



<b>ACTION SHEET</b> <b>PUBLIC UTILITES COMMITTEE MEETING OF 4/2/14</b>
<b>ISSUE NO. 6</b>  Update on the McClure/Nichols Reservoir Project. (Alex Puglisi and Robert Jorgensen)
<b>PUBLIC UTILITES COMMITTEE ACTION: Okay to forward to April 30, 2014 City Council meeting as an Informational Item.</b>
<b>SPECIAL CONDITIONS OR AMENDMENTS:</b>
<b>STAFF FOLLOW UP:</b>

<b>VOTE:</b>	<b>FOR</b>	<b>AGAINST</b>	<b>ABSTAIN</b>
COUNCILOR RIVERA, CHAIR			
COUNCILOR MAESTAS			
COUNCILOR BUSHEE			
COUNCILOR DIMAS			
COUNCILOR IVES			

# City of Santa Fe, New Mexico

# memo

**DATE:** March 26, 2014

**TO:** Public Utilities Committee Members  
City Council Members

**VIA:** Nick Schiavo, Interim Public Utilities Department and Water Division  
Director

**FROM:** Alex Puglisi, Interim Manager, Source of Supply Section

*Alex A. Puglisi*

## **ITEM AND ISSUE:**

In conjunction with the Nichols and McClure Reservoirs Intake Tower Rehabilitation Project, the Public Utilities Department-Source of Supply Section will manage remaining reservoir storage levels to ensure that the City can beneficially utilize as much of its surface water diversion rights as practicable. In 2014, McClure Reservoirs has been used to contain the majority of runoff from the Santa Fe water shed, except for consistent releases of 1.2 to 3.0 million gallons per day (MGD), which have been processed at the Canyon Road Water Treatment Plant (CRWTP) to provide drinking water to the citizens of Santa Fe.

The Source of Supply Section has started managed releases of the water stored in McClure Dam to maintain, and ultimately reduce, current levels of storage in the reservoir in a manner which will maximize all practicable beneficial uses of Santa Fe's surface water diversion rights. Storage levels in McClure had progressively increased in the month of March due to past and recent snowfall in the watershed and associated increases in runoff due to higher than average temperatures.

## **BACKGROUND AND SUMMARY:**

The Source of Supply Section started discharging 5.0 MGD to the Santa Fe River on March 19<sup>th</sup> in order to increase the level of drinking water treatment at the CRWTP to 3.0 MGD, meet the projected start date for rehabilitation of the McClure Reservoir Intake Tower Project, lower McClure storage levels down to acceptable levels in preparation for remaining Spring 2014 runoff, and provide irrigation flows to Acequia Madre and other irrigation systems. Three of the 5.0 million gallons per day (MGD) in initial flows were diverted to treatment at the CRWTP with 2.0 MGD sent to Acequia Madre. Since the CRWTP treatment processes had to be adjusted to treat four times the amount of water than previous treatment levels during the winter months, some water had to be sent directly to the river (1.0 MGD) during the initial release to allow

treatment levels to be adjusted to accommodate the increased flow containing higher levels of organic materials and turbidity.

As Spring and Summer 2014 progress, releases from McClure Dam will increase to pre-calculated maximum volumes in order to meet the Office of the State Engineer (OSE) Dam Safety Guidelines for the safe draining and filling of reservoir impoundments, while still meeting the proposed construction date of September 1st for the replacement of the McClure Intake Tower. The planned draining of McClure Reservoir and refilling of Nichols Reservoir will both be performed in accordance with the aforementioned OSE guidelines, which call for a maximum one (1) foot per day increase, or decrease, in impoundment storage levels. Any water released from McClure above the volume undergoing treatment by the CRWTP during this time period will be utilized for Living River Ordinance flow releases, irrigation deliveries, the filling of Nichols Reservoir to an approximate 80% storage level, and any pass-through flows required in response to monsoonal precipitation or OSE storage restrictions. It is projected that the CRWTP will be operated at a level of 7.0 MGD depending on the water quality of the water being released. Releases from McClure will peak in the months of May and June when Living River and irrigation releases are both in effect and will taper off from that peak until the reservoir is completely empty. All efforts will be made to conduct releases in a manner which will minimize the loss of any pooled water volumes due to water quality degradation. Such degradation will be hastened by lower reservoir pool depths, warm summer temperatures, rapid growth of algae, and the higher levels of organic matter and sediment present at the bottom of the reservoir. The attached construction update from the Department's engineering staff provides more detail on the status of the Nichols and McClure Reservoir Improvements Project and the proposed milestones for completion.

#### **RECOMMENDATION:**

The Public Utilities Department recommends that releases from McClure Reservoir be performed throughout Spring and Summer 2014, as determined by calculations made by staff to maximize the use of stored water for beneficial uses such as the production of drinking water for the citizens of Santa Fe, Living River Ordinance flows, and irrigation deliveries. All calculations will be updated on a weekly basis, at a minimum, to establish any adjustments in release volumes which must be made to account for uncertainties such as precipitation levels, public consumption levels, Buckman Direct Diversion Water Treatment Plant production rates, and irrigation demand.

It is anticipated that flows will be at sustainable levels suitable for the Annual Fishing Derby after the first week in June through the end of the month. Therefore, the Public Utilities Department is also recommending that plans for the fishing derby focus on this time period for that annual event.

## McClure & Nichols Reservoirs Improvements

Major rehabilitation work at Nichols Dam and McClure Dam is underway. A \$5,596,539 construction contract was awarded to RMCI, Inc. to replace intake towers at each dam. Replacement of the intake towers is needed to improve dam safety, operating personnel safety, and to improve flow control of reservoir releases and Living River target flows.

Water is released from a dam in either a controlled release through the outlet works or over the spillway when the water level reaches the spillway overflow elevation. The outlet works are used to make controlled releases of reservoir water impounded behind the dam. The outlet works consists of an intake structure that has valve openings at various heights that allow reservoir water to flow into the structure at a selected flow rate. Water then flows down the intake tower to an outlet conduit and through the bottom of the dam back into the river and/or pipeline.

McClure Dam was originally constructed in the 1920's and raised in the 1940's. The existing vertical concrete intake tower is slightly over 100 feet in height with an 8 foot outside diameter and an inside diameter of only 4 feet. Nichols Dam was originally constructed in the early 1940's. The now demolished vertical concrete intake tower was about 80 feet in height with an outside diameter of 10 feet and a 5 foot inside diameter.

The intake towers at both dams are located several hundred feet from the dam crest. Operations and maintenance staff must use a boat to reach the towers or walk across ice when the reservoirs are frozen. Once personnel reach the tower, they must climb a vertical ladder to reach the top of the tower. Depending on the reservoir level, the climb could be 5- 60 feet high. To access the valves on the inside of the tower, operating personnel must then descend a vertical ladder in the same manner. Access to the intake towers and the work space inside the towers is extremely difficult and hazardous.

Santa Fe Engineering Consultants prepared a preliminary engineering report recommending that catwalks from the dam crest to the intake tower be constructed to improve personnel safety, and that intake valves be repaired or replaced to improve operations and dam safety. However, a detailed structural analysis at the beginning of the engineering design work found that the existing intake towers did not meet current seismic stability requirements; therefore, a decision was made to replace the existing vertical intake towers.

An inclined intake structure was designed to replace the existing vertical intake tower. The inclined intake structure will run along the upstream face of the dam from the dam crest to the outlet conduit. Direct access from the dam crest will improve operator safety eliminating the use of a boat or walking over ice and then climbing a tower. The inclined intake structure will be constructed of reinforced concrete and have a square cross section that is 8 feet wide and 8 feet high on the inside with 2 foot thick walls, floor, and roof sections. Access doors will be located on the dam crest and personnel will be able to walk down stairs into the structure. The

inclined intake structure will have sufficient space for maintenance of piping, valves, and meters which will be located inside the structure. Reservoir water will be carried in the piping inside the concrete intake tunnel so the tunnel will be dry. The release of water through the reservoirs will be precisely controlled by automatically controlled valves with metered flow. Dam safety will be increased with the installation of intake valving and a redundant emergency drain valve system which can be controlled from either the dam crest or remotely at the Canyon Road Water Treatment Plant and with improved dam instrumentation.

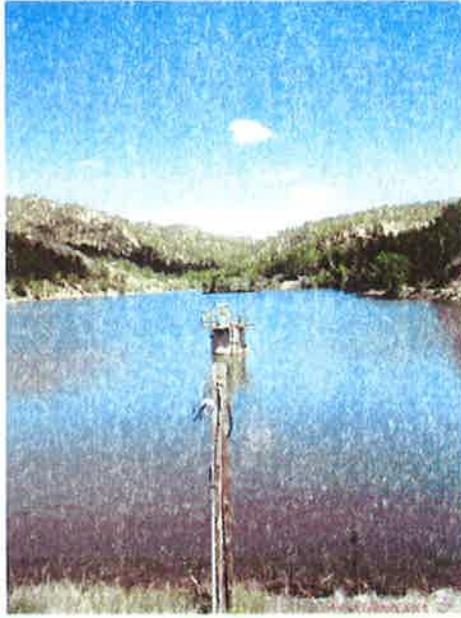
Construction of the inclined intake structure requires that the reservoirs be drained, so work will be done on one reservoir per year. Work at Nichols Dam began September 3, 2013 and is currently on schedule to be substantially completed in mid-May 2014. Construction for McClure Dam is scheduled to begin September 1, 2014 and be substantially completed by June 8, 2015.

The construction schedule was developed to minimize the adverse impacts on reservoir storage. Taking a reservoir out of service beginning in September allows reservoir water to be utilized during peak demand in the summer months. The refilling of the reservoir starting in late spring allows efficient capture of late spring runoff from the Santa Fe River.

Work at Nichols Reservoir will be sufficiently completed by mid-May 2014 so that refilling the reservoir can begin. The draining of McClure Reservoir is now underway so that it will be drained to the elevation of the lowest intake valve by September 1, 2014. so There after RMCI can begin demolition and subsequent construction work.

A reservoir management plan has been developed to accommodate the work at Nichols Reservoir and at McClure Reservoir. The water drained from McClure Reservoir will be treated and delivered to consumers; will accommodate bypass flows under the Santa Fe 'living river' program, supply acequias, and fill Nichols Reservoir once construction is completed. The plan maximizes the use of water for treatment and delivery to water customers and minimizes excess release down the Santa Fe River.

The reservoir management plan will undergo periodic review and adjustment based on watershed runoff projections, weather conditions and precipitation, availability of other water supply sources such as the Buckman Direct Diversion, Buckman Well Field, and water customers' demand.



**Nichols Reservoir & Intake Tower Prior to Construction**



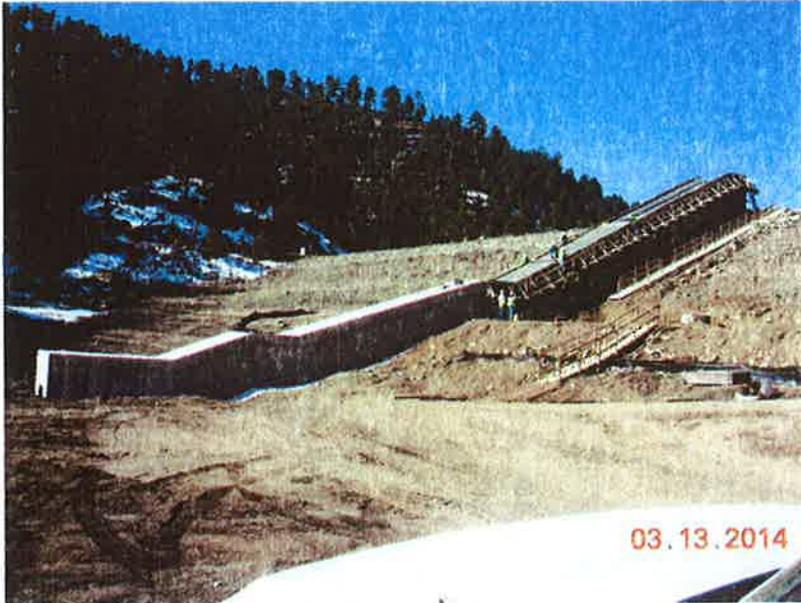
**Nichols Reservoir Drained to Lowest Valve September 18, 2013**



Nichols Dam Stop Log Removed September 25, 2013.



Nichols Dam Showing Tower Demolition. Note: Santa Fe River Streamflow Feeding the Canyon Road Water Treatment Plant



Nichols Dam Inclined Intake Structure Concrete Construction



Nichols Dam Inclined Intake Structure Entrance



**McClure Dam and Reservoir on October 3, 2013. The Reservoir was at 86% of Total Storage Capacity After Heavy Late Summer/Early Fall Rains**

# Nichols and McClure Reservoirs Restoration Project

## Frequently Asked Questions

### ***Why are improvements at the reservoirs needed?***

Replacement of the intake towers at both Nichols and McClure Dams are needed to improve dam safety, operating personnel safety, and improve flow control of reservoir releases.

- Existing intake towers are 70 – 80 years old and do not meet current seismic stability requirements.
- Intake valves leak and only one valve at each tower is in operating condition.
- Intake structure is located several hundred feet from the shore and can only be accessed by boat or walking on ice when the reservoir is frozen.
- Intake towers are 80 - 100 feet high and only 4 – 5 feet in diameter and valves and valve actuators are located inside the tower where there is inadequate room for repair, replacement, or maintenance.

### ***How long will construction take?***

Construction takes 9 months per dam and will be done one dam per year. Work at Nichols Dam began September 3, 2013 and will be completed in mid-May 2014, when filling of the reservoir will begin. Taking a reservoir out of service beginning in September allows reservoir water to be used to meet peak summer demand. Construction at McClure Dam will begin September 1, 2014 and be substantially completed in late spring 2015 when subsequent filling of the reservoir will begin. Reservoir refilling in late spring allows the capture of late spring runoff from the Santa Fe River watershed.

### ***Why do the reservoirs have to be drained?***

Water in the reservoirs must be drained for the removal of the existing intake towers. New concrete intake structures will be constructed from the bottom of the dams to the crest of the dams on the upstream face of the dam embankments.

### ***What will happen to the water being drained from McClure Reservoir?***

A reservoir management plan has been developed to maximize the treatment and delivery of water to Santa Fe customers, meet target flows under Santa Fe's 'living river' program, supply acequias, and fill Nichols Reservoir. The reservoir management plan will be adjusted based on watershed runoff projections, weather conditions, precipitation, and availability of other water supply sources such as the Buckman Direct Diversion Project, Buckman Well Field, and customer's water demand.

### ***How quickly will McClure Reservoir be drained?***

Currently, McClure Reservoir is 70% of total storage capacity. It is anticipated it will take until late summer to drain McClure Reservoir. The Office of State Engineer recommends the City Water Division draw down only 1 foot in elevation of water storage capacity per day to avoid damage in the earthen dam embankment such as sloughing. As the surface water area shrinks, the releases from McClure Reservoir will slow down.

***What will happen to the fish in the reservoir?***

Fish will be salvaged to the extent possible and transferred to Nichols reservoir to replace the fish which were moved from Nichols Reservoir to McClure Reservoir last year.

***Will customers experience water shortages?***

No. McClure Reservoir water will continue to be used throughout the summer, with the majority used as drinking water. The City has additional water sources including the Buckman Direct Diversion Facility, the Buckman Production Wells and the wells within the City limits. Even without the reservoirs and continuous drought, the City can still meet customer water demand during the peak demand of the summer months.

***How much water do we get from the Santa Fe River Watershed and reservoirs?***

The Santa Fe River watershed provides up to 40% of Santa Fe's drinking water. The reservoir storage allows water to be used as needed to meet water demand.

- McClure Reservoir holds 3,257 acre feet of water or 1,061 million gallons when completely full.
- Nichols Reservoir holds 684 acre feet of water or 223 million gallons when completely full.

***What happens if there is a wildfire in the watershed, the Buckman Direct Diversion isn't operational due to low flows on the Rio Grande, or another heavy rain storm similar to the rain events last fall?***

The City Water Division has planned for worst-case scenarios and has the flexibility to use a combination of different water sources and water saved from the community's response to water conservation efforts, particularly during peak demand.

***Can work at McClure Dam be postponed?***

Postponing the intake structure replacement offers no benefit. The longer it takes to replace the intake structure, the higher probability that costly repairs to outdated facilities will be required. The degradation of the functionality of the intake structure will also result if replacement is postponed putting the water supply and dam safety at greater risk.

***Where can I find more information?***

The City provides daily information on water production, reservoir capacity, and total system storage at [http://www.santafenm.gov/daily\\_water\\_production\\_reports](http://www.santafenm.gov/daily_water_production_reports).

For drought management information and water conservation, please visit [www.savewatersantafe.com](http://www.savewatersantafe.com).