 15, 2001, by and between Town of Milliken (hereafter Milliken), and Central Colorado Water Conservancy District and Groundwater Management Subdistrict of the Central Colorado Water Conservancy District (hereafter Central).

Milliken has tendered to Central and Central has accepted the following:

A. $500,000.00 by certified funds.

B. 60 shares of W. R. Jones Ditch which has been assigned by Milliken to Central together with 1/2 acres under a Dryup Agreement and Covenant.

All contingencies in the April 17, 2001, Agreement between the parties are hereby waived.

Town of Milliken

By _____

Central Colorado Water Conservancy District
and Groundwater Management Subdistrict of
the Central Colorado Water Conservancy District

By _____

Final will be in Words Draft H/I

AGREEMENT

THIS AGREEMENT, entered this ____ day of _____, 2001 by and between the Town of Milliken, hereinafter "Milliken" and Water Resources, LLC hereinafter "Water Resources."

WHEREAS, Water Resources owns 6.51 shares of the Hillsborough Consolidated Ditch Company being approximately 651 acre feet of water (the "Hillsborough Water Rights"), plus 60 shares of the Jones Ditch and 180 acres available for "dryup" (together, the "Jones Ditch Water Rights"); and

WHEREAS, Water Resources is willing to sell the Jones Ditch Water Rights and the Hillsborough Water Rights to Milliken under the terms and conditions set forth herein (the Jones Ditch Water Rights and the Hillsborough Water Rights are together sometimes hereafter known as the "Jones/Hillboro Water Rights").

NOW, THEREFORE, in consideration of the premises and the mutual promises and covenants of the parties hereto, it is agreed as follows:

1. Milliken hereby agrees to buy from Water Resources and Water Resources agrees to sell to Milliken the Jones/Hillsborough Water Rights on the terms and conditions set forth in this Agreement.

2. In exchange for the sale of the Jones/Hillsborough Water Rights to Milliken, Milliken shall pay Water Resources $3,310,000 in the form of a promissory note that is attached as Exhibit A. $500,000 $2,810,000

3. Title shall be merchantable in Water Resources and Water Resources shall provide a copy of the stock certificates for the shares upon execution of this Agreement. Water Resources shall execute and deliver an assignment of water stock and a Special Warranty Deed conveying free and clear title to Milliken at Closing. Any transfer fees shall be paid by Milliken. Closing shall occur at the Law offices of Fred L. Otis, Otis, Coan & Stewart, LLC on _____, 2001.

$500,000

4. Water Resources warrants that title to the water rights and water stock will be conveyed free and clear of all lien encumbrances, assessments and leases of any kind. All assessments due, or made by the companies prior to the date of closing, shall be paid by Water Resources.

Row with $500,000

AGREEMENT

THIS AGREEMENT, entered this 24th day of April, 2001 by and between the Town of Milliken, hereinafter "Milliken" and Water Resources, LLC hereinafter "Water Resources."

WHEREAS, Water Resources owns 6.51 shares of the Hillsborough Consolidated Ditch Company (the "Hillsborough Water Rights"), plus 60 shares of the Jones Ditch(together, the "Jones Ditch Water Rights"); and

WHEREAS, Water Resources is willing to sell the Jones Ditch Water Rights and the Hillsborough Water Rights to Milliken under the terms and conditions set forth herein (the Jones Ditch Water Rights and the Hillsborough Water Rights are together sometimes hereafter known as the "Jones/Hillsborough Water Rights").

NOW, THEREFORE, in consideration of the premises and the mutual promises and covenants of the parties hereto, it is agreed as follows:

1. Milliken hereby agrees to buy from Water Resources and Water Resources agrees to sell to Milliken the Jones/Hillsborough Water Rights on the terms and conditions set forth in this Agreement.

2. In exchange for the Jones/Hillsborough Water Rights, Milliken shall convey to Water Resources eleven hundred and three (1103) fully paid raw water fee credits, which are defined as one credit for each raw water fee required by Milliken to satisfy the contribution, or fee in lieu thereof for the construction of a single family residence (the "Credits"). The Credits include the following:

   a. The Credits shall be used only in the Centennial Farms, Settler's Village and Colony Pointe subdivisions. Within such subdivisions however, Water Resources and its assigns may freely assign, transfer and retransfer the Credits, collectively or individually, to any other developer, subdivider, builder or seller of lots within such subdivisions.

   b. The Credits shall completely satisfy Milliken's requirements for transferring water, or fees in lieu of raw water, to the Town as a precondition for issuance of a water tap or the issuance of a single family building permit, or equivalent thereof, including, without limitation, the requirements of Milliken's Ordinance No. 423, Section 1. A (11) will not expire and are not chargeable or subject to any further requirements or adjustments.

   c. Milliken shall document the Credits in any form requested by Water Resources.

3. Title shall be merchantable in Water Resources and Water Resources shall provide a copy of the stock certificates for the shares upon execution of this Agreement. Water Resources shall execute and deliver an assignment of water stock and a Special Warranty Deed conveying free and clear title to Milliken at Closing. Any transfer fees shall be paid by Milliken. Closing shall occur at the Law offices of Fred L. Otis, Otis, Coan & Stewart, LLC on May 14, 2001(the "Closing Date").

4. Water Resources warrants that title to the water rights and water stock will be conveyed free and clear of all lien encumbrances, assessments and leases of any kind. All assessments due, or made by the companies prior to the date of closing, shall be paid by Water Resources.

5. This Agreement is contingent on the successful purchase by Water Resources of the Jones/Hillsborough Water Rights from a third party on or before the Closing Date, under terms and conditions that are satisfactory to Water Resources.

6. This document represents the complete agreement of the parties hereto and no oral modification shall be recognized. Any amendments or additions shall be made in writing signed by the parties.

7. This agreement is binding upon the parties, their successors and assigns.

TOWN OF MILLIKEN

Linda L Measner

By: Mayor

WATER RESOURCES, LLC

By: BRET HALL, MANAGER

ASSIGNMENT OF RAW WATER FEE CREDITS

THIS AGREEMENT is made and entered into this 15 day of May, 2001, by and between Water Resources, LLC, 3026 4th Avenue, PO Box 2150,Greeley, Colorado, 80632 (hereinafter called "Assignor") and Lot Holding Investments, LLC, 3026 4th Avenue, PO Box 2150, Greeley, Colorado, 80632 (hereinafter called "Assignee") and the consenting party, Town of Milliken (the "Town").

Background Information. The following background information is provided to assist in understanding the purposes and objectives sought to be attained by the parties to this Assignment.

A. On or about May 15, 2001, Assignor, received 1103 Raw Water Fee Credits (the "Credits") from the Town in exchange for certain water that was transferred to the Town.

B. Assignee and Assignor have agreed that Assignor will transfer 960 of the Credits to Assignee, and theTown has consented to such transfer.

Now, Therefore, in consideration of the mutual promises of the parties and other good and valuable consideration, Assignor hereby assigns, transfers, and conveys 960 Credits to Assignee. Town consents to the transfer of such Credits.

IN WITNESS WHEREOF, the parties have executed this Assignment as their free and voluntary act and deed.

ASSIGNOR:
Water Resources, LLC

By _____
Bret Hall, Manager

ASSIGNEE:
Lot Holding Investments, LLC

By _____
Bret Hall, Manager

CONSENT TO ASSIGNMENT
Town of Milliken

By _____
Its Town Administrator

CLOSING AGREEMENT AND RECEIPT

This Closing Agreement and Receipt is made May 15, 2001, by and between Town of Milliken (hereafter Milliken), and Central Colorado Water Conservancy District and Groundwater Management Subdistrict of the Central Colorado Water Conservancy District (hereafter Central).

Milliken has tendered to Central and Central has accepted the following:

A. $500,000.00 by certified funds.

B. 60 shares of W. R. Jones Ditch which has been assigned by Milliken to Central together with 112 acres under a Dryup Agreement and Covenant.

All contingencies in the April 17, 2001, Agreement between the parties are hereby waived.

Town of Milliken

By _____

Central Colorado Water Conservancy District
and Groundwater Management Subdistrict of
the Central Colorado Water Conservancy District

By _____

DISTRICT COURT, WATER DIVISION NO. 1, COLORADO 901 9th Avenue Greeley, CO 80631-1113	
CONCERNING THE APPLICATION FOR WATER RIGHTS OF **TOWN OF MILLIKEN** IN WELD AND LARIMER COUNTIES	Filed **▲COURT USE ONLY▲** Case No.: 02CW339

CORRECTED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECREE OF THE WATER COURT

This Application for Water Rights, Change of Water Rights and Approval of Plan for Augmentation was filed in the Water Court, Water Division No. 1, by the Town of Milliken. The Court, having considered the pleadings, evidence and arguments presented and the stipulations of the parties, and being fully advised in the premises hereby finds, concludes, adjudicates and decrees as follows.

FINDINGS OF FACT

1. Name and Address of Applicant. Town of Milliken, 1101 Broad Street, P.O. Box 290, Milliken, Colorado 80543. Telephone: (970) 660-5047.

2. The Application. The Application in Case No. 02CW339 was filed with the Water Clerk, Water Division No. 1, on December 27, 2002 and amended on September 17, 2003, January 31, 2005, April 15, 2005 and August 14, 2008. The Application in Case No. 05CW59 was filed with the Water Clerk, Water Division No. 1, on March 30, 2005 and amended on November 17, 2005. The application in Case No. 05CW59 was re-referred to the Water Judge on June 29, 2007 and the application in Case No. 02CW339 was re-referred on January 24, 2006. The cases were consolidated by order of this court on July 23, 2007.

3. Notice and Jurisdiction. By order of the court dated July 22, 2009, notice of the application as amended was published in the July, 2009 water court resume and in newspapers of general circulation in Weld and Larimer Counties, which publication was in addition to the notices published at the time of each application and amendment. All notices of this matter required by law have been fulfilled and the Court has jurisdiction over the subject matter of this application and over all persons and property affected by it, irrespective of whether they or its owners have appeared.

4. Statements of Opposition. Statements of opposition were filed by City of Loveland, Thompson Water Users Association, City of Greeley, The Greeley and Loveland Irrigation Company, The Seven Lakes Reservoir Company, Bijou Irrigation Company, Bijou Irrigation District, Consolidated Hillsborough Ditch Company, North Sterling Irrigation District, Centennial Water and Sanitation District, Henrylyn Irrigation District, City of Evans, United Water and Sanitation District, Harmony Ditch Company, Loveland Ready Mix Concrete Inc., City of Aurora, Lower Latham Reservoir, Town of Berthoud, City of Boulder, City of Englewood, Consolidated Home Supply Ditch and Reservoir Company and Town of Johnstown. No other statements of opposition have been filed and the time for filing statements of opposition has expired.

5. Summary of Consultation. The Division Engineer for Water Division No. 1 filed Summaries of Consultation dated May 28, 2003, December 17, 2003, July 7, 2005, August 4, 2005, October 20, 2005, April 11, 2008 and December 23, 2008. Applicant served copies of the Summaries of Consultation on the objectors. The Court has duly considered the Summaries of Consultation. A response to the Summaries of Consultation was filed with the court on August 28, 2008.

6. Stipulations. Stipulations or settlements were entered into between Applicant and the objectors as follows.

   6.1. A Stipulation with Henrylyn Irrigation District was entered into on August 10, 2009.

   6.2. A Stipulation with the City of Aurora was entered into on September 9, 2009.

   6.3. A Stipulation with the City of Englewood was entered into on September 10, 2009.

   6.4. A Stipulation with the City of Evans was entered into on September 16, 2009.

   6.5. A Stipulation with the City of Greeley was entered into on September 16, 2009.

   6.6. A Stipulation with the United Water and Sanitation District was entered into on September 16, 2009.

   6.7. A Stipulation with Loveland Ready Mixed Concrete, Inc. was entered into on September 16, 2009.

   6.8. A Stipulation with the Town of Johnstown was entered into on September 17, 2009.

   6.9. A Stipulation with the Lower Latham Reservoir Company was entered into on September 21, 2009.

6.10. A Stipulation with the Consolidated Hillsborough Ditch Company was entered into on September 23, 2009.

6.11. A Stipulation with Thompson Water Users Association was entered into on September 23, 2009.

6.12. A Stipulation with the City of Boulder was entered into on September 28, 2009.

6.13. A Stipulation with the Centennial Water and Sanitation District was entered into on September 29, 2009.

6.14. A Stipulation with the Harmony Ditch Company was entered into on September 29, 2009.

6.15. A Stipulation with the Bijou Irrigation Company and Bijou Irrigation District was entered into on September 29, 2009.

6.16. A Stipulation with the Town of Berthoud was entered into on October 5, 2009.

6.17. A Stipulation with the North Sterling Irrigation District was entered into on October 12, 2009.

6.18. A Stipulation with the City of Loveland was entered into on October 13, 2009.

6.19. A Stipulation with the Consolidated Home Supply Ditch Company was entered into on October 13, 2009.

6.20. The Greeley & Loveland Irrigation Company filed a Notice of Non-Participation at Trial on September 16, 2009.

6.21. The Seven Lakes Reservoir filed a Notice of Non-Participation at Trial on September 16, 2009.

CHANGE OF WATER RIGHTS

7. Decreed Name of Structure. Consolidated Hillsborough Ditch. Applicant is changing the water rights attributable to 14 shares out of 118 shares in the ditch represented by stock certificate Nos. 882, 894 and 895, the "Shares".

7.1. Previous Decree. The Consolidated Hillsborough Ditch was decreed priority numbers 1, 25, 40 and 51 from the Big Thompson River as more particularly described on the Table below. The decreed use is for irrigation. The decreed headgate location is on the Big Thompson River in Section 21, Township 5 North, Range 68 West of the 6th P.M., Larimer County, Colorado. Two separate deeded water rights totaling 5.64 c.f.s are part of priority No. 1. Three deeded rights

totaling 8.25 c.f.s. are all of priority No. 25. This decree shall have no effect on these deeded water rights. The water right decreed for the Hillsborough Reservoir aka Little Thompson Reservoir in Case No. CA 4862, the "Hillsborough Reservoir Senior Right", is also not being changed by this decree.

Appropriation Date	Adjudication Date	Priority	Court	Rate (c.f.s.)	Prorata Rate for 14 Shares (c.f.s.)[1]
1861-11-10	1883-05-28	No. 1	Boulder County	63.31	6.84
1874-10-15	1883-05-28	No. 25	Boulder County	8.25	0.00
1878-04-15	1883-05-28	No. 40	Boulder County	54	6.41
1881-10-06	1883-05-28	No. 51	Boulder County	45.69	5.42

1. These flows rates are presented for the solely for the purposes of tabulation and are not intended to serve as a term or condition governing the delivery or use of the shares.

7.2. Historical Use. The Shares were historically used to irrigate approximately 780 acres located in Sections 3, 10, 12, 13 and 14, T4N, R67W Weld County, Colorado on a total of 5 separate farms. Two (2) shares were used on 78.3 acres on the Apollo Farm, two and a half (2 1/2) shares were used on 86.6 acres on the CAP Farm, two and a half (2 1/2) shares were used on 90.6 acres on the Chessnut Farm, five (5) shares were used on 444 acres on the Main Farm, and two (2) shares were used on 80 acres on the Frank Oster Farm. The historically irrigated lands are shown on Map 1 attached hereto. The crops grown were grain corn, sugar beets, alfalfa, pasture grass, spring wheat, and dry beans. A study period of 1950 – 2000 was selected for those shares used on the Apollo Farm, the CAP Farm and the Oster Farm and a study period of 1950-1980 was selected for those shares used on the Chessnut Farm and the Main Farm. These study periods are consistent with periods when the Shares were applied to the respective farms via flood irrigation, represent periods with available local climate data and diversion data include dry, wet, and average years and are representative of the historical irrigation use of the Shares. Average ditch loss over the study period was determined to be 20%. The average consumptive use associated with the Shares for all farms equaled 710.85 acre feet.

7.3. Proposed Change. Applicant seeks to change the Shares to include augmentation, replacement, recharge and exchange, as well as the decreed irrigation use, either directly or after storage, with the right to totally consume the consumable portion of the water, either by first use or successive use for the purposes described in this decree, or disposition. Applicant claims the right to use the return flows

attributed to the changed uses with a priority date of December 27, 2002 for 12 shares and March 30, 2005 for 2 shares.

7.4. Delivery of Shares for Augmentation Use. When the shares are used for augmentation by delivery of the water directly to the Big Thompson River, the shares shall be delivered and measured at the augmentation structures located or to be located at the CAP Farm which will return water to the Little Thompson River in the NE ¼ of Section 10, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado or the Centennial North Pond outflow augmentation station which returns water to the Big Thompson River in the SW¼ of Section 6, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado, or at any other structure on the Consolidated Hillsborough Ditch approved by the Consolidated Hillsborough Ditch Company and capable of delivering water to the Big Thompson River, as long as deliveries are made upstream of the calling water right in compliance with the requirements of Paragraph 25.

7.5. Delivery of Shares for Recharge Use. When the Shares are used for recharge, they shall be delivered to and measured at any of the recharge ponds described below.

7.5.1. Centennial North Pond (aka Main Farm North Pond), located in the SE1/4 of the NE1/4 of Section 12, T4N, R67W, Weld County, Colorado. Maximum surface area. 9.5 acres.

7.5.2. Centennial South Pond (aka Main Farm South Pond), located in the SE1/4 of the SE ¼ of Section 12, T4N, R67W, Weld County, Colorado. Maximum surface area. 7.6 acres.

7.5.3. Ehrlich Lake (aka Fishing is Fun Pond), located in the SW¼ of Section 12, T4N, R67W, Weld County, Colorado. Maximum surface area. 10.5 acres.

7.5.4. Pheasant Hills Recharge Pond, located in the SW¼ of the NW¼, Section 14, T4N, R67W, Weld County, Colorado. Maximum surface area. 14 acres.

7.6. Delivery of Shares for Irrigation Use. When the Shares are used for irrigation, they shall be delivered to and measured at the Centennial North Pond where they may be pumped via a pump station located on the Pond for irrigation of parks and open space in Sections 12 and 14, T4N, R67W as shown on Map 2. Water pumped from the Centennial North Pond shall be measured via a flow meter or other continuous recording device. Shares used for irrigation will be subject to and included in the volumetric limits set forth in Paragraph 7.12.3 and also subject to the return flow obligations set forth in Paragraph 7.10. Shares applied for irrigation will be accounted for assuming 80% is consumed by the crop and 5% is

spray loss. The remaining 15% equals the return flows. The return flows shall be lagged back to the Big Thompson River as a credit against return flow obligations decreed in this decree using the Glover method described in Paragraph 24.4 and the aquifer parameters developed for the lands irrigated which are shown on Map 4 and Table 1a., attached to this decree.

7.7. Terms for Use of Ponds and Calculation of Recharge Credit.

7.7.1. Measurement and Accounting for Recharge Ponds. The amount of water recharged to the alluvial aquifer at each of the recharge ponds will be determined by measuring the amount of water delivered into each pond and measured by use of a continuous recording measuring device, and by subtracting 1) the amount of water which flowed out of or was discharged from that pond as determined by use of a continuous recording measuring device, 2) the amount of water that was lost to evaporation from that pond, 3) the amount of water pumped from the pond for irrigation use, if any, and 4) the amount of water retained in the recharge pond that has not yet percolated into the ground. Each recharge pond shall have a staff gauge installed such that the gauge registers the lowest water level at the recharge pond. The staff gauge must be readable from a readily accessible location adjacent to the pond. Each measuring device must be at least equivalent in accuracy to a Parshall flume. Applicant shall maintain the recharge ponds so as to keep them free of all vegetation.

7.7.2. Recharge Site Evaporation.

7.7.2.1. Surface Area Determination. The Ponds listed in Paragraphs 7.5.1 through 7.5.3 above have been surveyed and stage-area-capacity relationships have been developed and are set forth in Tables 2-4 attached hereto. Applicant shall survey the Pheasant Hills Recharge Pond and develop a stage area capacity curve which shall be approved by the Division Engineer prior to using the same.

7.7.2.2. Evaporation Calculation. The amount of evaporation shall be determined by multiplying the surface area of each pond by the monthly evaporation factors (evaporation in inches per acre of pond surface area). The Applicant shall compute gross pan evaporation from monthly data from the Greeley West weather station published on the NCWCD web site by multiplying standard alfalfa reference ETr by 1.2 (FAO Irrigation and Drainage Paper #24/56-1977/1998) and then multiplying the resultant by 0.7 to obtain gross pond evaporation, or if unavailable, the gross evaporation values, which are inches per acre per day of exposed surface area, in the following table, will be used.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.35	1.575	2.475	4.05	5.4	6.525	6.75	6.075	4.5	3.15	1.8	1.35

Source. NOAA Technical Report NWS33 estimate of 45 inches of evaporation for shallow lakes in the area of the Town of Milliken, distributed monthly according to the NOAA monthly distribution percentages for sites under 6500 ft msl.

7.7.2.3. Lagging of Recharge. The net monthly volume of recharge or depletions from the ponds shall be lagged to the Big Thompson River using the Glover method described in Paragraph 24.4, using the aquifer parameters shown on Table 5 attached to this decree.

7.7.3. Measurement and Replacement of Evaporation from Intercepted Groundwater. If Milliken's recharge ponds intercept and expose groundwater, the evaporation from the intercepted groundwater must be replaced. During any month within which recharge deliveries are not made, and water remains in any one of the recharge ponds, Milliken will measure the remaining amount in each pond using a staff gauge. Using the ponds stage-area-capacity relationship, the surface area of the exposed groundwater will be determined, and the monthly evaporation of groundwater will be calculated as described above in Paragraph 7.7.2.2., for as long as water remains in the pond. The calculated monthly evaporation of groundwater will be included as a depletion required to be replaced.

7.8. Diversion and Delivery of Shares. The Shares will continue to be diverted at the river headgate for the Consolidated Hillsborough Ditch. Applicant may take delivery of the Shares only when and in the same manner as water is being delivered to other Consolidated Hillsborough Ditch Company shareholders. The Water Court retains continuing jurisdiction over the issue of whether future changes in the historical diversion pattern by the Consolidated Hillsborough Ditch Company cause Applicant to be unable to receive the volumes of water set out in this decree or if material changes in historical diversion patterns as a result of this change case cause injury to any opposer's or any other person's water right.

7.9. Ditch Loss. The ditch loss on the Shares will be assessed the same as for all other shares in the ditch. Changed Shares will be entitled to pro rata delivery at the augmentation station or ponds, the same as other shareholders using water for irrigation, subject to the volumetric limits of Paragraph 7.12.3 and Paragraph 7.12.4.

7.10. Quantification of Return Flows. Return flow factors for quantifying Applicant's return flow obligation from Share deliveries to augmentation stations or recharge

ponds have been computed, based on historical returns accruing 66% as subsurface return flows and 34% as surface return flows. Return flows were lagged to the Big Thompson River from a central point on each of the Apollo Farm, the CAP Farm, the Chessnut Farm, the Main Farm and the Frank Oster Well Farm using the Alluvial Water Accounting System (AWAS) method. Return flow factors for each month for Shares used on all farms are shown in the tables below. Daily return flow obligations for the months of May through September shall be determined by multiplying the daily Share deliveries by the appropriate monthly factor to arrive at the return flow obligation on that day. Daily return flow obligations for the months of October through April shall be determined by multiplying the previous year's (October through September) total Share deliveries by the appropriate monthly factor and then dividing the result by the number of days in that month in order to arrive at the return flow obligation on that day.

Summer Return Flow Factors.

	May	June	July	August	Sept
14 Shares	0.409	0.269	0.242	0.275	0.409

Winter Return Flow Factors.

	Oct	Nov	Dec	Jan	Feb	March	April
14 Shares	0.038	0.031	0.028	0.026	0.024	0.022	0.024

7.11. Return Flow Replacement. Return flows associated with the Shares historically accrued to the Big Thompson River in Sections 1, 2 and 3 of T4N, R67W. Return flow replacements shall be required on all days when there is a downstream call for water on the Big Thompson or South Platte River at or below the Evans Town Ditch Headgate senior to December 27, 2002 for the 12 shares associated with the Apollo, CAP, Chessnut and Main Farms and March 30, 2005 for the 2 shares associated with the Oster Farm. Return flows shall be made in accordance with the requirements of Paragraph 25.

7.12. Conditions of Share Use. To prevent an expansion of use and injury, Applicant's use of the changed Shares shall be subject to the following terms and conditions.

7.12.1. Dry Up Acreage. The 780 acres associated with the Apollo Farm, the CAP Farm, the Chessnut Farm, the Main Farm and the Frank Oster Farm as shown on Map 1 may be irrigated; provided, such irrigation is accomplished via use of the consumptive use portion of the Shares, treated water provided by Milliken or another municipal water provider, augmented wells, non-tributary water, not non-tributary water that is duly augmented or any other source of water approved for use on those lands by the Water Court. These lands are, or will be, within the Town of Milliken's service area and may be irrigated for municipal purposes without injury to other water rights; provided irrigation is limited as

described in this paragraph. There shall be no use of other Hillsborough Ditch shares on these lands, unless such shares are approved for municipal use pursuant to a Substitute Water Supply Plan approved by the State Engineer under § 37-92-308, C.R.S., and/or successor statutes, or a subsequent water court decree. To ensure that only the consumptive use portion of the Shares is used for irrigation on the lands described in this decree, the Shares used for irrigation shall be subject to and included in the volumetric limits set forth in this decree.

7.12.2. Diversion Season. The diversion season for the Shares shall be between April 10 and October 31 each year.

7.12.3. Monthly Volumetric Limits. The Shares shall be subject to monthly, maximum volumetric limits in acre feet on deliveries of water from the ditch to Milliken as follows.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.0	0.0	0.0	19.3	325.0	472.8	556.4	335.1	266.8	32.9	0.0	0.0
0	0	0	0	1	4	2	5	5	6	0	0

7.12.4. Annual Volumetric Limits.

7.12.4.1. The 30-year rolling average annual volume of water delivered from the ditch to Milliken attributable to the Shares shall not exceed 1,344 acre-feet. For the 29 years prior to 2010, for purposes of computing the 30 year rolling averages, Applicant shall utilize the pro-rata delivery amount associated with the Shares based upon the Consolidated Hillsborough Ditch River Headgate diversions. To calculate the pro rata delivery amount associated with the Shares for the first year of operation under this decree, Applicant shall utilize the river headgate diversions for the years 1980-2009, less 20 percent for ditch losses.

7.12.4.2. The maximum annual volume of water delivered from the ditch to Milliken attributable to the Shares shall not exceed 1,637.74 acre feet

7.12.5. River Headgate Diversion Limitations. The City of Loveland ("Loveland") and Consolidated Home Supply Ditch and Reservoir Company ("Home Supply") contend that in addition to the volumetric limitations imposed by this decree, the Court should impose a river headgate diversion limitation requiring the Consolidated Hillsborough Ditch Company ("Hillsborough") to reduce river headgate diversions in an amount proportionate to Milliken's pro-rata entitlement once 1)

Milliken reaches any of its volumetric limitations or 2) when Milliken is not using the water attributable to the Shares. The term including the components at 1) and 2) is referred to as the "River Headgate Diversion Limitation." Milliken contends that no such term is necessary to prevent injury to other water users. Hillsborough contends that such a term is not only unnecessary to prevent injury to other water users but would detrimentally impact ditch company operations and cause injury to its water rights and shareholders. By stipulation of the parties, no River Headgate Diversion Limitation is imposed by this decree, nor was this issue litigated or determined. Therefore, this decree shall not be deemed precedential on this issue. If the River Headgate Diversion Limitation is included in a decree in a future change case involving Consolidated Hillsborough Ditch shares, whether actually litigated, or resolved by settlement with Hillsborough, Loveland and/or Home Supply may file a motion under the Court's retained jurisdiction in this case to include in this decree a River Headgate Diversion Limitation term. Loveland and Home Supply agree that the River Headgate Diversion Limitation term shall be limited to a modification of diversions by Hillsborough at the river headgate of the Hillsborough Ditch by a reduction of 5.47 cfs (the pro rata flow rate of Priority No. 1 represented by Milliken's 14 shares, minus 20% ditch loss), and shall not modify the volume of water Milliken is entitled to under the terms of this decree nor impose any additional obligations on Milliken. The deadline for filing of a motion by Loveland and/or Home Supply shall be one year after entry of said future decree, or if said future decree is appealed, one year after such appeal is decided.

7.12.6. Records. Applicant shall maintain daily records of the following for the Shares: (1) the volume of water delivered to the recharge ponds, (2) the volume of water delivered to augmentation stations, (3) the return flow replacement obligations, (4) stream deliveries for the replacement of the return flow obligations, and (5) the monthly, annual and 30-year volumetric delivery limitations and the running totals delivered against those limitations. The Applicant shall also maintain such additional records as reasonably requested by the Division Engineer.

7.12.7. Accounting. Accounting for the use of the Shares shall be on the accounting forms attached hereto as Table 9. These forms shall contain the information required by Paragraph 7.12.6 and be submitted to the Division Engineer at least monthly.

8. Decreed Name of Well to be Changed. Ehrlich Feedlot Well No. 10446. The claim to change the Ehrlich Feedlot Well No. 10446 is hereby dismissed without prejudice. As of the date of this decree, all post-pumping depletions associated with the historical use of the Ehrlich Feedlot Well No. 10446 have accrued to the Big Thompson River.

9. Decreed Name of Well to be Changed. Knaub Well No. 0456.

9.1. Previous Decree. The Knaub Well No. 0456 was decreed in Case No. W-420 on February 7, 1972 with appropriation date of December 31, 1934 for 1.7 c.f.s. The decreed use is for irrigation of land in Section 14, Township 4 North, Range 67 West of the 6th P.M. in conjunction with other wells as listed in said decree.

9.2. Historical Use. The Knaub Well No. 0456 was historically used to irrigate 160 acres in the NW¼ of Section 14, Township 4 North, Range 67 West of the 6th P.M. Weld County Colorado along with 2 shares of the Consolidated Hillsborough Ditch from 1950 through 2000. Net Stream Depletions associated with the use of the Knaub Well over the study period averaged 78.09 acre feet with a maximum of 124.16 acre feet.

9.3. Proposed Change. Applicant has redrilled the well and seeks to change the location to the NW¼ NW¼ of Section 14 Township 4 North Range 67 West of the 6th P.M., Weld County Colorado at a point 450 feet south and 1000 feet east of the Northwest corner of said Section 14 to provide raw water to the Town's Reverse Osmosis Treatment Plant located in Section 14 for municipal uses within the Town of Milliken service area.

9.4. Conditions on Changed Use of Knaub Well No. 0456. Applicant shall limit net stream depletions from the future use of the Knaub Well No. 0456 to no more than 78.09 acre feet per year on a 30 year rolling average and a maximum annual depletion of 124.16 acre feet for the uses described in Paragraph 9.3. Diversions by Applicant from the Knaub Well No. 0456, and post-pumping depletions associated with the historical use of the Knaub Well No. 0456, shall be augmented under the augmentation plan and subject to the terms and conditions of said augmentation plan as set forth in Paragraphs 17-28 below.

NEW RECHARGE, STORAGE, GROUNDWATER AND EXCHANGE RIGHTS

10. Decreed Name of Water Right. The Pheasant Hills Recharge Water Right.

10.1. Location of Recharge Structure. The Pheasant Hills Recharge Pond is located in the SW1/4 of the NW1/4 of Section 14, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado. Recharge will also occur in the Consolidated Hillsborough Ditch.

10.2. Source and Point of Diversion. The Big Thompson River through the headgate of the Consolidated Hillsborough Ditch which is located in the SE¼ NW¼ of Section 21, Township 5 North, Range 68 West of the 6th P.M., Weld County, Colorado.

10.3. Amount Claimed. 32.54 c.f.s., Conditional.

10.4. Date of Appropriation. August 13, 2008 by resolution of the Milliken Town Council to appropriate said right.

10.5. Maximum Surface Area. The maximum surface area of the Pheasant Hills Recharge Pond is 14 acres.

10.6. Use. Applicant will use the Pheasant Hills Recharge Water Right to recharge the alluvial aquifer to replace out-of priority depletions from the wells augmented under the decreed augmentation plan. Water may be recharged to the alluvial aquifer via storage in the Pheasant Hills Recharge Pond and via seepage from the Consolidated Hillsborough Ditch when delivery is being made to the Pheasant Hills Recharge Pond under this decree.

10.7. Description of Recharge Operations. Water is diverted in priority at the diversion point described in Paragraph 10.2 and percolates from the ditch and pond into the underground aquifer for Applicants' stated beneficial uses. Recharge accretions accrue to the Big Thompson River in Section 2, T4N, R67W, in the reach from the headgate of the Big Thompson Platte River Ditch to the Evans Town Ditch. To calculate the amount of water recharged in each reach of the Ditch, Applicant shall use the following method. The amount of water recharged to the alluvial aquifer in the ditch reaches shall be determined by measuring the amount of water released to each reach or set of reaches as shown on Table 6 by use of a continuous recording measuring device and by subtracting: a) the amount of water which flowed out of or was discharged from that reach as determined by use of a continuous recording measuring device or by pro-ration, based on reach length as shown in Table 6, for reaches between measuring devices; b) the amount of water that was lost to evaporation from that reach. Each measuring device must be at least equivalent in accuracy to a Parshall flume. Under either method Applicant shall be entitled to credit for recharge accretions in the Ditch for recharge water carried through the Ditch only on days when recharge water is the only water being carried in the Ditch. Applicant shall be entitled to credit for recharge accretions pursuant to the terms of this decree in the event other recharge water is also carried in the Ditch at the same time.

10.8. Measurement and Accounting. Measurement and accounting for the recharge associated with the Pheasant Hills Recharge Pond shall be computed and maintained in the same manner as described in Paragraph 7.7.1 above.

10.9. Surface Area Determination. Prior to use for recharge, the Pheasant Hills Recharge Pond will be surveyed and a stage-area-capacity relationship will be developed. Applicant shall maintain the Pheasant Hills Recharge Pond so as to keep the pond free of all vegetation. For the Consolidated Hillsborough Ditch, the maximum surface area, as set forth in Table 6 shall be used whenever water is exposed to the atmosphere in the Ditch.

10.10. Evaporation Calculation. Evaporation shall be calculated as described in Paragraph 7.7.2.2 above.

10.11. Lagging of Recharge. Aquifer characteristics for the Pheasant Hills Recharge Pond and the Consolidated Hillsborough Ditch have been determined using the aquifer parameters developed for the Big Thompson alluvium for the State's

Colorado Decision Support Systems and are set forth in Table 5. These aquifer characteristics will be used along with the Glover Method discussed in Paragraph 24.4 below to determine the timing and quantity of recharge accretions to the Big Thompson River.

10.12. Location of Recharge. Recharge accretions from the Pheasant Hills Recharge Pond will impact the Big Thompson River upstream of the Evans Town Ditch Headgate. The Consolidated Hillsborough Ditch has been divided into Four Sections as shown on Map 3. Recharge accretions from the Ditch will impact the Big Thompson and Little Thompson Rivers in the locations shown on Map 3.

11. Decreed Name of Storage Right. Hillsborough Reservoir aka Little Thompson Reservoir, Second Priority.

11.1. Location of Reservoir. The dam for the Hillsborough Reservoir is located in the SE¼ of Section 9, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado.

11.2. Source and point of diversion. The Big Thompson River through the headgate of the Consolidated Hillsborough Ditch which is located in the SE¼ NW¼ of Section 21, Township 5 North, Range 68 West of the 6th P.M., Weld County, Colorado. The Consolidated Hillsborough Ditch has a capacity of at least 80 c.f.s.

11.3. Amount Claimed. 500 acre-feet at a diversion rate of 32.54 c.f.s., Conditional.

11.4. Date of Appropriation. August 13, 2008 by resolution of the Milliken Town Council to appropriate said right.

11.5. Maximum Surface Area and Dam Height. The maximum surface area of the Hillsborough Reservoir at its high water line is 30 acres and the Maximum Dam Height is 29.1 feet and its length is 1000 feet.

11.6. Use. Applicant will use the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority to recharge the alluvial aquifer either directly from the Reservoir, or after delivery to the recharge ponds described in Paragraphs 7.5 and 10, or from ditch seepage occurring during the conveyance of the Second Priority to the Reservoir to replace out-of priority depletions from the wells augmented under the decreed augmentation plan, and for recreation within the Hillsborough Reservoir and recharge ponds, and for irrigation, within the Town of Milliken Service area as it now exists and may be changed in the future after storage in Hillsborough Reservoir. In ditch recharge from diversion of the Second Priority shall be subject to all the terms and conditions of Paragraphs 10.7, 10.9, 10.10 and 10.11.

11.7. Conditions On Hillsborough Reservoir Second Priority. Water shall only be stored or recharged in the Hillsborough Reservoir under the Hillsborough

Reservoir aka Little Thompson Reservoir, Second Priority when said right is in priority and only after the Hillsborough Reservoir Senior Right has been satisfied. Nothing in this decree shall prohibit the storage of water in Hillsborough Reservoir pursuant to a lawful exchange. Applicant shall not take credit for recharge generated while water is stored within the Hillsborough Reservoir under the Hillsborough Reservoir aka Little Thompson Reservoir, Second Priority until the requirements of Paragraph 11.11 have been met.

11.8. Evaporation Calculation. Evaporation shall be calculated as described in Paragraph 7.7.2.2 above.

11.9. Lagging of Recharge. Aquifer characteristics for the Hillsborough Reservoir have been determined using the aquifer parameters developed for the Big Thompson alluvium for the State's Colorado Decision Support Systems and are set forth in Table 5. These aquifer characteristics will be used along with the Glover Method discussed in Paragraph 24.4 below to determine the timing and quantity of recharge accretions to the Big Thompson River unless modified as a result of proceedings pursuant to Paragraph 11.11.2.

11.10. Location of Recharge. Recharge accretions from Hillsborough Reservoir will accrue to the Big Thompson River in Section 2, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado.

11.11. Claiming Recharge from Hillsborough Reservoir. Prior to taking credit for recharge accretions accruing from Hillsborough Reservoir under the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority, Applicant must comply with the following requirements.

11.11.1. Applicant must construct and/or install structures which are sufficient to measure water into storage and measure the subsequent recharge of that water from the Reservoir as reasonably required by the Division Engineer;

11.11.2. The rate of historical seepage of water from Hillsborough Reservoir under the Hillsborough Reservoir Senior Right, the rate of seepage of water from Hillsborough Reservoir under the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority, and a procedure for calculating the amount and timing of recharge accretions to the river attributable to water delivered for recharge purposes into Hillsborough Reservoir under the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority must be established. To establish the rate of historical seepage of water from Hillsborough Reservoir under the Hillsborough Reservoir Senior Right, Applicant shall install measuring devices and collect daily measurements of seepage during at least one entire water year. No later than six years from the date of this decree, Applicant shall file with the Court and serve on the State and Division

Engineers and the objectors, a report analyzing the results of the data collection and proposing a procedure for calculating the amounts of seepage from the Hillsborough Reservoir Senior Right and from the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority, and a procedure for calculating the amount and timing of accretions to the river from the Second Priority, the data and analysis supporting the proposed procedures and all data collected by Applicant pursuant to this paragraph, including the daily measurements referenced in this decree. The State and Division Engineers and Objectors shall have 90 days from the date of service of the written notice to file objections to Applicant's report and proposed procedures and the Court shall thereafter hold a hearing to resolve such objections. If no objections are filed, the Applicant may thereafter use such procedures to calculate recharge accretions from the delivery of water to Hillsborough Reservoir under the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority;

11.11.3. Applicant must survey the reservoir to establish the stage-area-capacity relationship of the reservoir; and

11.11.4. Applicant must develop accounting forms which would track the diversion and use of the different waters stored in the reservoir and distinguish seepage from the reservoir which is attributable to the Hillsborough Reservoir aka Little Thompson Reservoir Second Priority consistent with the procedures approved pursuant to Paragraph 11.11.2.

11.11.5. The deadlines for Applicant's performances set forth in this Paragraph 11.11 shall not be extended by the Water Court except upon the stipulation of all the parties to this proceeding. In the event Applicant fails to timely complete all the performances and timely file all the documents required by this Paragraph 11.11, Applicant shall be deemed to have abandoned the conditional claim for recharge accruing from Hillsborough Reservoir under the Hillsborough Reservoir a/k/a Little Thompson Reservoir, Second Priority, and the Water Court shall enter a decree abandoning said portion of the conditional claim.

11.11.6. In the event a hearing is required under Paragraph 11.11.2, above, the pre-trial procedures and deadlines set forth in the then current version of Rule 11 of the Uniform Local Rules for All State Water Court Divisions shall apply to disclosures, discovery, motions and other pre-trial activities. For this purpose, the matter shall be deemed to be "at issue" ninety (90) days after Applicant files and serves the report, data and procedure for calculations required by Paragraph 11.11.2, above.

12. Decreed Name of Groundwater Rights. Town of Milliken Well No. 3.

12.1. Location. Town of Milliken Well No. 3 is located in the NW¼ of the NW¼, Section 14, Township 4 North, Range 67 West of the 6th P.M., Weld County Colorado approximately 317 feet south and 997 feet east from the northwest corner of said section.

12.2. Appropriation Date. December 11, 2002.

12.3. Amount Claimed. 1000 g.p.m., conditional.

12.4. Use. Town of Milliken Well No. 3 will be used for all Municipal Uses within the Town of Milliken Service Area as it now exists or may exist in the future.

13. Decreed Name of Groundwater Rights. Colony Point Recharge Well.

13.1. Location. Colony Point Recharge Well will be located in the SW¼, Section 12, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado approximately 2100 feet north and 100 feet east from the southwest corner of said section.

13.2. Appropriation Date. September 11, 2003.

13.3. Amount Claimed. 1500 g.p.m., conditional.

13.4. Uses. Colony Point Recharge Well will be used for irrigation within the Town of Milliken Service area as it now exists or may exist in the future and for piscatorial and wildlife and recharge uses within the Centennial North Pond or Ehrlich Lake.

14. Decreed Name of Groundwater Rights. Settlers Village Recharge Well.

14.1. Location. The Settlers Village Recharge Well will be located in the SE¼, Section 12, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado approximately 2415 feet north and 1962 feet west of the southeast corner of said section.

14.2. Appropriation Date. September 11, 2003.

14.3. Amount. 1500 g.p.m., conditional.

14.4. Use. Settlers Village Recharge Well will be used for irrigation within the Town of Milliken Service area as it now exists or may exist in the future and for piscatorial and wildlife and recharge uses within the Centennial North Pond or Ehrlich Lake.

15. Decreed Name of Groundwater Rights. Oster Well 65727-F.

15.1. Location. Oster Well 65727-F is located in the SE¼ of the NE¼ of Section 10, Township 4 North, Range 67 West of the 6th P.M., Weld County, Colorado

approximately 1480 feet from the North Section line and 200 feet from the East Section line.

15.2. Appropriation Date. March 30, 2005.

15.3. Amount. 10 acre feet at 15 gpm, conditional.

15.4. Use. Commercial uses associated with the operation of a car washing facility located within the Town of Milliken, including irrigation of less than 1 acre.

16. Decreed Exchange.

16.1. Exchange. Applicant claims the following right of substitution and exchange pursuant to C.R.S § § 37-80-120, 37-82-106, 37-83-104, and 37-92-101 et. seq.

16.2. Operation of the Exchange. At such times when augmentation water is delivered to the Big Thompson River in excess of the replacement requirements under the plan for augmentation, the excess water will be exchanged for water diverted at the Consolidated Hillsborough Ditch Headgate described in Paragraph 7.1 above and delivered to the Hillsborough Reservoir or the recharge ponds described in this decree. The exchange will only operate at such times when, and to such extent that, no water rights located between the point of delivery to the Big Thompson River and the point of diversion will be injured by the exchange. Applicants shall provide prior notice to the Water Commissioner, who shall approve the exchange prior to operation and assess reasonable transit losses on the amount exchanged. The exchange will only operate at such times when there is a live stream between the point of delivery to the Big Thompson River and the point of diversion.

16.2.1. Legal Description of Points of Diversion. The point of diversion is the Consolidated Hillsborough Headgate described in Paragraph 7.1 above.

16.2.2. Legal Description of the Reach of the Big Thompson River within the Exchange Reach. The augmentation water delivered to the Big Thompson River will be delivered within a reach of the Big Thompson River, consisting of an upstream point located at the Consolidated Hillsborough Headgate and a downstream point located at the Evans Town Ditch Headgate.

16.2.3. Appropriation. August 13, 2008.

16.2.4. Amount. 5 c.f.s., conditional.

16.2.5. Use. Water diverted via this exchange will be used for recharge of the alluvial aquifer after delivery to Hillsborough Reservoir, or after delivery to the recharge ponds described in Paragraphs 7.5 and 10, or

from ditch seepage occurring during the conveyance of the exchange water to replace out-of priority depletions from the wells augmented under the augmentation plan decreed in this decree. Water diverted under this exchange may also be used for recreation within Hillsborough Reservoir and recharge ponds and for irrigation within the Town of Milliken Service area as it now exists and may be changed in the future either directly or after storage in Hillsborough Reservoir. In ditch recharge from diversions pursuant to the exchange shall be subject to all the terms and conditions of Paragraphs 10.7, 10.9, 10.10 and 10.11.

16.3. Appropriative Right of Exchange. The appropriative right of exchange will be operated pursuant to § §37-80-120, 37-82-106, 37-83-104, and 37-92-101, et seq., *C. R. S.* and in accordance with the terms and conditions of this decree.

PLAN FOR AUGMENTATION

17. Structures to be Augmented. Two wells used for potable municipal supplies, two wells used for recharge, recreation and irrigation, four wells used for irrigation within the Town of Milliken service area as it now exists or may exist in the future, and one commercial well. The wells are more particularly described in the Table below.

Well Name	Permit No.	WDID	Use	Admin Number	Priority Date	Location
Town of Milliken Well No. 3	59961F	4-5660	Municipal/Potable	To be assigned	12-11-2002	NW¼ of the NW¼ of Section 14, Township 4N, Range 67W
Knaub Well No. 0456	63813F	4-5273	Municipal/Potable	31045	12-31-1934	NW1/4 of the NW1/4 of Section 14, T4N, R67W
Seele Well #11676	11676R	4-5463	Irrigation/Non-potable	33023	5-31-1940	SW1/4 of the SW1/4 of Section 11, T4N, R67W
Oster Well #13787	13787R	4-5400	Irrigation/Non-potable	33115	8-31-1940	SE1/4 of the SE1/4 of Section 10, T4N, R67W
Well #15032	15032R	4-5371	Irrigation/Non-potable	38137	6-1-1954	NW1/4 of the NE1/4 of Section 11, T4N, R67W

Well #15031	15031S	4-5372	Irrigation/Non-potable	31532	5-1-1936	NW1/4 of the NE1/4 of Section 11, T4N, R67W
Oster Well #65727F	65727F	NA	Commercial & Irrigation	To be assigned	3-30-2005	SE1/4 of the NE1/4 of Section 10, T4N, R67W
Colony Point Recharge Well	62573F		Municipal-Irrigation, Piscatorial, Wildlife and Recharge	To be assigned	9-11-2003	SW¼, S12, T4N, R67W
Settlers Village Recharge Well	62874F		Municipal-Irrigation, Piscatorial, Wildlife and Recharge	To be assigned	9-11-2003	SE¼, S12, T4N, R67W

Town of Milliken Well No. 3 and the Knaub Well No. 0456 are referred to as the "RO Wells". The Seele Well #11676, Oster Well #13787, Well #15032, and Well #15031 are referred to as the "Irrigation Wells". Oster Well #65727-F is referred to as the "Commercial Well". The Colony Point Recharge Well and the Settlers Village Recharge Well are referred to as the "Recharge Wells". The wells with separately decreed water rights shall only be used for the purposes authorized by their decrees and are currently used for such purposes. Nothing in this decree shall be construed to affect or change the decreed attributes of the wells' separately decreed water rights.

18. Replacement, Alternate Point of Diversion or Supplemental Wells. Any well that is constructed with a valid well construction permit issued by the Office of the State Engineer as a replacement well for one of the wells listed in the table in Paragraph 17 above may also be covered by the plan provided the replaced well is properly abandoned. The table shall be updated with the new permit number and well location but such update does not require an amendment to this decree. Any well constructed as an alternate point of diversion or supplemental well for one of the wells listed under Paragraph 17 may also be covered by this plan provided it is added to the plan pursuant to Paragraph 20.

19. Deletion of a Well. Applicant shall replace all out of priority depletions from the wells pursuant to the terms of this decree until and unless a decree or order of this Court authorizes the deletion of a well from the plan for augmentation. Applicant may file a Motion in this decree, with notice as required by law to all parties, to delete a well and the Court retains continuing jurisdiction to consider the terms and conditions on which such motion may be granted, including but not limited to, terms and conditions requiring replacement of ongoing depletions resulting from use of the well prior to the date the Court allows the well to be deleted from the plan for augmentation. The parties in this decree shall have 60 days after the date of service of such notice in which to respond to

said motion and to request a hearing on the Motion, and Applicant shall have 15 days after service of any response in which to file a reply. Applicant may also file an Application in the Water Court, with notice as required by law, seeking the deletion of a well from the plan for augmentation and proposing terms and conditions on which said application should be granted.

20. Addition of Wells. If Applicant seeks to add a well to this Plan for Augmentation, Applicant shall file an Application with the Water Court to add the well to the Plan for Augmentation. A well may be added to the plan under such appropriation date and priority as the Court may determine, so long as the well is operated and used, and out of priority depletions are replaced, on terms and conditions at least as restrictive as decreed in this decree for the Plan for Augmentation. Depletions for a well added to this plan shall be quantified using the methodology described in Paragraph 24.3.3 in this decree, and shall use the Glover Method described in Paragraph 24.4, or other appropriate method as determined by the Court when the wells are added to the Plan, for determining the timing of depletions from past and future pumping. If the method for determining depletions from a well to be added to this plan has not been determined in Paragraph 24.3.3 because the use of the well is not 1) municipal use by means of Reverse Osmosis (RO wells), 2) irrigation use, 3) recharge use or 4) commercial use by a car wash, then Applicant shall propose a method for determining depletions as part of the Application to add the well to the plan and the Court shall determine the appropriate method for determining depletions. Out of priority depletions resulting from use of any well which Applicant requests the court to add to this plan shall be replaced in accordance with the following. Out of priority depletions from use of the well that have occurred prior to the date the court allows the well to be added to the plan, shall be replaced in compliance with an applicable water court decree or substitute water supply plan approved by the State Engineer. Out of priority depletions from use of the well that will occur after the court decree adding the well to the plan, whether or not the depletions result from pumping before or after the date the court allows the well to be added to the plan, shall be replaced by the Applicant under the terms and conditions of this decree and any additional terms and conditions ordered by the court in connection with adding the well.

21. Location of Depletion. The wells augmented under the plan in this decree deplete the Big Thompson River above the Evans Town Ditch Headgate.

22. Water Rights to be Used for Augmentation.

22.1. Water rights described in Paragraphs 7, 10, 11, 13, 14, and 16 above.

22.2. Fully consumable water associated with 1 Share in the Greeley and Loveland Irrigation Company, 5 shares in the Seven Lakes Reservoir Company and 0.5 contract rights in the Loveland and Greeley Reservoir Company a/k/a Lake Loveland being changed in Case No. 2002CW43 to numerous uses including augmentation, the "GLIC Companies Shares". Fully consumable water available for augmentation from the GLIC Companies Shares shall be used in this augmentation plan consistent with the terms of the substitute water supply plan

approved by the State Engineer and/or the terms of any decree entered in Case No. 2002CW43.

22.3. Water added pursuant to Paragraph 23 below.

23. Additional Supplies of Augmentation Water. Pursuant to § 37-92-305(8) C.R.S., the Court may authorize Applicant to use additional or alternative sources of augmentation water for replacement in this Augmentation Plan, including water leased by Applicant, if such sources are part of a substitute water supply plan approved pursuant to § 37-92-308 C.R.S., or if such sources are decreed for such use. The Court may also authorize Applicant to use additional or alternative sources of augmentation water for replacement in this Augmentation Plan, including water leased by Applicant, if such sources are part of an interruptible water supply agreement approved pursuant to § 37-92-309, C.R.S. This paragraph sets forth the procedure under which these sources may be added to this plan. These procedures are adequate to prevent injury to other water rights that might otherwise result from the addition of these sources to this plan.

23.1. Additional Water Rights Separately Decreed for Augmentation Use. If a water right is decreed or lawfully available for augmentation use and not already approved for such use under this decree, Applicant shall give at least 30 days advance written Notice of Use of Water Right for Augmentation, to the Court, the Division Engineer and all the objectors in this decree which shall describe 1) the water right by name and decree, if any; 2) the annual and monthly amount of water available to Applicant from the water right, 3) the location or locations at which the water will be delivered to the stream; 4) evidence that the claimed amount of water is and will not be used by any other person, and 5) the manner in which Applicant will account for use of the augmentation credits. No water right may be used unless the Division Engineer approves of its use.

23.2. Other Additional Water Rights. If a water right is not decreed or otherwise lawfully available for augmentation use, and Colorado statutes or other governing authority provide a mechanism for using such water right without the need of a decree or well permit, Applicant shall provide written notice to the objectors in this decree of its request for approval of the State Engineer pursuant to § 37-92-308 or § 37-92-309, C.R.S., or other applicable statute. Such notice shall be in addition to any notice required by the applicable statute. Applicant may use such water rights in the plan of augmentation upon the State Engineer's approval of the administrative application for the term of such approval, unless such approval is reversed or modified on appeal or under retained jurisdiction.

23.3. Agreements. Applicant may not use additional augmentation supplies discussed in this Paragraph 23 unless Applicant has a written agreement with the owners of the additional augmentation supplies allowing Applicant to do so or other document evidencing a right to the water. A copy of any such agreement or document shall be provided with the written notice to the objectors and the Division Engineer and/or State Engineer required in Paragraph 23.1 and Paragraph 23.2.

24. Operation of the Plan for Augmentation.

24.1. Plan for Augmentation. Diversions from the wells listed in Paragraph 17 cause depletions to the Big Thompson River. Depletions will also continue to result from past pumping and this plan is intended to account for such depletions. To the extent that those depletions are out of priority, the purpose of this plan is to provide for replacement of such out of priority depletions in time, location and amount, under the terms of this decree, to prevent injury to vested water rights or decreed conditional water rights. The Court approves the Plan for Augmentation subject to the terms and conditions of this decree.

24.2. Method for Determination of Ongoing Well Depletions from Past Pumping. The steps involved in determining the quantity and timing of the depletions from past pumping are summarized below.

24.2.1. Depletions from Pumping of Irrigation Wells prior to March 31, 2010. Ongoing depletions associated with the use of the Irrigation Wells from 1950 through March 31, 2010 have been determined using the Modified Blaney-Criddle methodology as contained in the IDSCU Model developed by IDS, Climate Data from the NWS weather stations located in Greeley Colorado from 1950-2006, and an 80 percent efficiency. Climate conditions for 2007 through March 31, 2010 were assumed to equal the average of conditions from 2002-2006, a conservatively dry period.

24.2.1.1. Depletions from Past Pumping of RO Wells and Commercial Well from 2002 through March 31, 2010. The depletions associated with use of the RO Wells and the Commercial Well from the years 2002 through March 31, 2010 were determined in the same manner as discussed in Paragraph 24.3 below.

24.3. Determination of Depletions from Future Pumping of Wells. Beginning with pumping occurring after April 1, 2010, Applicant shall calculate well depletions as follows.

24.3.1. Measured Well Pumping. Applicant's method of determining well depletions shall be based on well pumping measurements. Applicant shall collect actual well pumping data based on flow meter readings and determine the amount pumped as required by this decree.

24.3.2. Flow Meters. Flow meters will be maintained in working order. Meters will be tested and certified as accurate at least once every four years by a registered professional engineer or other qualified

person. In the event a flow meter malfunctions, the amount of water pumped during the time of malfunction may be estimated as follows.

24.3.2.1. For Irrigation Wells based on power records for the well, by calculating the acre foot pumped per kilowatt hour consumption for irrigation of the crops for the prior two months of pumping and multiplying that number times the kilowatt hours for the time period the flow meter malfunctioned.

24.3.2.2. For RO Wells based on the following equation. (measured total RO treatment plant production) + (measured RO Plant brine reject) – (amount pumped as measured from the other RO Well with a functioning well meter) – (measured RO treatment plant inflow from non-well sources).

24.3.2.3. For the Recharge Wells based on power records for the well, by calculating the acre foot pumped per kilowatt hour consumption for the prior two months of pumping and multiplying that number times the kilowatt hours for the time period the flow meter malfunctioned.

24.3.2.4. A malfunctioning flow meter shall be repaired or replaced within 30 days of the time the malfunction is discovered. If not replaced within such time period, Applicant shall, cease use of the well until the malfunctioning flow meter is repaired or replaced.

24.3.3. Return Flow Factors and Depletive Effect. The return flow factors and depletive effect associated with pumping of the wells will be calculated as follows.

24.3.3.1. RO Wells. The RO Wells provide potable water for both in-house and outdoor usage via treatment at a Reverse Osmosis Facility located within the Town of Milliken. A percentage of the water pumped from the RO Wells is discharged at the Reverse Osmosis Facility as brine effluent. These discharges are, and shall continue to be, measured via a flow meter at the RO Facility and returned to the Little Thompson River via a sealed pipeline at approximately the intersection of Colorado State Highways 257 and 60. The remainder of the water pumped from the RO Wells is delivered to Applicant's customers. Return flow factors and depletive effect for

the RO Wells will be determined as follows.

24.3.3.1.1. Base Use. The in-house usage from RO Well Pumping (the "Base Use") will be calculated as the total amount pumped from each RO well during the month minus brine effluent return flows, multiplied by the Base Use Ratio. The Base Use Ratio is the average of December, January and February in-house use of all Milliken's water supplies, for the immediately preceding December, January and February divided by the total water use in each month. For the months of December, January and February, the Base Use ratio is 1.0. The percentage of the Base Use attributable to consumptive use will be calculated as the smaller of 1) 15% or 2) 1 minus the plant discharge percentage, calculated as total annual Milliken Waste Water Treatment Plant (MWWTP) effluent discharge, December through November of the previous year divided by Milliken's total annual indoor use (including pumping from the Commercial Well and all other supplies delivered into Milliken's potable water supply), not to be less than 10%. The total annual indoor use shall be calculated as the average of all Milliken's potable water deliveries during December, January and February in previous year x 12 months. The non-consumptive portion of the Base Use is returned to the Big Thompson River via Milliken's Waste Water Treatment Plant located along the Big Thompson River near the center of Section 1, T4N, R67W in the same month in which it was pumped. To calculate the net depletive effect on the Big Thompson River, the return flows associated with the Base Use will be accounted for as an offset to lagged depletions from 100% of the pumping of the RO Wells in the same month in which the return flows accrue to the Big Thompson River. If after this decree is entered another decree is entered in another case that allows a lower Base Use percentage for the MWWTP than set forth in

this decree, upon notice to all parties in this case, Milliken may invoke the Court's retained jurisdiction to determine if the MWWTP Base Use percentage decreed in this decree should be reduced.

24.3.3.1.2. Outdoor Use. The outdoor usage ("Outdoor Use") will be calculated as the total amount pumped in a specific month, minus brine effluent return flow, minus that month's Base Use. The Outdoor Use will be multiplied by 15% to derive the Outdoor Use return flows. The return flows associated with Outdoor Use will be lagged back to the Big Thompson River on a monthly basis using the Glover Equation described in Paragraph 24.4 below and the average Glover parameters for the irrigated areas as set forth in Table 1b. To calculate the net depletive effect on the Big Thompson River the return flows associated with the Outdoor Use of the RO Wells shall be lagged and accounted for as an offset to lagged depletions from 100% of the pumping of the RO Wells in the same month in which the return flows accrue to the Big Thompson River.

24.3.3.2. Irrigation Wells. The return flows associated with the Irrigation Wells for each month shall be determined by multiplying the amount pumped in each month by 15%. The return flows associated with the use of the Irrigation Wells will be lagged back to the Big Thompson River on a monthly basis using the Glover Equation described in Paragraph 24.4 below and the average Glover parameters for the irrigated areas as set forth in Table 1b. To calculate the net depletive effect on the Big Thompson River the return flows associated with the use of the Irrigation Wells shall be lagged and accounted for as an offset to lagged depletions from 100% of the pumping of the Irrigation Wells in the same month in which the return flows accrue to the Big Thompson River.

24.3.3.3. Recharge Wells. The depletive effect on the Big Thompson River associated with the Recharge Wells for each month shall be 100% of the amount pumped in each

month and this amount will be lagged using the Glover equation described in Paragraph 24.4. The water delivered from the wells to the respective recharge ponds shall be accounted for as a recharge delivery to the respective pond.

24.3.3.4. Commercial Well. The consumptive use associated with the Commercial Well for each month shall be determined by multiplying the amount pumped in each month by 85% and this amount will be lagged using the Glover equation described in Paragraph 24.4. The return flows resulting from diversions at the Commercial well are conveyed to the Milliken Waste Water Treatment Plant, located in the SE¼ SE¼ of Section 1, Township 4 North, Range 67 West of the 6th P.M. and are released to the Big Thompson River.

24.4. Timing and Location for Depletions and Accretions. The stream depletions to the Big Thompson River resulting from the amounts pumped by the RO Wells, the Irrigation Wells and the Recharge Wells and from the consumptive use associated with the Commercial Well and the stream accretions to the Big Thompson River resulting from irrigation return flows associated with such pumping and from recharge activities pursuant to this plan shall be calculated by means of the analytical equations described by Glover (Glover 1977) and others. Although there are various methods for applying the analytical equations described by Glover, the method to be used in this case shall represent a parallel no-flow boundary which requires the following parameters. (1) a boundary condition for the alluvial aquifer indicating that the boundary constitutes a "no-flow" condition; (2) the width of the aquifer on the side of the river where the well or recharge structure is located, commonly referred to as "W"; (3) the distance from the river to the location of the well or recharge structure, commonly referred to as "X"; (4) the transmissivity of the aquifer between the location of the structure and the stream, commonly referred to as harmonic "T", and (5) the specific yield of the aquifer, commonly referred to as "S". The aquifer parameters for each of the wells and recharge ponds which are a part of this plan were determined using the aquifer parameters developed for SPGIS by the Integrated Decision Support (IDS) Group at Colorado State University, and the aquifer parameters for the Big Thompson alluvium developed for the State's Colorado Decision Support Systems. The "X" and "W" factors for each structure were determined by measurement of the perpendicular distance from the Big Thompson River to the structure. The "T" factor was determined by using the harmonic mean transmissivity, which is the transmissivity between the location of the structure and the Big Thompson River using mapping tools developed by the IDS Group. The specific yield for the aquifer shall be equal to twenty percent (20%). The aquifer parameters developed for the wells and recharge ponds included in this plan are shown on the attached Tables 5 and 7. The Applicant has proposed use of

the "alluvial aquifer" setting in the Integrated Decision Support Alluvial Water Accounting System ("AWAS") to complete the calculations of the stream depletions and stream accretions described in the Glover equation. AWAS was developed in 2003 by the Integrated Decision Support System at Colorado State University. AWAS is based upon the Analytical Stream Depletion Model of the Office of the State Engineer, Colorado Division of Water Resources, which was developed by Dewayne R. Schroeder in 1987 to compute stream depletion or accretion caused by a well pumping from or recharging to an aquifer hydraulically connected to the stream. The alluvial aquifer setting of the AWAS program, or another program which incorporates the Glover no-flow alluvial aquifer boundary method, shall be used to determine the timing of stream depletions and stream accretions. The accounting for depletions and accretions shall be completed on a well-by-well and site-by-site basis. Diversions from any wells added to the decree under Paragraph 20 shall be lagged to the Big Thompson River by the Glover method described in this decree or other appropriate manner as determined by the Water Court when the well is added.

24.5. Annual and Monthly Projections.

24.5.1. Timing and Purpose of Projection. The projection year shall be May 1 through April 30. On or before May 1 of each year Applicant will make a one-year projection (for each month of the one-year projection period beginning on May 1 of the current year) of its operations. The purpose of the projection is to demonstrate that Applicant will have sufficient augmentation supplies to replace all depletions and return flow obligations during the entire projection period. The projection will be used to limit the pumping of wells to assure that full augmentation will occur during the projection period. The projection will be provided to the Division Engineer. The objectors will receive the projection and all backup information to support the projection upon written request and payment of reasonable copying costs. The City of Greeley shall be provided the projection and all backup information annually upon payment of reasonable duplication costs. If a projection is not submitted by May 1, all well pumping under the plan for augmentation decreed in this decree shall cease until the projection is submitted.

24.5.2. Information Required for Annual and Monthly Projections. Subject to the requirements of Paragraph 24.5.1, the annual and monthly projections will include the following information.

24.5.2.1. Previous Depletions. The depletions associated with previous pumping of the wells.

24.5.2.2. Projected Well Pumping and Depletions. The amount of pumping and resulting depletions from the wells that can

occur in the current year without causing unreplaced depletions over the one-year projection period.

24.5.2.3. Augmentation supplies. The projected deliveries of water available under the water rights listed in Paragraph 22 during the projection period.

24.5.2.4. Ditch Shares Return Flows. The return flow obligations attributable to previous and projected use of ditch shares.

24.5.2.5. Water Available from the GLIC Companies Shares. Water available to Applicant for augmentation associated with the fully consumptive portion of the GLIC Companies Shares.

24.5.2.6. Additional Supplies. Any additional net replacement supplies or credits that have been authorized for use in this plan pursuant to Paragraph 23, the amounts of which are known at the time the projection is made, that Applicant has secured for any or all of the projection period.

24.5.2.7. Transit Loss. Estimated Stream Transit Loss. Estimated stream transit loss, if any, as determined pursuant to Paragraph 45.

24.5.3. Projection Limitations and Assumptions

24.5.3.1. Period of Call. The projection shall be completed assuming there is a year-round call downstream and senior to the priorities of the wells, and that all depletions from well pumping and all return flow obligations associated with the Shares must be replaced at all times throughout the projection period.

24.5.3.2. Projected Deliveries to the Storage and Recharge Rights. The projected storage and recharge deliveries under the rights described in Paragraphs 10, 11, 13, 14 and 16 to the Hillsborough Reservoir and the Pheasant Hills Recharge Pond and other recharge ponds described in Paragraph 7.5 shall equal the amount of water actually in storage or recharge under said rights at the time the projection is made.

24.5.3.3. Projected Changed Ditch Share Deliveries. The projected deliveries associated with the Shares shall be in acre feet by month as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
0	0	0	19.30	163.3	222.5	281.4	246.4	145.3	10.6	0	0	1117.4

24.5.3.4. Projected Water Available from the GLIC Companies Shares. Applicant shall not project water associated with the GLIC Companies Shares in the projection required in this decree. Applicant may petition the court at any time under retained jurisdiction if it wishes to project water associated with the GLIC Companies Shares in this projection in the future.

24.5.3.5. Additional or Alternate Supplies. Any additional or alternate net replacement supplies or credits that have been authorized for use in the plan pursuant to Paragraph 23, the amounts of which are known at the time the projection is made, that Applicant has secured for any or all of the projection period.

24.5.4. Periodic Updates. Applicant shall complete a periodic update of the annual and monthly projection based on actual to date operations of all wells and augmentation supplies included in the projection for any month in which (1) projected augmentation supplies will be less than in the May 1 projection or the most recent periodic update or (2) projected well pumping will be more than in the May 1 projection or the most recent periodic update; or (3) Applicant has sold or transferred a replacement source relied upon in a previous projection; or (4) one or more of the Applicant's agreements for augmentation supplies has been modified, has terminated or has expired, unless a modification is for the sole purpose of making a periodic adjustment of the amount which Applicant shall pay for water under the terms of the agreement. The Applicant shall complete any periodic update not later than the end of the month following the occurrence of the event which causes the update to be required and shall, in the same month a periodic update is completed, submit the update to the Division Engineer and Water Commissioner and at the same time notice the objectors, who may obtain copies of the update and all backup information to support the update upon written request and payment of reasonable copying costs. Applicant may update the annual projection at other times it deems appropriate and shall submit each update to the Division Engineer and Water Commissioner without payment of copying costs and at the same

time notice the objectors, who may obtain copies of the update and all backup information to support the update upon written request and payment of reasonable copying costs.

24.5.5. Projection Spreadsheet. The annual and monthly projections for the plan for augmentation shall be submitted on the projection spreadsheet attached hereto as Table 8. The projection spreadsheet is not decreed in this decree and may be changed from time to time so long as all information required by this decree is included in the spreadsheet 30 days advance written notice of proposed changes is provided to objectors and all changes are approved by the Division Engineer. Copies of any revised projection spreadsheet shall be provided to objectors.

24.6. Limitation of Current Year Pumping and Depletions. In order that depletions from well pumping and return flow obligations can be fully replaced under the terms and conditions of this decree by the amount of projected augmentation supplies, Applicant's well pumping shall at all times be limited to the amounts allowed by the projections completed in accordance with Paragraph 24.5. If at any time the projected depletions from well pumping and return flow obligations which must be replaced under this plan exceed the amount of projected supplies, Applicant shall immediately do either or both of the following.

24.6.1. Additional Water Rights. Applicant shall secure by purchase or lease sufficient water rights in accordance with Paragraph 23 which will be sufficient to replace all projected depletions and return flow obligations under this decree.

24.6.2. Reduction of Projected Out of Priority Depletions. Applicant shall reduce the out of priority depletions from wells by curtailing well pumping in an amount which will assure that all well depletions and return flow obligations projected under Paragraph 24.5 will be replaced in accordance with the terms and conditions of this decree.

24.7. Post-Pumping Depletions. The Court finds that depletions from pumping of wells included in this decree continue for a period of time after well pumping has ceased. In addition to any other requirement to replace well depletions under this decree, Applicant shall, in accordance with the terms and conditions of this decree, replace all depletions that occur after pumping of any of the wells included in this decree cease. The augmentation supplies to replace such depletions under this decree shall be those water rights described in this decree or any other augmentation supplies which may have been added under the terms and conditions of this decree. Applicant shall be required to operate and use such water rights in order to assure that all post-pumping well depletions will be replaced in accordance with this decree. The Court retains continuing jurisdiction of the plan for augmentation decreed in this decree to determine whether all such

post-pumping depletions are being and will be replaced under the terms and conditions of this decree.

24.8. Accounting and Reporting. Accounting for the Plan for Augmentation shall be on the accounting forms attached hereto as Table 9. Each accounting year shall consist of the period from May 1 through April 30. Accounting shall be done on a daily basis and submitted monthly to the Division Engineer and Water Commissioner.

25. Replacement. Applicant shall, in compliance with the terms and conditions of this decree, replace all stream depletions resulting from operation of the wells listed in this decree ("depletions") and all historical return flows from the water rights changed and used in this decree, in time, location and amount when there is a valid senior call for water from a location downstream of the location of the stream depletions from such wells or the location where the return flows associated with the Shares historically accrued to the Big Thompson River, which is Sections 1, 2 and 3 of T4N, R67W. Depletions will be considered to be out of priority during all times when there is a valid call for water downstream of the affected well from a water right that is senior to the individual well's respective water right. Unless accounting is provided for either individual wells or groups of wells, depletions from wells shall be considered out of priority at all times when there is a valid downstream call for water from water rights senior to the priority date of the most junior well being covered by this plan for augmentation. Applicant shall replace all return flows from the changed Shares in compliance with the requirements of Paragraph 7.11.

26. Aggregation of Replacement by Agreement. Aggregation of replacements in the operation and administration of this decree is prohibited. Applicant may, however, petition the Court for approval of a procedure by which it might aggregate winter replacements. Such procedure shall at a minimum include (1) an agreement(s) with the owner(s) of the affected reservoir(s) against which Applicant would seek to aggregate replacements, (2) assurance that Applicant has water supplies to make up any aggregated out-of-priority depletions, (3) removal of the call by the affected reservoir(s) to the extent of the aggregation, and (4) a showing by Applicant that such procedure will prevent injury to all vested water rights and decreed conditional water rights. Any petition under this subparagraph shall be served on all parties in this case upon filing with the Court and shall otherwise be processed under the continuing retained jurisdiction of the Court set forth in Paragraph 51 below.

27. Curtailment. Applicant's Plan for Augmentation is sufficient to permit the continuation of diversions by the wells when curtailment would otherwise be required to meet a valid senior call for water, to the extent Applicant complies with all the terms and conditions of this decree including, but not limited to providing the necessary replacement water as required by this decree. Pursuant to § 37-92-305(8) *C.R.S.*, the State Engineer shall curtail all out-of-priority diversions, the depletions from which are not so replaced as to prevent injury to vested water rights and decreed conditional water rights.

28. Maximization of Use. Under this decree, Applicant is entitled to divert water from the Big Thompson River and operate the Plan for Augmentation. So long as such diversions take place in accordance with the terms and conditions set forth in this decree, Applicant is entitled to operate its water rights and Plan for Augmentation in the manner which will, in Applicant's judgment, maximize the beneficial use of its water rights for the purposes for which they were adjudicated.

CONCLUSIONS OF LAW

29. Incorporation of Findings of Fact. The foregoing Findings of Fact are incorporated in this decree.

30. Notice and Jurisdiction. The Water Court for Water Division No. 1 has jurisdiction over the subject matter of these proceedings and over all persons, owners of property and water rights that may be affected hereby, pursuant to § 37-92-203(1), § 37-92-302 and § 37-92-304, C.R.S. whether or not they have chosen to appear. The original application in this matter, the amendments to the application, and the resume publications of the application and the amendments placed such persons on notice of the relief requested by the application and granted by this decree.

31. Change of Water Rights Contemplated by Law. The Change of Water Rights in Paragraphs 7-9 of this decree is contemplated by law and satisfies the requirements of C.R.S. § 37-92-101 *et seq.*, including but not limited to § §37-92-103(5), 37-92-302, 37-92-304(6), 37-92-305(3). The change of water rights will not injuriously affect any owner of or person entitled to use water under a vested water right or decreed conditional water right, so long as operated and administered in accordance with the terms of this decree.

32. Adjudication of Water Rights Contemplated by Law. The water rights in Paragraph 10-Paragraph 16 of this decree are contemplated by law and satisfy the requirements of § 37-92-101 *et seq.*, including but not limited to § § 37-92-103, 37-92-302, 37-92-305(1), 37-92-305(9) and 37-92-305(12) C.R.S. The appropriations for the water rights were lawfully initiated on the date shown in the Findings of Fact and were pursued with reasonable diligence from the date of initiation. Applicant has established that the conditional water rights described in this decree can and will be diverted and controlled and the water will be beneficially used and the project can and will be completed with diligence within a reasonable time.

33. Plan for Augmentation Contemplated by Law. The application for approval of the Plan for Augmentation in Paragraphs 17-28 of this decree is contemplated by law and satisfies the requirements of § 37-92-101 et seq., C.R.S., including but not limited to § §37-92-103, 37-92-302, 37-92-304(6), 37-92-305(3), 37-92-305(5), 37-92-305(8) and 37-92-305(12). Operation of the Plan for Augmentation will not injuriously affect any owner of or person entitled to use water under a vested water right or decreed conditional water right, so long as operated and administered in accordance with the terms of this decree.

34. Retention of Dominion. Dominion over water depends on a water user's intent and ability to quantify and use, by recapture or other proper means, a certain quantity of water which may be distinguished by volume from other water in a stream. *Public Service Co. v. Willows Water Dist.*, 856 P.2d 829 (Colo. 1993). Applicant has the intent and ability to maintain dominion over, and to use for the purposes adjudicated by this decree, all recharge water and water released for replacement of out of priority depletions described in this decree, until used for augmentation pursuant to the terms of this decree.

35. Burden of Proof. Applicant has met its burden of proof and is therefore entitled to a decree approving its Change of Water Rights and Plan for Augmentation.

36. Administrability. The change of water rights and plan for augmentation decreed in this decree are administrable by the officials of the State of Colorado.

DECREE

37. Incorporation of Findings and Conclusions. The foregoing Findings of Fact and Conclusions of Law are incorporated in this decree as if set forth in full.

38. Approval of Change of Water Rights, Water Rights and Plan for Augmentation. The change of water rights set out in Paragraphs 7-9, the Water Rights set out in Paragraphs 10-16 and the plan for augmentation set out in Paragraphs 17-28 are hereby confirmed, approved, adjudicated and decreed subject to the terms and conditions of this decree.

39. Adequacy of Replacement and Augmentation Supplies. The replacement and augmentation supplies which Applicant will use for operation of the Plan for Augmentation shall be of a quality and quantity so as to meet the requirements for which the water of senior appropriators has normally been used. Such substituted water shall be accepted by senior appropriators in substitution for water derived by exercise of his decreed rights. C.R.S. § 37-92-305(5).

40. No Injury. The terms and conditions provided for in this decree are adequate to assure that no injury to any water users will result from operation of the plan for augmentation, including the change of water rights.

41. Measuring Devices. In addition to the measuring devices expressly required in this decree, Applicant shall install and maintain, at Applicant's expense, such additional meters, gauges, or other measuring devices as are required by the Water Commissioner or Division Engineer, and shall report at reasonable times to the Water Commission and/or Division Engineer the readings of such meters, gauges, or other measuring devices pursuant to § 37-92-502(5)(a), C.R.S.

42. Satisfaction of Senior Water Rights. So long as operated and administered in accordance with this decree, the plan for augmentation will be sufficient to permit the continuation of

withdrawals, and resulting depletions, from the wells without impairing the water rights of others, in the amounts and for the purposes adjudicated in this decree, when curtailment of such operations would otherwise be required to meet valid senior calls for water. Pursuant to § 37-92-305(8) C.R.S., the State Engineer shall curtail all out-of-priority diversions, the depletions from which are not so replaced as to prevent injury to vested water rights or decreed conditional water rights.

43. Accounting. Applicant has demonstrated an appropriate method of accounting for diversions and stream depletions associated with the operation of the plan for augmentation, new water rights and change of water rights. In addition to any additional requirements in Paragraphs 7.7.1, 7.12.7, 10.8 and 24.8, Applicant's accounting under this decree shall include the following information. (1) The volume of water pumped and corresponding depletions for each well, which shall be accounted for daily and reported monthly; (2) Deliveries of Shares for the purposes allowed by this decree, adjusted for all ditch losses, and historical return flow obligations, which shall be recorded daily and submitted monthly; (3) The amount of recharge pond evaporation and recharge accretions to the Big Thompson River, from each recharge pond which shall be accounted for daily and reported monthly and shall specifically list each recharge pond and the accretions from each pond; (4) Deliveries of water from the sources described in Paragraphs 10, 11, 16 and 22.2 which are used in the plan which shall be accounted for daily; (5) the amount of any additional or alternative augmentation supplies allowed under Paragraph 23 which shall be accounted for daily and submitted monthly; (6) the calling water right and its priority; and (7) any transportation losses determined pursuant to Paragraph 45. The accounting and reporting intervals of this paragraph notwithstanding, when there is a valid downstream Big Thompson or South Platte River call senior to priority dates of the wells or senior to the date of Applicant's appropriation of return flows from the Shares, Applicant shall replace all such depletions and return flow obligations on a daily basis. Unless specifically indicated by this decree, all accounting records required by this decree shall be filed with the State Engineer and Division Engineer on a monthly basis. The accounting forms, Table 9, are adequate to account for the water rights and augmentation plan under this decree; however, they are not decreed in this decree and may be changed from time to time so long as the information required by this decree is included in the forms, 30 days advance notice of proposed changes is provided to the objectors and such changes are approved by the Division Engineer or Water Commissioner. Copies of any revised forms shall be provided to Objectors. Applicant will attempt to complete the monthly accounting on or before the 10th day of each month following the month of operation, but shall complete the monthly accounting before the last day of the following month. The monthly accounting and all backup and supporting information and documents shall also be provided to any objector making a written request for said accounting for that accounting year, upon payment of reasonable costs. The accounting shall be delivered to the Division Engineer and Water Commissioner in the manner they prescribe and may be delivered to other objectors in paper or electronic format at Applicant's option.

44. Consolidated Hillsborough Ditch (Company) Company Provisions. Except as set forth in this decree or agreed to by separate agreement between Applicant and the Company,

Milliken and its operation of this decree shall not create any additional operational or accounting obligations for the Company.

44.1. Diversions. Milliken shall continue to divert the water represented by its Shares through the Company's headgate on the Big Thompson River.

44.2. Headgates. Milliken currently takes delivery of the water represented by 11.5 of its shares (stock certificates no. 882 and 894) through the Hillsborough Ditch and extensions and from there to two farm headgates located in Section 13, Township 4 North, Range 67 West, 6th P.M., Weld County, Colorado. Milliken shall continue to take delivery of the water represented by the 11.5 shares at these two farm headgates, or at other locations if such other locations are approved by the Hillsborough Ditch Company. Milliken shall take delivery of the water represented by 2.5 of its shares (stock certificate no. 895) at the location of the historical farm headgate for the "CAP Farm", which farm is located generally in Section 3, Township 4 North, Range 67 West, or at other locations if such other locations are approved by the Hillsborough Ditch Company.

44.3. Extension Companies. Milliken must have and/or acquire the proper share ownership in the extension companies to carry its water to the historical farm headgates on the ditch, or pay the proper fees, as set by the Company(ies), for such carriage of water. The 2.5 shares were historically used in the upper section of the ditch and Milliken is entitled to take delivery at the location of the CAP Farm headgate without ownership in the extension companies. Milliken currently has the proper share ownership in the extension companies for delivery of the 11.5 shares at the two farm headgates currently used by Milliken, but does not currently have sufficient share ownership in the extension companies to take delivery of additional shares (in excess of the 11.5) at the two farm headgates.

44.4. Ditch Loss. The ditch loss on the Shares will be assessed the same as for all other shares in the ditch.

44.5. Agreement Required. Milliken is proposing, among other things, to utilize Company structures, including the Hillsborough Ditch and the Little Thompson Reservoir, to run/store a junior water right(s) and to divert water by exchange (and seek to claim credit for seepage resulting from the running of such water in the Hillsborough system). These operations are outside normal deliveries to Hillsborough's shareholders and are not currently approved by the Company. Any use of Company structures (including any claim to seepage resulting therefrom) by Milliken, including use of the structures to exercise the rights sought in Paragraphs 10, 11 and 16 in this decree, may take place, if at all, only if Milliken and the Company agree to the terms and conditions of such use by separate agreement.

45. Transportation Losses. When water available under the water rights which are the subject of this decree is transported in the Big Thompson River, for any of the functions,

purposes or uses adjudicated by this decree, including but not limited to replacement of out of priority depletions, return flow obligations or recapture and/or beneficial use by Applicant, the Division Engineer, or his designated representative, shall assess losses resulting from such transportation in the same amount such losses are assessed against other water users when determining the amount of water available for such uses by Applicant. The Division Engineer, or his designated representative, will administer all such water transported in the Big Thompson River or its tributaries under this decree, including water for replacement of depletions or recapture and/or beneficial use by Applicant, past intervening headgates to ensure that such water is not intercepted or otherwise diminished in quality or quantity by diversion, use or other interference by intervening water rights and to assure that such water remains available and suitable for Applicant's uses under this decree.

46. Binding Effect of Decree. Applicant shall record this decree with the clerk and recorder for Weld County within 10 days after the decree becomes final upon the expiration of the right of all parties to appeal this decree. The terms and conditions of this decree shall bind, and be enforceable against, the Applicant and successors in interest until all obligations under this decree have been fulfilled. Nothing in this paragraph is intended to prohibit Applicant from adjudicating an additional plan for augmentation to replace depletions from the wells under additional decree. Nor is anything in this paragraph intended to affect the exercise of any remedy which may be available to any person affected by the failure of the Applicant to comply with the terms and conditions of this decree.

47. No Precedent. There was no trial in this matter and no issues were litigated. The findings of fact, conclusions of law, judgment and decree were completed as the result of substantial discussions, negotiations and compromises by, between and among the Applicant and the several objectors pertaining to all parts of the findings, conclusions, judgment and decree. It is specifically understood and agreed by the parties hereto, and found and concluded by the court, that the acquiescence of the parties to a stipulated decree under the specific factual and legal circumstances of this contested matter and upon the numerous and interrelated compromises reached by the parties shall never give rise to any argument, claim, defense or theory of acquiescence, waiver, bar, merger, stare decisis, res judicata, estoppel, laches, or otherwise, nor to any administrative or judicial practice or precedent, by or against any of the parties hereto in any other matter, case or dispute, nor shall testimony concerning such acquiescence of any party to a stipulated decree in this decree be allowed in any other matter, case or dispute. All parties stipulate and agree that they do not intend the findings, conclusions, judgment and decree to have the effect of precedent or preclusion on any factual or legal issue in any other matter. The parties further stipulate and agree that they each reserve the right to propose or to challenge any legal or factual position in any other plan for augmentation or other matter filed in this or any other court without limitation by these finding, conclusions, judgment and decree.

48. Integrated System. Applicant's water rights decreed in this decree are part of Applicant's integrated system of water rights and structures under § 37-92-301(4)(b) C.R.S. Work

performed and effort or costs expended by the Town on any water rights or structures that are part of its integrated water system shall be considered in determining whether reasonable diligence has been shown in the development of the conditional water rights decreed in this decree for all features of the system as provided in § 37-92-301(4)(b), C.R.S.

49. Diligence. The conditional water rights decreed in this decree are continued in full force and effect until **October 31, 2015**. If Applicant desires to maintain such conditional rights, an application for finding of reasonable diligence shall be filed on or before **October 31, 2015**, or a showing made on or before such date that the conditional water rights have become absolute by reason of the completion of the appropriation.

50. Priority. The priority in this decree awarded Applicant for the conditional water rights decreed in this decree were filed in the Water Court in the year of 2002 for the water rights described in Paragraph 12 and, 2003 for the water rights described in Paragraphs 13 and 14 and 2008 for the water rights described in Paragraphs 10, 11 and 16 and shall be administered as having been filed in those years; and shall be junior to all priorities filed in previous years. As between all rights, filed in the same calendar year, priority shall be determined by historical date of appropriation and not affected by date of the entry of the decrees.

51. Retained Jurisdiction. Pursuant to § 37-92-304(6), C.R.S. the Plan for Augmentation decreed in this decree shall remain subject to reconsideration on the issue of injury to vested water rights or decreed conditional water rights of others which may result from future operation of the Plan for Augmentation for (5) five years from the date on which at least 8 shares changed in this decree are first used for augmentation or recharge pursuant to this decree. Except to the extent subject to retained jurisdiction, the findings, conclusions and decree in this decree are final. The retained jurisdiction provision of this paragraph is in addition to specific retained jurisdiction provisions included in other sections of this decree.

51.1. Continuing Jurisdiction. In addition to the general retained jurisdiction set forth above, the Court retains continuing jurisdiction as described in Paragraphs 7.8, 7.12.5, 19, 24.3.3.1.1, 24.7 and 26.

51.2. Retained Jurisdiction Provisions. Provisions regarding retained jurisdiction are also set out in Paragraphs 11.11.2, 23.2 and 24.5.3.4.

51.3. Review of Disputes about Projections. The Court also retains continuing jurisdiction to review any disputes about the manner in which the projection spreadsheet required by Paragraph 24.5 and attached as Table 8 is actually being used as required in this decree to depict and project plan operations and to limit well pumping.

51.4. Procedure for Retained Jurisdiction. Unless a different procedure is specifically set forth in a previous paragraph of this decree, any person, including the State

and Division Engineers, may invoke retained jurisdiction within the general retained jurisdiction or under continuing jurisdiction, by filing a Petition to do so with this Court. Such Petition shall be filed under the caption and case number of this case and shall be served on counsel of record for all parties who have appeared. Any Petition to invoke the retained jurisdiction shall set forth with particularity the factual basis and the alleged injury or violation of this Decree upon which the requested reconsideration is premised, together with proposed decree language modifications offered by the moving party or relief requested to remedy the alleged injury or violation. Parties shall be given 60 days from the service of the Petition to file a response thereto. The moving party shall have the initial burden of going forward to establish the prima facie facts and the existence of the injury or violation alleged in the Petition, then Applicant shall have the burden of proof to show either that the alleged injury or violation has not occurred or will not occur, or to propose additional terms and conditions which will prevent injury or violation from occurring.

52. Administration by State and Division Engineers. The State Engineer and Division Engineer shall administer this decree in accordance with the terms and conditions set forth in this decree. Pursuant to § 37-92-305(8), the State Engineer shall curtail all out-of-priority diversions, the depletions from which are not so replaced as to prevent injury to vested water rights or decreed conditional water rights.

53. Stipulations and Settlements. The Stipulations entered into between Applicant and Objectors are approved by the Court.

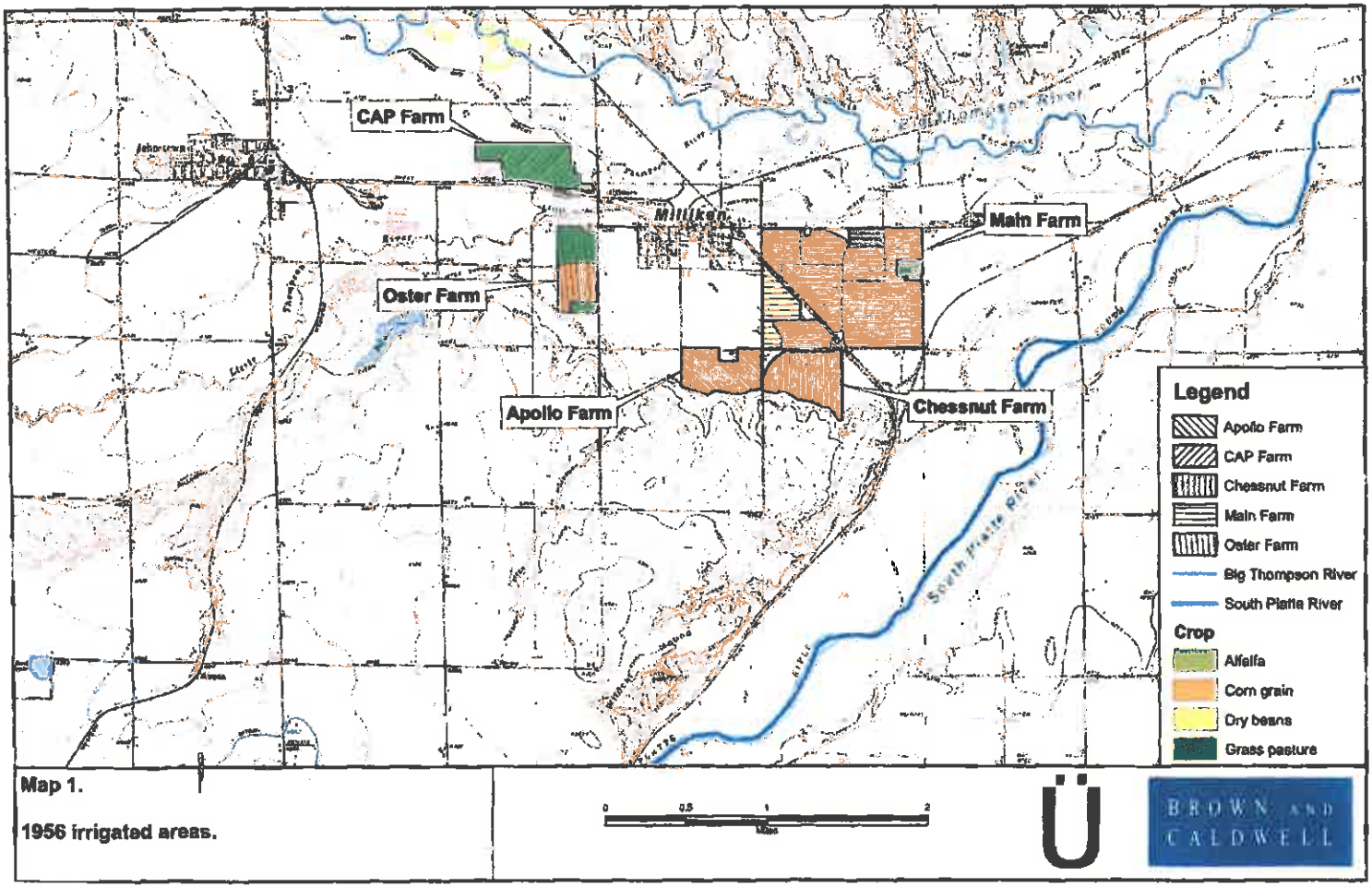
Dated November 18, 2009, entered nunc pro tunc October 27, 2009.

By the court,

James Hartmann

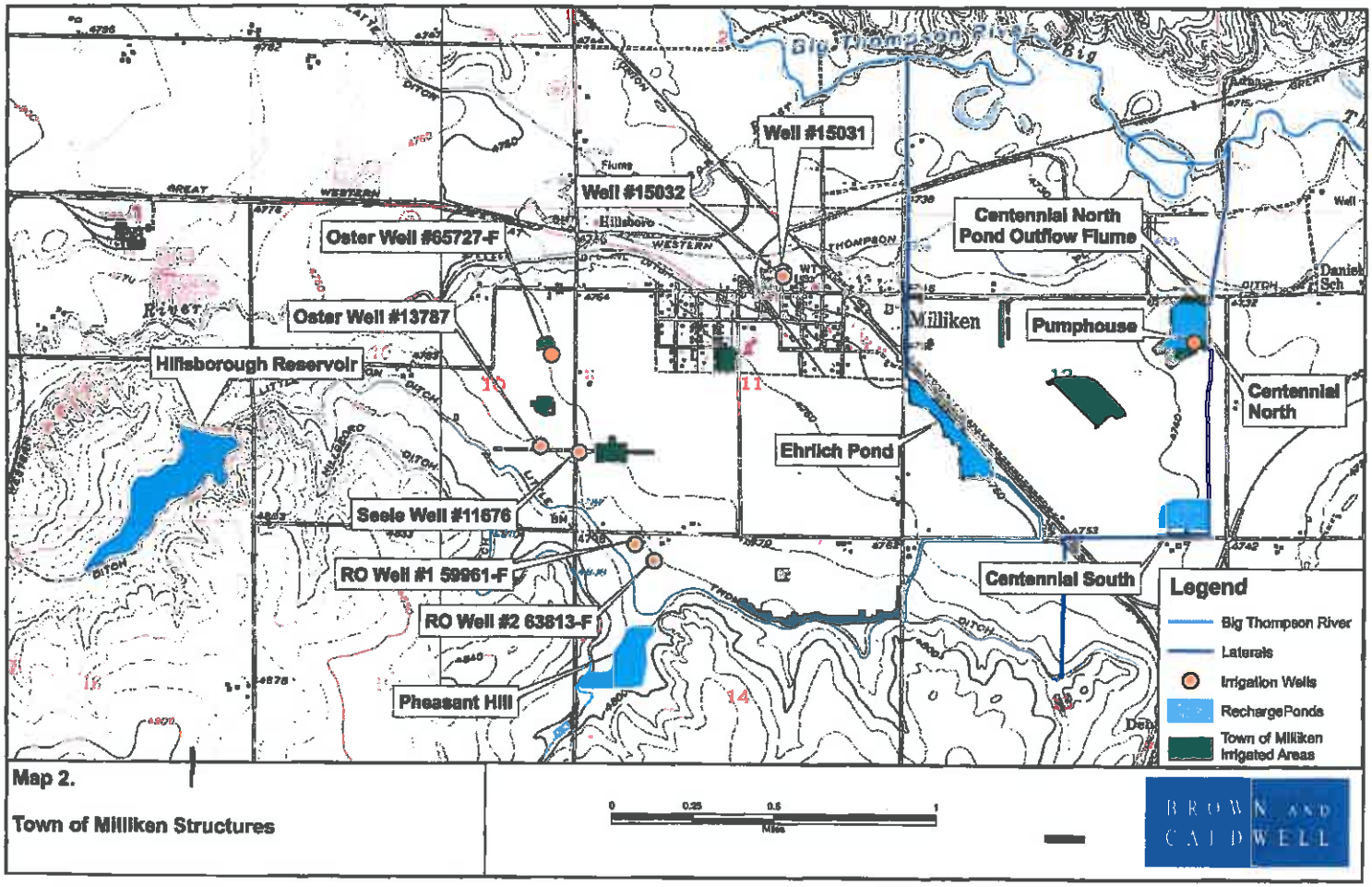
James F. Hartmann
Water Judge
Water Division No. 1

This document was filed pursuant to C.R.C.P. § 1-26. A printable version of the electronically signed order is available in the Court's electronic file.



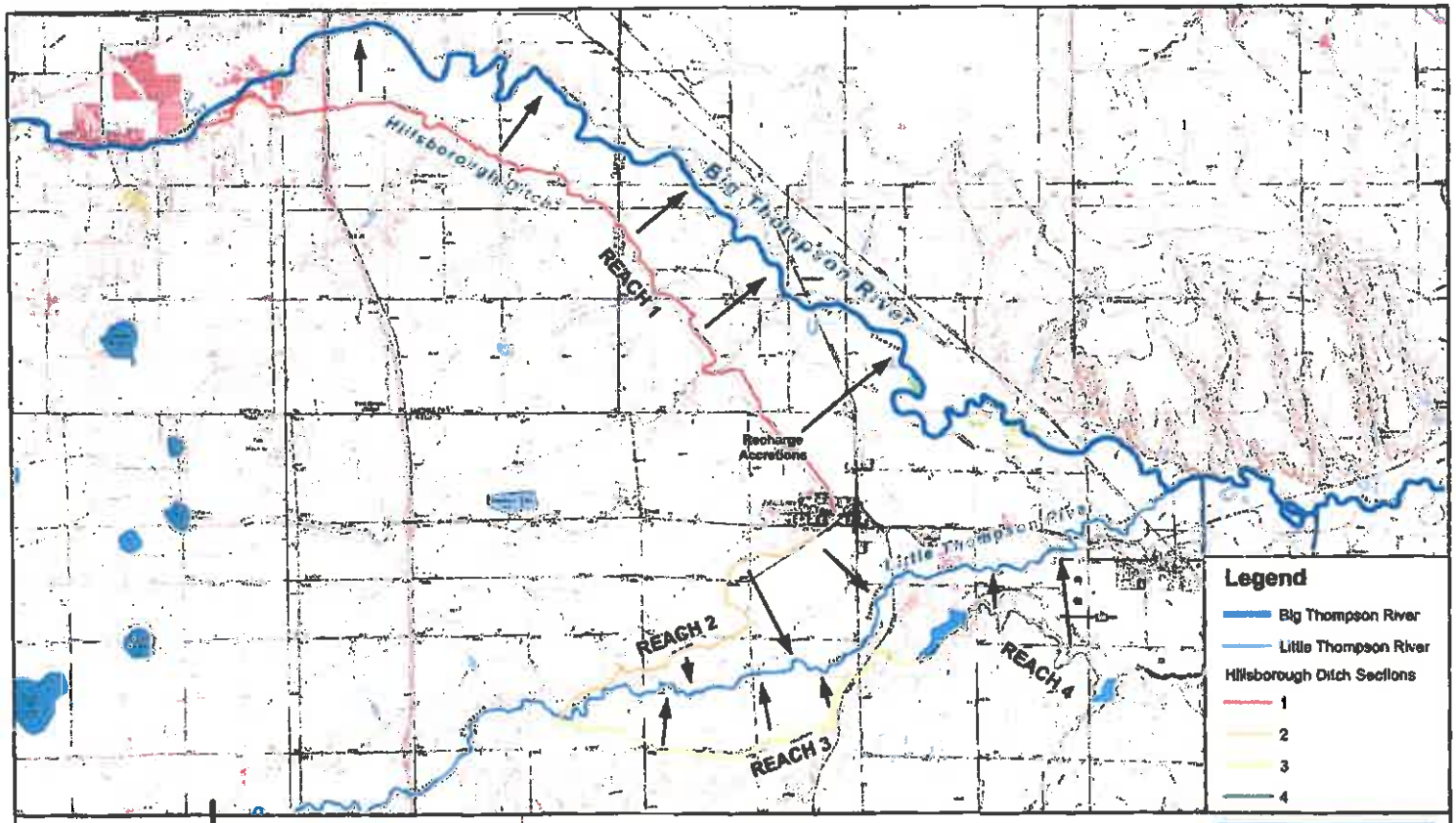
Map 1.

1956 irrigated areas.



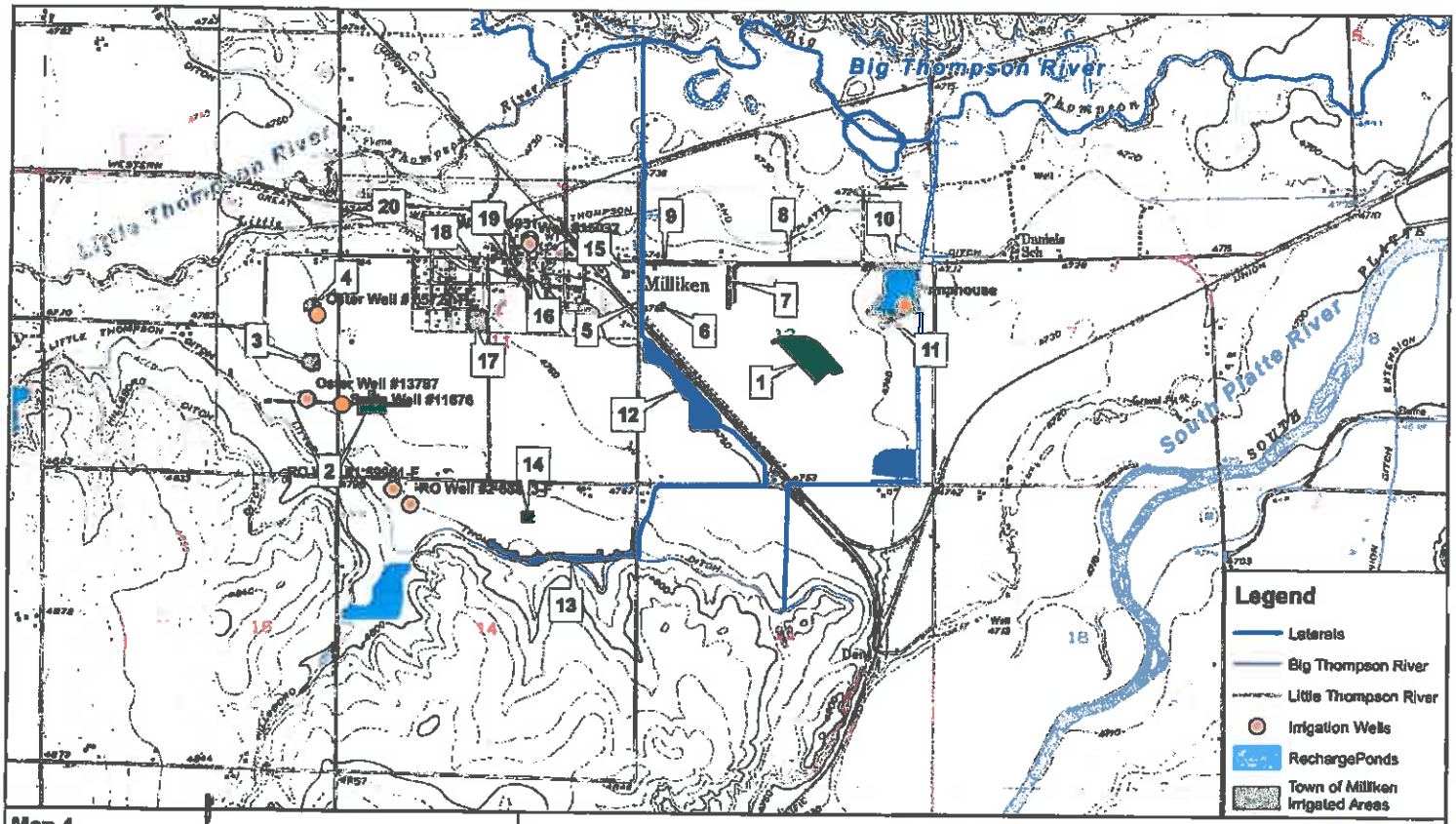
Map 2.

Town of Milliken Structures



Map 3.

In-Ditch Recharge.



Map 4.

Glover parameters for irrigated areas.

Decree Table 1a. Summary of Glover Parameters used to lag return flows from municipal irrigation of parks and open spaces

	LAGGED TO: LITTLE THOMPSON RIVER		LAGGED TO: BIG THOMPSON RIVER		
Irrigated area number	Distance to river X (ft)	Distance from river to alluvial boundary W (ft)	Distance to river X (ft)	Distance from river to alluvial boundary W (ft)	Harmonic transmissivity (gpd/ft)
1			3,558	7,765	73,889
2	3,342	5,864			82,732
3	2,337	4,049			82,732
4	1,362	4,028			82,732
5			4,232	9,679	82,671
6			4,542	9,087	82,671
7			3,258	9,713	78,908
8			2,234	8,963	81,113
9			3,685	9,468	82,671
10			1,719	7,620	90,000
11			2,518	7,744	90,000
12			5,331	8,949	68,177
13	6,914	7,414	8,840	9,340	74,037
14	6,033	6,892	7,861	8,769	71,787
15			3,711	9,366	84,152
16	2,308	9,719			85,489
17	2,361	6,935			85,578
18	1,383	7,441			85,726
19	1,629	14,751			85,578
20	594	8,056			89,697
Average	2,826	7,515	4,291	8,872	82,017

Decree Table 1b. Summary of Glover Parameters used to lag depletions from municipal irrigation of parks and open spaces

Well Name	Permit No.	WDID	W (ft)	T (gpd/ft)	S	X (ft)
Seele Well #11676	11676R	405463	7458	50,000	0.2	6707
Oster Well #13787	13787R	405400	7596	50,000	0.2	6477
Well #15032	15032R	405371	3296	60,000	0.2	3168
Well #15031	15031S	405372	3025	50,000	0.2	2439
Oster Well #65727-F	65727-F	NA	8646	50,000	0.2	5123
Centennial North Pumphouse	NA	NA	8700	90,000	0.2	3509

Table 2

North Centennial Pond

Stage	Area (acres)	Storage (AF)
0	0.001	0.000
1	0.053	0.007
2	0.182	0.077
3	0.726	0.495
4	2.203	1.626
5	3.413	4.429
6	4.306	8.287
7	5.134	13.005
8	5.976	18.556
9	6.561	24.823
10	6.997	31.602
11	7.425	38.813
12	7.869	46.460
13	8.333	54.561
14	8.818	63.136
15	9.416	72.253

Table 3

South Centennial Pond

Stage	Area (acres)	Storage (AF)
0	0.017	0.000
1	0.442	0.301
2	2.583	1.613
3	4.004	4.906
4	5.815	9.816
5	6.389	15.918
6	6.682	22.453
7	6.981	29.285
8	7.287	36.418
9	7.599	43.861

Table 4

Ehrlich Pond

Stage	Area (acres)	Storage (AF)
0	0.007	0.000
1	0.659	0.329
2	1.773	1.523
3	3.305	3.948
4	4.371	7.730
5	5.320	12.575
6	5.973	18.222
7	6.560	24.489
8	7.047	31.293
9	7.509	38.571
10	7.954	46.302
11	8.386	54.472
12	8.814	63.072
13	9.238	72.098
14	9.664	81.549
15	10.090	91.426
16	10.526	101.735

Decree Table 5. Glover Parameters for Milliken Recharge Areas

Recharge Area	Distance from River to Alluvial Boundary, W (ft)	Transmissivity, T (gpd/ft)	Specific Yield, S	Distance from Area to Receiving Stream, X (ft)	Comments
Centennial North Pond (aka Main Farm North Pond)	10642	90000	0.2	3244	
Centennial South Pond (aka Main Farm South Pond)	8931	90,000	0.2	6314	
Ehrlich Lake (aka Fishing is Fun Pond)	9540	90,000	0.2	6350	
Pheasant Hill	10,425	31,254	0.2	9,702	X (ft) measured from Pheasant Hill to Big Thompson River; W (ft) measured from Big Thompson River to Hillsborough Ditch beyond Pheasant Hill; T (gpd/ft) is average point transmissivity from data points closest to transmissivity in coverage available through CDSS ("tgrid1106").
Hillsborough Reservoir	5,266	19,133	0.2	3,174	X (ft) measured from Hillsborough Reservoir to Little Thompson River; W (ft) measured from Little Thompson River to Hillsborough Ditch beyond Hillsborough Reservoir; T (gpd/ft) is average point transmissivity from data points closest to transmissivity in coverage available through CDSS ("tgrid1106").
Hillsborough Ditch					
Section 1 (43,442 ft)	3,740	32,263	0.2	3,740	X (ft) measured for each section as the average distance to the receiving river (Section 1 Big Thompson; Sections 2-4 Little Thompson); W (ft) measured same as X since Hillsborough Ditch is considered alluvial boundary; T (gpd/ft) is average point transmissivity from data points along each section of ditch in coverage available through CDSS ("tgrid1106").
Section 2 (20,490 ft)	3,074	20,154	0.2	3,074	
Section 3 (20,706 ft)	2,166	18,559	0.2	2,166	
Section 4 (16,328 ft)	3,778	22,016	0.2	3,778	

Table 6. Assumed maximum surface area for purposes of calculating evaporation from surface of Consolidated Hillsborough Ditch

Ditch Section	Length, ft	Width, ft	Maximum Surface Area, acres
Section 1	43442	20	19.95
Section 2	20490	20	9.41
Section 3	20706	20	9.51
Section 4	16328	20	7.50

Decree Table 7. Summary of Milliken Municipal Wells and Glover Parameters

Well Name	Permit No.	WDID	W (ft)	T (gpd/ft)	S	X (ft)
Potable Well No. 3	59961-F	405660	11005	50,000	0.2	9620
New Potable Well	63813-F	405273	11005	50,000	0.2	10186
Seele Well #11676	11676R	405463	4651	50,000	0.2	3499
Oster Well #13787	13787R	405400	3477	50,000	0.2	3026
Well #15032	15032R	405371	9500	60,000	0.2	2276
Well #15031	15031S	405372	9200	50,000	0.2	2165
Oster Well #65727-F	65727-F	NA	5850	50,000	0.2	3040
Settlers Village Well	NA	NA	11511	100,000	0.2	5077
Colony Point Well	NA	NA	11857	100,000	0.2	8071

2009 Projection - 2002-CW-339 & 2005-CW-069
Town of Monument
(all values in acre-feet - all positive numbers indicate depletions and all negative numbers indicate depletions)

		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
	DEPLETIONS													
	Potable Well Pumping Well No. 3 (permit no. 53661-F)	29.54	24.53	26.17	29.75	26.39	22.36	16.76	5.47	6.82	9.91	19.55	17.63	226.40
	Potable Well Pumping New Well (permit no. 63813-F)	18.91	24.53	26.17	29.75	22.39	22.36	16.76	5.47	6.82	9.91	19.55	17.63	226.40
		37.38	49.06	52.34	59.50	48.78	44.72	33.52	10.94	13.64	19.82	39.10	35.25	452.80
[1]	*Total Potable Well Pumping*	17.07	17.07	17.07	17.07	17.07	17.07	17.07	17.07	17.07	17.07	17.07	17.07	204.87
a)	*Potable well pumping to in-house*	20.31	31.99	35.27	42.43	31.71	27.70	16.45	3.88	0.00	0.00	22.03	18.18	248.93
b)	*Potable well pumping to irrigation*	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.00	0.00	0.00	0.16	0.16	
[2]	*Town Irrigation Return Flow Factors*	0.83	0.62	0.80	0.69	0.83	0.80	0.80	0.85	0.80	0.80	0.80	0.66	
[3]	*Town WWTP Return Factors*													
[4]	*Potable Wells Irrigation Return Flows (permit nos. 53661-F and 63813-F)*	9.12	4.85	4.89	6.36	5.26	4.15	2.68	0.09	0.00	0.00	3.90	2.73	38.36
a)	*Irrigation Return Flow Amounts*	1.99	0.76	2.11	2.43	2.81	3.38	3.02	2.68	2.22	1.92	1.76	1.96	27.34
b)	*Lagged Irrigation Return Flows*	15.37	15.37	15.37	15.37	15.37	15.37	15.37	12.90	10.68	17.63	16.37	16.37	184.36
[5]	*Potable Wells WWTP Return (permit nos. 53661-F 63813-F)*	-12.44	-12.80	-13.14	-13.47	-13.78	-14.09	-14.37	-14.63	-14.88	-15.13	-15.38	-15.65	-169.95
[6]	*Lagged Potable Wells Depletions (permit no. 53661-F and 63813-F)*	-12.44	-12.80	-13.14	-13.47	-13.77	-14.09	-14.37	-14.63	-14.88	-14.47	-14.66	-14.38	-166.90
a)	*Post-pumping depletions from pumping in prior years*	-12.44	-12.80	-13.14	-13.47	-13.77	-14.09	-14.37	-14.63	-14.88	-14.47	-14.66	-14.38	-166.90
b)	*Depletions from current year pumping*	0.00	0.00	0.00	0.00	-0.02	-0.06	-0.14	-0.25	-0.44	-0.66	-0.91	-1.17	-3.65
[7]	*Potable Wells RO Returns (permit nos. 53661-F and 63813-F)*	7.68	9.84	10.97	11.90	11.76	9.66	4.90	3.89	3.67	3.90	7.62	7.66	90.15
[8]	*Net River Impact*													
	Net Potable Well Depletions	12.39	14.17	14.40	16.29	16.14	13.31	8.37	3.59	1.96	0.52	9.81	9.91	132.22
[9]	*Irrigation Well Pumping*													
	Seele Well #1675 (permit no. 11676)	1.50	2.05	3.22	2.45	1.83	0.31	0.01	0.00	0.00	0.00	0.00	0.25	11.86
	Oster Well #37078 (permit no. 137874)	2.02	2.79	4.35	3.29	2.22	0.42	0.02	0.00	0.00	0.00	0.00	0.24	16.04
	Well #62035 (permit no. 150358)	3.76	5.16	8.10	6.11	4.58	0.78	0.04	0.00	0.00	0.00	0.00	0.74	29.76
	Well #62036 (permit no. 150358)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Irrigation Well Pumping	7.27	10.00	15.67	11.85	8.64	1.51	0.07	0.00	0.00	0.00	0.00	1.23	57.66
[10]	*Lagged Irrigation Well Depletions*	-3.69	-4.66	-6.05	-7.47	-7.96	-7.85	-6.75	-5.7	-4.84	-4.19	-3.82	-3.3	-66.71
a)	Lagged Municipal Irrigation Well Depletions	1.06	1.50	2.36	1.77	1.13	0.23	0.01	0.00	0.00	0.00	0.00	0.21	8.05
b)	Municipal Irrigation Return Flow Amounts	0.22	0.15	0.3	0.49	0.5	0.61	0.63	0.49	0.36	0.31	0.27	0.26	4.31
c)	Lagged Municipal Irrigation Well Accretions	-0.01	-1.45	-5.76	-6.98	-7.35	-7.04	-6.22	-5.27	-4.48	-3.85	-3.55	-3.04	-47.43
d)	Net depletion to River													
[12]	Cater Commercial Well (permit no. 65727-F) pumping	0.60	0.73	0.87	0.77	0.63	0.37	0.25	0.25	0.25	0.25	0.25	0.37	5.43
[13]	Cater Commercial Well (permit no. 65727-F) depletions	-0.38	-0.4	-0.43	-0.47	-0.5	-0.51	-0.49	-0.48	-0.47	-0.42	-0.41	-0.4	-5.39
[14]	Kraeb Well (permit no. 3486) post-pumping irrigation depletions	-0.15	-0.15	-0.15	-0.14	-0.13	-0.13	-0.12	-0.12	-0.11	-0.11	-0.1	-0.1	-1.52
[15]	*Recharge Well Pumping and Depletions*													
a)	Settlers Village Recharge Well Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0.00
b)	Quarry Point Recharge Well Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0.00
c)	*Total Lagged Recharge Well Depletions from Pond Evaporation*	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	HISTORIC RETURN FLOW OBLIGATIONS													
[16]	14 Shares Consolidated Monumental Ditch:													
a)	Summer Return Flow Factors	0.409	0.253	0.198	0.275	0.409	0.028	0.031	0.025	0.028	0.024	0.022	0.224	
a)	Winter Return Flow Factors													1117.5
b)	Previous Years Delivery Monumental Ditch - 14 shares	183.3	222.6	281.4	248.4	145.3	15.6	0.0	0.0	0.0	0.0	47.9	1117.5	1117.5
c)	Current Year's Delivery Monumental Ditch - 14 shares	-66.76	-69.99	-65.16	-67.72	-62.44	-42.53	-34.38	-31.73	-28.71	-26.76	-24.96	-27.08	-538.17
d)	Lagged Historic Return Flows - 14 shares													
[17]	**AUGMENTATION SOURCES**													
	Delivery of up to 15.5 shares of Consolidated Monumental Ditch	48.59	36.74	54.43	73.63	43.60	3.18	0.00	0.00	0.00	0.00	14.38	335.25	
a)	- total delivery into Ehrich Lake (aka Fishing is Fun Pond)	48.59	36.74	54.43	73.63	43.60	3.18	0.00	0.00	0.00	0.00	14.38	335.25	
b)	- total delivery into Centennial North Pond (aka Main Farm North Pond)	32.89	44.45	66.23	46.28	29.67	2.12	0.00	0.00	0.00	0.00	9.59	223.53	
c)	- total delivery into Centennial South Pond (aka Main Farm South Pond)													
[18]	*Beginning of Month Pond Storage*	0.19	26.94	43.57	61.19	65.02	62.44	30.59	12.59	0.00	0.00	0.00	0.00	
a)	- Beginning-of-month storage Ehrich Lake (aka Fishing is Fun Pond) - max. - 101.9 af	1.22	13.55	24.49	30.60	30.60	25.85	6.13	3.64	0.00	0.00	0.00	0.00	
b)	- Beginning-of-month storage Centennial North Pond (aka Main Farm North Pond) - max. - 30.6 af	4.79	13.70	13.70	13.70	13.70	13.70	7.74	3.77	0.00	0.00	0.00	0.00	
c)	- Beginning-of-month storage Centennial South Pond (aka Main Farm South Pond) - max. - 13.7 af													
[19]	*Pond Evaporation (see Evap tab)*	4.80	5.44	5.62	5.06	3.76	2.63	1.60	1.12	0.00	0.00	0.00	0.00	29.63
a)	- Ehrich Lake (aka Fishing is Fun Pond)	1.22	1.50	1.69	1.52	1.13	0.79	0.45	0.31	0.00	0.00	0.00	0.00	8.75
b)	- Centennial North Pond (aka Main Farm North Pond)	3.58	3.94	3.76	3.55	2.63	1.84	1.15	0.81	0.00	0.00	0.00	0.00	20.87
c)	- Centennial South Pond (aka Main Farm South Pond)													
[20]	*Shares Pumped for Irrigation:*	21.89	29.85	37.95	23.53	21.38	14.69	3.40	3.00	0.00	0.00	0.00	11.96	160.80
a)	- Centennial North Pond Pumping (aka Main Farm North Pond)	1.51	1.82	2.37	2.82	2.3	2.84	2.45	2.19	1.7	1.95	1.35	1.26	24.47
b)	- Lagged Return Flows from municipal irrigation with share water													

Revised 3-15-09

2009 Projection - 2002-CW-338 & 2005-CW-059
Town of Milliken
(all values in acre-feet - all positive number indicate accretions and all negative numbers indicate depletions)

		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
[21]	*Projected Amount of Recharge to Aquifer - Total*													
a)	- Recharged to Ehrlich Lake (aka Fishing is Fun Pond)	26.84	43.57	61.19	65.02	52.44	26.80	12.80	5.69	0.00	0.00	0.00	7.19	299.94
b)	- Recharged to Centennial North Pond (aka Main Farm North Pond)	13.55	24.49	34.84	36.87	25.85	8.13	3.64	1.85	0.00	0.00	0.00	1.22	152.84
c)	- Recharged to Centennial South Pond (aka Main Farm South Pond)	16.43	28.73	34.82	31.15	21.13	7.74	3.77	1.81	0.00	0.00	0.00	4.79	152.17
[22]	*End of Month Pond Storage*													
a)	- End-of-month storage Ehrlich Lake (aka Fishing is Fun Pond) - max. - 101.9 af	25.84	43.57	61.19	65.02	52.44	26.80	12.80	5.69	0.00	0.00	0.00	7.19	
b)	- End-of-month storage Centennial North Pond (aka Main Farm North Pond) - max. - 30.6 af	13.55	24.49	30.60	30.60	25.85	8.13	3.64	1.85	0.00	0.00	0.00	1.22	
c)	- End-of-month storage Centennial South Pond (aka Main Farm South Pond) - max. - 13.7 af	13.70	13.70	13.70	13.70	13.70	7.74	3.77	1.81	0.00	0.00	0.00	4.79	
[23]	***Total Lagged Recharge Accretions from Recharge with CWD Shares***	83.84	92.25	83.70	87.35	71.62	73.22	71.83	69.06	65.79	62.27	58.65	55.69	786.19
a)	Lagged accretions from Ehrich Lake	31.23	29.92	29.36	28.87	30.71	32.04	33.00	33.16	32.56	31.49	30.16	28.78	372.05
b)	Lagged accretions from Centennial North Pond	22.48	22.86	24.70	27.41	29.60	29.05	28.11	23.10	20.63	18.60	17.04	15.85	277.37
c)	Lagged accretions from Centennial South Pond	9.93	9.53	9.64	10.27	11.21	12.13	12.72	12.83	12.60	12.19	11.06	11.06	136.77
[24]	*Direct Flow Delivery*													
a)	Delivery via Centennial North Pond outflow (aka Main Farm North Pond) - from 11.5 shares in Lower Extension	32.68	44.49	56.28	49.28	29.07	2.12	0.00	0.00	0.00	0.00	0.00	9.59	223.50
b)	Delivery via CAP - from 2.5 shares in Upper Ditch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
c)	Transit loss of CAP delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d)	Net delivery from CAP augmentation station	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[25]	Augmentation delivery of Town's Greeley-Loveland Shares	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[26]	Total Lagged Accretions from Junior Water Right Deliveries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
a)	Lagged Accretions from in-ditch recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b)	Lagged Accretions from Pleasant Hills Recharge Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
c)	Lagged Accretions from Hillsborough Reservoir Seepage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[27]	*River Call*													
a)	*Number of Days of Downstream Senior Call to 05CW059*	31	30	31	31	30	31	30	31	31	28	31	30	
b)	*Number of Days of Downstream Senior Call to June 1, 1954 (latest priority of wells)*	31	30	31	31	30	31	30	31	31	29	31	30	

BALANCE		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
[28]	Total Lagged Obligation	-58.95	-59.72	-60.07	-59.16	-51.28	-36.90	-32.90	-33.96	-26.77	-22.65	-19.29	-21.79	-474.19
[29]	Total Replacement Source	97.61	106.56	122.36	119.45	103.39	79.16	74.32	71.24	67.49	63.62	60.20	56.54	1033.16
[30]	Excess (+) / Deficit (-)	38.67	57.84	62.29	60.30	52.11	42.26	41.42	37.28	40.72	41.07	40.97	34.75	558.97

Milliken 2002-CW-338 & 2005-CW-059 Accounting Form Notes

[1] Total well pumping from Town's potable well
a) Calculated potable well pumping to in-house use - based on average from past years Dec. - Feb. total use (row [1])
b) Calculated potable well pumping to irrigation: row [1] - row [1a] (must be greater than zero)
[2] Irrigation return flow factors = 15% of irrigation well pumping
[3] Wastewater Treatment Plant return flow factors = 90% of Town's in-house use is assumed to be non-consumptive and returns through the WWTP
[4] Calculated Irrigation Well Returns: [4a] = row [1]b] x row [2]; [4b] = lagging of [4a] using AWAS model
[5] Calculated Wastewater Treatment Plant returns: row[1]a] x row [3]
[6] Lagged RO well depletions include net of row [1], Row [4] & row [5] as input into AWAS model (model includes all past years pumping since April 2005)
a) Post-pumping depletions from pumping in prior years (since 2003)
b) Depletions from current year pumping
[7] Potable well RO returns = 20% of total RO well pumping: row [1] x 0.20
[8] Net river effect from potable well pumping = row [4b] + row [5] + row [6] + row [7]
[9] Total well pumping from irrigation wells
[10] Municipal irrigation well depletions
a) Lagged municipal irrigation well depletions, includes all previous years commencing in 2003 (AWAS model)
b) Municipal Irrigation Return Flow Amounts = row[2] X row [9]
c) Lagged Municipal Irrigation Well Accretions = lagging of row[10]b using AWAS model
d) Net depletion to River = row[10]a + row[10]b
[12] Pumping from Cater Well 85727-F input to AWAS model
[13] Calculated depletions from Cater Well 85727-F from AWAS model
[14] Krauth well remaining post pumping depletions from historical irrigation
[15] Placeholder for Recharge well pumping and lagged depletions of pond evaporation.
[16] Lagged historical return flows for up to 14 shares of Consolidated Hillsborough Ditch
a) Summer return flow factors (Aug Plan Report, Table 4B)
b) Winter return flow factors (Aug Plan Report Table 4B)
c) Previous years delivery to recharge and augmentation - up to 14 shares Hillsborough Ditch
d) Lagged return flows from delivery of 14 shares
Jan - April and Oct - Dec calculated returns: row [16]c) x monthly factor row [16]b)
May - September calculated returns: (row [17]a) + row [17]b) + row [17]c) + row [24]a) + row [24]b)) x monthly factor row [16]a)
[17] Measured delivery of Consolidated Hillsborough Inlet a)Ehrich Lake, b)Centennial North Pond and c)Centennial South Pond
[18] Calculated beginning of month pond storage for all ponds
[19] Monthly pond evaporation - minimum of: max pond evaporation from "Evap" tab or beginning of month storage
[20] a)Estimated amount of Consolidated Hillsborough Ditch share water pumped from Centennial North Pond for municipal irrigation purposes, based on crop irrigation water requirement of irrigated areas.
b) Lagged return flows from 15% deep perc of share water pumped from Centennial North Pond for municipal irrigation
[21] Total volume recharged to aquifer
a) Total volume recharged to aquifer = 0.6*(row [17]a) + row [18]a) - row [19]a), input into AWAS model

2008 Projection - 2012-CW-339 & 2015-CW-035
Town of Milliken
(all values in acre-feet - all positive numbers indicate accretions and all negative numbers indicate depletions)

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total

b) Total volume recharged to aquifer = 0.5*(row [17]a) + row [18]b) - row [19]b) - row [20]), input into AWAS model
c) Total volume recharged to aquifer = 0.5*(row [17]a) + row [18]c) - row [19]c), input into AWAS model
[22] Calculated end of month pond storage for all ponds = row 17 + row 18 - row 19 - row 20 - row 21
[23] Lagged recharge accretion from Hillsborough Ditch deliveries - indicates all ponds and all previous years lagged accretions (AWAS model)
[24] Direct Flow Augmentation delivery of Consolidated Hillsborough ditch shares
a) Delivery through Centennial North Pond outlet to Big Thompson River
b) Delivery through CAP Farm augmentation structure to Little Thompson River
c) Transit loss of CAP delivery in Little Thompson River
d) Net delivery from CAP Farm augmentation structure to Big Thompson River
[25] Placeholder for use of Town's Greeley-Loveland shares, once decreed for change of use to augmentation
[26] Placeholder: No augmentation credit given to Town's junior conditional water rights
[27]a) Number of days of downstream senior call to 03CW339 Dec 1, 2002 (assume year-round call for projection)
b) Number of days downstream senior call to lesser priority cuts of all uses - June 1, 1954 for well 10532-F (assume year-round call for projection)
[28] Total Lagged Depletions and return flows: (row [8] + row [10] + row[13] + row[14]) x row [27]a)/# days in month + (row [16]d) x row [27]a)/# days in month
[29] Total replacement sources: row [23] + row [24]a) + row [24]d)
[30] Net River Effect: row [28] + row [29]

Example Accounting Form [illegible]

Town of [illegible]

MONTH: JAN

DAYS: [illegible]

[2] River Call Analysis

a) Priority Date of Call

b) Calling Structure

c) Number of Days of Downstream Senior Call [illegible]

d) Number of Days of Downstream Senior Call [illegible]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	[illegible]	Total
[2a] Total Lagged Obligation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[2b] Total Replacement Source	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[2c] Surplus (+) / Deficit (-) [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[3] [illegible]														
a) [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
b) [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
c) [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] Accounting Form Notes

[1] [illegible]

[2] [illegible]

[3] [illegible]

[4] [illegible]

[5] [illegible]

[6] [illegible]

[7] [illegible]

[8] [illegible]

[9] [illegible]

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[29] [illegible]