



PUBLIC WORKS DEPARTMENT

MAYOR: Lauren McLean | DIRECTOR: Stephan Burgos

MEMO

TO: Mayor and Council
FROM: Steve Burgos, Public Works Director
CC: Courtney Washburn
DATE: August 7, 2020
RE: Water Renewal Utility Plan: Regulatory Requirements and Climate Change Impacts

EXECUTIVE SUMMARY

This memo is the third in a series of six that Water Renewal Services will deliver to city council in order to provide background information on the elements that comprise the Water Renewal Utility Plan. City council action on the recommended plan will be requested once all background materials have been delivered. This memo summarizes the current and future regulatory requirements and climate change pressures facing Boise.

Boise's Water Renewal Services renews approximately 10 billion gallons of water every year. Currently, this water is discharged to the Boise River. The quality requirements of the renewed water are determined by the Environmental Protection Agency (EPA) and the Idaho Department of Environmental Quality (IDEQ). These requirements are established for worker safety, to protect public health and the health of the Boise River. Significant public outreach and community survey results consistently indicate that protecting and enhancing the Boise River water quality and habitat should continue to be a top priority for the city. For Water Renewal Services, these requirements and community expectations drive capital investments and require diligent operational oversight. Meeting the anticipated regulatory requirements over the next 20 years is expected to require approximately \$160 million in capital investment.

Boise is also facing increasing pressures due to climate change, including greater stresses on water resources in the Treasure Valley. The city expects to see changing precipitation patterns, growing use of irrigation water and increasing drought frequency. When looked at in combination, these pressures will place an increasing value on reliable water supplies within the Treasure Valley. Water Renewal Services is uniquely positioned to support the community in continued improvement of the Boise River and in combating climate change impacts. The Water Renewal Utility Plan evaluated how Water Renewal Services can address the impacts of climate change by

making recycled water available in our community. Additionally, Water Renewal Services will align with Boise's Energy Future to identify opportunities for energy efficiency, reductions in natural gas use, and the use of 100% clean electricity by 2030.

INTRODUCTION

Multiple community and stakeholder surveys demonstrated that the Boise River is regarded as an important piece of our city's identity and that protecting and enhancing it should be a continued priority. At the core of protecting the Boise River is continuing to meet the regulatory requirements from the Environmental Protection Agency (EPA), now administered by Idaho Department of Environmental Quality (IDEQ). The permits include limits that must be achieved at the city's water renewal facilities before renewed water is discharged to the Boise River. These standards have grown increasingly stringent over the last several decades and this trend is expected to continue. Meeting the regulations requires additional investment from the city, which the Water Renewal Utility Plan addresses.

The effects of climate change are integral to the city's planning process. Our community has reinforced the need for a resilient utility and city that can respond to changing conditions and pressures. Water Renewal Services has a unique opportunity to help lead the city's response to climate change. The renewed water produced at the water renewal facilities can be used as a clean, reliable water supply for the community.

As we look to the future, regulatory requirements will become more stringent and environmental factors such as water scarcity and climate change become increasingly impactful. As a community, Boiseans have voiced that preparedness, environmental protection and maximizing the use of our water locally are all important community values.

BACKGROUND

Regulatory Requirements

The city is responsible for meeting both state and federal regulatory requirements for renewed water that is discharged into the Boise River. The Clean Water Act prohibits anybody or any entity from discharging pollutants (treated wastewater) through a point source, such as a pipeline, into a water of the United States unless they have a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit contains limits on what and where the water renewal facilities can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not impact public health or deteriorate the quality of the receiving water body.

The permits contain numerical limits to protect water quality. Regulatory agencies, with input from the public, determine what is considered the 'beneficial use' of a water body. These uses include water supply, human contact recreation, and aquatic life. Because the community expects the Boise River to meet these uses, Idaho Department of Environmental Quality (IDEQ) determines how much of a pollutant the river can have



while meeting the beneficial uses then translate this amount into numeric limits for water renewal facility permits. Historically, the city's commitment to meet and sometimes exceed the treatment levels required by these regulations has been an important piece of the river's protection. Meeting the permits limits, exceeding treatment requirements and developing innovative approaches mirror the community expectation for water quality and habitat improvement in the Boise River.

Water Renewal Services has a history of innovating to cost effectively meet regulations while achieving the greatest economic and environmental benefits possible. For example, the city has gained national recognition for Dixie Drain Phosphorus Removal Facility and the unprecedented approach to managing phosphorus through pollutant offsets. The city achieves the required phosphorus removal by treating an irrigation drain downstream and removing more phosphorus than the permit requires, with increased environmental benefit and at a cost that is significantly less expensive than upgrades at the water renewal facilities to achieve the same removal. More recently, the city has been looking at creative methods to address river temperatures. The city is investigating the temperature reduction effectiveness of mainstream and side stream river habitat improvement and shading projects. The city plans to use these alternative projects in lieu of larger, more expensive capital projects that have negative environmental impacts.

Climate Change Impacts

Boise is a high-desert city with low annual precipitation and hot, arid summer temperatures. This makes our community highly susceptible to drought due to our reliance on water sources like snowpack, supplied surface water, and groundwater for much of our needs.

Climate change exacerbates the water scarcity dilemma, with impacts already being felt. Boiseans have noticed differences in the Treasure Valley's climate: hotter days in the summer, lower water levels in Lucky Peak Reservoir, winter recreation starting later in the season, and reduced air quality due to severe wildfires locally and throughout the western U.S. Because of these concerns, the city initiated the Boise Climate Adaptation Assessment, a research partnership between the University of Idaho, Boise State University, and the Langdon Group. The risk assessment was based on 20 down-scaled regional models, specific to the Boise watershed and airshed. The assessment concluded that Boise will see a significant increase in severe climate events and dangers, including the following outcomes, by mid-century:

- Fourfold increase in the number of heat stress days (days in which the heat index exceeds 91 degrees)
- 100% increase in the number of heavy precipitation days (days with an excessive amount of rainfall that exceed the capacity of current stormwater and water renewal systems)
- Irrigation demands will double
- Moderate drought will occur every other year and severe drought in one of every three-four years



- 400% increase in poor air quality days due to wildfires
- Seasonal stream flows will see more runoff in the winter (increasing flooding dangers), less in spring and summer

In relation to energy, Water Renewal Services uses approximately 40% of the city’s overall municipal electricity use. Boise’s Energy Future provides a strategy for meeting the city’s clean electricity goals. The Water Renewal Utility Plan is aligned with Boise’s Energy Future to help the city achieve these goals.

Identifying alternative water management strategies and integration of renewable energy will be key to mitigating the effects of climate change on our community. The Water Renewal Utility Plan considered how Water Renewal Services can play a role in this mitigation.

ANALYSIS

Regulatory Requirements

The Water Renewal Utility Plan evaluated how current and future regulatory requirements will influence Water Renewal Services’ actions and investments. The information in the plan considered the investments needed to address existing phosphorus, ammonia, and temperature requirements as well as expected future regulations. Conclusions in the plan were informed by the city’s ongoing collaboration with IDEQ as they work to develop the city’s new Idaho Pollutant Discharge Elimination System (IPDES) permit. The IDEQ now administers the city’s Clean Water Act permit and will reissue the permit with new limitations and conditions in 2021.

Over the next two decades, the city expects to invest between \$130 million - \$190 million to address the increasingly stringent regulations. Table 1 provides a breakdown of the expected costs.

Requirements	Expected 20-Year Investment ^a
Phosphorus ^b	\$45M - \$67M
Temperature ^c	\$16M - \$24M
Future Regulatory Requirements ^d	\$64M - \$96M
TOTAL ^e	\$130M - \$190M

^a All costs presented as 2020 dollars

^b Additional investments to address phosphorus limits

^c Assumes implementation of 316(a) variance approach. Total costs for compliance shown, but half of costs are associated with level of service goals

^d Dependent on direction from Water Renewal Utility Plan

^e Totals rounded to the nearest \$10M



The expected costs for meeting regulatory requirements, such as those presented in Table 1, are largely driven by the end use of the water. In river environments like the Boise River, phosphorus and temperature often require treatment to protect water quality. However, shifting towards more recycled water use or aquifer recharge would shift the regulatory focus to salts and nitrogen, which is a key concern for those uses. Ultimately, the goal of these regulations is the same – protect the water quality for all our community’s water resources.

Going forward, the city will continue to actively identify and monitor future regulatory issues. As we have heard from the community, there is an expectation for continued use and improvement of the Boise River. By anticipating the resulting heightened regulations, the Water Renewal Utility Plan will aid in achieving the desired water quality standards, supporting both community values and regulatory needs.

Climate Change Impacts

Climate change will have a profound impact on water resources in the Treasure Valley, particularly how we value water. The 2019 water right rental rates in the Treasure Valley were approximately \$20/acre-foot. In drought-stricken areas, rental rates can easily exceed \$1,000/acre-foot. Climate change and increasing water scarcity will increase the value of water over time.

This trend will continue and result in the need for consistent, drought-proof water supplies. Creating recycled water in the future at the water renewal facilities is one such drought-proof water supply. The Water Renewal Utility Plan considered how this water could be put to beneficial use in our community. Options such as recycling water in industrial applications, offsetting demand for irrigation supplies, and putting the water back in the aquifer were evaluated. Each of these applications would offset existing demands on the city’s water resources and provide a valuable use of our community’s renewed water.

Monitoring and understanding the value of water to our community will be a key management metric moving forward. This metric will allow Water Renewal Services to make economically sound decisions on how water should be renewed and recycled. The dynamic nature of climate change means this will be a moving target requiring a plan that is flexible and adaptable.

CONCLUSION

Water Renewal Services faces external pressures related to regulatory requirements, climate change, and water scarcity. These pressures impact how we will manage our water in the future. The Water Renewal Utility Plan provides an opportunity to proactively identify and address these pressures. Through investments in our water renewal system, we can be better positioned to mitigate water scarcity and climate change, while continuing to achieve community resiliency and sustainability goals.



REFERENCE DOCUMENTS

The following documents related to this topic are available upon request:

- Boise Climate Adaptation Assessment
- Boise's Energy Future
- Idaho Pollutant Discharge Elimination System (IPDES) Permit Renewal Documents
 - City of Boise Justification for Total Phosphorus Schedules of Compliance
 - Documentation of Combined Phosphorus Effluent Limitations in IPDES Permits for Lander and West Boise Water Renewal Facilities
 - City of Boise 316(a) Demonstration Project for IPDES permits ID00200443 and ID0023981 (in progress).

RECOMMENDED OR REQUESTED ACTION

Information only.

