

DRAFT CEDAR VALLEY AND NORTHERN UTAH VALLEY GROUNDWATER MANAGEMENT PLAN

Introduction

The *Cedar Valley and Northern Utah Valley Groundwater Management Plan* amends the northern Utah Valley portions of the *Utah/Goshen Valley Groundwater Management Plan*, November 15, 1995, and the *Cedar Valley Ground-Water Policy*, November 15, 1995. This plan also amends actions adopted in correspondence from Jerry D. Olds, State Engineer, dated November 2, 2004 regarding the management of groundwater in Cedar Valley.

The objectives of this groundwater management plan are to ensure groundwater withdrawals do not exceed a safe yield, the physical integrity of the aquifer is safeguarded and water quality in northern Utah and Cedar Valleys is protected. Studies and water right records indicate if all known water rights were exercised, groundwater withdrawals in Cedar and northern Utah Valleys would exceed recharge. Groundwater withdrawals do not currently exceed recharge.

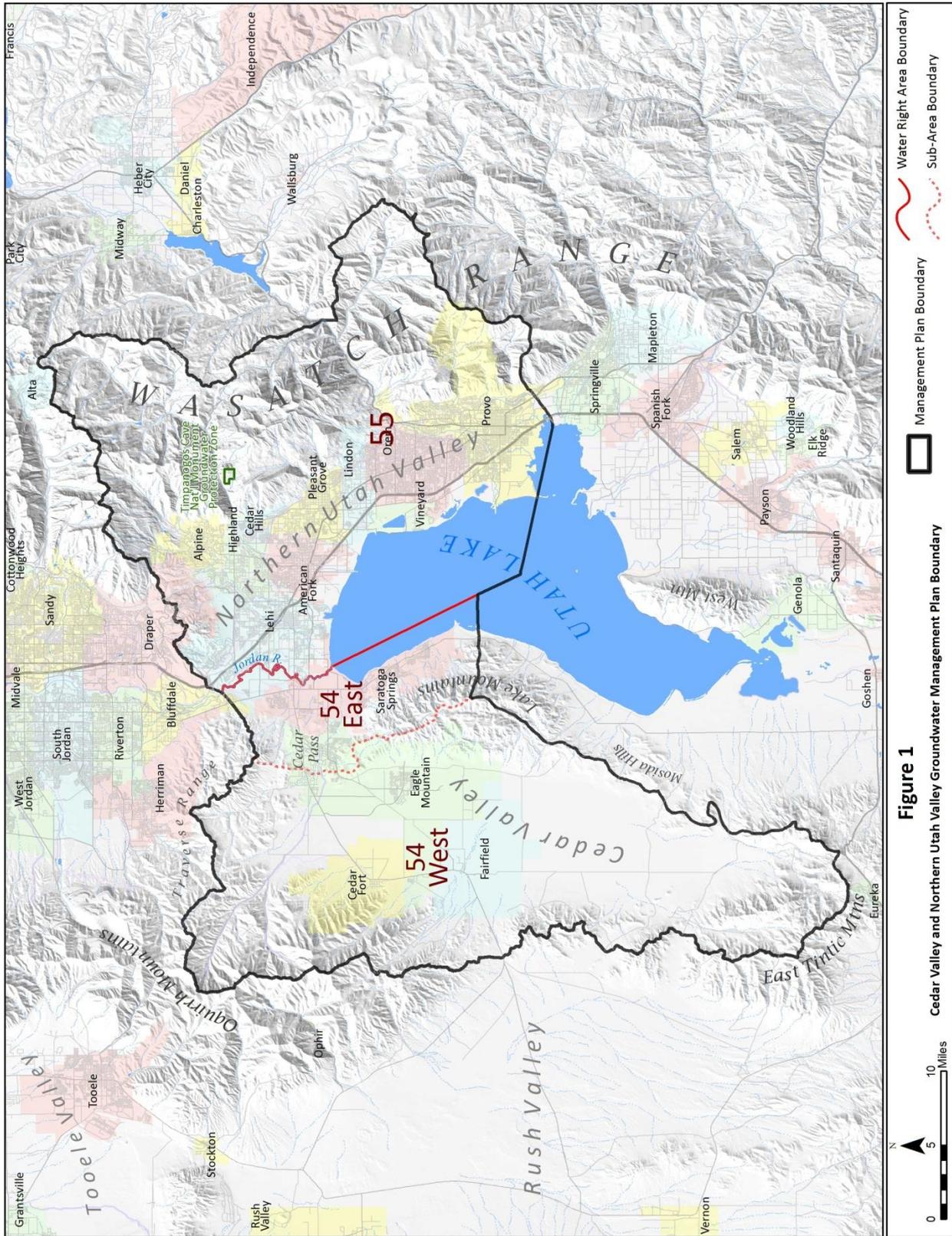
The intent of this plan is to provide specific management guidelines for northern Utah and Cedar Valleys under Section 73-5-15 of the Utah Code. The 1995 *Utah/Goshen Valley Groundwater Management Plan* remains in effect for Goshen Valley and portions of Utah Valley not included in this plan.

Affected Area

This groundwater management plan applies to Cedar Valley (Water Right Area 54) and northern Utah Valley (within Water Right Area 55, with the eastern boundary defined as the topographic high) as shown in Figure 1. For purposes of this plan, Water Right Area 54 is divided into 54 East and 54 West. Area 54 West is defined in the November 15, 1995 *Cedar Valley Groundwater Policy* as the alluvial valley west of Utah Lake which is bounded on the north by the Traverse Range, on the west by the Oquirrh and East Tintic Mountains, and in the east by the Lake Mountains. Area 54 East is the remaining portions of Water Right Area 54 not included in Area 54 West. The *Cedar Valley and Northern Utah Valley Groundwater Management Area Boundaries* can be found on the Division of Water Rights webpage, www.waterrights.utah.gov/gisinfo/maps.

Background

The United States Geologic Survey (USGS) published two reports entitled “Hydrology of Northern Utah Valley, Utah County, Utah, 1975 – 2005” (Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009) and “Three-Dimensional Numerical Model of Ground-Water Flow in northern Utah Valley, Utah County, Utah” (Gardner, 2009). The Utah Geological Survey (UGS) analyzed the hydrogeology of Cedar Valley in a report “Hydrogeology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah.” (Jordan and Sabbah, 2012). These documents, used in conjunction, describe the hydrogeology in northern Utah Valley and Cedar Valley.



The Cedar Valley and Northern Utah Valley Groundwater Management Plan encompasses two hydrologic groundwater systems with distinct recharge sources, both naturally discharging towards Utah Lake and the Jordan River. These two systems are associated with water right administrative Area 54 and portions of Area 55 (see Figure 1.)

The Area 54 groundwater system is predominantly recharged from the Oquirrh Mountains. Groundwater moves generally from the west to the east, exiting Cedar Valley through the subsurface at Cedar Pass and Mosida Hills as illustrated on Figure 2. Approximately 10,000 acre-feet of groundwater leaves Cedar Valley by subsurface outflow through the Cedar Pass area and approximately 4,700 acre-feet leaves through the Mosida Hills area.¹ Groundwater in Area 54 eventually discharges to Utah Lake and the Jordan River.

The groundwater in the Area 55 system is predominantly recharged from the Wasatch Range. It moves generally from east to west, ultimately discharging to Utah Lake and the Jordan River. The estimated long-term average recharge to each flow system is tabulated in Table 1.

Table 1. Hydrologic System Recharge.

| Recharge by Area | |
|--------------------------------|----------------------------|
| <u>Area 54</u> | <u>Quantity (ac-ft/yr)</u> |
| 54 West ¹ | 25,000 |
| 54 East ² | 1,000 |
| Total Area 54 | 26,000 |
| <u>Area 55</u> | <u>Quantity (ac-ft/yr)</u> |
| Utah Valley³ | 145,000 |

Current Conditions

Northern Utah County

The current estimate of average annual withdrawal from wells in northern Utah Valley is about 69,600 acre-feet⁴. In addition, an estimated 69,000 acre-feet⁵ of water per year discharges to valley drains and springs and is fully utilized by existing rights. The total usage in northern Utah Valley from wells and discharges is projected to be 138,600 acre-feet per year. Approximately

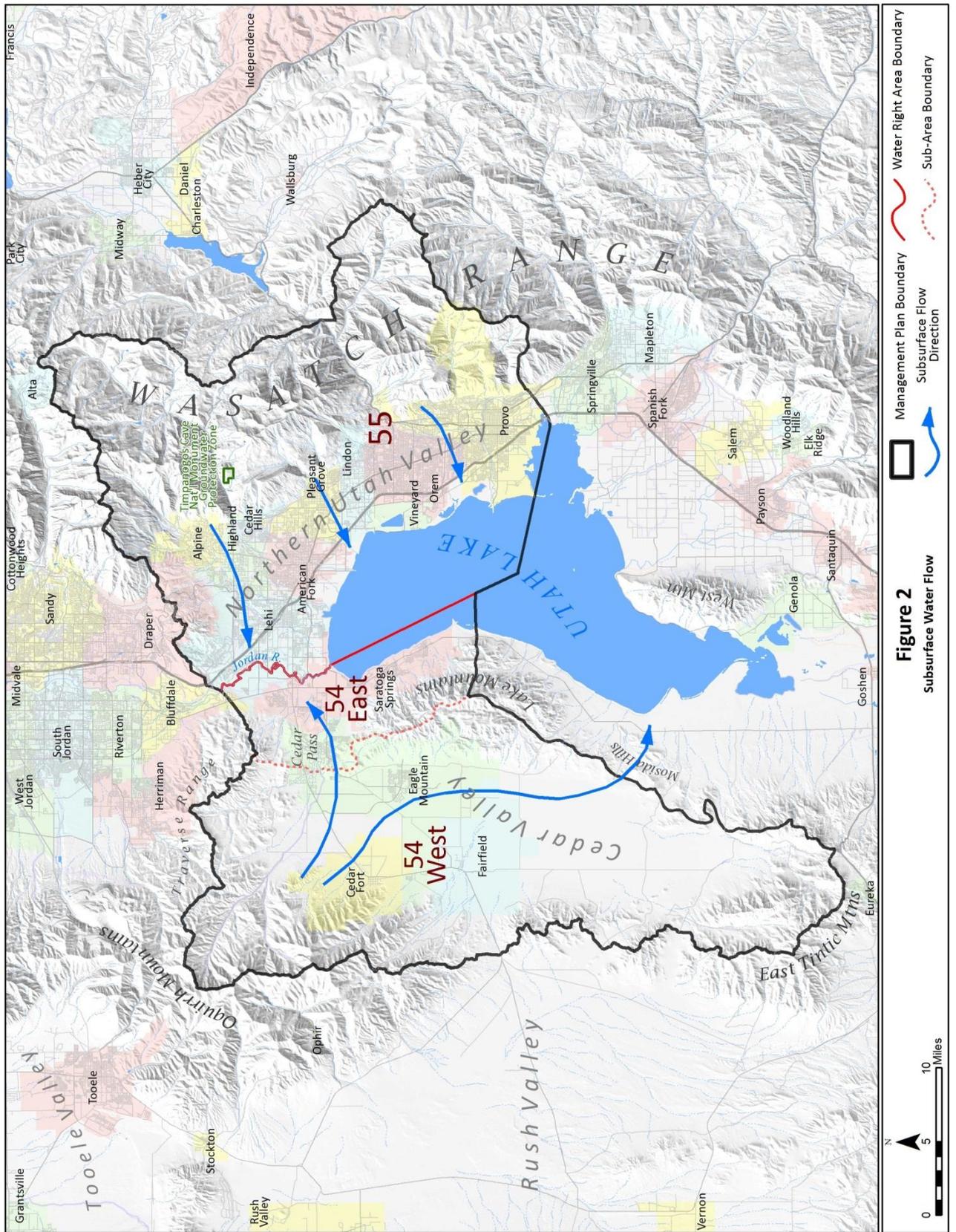
¹ J. Lucy Jordan, Walid W. Sabbah, 2012, Utah Geological Survey (USG), “Hydrology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah,” page 2.

² Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) “Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005,” page 24, 33, and 35.

³ Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) “Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005,” 145,000 acre-feet is estimated by reducing the amount of recharge from of Area 54 East from the recharge of all of northern Utah Valley, page 24 and 25.

⁴ USGS, Utah Department of Natural Resources, and Utah Department of Environmental Quality. “Groundwater Conditions in Utah,” 1995 – 2011, average withdrawal for Northern Utah Valley.

⁵ Jay R. Cederberg, Phillip M. Gardner, Susan A. Thiros, 2009, United States Geologic Survey (USGS) “Hydrology of Northern Utah Valley, Utah County, Utah, 1975-2005,” page 24, 33, and 35.



1,000 acre-feet of well withdrawal in northern Utah Valley occurs within the area as defined as Area 54 East, therefore the calculated value of groundwater withdrawal in the Area 55 portion of northern Utah Valley is 137,600 acre-feet.

Based on existing water rights, the amount of potential groundwater withdrawal from wells in northern Utah Valley was conservatively estimated by totaling quantities of water associated with perfected (developed) and approved (undeveloped or developing) groundwater rights of record with the Division of Water Rights. To provide the most accurate assessment of potential groundwater withdrawal, existing water rights were in some cases adjusted based on projections of future use. The potential groundwater withdrawal (including drains and springs) is estimated to be 265,000 acre-feet per year for northern Utah Valley; approximately 245,000 acre-feet for the Area 55 section of the valley; and approximately 20,000 acre-feet within the Area 54 East.

Table 2. Estimated Potential Groundwater Withdrawal in Northern Utah Valley.

| Potential Groundwater Use | |
|--|----------------------------|
| <u>Type</u> | Quantity (ac-ft/yr) |
| Domestic and Stock | 2,000 |
| Irrigation | 37,000 |
| Municipal | 209,000 |
| <u>Industrial/Other</u> | <u>17,000</u> |
| Total (all of northern Utah Valley) | 265,000 |
| Total Potential in 54 East | (20,000) |
| Total (Potential in Area 55) | 245,000 |

Cedar Valley

The current average annual withdrawal from wells in Area 54 West is about 5,700⁶ acre-feet. In addition, an estimated 3,700⁷ acre-feet per year discharges to valley drains, ditches and springs. The total estimates of usage from wells and discharges to valley drains, ditches and springs in Area 54 West are estimated to be 9,400 acre-feet per year.

Based on existing water rights, the amount of potential groundwater withdrawal from wells and springs in Area 54 West was estimated by totaling perfected (developed) and approved (undeveloped or developing) groundwater rights of record with the Division of Water Rights. To provide the most accurate assessment of potential groundwater withdrawal, existing water rights were compared and adjusted to reflect measured groundwater use data reported to the Division of Water Rights. The potential groundwater withdrawal (including drains and springs) is estimated to be 19,500 acre-feet per year as shown by use in Table 3.

⁶ USGS, Utah Department of Natural Resources, and Utah Department of Environmental Quality. “Groundwater Conditions in Utah,” 1995-2011, average withdrawal for Cedar Valley, Utah County.

⁷ J. Lucy Jordan, Walid W. Sabbah, 2012, Utah Geological Survey (USG), “Hydrology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah,” page 100.

Table 3. Estimated Potential Groundwater Withdrawal in Area 54 West.

| Potential Groundwater Withdrawal Area 54 West | |
|--|----------------------------|
| Type | Quantity (ac-ft/yr) |
| Domestic and Stock | 500 |
| Irrigation | 11,700 |
| Municipal/Domestic | 7,300 |
| Industrial/Other | <u>negligible</u> |
| Total | 19,500 |

Summary

A summary of the hydrologic and water right data described in this plan is presented in Table 4. Groundwater use in Area 54 is less than half of the average annual projected long-term recharge; however, potential use in this area exceeds the long-term average recharge by 13,500 acre-feet per year. In Water Right Area 55 the estimated groundwater use is slightly under the long-term average recharge; however, potential use in this area exceeds long-term recharge by 100,000 acre-feet per year.

Table 4. Summary of Hydrologic and Water Right Data.

| Recharge, Potential and Actual Use by Area | |
|---|----------------------------|
| Area 54 | |
| | Quantity (ac-ft/yr) |
| Recharge | |
| 54 West | 25,000 |
| <u>54 East</u> | <u>1,000</u> |
| Total | 26,000 |
| Potential Use | |
| 54 West | 19,500 |
| <u>54 East</u> | <u>20,000</u> |
| Total | 39,500 |
| Difference in Potential Use versus Recharge | -13,500 |
| Actual Use | |
| 54 West | 9,400 |
| <u>54 East</u> | <u>1,000</u> |
| Total | 10,400 |
| Difference in Actual Use versus Recharge | 15,600 |
| Area 55 Portion of Utah Valley | |
| Recharge | Quantity (ac-ft/yr) |
| Utah Valley | 145,000 |
| Potential Use | |
| Total | <u>245,000</u> |
| Difference in Potential Use versus Recharge | -100,000 |
| Actual Use | |
| Total | 137,600 |
| Difference in Actual Use versus Recharge | 7,400 |

Appropriation Policy

The following policy guidelines are hereby implemented to ensure groundwater withdrawals do not exceed a safe yield, the physical integrity of the aquifer is safeguarded and water quality in northern Utah and Cedar Valleys is protected.

- 1) The appropriation of groundwater in Northern Utah Valley and Cedar Valley was administratively suspended by the State Engineer in 1995. These areas will remain effectively closed to new consumptive use appropriations.
- 2) All applications that represent a new groundwater withdrawal from the Northern Utah County Groundwater Management Area comprised of the portion of Water Right Area 55 and Area 54 East, shown on Figure 1, filed after September 30, 2010, being held without action during the development of this plan, are subject to this plan.
- 3) Surface water diversions may not be changed to underground point(s) of diversion unless:
 - a. The new well is to replace a spring or drain impacted by new groundwater development, where flow is insufficient to supply historical beneficial use. A water user is required to file a change application setting forth a claim of reduced flow due to new groundwater development. The claim of reduced flow must show the reduction is not related to an alteration of the conveyance works of surface rights that may affect the historical return flows or seepage losses from conveyance facilities; or
 - b. The well is for the recovery of water from an approved Aquifer Storage and Recovery project; or
 - c. The surface source proposed to be changed is within area 54 West (see Figure 1.) and the proposed well remains within area 54 West; or
 - d. The surface source proposed to be changed is within a canyon area and the proposed well remains within the same canyon area.
- 4) Change applications proposing to move groundwater anywhere in a given water right area within the management plan boundary will be reviewed on their individual merits, keeping safe yield limitations as a guideline, and may be approved. The 2004 modification to the 1995 Cedar Valley policy limiting the movement of water rights from area 54 East to area 54 West is rescinded.

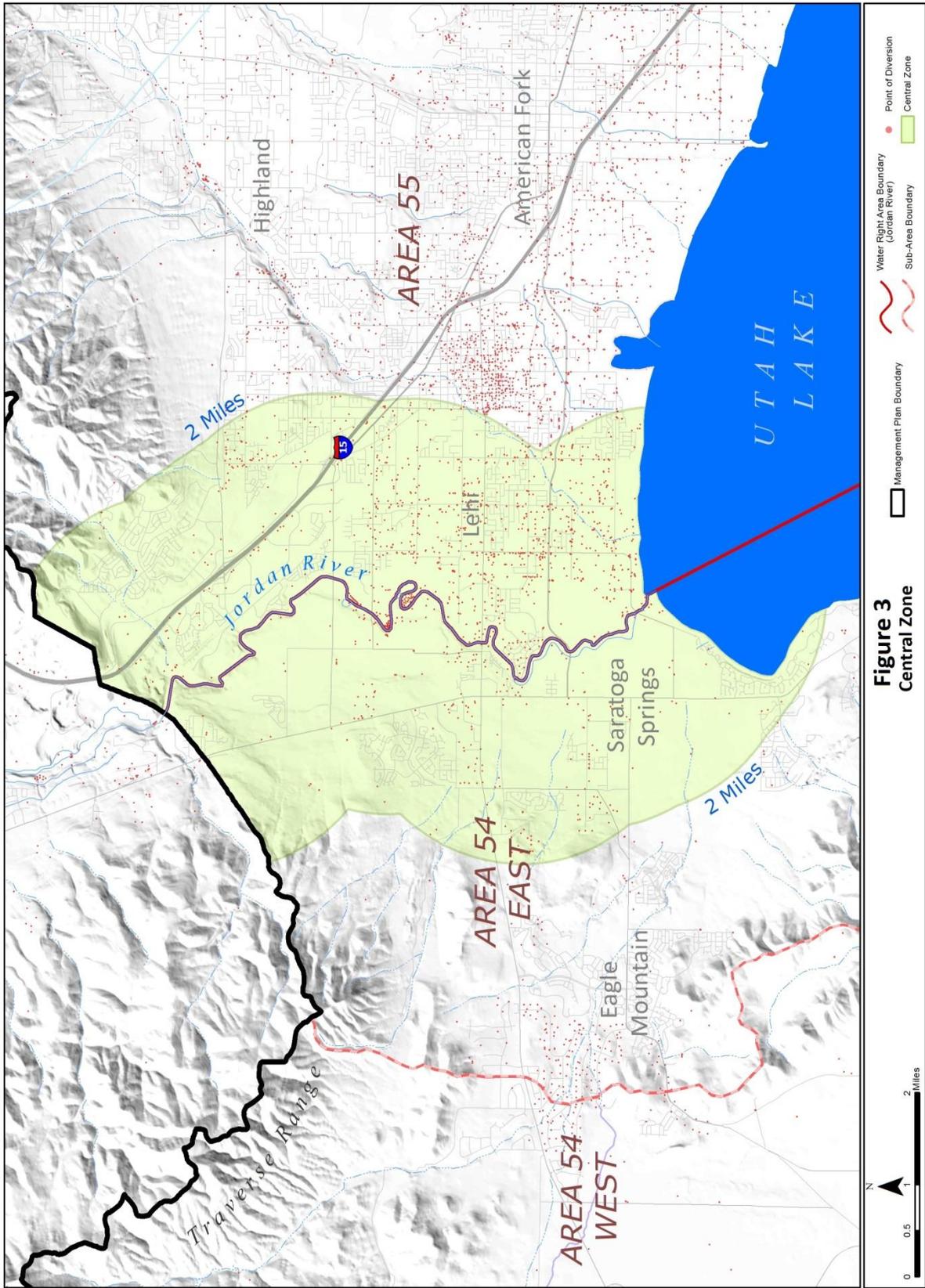


Figure 3
Central Zone

- 5) Change Applications proposing to move underground points of diversion from Water Right Area 54 to Area 55, or Area 55 to Area 54, will not be approved except under the following conditions:
 - a. The underground point of diversion to be changed is an approved location as of June 4, 2013 within the Central Zone as shown on Figure 3. The Central Zone is defined by a two-mile buffer around the boundary between areas 55 and 54, and;
 - b. The proposed hereafter point of diversion must remain within the defined Central Zone.
- 6) Applications to develop groundwater will not be approved in the Timpanogos Cave National Monument Protection Zone as defined in the Timpanogos Cave National Monument Water Right Settlement Agreement dated March 22, 2004.

Safe Yield

An objective of this plan is to set a safe yield for northern Utah and Cedar Valleys. Based on the recharge information presented, the safe yield for the portion of Area 55 discussed in this plan is estimated to be 145,000 acre-feet and the safe yield for Area 54 is estimated to be 26,000 acre-feet. It is vital for the protection of the groundwater resource to ensure the safe yield is not exceeded.

Inasmuch as potential withdrawals exceed safe yield, future water use will be monitored and further measures will be implemented as necessary to assure safe yield is maintained. All diversions of groundwater within northern Utah and Cedar Valley that are approved to divert 100 acre-feet or more per year are required to install, operate and maintain flow-measuring devices, and report withdrawals annually to the State Engineer Water Use Program. Prior to implementation of the monitoring and recording requirements, the State Engineer will notify affected water users. Measuring and reporting withdrawals of groundwater in conjunction with other data collection and monitoring will aid the State Engineer and water users in protecting the resource and implementing the objectives of the groundwater management plan.