



JULY 10, 2019  
WATER CONSERVATION AND DROUGHT MANAGEMENT  
ADVISORY BOARD  
REGULAR MEETING 2:00 P.M.

City Council Chambers  
217 East Center Street  
Moab, Utah 84532

1. Call To Order
2. Approval Of Minutes

Documents:

[WATER BOARD MINUTES 2019-06-12 DRAFT.PDF.PDF](#)

3. Citizens To Be Heard
4. Board And Staff Reports
5. Other Business
- 5.I. Water Data--Discussion

Documents:

[JUNE 2019 MOAB WATER FACTS.PDF](#)

- 5.II. HSA Phase II Report And Memo To Council--Discussion

Documents:

[WATER BOARD MEMO RE HESA II.PDF](#)

- 5.III. Outdoor Watering Campaign--Review
6. Adjournment

**Special Accommodations:**

In compliance with the Americans with Disabilities Act, individuals needing special accommodations during this meeting should notify the Recorder's Office at 217 East Center Street, Moab, Utah 84532; or phone (435) 259-5121 at least two (2) working days prior to the meeting.

Check our website for updates at: [www.moabcity.org](http://www.moabcity.org)

**CITY OF MOAB**  
**WATER CONSERVATION AND DROUGHT MANAGEMENT ADVISORY BOARD**  
**REGULAR MEETING MINUTES—DRAFT**  
**JUNE 12, 2019**

**Call to Order:** Board Chair Kara Dohrenwend called the meeting to order at 2:01 PM in the City Council Chambers located at 217 East Center Street in Moab. In attendance were Water Board members Arne Hultquist, Mike Duncan, Kara Dohrenwend and Denver Perkins. Also in attendance were City Councilmember Kalen Jones, City Planner Nora Shepard, Assistant City Engineer Mark Jolissaint, City Engineer Chuck Williams, Sustainability Director Rosemarie Russo, Records/Project Specialist Eve Tallman and one member of the public. An audio recording of the meeting is archived at: <https://www.utah.gov/pmn/index.html>.

**Approval of Minutes:** Hultquist moved to approve the Water Board Minutes of May 8, 2019. Perkins seconded the motion. The motion passed 4-0 with Boardmembers Perkins, Duncan, Dohrenwend and Hultquist voting aye.

**Citizens to be Heard:** There were no citizens to be heard.

**Debrief of Utah Water Conservation Forum WaterCon**

Councilmember Jones reported on the water conservation conference he attended and discussed the State's municipal goals for 2030 as well as 2040 and 2065 projections. He stated Grand County is in a region consisting of Grand, San Juan, Emery and Carbon counties and noted a 19 percent conservation goal for 2030 using a 2015 baseline. He suggested boardmembers could find out more information at [water.utah.gov/waterwise](http://water.utah.gov/waterwise).

**Water Budget and Development Implications Recommendation—Approved**

**Discussion:** City Engineer Williams discussed the recent document from the Hydrologic Systems Analysis, LLC (HSA—Ken Kolm and Paul van der Heijde) that provided responses to Water Advisory Board concerns with the Hydrologic and Environmental System Analysis (HESA) Phase 1 Report. He stated further comments could be forwarded to him on the Phase 1 or 2 reports. Discussion ensued regarding the Mayor's request for statistics that could inform the Future Land Use Plan and other future policy recommendations. Referencing the Kolm report and the Hanson Allen and Luce (HAL) culinary water master plan, ranges of water supply figures and projected need were mentioned. HAL predicted a Moab population of 8,710 in 2060, representing one percent growth and requiring 5,662 Equivalent Residential Units (ERCs). Williams stated that the analysis conducted by the engineering staff determined the HAL numbers were reliable. Discussion continued regarding the range of available water—9,172 Acre Feet (AF) to 11,050 AF and when accounting for a 20 percent April snowpack due to climate change, a range of 7,337 AF to 9,126 AF; these figures include surface flow in Mill Creek. It was pointed out that these figures include surface water that would need to be treated at significant expense. Williams was asked about competition with Grand Water and Sewer Services Agency (GWSSA) and San Juan County and he indicated this question is key. Hultquist brought up that more storage tanks for the City were needed. He added that if the Kolm and HAL reports included only groundwater from the Glen Canyon Aquifer (GCA) there would be far less groundwater than reported. Production potential from current wells was discussed as a matter to be definitively determined.

The discussion turned to the current overnight accommodation moratorium with Planner Shepard. She summarized progress including overlays for existing structures and legalizing existing rental units. She clarified that the direction indicated by Council would be for no additional new units in the short term and higher standards for future development and

redevelopment. The percentage of water used by overnight accommodations including vested units was requested. The question was raised whether growth could be limited based on water supply limitations. Hultquist suggested the Water Board could help draft ordinances for water conservation in general. The Board discussed the water quantity available according to the City Engineer was not easily accessible. Perkins suggested the City should protect its water from encroaching uses by San Juan County. Duncan concurred that there is a cost differential between easy-to-access water versus tough water to access. Hultquist acknowledged the science was imperfect. Tallman brought up buildout numbers including overnight accommodations. Dohrenwend offered to summarize the meeting's discussion in a memo, and if Boardmembers agreed, she would pass it on to City leadership. Duncan brought up the timeline regarding the moratorium. Jeff Adams, a member of the audience, pointed out the Kolm water budget had no range of available water and was stated as 9,000 AF.

**Motion and Vote:** Hultquist moved to approve a motion to direct the Chair to draft a memo to Mayor and Council and senior staff regarding the Board's response to the HSA Phase 2 report and available water supply. Perkins seconded the motion. The motion carried 4-0 aye, with Duncan, Dohrenwend, Perkins and Hultquist voting aye. It was agreed the memo would include an offer to meet with make a presentation to Council.

**Moab Water Facts—Approved**

**Motion and Vote:** Corrections and revisions were offered with a call for final edits so the document could be prepared to send with the Board's memo to Council. Hultquist moved to approve the Moab Water Facts June 2019 revision. Perkins seconded the motion. The motion carried 4-0 aye, with Duncan, Dohrenwend, Perkins and Hultquist voting aye.

**Vulnerability, Consequences and Adaptive Planning Study (VCAPS):**

Russo indicated she had requested funding from the Travel Council. Duncan noted GWSSA had requested funding from Grand County.

**Future Agenda Items:** Further discussion of water supply, Kolm review, Council memo, watering campaign.

**Adjournment:** Hultquist moved to adjourn. Perkins seconded the motion. By unanimous vote, the meeting was adjourned at 4:06 PM.

# MOAB WATER FACTS

City of Moab Water Conservation and Drought Management Advisory Board

Updated June 2019

## Estimated Current and Future Water Use for Moab & Spanish Valley

Water Provider	Estimates of current groundwater use	Estimates of groundwater production potential	Estimates of projected groundwater requirements
Moab City	2,283 AF <sup>2</sup>	5,401 AF <sup>2</sup>	City at build-out: 9,434 AF <sup>2</sup>
Grand Water & Sewer Services Agency (GWSSA)	830 AF <sup>3</sup>	3,940 AF <sup>3</sup> (reported as 9,444 AF yet only 3,940 AF of water rights exist)	GWSSA by 2060: 1,550 AF <sup>3</sup>
San Juan Spanish Valley Special Services District (SJSVSSD)	0 AF (residents currently use existing wells & springs)	500 AF <sup>1</sup>	SJSVSSD by 2060: 500 (5,000 if full rights are developed as stated in the SJSVSSD 40-year water right plan) <sup>1</sup>
Private Wells for domestic use	400 AF <sup>1</sup>	400 AF <sup>1</sup>	If use stays the same: 400 AF <sup>1</sup>
Irrigation wells & springs (private)	700 AF <sup>1</sup>	700 AF <sup>1</sup>	700 AF <sup>1</sup>
Kens Lake Diversion (GCWCD & Moab Irrigation Co. at Sheley Tunnel)	3,100 AF <sup>1</sup>	3,100 AF <sup>1</sup>	3,100 AF <sup>1</sup>
Moab Lower Diversions	1,783 <sup>4</sup>	1,783 AF <sup>4</sup>	1,783 AF <sup>4</sup>
	<b>Estimated current total groundwater being diverted = 9,096 AF</b>	<b>Current groundwater production potential = 15,824 AF</b>	<b>Estimated total future water requirements = 17,467 AF</b>

### Sources:

1. Utah Division of Water Rights
2. Moab City 2016 Water Conservation Plan
3. GWSSA 2014 Water Conservation Plan
4. Moab Irrigation Company 2017 Water Distribution Plan

## Moab Area Water Rights Overview

### Paper Groundwater Rights:

Moab City: 10,091 AF<sup>2</sup>

GWSSA: 3,940 AF<sup>3</sup>

SJSVSSD: 500 AF<sup>1</sup> (pending water right appropriation for 4,500 additional AF)

Estimated private well water rights currently in use: 400 AF<sup>1</sup>

Estimated irrigation well water rights currently in use: 700 AF<sup>1</sup>

### Surface water rights that are "base flow" or groundwater:

GCWCD & MIC @ Sheley Tunnel: 3,100 AF<sup>1</sup>

MIC Lower Diversions: 1,783 AF<sup>4</sup>

### Total amount of groundwater currently considered appropriated:

Paper water rights (15,631 total) + base flow rights (4,883) = 20,514 AF

## Other Details from Division of Water Rights

Spanish Valley is currently closed to new appropriation of surface water<sup>1</sup>

Current local groundwater appropriation limit for one acre parcels is 6.73 AF\*<sup>1</sup>

Spanish Valley groundwater is open to transfer appropriations<sup>1</sup>

The adjudication process currently being administered by the Division of Water Rights will be ongoing for at least another year and may alter estimates of groundwater rights.

\* See <https://www.waterrights.utah.gov/wrinfo/policy/wrareas/area05.asp>

### Conversions and Acronyms:

AF=Acre Foot or Acre Feet

1 AF=325,851 gallons

cfs=cubic feet per second

1 cubic foot=~7.5 gallons

1 cfs/year=236,000,000 gallons

1 cfs/year=724 AF

100 gallons per minute=161.41 AF

GWSSA=Grand Water and Sewer Service Agency

SJSVSSD=San Juan Spanish Valley Special Service District

UDWRi=Utah Division of Water Rights

GW=Groundwater

GCWCD=Grand County Water Conservancy District

MIC=Moab Irrigation Company

TNC=The Nature Conservancy

GCA=Glen Canyon aquifer

VF=Valley Fill aquifer

MAWP=Moab Area Watershed Partnership

### Estimates of Annual Use:

single-family home with landscaping = 1.0 AF  
condominium without landscaping = .45 AF  
seasonal cabin without landscaping = .25 AF  
hotel room = .36 AF

### Overall Moab Usage:

Residential 50%  
Nightly Accommodations 16%  
Other commercial and Institutional 17%  
Cemeteries & Parks 3%  
Water Loss 6%  
Other 8%

### Common Household Uses of Drinking Water (Gallons per Capita per Day)

Bathing: 20  
Toilet Flushing: 24  
Lawn Watering and Pools: 25  
Laundry: 8.5  
Dishwasher: 4  
Car Washing: 2.5  
Drinking and Cooking: 2  
Garbage Disposal: 1

### Wastewater Treatment Quick View

Old plant averaged 1 Million Gallons per Day (MGD)  
New Water Reclamation Facility (WRF) capacity 1.7 MGD  
Old plant used 2 Million Gals of water per month  
New WRF uses 25,000 Gals of water per month

## Groundwater or Surface Water?

Surface water comes from snowmelt or rainwater runoff and is usually associated with rivers, lakes and streams. It also comes from groundwater discharging in springs or "gaining" reaches of streams. Groundwater comes from snowmelt or rainwater infiltrating the ground. It can also come from surface water (streams) infiltrating the ground in "losing" reaches of streams. Streams with water in them when there isn't any snowmelt or precipitation runoff contain groundwater that has discharged to the stream. This amount of water is called base flow. Surface water in streams generally moves quickly through an area, whereas groundwater in aquifers generally moves very slowly. Surface water quality is determined by the geological strata it comes in contact with, along with human-caused contaminants. Groundwater quality is determined by the geological strata it comes in contact with prior to infiltration. The law of groundwater resources is different from, but related to, surface water rights. Groundwater is extracted from underground aquifers (pumping from wells or flowing from springs), the geohydrological characteristics of which vary widely. Recharge rates can vary from year to year. In many cases, they are hydrologically interconnected to surface water resources, recharging from and discharging to water in streams and lakes.

## Water Resources Key Terms

**Aquifer:** A geologic formation that is water-bearing. A geological formation or structure that stores and/or transmits water, such as to wells and springs. Use of the term is usually restricted to those water-bearing formations capable of yielding water in sufficient quantities to constitute a usable supply for people's uses.

**Build-out:** The state of maximum population if all land is developed as zoned.

**Discharge:** Outflow that is measured as the rate at which a volume of water passes a given point in a given period of time.

**Flow System:** Bedrock controlled by topography, degree of dissection, continuity, and hydro structures; and alluvium controlled by collapsed anticlines/graben hydrostructures, topography, dissection, continuity, and deposit thickness.

**Freshwater:** Most of the water on earth is salty. Much of the global supply of freshwater is locked up in glaciers, ice caps, and elsewhere. This means that freshwater supplies for humans and ecosystems must come from the relatively small amounts that run off as surface water or are contained in accessible groundwater aquifers.

**Instream flow protection:** Relatively new principle that balances traditional demands for water withdrawals with services such as boating, fishing, ecosystem protection and scenic values.

**Losing Stream:** Stream or reach of a stream that is losing water by seepage into the ground.

**Prior appropriation water rights:** Awards water rights to the first party to appropriate it and makes beneficial use of it. It is sometimes called "first in time, first in right." Riparian water rights are used in the East, where water is abundant. Municipal governments have certain protections under western water law. While riparian water law tends to arbitrate right holders as equal in status, prior appropriation creates primacies such as that first users have rights that take precedence over those coming later. It was developed because of the arid climate in the West. The first user is referred to as a senior right holder. Later users known as junior rights holders can gain access to the portion of the water not used by senior holders. Appropriation water rights are also "use it or lose it" rights. The rights exist only so long as the water is actually used; if use stops, the right is lost.

**Per capita domestic supply:** The sum of public supply and domestic self-supply in relation to the population. U.S. domestic use averaged 123 gallons per person per day in 1960, 163 gallons in 1980, 164 in 2000 and 320 in 2016.

**Recharge:** Introduction of surface or groundwater into groundwater storage by natural or artificial means.

**Safe yield:** The amount of water that can be withdrawn from an aquifer without significant ecological impacts, which could result from reductions in streamflow where groundwater discharge to the stream provides baseflow. If the amount of groundwater withdrawn exceeds the **safe yield** amounts, the well can go dry. **Safe yield** is generally considered equal to the average replenishment rate of the aquifer from natural and artificial recharge.

**Water withdrawals/consumption:** Groundwater typically falls in the category of open-access resource, but in the West, groundwater laws tend to be consistent with prior appropriation. Groundwater management areas may be empowered to set and enforce rules, such as permitting, well spacing, well construction standards, allocation preferences, limited pumping rates, restrictions on place of use, and water monitoring and reporting.

**Water Terminology:** <https://www.waterrights.utah.gov/wrinfo/glossary.asp>



TO: Mayor and Council  
 FROM: Water Conservation and Drought Management Advisory Board  
 DATE: June 18, 2019

On May 14<sup>th</sup> at the City Council Workshop, the Moab Water Conservation and Drought Management Advisory Board (Water Advisory Board) was asked to work with the City Engineer to provide information regarding water availability to the Mayor and City Council. Based on discussions with the City Engineer, Chuck Williams, the Water Advisory Board submits the following information regarding the amount of water currently accessible to the City of Moab and what may be assumed for the future.

All of the culinary water available to the City, at present, is groundwater. This groundwater comes to us from the Glen Canyon Aquifer by way of the City's springs and wells. In recent years, the City has used about 2200 acre feet of that water annually.

Ken Kolm Report: Water Volume, High and Low Estimates-- Current Use		
CURRENTLY AVAILABLE WATER	Low Estimate	High Estimate
Estimated total volume of water available in Mill Creek & Glen Canyon Aquifer	9172 acre feet	11050 acre feet
Estimated Surface Water	5317 acre feet	5317 acre feet
<b>ESTIMATED GROUNDWATER AVAILABLE</b>	<b>3855 acre feet</b>	<b>5733 acre feet</b>

**The Future**

The Environmental Protection Agency estimates that April snowpack has reduced in the La Sal Mountains over the past 60 years by 20 percent. If that same reduction rate continues into the future the water volume available for use can be anticipated to be lower by at least that amount.

Ken Kolm Report: Water Volume, High and Low Estimates-- Use for 2060		
ANTICIPATED AVAILABLE WATER IN 40 YEARS	Low estimated use	High estimated use
Estimated total volume of water available in Mill Creek & Glen Canyon Aquifer	7337 acre feet	9126 acre feet
Estimated Surface Water	5317 acre feet	5317 acre feet
<b>ESTIMATED GROUNDWATER AVAILABLE</b>	<b>2020 acre feet</b>	<b>3809 acre feet</b>

The Kolm report shows that currently approximately 4,600 acre-feet is available (average of high and low estimates). In 40 years, the average falls to about 3,000 AF.

**Why does this matter?**

Groundwater is the easy-to-access (inexpensive) water available in the Valley. City water use is groundwater, and the rights associated with it are also groundwater rights. Surface water (water flowing in Mill Creek) is potentially useable, but at significant cost. In addition, shifting to using surface rights would require a change in the point of diversion, and Spanish Valley is currently closed to further allocation of surface water rights. Finally, extraction of groundwater from critical locations linked to the Glen Canyon Aquifer upstream of the City springs and wells could reduce both ground and surface water available in the system.

Further, the San Juan Spanish Valley Special Services District (SJSVSSD) recently drilled a well on the fringe of the upper part of the Glen Canyon Aquifer reportedly producing 400 gallons per minute, or approximately 646 acre feet a year; SJSVSSD holds a 500 acre foot water right. The impact of this production on the water volumes outlined above is not yet clear.