



INFORMATION ITEM MEMORANDUM

To: Members of the Water Resources Advisory Board

From: Jeff Arthur, Director of Public Works for Utilities
Joe Taddeucci, Water Resources Manager
Bret Linenfelser, Water Quality Manager
Kim Hutton, Water Resources Engineer
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MaryAnn Nason, Water Conservation & Outreach Coordinator

Date: **April 27, 2015**

Subject: **Drought Response Overview and Water Supply Update**

EXECUTIVE SUMMARY:

This memo provides an update on 2015 water supply conditions and the city's drought stage determination procedures as set forth in the Drought Plan (Attachment 2).

BACKGROUND:

The Drought Plan consists of two separate volumes and is intended to provide guidance for recognizing and responding to droughts that will affect water supply availability. Volume I categorizes drought alert levels according to severity and also includes actions that might be taken to respond to each drought alert level. Volume II contains detailed technical supporting information.

During development of the Drought Plan, the city established a formula called the "storage index". The storage index was derived from statistical analysis and modeling of Boulder's water system using hundreds of years of tree-ring based historical hydrology. The storage index is basically a ratio of key storage parameters divided by projected demand. Staff applies the formula each year in early May when key water supply information becomes known. The drought alert levels corresponding to various storage index values are shown in Table 1.

The Drought Plan identifies water use reduction goals and response options for each stage of drought. The storage index calculation is one component of staff's evaluation of water supply conditions and is reviewed in conjunction with other appropriate data and operating experience. While early May is a decision point in Boulder's drought response analysis, staff is continuously

monitoring trends in snowpack, precipitation, runoff, reservoir filling and water system administration throughout the year.

**Table 1: Suggested drought response triggers for May 1
(City of Boulder Drought Plan, Volume 1)**

Projected Storage Index (1)	Drought Alert Stage
Greater than 0.85	None
Between 0.85 and 0.7	I
Between 0.7 and 0.55	II
Between 0.55 and 0.4	III
Less than 0.4	IV

(1) Projected storage index = (projected usable Boulder mountain storage + 40% of Boulder’s portion of projected CBT storage) / Boulder’s unrestrained water demand in non-drought years.

ANALYSIS:

The city’s water supply system includes both native basin (North and Middle Boulder Creeks) and Colorado Big Thompson (CBT) water sources (Attachment 1). As of April 1, 2014, water supply conditions in the city’s source water areas were as follows:

- With the exception of Silver Lake Reservoir, which is currently being partially drained for a spring outlet works inspection, mountain reservoir storage levels in the North Boulder Creek basin are roughly full. On the Middle Boulder Creek side, Barker Reservoir is about 75% full while Kossler Reservoir is mostly drained for a spring and summer construction project. Despite the dam safety and construction work, staff anticipates that all reservoirs will fill this year.
- Snowpack is about average for this time of year. As of April 1, 2015, snow water equivalent measurements were average for the Boulder Falls Snow Course and University Camp Snotel Sites. If the March dry trend continues through April, May 1 snowpack may be slightly below average but still sufficient for Boulder’s water supply needs.
- Initial indications from the Northern Colorado Water Conservancy District are that the Colorado Big Thompson (CBT) 2015 allocation¹ will be 70%. A 70% allocation represents 14,709 acre-feet of water available to the city. The annual CBT allocation is typically about 70%.

May 1 is the time of year when the key city water supply factors are the most informative because the snowpack has usually fully developed by this time, and Boulder’s CBT allotment for the year is known. Those two items combined with current reservoir storage levels provide a good indication of the city’s available water supply for the coming year. While the May 1 storage index calculation is still a few weeks away, it is unlikely that a drought response will be triggered.

¹ The city water utility presently owns 21,015 units of CBT water. A 100 percent quota provides one acre-foot of water for each unit for that year. The historical average for the annual quota is about 70 percent or 0.7 acre-foot per unit.

NEXT STEPS:

Staff continuously monitors water supply conditions and will perform the storage index calculation in early May. As in every year, staff will continue to inform the public of the status of the water supply and encourage the wise use of water. The city's Water Conservation Program helps coordinate outreach efforts locally and regionally, working with Water Resources to monitor supply conditions and increase outreach efforts if hot, dry conditions are expected.

ATTACHMENTS:

- 1 – City of Boulder Source Waters
- 2 – City of Boulder - Drought Plan (electronic links)

Protect Your Drinking Water Sources



PROTECT & CONSERVE BOULDER'S WATER



**CITY OF BOULDER
DRINKING WATER
PROGRAM**
5605 NORTH 63RD ST.
BOULDER, CO 80301

FOR MORE INFORMATION CALL:
303-413-7400
OR VISIT OUR WEB SITE AT:
WWW.BOULDERUTILITIES.NET

Watersheds Providing Boulder's Drinking Water

Betasso Water Treatment Facility (WTF)

- 1** Barker Reservoir Watershed
38 sq. miles
- 2** Lakewood Reservoir Watershed
21 sq. miles
- 3** Silver Lake Watershed
Owned by the city of Boulder
10 sq. miles

Boulder Reservoir Water Treatment Facility (WTF)

- 4** Colorado Big Thompson / Boulder Feeder Canal Watershed - 1,004 sq. miles
- 5** Boulder Reservoir Watershed
9 sq. miles
- 6** Watersheds occasionally linked to Boulder's water storage reservoirs
132 sq. miles

- Hydroelectric Facilities
- Water Treatment Facilities
- Canals / Ditches
- Source Water Pipelines
- Treated Water Pipelines

Drinking Water Supply Current Usage (%)

- 40% Barker Reservoir
- 40% Lakewood Reservoir plus Silver Lake Watershed
- 20% Boulder Feeder Canal plus Boulder Reservoir



Area covered by 3D view is approximately 4,200 sq. miles

Approximate Foreground Scale
1:43,500

Approximate Horizon Scale
1:79,500

Date: June 2002



Computer Terrain Mapping, Inc.
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303-444-1670 FAX: 303-443-1856

Attachment 2

City of Boulder Drought Plan (electronic links)

[DROUGHT PLAN - Volume I Drought Planning and Response Plan](#)

[DROUGHT PLAN - Volume II Technical Information and Analysis](#)