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Water Conservation Plan

For Spanish Valley

Grand County, Utah

Grand Water & Sewer Service Agency

Approved December 10, 2020

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1 - INTRODUCTION

To encourage the proper and sensible use of water and to preserve resources needed for the future of Spanish Valley, the Grand Water & Sewer Service Agency (Agency) presents this Water Management and Conservation Plan. This plan is written to address the concerns of citizens and leaders of Spanish Valley and the State of Utah and to comply with the State of Utah Water Conservation Plan Act. The Agency represents Grand County Water Conservancy District, Grand County Special Service Water District, and Spanish Valley Water & Sewer Improvement District through an interlocal agreement. This plan constitutes the Water Conservation Plan for the districts. Our Mission Statement:

> The Mission of Grand Water & Sewer Service Agency is: to utilize our expertise, knowledge, experience, and long range planning to secure and maximize the resources to protect our community's health and welfare by providing culinary water, irrigation water and wastewater collection services with a commitment to efficiency, sustainability, safety, and public awareness.

2 – SYSTEM PROFILE

The Grand Water & Sewer Service Agency provides drinking water and untreated agricultural water to the unincorporated area of Spanish Valley, south of the City of Moab in Grand County, Utah. The population of the Agency's service area is approximately 4,280.

- **As of December 2019, the Agency provided water to 1,915 residential, 109 commercial, 9 industrial, 17 institutional, 164 irrigation, and 14 secondary connections.**

The climate of Spanish Valley is high desert with a mean annual precipitation of approximately 8 inches. Little of the precipitation that falls on Spanish Valley enters the groundwater system. The main contributor to groundwater and surface streams is snowfall in the La Sal mountains. Average annual water-year precipitation at the La Sal mountain Snotel Site (#572) at elevation 9560 ft. is 33 inches.

Spanish Valley is a mix of suburban and rural development. Population is most dense and lot size smallest near the Moab City limits. Population density thins as one moves south through the valley. This area of lower density has experienced the most growth in the system over the past decade. Condominiums have increased in the valley and we currently have several hotels under construction. Agricultural land is mostly to the south, however, there are farms and fields scattered the length of the entire valley.

The drinking water distribution system, source wells and storage facilities that serve Spanish Valley were initially installed in 1981. Additional source, storage, and distribution were added in 2002 and 2018-2020. The source of water is from four wells which are adjacent to the base of Johnson's Up-on-Top mesa *(Appendix A - Service Area Map).* The wells draw from the Glen Canyon aquifer which is recharged by La Sal mountain snowmelt and is an EPA designated Sole

Source Aquifer. Well production capacity is 3,285 gallons per minute. 4,500,000 gallons of drinking water storage is provided by a one-million gallon steel tank, a three-million and a 500,000-gallon reinforced concrete tank *(Appendix A - Service Area Map)*

The Sheley Tunnel / Ken's Lake pressurized irrigation system, also known as the Mill Creek Project, was completed in 1981. Water is diverted from Mill Creek through Sheley Tunnel to Ken's Lake, a 2,610 acre-foot capacity reservoir. *(Appendix A - Irrigation Service Area Map).*

3 – WATER SUPPLY

The Agency withdraws approximately 1100 acre-feet of culinary water annually from its wells. This supplies the total water required to meet demands on the culinary system providing for both indoor and outdoor water uses. Irrigation and secondary water account for approximately 3,800 acre-feet through the Ken's Lake pressurized irrigation system and shallow wells.

It is recognized that questions remain regarding the total quantity of water available from ground water aquifers. The Division of Water Rights is near completion of an adjudication in the valley. A Groundwater Management Plan will be developed in the area following the adjudication. The stakeholders including Moab City, GWSSA and San Jan Spanish Valley SSD will work with the public, the Division of Water Rights and other entities to chart a course into the future.

Table 1. – Culinary Water Supply

SOURCE	VOLUME	TOTAL	TYPE
Wells	2815 AF	2815	Culinary
Springs	0	0	
Surface	0	0	
Purchased	0	0	
Exchanged	0	0	
Total		2815 AF	

Table 2. – Irrigation Water Supply

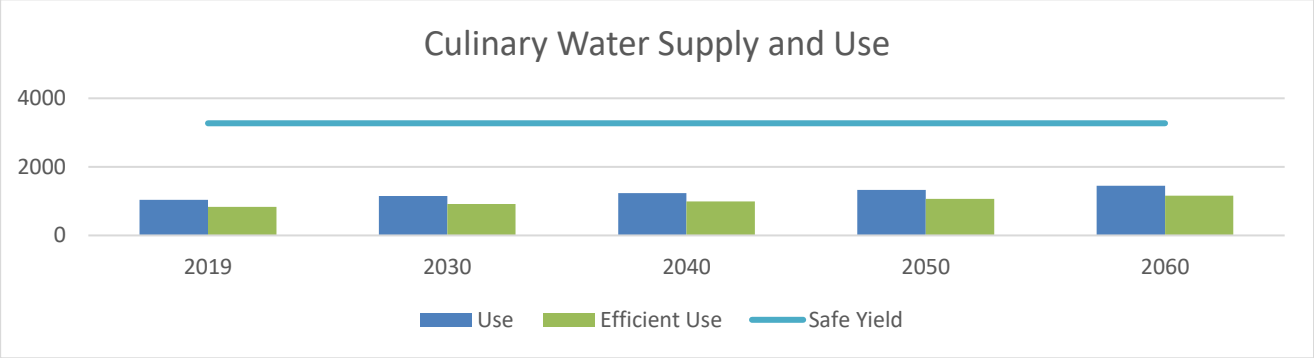
SOURCE	VOLUME	TOTAL	TYPE
Wells	2531 AF	2531 AF	
Springs	0	0	
Surface	7146	7146	Mill Creek
Purchased	0	0	
Exchanged	0	0	
Total		9677 AF	

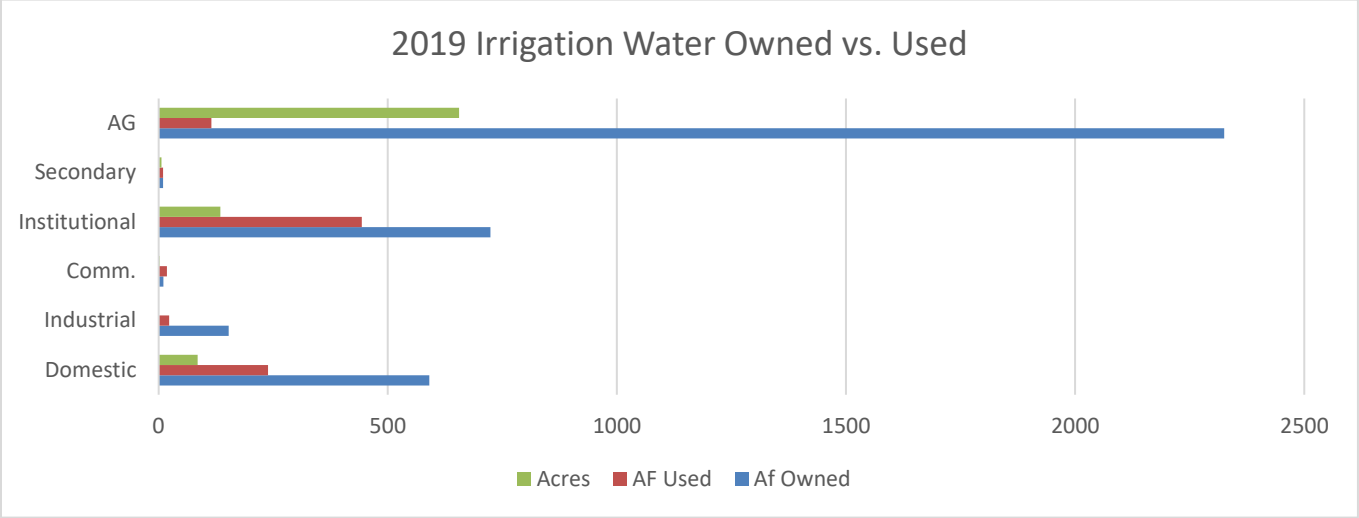
Table 3. – Water Rights Inventory

Water Right Number	AF/Year	Source(s)
Culinary Water		
05-3345	50.4	George White wells (GW)
05-906	1355.94	Spanish Valley/ Chapman wells
05-3656	816.00	Spanish Valley/ Chapman wells
05-148	24.0	George White wells
05-3343	472.608	George White wells
05-492	24.0	George White wells
05-3344	43.569	George White wells
05-681	92.296	George White wells
05-475	723.98	Spanish Valley/ Chapman wells
05-1062	28.35	GW, Spanish Valley/ Chapman wells
Total Culinary Rights	**2,815.143 AF**	
Irrigation Water		
05-1285	2144.381	Irrigation wells
05-2802	110.0	Irrigation wells
05-418	276.8	Irrigation wells
05-1458	2200.00	Mill Creek @ Sheley Tunnel
05-1523	4945.738	Mill Creek @ Sheley Tunnel
Total Irrigation Rights	**9676.919**	

Table 4. – Safe Yield of Existing Sources

Chapman Well	1470 gpm
George White #4	1100 gpm
George White #5	550 gpm
Spanish Valley Well	150 gpm
Total gpm	3271 gpm





4 – WATER MEASUREMENT

Metering: 100 % of GWSSA's connections are metered. The meters are read monthly. Flow meters are installed at each source, at the chlorination facilities (inflow to tanks) and the outflow from all tanks. Meters are replaced as needed and comparisons of sold vs. pumped water are made monthly. Any discrepancies are investigated and addressed immediately.

The following table shows the amount of water delivered into the water system and the metered outflows to end-users for the years 2014 to 2019.

Table 5. – Non-Revenue Culinary Water 2014-2019

INFLOW (AF)		OUTFLOW (AF)	
Year	Total	Total	% Diff.
2014	908	829	-8.70
2015	910	837	-8.02
2016	1,010	888	-12.08
2017	1,069	961	-10.10
2018	1,095	1,020	-6.85
2019	1,103	1,039	-5.80

Water Losses are due to leaks, fire flows, unauthorized use, and inaccuracies in measurements. GWSSA believes controlling system losses in both the culinary and irrigation systems is the highest and best use of resources to conserve water.

Table 6. – Increasing Rate Structure

Culinary Water Rates

Base Rate	$21.75
0 – 6,000 gal	$0.60 / 1,000 gallons
6,001 – 10,000 gal	$1.40 / 1,000 gallons
10,001 – 20,000 gal	$1.80 / 1,000 gallons
20,001 – 30,000 gal	$2.20 / 1,000 gallons
30,000 – 50,000 gal	$2.75 / 1,000 gallons
50,001 and up	$4.00 / 1,000 gallons

The ascending or increasing block rate is designed to encourage conservation by increasing the cost per thousand gallons as usage increases. The Agency board has consistently increased the upper usage tiers to encourage outdoor water conservation.

Irrigation water rates are set to encourage correct use of water on irrigated agriculture. This is done by penalizing water use in excess of the irrigation demand. Irrigation water rates are as follows:

AF Required	Price/AF
0 - 4.9 AF	$50.16/AF or $143.33 - minimum bill
5 - 14.9 AF	$44.08/AF
15 - 24.9 AF	$41.00/AF
25 - 49.9 AF	$39.62/AF
50 - 124.9 AF	$31.75/AF
125 AF and up	$29.77/AF
Over Use	$143.33/AF

The Agency repairs leaks as soon as they are known.

5 – WATER USE

Table 6. – 2005 to 2019 culinary water use by customer type in AF

Year	Pop. Est.	Residential	Commercial	Ind.	Inst.	Other	Total (ACFT)
2019	4280	792.59	119.87	116	10.17	0	1,038.63
2018	4009	848.65	122.24	27.16	21.56	0	1,019.61
2017	3950	798.92	122.64	23.47	15.48	0	960.5
2016	3750	757.66	102.47	15.38	12.65	0	888.16
2015	3750	693.59	92.49	15.38	35.49	0	836.95
2014	3750	706.17	106.72	12.27	0	3.66	828.82
2013	3750	718.19	98.67	7.59	0	5.31	829.76
2012	3750	789.29	108.26	5.99	0	4.69	908.22
2011	3750	675.2	106.41	5.13	0	4.26	790.99
2010	3300	666.43	120.73	0.89	0	0	788.04
2009	3600	703.14	121.75	0	0	0	824.88
2008	3600	729.88	135.14	0	0	0	865.02
2007	3581	740.34	174.64	0	0	51.43	966.41

2006	3581	699.71	113.55	0	0	0	813.25

*Other: Construction water sold from hydrant at Agency office

Table 7. –2019 Irrigation Water Use by Customer Type in AF

	Domestic	Ind.	Comm.	Inst.	RSI	AG.	Total
2019 Used	238.36	22.82	17.68	443.46	9.30	1115.21	1846.83 AF
Acres	85.15	0	1.83	134.75	6	655.57	883.3 Acres
Owned	590.37	152.5	17.68	724	9.3	2325.41	3802.28 AF
Customers	98	4	1	3	14	58	164 Connections

*Note: Non -potable water use was not tracked by customer type until 2019.

The supply of Ken's Lake water varies each season. GWSSA watches snowpack and precipitation to determine if customers will be able to use their full allotment of water they own or if there will be restrictions for all users. RSI water is pumped to meet demand in conjunction with high flows on Mill Creek into Ken's Lake.

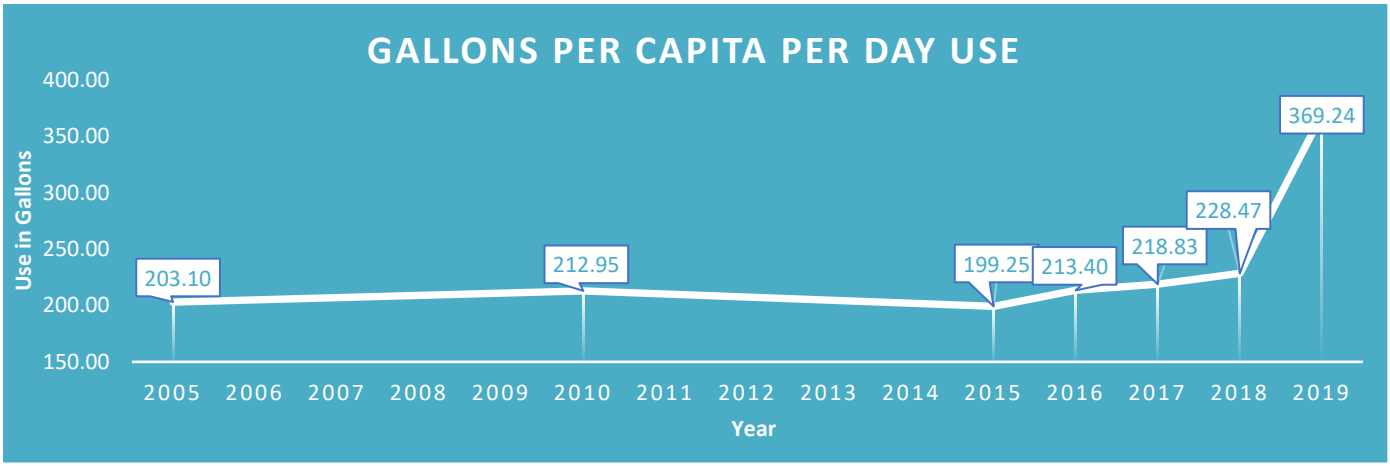
Most Industrial and institutional water use was included in the residential and commercial use until 2013. The Agency identified all industrial and institutional customers in 2013 in its effort to provide more detailed information to the State. It is reported here as it is on the water use reports. The reports have evolved over the years to be more specific.

Table 8. –2019 Total Use by Type

Type	Indoor Use	Outdoor Use	Irrigation Use	Total
Residential	281.52	511.07	247.66	1040.25
Commercial	30.04	89.78	17.68	137.5
Institutional	1.36	8.81	443.46	453.63
Industrial	2.50	113.5	22.82	138.82
Total	315.42	723.16	763.62	1770.20

It is very difficult for our system to estimate indoor use based on winter water use. In the winter, there are few tourists staying in hotels, condos, and RV parks. The winter water use only reflects the indoor use of our residents. For example, a local RV park uses 28,000 gallons per month in the winter and 665,000 gallons per month in the other months. Surely not all 665,000 gallons is used on the park strips and trees they have between spaces. We used the March 2019 Data in combination with average data for institutional and industrial customers. It is a clearer picture of our indoor vs. outdoor watering.

Table 9. – Gallons Per Capita Per Day Use



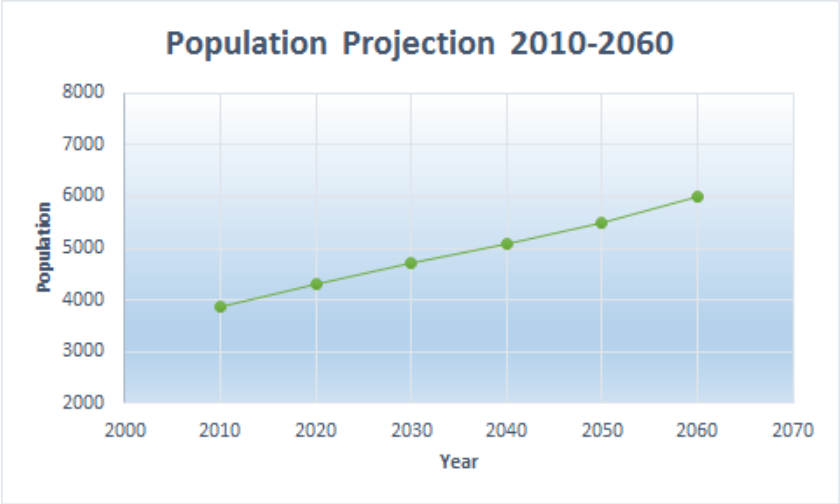
It is important to note again that the Ken's Lake irrigation water use was not tracked by customer type and included in the water use data until 2019. Ken's Lake use also includes customers in San Juan County that are not reflected in our population data.

5 – CONSERVATION PRACTICES

Growth Projections - Culinary System

An estimate of Spanish Valley's expected future population growth through the year 2060 is shown in the following figure. Many factors influence this projection, and the estimates shown may vary substantially from the actual population experienced.

Table 10. – Population Projections



2019	4,280
2020	4,310
2030	4,728
2040	5,083
2050	5,481
2060	5,984

The population projection data is taken from the Governor's Office of Planning and Budget, Demographic and Economic Analysis (DEA) Section. Municipal Population Projections. This information is listed as the "Balance of Grand County" that does not include Castle Valley Town or Moab City. ***Population of the Agency's service area is slightly less.***

New Development - Utah State University is in the planning phase of a new Moab campus that is in the Agency's service area. The Agency also anticipates construction of additional multiple family dwellings and commercial growth to accompany the development of the University.

Overall Water Conservation Goal: Achieve Regional Conservation Goals

2025	309 gpcd
2030	282 gpcd
2040	272 gpcd
2065	267 gpcd

As shown above, the gallons per capita per day usage including irrigation water customers was 369.24 gpcd for 2019. The goal will be achieved by implementing the measures under **Future Conservation Measures – 5-year plan** below. Actions will be implemented over the next five years and tracked monthly. The numbers will be reported annually to the Division of Water Rights in the annual Water Use Reports. The results will be provided yearly to the GWSSA Board in our annual report. The board will discuss the efficacy of the plan and suggest any additional measures to achieve our conservation goal.

Due to the number of vacation homes and condominiums compared to year-round resident occupied housing units; the data is skewed for the per capita use calculation. The use per capita includes water use by seasonal residents who are not counted in the census. It also includes water used to landscape condominium complexes that are not 100% occupied by residents. April through October is the tourist season in Moab and on busy weekends the population can easily double.

The Agency Manager, Dana Van Horn is responsible for implementation of conservation efforts. She can be reached at 435-259-8121 or Dana@grandwater.org

Conservation committee members at the time of this report were:
Ken Helfenbein, Board Member
Preston Paxman, Board Member
Dale Weiss, Board Member
Karla Vanderzanden, Citizen
Dana Van Horn, Agency Manager

Conservation Best Management Practices

1. **Water Conservation Committee:** Conservation committee made up of board members, staff and representative from the public.
2. **Water Conservation Plan:** GWSSA has had a WCP since 2004.
3. **Public Awareness/PR:** GWSSA has educational information on its website, Facebook, billing messages, and new customer mailing packets. Work with Moab City to distribute messages to the public.
4. **Education/ Training:** New customers are given a packet that uses information from Slow the flow and water-wise plants that includes GWSSA's conservation goals compared to the

state average. It also provides a tutorial on how to read our bill and determine use. We intend to develop a school program as suggested in the Plan checklist.

5. **Outreach Services:** GWSSA recommends USU Moab Extension office to help collaborate with citizens on water audits. We check water use monthly at meter reading and call citizens with uncharacteristic use.
6. **Rebates/Incentives/Rewards:** GWSSA offers free rain gauges to customers to determine application rates outdoors.
7. **Ordinances and Standards:** GWSSA advises customers to not water between 10-6 through social media and billing messages. GWSSA requires secondary irrigation connections to all subdivisions that are able to connect. Grand County requires new commercial development to use water-efficient landscaping. Grand County is the building authority and enforces these rules. During times of drought or water shortages, GWSSA implements the "Ken's Lake Critical Water Year Action Plan". It outlines ways to manage the irrigation water shortage in times of low snowpack.
8. **Water Pricing:** GWSSA's tiered pricing structure is aggressive at the higher end of usage. Residents and businesses using more than 50,000 gallons in a month are charged $4.00/1kgal. In 2021 that rate will be $5.00/1k gallon. Residential secondary users are charged a base rate and a tiered usage rate. Customers are notified via telephone if their usage is uncharacteristic. Staff asks questions and creates a work order to check for leaks if appropriate.
9. **Physical System:** Landscape at all GWSSA facilities is either native plants with no additional water provided or drip irrigation to small beds of desert/native plants at the office. Sold water is compared with productions and tracked monthly. All connections are metered. Meters are repaired or replaced regularly. Flows are monitored to detect leaks. We encourage customers to call and report water leaks. Customer leaks are tracked monthly. Customers are rewarded with a "leak relief" rate upon proof of repair.

Future Conservation Measures – five-year plan

Conservation Goal: reach 309 gpcd before 2025.

- **School Education:** Develop a school program for elementary students to encourage indoor water conservation practices. Costs for this program should be less than $500/year for distribution materials. We plan to partner with the local watershed council and/or other local educators/experts for additional school interactions. Presently we are looking in to partnering with Canyonlands Field Institute for assistance with applying for grants and help from their educators in delivering the message. This is a brand-new program and implementation may take a year or more depending on the scope of our efforts. Cost may vary significantly from what is estimated in this report. Costs will be evaluated every year during the budgeting process.
- **Purchase Irrigation Water Wells:** Continue to purchase irrigation water wells for use in the RSI system. This goal is ongoing. However, we intend to drill a new irrigation well if we cannot find suitable existing wells to purchase. The new well would have a timeframe

of less than three years. The project is already on the County's Community Impact Board's priority list. Providing lower-quality water from our valley aquifer for outdoor use will help conserve the pristine culinary water we use from the Glen Canyon Aquifer for drinking. Progress will be measured monthly using well and billing data. Cost for this is ongoing and will vary depending on the well. A new well is estimated to cost $1.2M.

- **Increase Leak Detection:** Pursue an aggressive leak detection program. Perform AWWA water audit. Continue to act quickly when leaks are detected. The water audit will be performed in 2021. Progress will be tracked monthly by comparing pumped vs. sold water. It will be reported annually on the Water Use Report. We believe this is the most impactful way to lower our per capita numbers. Costs will vary based on leaks that are detected. There are ample funds in the budget for waterline repairs each year.
- **Evaluate Rates:** Maintain a financially viable water system. Continue to evaluate rates yearly. Perform rate studies every five to seven years. Maintain revenue at a level that will enable GWSSA to continue to save money for system improvements and replacement of aging, possibly leaking main lines and services. Costs will vary based on rate study provider.
- **Irrigation Conservation Education:** Develop a new conservation mailing and social media campaign to encourage conservation on the irrigation system. We currently partner with the City of Moab on some conservation mailings and advertisements. Cost will vary by type of media employed. Budget $500 to $1,500 per year. Recommend fixing leaking valves and risers in fields. Inform irrigators of lawn and garden watering best practices. For years conservation efforts focused on culinary water users. Residents who use Ken's Lake water for lawn and garden have a different attitude regarding water as they pay for all of it in January and intend to use all of it in the season. That mindset needs to be adjusted as we face year after year of drought. We will provide information on smart water controller rebates, Rocky Mountain Power rebates, available resources from Moab USU extension office and reach out to local landscapers to help educate customers and possibly distribute materials to their customers. We intend to pursue implementing a list of local xeriscape landscapers to provide to our customers in 2021. Progress can be tracked monthly based on current and historic usage and will be reported annually on the Water Use Report.
- **Hotel Research and Incentives:** As of the time of this report, there is one new hotel in our service area. Two more are under construction. Over the next five years, staff will monitor hotel use and develop a plan to encourage conservation by our transient population. In addition, we will develop table tents or advertising in the tourist booklets (stocked in most overnight rentals) to educate our tourists on our annual rainfall and other environmental issues that make our water resources scarce. Moab City employed a program called Green to Gold in the hotels downtown. We will consider partnering with them on this program for hotels in our service area. Implementation will begin in 2021 and plan be ongoing for the next five years. Progress will be monitored monthly with usage reports for the hotels and other overnight accommodations. Costs will vary based on advertising rates and printing costs. It is estimated at $1000/year.

Appendix A
Service Area Map

Grand Water & Sewer Service Agency
Service Area Map

Legend

- PRV

Waterlines

SIZE_

- 10
- 12
- 14
- 16
- 2
- 4
- 6
- 8

Zone_Num

- 1
- 2
- 3
- 4
- 4A
- 5
- 6
- 7
- Parcels

N

0 0.4 0.8 1.6 Miles

Prepared June 23, 2020
by Dana Van Horn
See GWSSA data disclaimer for important information

George White Well #4 and #5 to 1mg tank

GW Booster Pump - to 3mg tank

1mg tank - George White Wells 4 & 5

Johnson's Up On Top Mesa

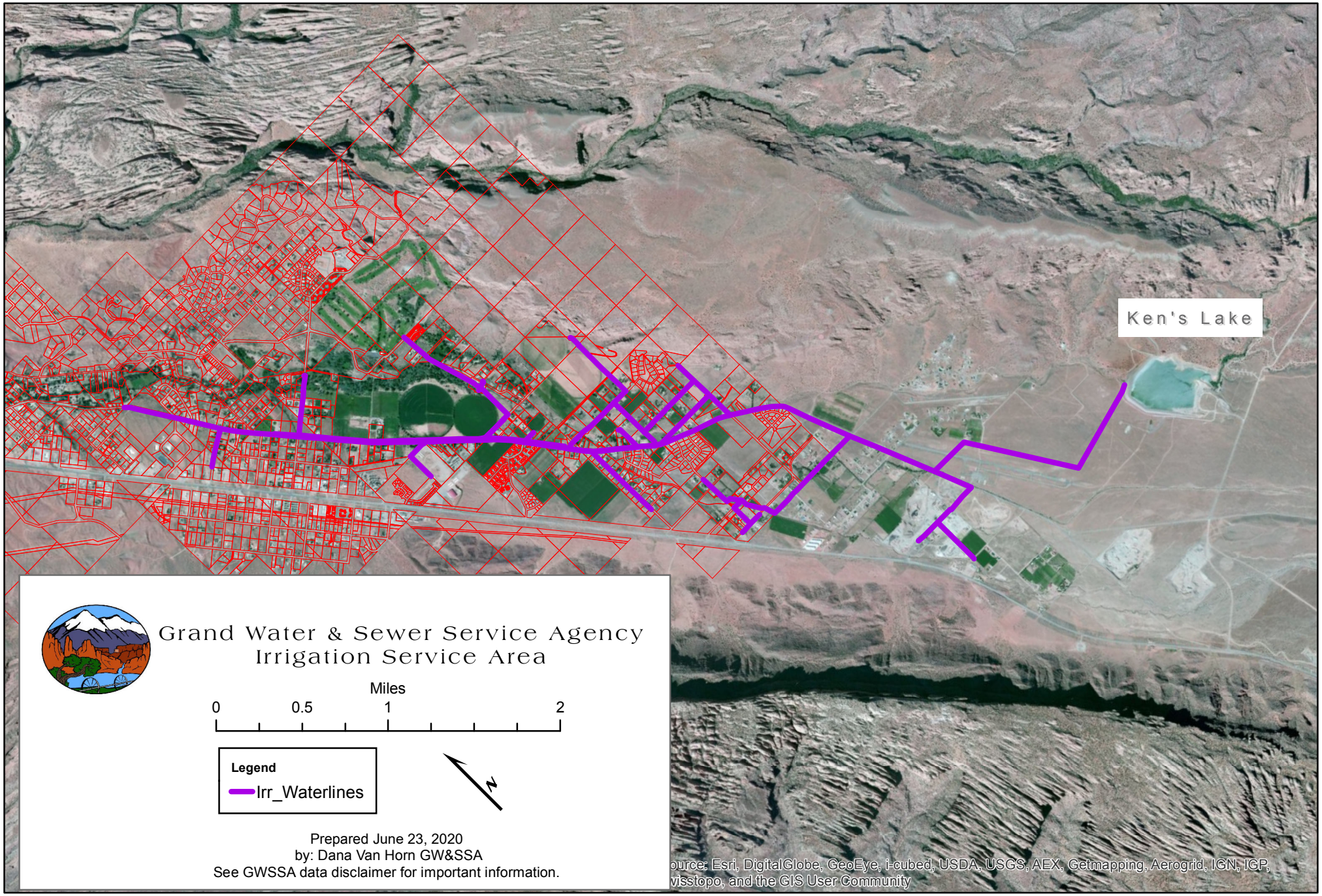
Chapman Well - to 3mg tank

500 k gal tank - All sources

3mg tank - All sources

Spanish Valley Well to 3mg tank

Appendix B
Irrigation Service Area Map


Ken's Lake
Grand Water & Sewer Service Agency
Irrigation Service Area
Miles
0
0.5
1
2
Legend
Irr_Waterlines
N
Prepared June 23, 2020
by: Dana Van Horn GW&SSA
See GWSSA data disclaimer for important information.
ource: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,
visstopo, and the GIS User Community