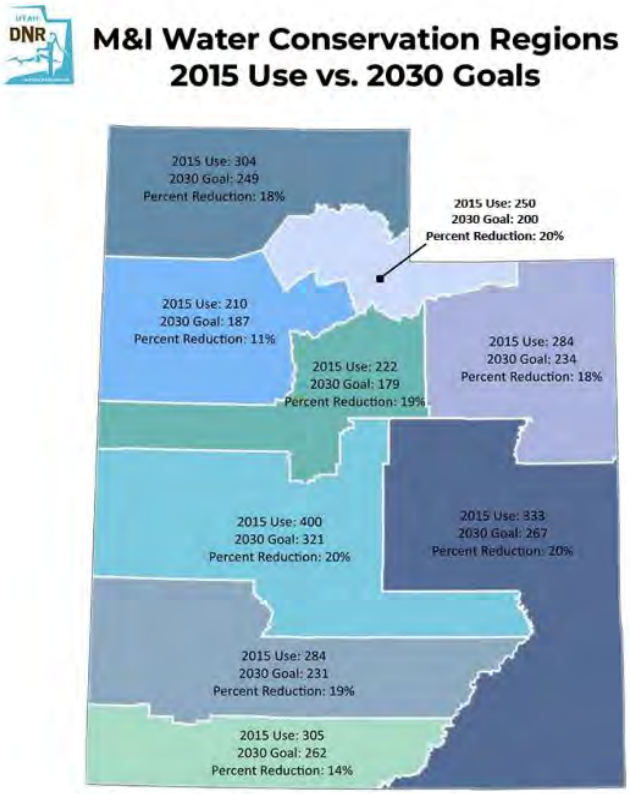
Vernal City General Plan

Water Use & Preservation Element

Introduction

This Water Use and Preservation Element fulfills requirements under Utah Code 17-27a-403, Utah Code 10-9a-403, SB110 (2022), and SB76 (2023), integrating water and land use planning to promote sustainable development and ensure long-term water security. The element addresses:

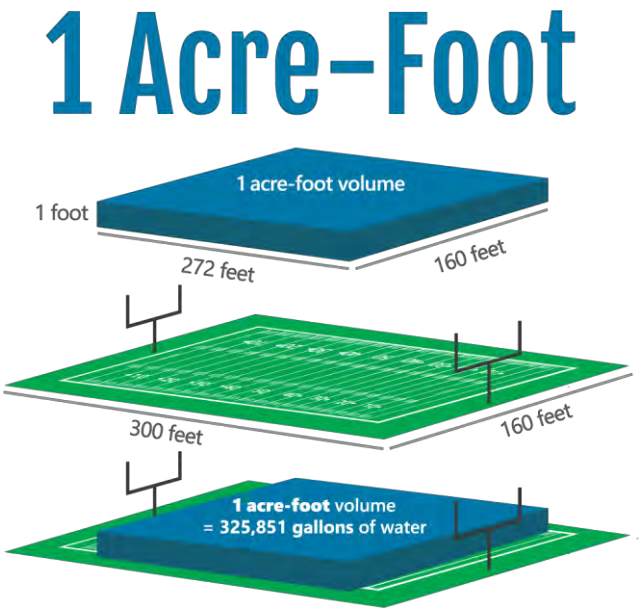
- The impact of development on water demand and infrastructure
- Strategies to reduce water use for existing and future development
- Operational modifications to reduce waste
- Coordination with state and regional stakeholders



A regional approach allows the goals to be tailored for nine different regions and takes into account climate, elevation and each region's characteristics. Note: Use is measured in gallons per capita per day.

Vernal City is located in the Green River Basin and plays a central role in regional development. This plan supports Utah's goal of reducing municipal water use by 18% by 2030 and integrates water-conscious growth policies to ensure long-term reliability.

Water Demand and Infrastructure Impact



Vernal City obtains all culinary water from the Uintah Water Conservancy District (UWCD) under active water rights. Active consultation with UWCD and city staff was conducted during the preparation of this element. The Vernal City water system presently delivers Water from the Ashley Valley Water Treatment Plant (AVWTP) to Vernal City. Water is fed to the AVWTP either through the raw water line from Ashley Springs or pumped from Red Fleet Reservoir through the Reach No. 1 of the Tyzack Aqueduct. The use of Red Fleet water occurs during periods of high flows on Ashley Creek which raise the turbidity and lowers the alkalinity of the water from the Ashley Springs to levels that are difficult to treat at the AVWTP. During a normal year, water from Ashley Springs is used during low flow periods, approximately nine months of the year. Water is pumped from Red Fleet during high flow periods on Ashley Creek and into the summer, approximately three months of the year. Unless otherwise specified, all water volumes and figures referenced in this document are reported in acre-feet per year (AFY).

Existing Conditions:

- **Population (2024):** 10,405 people per 2024 DWR report
- **Existing Connections (2024):** 3,248 Connections
- **Estimated ERC Value (2024):** 4,270.54 (AFY)
- **Total Estimated Water Use (2024):** 2,086.41(AFY)
- **Average Use per ERC:** 0.489 AF/year
- **Maximum Reliable Water Supply Possible Estimate**: 5,198 (AFY)
- **Yearly Purchase Summary** (2020-2024): 2,974 ACFT- 3,510 (AFY)
- **Estimated Water loss:** 39.66%

  Sources: Vernal City Water Rights Study 2024 by CRS Engineers, pp. 21; Water Rights Report from DNR

Water Demand by Use Type based on Vernal City data reported to DNR from 2024

- **Residential:** 1302.99 connections ~ 61.52% of total use - Based on "Residential" category in 2024 data
- **Commercial:** 429.37 Connections ~20.27% of total use - Based on "Commercial" category in 2024 data
- **Institutional:** 346.26 Connections ~16.35% of total use - Based on "from Institutional" category in 2024 data
- **Industrial:** 7.79 Connections ~0.37% of total use - Based on "Industrial" category in 2024 data

III. Projected Growth and Water Demand Scenarios

Growth in the Uintah Basin, and specifically in Vernal City, can be unpredictable. There are numerous reasons for this, but the predominant one is that the most significant player in the economy is the energy sector. Energy has historic ebbs and flows which result in a "boom and bust" economy and, therefore, corresponding population fluctuations. For purposes of long-range planning, Vernal City has relied on projections provided by the Utah Department of Workforce Services, which indicate an annual growth rate of 1.1% to 1.5%. In recent years, however, growth within Vernal City has not been dominated by a single sector but has been relatively balanced across residential, commercial, industrial, and institutional categories. The tables below provide a snapshot of current land use and water conditions within Vernal City and are based solely on culinary water use, as Vernal City does not operate a secondary water system. Future annexations will need to carefully evaluate the impacts of bringing associated water shares into the City's system.

SCENARIO 1: Low population growth of 1.1%

Year	Population	Supply AF/YR	Residential AF/YR	Commercial AF/YR	Industrial AF/YR	Institutional AF/YR	Wholesale AF/YR	Total Use AF/YR	Left Over AF/YR
2025	10,405	3,510.5	1,303	429	8	346	32	2,118	1,392
2030	10,990	3,510.5	1,376	454	8	366	34	2,277	1,233
2045	13,828	3,510.5	1,732	571	10	460	42	2,845	665
2060	16,294	3,510.5	2,041	672	12	542	50	3,401	110

SCENARIO 2: Moderate population growth of 1.3%

Year	Population	Supply AF/YR	Residential AF/YR	Commercial AF/YR	Industrial AF/YR	Institutional AF/YR	Wholesale AF/YR	Total Use AF/YR	Left Over AF/YR
2025	10,405	3,510.5	1,303	429	8	346	32	2,118	1,392
2030	11,099	3,510.5	1,390	458	8	369	34	2,277	1,233
2045	14,558	3,510.5	1,823	601	11	484	44	2,978	533
2060	17,670	3,510.5	2,213	729	13	588	54	3,637	-127

SCENARIO 3: High population growth of 1.5%

Year	Population	Supply AF/YR	Residential AF/YR	Commercial AF/YR	Industrial AF/YR	Institutional AF/YR	Wholesale AF/YR	Total Use AF/YR	Left Over AF/YR
2025	10,405	3,510.5	1,303	429	8	346	32	2,118	1,392
2030	11,209	3,510.5	1,404	463	8	373	34	2,277	1,233
2045	15,324	3,510.5	1,919	632	11	510	47	3,116	3,95
2060	19,158	3,510.5	2,399	791	14	638	58	3,889	-379

Note: The water supply values shown above represent the maximum amounts purchased by Vernal City within the past five years. However, according to the Vernal City Water Rights Study completed by CRS Engineers in 2024, the City's existing water rights could provide an estimated supply ranging from approximately 4,307 acre-feet (minimum) to 5,198 acre-feet (average) available for Vernal City to obtain. These tables, aligned with the Division of Water Resources' Method 2, at least one scenario will be updated no less than once every five years as part of General Plan or utility master plan updates.

City Operations and Policy

Vernal City recognizes its role in setting the tone for water conservation efforts. By retrofitting public facilities, improving landscape design, and tracking water use internally, the City plans to continue the existing trend showcased in the Dinah landscape re-design, modeling the conservation behaviors it seeks to promote citywide focusing on target properties including but not limited to: 500 S 700 W, 500 W 500 N, Public Works Facility, Main Street Rex Statue, and Waling Park. Vernal City prioritizes keeping the iconic Main Street flowers healthy and vibrant, recognizing their role in community pride and identity. Whether through well water, a future secondary system, or other sources, their irrigation remains a key part of City operations and landscape planning.

1. **Retrofit** City-Owned Facilities To reduce long-term operating costs and indoor water use, the City will:
    a. Conduct a facility-wide audit to identify outdated plumbing fixtures and irrigation systems.
    b. Work to replace all city restroom, kitchen, and janitorial fixtures with high-efficiency models (WaterSense certified or better).
    c. Prioritize retrofits in high-traffic buildings such as the courthouse, community centers, airport, and innovations hub.
2. **Review** Public Landscapes to Waterwise Design
    a. Replace existing lawns and ornamental turf in City-maintained areas with xeriscaping or low-water-use ground cover.
    b. Use drought-tolerant trees and native shrubs in public-facing landscapes, particularly around buildings and medians.

c. Consider developing a formal landscape design standard based on water usage, maintenance, variety, appeal
d. Redesign irrigation systems to support drip irrigation or weather-based controls.
e. Review new ornamental water features (e.g., fountains, ponds) to prioritize use of reclaimed/ recycled water.

Water Conservation: Existing Development

Strategies to Reduce Per Capita Water Use in Existing Development

To support long-term water sustainability, Vernal City will implement targeted strategies to encourage the voluntary participation of residents looking to reduce water use in existing homes, businesses, and public facilities. These strategies focus on reducing indoor and outdoor demand, improving system efficiency, and increasing public awareness.

Turf Removal and Xeriscaping Promotion

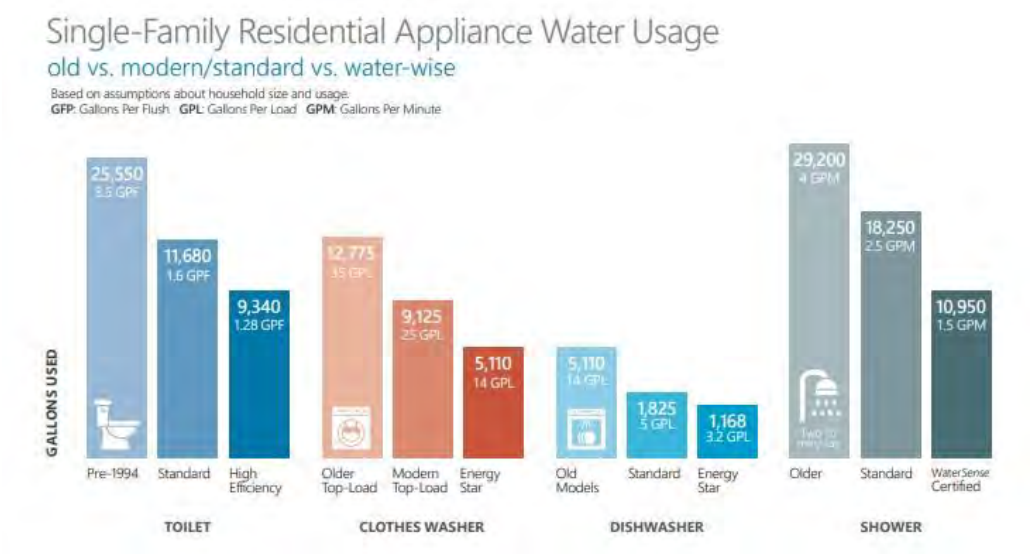
- Outreach and promotion to educate the residents that live in the Uintah Water Conservancy district boundaries looking to save money or reduce landscaping maintenance. Where programs from the state for monetary reimbursement the residents who are interested in changing their landscaping to know of the options available.
- Educate the different values of high-water-use turf vs drought-tolerant landscaping through public education and outreach.
    - Launch a coordinated, city-wide outreach campaign in partnership with other providers.
        - Develop print, radio, and digital materials emphasizing:
            - Common outdoor water waste habits and how to remedy them
            - Seasonal watering schedules and rebate availability
            - There are reasons why turf may be beneficial (heat island) so providing educational resources on types of grasses.

Grass Type	Gallons per Season (25 weeks)		
	1,000 sq ft	5,000 sq ft	10,000 sq ft
Kentucky Bluegrass	25,000	125,000	250,000
Tall Fescue	18,700	93,500	187,000
Fine Fescue	15,600	78,000	156,000
Buffalograss	9,400	47,000	94,000
Xeriscape (native drought tolerant)	7,500 or less	37,500 or less	75,000 or less

- Use models such as the Central Utah Water Conservancy District (CUWCD) conservation grant programs to establish local funding streams.
- Promote demonstration projects on public or school properties to showcase xeriscaping benefits.

Support Education on Retrofit for Water-Efficient Technology

- Work with water providers and state agencies to expand access to retrofit programs for:
    - Smart irrigation controllers
    - High-efficiency appliances (e.g., toilets, washers)
    - Low-flow fixtures and nozzles
    - Secondary water metering systems
- Work with HCNEU on grants and other focus on health aspects.
    - Provide information on targeted retrofits.
    - SFR with old appliances vs. SFR with water-wise appliances



	Older Models	Standard	Energy Star Certified
Toilet	3.5 GPf = 25,550 Gal/YR	1.6 GPF = 11,680 Gal/YR	1.28 GPF = 9,340 Gal/YR
Washing Machine	35 G/load = 12,77 Gal/YR	25 G/load = 9,125 Gal/YR	14 G/load = 5,110 Gal/YR
Dish Washer	14 G/load = 5,110 Gal/YR	5 G/load = 1,825 Gal/YR	3.2 G/load = 1,168 Gal/YR
Shower (2 for 10 min)	4 GPM = 29,200 Gal/YR	2.5 GPM = 18,250 Gal/YR	1.5 GPM = 10,950 Gal/YR

Water Conservation Future Development

In accordance with Utah Code 10-9a-403 Vernal City will incorporate proactive water conservation strategies into land use policy and development review procedures. These measures will ensure that all future development supports long-term water resilience and that land use intensity is aligned with available water supply and delivery capacity.

1. **Amend Development Codes to Encourage Water-Efficient Design:**

   These updates may include the adoption of model ordinances from other Utah communities and will prioritize the following strategies:

   a. The City will explore adopting model ordinances for landscaping and water efficiency such as:
      i. Clarify existing landscaping ordinances to explicitly state that landscaping may include low-water elements such as decorative mulch, rock, and other permeable ground covers, provided tree and shrub requirements are met. This clarification will reduce interpretation discrepancies and support water-wise site design.
      ii. Encourage Smart Irrigation Systems: encourage smart controllers and weather-based irrigation systems in all new residential and commercial developments.
      iii. Fixture Standards: Encourage high-efficiency indoor plumbing fixtures in accordance with EPA Water Sense standards.
      iv. Limit turf grass coverage in new subdivisions and prohibit turf in park strips.
      v. Apply stricter standards in arid areas or where culinary water is used for irrigation.
      vi. Require water-efficient landscape design for all commercial, multifamily, and institutional developments.
      vii. Encourage or require the use of drought-tolerant and native vegetation.
      viii. Tree Preservation and Selection: Protect existing tree canopy and require drought-tolerant species for new plantings.
      ix. Stricter Standards in High-Risk Areas: Apply tighter restrictions in areas where culinary water is used for irrigation or where secondary systems are not available.
      x. Incentivize the connection of landscape meters to facilitate future transition to a secondary water system.

2. **Encourage secondary Water Availability and Agricultural Irrigation Duty:**

   In addition to general conservation measures, Vernal City will ensure that development relying on irrigation systems adheres to realistic supply assessments:

   a. **Parcel-Level Irrigation:** Residential parcels with pasture, turf, or irrigated open space must be assessed using agricultural irrigation duty, not just standard ERC (equivalent residential connection) values. The default average for Vernal City is 4.0 acre-feet per acre.
   b. **Secondary Systems:** Secondary water systems serving turf or pasture irrigation should be encouraged and be evaluated for pressure, conveyance reliability, and drought-season capacity.

3. **Promote On-Site Water Reuse:**

   Where feasible, the City will incentivize or require on-site water reuse systems to reduce peak summer demand and extend the usable life of supply infrastructure. Coordination with the Health Department will ensure public safety and compliance. Depending on the type of reuse system proposed, approval through the Utah Division of Water Rights may also be required to ensure compliance with state regulations:

   a. Rainwater harvesting systems
   b. Drip irrigation in landscaped areas
   c. Stormwater capture and reuse for outdoor use

4. **Consider Incentivizing Water-Efficient Land Use Patterns:**

   To reduce long-term demand and infrastructure strain, the City will consider promoting:

   a. Higher-density development (e.g., townhomes, cluster subdivisions) that use less water per capita
   b. Density bonuses or expedited permitting for developments meeting advanced conservation benchmarks
   c. Zoning and subdivision approvals tied directly to verified water availability and known water right constraints

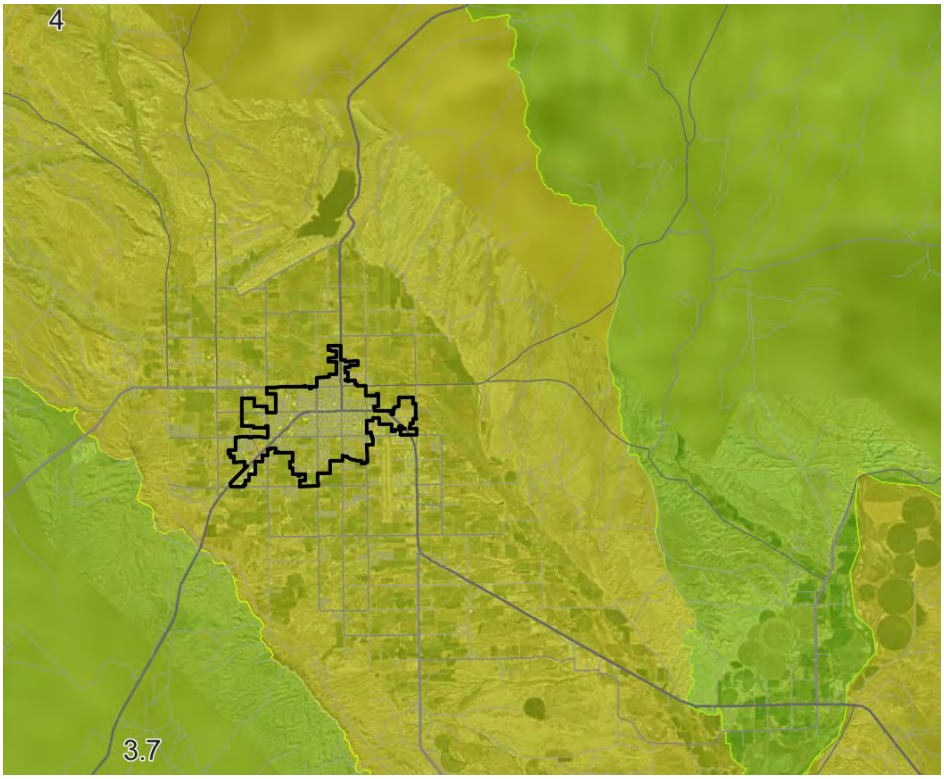
Irrigation and Agricultural Water Use

Irrigation refers to the act of applying water to support the growth and maintenance of any type of plants or crops. This includes watering lawns, gardens, shrubs, pastures, orchards, and non-native trees and landscaping. In planning and water rights contexts, all of these are considered irrigation, even if the plant material is not harvested for agricultural production.

Irrigation Duty

In Utah, the amount of water typically diverted for irrigation purposes is measured as "duty of water" defined as the annual volume of water (in acre-feet) allocated per irrigated acre to achieve optimal crop growth. This figure accounts for the most water-intensive crops (e.g., alfalfa) and assumes traditional surface irrigation methods during the region's growing season.

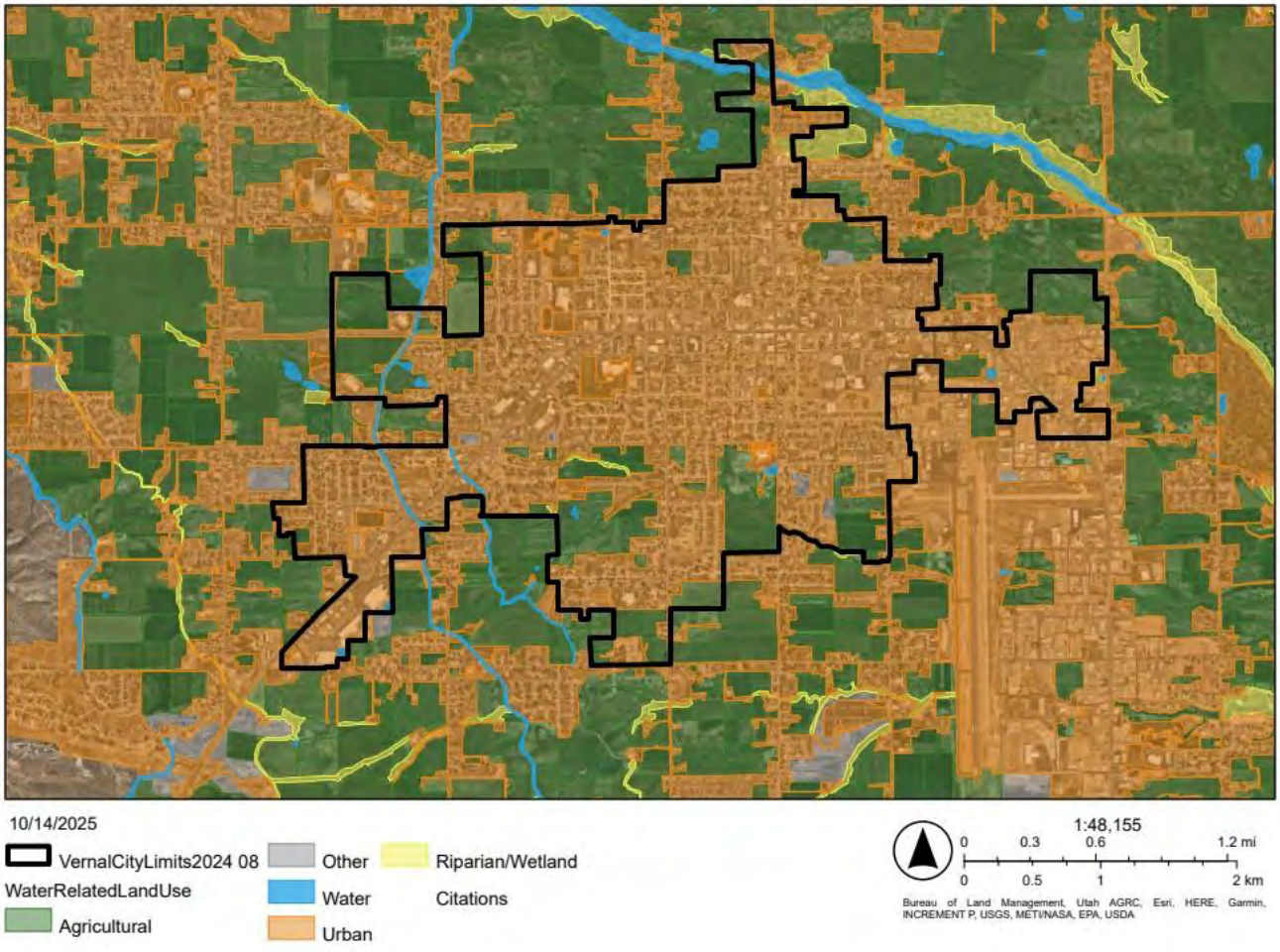
The average diversion duty in Vernal is approximately 4.0 AF per acre with approximately 3.7 AF per acre surrounding, but it varies considerably based on location and climate:



Note: These figures reflect diversion, not consumption. Actual crop consumptive use is generally lower due to return flows and conveyance losses.

Vernal City does not currently have any parcels zoned for agriculture, and municipal boundaries do not include large-scale irrigated farmland. As a result, agricultural water use is negligible within city limits, and the City's culinary water system does not serve agricultural operations. The accompanying map of water-related land use shows only a few parcels within city limits that are currently irrigated. These irrigated areas are primarily sprinklered alfalfa fields. Vernal City does not operate a secondary metered irrigation system, and irrigation water within the City may be obtained through private canals or the culinary water system. Consequently, organized data on agricultural water use within Vernal City is limited.

Water Related Land Use Map:



Because irrigated agriculture is not currently zoned for land use within the City, the primary outdoor irrigation concerns relate to residential and commercial landscaping, not crop production. Accordingly, conservation strategies focus on landscape water efficiency rather than agricultural conversion.

1. **Encourage On-Farm Efficiency Improvements**

   To optimize agricultural water use and reduce system losses, Vernal City will support voluntary adoption of improved on-farm irrigation methods, including:

   a. Drip and micro-irrigation systems for orchards, small pasture operations, or specialty crops
   b. Sprinkler retrofits in place of flood irrigation where feasible
   c. Use of soil moisture monitoring to time watering more precisely

Producers will be encouraged to participate in NRCS-funded programs such as:

a. Environmental Quality Incentives Program (EQIP)
b. ACEP Agricultural Land Easements (ALE)
c. Regional Conservation Partnership Program (RCPP)

Note: These programs offer technical and financial support for irrigation upgrades, system planning, and conservation planning.

2. Integrate Agricultural Suitability and Soil Data

The City will work with NRCS and other partners to incorporate the following into the General Plan and zoning ordinance updates:

a. Soil productivity classifications
b. Crop suitability mapping
c. Irrigation infrastructure overlays

This data can help prioritize areas for:

a. Possible future agricultural zoning protections
b. Targeted infrastructure upgrades
c. Future irrigation optimization grants

Future annexations of agriculturally used land will be reviewed carefully to ensure:

- **Conversion of irrigation rights** for municipal use where appropriate
- **Avoidance of added strain** on culinary water resources
- **Coordination with local irrigation companies** to maintain proper use and avoid cross-connections. In 2024 the DNR reported Canal companies include:
  - Ashley Central Irrigation Company
  - Ashley Upper Irrigation Co.
  - Ashley Upper Irrigation Co. (Alta Ditch)
  - Ashley Valley Reservoir Company
  - High Line Canal Company
  - Island Ditch Company
  - River Irrigation Company
  - Rock Point Canal & Irrigation Company
  - Steinaker Canal and Irrigation Company
  - Sunshine Canal Company
  - Uintah Independent Ditch Company
  - Uintah Water Conservancy District
  - Union Canal Company
  - Whiterocks Irrigation Company

Action Plan and Implementation

To achieve meaningful water savings and align land use decisions with long-term water availability, Vernal City will implement this Water Element in phases, supported by clear timelines, performance metrics, and interagency coordination. This approach ensures that planning efforts evolve alongside community needs, infrastructure improvements, and conservation goals.

1. **Timeline for Key Implementation Actions**

   Note: These timelines may shift based on funding availability, interlocal coordination, and state-level support.

   Fall 2025: research, write, and adopt water element

   Spring 2026: review water element as an overall piece of the updated general plan

   2027: Public information and education

   2028: Ordinance updates

   2029: Secondary water metering expansion

   2030: conversion incentives/updated water master plan with infrastructure plans

2. **Measurement Tools and 2030 Reduction Goal**

   Vernal City adopts the statewide target of 18% per capita water use reduction by 2030, as recommended by the Utah Division of Water Resources. To track progress, the City can:

   a. Monitor annual water use per ERC and compare to baseline (2024) values
   b. Track number of secondary meters installed
   c. Track square footage of turf converted via incentive or voluntary programs
   d. Monitor the percentage of new developments using drought-tolerant landscaping
   e. Evaluate implementing a required annual report from water providers to evaluate progress

3. **Apply for Funding**

   Vernal City may pursue assistance for the preparation or update of its Water Element through several available grant programs. These programs can support efforts to integrate water planning into the broader General Plan or to develop the Water Element as a standalone document. These grants include but are not limited to:

   1. Utah Division of Water Resources Technical Assistance Grant

      Funds may be used to:

      a. Develop landscape ordinance language
      b. Facilitate stakeholder workshops
      c. Build public education campaigns
      d. Contract engineering or GIS support for system mapping and metering analysis

2. Utah UDOT Technical Planning Assistance Grant

   Funds may be used to carry out planning projects that:

   a. Integrate land use and transportation planning
   b. Maximize the value of investment in public infrastructure
   c. Increase travel options to optimize mobility
   d. Create communities with opportunities to live, work, and play

Stakeholder Coordination

Vernal City will engage with the following agencies throughout the planning and implementation process to align with best practices and receive technical guidance:

- Utah Division of Water Resources - Assist with water budget methodology, supply planning
- Division of Drinking Water - Support for system-level planning and source protection
- Department of Agriculture & Food - Guidance on agricultural water use, grants, and reuse

Effective regional planning requires close collaboration with cities and water districts. Vernal will make an effort to continue coordination with the following entities:

- Ashley Valley Water and Sewer
- Maeser Water
- Central Utah Water Conservancy District
- Uintah County
- Private irrigation companies and associations
- Naples City
- Ballard City
- Jensen Water District

Public Outreach and Feedback

Public input has been an important component in the development of the Vernal City Water Element. Discussions with the Planning Commission on August 12 included comments expressing concern about maintaining flowers and landscaping along Main Street and preserving Vernal's community identity while implementing water conservation measures. Additional opportunities for public input are being provided through a public hearing before the Planning Commission on October 14, and a subsequent public hearing on November 19th before Vernal City Council. In addition to public meetings, the draft document has undergone multiple staff reviews to ensure technical accuracy and consistency with City policies and operations.

TO INCLUDE IN APPENDIX:

1. Email correspondence to water districts/ stakeholders:

"Vernal City is in the process of preparing its Water Element in accordance with the State of Utah's general plan requirements. This document will serve as an advisory element within the Vernal City General Plan, guiding future land use and infrastructure decisions with a focus on long-term water supply, conservation, and system efficiency.

Attached is the Draft Vernal City Water Element for your review and input. As a valued partner in regional water planning, your feedback is essential to ensure the document accurately reflects current and future conditions.

Please help by:

- *Sharing conservation goals and policies, and*
- *Providing updates on planned infrastructure projects related to water resources.*

Please don't feel that you need to create any new information. Existing reports, summaries, or data you already have are perfect, and if some information isn't available, that's completely fine.

Comments or materials can be sent to Gabby Blackburn at gabby.blackburn@sunrise-eng.com by November 7th, 2025.

Thank you for your time and continued collaboration in planning for Vernal City's future.

2. Vernal City Metering Zone Analysis

Vernal City has begun implementing elements of the Water Element by engaging Sunrise Engineering to conduct an analysis identifying zones within the City that could be metered for lead detection. This effort represents an important first step toward improving system monitoring, enhancing water quality management, and supporting long-term infrastructure planning. The working map provided below illustrates the preliminary zones identified through this analysis.