



**CITY OF FLAGSTAFF
WATER COMMISSION
August 20, 2020
Virtual Meeting
SUMMARIZED MINUTES**

MEMBERS PRESENT

Ward Davis
Ben Ruddell
Timothy Bowers
Malcolm Alter
Elizabeth Christy
Marie Jones, P&Z Rep
Jamie Whelan, Council Rep

MEMBERS ABSENT

John Malin

STAFF PRESENT

Ryan Roberts
Marion Lee
Erin Young
Trevor Henry
Christine Cameron
Monica Rabb
Jim Janecek

OTHERS PRESENT

Talia Anderson
Connie Woodhouse
Dan Ferguson
Jack Rathjen
Robert Vane

I. CALL TO ORDER

Vice Chair, Ward Davis called the meeting to order at 4:00 p.m.

II. APPROVAL OF MINUTES – June 18, 2020

Moved by Timothy Bowers and seconded by Elizabeth Christy to approve the meeting minutes of June 18, 2020. Motion carried unanimously.

III. PUBLIC PARTICIPATION - None

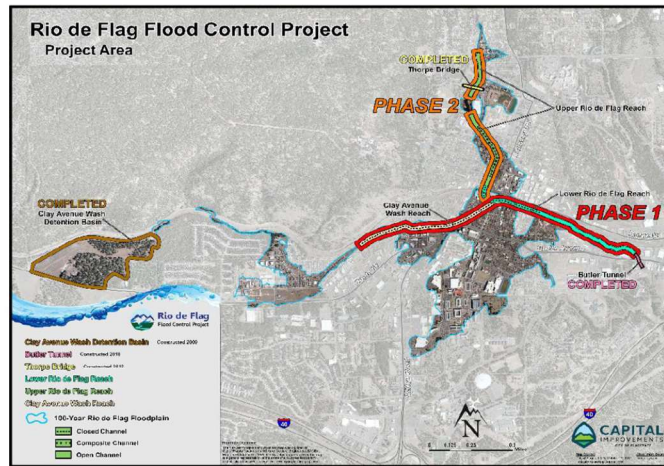
IV. NEW BUSINESS

A. Rio de Flag Flood Control Project Update – Trevor Henry & Christine Cameron

Trevor Henry and Christine Cameron provided a project update on the Rio de Flag Flood Control project that focused on the following:

US Army Corps of Engineers
Project Design
Environmental
Real Estate
BNSF Railway

The project team indicated the presentation was presented to City Council on August 18th.



USACE

Project Construction – Phase I

- US Army Corps – Agency Technical Review Submittal
 - BNSF Comments received
 - US Army Corps reviewing comments
 - Next Submittal to be released, late August 2020

- Project Schedule
 - US Army Corps and City of Flagstaff combined effort
 - Contract Award – Now looks like 2021

- Project Cost
 - As mentioned to Council at the last project update, \$15M cash contribution has been provided to US Army Corps
 - *In accordance with Project Cooperation Agreement

Project Design

- USACE and their Design Consultant
 - Agency Technical – All team comments are being reconciled by US Army Corps
 - Next submittal – Buildability, Constructability, Operability, Environmental (Fourth) September

- City Utility and Franchise Utility Designs
 - Public Utility design – ADEQ review and approval
 - Stakeholder’s Utility Relocations – BNSF policy for relocation, ADOT permit
 - Franchise Utility work plans were reviewed, working on specific areas

- USACE Design Completion
 - Project Team is working on a design schedule for completion

Environmental Clearance

- Studies are complete for all properties impacted by the work.

- Environmental Response Plan
 - City of Flagstaff requirement

- Contingency for handling unknown contaminated soils or groundwater.
- Draft scope under review with USACE

Real Estate

- Council has approved the property acquisition of all Phase I properties through Resolution.

Legal Descriptions

- All Phases I Legal Descriptions completed.

Appraisals

- Revisions and additional documentation are required by USACE

BNSF Railway

Project Coordination with BSNF

- Phase I design is reviewed and comments have been provided.
- Construction and Maintenance Agreement – Phase I
 - Defines roles and responsibilities, construction operating procedures, real estate agreement, utility relocations.
 - Draft under review by BNSF.
- Railroad Undercrossing – Phase II
 - BNSF is evaluating the in-line bridge option for the undercrossing regarding constructability, risk, and operational impacts.
- Construction and Maintenance Agreements – Future Council Action
- October 6 Executive Meeting

City Contact Information

Trevor Henry, Project Manager thentry@flagstaffaz.gov (928)213-2684
 Christine Cameron, Project Manager ccameron@flagstaffaz.gov (928)213-2682

Rio de Flag Flood Control Project web site:

<http://www.flagstaff.az.gov/4189/Rio-De-Flag-Flood-Control>

B. CLIMAS Report – Lake Level Response to Climate Variability in Lake Mary – Erin Young

Upper Lake Mary (ULM) has been an important source of water for Flagstaff since its construction in 1941. Water Services still can occasionally provide 50% of Flagstaff’s total demand from the lake. Water from this source is cheaper to produce and offsets the pumping of groundwater. Since 1960 the reservoir has spilled nearly 20 times, always in the winter or spring. While it is well understood that a filling event is dependent on a ‘good winter’ we have little information to help us define what a ‘good winter’ really is. On the contrary, the reservoir has nearly dried up completely or gone many years in a row without a good fill event.

Water resource management requires the ability to forecast supplies and plan for extreme climate patterns that are likely to impact the reliability of the reservoir as a water resource. This requires an understanding of the climatic conditions that lead to fill events and droughts.

Climate Assessment for the Southwest, or CLIMAS, is a NOAA-funded research program at the University of Arizona, focused on climate research. CLIMAS approached Water Services last year wanting to understand how we have incorporated climate science into our work and what questions were important to the utility. We discussed the history of Upper Lake Mary and the importance of this resource to our community and that we had not yet focused on characterizing patterns in lake levels over time and what management benefit doing so may provide beyond managing a full lake to meet three summer seasons of peak demand. Water Services wanted to have a better understanding of climate influences on lake levels, what conditions really constitute a drought, and how temperature and precipitation influenced patterns of fill and drought events. CLIMAS offered to provide this characterization for us provided we share data with them.

Talia Anderson, graduate student with the University of Arizona, led a research effort titled: *Upper Lake Mary: Lake Level Response to Climate Variability*. Under CLIMAS scientists Connie Woodhouse and Dan Ferguson, Ms. Anderson provided a technical report and presentation to staff earlier this year.

Some basic data were provided by staff to complete the study. Staff provided monthly lake level data and monthly water production data going back to 1960. To best correlate lake level conditions to temperature and precipitation patterns, the natural lake level conditions were reconstructed by adding water production volumes back into the lake level data record by using lake volumes and percentage full from a bathymetry study published by the USGS in 2008.

While the results are not necessarily a surprise some interesting patterns were noted and they represent the first characterization staff are aware of towards defining what we know of climate and ULM water supply reliability. Ms. Anderson provided a broad overview of her work and results as part of her presentation leaving time for questions and discussion.

The ULM lake level record, when analyzed for drought events, documents droughts of one to six years (1999-2004) in duration. The most intense single drought year, 2002, was part of this drought. The longest drought, defined as consecutive years below the median, lasted for 6 years (1999-2004). The severity of a drought event not only depends on the length, but also the intensity in each individual year and the cumulative departures. Years of above and below median lake levels show contrasting climate conditions, with particularly stark differences in Nov-Mar precipitation, March 1 SWE, and Apr-Jul temperatures. In contrast, monsoon season precipitation during below median lake level years and multi-year droughts can be slightly below to much above median, highlighting the tendency for opposite precipitation conditions in the cool and monsoon seasons.

OVERALL SUMMARY

Throughout all analyses in this report, cool season (Nov-Mar) precipitation consistently plays the most important role in determining ULM lake levels. This emphasizes the primary influence of combined winter snow accumulation and early spring precipitation on lake levels for the upcoming summer. While this relationship holds for the entire ULM record, it does appear that temperatures are warmer for the low lake level years in the 2nd half of the ULM record compared to 1st half. Because both precipitation and temperature influence snow accumulation and melt rates, the increase in surface temperatures over recent decades, as well as projected warming in the future, have important implications for the water cycle and surface water supply in the Flagstaff area. Warmer temperatures lead to less precipitation falling as snow and earlier spring melts, which drives shifts in peak runoff and supply.⁹ The significant increase in temperature could start to play a more important role in influencing ULM lake levels as seen in recent droughts in California⁵ and in streamflow records from the upper Colorado River basin⁶. Specifically, the recent 2012-2014 drought in California was not dominated by unusually low precipitation, but rather extremely high

temperatures⁵. In the Upper Colorado River Basin, decreasing runoff efficiency has been documented since the 1980's and has been attributed to increases in temperature⁶. Despite the continued importance of Nov-Mar precipitation in the ULM area, these changes in temperature have the potential to enhance the risk of decreased water supply in the future.

While surface water production is relatively highly correlated with lake level minimums, understanding the characteristics of drought events could provide additional information for supply planning. We show that the severity of a drought event not only depends on the length, but also the intensity of the drought in each individual year and the cumulative departures. The two most recent drought events lasting at least three years have temperatures above the 70th percentile, again highlighting the potential emergent role of warming temperatures.

Public Comment: Jack Rathjen indicated that at one point the Forest Service was going to thin in the area and asked if that was explored. He was curious on the water shed. Talia said that would affect the runoff, but they did not look in that.

Erin indicated that bits of pieces of the studies on climate change will be used in some areas.

V. OLD BUSINESS - None

VI. INFORMATIONAL ITEMS TO/FROM THE CHAIR, COMMISSION OR STAFF

Ryan Roberts gave a brief update on the De Silva Waterline Leak Investigation.

- Intermittent
- Leak Detection results-negative
- Lab Analysis on Water
- Five possible sources

Next Step:

- Implications of finding
- Short term-Immediate repair of all leaking joints
- Street Repair in the next weeks
- Long term – Design and Replacement of Waterline under aging infrastructure replacement program

Jamie Whelan thanked staff for moving on the De Silva Leak.

The Commissioners requested some updates on some projects like Red Gap. Ryan gave a brief update on the Red Gap project. On the Reclaimed Master Plan with Brown and Caldwell, Erin indicated the project kicked off July 1st and staff had several meetings so far. Staff will provide a brief update at the September meeting. On the Reclaimed Water Infiltration Study, Erin said staff is waiting on the availability of reclaimed water to do more testing and again will provide an update next month. The Rate Study is on hold for now, waiting on some CIP recommendations to incorporate. Malcolm Alter suggested to the Water Commission members to email staff (Ryan) for project updates and does not want to waste staff's time.

Jamie Whelan asked if the City ever considered taking over Doney Park Water. Ryan said no and has never been a discussion.

VII. ADJOURNMENT

Elizabeth Christy moved to adjourned at 5:32 p.m. and seconded by Malcolm Alter.