



PUBLIC NOTICE IS HEREBY GIVEN THAT THE PLANNING COMMISSION WILL
MEET FOR A REGULAR MEETING IN THE

Grand County Commission Chambers 125 East Center Street, Moab, Utah
May 11, 2026 - 5:30 PM

Call To Order

[Youtube Link](#)

Join Zoom Meeting

[Zoom Link](#)

Meeting ID: 420 993 8173

Find Your Local Number: <https://us02web.zoom.us/j/98078173>

Citizens To Be Heard 5:30 P.M.

We are receiving public comments by phone and online through Zoom. Dial: (669) 900 - 6833 Meeting ID: 420 993 8173 Planning Commission Zoom Link When joining the meeting, you will be placed in a waiting room and be added to the meeting by the moderator. Your comments will be recorded and on YouTube. (Unmute for public comment: *6)

Ex Parte Communications And Disclosures

Approval Of Meeting Minutes

Presentations (15 Min)

County Commission Update

Public Hearings

General Business - Action Items - Discussion And Consideration Of Approval

Discussion Items

1. **Water Use & Preservation Element**

Andrew Jackson, Planning and Zoning Director

2. **Data Center Water Use**

Andrew Jackson, Planning and Zoning Director

Future Considerations

Adjourn

NOTICE OF SPECIAL ACCOMMODATION DURING PUBLIC MEETINGS. In compliance with the Americans with Disabilities Act, individuals with special needs requests wishing to attend Grand County Commission meetings/hearings and other Grand County Boards, Commissions, or Committees are encouraged to contact the County two (2) business days in advance of these events. Specific accommodations necessary to allow participation of disabled persons will be provided to the maximum extent possible. T.D.D. (Telecommunication Device for the Deaf) calls can be answered at:(435) 259-1346. Individuals with speech and/or hearing impairments may also call the Relay Utah by dialing 711. Spanish Relay Utah: 1 (888) 346-3162

It is hereby the policy of Grand County that elected and appointed representatives, staff and members of the Grand County Commission meetings/hearings and other Grand County Boards, Commissions, or Committees may participate in meetings through electronic means. Any form of telecommunication may be used, as long as it allows for real time interaction in the way of discussions, questions and answers, and voting.

At the Grand County Commission meetings/hearings and other Grand County Boards, Commissions, or Committees any citizen, property owner, or public official may be heard on any agenda subject. The number of persons heard and the time allowed for each individual maybe limited at the sole discretion of the Chair. On matters set for public hearings there is a three-minute time limit per person to allow maximum public participation. Upon being recognized by the Chair, please advance to the microphone, state your full name and address, whom you represent, and the subject matter. No person shall interrupt legislative proceedings.

Requests for inclusion on an agenda and supporting documentation must be received by 5:00 PM on the Tuesday prior to a regular Commission Meeting and forty-eight (48) hours prior to any Special Commission Meeting. **Information relative to these meetings/hearings may be obtained at the GrandCounty Commission’s Office,125 East Center Street, Moab, Utah; (435)259-1346.**



AGENDA SUMMARY

Planning Commission Meeting

Date: May 11, 2026

Title: Water Use & Preservation Element

Fiscal Impact:

If this submission is from the general public you will need a commission sponsor, feel free to contact the Commission Administrators Office with any questions commadmin@grandcountyutah.net (435) 259-1342 or contact the Commissioners directly at commission@grandcountyutah.net

Presenter(s): Andrew Jackson, Planning and Zoning Director

Department: Planning and Zoning

Legal Review: No

Approved and within budget? Not Applicable

Budget Number:

Recommended Motion:

Background:

Discussion only

Attachments:

1. Water Use & Preservation Element with edits 5-8-2026

WATER USE &

PRESERVATION ELEMENT

Of the Grand County General Plan

April 2026



GRAND COUNTY
— U T A H —



GRAND COUNTY
— U T A H —



GRAND COUNTY
— U T A H —

In cooperation with the Grand Water and Sewer Service Agency, the Thompson Special Service Water District, and the Arches Special Service District.

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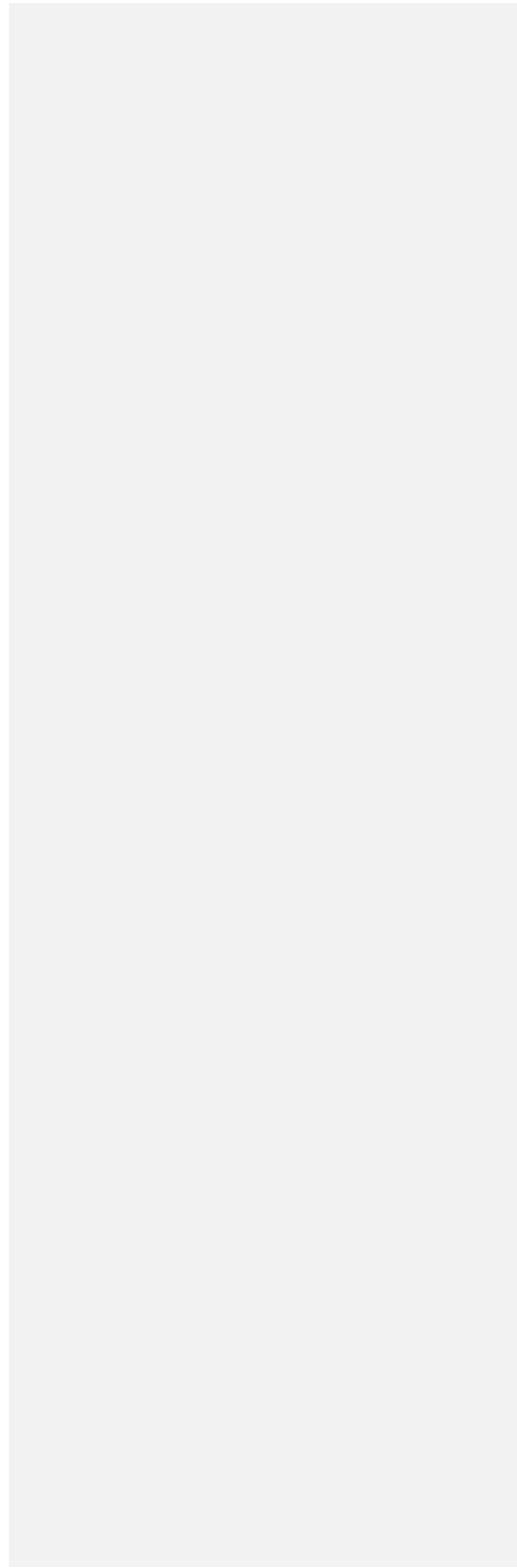
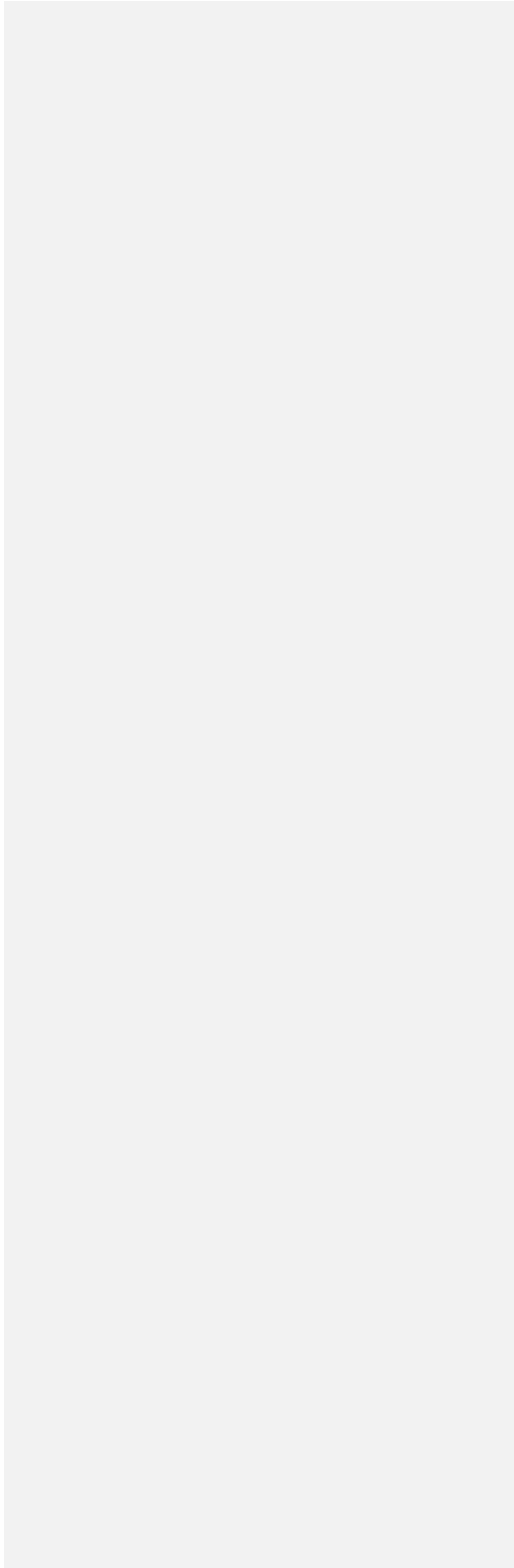
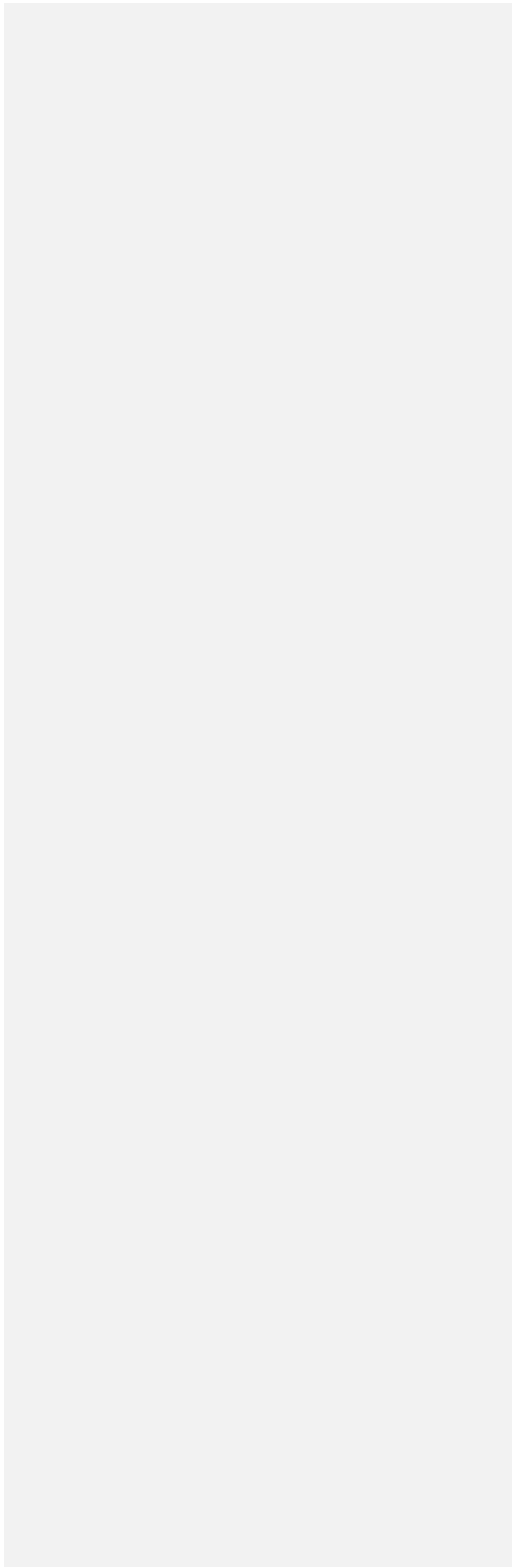


Table 1. Projected Total Water Demand (2025–2060) 3234





DISCLAIMER..... 1

DOCUMENTS REVIEWED..... 4

SECTION 1. INTRODUCTION..... ~~87~~

SECTION 2. POPULATION GROWTH AND DEMAND DRIVERS ~~1214~~

SECTION 3. GRAND COUNTY WATER PROFILE ~~2017~~

SECTION 4. WATER USE CONDITIONS ~~2623~~

SECTION 5. EFFECT OF DEVELOPMENT ON WATER DEMAND ~~3027~~

SECTION 6. METHODS OF REDUCING WATER DEMAND FOR FUTURE DEVELOPMENT ~~3833~~

SECTION 7. METHODS OF REDUCING WATER DEMAND FOR EXISTING DEVELOPMENT..... ~~4439~~

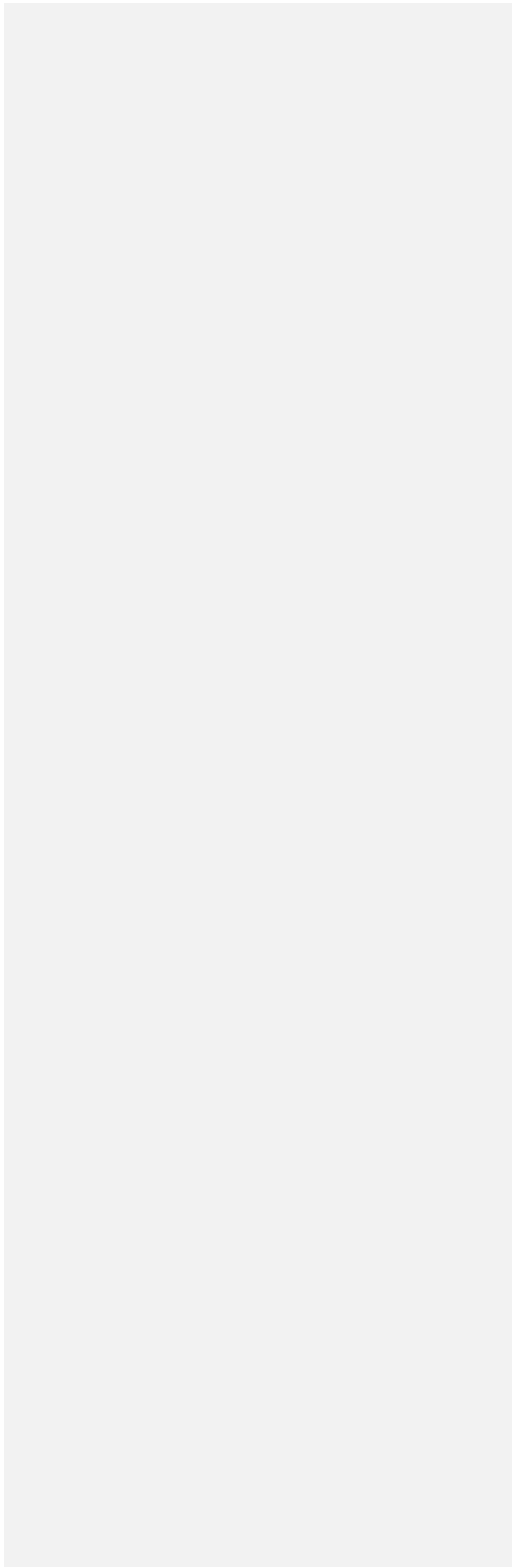
SECTION 8. COUNTY OPERATIONAL IMPROVEMENTS TO ELIMINATE WATER WASTE ~~5045~~

SECTION 9. REGIONAL COLLABORATION ~~5449~~

SECTION 10. GOALS, POLICIES, AND IMPLEMENTATION ~~6055~~

SECTION 11. CONCLUSION..... ~~6661~~

APPENDIX A..... ~~6863~~



DISCLAIMER

This Water Use and Preservation Element is a component of the Grand County General Plan and serves as a **planning and policy document**. It provides guidance for land-use decision-making and establishes a framework for evaluating the relationships among development, water demand, and available supply. It does not constitute a regulatory document, a capital improvement commitment, or a guarantee of water availability.

1. No Guarantee of Water Availability or Service

Nothing in this Element shall be interpreted as:

- A guarantee of water availability for any property, project, or use;
- An assurance of water service by any water provider; or
- A commitment by Grand County or any other entity to construct, finance, or maintain water infrastructure.

The applicable water provider determines **their** water availability and service, and is subject to:

- Ownership and validity of water rights;
- System capacity and infrastructure limitations;
- Operational conditions and regulatory requirements.

All development proposals are subject to independent verification of water availability by the applicable provider.

2. No Allocation or Control of Water Rights

Grand County does not own, allocate, or administer water rights. Authority over water rights is vested in the Utah Division of Water Rights, which is governed by state law.

This Element does not:

- Allocate water rights;
- Modify existing water rights; or
- Create any entitlement to water use.

Any use of water must comply with applicable state law and regulatory requirements.

3. Planning Assumptions and Projections

The analyses, projections, and estimates contained in this Element—including population projections, water demand forecasts, and infrastructure assumptions—are based on the best **available data at the time of adoption** and are intended for planning purposes only.

Commented [AJ1]: Commissioner O'Brien added "their."

Commented [AJ2R1]: OK

Commented [3]: Could these sources be cited at some point in the document.

Commented [AJ4R3]: Yes, they are listed in the documents reviewed section on page 4.

These projections:

- Are subject to change based on future conditions;
- Do not represent guaranteed outcomes; and
- Should not be relied upon as precise forecasts for specific projects or investments.

Actual water demand and supply conditions may differ due to changes in climate, economic conditions, land use patterns, or regulatory requirements. **ma**

Commented [5]: Good a mention that the supply of water may be due to changes in climate.

Commented [AJ6]: Commissioner O'Brien's edits are in blue

Commented [AJ7R6]: I don't know what ma means

Commented [AJ8R6]:

4. Infrastructure and Funding Uncertainty

The Element identifies potential infrastructure projects and funding strategies, including programs such as the Permanent Community Impact Board (CIB). These projects are conceptual and subject to:

- Engineering feasibility;
- Environmental review and permitting;
- Funding availability; and
- Interagency coordination.

Inclusion of a project in this Element or its appendices does not constitute:

- A commitment to construct or fund the project;
- Approval of any specific project; or
- Assurance that funding will be obtained.

5. Colorado River Water Development

The Element identifies the potential use of Colorado River water as a long-term supply strategy. Such use is contingent upon:

- Successful proving up of water rights through beneficial use;
- Construction of diversion, conveyance, and treatment infrastructure;
- Compliance with state, federal, and interstate regulatory requirements.

Colorado River water is not assumed to be currently available for development, and no project shall rely on such supply unless it is demonstrated to be legally, physically, and financially feasible.

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6. Grand County Protections for Drinking Water Sources

This Element identifies ways in which Grand County can enhance protections for drinking water preservation and use. This can be attained through:

- Using its Land use authority;
- Staying up to date on the effects of Climate Warming trends;
- Staying up to date on withdrawals and recharge from its two major aquifers;
- Using individuals with hydrological knowledge to provide informed advice to the County.

76. Third-Party Systems and Operations

Water systems in Grand County are owned and operated by independent entities. The County does not control system operations, maintenance, or service decisions.

Accordingly:

- The County is not responsible for the water provider's determinations of system capacity determinations or service availability;
- Water providers retain sole authority over operational decisions;
- Development approvals by the County do not obligate providers to deliver water service.

7. No Creation of Vested Rights or Entitlements

This Element does not create:

- Vested development rights;
- Entitlements to water service; or
- Legal claims against the County or any water provider.

All land use decisions remain subject to applicable laws, regulations, and approval processes in effect at the time of application.

8. Relationship to Other Plans and Regulations

This Element is intended to be consistent with state law and to complement other planning documents, including water provider master plans and regional water planning efforts.

In the event of conflict:

- State law and water rights administration shall control;
- Water provider determinations regarding their capacity and service shall prevail;
- This Element shall be interpreted as a policy guide rather than a controlling regulatory document.

Commented [AJ9]: Commissioner O'Brien inserted this section

Commented [AJ10R9]: I'll defer to the planning commission

Commented [11]: and of course renumbering

Commented [AJ12R11]: I'll defer to the planning commission

Commented [AJ13]: Commissioner O'Brien modified this

Commented [AJ14R13]: Ok

Commented [AJ15]: Commissioner O'Brien added the word their

Commented [AJ16R15]:

Commented [AJ17R15]: OK

9. Limitation of Liability

Grand County shall not be liable for:

- Decisions made by third-party water providers;
- Changes in water availability or system capacity;
- Reliance on planning-level projections or assumptions contained in this Element; or
- Delays, costs, or impacts associated with water supply or infrastructure limitations.

Disclaimer Summary

This Element provides a **framework for planning and coordination**, not a guarantee of water supply or service. All development decisions must be supported by independent verification of water availability, infrastructure capacity, and regulatory compliance.

DOCUMENTS REVIEWED

This Water Use and Preservation Element is based on a comprehensive review of available planning documents, water system data, state guidance materials, and technical resources relevant to water supply, demand, and land use in Grand County. The documents listed below informed the analysis, projections, and policy recommendations contained in this Element.

The County relied on the most current information available at the time of adoption. These materials were used to provide context, identify trends, and support planning-level analysis. They are not incorporated by reference as regulatory documents.

1. Grand County Planning Documents

- Grand County General Plan (current adopted version)
- Spanish Valley Future Land Use Plan
- Grand County Land Use and Development Management Code
- Previous planning studies and policy documents related to land use, growth, and infrastructure

These documents establish the County's land use framework and provide the basis for evaluating the relationship between development patterns and water demand.

2. Water Provider Plans and System Data

- Grand Water & Sewer Service Agency (GWSSA) planning documents and system data
- Arches Special Service District (ASSD) system information and operational data
- Thompson Special Service Water District (TSSWD) system information

- Moab City Water Conservation Plan Update
- Castle Valley Water Management Plan
- Provider-level demand data, production records, and infrastructure capacity information

Water provider data was used to establish baseline demand conditions, evaluate system capacity, and identify infrastructure constraints.

3. State Planning Guidance and Technical Resources

- Utah Division of Water Resources – State Water Plan and regional planning documents
- Utah Division of Water Resources – Water conservation guidance and per capita use targets
- Utah Division of Water Rights – water rights administration and regulatory information
- Relevant provisions of Utah Code §17-79-403(2)(v), including amendments under Senate Bill 110 (2022) and Senate Bill 76 (2023)

These resources provide statutory requirements, planning guidance, and conservation benchmarks used in developing this Element.

4. Federal and Regional Resources

- U.S. Environmental Protection Agency – Sole Source Aquifer designation for the Glen Canyon Aquifer and for the Castle Valley Aquifer
- Colorado River Basin planning and regulatory frameworks, including interstate compact considerations
- Regional hydrologic and climate data relevant to water supply and demand

These resources provide context for groundwater protection, long-term water supply considerations, and regulatory constraints affecting Colorado River water use.

5. Local and Project-Specific Information

- Data and information related to the Uranium Mill Tailings Remedial Action (UMTRA) project in Crescent Junction and Thompson Springs
- Local water use estimates, including culinary and irrigation demand
- Population projections and demographic data used for demand modeling

These materials were used to evaluate localized conditions, including water-constrained areas and post-remediation development considerations.

6. Funding and Implementation Resources

Commented [AJ18]: Commissioner O'Brien inserted this

Commented [AJ19R18]: OK

Commented [20]: Is this considered in this Element and projections that can be based on this data? What Sources were used?

Commented [AJ21R20]: Great comment. I need to do a better job of establishing that this document is a demand side element of the general plan, per 17-79-403 (2) (a) (v).

Please also see: Udall, B., & Overpeck, J. (2017). *The twenty-first century Colorado River hot drought and implications for the future*. *Water Resources Research*, 53(3), 2404–2418.
Vano, J. A., et al. (2014). *Understanding uncertainties in future Colorado River streamflow*. *Bulletin of the American Meteorological Society*, 95(1), 59–78.

Further suggested readings include: DeOreo, W., Mayer, P., Dziegielewski, B., & Kiefer, J. (2016). *Residential end uses of water, version 2*. Water Research Foundation.
Gleick, P. H., Haasz, D., Henges-Jeck, C., Srinivasan, V., Wolff, G., Cushing, K. K., & Mann, A. (2003). *Waste not, want not: The potential for urban water conservation in California*. Pacific Institute.

- Guidance materials and program information for the Permanent Community Impact Board (CIB)
- State and federal funding program information relevant to water infrastructure and conservation

These resources informed the development of implementation strategies and the Capital Projects and Funding Matrix included in Appendix A.

7. Use of Data and Limitations

The documents reviewed were used to:

- Establish baseline conditions for water supply and demand;
- Inform population and demand projections;
- Identify infrastructure constraints and opportunities; and
- Support development of policy and implementation strategies.

Data and information from these sources are subject to inherent limitations, including differences in methodology, reporting periods, and data availability. Where necessary, planning-level assumptions were applied to provide a consistent analytical framework.

Documents Reviewed Summary

The materials listed in this section provide the foundation for the analysis and recommendations contained in this Element. Together, they support a planning approach that is informed by:

- Local conditions and provider data;
- State statutory requirements and guidance;
- Regional water supply constraints; and
- Practical considerations related to implementation and funding.

Climate Change

Climate change is projected to decrease water supplies in the Colorado River Basin by 5–15% by 2050, based on peer-reviewed research (Udall & Overpeck, 2017; Vano et al., 2014). Meanwhile, water conservation efforts can cut demand by 20–40% (DeOreo et al., 2016; Gleick et al., 2003).

Since conservation savings surpass expected climate impacts, reducing water demand is the most effective and manageable strategy for Grand County to ensure long-term water security. In summary: climate change is likely to cause a modest, secondary effect on the Glen Canyon Aquifer, the Valley Fill Aquifer, and Ken’s Lake—typically resulting in single-digit to low–

Commented [22]: So we will have projections of water supply as well as projections of population and water demand?

Commented [AJ23R22]: Those summaries of such documents were reviewed. It is up to the planning commission to decide how much supply-side information is needed. Comments regarding supply are probably best suited for the various service providers' water conservation/master/management plans.

Commented [AJ24]: While this document should address only demand reduction, the few comments I have received from the public mostly concern climate change, global warming, and global heating. Here is a possible section to address this issue and show the magnitude of climate impact versus conservation potential. **I believe this discussion on water supply is beyond the scope of this document.**

teens percentage decreases in recharge and water availability by 2050. The primary factor stressing Grand County's water system remains demand, not supply loss.

- Climate impact: **hundreds of acre-feet/year**
- Conservation potential: **thousands of acre-feet/year**

SECTION 1. INTRODUCTION

Grand County, Utah, is located ~~with~~ in an arid high ~~-desert-environment~~ where water availability is limited, variable, and subject to long-term climatic uncertainty. Precipitation is low, evapotranspiration rates are high, and groundwater recharge depends on the snowpack in the La Sal Mountains. ~~These conditions establish a finite and constrained water supply that does not inherently expand with population growth or development.~~

The County's primary sources of water include groundwater from the Glen Canyon Aquifer and Valley Fill Aquifer, supplemented by surface water storage at Ken's Lake Reservoir and limited spring-fed systems. These sources provide the foundation for culinary and irrigation uses throughout the County, but are subject to both physical and operational limitations. In particular, groundwater systems recharge slowly and must be managed to ensure long-term sustainability.

At the same time, Grand County continues to experience steady population growth and significant seasonal fluctuations associated with tourism and recreation. These factors increase both baseline and peak water demand, placing additional pressure on water supply systems, storage capacity, and distribution infrastructure. Peak demand conditions—rather than average annual demand—often control system performance and reliability.

This Water Use and Preservation Element is adopted in accordance with Utah Code §17-79-403(2)(v), as amended by Senate Bill 110 (2022) and Senate Bill 76 (2023). The statute requires counties to evaluate the relationship between land use and water demand and identify methods to reduce water consumption and improve long-term water efficiency. Specifically, this Element addresses:

- The effect of permitted development and land use patterns on water demand and infrastructure;
- ~~Methods of reducing water demand and per capita consumption for future development;~~
- ~~Methods of reducing water demand and per capita consumption for existing development;~~ and
- Opportunities for the County to modify its operations to eliminate practices or conditions that waste water.

The purpose of this Element is to integrate water resource considerations directly into land use planning and decision-making. This includes establishing a clear analytical connection between population growth, development patterns, and water demand, and identifying the policy tools necessary to ~~modify~~ manage that demand within the limits of available supply.

Commented [25]: Actually without Colorado River Water or some other new source the water supply will decrease with time if Climat Warming continues as predicted.

Commented [AJ26R25]: Please see the climate change section above

Commented [27]: I believe these methods are the same and will reduce water demand over levels that would occur without using them. The ultimate use of this water savings will depend on the future supply of water.

Commented [AJ28R27]: This is taken from §17-79-403(2)(v) UCA as stated in the paragraph above.

Commented [AJ29]: Commissioner O'Brien changed this

Commented [AJ30R29]: Ok

Commented [AJ31R29]:

A central premise of this Element is that **water availability is a governing constraint on development**, not a condition that can be assumed to expand with growth. Accordingly, this Element supports a planning framework in which land use decisions, development intensity, and infrastructure investments are evaluated in the context of long-term water supply, system capacity, and operational reliability.

The Element also recognizes the institutional structure of water management in Grand County. The County does not own or control water rights and does not operate public water systems. Water service is provided by independent entities, including the Grand Water & Sewer Service Agency, the Arches Special Service District, the Thompson Special Service Water District, municipal providers, and other providers. These entities retain authority over water rights, system operations, infrastructure planning, and service delivery.

As a result, this Element functions as a **policy and coordination tool**, rather than a regulatory or allocation mechanism. It establishes a framework to align land-use decisions with water-supply conditions and to support coordination between the County and water providers to ensure development is consistent with available resources.

In addition to managing demand, the County is evaluating long-term supply strategies, including the potential development of existing Colorado River water rights. These rights require “proving up” through beneficial use and the construction of diversion, conveyance, and treatment infrastructure. Colorado River **water (if obtained)** is anticipated to be used primarily for irrigation and outdoor purposes, thereby reducing reliance on culinary water sources and preserving higher-quality supplies—such as Ken’s Lake storage and spring-fed systems—for potable use.

The Grand Water & Sewer Service Agency (GWSSA) provides drinking and irrigation water to Spanish Valley and nearby unincorporated areas of Grand County. The system features four production wells drawing from the Glen Canyon Aquifer, an EPA-designated Sole Source Aquifer. It also diverts surface water through Mill Creek via the Sheley Tunnel into Ken’s Lake Reservoir. Additionally, it has about 4.5 million gallons of drinking water storage spread across three tanks. Each year, the system supplies approximately 3,631 acre-feet of drinking water rights and 7,823 acre-feet of irrigation or secondary water rights.

The Arches Special Service District provides sanitary sewer within its service area. Culinary water is sourced from private shares of Colorado River Water. Two hotel properties and the Canyonlands by Night and Day tour company are served by the private shares mentioned above.

The Thompson Special Service Water District serves a small community and relies on limited sources and storage. The water district currently depends on two springs in Thompson Canyon for its drinking water supply. System reliability depends on the continuous operation of

Commented [32]: Is this true about water supply, if the document does not consider climate warming.

Commented [AJ33R32]: Yes, it is supported by the various water providers’ plans. Please also see the above section on climate change. Again, demand-side reductions are able to offset anticipated climate change/warming/heating supply reductions by mid-century.

Commented [AJ34]: Commissioner O’Brien added this

Commented [AJ35R34]: I am not sure this addition is needed. I think it is inherent in the paragraph.

production, storage, and distribution components, as well as the district’s ability to prevent and quickly repair leaks and line breaks.

The County also recognizes the unique conditions associated with the completion of the Uranium Mill Tailings Remedial Action (UMTRA) project in areas such as Crescent Junction and Thompson Springs. The project completion will potentially allow water that is being used for the UMTRA project to be available to one or both of these areas. While the removal of legacy contamination reduces barriers to development, these areas remain constrained by limited water supply and infrastructure. Future development in these locations will require demonstrated water rights, infrastructure investment, and long-term reliability of supply.

Commented [AJ36]: Commissioner O’Brien added this
Commented [AJ37R36]: Great comment

Implementation of this Element will require coordination, investment, and funding. Grand County will pursue financial support through programs such as the Permanent Community Impact Board to advance infrastructure projects, prove up water rights, and support system improvements in water-constrained areas.

The analysis and projections contained in this Element are based on the best available data at the time of adoption and are intended for planning purposes. They do not guarantee the availability of water for specific projects or uses. Water providers retain authority over capacity determinations and service decisions.

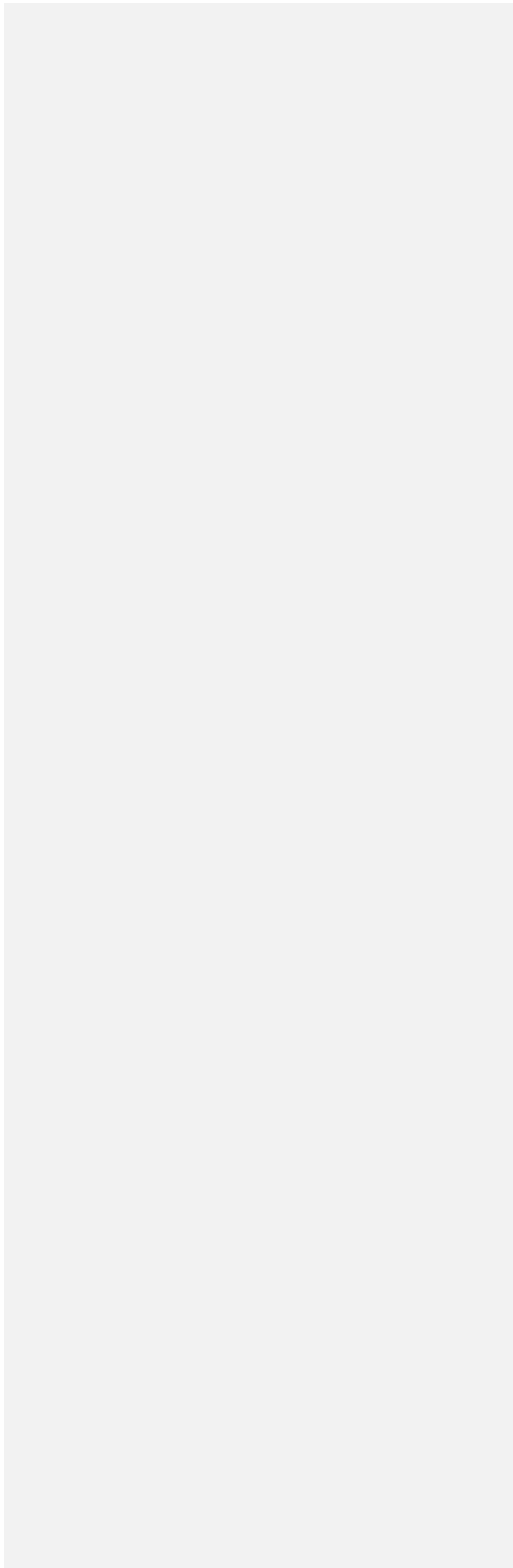
Commented [38]: Some citations appearing somewhere in this Element would be helpful. Maybe at least for data that is take outside of the document that are noted as examined earlier.

Commented [AJ39R38]: This is cited in the documents reviewed section.

By adopting this Element, Grand County establishes a clear, defensible framework for managing growth in a water-constrained environment. By aligning land use decisions with water availability, promoting conservation and efficiency, and supporting long-term supply strategies, the County affirms its commitment to protecting its limited water resources while supporting sustainable economic and community development.

Commented [40]: I think this is not the case unless the one keeps track of Climate Warming effects on water supply.

Commented [AJ41R40]: Please see the Climate Change section above.



SECTION 2. POPULATION GROWTH AND DEMAND DRIVERS

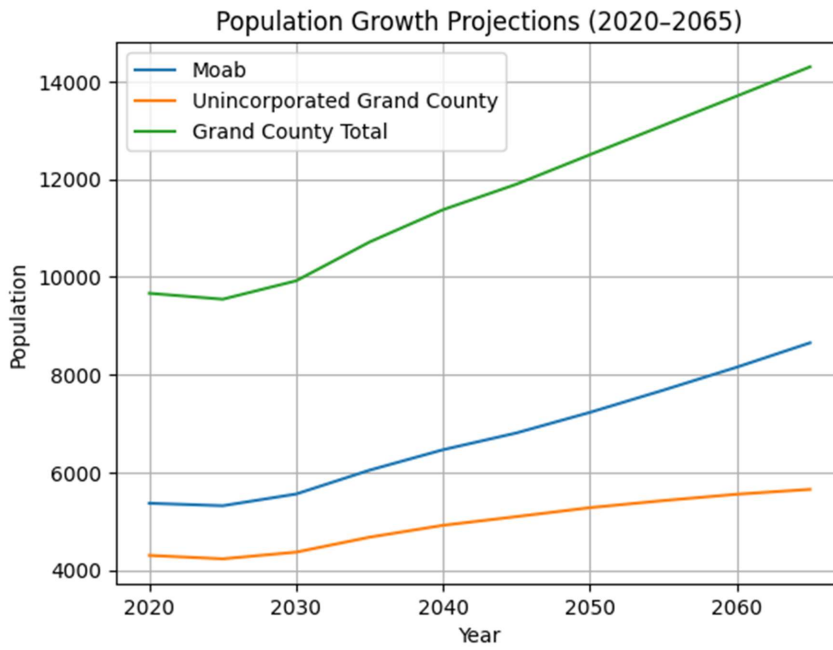
Population growth is the primary long-term driver of water demand in Grand County and forms the analytical foundation for evaluating future water needs under Utah Code §17-79-403(2)(v). This section establishes the relationship between projected population trends, seasonal demand variability, and land use patterns, and provides the basis for the demand scenarios evaluated in Section 5.

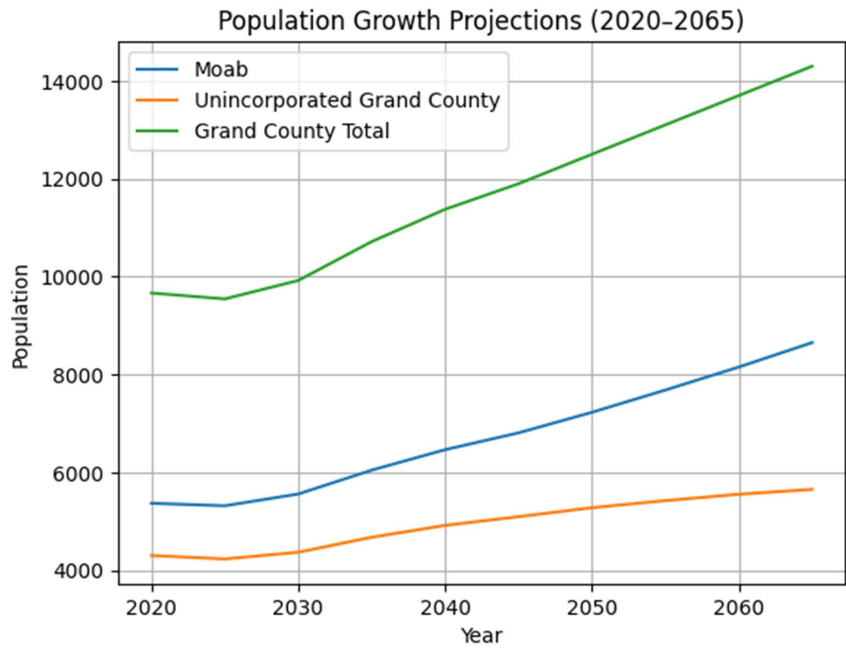
Grand County has experienced steady population growth over the past several decades and is projected to continue growing throughout the planning horizon. Based on adopted projections, the County's population is expected to increase from approximately **9,664 residents in 2020 to approximately 14,300 residents by 2065**. While the growth rate is moderate relative to more urbanized regions of Utah, it reflects a sustained increase in baseline demand that must be accounted for in long-term water planning. [Can a reference to the source for the projections be added here?](#) [Population projections are based on forecasts prepared by the Kem C. Gardner Policy Institute, with local interpolation and calibration using Grand County and Moab growth trends, permit activity, and historic population distribution patterns.](#)

Commented [AJ42]: Commissioner Klaes added this question

Commented [AJ43R42]: Done

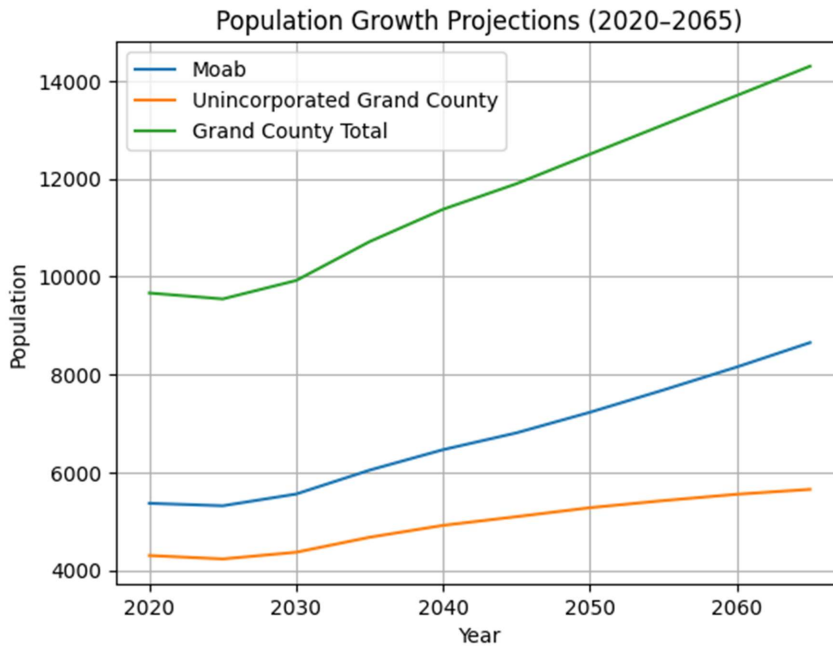
Figure 1. Grand County Population Projection (2020–2065)





Commented [44]: Where does this information come from (a citation) and there is an interesting downturn from 2020 to about 2024 a comment on that in the text might be helpful. Why are these projections to 2065 and the water demand projections only to 2060?

Commented [AJ45R44]: See source information now below chart.



As shown in Figure 1, population growth is not linear but trends upward over time, with incremental increases that accumulate into substantial long-term increases in water demand~~population demand~~. Even modest annual increases, with no changes in per capita use~~age usage~~, result in significant additional water use over the full planning horizon.

Population projections are based on forecasts prepared by the Kem C. Gardner Policy Institute, with local interpolation and calibration using Grand County and Moab growth trends, permit activity, and historic population distribution patterns.

Commented [AJ46]: Commissioner O'Brien made the changes in blue

Commented [AJ47R46]: My changes are in red

2.1 Functional Population and Seasonal Demand

In addition to permanent residents, Grand County experiences substantial seasonal population fluctuations associated with tourism and recreation. Visitors increase the County's **functional population**, particularly during spring, summer, and fall peak seasons.

These seasonal increases have several important implications:

- **Peak Demand Conditions:** Visitor activity increases short-term water demand beyond levels associated with permanent residents;

- **Infrastructure Sizing:** Water systems must be designed to accommodate peak demand rather than average annual use;
- **Operational Stress:** Wells, storage tanks, and distribution systems experience increased stress during high-use periods;
- **Demand Variability:** Seasonal fluctuations complicate demand forecasting and system management.

In many cases, peak seasonal demand is driven more by visitor activity and outdoor water use than by permanent population growth. As a result, planning for water supply and infrastructure must consider both the resident population and seasonal demand patterns.

2.2 Land Use Patterns and Demand Intensity

Population growth alone does not fully determine water demand. The manner in which growth occurs—particularly land use patterns and development design—has a direct and measurable effect on per capita water use.

Key relationships include:

- **Low-Density Development:** Larger lots with potentially large irrigated landscapes increase outdoor water demand and overall consumption, independent of lot size. The county’s waterwise landscaping ordinance, including the state sod buy-back program, should reduce demand;
- **Higher-Density Development:** Compact development reduces irrigated area and lowers per capita water use;
- **Landscape Design:** Turf-intensive landscaping significantly increases demand, while drought-tolerant landscaping reduces it;
- **Development Type:** Commercial and tourism-related uses may generate higher seasonal demand and greater irrigation requirements.

Analysis of seasonal water production and wastewater treatment flows for Moab, Grand Water & Sewer Service Agency (GWSSA), and San Juan Spanish Valley Special Service District (SJSVSSD) indicates that summer water consumption increases substantially more than wastewater inflows during the tourism season. Average sewer treatment plant flows increased approximately 1.57 times over winter baseline conditions, while culinary water consumption increased approximately 4.04 times over winter usage. Because indoor tourism-related water use generally returns to the wastewater system while irrigation water does not, the data suggests that outdoor landscape irrigation, rather than tourism alone, is the primary driver of peak seasonal water demand in the Moab and Spanish Valley area.

These factors demonstrate that water demand is not solely a function of population but also of development intensity, design, and land-use **policy**.

Commented [48]: Low-density development isn't what causes increased outdoor water demand. Large irrigated areas are the cause. Within the bounds of land use code, minimal outdoor water usage should be the goal, somewhat independent of lot size.

Commented [AJ49R48]: Correct. See corrected wordage.

Commented [50]: Regarding low density development, there is an important impact that is not noted here. That is the impact it has on infrastructure.

Commented [AJ51R50]: Correct. There are two impacts not addressed here. One is the maintenance cost of the water pipe length, which is related to the lot frontage. The second is the potential volume of usage. The volume of a pipe is calculated using the volume formula for a cylinder: $V = \pi r^2 h$. This means a two-inch pipe has four times the capacity of a one-inch pipe. Thus, pipe size may influence possible demand.

Commented [52]: The link between commercial/tourism and higher seasonal demand is pretty clear. But I don't see the link to commercial/tourism and greater irrigation requirements. Also, commercial and tourism are 2 separate things. What is considered commercial? What are the big commercial uses?

Commented [AJ53R52]: Great point. See added paragraph.

2.3 Spatial Distribution of Growth

The location of future growth within Grand County is an important determinant of water demand and infrastructure requirements.

Growth is expected to occur in:

- **Spanish Valley and areas served by the Grand Water & Sewer Service Agency (GWSSA)**, where infrastructure exists but may require expansion;
- **Unincorporated areas with limited infrastructure**, where development may be constrained by water availability;
- **Crescent Junction and Thompson Springs**, where the completion of the UMTRA project may **provide a source of additional water supply** ~~increase development interest~~, but where water supply and infrastructure ~~are currently~~ **remain** limited.

In water-constrained areas, population growth cannot be assumed to translate directly into developable capacity. Instead, development must be evaluated based on the availability of **water and** water rights, the feasibility of infrastructure, and long-term supply reliability.

2.4 Relationship to Water Demand Modeling

The population projections presented in this section inform the demand scenarios evaluated in Section 5. These scenarios assess how different conservation strategies and land use patterns affect total water demand over time.

Importantly, the projections are not intended to predict exact future conditions. Rather, they provide a **reasonable planning framework** for evaluating long-term trends **in water demand** and assessing the effectiveness of policy interventions **designed to decrease water demand.**

The analysis demonstrates that:

- Population growth increases baseline water demand;
- Seasonal demand amplifies peak conditions;
- Land use patterns determine the magnitude of demand; and
- Conservation measures can ~~offset or reduce~~ **ameliorate** growth-related demand increases.

2.5 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Grand County will continue to experience population growth over the planning horizon;

Commented [AJ54]: The text in blue are Commissioner O'Brien's edits

Commented [AJ55R54]: Often, development interest and additional water supply are interrelated.

Commented [AJ56]: Text in blue is Commissioner O'Brien's edits

Commented [AJ57R56]: Great catch

Commented [AJ58]: Commissioner O'Brien's edits are in blue

Commented [AJ59R58]: I would keep the words reasonable planning, because this is a planning document.

Commented [AJ60]: Commissioner O'Brien's edits are in blue

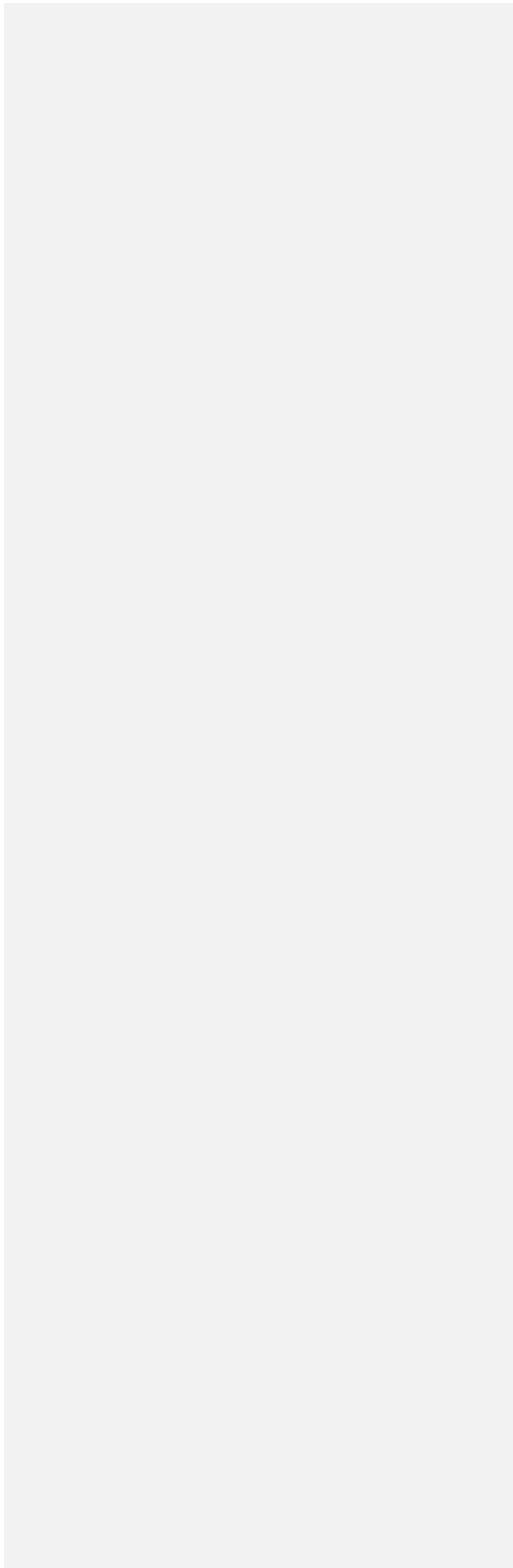
Commented [AJ61R60]: According to the Cambridge Dictionary, ameliorate means to make a bad, unpleasant, or difficult situation better, improve conditions, or make something more tolerable. It is a formal verb often used in contexts of improving social, environmental, or health-related issues, deriving from the Latin melior (better). I think 'offset or reduce' is appropriate, but I will leave that to the planning commission.

- Population growth will increase baseline water demand in the absence of conservation measures;
- Seasonal tourism significantly increases peak demand and must be considered in system planning;
- Land use patterns and development design are critical determinants of per capita water use; and
- The spatial distribution of growth affects infrastructure needs and system capacity requirements.

Section Summary

Population growth, seasonal demand, and land use patterns collectively define the conditions under which future water demand will occur in Grand County. While growth is expected to continue, the relationship between population and water demand is **not fixed**. Instead, it is shaped by policy decisions, development standards, and conservation practices.

This section establishes the analytical foundation for evaluating the **effects of development on water demand and infrastructure in Section 5, and for identifying appropriate demand-reduction strategies** in subsequent sections.



SECTION 3. GRAND COUNTY WATER PROFILE

This section describes the physical water supply systems, infrastructure conditions, and institutional framework that define water availability in Grand County. Understanding these factors is essential to evaluating **some parts of** the relationship between growth, water demand, and long-term system capacity.

Water supply in Grand County is constrained by limited natural recharge, variable climatic conditions, and the capacity of existing infrastructure systems. These constraints establish the physical limits within which land-use decisions must be made.

3.1 Water Supply Sources

Water supply in Grand County is derived from groundwater, limited surface-water storage, and small spring-fed systems.

Groundwater Systems

Groundwater is the primary source of drinking water in the County. The principal aquifers include:

- **Glen Canyon Aquifer**, designated as a Sole Source Aquifer by the U.S. Environmental Protection Agency;
- **Valley Fill Aquifer**, which provides a localized supply in developed areas.

These aquifers support the majority of residential, commercial, and institutional water use. Recharge occurs slowly and is largely dependent on snowpack in the La Sal Mountains. Because recharge rates are limited, groundwater systems must be managed conservatively to maintain long-term sustainability.

Surface Water and Storage

Surface water plays a secondary but important role in the County's water system. Ken's Lake Reservoir provides storage for diverted water and supports irrigation and secondary water systems in Spanish Valley.

Surface water availability is subject to hydrologic variability, including drought conditions and changes in snowpack. As a result, it cannot be relied upon as a fully stable supply without careful management.

Commented [AJ62]: I think this entire section needs to be deleted. Some members of the public are confusing this document with the state-required water conservation plans, which address supply and infrastructure. I did not realize there would be this much confusion. I know it is because this section, along with other areas of the document, discuss supply. **I tried to follow the six-step rational planning method, but I now realize that it is causing too much confusion.** I expected more demand-side public comments, but most were focused on the document being too long to read or climate change/warming/heating rather than demand.

To make the document's purpose clearer, this section may need to be deleted.

Commented [AJ63]: Commissioner O'Brien's edits are in blue

Commented [64]: I have added "some parts of" because to determine long-term system capacity Climate Warming needs to be taken into consideration. and the next sentence notes that.

Commented [AJ65R64]: See the subsection above related to climate change

Spring Systems

Spring-fed systems provide water in localized areas, particularly in Thompson Springs. These systems have limited capacity and minimal redundancy, making them sensitive to both demand increases and supply fluctuations.

3.2 Infrastructure Systems and Service Areas

Water service in Grand County is provided by multiple independent entities, each operating its own system with varying capacities and limitations.

Primary providers include:

- Grand Water & Sewer Service Agency (GWSSA)
- Arches Special Service District (ASSD)
- Thompson Special Service Water District (TSSWD)

These systems consist of:

- Production wells
- Storage tanks
- Pumping facilities
- Distribution networks

Infrastructure capacity varies significantly across the County. While some areas, such as Spanish Valley, have ~~relatively developed systems, other areas~~ well-developed systems, others lack sufficient infrastructure to support additional growth without significant investment.

Commented [AJ66]: Grammatic change

The County does not own or operate these systems and does not control water rights. Its role is to align land use decisions with the capabilities of these providers.

3.3 System Constraints and Reliability

Water systems in Grand County operate under several key constraints:

Limited Recharge and Finite Supply

Groundwater recharge is slow and dependent on climatic conditions. Water availability cannot be assumed to increase with demand.

Commented [67]: On page 17 and here we do note that climate plays a role, but it is not modeled or talked about in terms of its effect on how many people, how much agriculture, and so on that can be supported.

Commented [AJ68R67]: Please see the subsection above on climate change

Infrastructure Capacity

System capacity is limited by:

- Well production rates
- Storage volume
- Pumping capacity
- Distribution network limitations

Expansion of infrastructure requires substantial investment and planning.

Seasonal Demand Variability

Peak demand occurs during high tourism seasons and irrigation periods. These peaks can strain system capacity even when average demand appears manageable.

System Redundancy

Smaller systems, particularly in rural areas, have limited redundancy. This increases vulnerability to supply interruptions and infrastructure failure.

3.4 Colorado River Water Rights and Future Supply

Water providers Grand County and regional partners hold existing Colorado River water rights that could provide a long-term supplemental supply. These rights must be **proven up through beneficial use**, which requires the development of infrastructure to divert, convey, treat, and deliver water.

Colorado River water is planned to be used primarily for:

- Irrigation and outdoor use;
- Secondary water systems;
- Reduction of demand for drinking water supplies.

This strategy allows higher-quality water sources—such as groundwater, Ken’s Lake storage, and spring systems—to be preserved for potable use.

Commented [AJ69]: Commissioner O’Brien’s edits are in blue

Commented [AJ70R69]: I’m not sure who holds the actual water rights.

Commented [71]: In the near term, this is OK. Longer term, all sources of water should be considered for drinking water. Is there a reason that Colorado River water would not be considered for commercial uses?

Commented [AJ72R71]: I believe the water in Ken’s lake, springs, and wells is more readily suitable for culinary use than the Colorado River water. The idea would be to use the river water for irrigation, freeing up other water for culinary use.

However, several constraints apply:

- Development of Colorado River infrastructure is capital-intensive;
- Projects require regulatory approvals and coordination across jurisdictions;
- Timing and feasibility are uncertain;
- These supplies cannot be assumed to be immediately available.

Accordingly, Colorado River water is treated as a **potential future supply** rather than a baseline assumption for current development approvals.

3.5 Crescent Junction and Thompson Springs (Post-UMTRA Conditions)

The completion of the Uranium Mill Tailings Remedial Action (UMTRA) project has removed environmental constraints in Crescent Junction and Thompson Springs. However, water supply and infrastructure limitations remain.

Commented [73]: I have assumed earlier that this is about potential water from the completion, if this is the case shouldnt we say that.

Commented [AJ74R73]: I think it is both

Crescent Junction

- Lacks a centralized culinary water system capable of supporting significant growth;
- Requires development of wells, storage, and distribution infrastructure;
- Development is constrained until a water supply is demonstrated.

Thompson Springs

- Relies on limited spring-fed systems;
- Has minimal redundancy and limited expansion capacity;
- Requires system upgrades to support reliability and potential growth.

These areas are considered **water-constrained-growth areas**, and development must be evaluated based on demonstrated water rights, infrastructure feasibility, and long-term supply reliability.

Commented [AJ75]: Grammatical change

3.6 Funding and Implementation Context

Development of new water supply and infrastructure—including Colorado River projects and rural system improvements—requires substantial financial investment.

Grand County will pursue funding through the Permanent Community Impact Board (CIB), as well as other state and federal programs, to support:

- Infrastructure necessary to prove up Colorado River water rights;
- System improvements in Crescent Junction and Thompson Springs;
- Expansion of storage, conveyance, and distribution systems;
- Conservation and efficiency programs.

Funding availability and timing will influence the feasibility and phasing of these projects.

3.7 Institutional Roles and Coordination

Water management in Grand County involves multiple entities with distinct responsibilities:

- **Water Providers:** Control water rights, system operations, and infrastructure;
- **Grand County:** Controls land use and development approvals;
- **State Agencies:** Regulate water rights and provide planning and funding support.
- **Federal agencies (especially with regard the Colorado River)**

Effective water planning requires coordination among these entities to ensure that land use decisions reflect actual supply conditions and system capacity.

3.8 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Water supply in Grand County is limited and constrained by natural and infrastructure conditions;
- Groundwater systems provide the primary supply but recharge slowly and must be managed carefully;
- Infrastructure capacity varies significantly across the County and limits development potential in certain areas;
- Colorado River water represents a potential future supply but requires significant investment and cannot be assumed to be immediately available;
- Crescent Junction and Thompson Springs remain water-constrained despite completion of the UMTRA project; and
- Long-term water supply planning depends on coordination, funding, and infrastructure development.

Section Summary

This section establishes the physical, physical and operational constraints that define water availability in Grand County. These constraints form the basis for evaluating the effect of development on water demand and infrastructure in Section 5 and for identifying appropriate conservation and policy responses in subsequent sections.

Commented [76]: I very much like this description of the their responsibilities.

Commented [AJ77R76]: Add supply to water providers

Commented [AJ78]: Commissioner O'Brien's edits are in blue

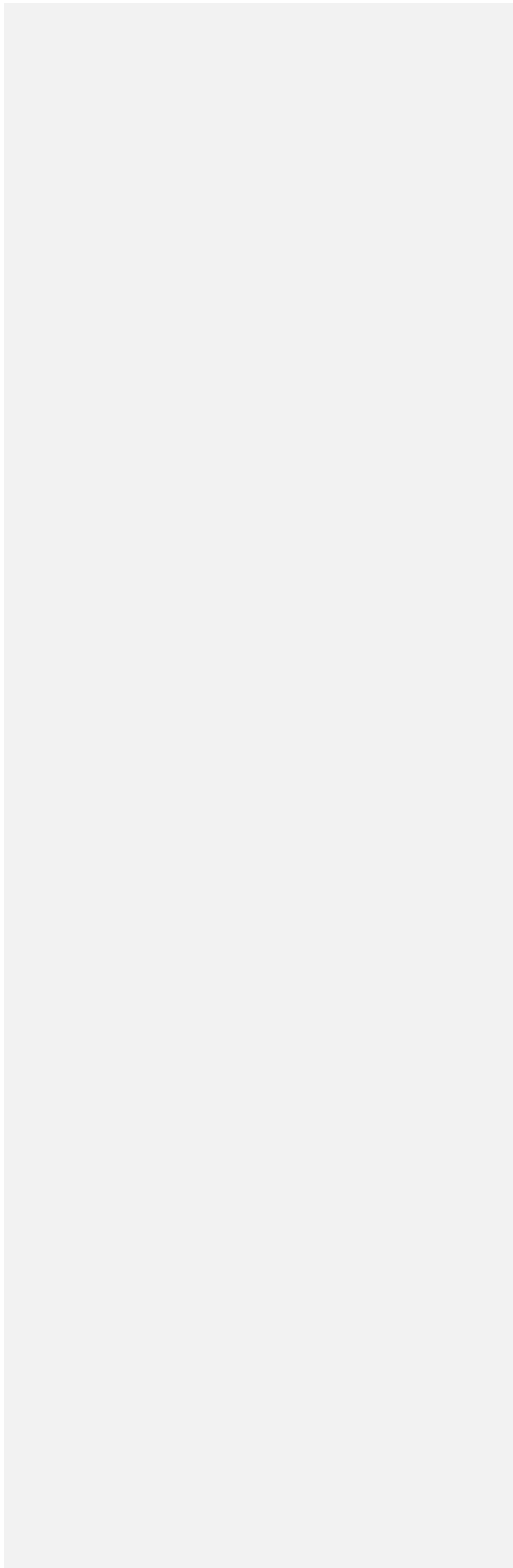
Commented [AJ79R78]: OK

Commented [AJ80R78]:

Commented [AJ81]: Commissioner O'Brien's edits are in blue

Commented [82]: It might establish the operation constraints but not the physical constraints if we are talking about what nature supplies: recharge, stream flows, soil moisture that are effected by Climate Warming.

Commented [AJ83R82]: Please see the subsection on climate change above.



SECTION 4. WATER USE CONDITIONS

This section describes existing water use patterns in Grand County, including total demand, per capita consumption, outdoor irrigation, system efficiency, and seasonal variability. These conditions establish the baseline against which future demand projections and conservation strategies are evaluated.

Water use in Grand County is characterized by stable indoor demand and highly variable outdoor demand, with peak conditions driven primarily by irrigation and seasonal population increases. Understanding this structure is critical to identifying effective demand reduction strategies.

4.1 Total Water Demand

Water use in Grand County consists of both culinary (potable) and non-potable (primarily irrigation) demand. Based on available provider data, total system demand is approximately:

- **Culinary Demand:** ~988 acre-feet per year
- **Irrigation and Secondary Demand:** ~1,490 acre-feet per year
- **Total System Demand:** ~2,400–2,500 acre-feet per year

These figures demonstrate that irrigation demand accounts for a substantial share of **total water use**, particularly during peak seasons.

Culinary demand is relatively stable and predictable, reflecting indoor residential and commercial use. In contrast, irrigation demand varies significantly based on weather conditions, landscape design, and seasonal occupancy patterns.

4.2 Per Capita Water Use

Average system-wide water use is estimated at approximately **184 gallons per capita per day (GPCD)**. This level of use is currently within the regional conservation target established by the Utah Division of Water Resources.

However, several important considerations apply:

- Per capita use fluctuates significantly between peak and off-peak seasons;
- Tourism activity increases total demand without being fully reflected in resident population figures;
- Outdoor irrigation disproportionately influences per capita calculations.

As a result, per capita metrics should be understood as **planning indicators** rather than precise measures of individual consumption.

Commented [84]: Is data available that shows the % residential irrigation vs farm/ranch?

Commented [AJ85R84]: From Table 2.3 – Record of Irrigation Water Use (by year), page 10, of the 2025 Water Conservation Plan for the Grand Water & Sewer Service Agency from 2019 to 2024, average breakdown is 22% Residential, 0% industrial, 21% commercial, 9% institutional, and 49% agricultural. Records for irrigation usage began in 2019.

Commented [86]: I will not quibble to much about this. But throughout the Elements it would be good to provide some information (footnotes) about where the information comes from.

Commented [AJ87R86]: The information is from the documents listed in the documents reviewed section.

Commented [AJ88R86]: Sources: Production and operational data from Grand Water & Sewer Service Agency, San Juan Spanish Valley Special Service District, and the City of Moab; seasonal wastewater treatment flow analysis

Commented [AJ89]: Not completely true. Sewer flows indicate a 1.5 times increase between summer/winter. Water usage increases 4X during summer.

Commented [90]: Outdoor residential irrigation influences per capita calculations.

Commented [AJ91R90]: Correct

Maintaining or reducing per capita water use over time is necessary to [help](#) offset the effects of population growth [on total demand](#) and maintain system reliability.

Commented [AJ92]: Commissioner O'Brien's edits are in blue

Commented [AJ93R92]: ok

4.3 Outdoor Water Use and Irrigation Demand

Outdoor irrigation is the **largest discretionary component of water demand** in Grand County and represents the most significant opportunity for long-term reduction.

Commented [94]: Same comment as above, it's important to distinguish between residential irrigation and farm/ranch irrigation.

Commented [AJ95R94]: Correct

Irrigation demand is influenced by:

- Extent of irrigated landscape area
- Presence of turf and water-intensive vegetation
- Irrigation system design and efficiency
- Use of culinary versus secondary water
- Seasonal weather conditions

In many cases, outdoor water use during peak months exceeds indoor demand. This makes irrigation the **primary driver of both total demand and peak system stress**.

Because outdoor use is largely controllable through design, technology, and management practices, it is the central focus of conservation strategies identified in subsequent sections.

4.4 Seasonal Demand and Peak Conditions

Water demand in Grand County varies significantly throughout the year. Peak demand typically occurs during:

- Spring and summer irrigation seasons;
- Periods of high tourism activity;
- Extended dry weather conditions.

Commented [96]: Yes, and another impact of Climate Warming is hotter summers more irrigation is needed, but we can how to control that through irrigating using better methods.

Commented [AJ97R96]: I'm not sure what this means. Sorry 😞

Commented [AJ98]: Not nearly as significant as summertime irrigation

These peak periods are critical for system planning because:

- Infrastructure must be sized to meet peak demand, not average demand;
- Storage and pumping systems experience maximum stress during these periods;
- Short-term demand spikes can affect system reliability and service levels.

In many cases, peak demand is driven more by irrigation and visitor activity than by permanent population. As a result, managing peak demand is essential to avoiding costly infrastructure expansion and maintaining system performance.

4.5 System Efficiency and Water Loss

System efficiency is measured in part by the difference between water produced and water delivered to customers. Current system losses are estimated at approximately **7–8 percent of total culinary production**, or roughly **80–90 acre-feet per year**.

Sources of water loss include:

- Distribution system leaks
- Meter inaccuracies
- System flushing and operational uses
- Unmetered or unauthorized consumption

While current loss levels are within acceptable industry standards, they represent an opportunity for improvement. Reducing system losses effectively increases available supply without the need for new water sources.

4.6 Functional Demand Drivers

Water demand in Grand County is influenced by both **the permanent and functional populations**, including visitors and seasonal residents.

Key demand drivers include:

- Tourism-related lodging and commercial uses;
- Seasonal occupancy patterns in residential units;
- Outdoor recreation-related water use;
- Landscape and irrigation practices associated with hospitality uses.

These factors introduce variability into demand patterns and increase peak usage, particularly in areas with concentrated tourism activity.

4.7 Relationship to Supply Strategy

Existing water use patterns directly inform the County's long-term supply strategy. Specifically:

- High irrigation demand supports the use of **Colorado River water for outdoor and non-potable uses**;
- Preservation of higher-quality sources—such as groundwater, Ken's Lake storage, and spring systems—is prioritized for **culinary use**;
- Demand reduction strategies focus on reducing outdoor use to maintain system reliability without expanding potable supply.

Commented [99]: What about leakage that is post-meter? Not considered part of the "system"? Water meters are part of the system, and some water meters can detect leakage.

Commented [AJ100R99]: Hopefully, this is regulated by graduated water-fee schedules

Commented [101]: Other commercial uses? Cement plants, car washes, vineyards, farming/ranching etc.

Commented [AJ102R101]: I agree, hospitality usage probably isn't significantly different from those of other non-residential uses.

This relationship between demand structure and supply strategy is critical to achieving the outcomes identified in Section 5.

4.8 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Outdoor irrigation represents the largest and most controllable component of water demand;
- Total water demand is driven more by irrigation and seasonal factors than by indoor use;
- Per capita water use is within regional targets but must continue to decline to offset growth;
- Peak demand, rather than average demand, is the primary driver of infrastructure requirements;
- System losses are within acceptable ranges but present opportunities for efficiency improvements; and
- Water demand patterns are influenced by both permanent and seasonal populations.

Section Summary

This section establishes the baseline conditions of water use in Grand County and identifies the factors that drive both total demand and peak system stress. These conditions provide the foundation for evaluating the **effects of development on water demand and infrastructure in Section 5 and for identifying effective demand-reduction** strategies in subsequent sections.

SECTION 5. EFFECT OF DEVELOPMENT ON WATER DEMAND AND WATER INFRASTRUCTURE (§17-79-403(2)(v)(A))

This section evaluates the relationship between projected development patterns and future water demand, and assesses the implications of that demand on existing and planned water infrastructure. The analysis is based on population projections presented in Section 2, existing supply conditions described in Section 3, and current water use patterns identified in Section 4.

The purpose of this section is to determine how growth affects water demand and infrastructure requirements and to establish whether those effects can be managed within the County's long-term water supply constraints.

5.1 Analytical Framework

Future water demand in Grand County is influenced by three primary factors:

1. **Population Growth** – increases in permanent residents raise baseline indoor water demand;
2. **Land Use Patterns and Development Design** – density, landscaping, and irrigation practices determine per capita water use;
3. _____
4. **Seasonal and Tourism-Related Demand** – visitor activity increases peak demand and amplifies system stress.

5. _____

1. **Climate Warming** – which will increase the need of plants for water quantity for both landscaping and agricultural lands. These effects will be ameliorated by the better landscaping and irrigation practices in (2).

To evaluate the combined effect of these factors, this Element uses a scenario-based approach to model total annual demand under varying levels of conservation and efficiency.

5.2 Projected Water Demand Scenarios

Three demand scenarios were evaluated over the planning horizon:

- **Baseline Scenario** – assumes continuation of current development patterns, irrigation practices, and system efficiency;
- **Moderate Conservation Scenario (20% Reduction)** – assumes implementation of water-efficient landscaping, improved irrigation systems, reduction of system losses, and expanded conservation programs;

Commented [103]: I don't see where density necessarily influences water demand. But it greatly influences infrastructure.

Commented [AJ104R103]: Correct, it has more to do with irrigated areas

Commented [105]: Where do commercial and agricultural fit in this section?

Commented [AJ106R105]: While agriculture represents about 50% of summer irrigation, as a percent of total irrigation demand, it has been going down over time.

Commented [107]: I will not place such verbiage throughout this Element without some agreement that by Planning Commission that this Element will address the effects of Climate Warming on water availability and growth. I believe such a consideration is necessary given all of the references to accommodating growth in the Element.

Commented [AJ108R107]: We should delete all references to the water supply in this document. Water supply is beyond the scope of this element and is addressed in the

Commented [109]: How were the 20% and 30% scenarios decided upon. Have they occurred in other places. Maybe a reference to where these percents were use by other professionals. This helps the reader to have confidence in these numbers (they do not seem unreasonable to me in the long-term).

Commented [AJ110R109]: The state establishes regional reduction goals. In 2015, the goal was to reduce demand by 20% by 2030. In 2019, the reduction goal was updated to 25% by 2025. The new state conservation plan has not been adopted, but it is expected that, due to the region exceeding previous reduction goals, the new 2030 goal will be likely be 30%.

Commented [111]: Add "reduction of system losses" to this section

Commented [AJ112R111]: Done

- **High Conservation Scenario (30% Reduction)** – assumes aggressive demand reduction measures, including significant turf limitations, widespread use of secondary water, reduction of system losses, and advanced irrigation technologies.

Commented [113]: Add "reduction of system losses" here also.

Commented [AJ114R113]: Done

Table 1. Projected Total Water Demand (2025–2060)

Year	Baseline Demand (AF/yr)	20% Reduction (AF/yr)	30% Reduction (AF/yr)
2025	2400	1920	1680
2030	2550	2040	1785
2035	2700	2160	1890
2040	2850	2280	1995
2045	3000	2400	2100
2050	3150	2520	2205
2055	3300	2640	2310
2060	3450	2760	2415

Table 1: Baseline Demand assumes continuation of the current landscape and usage patterns. The 20% and 30% Reduction scenarios mirror the state model approach, showing how aggressive conservation can hold long-term demand nearly flat even as the population grows.

Commented [115]: This table is filled with projections that make no sense. It assumes that 20 and 30% reductions take place immediately. For example that in 2025 the 20% reduction results in 1920 AF/y demand and a 30% reduction results in 1680 AF/y demand. But clearly the efforts described in this Element have an effect that develops slowly over the 35 year period. This leads later in the Plan to statement about (for example) the 20% reduction leading to lower levels of water demand that currently used in (for example) 2025, 2030, 2035, and 2040. This might be the case but we certainly know it is not the case in 2025 and not likely for the other years. The 20% reduction goal is: I assume for 2060.

Commented [AJ116R115]: Great comment, I understand how you could make this assumption. For a while, the region has met or exceeded the demand reduction goals established in both 2015 and 2019. It is expected that this trend will continue. This reduction is for unincorporated Grand County; similar trends have been noted in Moab City as well.

I reviewed the Town of Castle Valley’s recently adopted 2026 Water Management Plan with interest. A paragraph on page A6 states:

Water Use Trends. Even during the relatively short history of TCV, there has been a **visible** trend in the use of lots **away from large irrigated areas and/or water intensive uses toward smaller scale irrigation and residential uses needing far less water**, including an increase in the number of second homes with non-resident owners. **This trend is expected to continue**, so in addition to supporting the use of the 2:1 ratio described above **this trend will also be considered when estimating future water use** on TCV lots that currently have no water rights and on undeveloped BLM land in TCV.

Although the town does not have a centralized piped water system with individual meters for residences, it seems to recognize a trend toward demand reduction. This element does not include areas within municipalities, it does appear from published and adopted plans that demand reductions have also been noted within municipal boundaries.

Figure 2. Projected Water Demand Scenarios (2025–2060)

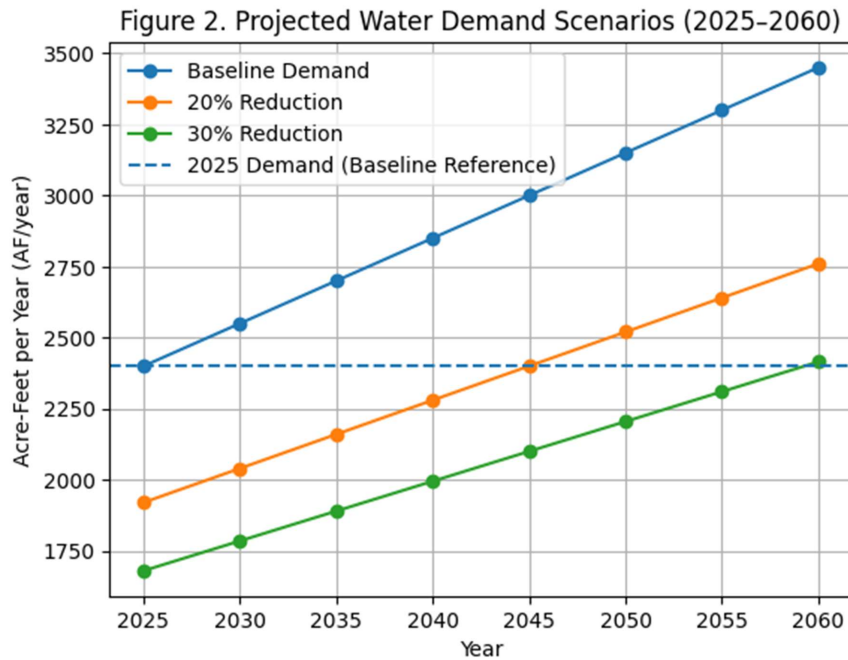


Figure 2 includes a dashed horizontal reference line representing **current demand (approximately 2,400–2,500 acre-feet per year)** and serves as a benchmark for evaluating long-term trends. The 20% and 30% reduction scenarios illustrate that total demand can remain near or below current levels despite continued population growth. This demonstrates the effectiveness of conservation measures in mitigating the impacts of development on water infrastructure.

5.3 Interpretation of Demand Scenarios

The modeled scenarios demonstrate the following:

- Under the **Baseline Scenario**, total demand increases steadily over time, reaching approximately **3,400–3,500 acre-feet per year by 2060**, reflecting the cumulative effect of population growth and current land use practices.
- Under the **Moderate Conservation Scenario**, total demand remains approximately **level with current conditions**, indicating that achievable conservation measures can offset the additional demand associated with projected growth.

Commented [117]: I would eliminate this graph for the reasons stated in the comment above. Unless you think that a 20% and 30% reduction in demand can be in place immediately and was in 2025, then this graph is simply does not make sense.

If this graph is replaced with another, we should have a graph for the effects of Climate Warming on water supplies.

Commented [AJ118R117]: Please see the response to the previous two comments on this topic. This graph is important to the document.

Commented [119]: This is an example of the misinterpretation that can result in using this table. Both the lines for 20 and 30% reduction fall below the current demand and for many future years, but are based on an assumption that those 20 and 30% reductions are in place immediately.

Commented [AJ120R119]: They have been in place since at least 2015.

Commented [121]: Again, only if you assume that the 20% reduction occurs very quickly and in 2060 it exceed current demand when the 20% reduction is fully realized.

Commented [AJ122R121]: Not necessarily quickly. It has been happening since at least 2015.

- Under the **High Conservation Scenario**, total demand **declines below current levels**, demonstrating that aggressive conservation strategies can reduce overall system demand even as population increases.

These results establish that water demand is not solely a function of growth, but is strongly influenced by policy, design, and management decisions.

5.4 Effect of Development on Water Demand

The analysis demonstrates that development does not inherently increase total water demand. Rather, the effect of development depends on how it is designed and managed.

Key relationships include:

- **Development Density:** Higher-density development reduces per capita water use by limiting irrigated area;
- **Landscape Design:** Turf-intensive landscapes significantly increase outdoor demand, while drought-tolerant landscaping reduces it;
- **Irrigation Practices:** Efficient systems and smart controllers reduce water use and minimize waste;
- **Water Source Allocation:** Use of non-potable water for irrigation reduces demand on culinary supplies;
- **Tourism-Oriented Development:** Increases peak demand and seasonal variability.

Commented [123]: Not necessarily true. But it does decrease infrastructure costs.

Commented [AJ124R123]: Correct

Accordingly, land use policy and development standards are the primary tools for controlling water demand associated with growth.

5.5 Infrastructure Implications

Water demand directly affects the capacity and performance of water infrastructure systems.

System Capacity

Increased demand requires expansion of:

- Production wells
- Storage facilities
- Pumping systems
- Distribution networks

Without conservation, continued growth would necessitate significant capital investment in system expansion.

Peak Demand Constraints

Peak demand conditions represent the most critical constraint on infrastructure. Even when average annual demand is manageable, peak conditions can:

- Exceed pumping capacity;
- Deplete storage reserves;
- Increase risk of service interruptions.

Managing peak demand is therefore essential to maintaining system reliability.

Spatial Impacts

Development in areas with limited infrastructure—such as Crescent Junction, ~~and~~ Thompson Springs, ~~and Cisco~~—may not be supportable without:

- New water sources;
- Infrastructure construction;
- Demonstrated long-term supply reliability.

Commented [AJ125]: Commissioner O'Brien's edits are in blue

Commented [AJ126R125]: Correct

5.6 Role of Colorado River Water

The use of Colorado River water is a critical component of the County's long-term demand management strategy.

Rather than expanding potable supply to meet increased demand, the County ~~will attempt~~ ~~intends~~ to:

- Utilize Colorado River water for irrigation and outdoor uses;
- Reduce reliance on culinary water for non-potable purposes;
- Preserve higher-quality sources—such as groundwater, Ken's Lake storage, and spring systems—for drinking water.

Commented [127]: This change is in line with what follow shortly "Its use depends on: three sentences below the ellipses.

Commented [AJ128R127]: I think the county intends to do this

Commented [129]: And some commercial uses?

Commented [AJ130R129]: I'm not sure if it would go to commercial use, unless it is for outside non-culinary use

This approach ~~would allow the County to offset some~~ ~~allows the County to offset~~ growth-related demand without increasing pressure on limited potable water supplies.

However, Colorado River water cannot be assumed to be ~~immediately~~ available. Its use depends on:

- Successful proving up of water rights;
- Construction of infrastructure;
- Regulatory approvals and funding.

Commented [AJ131]: Commissioner O'Brien's edits are in blue

Commented [AJ132R131]: Ok

- Declining flow of the Colorado River due to Climate Warming and overallocation.

Commented [AJ133]: Commissioner O'Brien's edits are in blue

Accordingly, demand projections do not assume full availability of these supplies unless demonstrated.

Section 3.7 Grand County Protections for Drinking Water Sources

The County has land use authority and has an important role in protecting water resources within its jurisdiction and can do this through land use regulations.

The two major aquifers in Grand County that supply drinking water are the Glenn Canyon Aquifer and the Castle Valley Aquifer. Both of these aquifers are designated by the EPA as Sole Source Aquifers (only one other aquifer in Utah is so designated). They each represent the principal source of drinking water for their respective areas (they supply well over 50 percent of the culinary water for their areas without an alternative source of drinking water). Protecting these sources of drinking water is crucial for Grand County's current and future residents. Recent research has indicated that the Glen Canyon Aquifer is already being used at a level where additional withdrawals from the aquifer would likely deplete storage and not be sustained by recharge. (Garner et al. 2019 in the Journal of Hydrology).

· Grand County will consider ways of extending land use protections for the culinary drinking water in both of these EPA designated Sole Source Aquifers.

· The County should use information on current withdrawals and recharge and projections of future withdrawals and recharge of the Glen Canyon Aquifer so that this information can inform its land use policies.

· The County should use information on current climate warming and projections of climate warming effects on the availability and use of water within the County so that this information can inform its land use policies.

· The County will consider the establishment of a Water Advisory Committee consisting mainly of individuals with relevant knowledge of hydrology to advise the County on water availability and use so that the advice of this committee can inform land use policies within the County.

5.87 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Population growth will increase baseline water demand in the absence of conservation measures;
- Outdoor irrigation is the primary driver of increased demand associated with development;

Commented [AJ134]: Commissioner O'Brien's edits are in blue

Commented [AJ135R134]: Great comment. I think this is already in the Land Use Code.

- Moderate conservation measures **possibly-can** offset the additional demand associated with projected growth;
- Aggressive conservation measures can reduce total demand below current levels;
- Peak seasonal demand is the primary constraint on infrastructure capacity;
- Development design and land use policy are the primary determinants of water demand; and
- Colorado River water **provides a viable long-term** strategy for reducing reliance on the culinary supply for irrigation.

Commented [136]: The 20% scenario does not accomplish this by 2060 and the 30% scenario almost makes this offset.

Commented [AJ137R136]: Moderate conservation measures have been shown to reduce demand significantly

Commented [AJ138]: Commissioner O'Brien's edits are in blue

Commented [AJ139R138]: I think it is a viable strategy

5.8 Policy Implications

The findings of this section establish the basis for policy direction in subsequent sections.

Specifically:

- Water demand can be **modifiedcontrolled** through land use regulation, development standards, and conservation practices;
- Development approvals must be conditioned on demonstrated water availability and infrastructure capacity;
- Reducing outdoor water use is the most effective strategy for managing long-term demand;
- Infrastructure planning must prioritize peak demand conditions; and
- Long-term supply strategies must be coordinated with realistic funding and implementation timelines.

Commented [AJ140]: Commissioner O'Brien's edits are in blue

Commented [AJ141R140]: correct

Section Summary

This section demonstrates that the relationship between development and water demand is **not fixed**, but is **modifieddetermined** by policy choices, development patterns, and conservation practices.

With appropriate measures in place, Grand County can accommodate projected growth **without significantly increasing total water demand (under the 30% reduction scenario), while maintaining system reliability and protecting long term water supply.**

Commented [AJ142]: Commissioner O'Brien's edits are in blue

Commented [AJ143R142]: Yes, to the modification of the first paragraph. I don't know about changes to the second paragraph.

SECTION 6. METHODS OF REDUCING WATER DEMAND FOR FUTURE DEVELOPMENT (§17-79-403(2)(v)(B))

This section identifies methods to reduce water demand associated with future development. These methods are intended to ensure that new growth occurs within the limits of available water supply and infrastructure capacity, ~~consistent with the findings of Section 5.~~

Future water demand is largely determined at the point of development approval. Accordingly, the most effective demand-reduction strategies are those embedded in land-use **regulations, development standards, and infrastructure requirements.**

6.1 Policy Framework

Water demand ~~reduction for future development~~ will be achieved through a combination of:

- Land use regulation and zoning
- Development design standards
- Infrastructure requirements and system design
- Coordination with water providers
- Financial feasibility and funding alignment

The County establishes requirements through its land use authority, while water providers implement operational and pricing mechanisms within their systems.

6.2 Land Use and Development Pattern Controls

The form and intensity of development directly influence water demand. The County will promote development patterns that reduce per capita consumption and overall system demand.

Density and Land Use Alignment

- Encourage **compact and clustered development** to reduce irrigated area;
- Discourage large-lot, water-intensive development in areas with limited supply;
- Align zoning and future land use designations with long-term water availability;
- Limit development intensity in areas where infrastructure capacity is constrained.

These measures ~~help ensure that growth occurs in a manner consistent with available resources.~~ ~~reduce the impact of growth on available resources.~~

Commented [AJ144]: Commissioner O'Brien's edits are in blue

Commented [AJ145R144]: Ok

Commented [AJ146]: Commissioner O'Brien's edits are in blue

Commented [AJ147R146]: Please see the section title. UCA (§17-79-403(2)(v)(B)) specifically requires addressing future demand.

Commented [148]: Although there are good reasons to choose clustered development, irrigation reduction should be considered independent of density.

Commented [AJ149R148]: Agreed

Commented [150]: Same as previous comment.

Commented [AJ151R150]: Agreed

Commented [152]: Or via policy severely restrict outdoor uses of water in these areas.

Commented [AJ153R152]: Agreed

Commented [AJ154]: Commissioner O'Brien's edits are in blue

Commented [AJ155R154]: Great comment, I think the sentence should be centered on reducing water demand of future development.

6.3 Landscape Design Standards

Landscape design is the most significant controllable factor affecting water demand in **new** development.

The County will require:

- Limitation or prohibition of **non-functional turf**;
- Use of **drought-tolerant and climate-adapted plant materials**;
- **Hydro zoning** to group plants with similar water needs;
- Reduction of irrigated areas to those that serve a functional purpose.

These standards directly reduce outdoor water demand and peak system stress.

6.4 Irrigation System Requirements

Efficient irrigation systems are critical to reducing water use in new development.

The County will require:

- Installation of **drip irrigation systems** or equivalent high-efficiency technology;
- Use of **smart irrigation controllers** that adjust watering based on weather conditions;
- Elimination or restriction of spray irrigation in non-functional areas;
- Design standards that minimize overspray, runoff, and evaporation losses.

These requirements ensure that irrigation systems operate at maximum efficiency.

6.5 Secondary Water and Source Allocation

Water source allocation is a key component of demand reduction.

The County will:

- Require connection to **secondary (non-potable) irrigation systems** where **available**;
- Encourage expansion of secondary systems in areas with sufficient supply;
- Promote use of **Colorado River water for irrigation and outdoor uses** **if-as** it becomes **available**;
- Preserve higher-quality sources—such as groundwater, Ken’s Lake storage, and spring systems—for **culinary use**.

This strategy reduces demand on potable water supplies and supports long-term sustainability.

Commented [AJ156]: Kimmerle said: Are these standards/regulations for county property? Or for residential and commercial properties? How would the county enforce these?

Commented [AJ157R156]: Great question. This section specifically relates to future development, regardless of ownership. The county enforces this through the recently adopted waterwise landscape ordinance.

Commented [AJ158]: Kimmerle said: Does a property owner have to have water rights/shares to do this? I was recently at GWSSA and asked about irrigation water. The employee there said that all shares of secondary water have been sold and I would need to find someone “by word of mouth” to buy a share(s) from.

Commented [AJ159R158]: Great question. GWSSA is the water supplier in Spanish Valley.

Commented [AJ160]: Commissioner O’Brien’s edits are in blue

Commented [AJ161R160]: I think as is a better word choice than if.

6.6 Water-Efficient Building Design

Indoor water use can be reduced through building-level efficiency standards.

The County will require or encourage:

- Installation of **high-efficiency plumbing fixtures**;
- Use of water-efficient appliances and systems;
- Building design practices that reduce overall water demand.

While indoor use is less variable than outdoor use, these measures contribute to long-term reductions.

6.7 Development Review and Approval Requirements

Water demand considerations will be integrated into the development review process.

Water Availability Verification

All development proposals must demonstrate:

- Availability of **legally recognized water rights**;
- Confirmation of **system capacity** from the applicable water provider;
- Ability to deliver water under both average and peak demand conditions.

Infrastructure Capacity and Phasing

- Development approvals may be conditioned on **infrastructure improvements**;
- Projects may be required to **phase development** based on available capacity;
- Expansion of service areas must be supported by infrastructure planning.

Financial Feasibility

Development reliant on new or expanded water infrastructure must demonstrate:

- A credible funding strategy, including potential use of the Permanent Community Impact Board (CIB);
- Coordination with water providers and regional partners;
- Feasibility of constructing necessary infrastructure within a reasonable timeframe.

Development shall not rely on speculative or unproven water supply.

Commented [AJ162]: Kimmerle said: How would this be handled? Do we need more regulation in Grand County? Could we think of a way to incentivize instead of regulating?

Commented [AJ163R162]: Great question, it is already in the current code with the recent adoption of the waterwise landscaping ordinance.

Commented [164]: As a part of this, can developers create HOA requirements which significantly limit outdoor use, thereby reducing expected demand?

Commented [AJ165R164]: Yes

Commented [166]: do they really need CIB funding to proceed if they have other funding? I would eliminate starting with ", including . . ."

Commented [AJ167R166]: In most cases, the potential use of PCIB funding is an important piece of the funding puzzle.

6.8 Water-Constrained Areas

Special consideration applies to areas with limited water supply and infrastructure, including Crescent Junction, ~~and~~ Thompson Springs, ~~and~~ Cisco.

In these areas:

- Development shall be limited by **demonstrated water availability**;
- New infrastructure must be constructed prior to or concurrent with development;
- Long-term supply reliability must be established;
- Development intensity may be restricted based on system capacity.

These requirements ensure that growth does not exceed available resources.

6.9 Coordination with Water Providers

Water providers play a central role in implementing demand reduction strategies.

The County will coordinate with providers to:

- Verify water availability and system capacity;
- Align development approvals with infrastructure planning;
- Support conservation programs and demand management;
- Integrate provider data into planning decisions.

This coordination ~~helps ensure~~ensures that land use decisions reflect operational realities.

6.10 Key Findings

Based on the analysis presented in this section, the following findings are ~~recognized~~established:

- Water demand associated with future development can be significantly reduced through design and regulatory standards;
- Outdoor irrigation is the primary controllable component of demand;
- Secondary water systems and the potential Colorado River supply are critical to reducing reliance on culinary water;
- Development review processes provide an effective mechanism for implementing demand reduction measures;
- Financial feasibility and infrastructure capacity are essential components of sustainable development; and
- Water-constrained areas require stricter controls to ensure long-term reliability.

Commented [AJ168]: Commissioner O'Brien's edits are in blue

Commented [AJ169R168]: Ok, add 'and' too.

Commented [170]: Is transported water acceptable? This seems to highly encourage conservation.

Commented [AJ171R170]: Yes, that is currently the case at the new gas station in Crescent Junction.

Commented [AJ172]: Commissioner O'Brien's edits are in blue

Commented [AJ173R172]: Good comment, agreed

Commented [AJ174]: Commissioner O'Brien's edits are in blue

Commented [AJ175R174]: Ok on recognized. Not sure on the pre-modifier 'potential'

6.11 Policy Direction

Based on these findings, Grand County will:

- Integrate water demand reduction requirements into land use regulations and development standards;
- Require verification of water availability and infrastructure capacity for all development;
- Promote development patterns and landscape designs that minimize water use;
- Support use of non-potable water sources for irrigation; and
- Coordinate with water providers and funding agencies to implement infrastructure improvements.

Section Summary

This section establishes that reducing water demand for future development is **facilitated** **achieved** through **clear standards, enforceable requirements, and coordinated planning**.

~~By incorporating these measures into the development process, Grand County can help ensure that future growth occurs within the limits of the available water supply, while maintaining system reliability and avoiding unnecessary infrastructure expansion.~~

Commented [AJ176]: Kimmerle said: Again, is this only on county-owned properties? Or also private property?

Commented [AJ177R176]: Section 8 deals with only county owned properties

Commented [178]: Same comment about development patters and infrastructure cost vs landscape designs and water use.

Commented [AJ179R178]: gotcha

Commented [AJ180]: Commissioner O'Brien's edits are in blue

Commented [AJ181R180]: Facilitated or achieved it doesn't matter to me

Commented [182]: I do not see how we can ensure this even without consideration of Climate Warming and certainly without that consideration it is even more difficult.

Commented [AJ183R182]: Please see above subsection on Climate change/warming.

SECTION 7. METHODS OF REDUCING WATER DEMAND FOR EXISTING DEVELOPMENT (§17-79-403(2)(v)(C))

This section identifies methods to reduce water demand associated with existing development. Because the majority of Grand County’s built environment is already in place, reductions in water use within existing residential, commercial, and institutional uses represent the most immediate opportunity to improve system efficiency and reduce total demand.

As established in Section 4, outdoor irrigation is the largest discretionary component of water use and the primary driver of peak demand. Accordingly, the strategies in this section focus on reducing outdoor water use, improving system efficiency, and influencing water use behavior through incentives, pricing, and targeted regulation.

Commented [184]: largest discretionary component of residential water use?

Commented [AJ185R184]: Data from GWSSA indicates that outdoor water use quadruples water consumption compared to winter consumption, based on sewer information

7.1 Policy Framework

Water demand reduction in existing development will be achieved through a combination of:

- Incentive-based programs
- Operational improvements by water providers
- Pricing and demand management strategies
- Public education and outreach
- Targeted regulatory measures where necessary

Unlike new development, where standards can be applied at the time of construction, reducing demand in existing development requires a combination of voluntary participation and system-level management.

7.2 Landscape Conversion and Outdoor Water Use Reduction

Reducing irrigated turf and improving landscape efficiency represents the most significant opportunity for near-term water savings.

Turf Conversion Programs

The County will support and coordinate programs that:

- Provide incentives for removal of **non-functional turf**;
- Prioritize high-water-use properties, including commercial and institutional sites;
- Encourage replacement with **drought-tolerant, climate-adapted landscaping**;
- Focus on areas where conversion produces measurable reductions in demand.

These programs can generate substantial water savings and reduce peak demand.

Landscape Efficiency Improvements

Existing landscapes can be improved through:

- Conversion to **low-water plant palettes**;
- Redesign of irrigation zones to match plant water needs;
- Reduction of irrigated areas that do not serve a functional purpose.

Because outdoor irrigation is highly variable, these measures provide immediate and measurable reductions in water use.

7.3 Irrigation System Retrofits

Irrigation system performance is a critical factor in water demand.

The County will support programs that encourage:

- Installation of **smart irrigation controllers** that adjust watering based on weather conditions;
- Conversion to **drip irrigation systems** or other high-efficiency technologies;
- Repair or replacement of inefficient or outdated irrigation systems;
- Elimination of overspray, runoff, and unnecessary watering.

These measures improve efficiency and reduce both total demand and peak system stress.

7.4 Pricing and Demand Management

Water providers play a central role in shaping water-use behavior through pricing and operational controls.

Tiered Rate Structures

The County will support provider efforts to:

- Maintain or expand **tiered pricing structures** that increase rates for high-volume use;
- Use pricing signals to discourage excessive irrigation and discretionary use;
- Align rates with conservation objectives and system costs.

Seasonal and Drought Management

Providers may implement:

- Seasonal watering restrictions during peak demand periods;
- Drought response measures tied to supply conditions;
- Temporary or permanent reductions in allowable use during critical periods.

These tools are among the most effective methods for reducing demand across all user groups.

7.5 System Efficiency and Water Loss Reduction

Improving system efficiency increases available supply without developing new sources.

The County will support provider efforts to:

- Conduct **system-wide leak detection programs**;
- Implement **advanced metering infrastructure (AMI)** to improve data accuracy;
- Identify and address abnormal or continuous water use;
- Maintain system losses within acceptable **localized industry** standards.

Reducing water loss provides a cost-effective method of increasing system reliability.

7.6 Indoor Water Use Efficiency

While outdoor use represents the largest opportunity for savings, indoor efficiency contributes to long-term demand reduction.

The County will support programs that encourage:

- Replacement of older plumbing fixtures with **high-efficiency fixtures**;
- Use of water-efficient appliances;
- Retrofit programs **and leak detection equipment** when cost-effective and feasible.

These measures provide incremental reductions that contribute to overall system performance.

Commented [186]: I'd argue that acceptable industry ranges are not acceptable in our area.

Commented [AJ187R186]: Agreed

Commented [188]: Encourage use of leak detection equipment

Commented [AJ189R188]: agreed

7.7 Public Education and Outreach

Behavioral change is an essential component of water conservation.

The County will support:

- Public education campaigns focused on water-wise landscaping and irrigation practices;
- Partnerships with water providers, schools, and community organizations;
- Outreach programs that provide guidance on reducing water use.

Education enhances the effectiveness of other demand reduction strategies.

7.8 Targeted Regulatory Measures

Where voluntary and incentive-based measures are insufficient, targeted regulatory approaches may be implemented.

These may include:

- Ordinances addressing **water waste**, such as excessive runoff or irrigation during prohibited hours;
- Requirements for landscape upgrades during major redevelopment;
- Limitations on irrigation of non-functional turf in specific contexts.

Regulatory measures will be implemented to balance effectiveness, administrative feasibility, and community acceptance.

7.9 Coordination with Water Providers

Water providers are essential partners in implementing demand reduction strategies.

The County will coordinate with providers to:

- Support conservation programs and incentive initiatives;
- Align land use planning with operational demand management strategies;
- Utilize provider data to evaluate program effectiveness;
- Integrate conservation efforts across jurisdictions.

This coordination helps ensure ~~sensures~~ that efforts to reduce demand are consistent and effective.

Commented [AJ190]: Commissioner O'Brien's edits are in blue

Commented [AJ191R190]: OK

7.10 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Existing development represents the largest opportunity for near-term water demand reduction;
- Outdoor irrigation is the primary driver of discretionary water use;
- Incentive programs and irrigation retrofits can produce significant and measurable savings;
- Pricing and demand management strategies are effective tools for influencing behavior;
- System efficiency improvements can recover lost water and improve reliability; and
- Targeted regulatory measures may be necessary to achieve long-term conservation goals.

7.11 Policy Direction

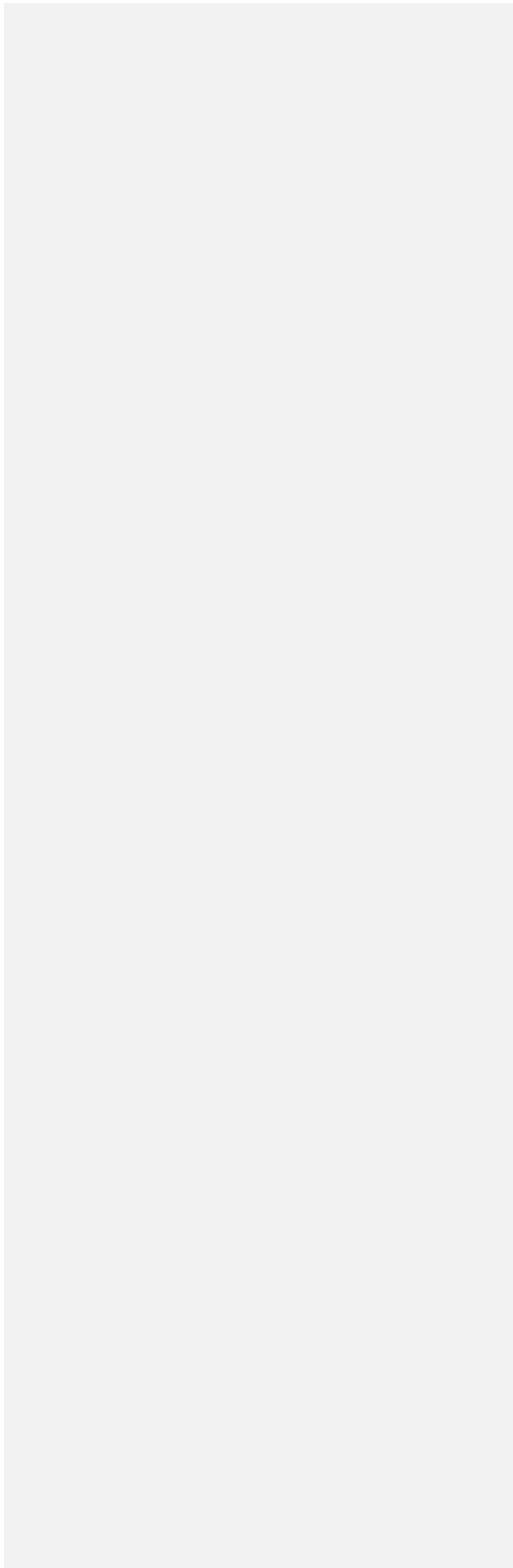
Based on these findings, Grand County will:

- Support and coordinate conservation programs for existing development;
- Promote landscape conversion and efficient irrigation practices;
- Encourage continued investment in system efficiency and monitoring;
- Support pricing and demand management strategies implemented by providers; and
- Utilize regulatory tools where necessary to reduce water waste.

Section Summary

This section establishes that meaningful reductions in water demand can be achieved within existing development through a combination of **incentives, pricing, system improvements, and education**.

Because these measures can be implemented immediately and across a broad range of users, they represent a critical component of the County's strategy for maintaining water supply reliability and accommodating future growth



SECTION 8. COUNTY OPERATIONAL IMPROVEMENTS TO ELIMINATE WATER WASTE (§17-79-403(2)(v)(D))

This section identifies actions Grand County will take within its own operations to reduce water use, eliminate waste, and improve system efficiency. As required by Utah Code §17-79-403(2)(v)(D), the County evaluates its internal practices and establishes a framework for implementing measurable improvements.

Although the County does not operate public water systems or control water rights, it owns and manages facilities, parks, landscapes, and infrastructure that contribute to overall water demand. These assets provide an opportunity to achieve direct reductions in water use while demonstrating best practices for the community.

8.1 Policy Framework

County operational improvements will be achieved through:

- **Facility upgrades and retrofits**
- **Landscape conversion and irrigation efficiency**
- **Operational policies and maintenance practices**
- **Monitoring, reporting, and performance tracking**

These measures are intended to reduce water use, improve efficiency, and support the broader conservation goals established in this Element.

8.2 County Facilities and Indoor Water Use

County-owned buildings represent a controllable source of water demand and provide opportunities for efficiency improvements.

Fixture and System Upgrades

The County will:

- Retrofit facilities with **high-efficiency plumbing fixtures**, including toilets, faucets, and urinals;
- Replace outdated equipment with water-efficient systems;
- Incorporate water-efficient design standards into all new County facilities.

Commented [AJ192]: Kimmerle said: Who will do all of this?

Commented [AJ193R192]: County maintenance crews

Operations and Maintenance

The County will:

- Establish protocols for **prompt detection and repair of leaks**;
- Maintain plumbing systems to ensure efficient operation;
- Integrate water efficiency considerations into routine facility management.

While indoor water use is relatively stable, these measures contribute to long-term reductions and support overall system efficiency.

8.3 County Landscapes and Outdoor Water Use

Outdoor irrigation associated with County-owned properties represents the largest opportunity for operational water savings.

Landscape Conversion

The County will:

- Replace **non-functional turf** with drought-tolerant, climate-adapted landscaping;
- Prioritize conversion at high-use and high-visibility sites;
- Reduce irrigated areas to those that serve a functional purpose.

Irrigation Efficiency

The County will:

- Retrofit irrigation systems with **drip irrigation or equivalent high-efficiency technology**;
- Install **smart irrigation controllers** that respond to weather conditions;
- Eliminate overspray, runoff, and unnecessary watering;
- Align irrigation schedules with conservation best practices.

These measures directly reduce outdoor water use and peak demand associated with County operations.

8.4 Operational Policies and Water Use Practices

Water efficiency will be incorporated into County operational policies and procedures.

The County will:

- Establish policies requiring **timely repair of leaks and irrigation system failures**;
- Limit irrigation during peak daytime hours to reduce evaporation;
- Adopt seasonal watering schedules consistent with conservation goals;
- Incorporate water efficiency into procurement and operational decisions.

These policies ensure that conservation practices are applied consistently across County operations.

8.5 Monitoring and Performance Tracking

Effective water management requires ongoing monitoring and evaluation.

The County will:

- Track water use at County facilities and properties on a regular basis;
- Establish baseline usage levels and identify opportunities for reduction;
- Evaluate the effectiveness of conservation measures over time;
- Incorporate water use data into broader planning and reporting efforts.

Monitoring allows the County to measure performance and adjust practices as needed.

8.6 Demonstration and Leadership Role

County facilities and landscapes serve as visible examples of water use practices.

By implementing water-efficient designs and technologies, the County will:

- Demonstrate the effectiveness of conservation measures;
- Support public education and outreach efforts;
- Encourage adoption of similar practices by residents, businesses, and developers.

Leadership through example strengthens the credibility of the policies established in this Element.

8.7 Funding and Implementation

Implementation of operational improvements may require capital investment.

The County will pursue funding through sources such as the Permanent Community Impact Board (CIB) and other programs to support:

- Facility retrofits and upgrades;
- Landscape conversion and irrigation improvements;
- Monitoring and metering systems.

Funding availability will influence the timing and scope of improvements.

8.8 Key Findings

Based on the analysis presented in this section, the following findings are established:

- County operations represent a controllable source of water demand;
- Outdoor irrigation at County facilities is the largest contributor to operational water use;
- Facility upgrades and irrigation improvements can significantly reduce water consumption;
- Operational policies and maintenance practices are essential to sustaining efficiency gains; and
- The County can influence broader community behavior through demonstration and leadership.

8.9 Policy Direction

Based on these findings, Grand County will:

- Implement water-efficient practices across all County-owned facilities and properties;
- Prioritize landscape conversion and irrigation efficiency improvements;
- Establish operational policies to reduce water waste;
- Monitor and evaluate water use to ensure continuous improvement; and
- Lead by example in demonstrating water conservation practices.

Section Summary

This section establishes that Grand County will reduce water **usage waste** within its own operations through **facility improvements, landscape conversion, operational policies, and performance monitoring**.

By taking direct action, the County reinforces the broader conservation strategies identified in this Element and demonstrates a commitment to responsible water management.

Commented [194]: Suggest changing "water waste" to "water usage"

Commented [AJ195R194]: agreed

SECTION 9. REGIONAL COLLABORATION

Long-term water supply reliability in Grand County depends on coordination among multiple jurisdictions, water providers, and regulatory agencies. Water resources, infrastructure systems, and demand patterns extend beyond jurisdictional boundaries, and no single entity has comprehensive authority over supply, demand, and delivery.

This section establishes the framework for coordination necessary to align land-use decisions, water-supply planning, conservation strategies, and infrastructure investment across the entities that influence water use in Grand County.

9.1 Institutional Context

Water management in Grand County involves multiple independent entities with distinct roles and authorities:

- **Grand County** – responsible for land use planning, zoning, and development approvals;
- **Water Providers** – including the Grand Water & Sewer Service Agency (GWSSA), Arches Special Service District (ASSD), and Thompson Special Service Water District (TSSWD), responsible for water rights, system operations, infrastructure planning, and service delivery;
- **Municipalities and Neighboring Jurisdictions** – including Moab City, Castle Valley, and San Juan County, which share water resources and infrastructure considerations;
- **State Agencies** – including the Utah Division of Water Resources and the Utah Division of Water Rights, which provide planning guidance, funding, and regulatory oversight;
- **Regional and Federal Frameworks** – including the Colorado River Compact and related agreements governing allocation and use of Colorado River water.

Each entity operates within its own statutory authority. Effective water management requires coordination across these institutional boundaries.

9.2 Need for Coordination

Regional collaboration is necessary due to the following conditions:

- **Shared Water Resources:** Groundwater aquifers and surface water systems extend across jurisdictional boundaries;
- **Interdependent Infrastructure:** Water systems may rely on shared or coordinated infrastructure investments;
- **Growth Patterns:** Land use decisions in one jurisdiction can affect water demand and system capacity in another;
- **Regulatory Requirements:** State and federal regulations require coordinated compliance, particularly for water rights and Colorado River use.

Without coordination, planning decisions may be inconsistent, inefficient, or unsustainable.

9.3 Coordination Objectives

Grand County will pursue regional collaboration to:

- Align land use decisions with **available water supply and infrastructure capacity**;
- Ensure that growth occurs within **long-term resource constraints**;
- Improve the effectiveness of **conservation and demand management strategies**;
- Support development of **regional infrastructure and supply solutions**; and
- Maintain compliance with **state and interstate water policies**.

9.4 Coordination Mechanisms

The County will implement coordination through the following mechanisms:

Interagency Communication

- Maintain regular communication with water providers regarding system capacity, demand trends, and infrastructure planning;
- Coordinate with municipalities and neighboring jurisdictions on land use decisions that affect shared water resources;
- Participate in regional planning discussions and technical working groups.

Development Review Coordination

- Require consultation with water providers during review of development proposals;
- Ensure that land use approvals are informed by current data on water availability and system capacity;
- Coordinate with providers on phasing and infrastructure requirements for new development.

Commented [AJ196]: Kimmerle said: Who will do all of this?

Commented [AJ197R196]: County staff. GWSSA is a participant in the Development Review Team emails.

Data Sharing and Planning Alignment

- Utilize data from water provider master plans, conservation plans, and state resources;
- Align the General Plan with current water supply and demand projections;
- Incorporate updated data into periodic plan amendments.

Joint Planning Efforts

- Participate in regional initiatives related to water supply, conservation, and infrastructure development;
- Support collaborative evaluation of long-term supply options, including Colorado River water development;
- Coordinate planning efforts to avoid duplication and improve efficiency.

9.5 Coordination with Water Providers

Water providers are central to implementing the strategies identified in this Element.

The County will coordinate with providers to:

- Verify water availability and system capacity for proposed development;
- Align development timing with infrastructure expansion;
- Support conservation programs and demand management strategies;
- Incorporate provider data and expertise into County planning decisions.

This coordination ensures that land use decisions reflect operational realities.

9.6 State, and Regional, and Federal Coordination

Grand County will coordinate with state and regional agencies to ensure consistency with broader water planning efforts.

Key entities include:

- Utah Division of Water Resources – conservation targets, planning support, and funding;
- Utah Division of Water Rights – administration of water rights and approvals;
- Regional funding programs and infrastructure partners;
- Interstate and federal frameworks governing Colorado River use.

Coordination with these entities ensures regulatory compliance and alignment with regional supply conditions.

Commented [AJ198]: Commissioner O'Brien's edits are in blue

Commented [AJ199R198]: Great comment, agreed

9.7 Colorado River Water Development Coordination

Development of Colorado River water resources requires multi-jurisdictional coordination.

Grand County will:

- Coordinate with neighboring jurisdictions and water providers on diversion, conveyance, and delivery systems;
- Align water rights administration and permitting processes;
- Participate in regional planning efforts for infrastructure development;
- Ensure that projects are consistent with interstate compact obligations and regulatory requirements.

These efforts are long-term in nature and require sustained collaboration.

9.8 UMTRA Transition Coordination

The completion of the UMTRA project in Crescent Junction and Thompson Springs creates new opportunities and challenges.

The County will coordinate with:

- State agencies and water providers to evaluate infrastructure needs;
- Regional partners to identify funding and implementation strategies;
- Stakeholders to ensure that development aligns with water availability and system capacity.

Coordination is necessary to ensure that post-remediation development does not exceed available resources.

9.9 Funding Coordination and CIB Participation

Implementation of water infrastructure and supply projects requires coordinated funding strategies.

Grand County will:

- Collaborate with partners on applications to funding entities. Collaborate with partners on applications to the Permanent Community Impact Board (CIB);
- Prioritize projects that support water supply reliability and demand reduction;
- Align funding applications with regional planning efforts;
- Coordinate project development to meet funding program requirements.

Commented [AJ200]: Kimmerle said: Who will do all of this? It feels like we are currently short on staff and adding more doesn't seem like a good idea.

Commented [AJ201R200]: Yes, we are short-staffed. I think there is currently a county subcommittee working on this.

Commented [202]: Seems like too much concentration on CIB funding.

Commented [AJ203R202]: Historically, PCIB funding has played a significant role in providing infrastructure funding (either through grants or low-interest loans) to those counties that are permanently impacted by mineral extraction on federal lands. With around 95% of the land in Grand County being property tax exempt, PCIB funding will be a significant source of infrastructure funding in the county in the future. Payment In Lieu of Taxes (PILT) is a source of funding. It does not 100% offset the lack of property tax on public lands. With limited chance of the conversion of public land to private land, PCIB will need to be used. A 2017 report to the Utah Legislature stated: Utah receives more property tax in 6 days from 21% taxable lands (\$48.1M) ...than it receives in an entire year in PILT from 65% non-taxable federal lands (\$40.9M)

Commented [AJ204]: Commissioner O'Brien's edits are in blue

Commented [AJ205R204]: See above response

CIB funding is a primary tool for implementing infrastructure and conservation projects, particularly in rural and water-constrained areas affected by mineral extraction on federal lands.

9.10 Key Findings

Based on the analysis presented in this section, the following findings are established:

- Water supply and demand in Grand County are influenced by multiple independent entities;
- Effective water planning requires coordination across jurisdictional and institutional boundaries;
- Land use decisions must be informed by accurate data from water providers;
- Regional collaboration is necessary to develop long-term supply solutions; and
- Coordinated funding strategies are essential to implementing infrastructure and conservation projects.

9.11 Policy Direction

Based on these findings, Grand County will:

- Maintain ongoing coordination with water providers, ~~and~~ regional partners, ~~and federal agencies~~;
- Integrate water supply considerations into land use decisions;
- Support regional planning efforts for water supply and infrastructure;
- Coordinate funding strategies to implement priority projects; and
- Ensure that development aligns with available water resources and system capacity.

Commented [AJ206]: Commissioner O'Brien's edits are in blue

Commented [AJ207R206]: Great comment. Agree

Section Summary

This section establishes that sustainable water management in Grand County depends ~~in part~~ on **coordinated action among multiple entities**, each with distinct roles and responsibilities.

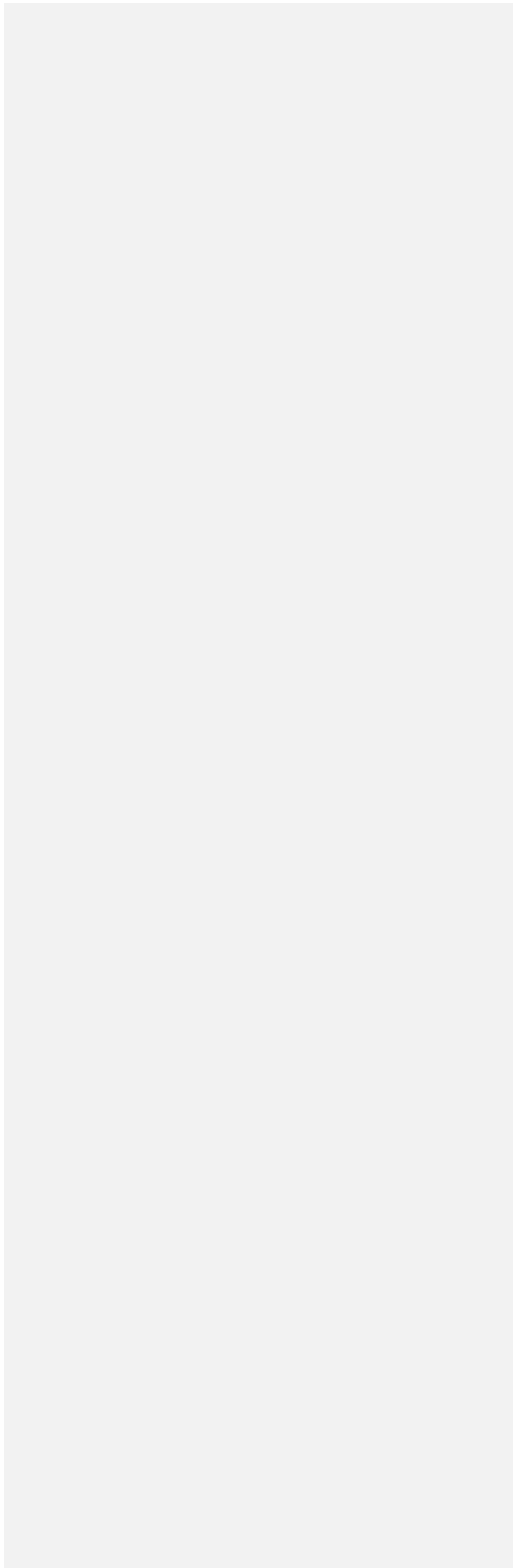
Commented [AJ208]: Commissioner O'Brien's edits are in blue

~~By formalizing a framework for regional collaboration, the County ensures that land use decisions align with water supply conditions, infrastructure capacity, and long-term resource sustainability.~~

Commented [AJ209R208]: My thought was that since Grand County is not a water provider, water management depends on coordinated action.

Commented [210]: I do not see how the County can ensure this by formalizing a framework for regional collaboration. Ensures that land use decision align with the water supply conditions and long term resource sustainability? And this is done without considering Climate Warming.

Commented [AJ211R210]: Great question. Please see the above subsection on climate change/warming/heating. While Grand County is not a provider of water, "will serve" letters from the water providers are required prior to development approval.



SECTION 10. GOALS, POLICIES, AND IMPLEMENTATION

This section establishes the goals, policies, and implementation measures **related to necessary to manage** water demand, support long-term water supply reliability, and align land use decisions with available resources. The framework presented herein is based on the analysis and findings of Sections 2 through 9 and is intended to guide decision-making by Grand County, water providers, and regional partners.

Commented [AJ212]: Commissioner O'Brien's edits are in blue

Commented [AJ213R212]: I think they are necessary

The policies in this section are implemented through land use regulation, development review, interagency coordination, and capital planning. They are designed **to help** ensure that growth occurs within the constraints of available water supply and infrastructure capacity.

Commented [AJ214]: Commissioner O'Brien's edits are in blue

Commented [AJ215R214]: I think they are designed to ensure, not just help to ensure

10.1 Goal 1: Align Growth with Water Supply and Infrastructure Capacity

Policy 1.1 – Water Availability Verification

All development proposals shall demonstrate the availability of a reliable water supply prior to approval.

Implementation Measures:

- Require documentation of legally recognized water rights or service commitment from a provider;
- Require verification of system capacity, including peak demand conditions;
- Coordinate with water providers during development review.

Policy 1.2 – Infrastructure Capacity and Phasing

Development shall be limited by the capacity of existing and planned water infrastructure.

Implementation Measures:

- Condition approvals on necessary infrastructure improvements;
- Require phasing of development based on system capacity;
- Align development intensity with service area capabilities.

10.2 Goal 2: Reduce Per Capita and Total Water Demand

Policy 2.1 – Demand Reduction Targets

Grand County shall maintain or reduce per capita water use over time.

Implementation Measures:

- Support conservation programs and provider initiatives;
- Track system-wide water use and performance metrics;
- Integrate demand reduction goals into planning decisions.

Policy 2.2 – Peak Demand Management

The County shall prioritize reducing peak seasonal demand.

Implementation Measures:

- Promote irrigation efficiency and landscape standards;
- Support provider efforts to implement seasonal demand controls;
- Align infrastructure planning with peak demand conditions.

10.3 Goal 3: Reduce Outdoor Water Use

Policy 3.1 – Landscape Efficiency Standards

Landscape design shall minimize water use in new development.

Implementation Measures:

- Limit or prohibit non-functional turf;
- Require drought-tolerant landscaping;
- Encourage hydro zoning and efficient design.

Policy 3.2 – Irrigation System Efficiency

Irrigation systems shall be designed to maximize efficiency.

Implementation Measures:

- Require drip irrigation or equivalent systems, **where feasible;**
- Require smart irrigation controllers;
- Prohibit inefficient irrigation practices.

Commented [216]: This might be reworded because some irrigation may not be feasible with drip irrigation.

Commented [AJ217R216]: agree

10.4 Goal 4: Promote Use of Non-Potable Water Sources

Policy 4.1 – Secondary Water Systems

Non-potable water shall be used for irrigation where available. O'Brien

Implementation Measures:

- Require connection to secondary systems where feasible;
- Support expansion of non-potable infrastructure;
- Prioritize non-potable use for outdoor demand.

Policy 4.2 – Colorado River Water Utilization

If acquired, Colorado River water shall be used to offset irrigation demand where feasible.

Implementation Measures:

- Support development of diversion and conveyance infrastructure;
- [Coordinate with water providers and local/state/regional and federal partners](#)
- [Coordinate with regional partners on project planning;](#)
- Ensure that reliance on such supply is supported by demonstrated feasibility.

10.5 Goal 5: Improve System Efficiency and Reduce Water Loss

Policy 5.1 – System Efficiency

Water systems shall be maintained and improved to minimize losses.

Implementation Measures:

- Support leak detection and repair programs;
- Encourage advanced metering infrastructure;
- Coordinate with providers on system performance improvements.

Commented [AJ218]: Kimmerle said: Where is non-potable water available? How can it be available to more people?

Commented [AJ219R218]: I don't think it is currently available. One strategy is to use Colorado Water as a non-potable water source freeing up potable sources for culinary needs.

Commented [AJ220]: Commissioner O'Brien's edits are in blue

Commented [AJ221R220]: Agree

Commented [AJ222]: Commissioner O'Brien's edits are in blue

Commented [AJ223R222]: I think all four bullet points are appropriate

10.6 Goal 6: Address Water Constraints in Rural Areas

Policy 6.1 – Crescent Junction and Thompson Springs

Development in water-constrained areas shall be limited by demonstrated supply.

Implementation Measures:

- Require verification of water rights and infrastructure capacity;
- Condition development on the construction of necessary infrastructure;
- Limit intensity of development based on system capability.

10.7 Goal 7: Support Conservation in Existing Development

Policy 7.1 – Existing Development Programs

The County shall support programs to reduce water use in existing development.

Implementation Measures:

- Support turf conversion and irrigation retrofit programs;
- Encourage provider-led pricing and demand management strategies;
- Promote public education and outreach.

10.8 Goal 8: Improve County Operations

Policy 8.1 – County Water Use Reduction

Grand County shall reduce water use within its own operations.

Implementation Measures:

- Retrofit County facilities with efficient fixtures;
- Convert landscapes to drought-tolerant designs;
- Monitor and track water use at County properties.

10.9 Goal 9: Support Development of Supplemental Water Supplies

Policy 9.1 – Colorado River Water Development

The County supports the development of supplemental water supplies where feasible.

Implementation Measures:

- Coordinate with water providers and regional partners;
- Support efforts to prove up existing water rights;
- Align land use planning with long-term supply strategies.

Policy 9.2 – Funding Strategy

The County shall pursue funding to support water infrastructure and conservation.

Implementation Measures:

- Pursue funding through the Permanent Community Impact Board (CIB);
- Coordinate regional funding applications;
- Align capital planning with funding opportunities.

10.10 Goal 10: Strengthen Regional Coordination

Policy 10.1 – Interagency Coordination

The County shall coordinate with water providers and regional partners.

Implementation Measures:

- Maintain regular communication with providers;
- Integrate provider data into planning decisions;
- Participate in regional water planning efforts.

10.11 Implementation Framework

The policies in this section will be implemented through:

- Updates to the Land Use Code and development standards;
- Coordination with water providers and regional agencies;
- Integration into development review processes;
- Capital planning and infrastructure investment;
- Conservation programs and public outreach.

Commented [224]: earlier at the end of section 3.4 we state "Accordingly, Colorado River water is treated as a potential future supply rather than a baseline assumption for current development approvals."

Commented [AJ225R224]: I'm not sure how this conflicts with the previous statement.

- Monitoring and modeling water sources is imperative to watershed health and community development
- Conservation of our sole source aquifers is imperative to maintain quality culinary water resources

Implementation will occur over time and will be influenced by:

- Funding availability;
- Infrastructure capacity;
- Regulatory requirements;
- Changing water supply conditions.

Commented [AJ226]: Commissioner O'Brien's edits are in blue

Commented [AJ227R226]: While these are good statements. This element needs to shift away from supply-side to demand management. That said, demand management will need to include a non-potable component to the equation.

10.12 Key Findings

- Water demand can be effectively altered~~managed~~ through policy and design;
- Land use regulation is a primary tool for demand reduction;
- Coordination with water providers is essential to implementation;
- Infrastructure investment and funding are critical to long-term supply; and
- Conservation and efficiency measures can ameliorate~~offset~~ growth-related demand increases.

Commented [AJ228]: Commissioner O'Brien's edits are in blue

Commented [AJ229R228]: I think good demand management inherently alters demand

Section Summary

This section proposes~~establishes~~ a comprehensive policy framework for altering~~managing~~ water demand, supporting a reliable water supply, and helping to align~~ingaligning~~ development with available resources.

Together, the goals, policies, and implementation measures provide a clear and enforceable path to help ensure that Grand County's growth remains consistent with its long-term water supply constraints.

Commented [AJ230]: Commissioner O'Brien's edits are in blue

Commented [AJ231R230]: I think it is good as originally written.

SECTION 11. CONCLUSION

This Water Use and Preservation Element establishes a ~~comprehensive~~ framework for integrating water resource considerations into land use planning and decision-making in Grand County. The analysis presented in this Element demonstrates that water availability is inherently constrained by limited groundwater recharge, variable surface water conditions, and finite infrastructure capacity. These constraints must be recognized as governing factors in future growth and development.

Commented [232]: Not a comprehensive framework even if the Water Use Preservation Element does not require that you examine Climate Warming when you consider how much water will be available for future growth.

Commented [AJ233R232]: Please see the above subsection on climate change/warming/heating. I think it is comprehensive. General in detail, but comprehensive in scope.

The Element further demonstrates that projected population growth and seasonal demand will increase baseline and peak water demand over time. However, the magnitude of that demand is not fixed. As shown in Section 5, water demand can be ~~ameliorated stabilized or reduced~~ through the application of conservation measures, efficient development design, and coordinated infrastructure planning.

Commented [AJ234]: Commissioner O'Brien's edits are in blue

Commented [AJ235R234]: Again, I'm not sure ameliorated is the correct word choice.

A central conclusion of this Element is that **water demand can be altered** ~~is determined by policy choices~~. Land use patterns, landscape standards, irrigation practices, and system management collectively ~~can modify~~ ~~define~~ the relationship between growth and water use. ~~Accordingly, this Element establishes a framework in which development is aligned with available water resources, rather than assuming that supply will expand expand expand to meet demand demand.~~

Commented [236]: It does not assume that supply will expand to meet demand, but assumes that supply will remain stable in the face of Climate Warming.

Commented [AJ237R236]: Please see the above subsection on climate change/warming/heating

Commented [AJ238]: Commissioner O'Brien's edits are in blue

This Element also recognizes the institutional structure of water management in Grand County. Water providers retain authority over water rights, system operations, and service delivery, while the County is responsible for land use planning and development approvals. Effective water management, therefore, depends on ongoing coordination among these entities and on collaboration with neighboring jurisdictions and state agencies.

Long-term water supply strategies, including the potential development of Colorado River water rights, are an important component of this framework. These supplies are intended to support irrigation and outdoor uses, thereby reducing demand on culinary water sources and preserving higher-quality supplies—such as groundwater, Ken's Lake storage, and spring systems—for potable use. However, these strategies require significant infrastructure, funding, and regulatory coordination, and cannot be assumed to be immediately ~~available~~ ~~or ever available~~.

Commented [AJ239]: Commissioner O'Brien's edits are in blue

Commented [AJ240R239]: Only time will tell.

The Element also addresses the unique conditions associated with Crescent Junction and Thompson Springs following completion of the Uranium Mill Tailings Remedial Action (UMTRA) project. While environmental constraints have been reduced, water supply and infrastructure limitations remain. Development in these areas must be supported by demonstrated water rights, infrastructure investment, and long-term supply reliability.

Implementation of this Element will require sustained coordination, investment, and funding. Grand County will pursue financial support through programs such as the Permanent

Community Impact Board to advance infrastructure improvements, prove up water rights, and support conservation initiatives.

Through the goals, policies, and implementation ~~measures proposed~~established in this Element, Grand County commits to:

- Treating water availability as a governing constraint on development;
- Reducing per capita and total water demand through conservation and efficiency;
- Promoting land use patterns and development practices that minimize water use;
- Improving system efficiency and reducing water waste;
- Supporting development of supplemental water supplies where feasible; and
- Coordinating with water providers, regional partners, and state agencies to ensure long-term sustainability.
- Monitoring and modeling water sources is imperative to watershed health and community development.
- Protecting our sole source aquifers to maintain quality culinary water resources.

This Element is intended to function as a planning and policy framework. It does not allocate water, guarantee service, or supersede the authority of water providers, County, or state agencies. ~~Instead, it provides a defensible basis for for for ensuring that land use decisions are informed by water supply conditions and infrastructure capacity.~~

By adopting this Element, Grand County affirms its commitment to managing growth in a manner that protects limited water resources, maintains system reliability, and supports the long-term health, safety, and welfare of its residents, businesses, and visitors.

Commented [AJ241]: Commissioner O'Brien's edits are in blue

Commented [AJ242R241]: Great comment

Commented [AJ243]: Commissioner O'Brien's edits are in blue

Commented [AJ244R243]: I'm not sure this applies

Commented [245]: Again we cannot ensure this.

Commented [AJ246R245]: Correct, that is why it is a planning and policy framework and not a guarantee. I would hope that land use decisions are informed by water supply conditions.

Commented [AJ247]: Commissioner O'Brien's edits are in blue

Commented [AJ248R247]: I prefer the original text

Commented [AJ249]: Commissioner O'Brien's edits are in blue

Commented [AJ250R249]: I think the commitment affirmation is through adoption of the element

APPENDIX A

CAPITAL PROJECTS AND FUNDING MATRIX

A.1 Purpose and Application

This appendix identifies priority water supply, infrastructure, and conservation projects necessary to implement the Water Use and Preservation Element. It is intended to function as:

- A **capital planning tool** for Grand County and water providers;
- A **funding support document** for grant and loan applications;
- A **prioritization framework** for infrastructure investment; and
- An **implementation bridge** between policy and action.

Projects included in this matrix are at the planning level and subject to refinement through engineering, feasibility analysis, and funding availability.

A.2 Water Supply Strategy Context

The projects in this matrix reflect the County’s adopted water supply strategy:

- **Colorado River water** is prioritized for:
 - Irrigation and outdoor use
 - Secondary (non-potable) systems
- **Groundwater, Ken’s Lake storage, and spring systems** are prioritized for:
 - Culinary (potable) use
 - Long-term supply reliability

This allocation reduces demand on potable supplies and aligns infrastructure investment with long-term sustainability.

A.3 Project Categories

Projects are grouped into four categories:

1. **Supply Development** — New or expanded water sources
2. **Infrastructure Improvements** — Storage, conveyance, and system upgrades
3. **Rural System Development** — Crescent Junction and Thompson Springs
4. **Conservation and Efficiency Programs** — Demand reduction initiatives

Commented [251]: I do not think this Appendix is necessary and would eliminate it.

Commented [AJ252R251]: Thank you for your suggestion. I will leave that up to the Planning Commission.

Commented [AJ255]: Commissioner O’Brien’s edits are in blue

Commented [253]: Is this only need for the scoring that follows.

A.4 Scoring Methodology (CIB-Aligned)

Projects are evaluated using a scoring framework consistent with the Permanent Community Impact Board (CIB):

Criterion	Description	Points
Supply Reliability	Improves long-term water availability	0-5
Demand Reduction	Reduces AF/year or peak demand	0-5
System Resilience	Improves redundancy and reliability	0-4
Feasibility	Technical and financial viability	0-3
Community Impact	Economic and service benefits	0-3

Maximum Score: 20

Projects scoring **16 or higher** are considered **priority funding candidates**.

Commented [254]: Why do we need this scoring framework in this document.

A.5 Capital Projects Matrix

Project Name	Location	Type	Description	Cost Range	Phase	AF Impact (Annual)	Score	Primary Funding
Colorado River Diversion & Irrigation System	Regional / Spanish Valley	Supply	Diversion, conveyance, and delivery system for irrigation and outdoor use	\$25M–\$75M+	2030–2040	800–1,200 AF reduction (culinary offset)	18	Permanent Community Impact Board, State, Federal
Colorado River Proving Up (Phased Use)	Countywide	Supply	Incremental beneficial use to perfect existing water rights	\$5M–\$20M	2026–2040	200–500 AF offset	17	Permanent Community Impact Board
Secondary Irrigation System Expansion	Spanish Valley	Infrastructure	Expansion of non-potable irrigation systems	\$2M–\$6M	2026–2035	300–600 AF reduction	18	Permanent Community Impact Board
Water Storage Expansion (Tanks/Reservoirs)	Countywide	Infrastructure	Additional storage for peak demand and reliability	\$3M–\$10M	2030–2040	Peak reduction (system capacity)	15	Permanent Community Impact Board
Leak Detection & Advanced Metering (AMI)	Countywide	Infrastructure	Metering upgrades and system leak detection	\$500K–\$2M	2026–2030	80–150 AF reduction	19	Permanent Community Impact Board
Crescent Junction Culinary System	Crescent Junction	Rural	New wells, storage, and distribution system	\$3M–\$10M	2026–2035	Reliability improvement	16	Permanent Community Impact Board
Thompson Springs System Upgrades	Thompson Springs	Rural	Spring protection, redundancy, and storage improvements	\$1M–\$5M	2026–2030	Reliability improvement	17	Permanent Community Impact Board
UMTRA Transition Infrastructure	Crescent Junction / Thompson Springs	Rural	System stabilization following remediation completion	\$2M–\$8M	2026–2035	Reliability improvement	16	Permanent Community Impact Board, Federal
Turf Conversion Incentive Program	Countywide	Conservation	Removal of non-functional turf	\$250K–\$1M	2026–2035	150–400 AF reduction	18	Permanent Community Impact Board

Commented [256]: Who did this scoring to rank projects??

Commented [AJ257R256]: Me. I think this whole matrix should be deleted to maintain the long-term relevance of the element.

Project Name	Location	Type	Description	Cost Range	Phase	AF Impact (Annual)	Score	Primary Funding
Smart Irrigation Retrofit Program	Countywide	Conservation	Installation of smart controllers and efficient irrigation systems	\$250K–\$1M	2026–2035	100–250 AF reduction	17	Permanent Community Impact Board

A.6 Phasing Strategy

Phase 1: 2026–2030 (Immediate Impact)

Focus:

- Rapid demand reduction
- System efficiency improvements
- Rural system stabilization

Priority Projects:

- Leak detection and Advanced Metering Infrastructure (AMI)
- Turf conversion
- Thompson Springs upgrades
- Initial Colorado River proving-up actions

Phase 2: 2030–2040 (System Expansion)

Focus:

- Infrastructure expansion
- Demand offset through irrigation supply

Priority Projects:

- Colorado River diversion system
- Secondary irrigation expansion
- Storage improvements

Phase 3: 2040+ (Long-Term Reliability)

Focus:

- Full integration of supplemental supply
- System optimization

Priority Projects:

- Regional system integration
- Additional capacity improvements

Commented [AJ258]: Commissioner O'Brien's edits are in blue

Commented [AJ259R258]: I'm not sure what the capital C means

A.7 Demand Reduction Summary

Combined implementation of conservation and infrastructure projects can achieve:

- **Total Reduction Potential:** 800–1,500+ AF/year
- **Primary Source of Savings:** Outdoor irrigation reduction
- **Secondary Benefits:** Reduced peak demand and improved system reliability

This reduction is sufficient to:

Offset projected growth-related demand increases and maintain total system demand at or near current levels.

A.8 Funding Strategy

Grand County and its partners will pursue funding through:

- The Permanent Community Impact Board (CIB) (primary funding source);
- State water infrastructure and conservation programs;
- Federal funding where applicable;
- Local funding and partnerships.

CIB funding is particularly critical for:

- Rural system development
- Colorado River infrastructure
- Conservation program implementation

A.9 Implementation Guidance

Implementation of projects in this matrix will be guided by:

- Availability of funding
- Demonstrated need and system constraints
- Coordination with water providers and regional partners
- Regulatory approvals and permitting requirements

Projects may be phased and refined over time based on updated data and conditions.

A.10 Key Findings

- Conservation programs provide the **most immediate and cost-effective reductions**;
- Colorado River water provides the **largest long-term supply substitution**;
- Rural systems require **infrastructure investment before growth can occur**;
- **Peak demand reduction** is critical to avoiding costly system expansion; and
- **Coordinated funding strategies** are essential to implementation.

Appendix Summary

This appendix translates the policies and strategies of the Water Use and Preservation Element into **specific, fundable, and implementable projects**.

It provides a clear framework for:

- Prioritizing investments
- Securing funding
- Coordinating implementation
- Achieving measurable water demand reductions

Commented [260]: This is a summary I can agree with. We can achieve measurable demand reductions through the sorts of policies suggested in this document. We do not know that those can sustain growth or how much growth in the face of Climate Warming..

Commented [AJ261R260]: Thank you. Thank you for the time you spent reviewing the document and making valuable suggestions/edits/commentary.