

WATER RESOURCES ADVISORY BOARD MEETING

MEETING DATE: Monday, 23 February 2015

MEETING TIME: 7:00 p.m.

MEETING LOCATION: Municipal Services Center, 5050 Pearl St., Boulder, CO 80301

Agenda Highlights:

1. Call to Order (7:00 p.m.)
2. Approval of 26 January Meeting Minutes (7:01 p.m.)
3. *Public comment (7:05 p.m.)
4. Matters from the Board (7:15 p.m.)
5. Matters from Staff (7:25 p.m.)
 - a) 2015 Flood Outreach Program (7:25 p.m.)
 - b) Update on National Flood Insurance Program - Community Rating System (7:45 p.m.)
 - c) Water Conservation Program (8:10 p.m.)
 - d) Update on South Boulder Creek Mitigation Study (8:30 p.m.)
 - e) Other matters (8:35 p.m.)
6. Discussion of Future Schedule (8:40 p.m.)
7. Adjournment (8:45 p.m.)

* Public Comment Item

Agenda item times are approximate.

Information:

- Please contact the WRAB Secretary email group at:
WRABSecretary@bouldercolorado.gov
- Packets are available on-line at: <http://www.bouldercolorado.gov> – [A to Z, Water Resources Advisory Board \(WRAB\), Next Water Resources Advisory Board Meeting](#)

**CITY OF BOULDER, COLORADO
BOARDS AND COMMISSIONS MEETING MINUTES**

Name of Board / Commission: Water Resources Advisory Board	
Date of Meeting: 26 January 2015	
Contact Information of Person Preparing Minutes: Andrea Flanagan 303.413.7372	
Board Members Present: Vicki Scharnhorst, Mark Squillace, Dan Johnson, Lesley Smith Board Members Absent: Ed Clancy	
Staff Present: Jeff Arthur, Director of Public Works for Utilities Bob Harberg, Principal Engineer, Utilities Joe Taddeucci, Water Resources Manager Bret Linenfelser, Water Quality and Environmental Services Manager Ken Baird, Utilities Financial Manager Tom Settle, Water Treatment Manager Chris Douville, Wastewater Treatment Manager Greg Izzo, Public Works Maintenance Manager Eric M. Ameigh, Public Works Project Coordinator Kim Hutton, Water Resources Specialist Douglas Sullivan, Engineering Project Manager Andrea Flanagan, Board Secretary	
Additional Speakers Present: Silvia Pettem Carol Ellinghouse	
Meeting Type: Regular	
Agenda Item 1 – Call to Order	[7:04 p.m.]
Agenda Item 2 – Public Participation and Comment	[7:05 p.m.]
Public Comment: None Board follow-up: None	
Agenda Item 3 – Information Item	[7:06 p.m.]
Presentation to the Board by Silvia Pettem and Carol Ellinghouse – “Boulder’s Waterworks Past & Present”	
No Board action was requested at this time.	
Agenda Item 4 – Approval of the 15 December 2014 Meeting Minutes:	[7:48 p.m.]
Motion to approve minutes as amended from December 15 as presented. Moved by: Squillace; Seconded by: Smith Vote: 3:0 (Ed Clancy absent; Dan Johnson abstaining)	
Agenda Item 5 – Information Item – 2014 Year in Review	[7:49 p.m.]
Joe Taddeucci, Ken Baird, Kim Hutton and Eric Ameigh presented the item to the board	
A significant portion of the work performed by the Utilities Division relates to the day-to-day operations and maintenance of existing infrastructure. While the WRAB has a very limited role in these activities, recommendations on capital improvements, master plans, and policy issues have a significant impact on operations. This memorandum provides an overview of 2014 operations to provide the WRAB with additional context for upcoming agenda items where the board will be asked to make recommendations as well as highlights of the 2014 capital improvements program.	
No Board action was requested at this time.	
WRAB Discussion Included:	
<ul style="list-style-type: none"> • Question about if the ditch companies are supposed to maintain their own ditches? • Question about why the city continues to pay for assessments when the water is transferred out of the ditches? • Question about how many shares the city owns in the ditch companies? 	

- Question about who lines the ditches to prevent the ditches from leaking? Is it a homeowner's responsibility or the ditch owners' responsibility?
- Question about how much water is left in the ditches and whether we should be thinking long-term about using the water in some other way?
- Question about if farmers are the primary shareholders of these ditch companies? If not, can the resources be better managed?
- Question about why Erie's wastewater rates are so high?
- Question about how sewer pipe lining projects are affecting ground water levels.
- Comment that the Year in Review was appreciated and will suggest to BVSD that they might consider doing the same.
- Requested clarification on the maintenance for the hydro systems and whether or not this is going to be continuous, because there were times last year that they were not online.

Agenda Item 6 –

[8:50 p.m.]

Matters From the Board:

Board Member Johnson brought up the below matter(s):

- Question about how the County taxes rate changes?
- Question about if there has been a big issue for customers about recent rate changes and increases to their utility bills?
- Suggests conducting further research as to whether or not the rate increases are 'fair' to Boulder public and suggests looking at possible new ways for tweaking the intended rate changes.

Board member Scharnhorst brought up the below matter(s):

- Questions about drought plan and levels of severity and whether or not these topics will be discussed in future studies?
- Questioned how many basins there are?
- Questioned how many months are typically needed to complete a rate study?
- Discussed precip data and asked whether the state and FEMA honor this data? Asked if city wants to spend money to push this data?

Board Member Smith brought up the below matter(s):

- Attended Watershed Forum in January and acknowledged city's efforts.
- Questioned if the city is going to participate in the Climate Scenario Planning Forum in Denver?
- Question about if there is there is any new water legislation?
- Suggests additional overview on how utility bill rates are calculated.
- Questions regarding selection process for forthcoming WRAB member.

Board Member Squillace brought up the below matter(s):

- Discussed new innovations for water planning.
- Discussed that the overarching goal of water conservation is inconsistent with trying to maximize revenue goals to control cost. Suggests designing rate structure that is cognizant of this incongruity.
- Suggests looking further at behavior economics to encourage people to use less water.
- Suggests idea for city to organize a workshop to encourage more meaningful community engagement on how to better improve the rate structure.
- Questioned if there are other innovations being used by other municipalities that the city could employ?

Matters From Staff:

[9:45 p.m.]

- Update on Colorado State Water Plan – Kim Hutton
- Utility Rate Study Kickoff – Eric Ameigh
- Jeff Arthur requested for additional feedback from Board about flood insurance/FEMA before presenting to Council.
- Update on Council retreat
- Update on South Boulder Creek – WRAB recommendation in May

Agenda Item 7 – Future Schedule

[10:09 p.m.]

- Flood Safety Outreach

- City Council Retreat Update
- National Flood Insurance Program Community Rating
- Fluoride Memo
- Rate Study Key Questions/Guiding Principles

Adjournment

[10:13 p.m.]

There being no further business to come before the Board at this time, by motion regularly adopted, the meeting was adjourned at 10:13 p.m.

Motion to adjourn by: Smith; Seconded by: Squillace

Motion Passes 4:0

Date, Time, and Location of Next Meeting:

The next WRAB meeting will be **Monday, 23 February 2015 at 7:00 p.m.**, at the **City's Municipal Services Center, 5050 Pearl St., Boulder, CO 80301**

APPROVED BY:

ATTESTED BY:

Board Chair

Board Secretary

Date

Date

An audio recording of the full meeting for which these minutes are a summary, is available on the Water Resources Advisory Board web page.

<https://bouldercolorado.gov/boards-commissions/water-resources-advisory-board-next-meeting-agenda-and-packet>

DRAFT

How the Community Rating System Works

Every year, flooding causes hundreds of millions of dollars' worth of damage to homes and businesses around the country. Standard homeowners and commercial property policies do not cover flood losses. So, to meet the need for this vital coverage, the Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP).

The NFIP offers reasonably priced flood insurance in communities that comply with minimum standards for floodplain management.

The NFIP's Community Rating System (CRS) recognizes community efforts beyond those minimum standards by reducing flood insurance premiums for the community's property owners. The CRS is similar to — but separate from — the private insurance industry's programs that grade communities on the effectiveness of their fire suppression and building code enforcement.

CRS discounts on flood insurance premiums range from 5% up to 45%. Those discounts provide an incentive for new flood protection

activities that can help save lives and property in the event of a flood.

To participate in the CRS, your community can choose to undertake some or all of the 18 public information and floodplain management activities described in the *CRS Coordinator's Manual*.

You're probably already doing many of these activities. To get credit, community officials will need to prepare an application documenting the efforts.

The CRS assigns credit points for each activity. Table 2 lists the activities and the possible number of credit points for each one. The table also shows the average number of credit points communities earn for each activity. These averages may give a better indication than the maximums of what your community can expect.

To be eligible for a CRS discount, your community must do Activity 310, Elevation Certificates. If you're a designated repetitive loss community, you must also do Activity 510,

Floodplain Management Planning. All other activities are optional.

Based on the total number of points your community earns, the CRS assigns you to one of ten classes. Your discount on flood insurance premiums is based on your class.

For example, if your community earns 4,500 points or more, it qualifies for Class 1, and property owners

in the floodplain get a 45% discount. If your community earns as little as 500 points, it's in Class 9, and property owners in the floodplain get a 5% discount. If a community does not apply or fails to receive at least 500 points, it's in Class 10, and property owners get no discount.

Table 1, below, shows the number of points required for each class and the corresponding discount.

Table 1:

How much discount property owners in your community can get

Rate Class	Discount		Credit Points Required
	SFHA*	Non-SFHA**	
1	45%	10%	4,500 +
2	40%	10%	4,000 - 4,499
3	35%	10%	3,500 - 3,999
4	30%	10%	3,000 - 3,499
5	25%	10%	2,500 - 2,999
6	20%	10%	2,000 - 2,499
7	15%	5%	1,500 - 1,999
8	10%	5%	1,000 - 1,499
9	5%	5%	500 - 999
10	0%	0%	0 - 499

* Special Flood Hazard Area

** Preferred Risk Policies are available only in B,C, and X Zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies. Although they are in SFHAs, Zones AR and A99 are limited to a 5% discount. Premium reductions are subject to change.



**CITY OF BOULDER
WATER RESOURCES ADVISORY BOARD
INFORMATION PACKET MEMORANDUM**

To: Water Resources Advisory Board

From: Jeff Arthur, Director of Public Works for Utilities
Bret Linenfelser, Water Quality and Environmental Services Manager
Tom Settle, Water Treatment Manager
Michelle Wind, Drinking Water Program Supervisor

Date: February 23, 2015

Subject: Information Item: Update on Water Treatment Fluoride Addition

EXECUTIVE SUMMARY

Fluoride is a naturally occurring mineral that has been demonstrated to help prevent tooth decay. If natural concentrations of fluoride in source waters are low, water providers can add fluoride to recommended levels through a process known as fluoridation.

In 1969, Boulder voters approved the controlled addition of fluoride to the community's drinking water in order to help reduce tooth decay. The 1969 ballot language stated that the City of Boulder would introduce fluoride into the water supply to maintain a concentration of "*approximately one part of fluoride to one million parts of water.*" At that time, fluoridation of drinking water was endorsed by various health organizations, such as the U.S. Public Health Service, American Public Health Association, American Dental Association, American Medical Association, and various local civic groups and regional organizations.

Since 1969, the city has fluoridated its drinking water to a level that meets the recommendations of various health organizations, as well as the requirements of the approved ballot language. The city currently adds fluoride, in the form of fluorosilicic acid, to maintain a concentration of approximately 0.9 parts per million, which is equivalent to 0.9 milligrams per liter (mg/L), in the treated water distribution system. In 2014, the city spent approximately \$60,000 on fluorosilicic acid at the Betasso and Boulder Reservoir water treatment facilities.

At this time, the city is not proposing any changes related to drinking water fluoridation, but the U.S. Department of Health and Human Services is considering recommending the optimal level of fluoride be reduced to 0.7 mg/L. If the recommendation is formally proposed, and is supported by the Colorado Department of Public Health and Environment, the city intends to reduce the amount of fluoride added to drinking water to maintain a concentration of 0.7 mg/L.

This memorandum is intended to be informational and does not require Water Resources Advisory Board (WRAB) action. This item is not scheduled as an Agenda Item, but WRAB members can ask questions or request that this item be scheduled as a future Agenda Item.

BACKGROUND

Fluoridation History and Purpose

Fluoridation is defined as the controlled addition of fluoride to a public water supply and typically occurs where naturally occurring fluoride concentrations are below the levels recommended to help prevent tooth decay. In some areas, defluoridation is required when the naturally occurring fluoride level exceeds recommended or regulated levels of fluoride.

Fluoride acts on the tooth surface and reduces the rate at which tooth enamel demineralizes and increases the rate at which it remineralizes in the early stages of cavities. In 1999, the U.S. Centers for Disease Control and Prevention listed water fluoridation as one of the ten great public health achievements of the 20th century. In contrast, most European countries have experienced substantial declines in tooth decay without water fluoridation, primarily due to the introduction of fluoride toothpaste in the 1970s. Public water fluoridation was first practiced in the United States and has since been introduced to many other countries to varying degrees, with many countries having water that is naturally fluoridated to recommended levels, and others that need to fluoridate their drinking water. On a more local level, the Colorado Department of Public Health and Environment (CDPHE) has published a [fluoride fact sheet for consumers](#).

Although there are dental benefits from the recommended levels of fluoridation, negative effects from too much fluoride have also been identified. The most common negative effect of too much fluoride is dental fluorosis (also termed mottling of tooth enamel), which is technically defined as developmental disturbance of the tooth enamel. Dental fluorosis can occur at any age, but the risk is higher at younger ages. Due to higher risk levels at younger ages, concerns have been raised about infant ingestion of fluoride, especially when water with fluoride is used in infant formula. Studies have shown that water with fluoride can safely be used for preparing infant formula, but if the child is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance for dental fluorosis. To lessen this chance, low-fluoride bottled water can be used to mix infant formula. Typically, low-fluoride bottled water is labeled as de-ionized, purified, demineralized or distilled. Additional information about this topic is available on the Centers for Disease Control and Prevention's [Infant Formula and Fluorosis](#) Web page.

Fluoride Regulation and Recommended Concentration Levels

A 1994 World Health Organization expert committee suggested a level of fluoride from 0.5 to 1.0 mg/L. Excessive fluoride from drinking water and other sources can cause dental fluorosis, but dental fluorosis is not considered to be a public health concern, based on the National Health and Medical Research Center research. There is information available that supports the benefits of adding fluoride and also the potential negative impacts of fluoride, especially if provided in a dose above regulated levels.

The CDPHE enforces the federal Maximum Contaminant Level (MCL) and the Maximum Contaminant Level Goal (MCLG) for fluoride in drinking water at 4.0 mg/L. The U.S. Environmental Protection Agency (EPA) defines the MCL as “the highest level of a contaminant that is allowed in drinking water” and specifies enforceable standards. MCLs are set as close to MCLGs as feasible, using the best available treatment technology and taking cost into consideration. The EPA defines the MCLG as “the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.”

The CDPHE sets the Secondary Maximum Contaminant Level (SMCL) for fluoride at 2.0 mg/L. SMCLs are not enforceable and are intended as guidelines for chemicals that primarily affect the aesthetic qualities of drinking water. When fluoride levels exceed the SMCL, public notification is required. The CDPHE endorses fluoridating water at a concentration of 0.9 mg/L, which is the level that the City of Boulder adds fluoride to comply with city Ordinance No. 3513 (Attachment A).

Contaminant Regulation in Fluoride Additives

Depending on the type of fluoride additive, there can be concerns with contaminants being present, typically at low levels. The CDPHE’s *Design Criteria for Potable Water Systems* require that “any chemical additives or materials that come in contact with the water will be certified under the American National Standards Institute (ANSI) standard 60 or 61, respectively.” The ANSI accredits the National Sanitation Foundation (NSF) to develop American National Standards. The NSF/ANSI Standard 60 covers chemicals that are used to treat drinking water, and NSF/ANSI Standard 61 covers devices, components, and materials that come into contact with drinking water.

For contaminants regulated by the U.S. EPA, the NSF/ANSI Standard 60 sets a single product allowable concentration (the concentration of the contaminant present at the tap in any consumer’s home) not to exceed 10 percent of the MCL. Thus, any fluoridation chemicals meeting NSF/ANSI Standard 60 cannot add greater than one-tenth of the MCL of any contaminant to finished water.

There are three fluoride-containing water treatment additives that are approved for use under the NSF/ANSI Standard 60: Drinking Water Treatment Chemicals. These are fluorosilicic acid, sodium silicofluoride, and sodium fluoride. The latter two chemicals are not currently available for use with an NSF/ANSI Standard 60 classification, as the only current suppliers are in China

and Belgium. The City of Boulder further specifies that the fluorosilicic acid supplied must conform to American Water Works Association (AWWA) Standard B703-00, which provides purchasers, manufacturers and suppliers with the minimum requirements for fluorosilicic acid, including physical, chemical, packaging, shipping and testing requirements. AWWA has been developing standards since 1908 that are used throughout the world, and although conformance to AWWA standards is not mandatory, many utilities and regulatory agencies choose to enforce these industry standards.

ANALYSIS

Historic and Current City of Boulder Fluoridation Process

In 1969, Boulder voters approved the fluoridation of Boulder's drinking water to recommended levels to help reduce tooth decay. The ballot language stated that the city would introduce fluoride into the water supply to maintain a concentration of ". . . *approximately one part of fluoride to one million parts of water.*" At that time, the fluoridation of drinking water was endorsed by various health organizations, such as the United States Public Health Service, American Public Health Association, American Dental Association, American Medical Association, and various local civic groups and regional organizations. The Boulder City Council approved fluoridation of Boulder's drinking water through Ordinance No. 3513 (Attachment A). Since 1969, the city has fluoridated its drinking water to a level that meets the recommendations of various health organizations, as well as the requirements of the approved ballot language.

Natural levels of fluoride in the city's raw source water are low, in the range of 0.1 mg/L, so the addition of fluoride is necessary to meet the fluoride requirements of Ordinance No. 3513 (Attachment A). From 1969 to 1993, the chemical used for fluoridation was sodium silicofluoride, a dry crystalline chemical supplied in 50-pound bags. The fluoride feed system required the bags to be manually emptied into a hopper, which was labor-intensive and potentially exposed staff to silicofluoride dust inhalation. Due to the required labor, exposure potential, and inadequate ventilation in the feed room, it was recommended that the existing fluoride feed system be replaced with a system utilizing a bulk storage system with automatic feed.

In 1993, the city completed improvements at the Betasso water treatment facility (BWTF) that allowed for bulk storage and automatic feeding of a liquid fluoride chemical known as fluorosilicic acid (also called hydrofluorosilicic acid), which is the most common fluoride additive in the United States. Similar improvements were also completed at the Boulder Reservoir water treatment facility (BRWTF) in 1998. The city still uses fluorosilicic acid to fluoridate the community's drinking water. In 2014, the city spent approximately \$60,000 on fluorosilicic acid at the BWTF and BRWTF.

Public Interest in Fluoride Addition

In 2006, a local ballot measure initiated by City of Boulder residents proposed eliminating the addition of any substance to the drinking water unless it is uncontaminated and approved by the U.S. Food and Drug Administration (FDA). The ballot measure narrowly failed, with 48.2

percent of voters supporting the measure and 51.8 percent of voters against the measure. The 2006 ballot measure was supported by the Clean Drinking Water Initiative, which was proposed by a group of community members known as Clean Water Advocates of Boulder. The Clean Water Initiative intended to prevent “medications” from being added by the city to the public drinking water supply unless the substance was approved by the FDA and did not contain “contaminants” in concentrations above EPA MCLGs. Clean Water Advocates of Boulder also expressed concern with the use fluorosilicic acid as a fluoride additive due to its potential to contain trace contaminants such as lead and arsenic. Since the ballot initiative did not specifically state that fluoride could not be added, if the ballot measure had passed, the city would have been required to use another form of fluoride, or potentially not add fluoride if a fluoride source could not be identified that met the intent of the ballot measure.

The city receives inquiries from Boulder residents about whether fluoride is added to drinking water, the concentration of fluoride, and what can be done to stop the addition of fluoride. City staff responds by recommending that residents review the information about fluoride on Inquire Boulder website and mobile app, including [responses to frequently asked questions](#), and discuss fluoride at an upcoming Water Resources Advisory Board meeting.

Residents, and the city, also have the ability to initiate a ballot measure to change the ordinance that requires fluoridation of Boulder’s drinking water. Information on the process to change a city ordinance is found in the Boulder Revised Code, [Article IV. – Direct Legislation](#), sections 37 through 42.

Potential Change in Recommended Fluoride Concentration

The city recognizes that additional research on fluoride has been completed in recent years by the U.S. Department of Health and Human Services (DHHS) and the U.S. EPA, which could lead to a new regulatory recommendation by the U.S. EPA. In 2012 the DHHS released a draft recommendation to reduce the “optimal” level of fluoride to 0.7 mg/L. While the DHHS has recommended an optimal level of 0.7 mg/L, the U.S. EPA sets the regulatory maximum levels for public drinking water supplies. A final DHHS optimal fluoride recommendation, and possible regulatory recommendation by the EPA, is expected in 2015. The city continues to pay close attention to scientific and regulatory developments and will comply with any regulatory changes.

If the final guidance from the DHHS is that 0.7 mg/L of fluoride is an optimal level, and the CDPHE supports the recommendation, the city intends to reduce the amount of fluoride added to drinking water to maintain a concentration of 0.7 mg/L. This approach is consistent with the legislative intent of the 1969 ballot measure and Ordinance No. 3513 (Attachment A).

Evaluation and Elimination of Fluoride Addition

Water providers may consider recommendations from research entities such as the AWWA as to whether or not they should fluoridate water or consider stopping fluoridation. The AWWA supports the fluoride level recommendations from entities such as the World Health Organization, American Medical Association, Centers for Disease Control and Prevention, and American Dental Association. AWWA also supports the application of fluoride in a responsible,

effective, and reliable manner, which includes monitoring and control of fluoride levels mandated by provincial, state, and/or federal laws, and that is subject to community acceptance through applicable local decision-making processes.

Even though the practice of fluoridation is supported by research entities such as AWWA, some water providers have stopped adding fluoride. Public concerns about possible negative impacts from fluoride, the addition of chemicals not required for water treatment, and the fact that fluoride is present in many consumable products are the more common reasons for eliminating fluoridation. Based on information from the Fluoride Action Network, the following Colorado water providers have stopped adding fluoride to drinking water since 2000.

- City of Colorado Springs - 2002
- Town of Telluride – 2004
- Town of Pagosa Springs – 2005
- Town of Palisade – 2012
- Project 7 – Gunnison Valley -2014
- City of Montrose – 2014

Although some Colorado water providers have stopped adding fluoride, approximately 72 percent of Coloradans still receive fluoridated drinking water through their community water system (based on the CDPHE data).

NEXT STEPS

At this time, the city is not proposing any changes related to drinking water fluoridation. If the U.S. DHHS finalizes the currently proposed recommended fluoride level of 0.7 mg/L, and the CDPHE supports the recommendation, the city intends to reduce the amount of fluoride added to drinking water to maintain a concentration of 0.7 mg/L.

ATTACHMENTS

- **Attachment A** – Excerpts from Ordinance No. 3513 - Pertaining to Fluoridation of Drinking Water in the City of Boulder.

Attachment A

Excerpts from Ordinance No. 3513 - Pertaining to Fluoridation of Drinking Water in the City of Boulder

ORDINANCE NO. 3513

AN ORDINANCE CONCERNING QUESTIONS TO BE SUBMITTED TO A VOTE OF THE QUALIFIED ELECTORS OF THE CITY OF BOULDER, COLORADO, AT THE GENERAL MUNICIPAL ELECTION TO BE HELD ON TUESDAY, THE 4TH DAY OF NOVEMBER, 1969; DIRECTING THAT THE FOLLOWING QUESTIONS BE SUBMITTED: THE QUESTION OF APPROVING OR REJECTING A PROPOSED RE-ENACTMENT WITH AMENDMENTS OF SECTION 84-A OF THE CHARTER OF THE CITY OF BOULDER TO PERMIT THE CITY COUNCIL TO HAVE GREATER POWER TO DETERMINE THE JURISDICTION, POWERS, AUTHORITY, AND OTHER RELATED MATTERS OF THE BOARD OF ZONING ADJUSTMENT; THE QUESTION OF APPROVING OR REJECTING A PROPOSED RE-ENACTMENT WITH AMENDMENTS OF SECTION 97 OF THE CHARTER OF THE CITY OF BOULDER TO PERMIT ALL QUALIFIED ELECTORS OF THE CITY, NOT MERELY ELECTORS WHO HAVE PAID A PROPERTY TAX IN THE PRECEDING YEAR, TO VOTE ON BOND ISSUES, UNLESS THE CITY COUNCIL FOR SUFFICIENT REASON RESTRICTS OR LIMITS SUCH GROUP OF QUALIFIED ELECTORS, AND TO STATE THAT ONLY THOSE BONDS AND OTHER INDEBTEDNESS PAYABLE SOLELY FROM THE PROCEEDS OF AD VALOREM TAXES ARE SUBJECT TO THE INDEBTEDNESS LIMITATION OF THREE PER CENT (3%) OF THE ASSESSED VALUE OF TAXABLE PROPERTY WITHIN THE CITY, AND TO BROADEN WHAT IS CLASSIFIED AS A "REVENUE" BOND, AND TO PROVIDE FURTHER THAT SUCH BOND MAY BE ADDITIONALLY SECURED BY A PLEDGE OF THE FULL FAITH AND CREDIT OF THE CITY WITHOUT BEING INCLUDED FOR PURPOSES OF COMPUTATION OF SAID THREE PER CENT (3%) LIMITATION; AND, THE QUESTION OF APPROVING OR REJECTING A PROPOSED ORDINANCE ENTITLED "AN ORDINANCE AUTHORIZING THE INTRODUCTION OF FLUORIDE INTO THE WATER SUPPLY SYSTEM OF THE CITY OF BOULDER, COLORADO; PROVIDING FOR THE REGULATION OF SAID FLUORIDATION OF WATER; MAKING OF REPORTS IN CONNECTION THEREWITH; AND, PRESCRIBING DETAILS IN RELATION TO THE FOREGOING"; SETTING FORTH NOTICES TO BE PUBLISHED, SETTING FORTH VOTING PRECINCTS AND POLLING PLACES THEREIN; AND PRESCRIBING AND SETTING FORTH OTHER DETAILS IN CONNECTION WITH SAID ELECTION.

FLUORIDATION OF THE CITY'S WATER

An ordinance entitled "An Ordinance authorizing the Introduction of Fluoride into the Water Supply System of the City of Boulder, Colorado; Providing for the Regulation of Said Fluoridation of Water; Making of Reports in Connection Therewith; and Prescribing Details in Relation to the Foregoing. "

QUESTION IN 3

Shall the following ordinance be adopted:

AN ORDINANCE AUTHORIZING THE INTRODUCTION OF FLUORIDE INTO THE WATER SUPPLY SYSTEM OF THE CITY OF BOULDER, COLORADO, BEING ENTITLED "FLUORIDATION OF WATER"; PROVIDING FOR THE REGULATION OF SAID FLUORIDATION OF WATER; AND THE MAKING OF REPORTS IN CONNECTION THEREWITH; AND, PRESCRIBING DETAILS IN RELATION TO THE FOREGOING.

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WHEREAS, it appears to be the consensus of scientific, medical, and dental opinion, that the presence of fluoride in drinking water is a deterrent to tooth decay; and,

WHEREAS, such chemical element is not found in the natural supply of water distributed to the citizens of the City of Boulder, in sufficient quantities to reduce tooth decay; and,

WHEREAS, fluoridation of drinking water under such conditions as exist in this municipality has been endorsed by such groups as the United States Public Health Service, the American Public Health Association, the American Dental Association, the American Water Works Association, the American Medical Association, various local civic groups and organizations, and many citizens; and,

WHEREAS, it appears that fluoride can be introduced into the drinking water supply of the City of Boulder, Colorado, as a measure to promote the public health and welfare.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BOULDER, COLORADO, THAT:

Section 1. The Coordinator of Public Facilities, with the cooperation of the Department of Public Health and the Director of the Boulder City-County Health Department, and subject to the supervision and control of the City Manager, is hereby authorized and directed to provide a means and to proceed with the introduction of the fluoride ion into the water supply furnished is

this municipality in such quantities as are required to maintain throughout the pipe distribution system a fluoride ion concentration of approximately one part of fluoride to one million parts of water.

Section 2. The Coordinator of Public Facilities shall keep an accurate record of the amount of fluoride-bearing chemical applied, the quantities of water treated and cause such analytical tests to be made for fluoride in the untreated and treated water as it shall be directed to do by the Department of Public Health or as required by law.

Section 3. The Coordinator of Public Facilities is hereby directed to make periodic reports to the City Council on the fluoridation of the water supply of the City of Boulder.

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Section 4. All sections, or parts of sections of the Revised Code of the City of Boulder, 1965, as amended, or ordinances,

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or parts of ordinances in conflict, or inconsistent herewith, are hereby repealed, provided, however, that the repeal of any section or parts of sections of the Revised Code of the City of Boulder, 1965, as amended, or any ordinance or part thereof, shall not revive any other section of said Code, ordinance, or ordinances, heretofore repealed or superseded.

**CITY OF BOULDER
WATER RESOURCES ADVISORY BOARD
INFORMATION PACKET MEMORANDUM**

To: Water Resources Advisory Board

From: Jeff Arthur, Director of Public Works for Utilities
Joe Taddeucci, Water Resources Manager
Bret Linenfelser, Water Quality Environmental Services Manager
Ken Baird, Utilities Financial Manager
Russ Sands, Watershed Sustainability and Outreach Supervisor
Joanna Bloom, Source Water Administrator
Bronwyn Weygandt, Billing Services Supervisor
Eric M. Ameigh, Public Works Project Coordinator

Date: February 23, 2015

Subject: Information Item: Background Information for Utility Rate Study

I. PURPOSE

The purpose of this memo is to provide the board with background information on the current structure for water and wastewater utility rates as well as an overview of issues that have arisen that support a review of the rate structure. This information will help inform the WRAB's recommendation of key questions and guiding principles for the rate study at its meeting on April 20, 2015. This memo covers water and wastewater rates. A second memo, to be included in the packet for the March 16, 2015 meeting, will provide the background for stormwater rates.

II. WATER UTILITY RATES

Before 2007, the water rate had two main components:

1. Service Charge: A charge, based on meter size and location inside or outside of the city, to recover fixed costs such as meter reading, maintenance, and billing and collection costs. A portion of the service charge also was allocated to capital investments.

2. Quantity Charge: A charge for the amount of water used, designed to recover costs associated with average and peak water usage requirements based on an Increasing Block Structure. The block structure is a tiered pricing system where each gallon of water used becomes more expensive at certain thresholds. The first block maximum was set by the account's average usage from December – March, or average winter consumption (AWC). All consumption up to the account's AWC was billed at the Block 1 rate. All consumption from 100 percent to 350 percent of AWC was billed at the Block 2 rate. Any consumption above 350 percent of AWC was billed at the Block 3 rate. There were some small nuances for different types of accounts (single-family

residential, multi-family residential, trailer parks, commercial/industrial, irrigation, sprinkler) but the 3 tiered block rate structure was in place for all accounts.

The increasing block structure assumed a basic level of consumption, as reflected by the AWC which is assumed to be the “normal” indoor use for an average household or business. It excluded outdoor watering because it was based on winter usage patterns. This AWC usage was charged at the lowest rate/in Block 1. Water to be used for anything beyond those normal needs, including irrigation or outdoor watering, would cost more (Blocks 2 and 3). The three tiered system attempted to discourage wasteful irrigation outdoors and limit discretionary indoor uses without punishing customers for normal indoor water use. However, the three tiered system had limitations.

In late 2002, during council discussions related to the Drought Plan, staff was directed by council to examine possibilities for further encouraging water conservation through the water rate structure. Earlier that year during a drought, the city had implemented mandatory watering restrictions. While the watering restrictions were successful in meeting the city’s short term conservation goals, it was suggested that water budgets might be a better mechanism for managing consumption and could reduce the need for mandatory watering restrictions in periods of drought. Council agreed that staff should explore water budgets.

In 2003 and 2004, WRAB, staff, and council engaged in a process to analyze the rate existing structure, to develop alternative structures that could meet the city’s goals, and to ultimately choose a new approach. Staff, along with significant consulting assistance, developed and analyzed over 20 alternatives for their ability to meet the following water utility goals, which were developed as part of the process:

- Discourage wasteful use, while promoting all justified types and amounts of use
- Be effective in yielding total revenue requirements
- Provide revenue stability and predictability
- Fairly allocate the total cost of service across customer classes to attain equity
- Be dynamic in its ability to respond to changing supply and demand conditions and/or environmental concerns

Water Budgets

The option ultimately chosen is the water budget structure the city uses today. The current structure works similarly to the old one, with a service charge based on meter size and a quantity charge that features an increasing block system. However, water budgets are tied to a five tier block rate structure rather than the previous three tiers. In general, blocks are determined by an account’s water budget, not by AWC. As a whole, the water budget system is more intelligent, responsive, and customizable for allocating and pricing water.

Water Budget Methodologies by Customer Class

The water budget methodology varies by customer class and is described below.

Single-Family Residential Indoor Water Use: Residential water budgets consist of two parts: an indoor allocation and an outdoor allocation. The indoor allocation is set at 7,000 gallons per

month (for four people). Customers with larger families can apply to get an additional 1,000 gallons a month for each additional person in the home.

The outdoor allocation is based on customer-specific irrigable area as provided by the city's geographical information system (GIS) and changes monthly using historic evapotranspiration (ET) rates which correlate with seasonal watering needs. The annual outdoor allocation is calculated as follows:

- The first 5,000 square feet of irrigable area gets 15 gallons of water per square foot (gpsf).
- The next 9,000 square feet of irrigable area gets 12 gpsf.
- All irrigable area in excess of 14,000 square feet gets 10 gpsf.

Multifamily Residential Indoor Water Use: Similar to single-family accounts, budgets for multifamily residential accounts are calculated by adding both an indoor allocation and an outdoor allocation. Multifamily residential accounts have a monthly indoor allocation of 4,000 gallons per living unit. For example, if an apartment complex has 10 apartments, its monthly indoor allocation would be 40,000 gallons. In 2008, multifamily account budgets were further enhanced by allowing customers to increase their water budget based on the number of bedrooms. If an apartment has more than two bedrooms, an additional 1,000 gallons of water per bedroom can be requested for up to three additional bedrooms for a maximum of 7,000 gallons per living unit per month.

Commercial, Industrial, and Institutional (CII) Indoor Water Use: When water budgets were first implemented in 2007, all CII customers were given a budget based on their historic average monthly use (AMU) from 2005. In 2008, new options were offered. CII customers can choose to stay with the AMU water budget or opt into one of the other four water budget options:

- **Average Monthly Use (AMU)** – The AMU is calculated using each account's annual water use data divided by 12 and does not change year to year unless there is a business need. If an increase in water use recently occurred due to a business change, the customer could also apply for a more recent three-to-six month AMU. By having the AMU remain constant, a customer is not penalized for conserving water. An AMU budget results in monthly wastewater charges based on all water used, which could include water used for irrigation.
- **Historical Monthly Use (HMU)** – A customer may choose to select the HMU option which is calculated using a rolling three-month average for each individual month. For example, the January budget is calculated by averaging the three previous Januarys' water use. HMU will result in monthly wastewater charges based on all water used, which could include water used for irrigation.
- **Indoor/Outdoor** – This is similar to the single-family budget in that it is comprised of both an indoor water allocation and an outdoor water allocation. The indoor allocation is based on the most recent AWC. The outdoor allocation is calculated based on irrigable area, including right of way, and seasonal watering needs. CII indoor/outdoor customers will be billed wastewater charges on actual water used or their indoor budget allocation

(AWC) whichever is lower for the billing period. A CII customer may not select this option if there is no irrigable area associated with the account.

- **Efficiency Standard** – Customer budgets are determined by a non-city Professional Engineer, who does a specific review of the customer’s indoor and outdoor uses based on reasonable and documented efficiency standards. Each month can be customized based on the customers needs. The proposed budget must be approved by the city and the customer is charged a fee for the city’s review. CII efficiency standard customers are billed wastewater charges on actual water used or the indoor budget allocation, whichever is lower for the billing period.
- **Plant Investment Fee (PIF)** – New CII customers or CII customers who are changing business type or increasing their meter size are assigned a PIF water budget. The PIF water budget is based on the PIF the customer chooses from the following options: 25 percent, 50 percent, or 85 percent of the customer class average for a given meter size. Each month can be customized based on the customers needs. Once a PIF Water Budget is defined, the property is no longer eligible to switch to one of the other CII Water Budget methods. If the PIF methodology does not work for the customer, they can elect to establish an Efficiency Standard water budget.

CII Water Budget Study

For CII customers, the variability in the types of customers and their water use makes establishing a single CII water budget impossible. In 2008, staff initiated a CII water budget study to identify if there was a better way to establish CII water budgets using sector specific benchmarks rather than historic use. Staff last reported to WRAB on the status of this project in [June of 2013](#) (memo begins on page 44), indicating that benchmarking could be used but might not be the best choice for billing. Staff plans to provide WRAB with a final update on this project in June of 2015.

Outdoor Water Budgets

As noted earlier, outdoor water budgets are established based on evapotranspiration (ET). Instead of using higher ET rates which would result in lush lawns, the city of Boulder uses 15 gallons per square foot as the standard – the minimum amount of water needed to keep Kentucky bluegrass from going dormant. This helps incentivize either less turf installation (in favor of low-water plants) and/or reduced outdoor lawn watering. With the exception of larger single family lawns (over 5,000 square feet) and some municipal sites (e.g. sports fields), the 15 gallons per square foot allotment is applied equally across customer classes.

This annual outdoor allocation is distributed throughout the year to meet monthly seasonal outdoor watering needs. The table below shows the monthly percentages that are applied to the annual outdoor allocation. These percentages were derived from historic data.

Monthly Outdoor Allocation Distribution	
Month	Percent of Annual Outdoor Allocation
January	0%
February	0%
March	1%
April	7%
May	14%
June	20%
July	20%
August	18%
September	12%
October	7%
November	1%
December	0%
Total	100%

Single Meters for Outdoor and Indoor Water Use

When a single meter supplies a property, the monthly indoor allocation is added to the monthly outdoor allocation to result in the customer’s monthly water budget. The outdoor allocation is based on GIS data for a customer-specific irrigable area, using the application rate of 15 gallons per square foot for all irrigated areas. The outdoor allocation is based on historic, seasonal outdoor use patterns.

Metered Irrigation Accounts

When a property has a meter dedicated for irrigation use, an irrigation-only or “metered irrigation” water budget is established based solely on the outdoor allocation discussed above. However, irrigation-only accounts receive an additional 1 percent of their outdoor allocation in December, January and February to allow for some winter watering and a monthly water budget greater than zero. In 2008, the irrigable area was increased to include right of way adjacent to the property.

Water Budget Adjustments

Adjustments to water budgets can be made for a variety of reasons. In general, it is up to the customer to request an adjustment. Information about seeking an adjustment can be found on the city’s website or the information may be offered during conversation between a staff member and a customer. There have been times when staff has done mass mailings to specific classes of customers to inform them of the opportunity to adjust their water budgets. For example, in 2008, a new adjustment option was made available to multifamily residential customers who had units with more than two bedrooms. In that case, staff sent letters to all 2,600 multifamily customers. It is unknown; however, how many customers are aware of the opportunity to request an adjustment.

Rate Structure with Increasing Blocks

Customers pay a fixed monthly service charge based on meter size and a quantity charge based on the amount of water used. The table below shows the quantity charges and block breakpoints used with water budgets.

Block	Quantity Charge (per 1,000 gal)	2015 Rates (per 1,000 gal)	Number of Gallons billed in each Block
Block 1	¾ x Base Rate	\$ 2.55	0 to 60% of total monthly water budget
Block 2	Base Rate	\$ 3.40	61-100% of total monthly water budget
Block 3	2 x Base Rate	\$ 6.80	101-150% of total monthly water budget
Block 4	3 x Base Rate	\$10.20	151-200% of total monthly water budget
Block 5	5 x Base Rate	\$17.00	> 200% of total monthly water budget

Monitoring Budgets and Water Consumption

Because customers are on a water budget and exceeding the budget can be costly, there is a desire on the part of many customers to monitor and understand their water consumption. The city allows each customer one extra, complimentary meter reading every six months. Meter technicians will read the meter and leave a door hanger with the information. If a customer would like an additional reading within the six-month timeframe, a \$35 fee is charged to recover costs.

In the past, a \$200 “water monitor” was used as a tool for customers to see their water use in real-time. Due to a variety of problems with the manufacturer, this is not currently an option.

Customer Data

Boulder has approximately 28,900 water customers and four customer classes, as follows:

Customer Class	Number of Accounts
Single Family Residential	22,800
Multi Family Residential	2,600
Commercial/Industrial	2,100
Irrigation Only	1,400

2014 BILLED REVENUE BY CUSTOMER CLASS

	Single-Family Residential	Multifamily Residential	Comm/Ind/Institutional	Irrigation Only	TOTAL
Service Charge	\$2,700,628	\$913,317	\$844,386	\$285,470	\$4,743,801
Block 1	3,769,243	2,117,933	2,182,525	790,570	\$8,860,271
Block 2	729,395	524,878	905,107	339,121	\$2,498,501
Block 3	490,177	284,414	610,062	411,634	\$1,796,287
Block 4	164,061	88,809	230,340	266,979	\$750,188
Block 5	259,563	118,654	719,270	629,624	\$1,727,111
Bill Adjustments	(85,450)	(42,164)	(53,388)	(84,446)	(\$265,449)
TOTAL	\$8,027,616	\$4,005,842	\$5,438,302	\$2,638,952	\$20,110,712

2014 BILLED WATER USE BY CUSTOMER CLASS (in thousand gallons)

	Single-Family Residential	Multifamily Residential	Comm/Ind/Institutional	Irrigation Only	TOTAL
Block 1	1,557,562	875,179	873,585	324,668	3,630,994
Block 2	225,858	162,501	280,538	104,056	772,953
Block 3	75,903	44,027	94,448	63,005	277,383
Block 4	16,931	9,165	23,771	27,119	76,986
Block 5	16,072	7,347	44,539	36,937	104,895
TOTAL	1,892,326	1,098,219	1,316,881	555,785	4,863,211

III. WASTEWATER UTILITY RATES

Wastewater rates are related to water rates but their calculation is much simpler. Like water, wastewater rates have both a fixed service charge and a variable quantity charge. The service charge is based on water meter size and the quantity charge is based on water use. There is no block structure for wastewater however.

For residential accounts, quantity charges are billed using actual water use or AWC, whichever is lower. The reason for this, and the reason wastewater quantity charges are based on water consumption, is because of a logical assumption that during the months of December through March, the only wastewater produced by a residence is the water that entered the building and was used indoors. AWC is assumed to represent the amount of water used indoors (as described above) and thus the amount of water that leaves as wastewater. If a customer uses less water than AWC in a given month, then it saves on its wastewater quantity charge.

Non-residential customers are billed for wastewater quantity charges based on actual use or indoor water budget allocation depending on their selected water budget option.

Wastewater Rate Issues

The wastewater service charge has remained low for some time. Meanwhile, the rate used to determine quantity charges has continued to grow. Given the amount of time that has passed since wastewater rates were last reviewed, it is not clear whether the relationship between the service charge and the quantity charge is still accurate as it relates to the cost of providing wastewater services.

IV. TRADITIONAL RATE STUDY

A traditional rate study is divided into three general areas of inquiry. The first deals with determining the utility's Revenue Requirement. This involves understanding all the costs related to operating the utility, including operating, capital, debt service, and maintaining appropriate reserve levels. The amount of revenue needed from rates is then calculated by taking the utility costs and subtracting other anticipated revenue, such as plant investment fees, hydroelectric, interest income, etc.

Once the revenue requirement is determined, the second step is to perform a cost of service analysis. This study seeks to equitably allocate the revenue requirement between the various

customer classes of service. For a major rate study the cost of service analysis is often performed by consultants. The model can then be updated by staff in other years.

The third area of inquiry, called rate design, has to do with how the rate structure and the setting of rates help to meet revenue requirements and also other goals, such as water conservation, economic development, or local ideas of equity amongst customers. The evolution of water budgets since their implementation in 2007, and the data that has been generated since that time, provides a rich opportunity to assess whether and how water budgets have helped the city meet its conservation and other goals.

V. NEXT STEPS

Feb. 23, 2015 WRAB Meeting – Staff will be available to answer questions about the information contained in this memo and receive feedback on additional information that could help the board in providing input into the rate study. There will be no staff presentation of the material at this meeting.

March 16, 2015 WRAB Meeting – Staff will prepare a similar memo on stormwater fees for the March 16 packet and be available to answer questions and receive feedback. There will be no presentation of the material at this meeting.

April 20, 2015 WRAB Meeting – The board will discuss and recommend key questions and guiding principles for the rate study project. These questions and principles will inform the staff scoping of the necessary analyses.

April/May 2015 – Staff will check in with City Council on WRAB's recommended key questions and guiding principles prior to proceeding with the study.