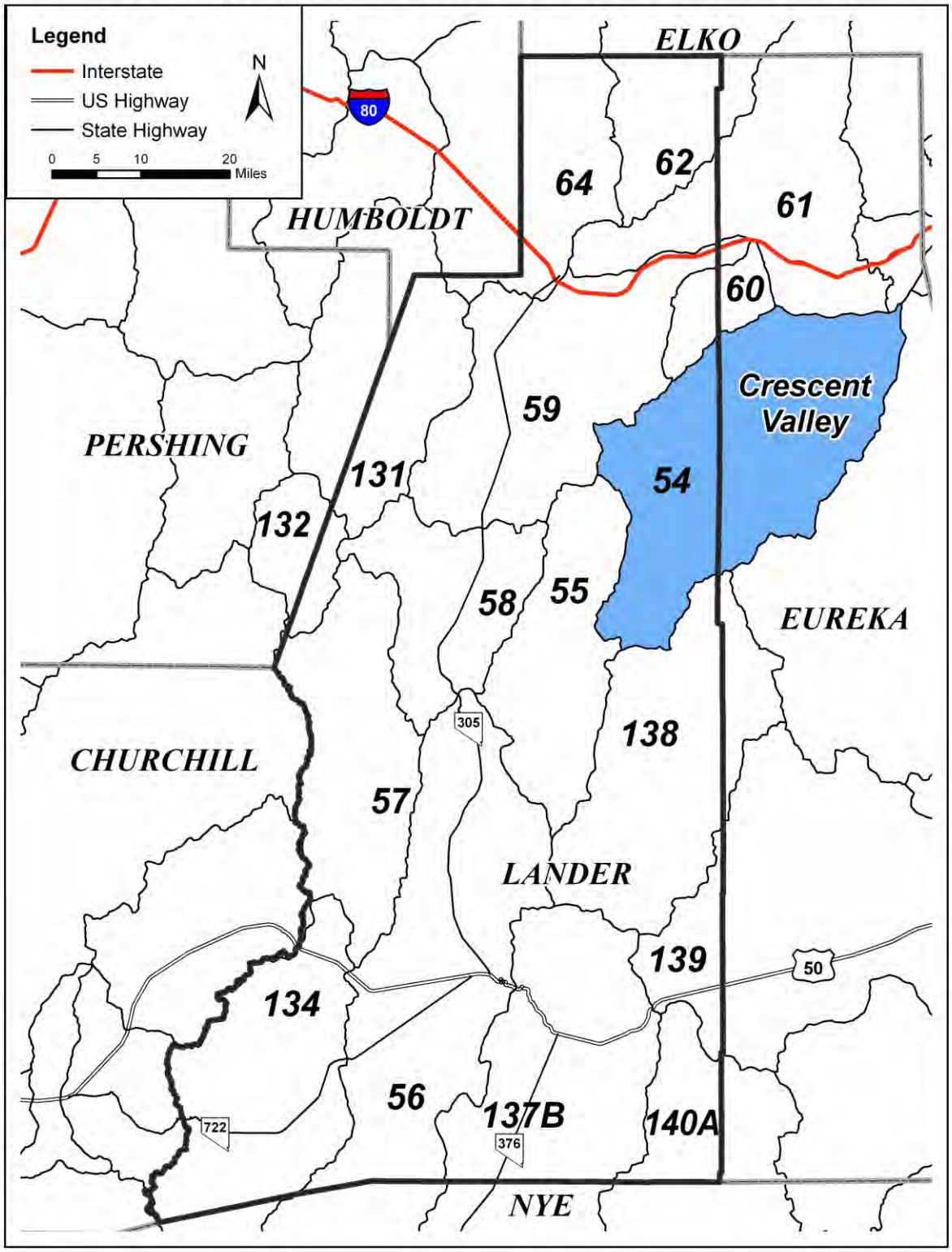
Appendix A
Hydrographic Basin 54: Crescent Valley



Basin 54 - Crescent Valley

Crescent Valley is a semi-closed basin that is bounded on the west by the Shoshone Range, on the east by the Cortez Mountains, on the south by the Toiyabe Range, and on the north by the Dry Hills. The drainage basin is about 45 miles long, 20 miles wide, and includes an area of approximately 750 square miles. Water enters the basin primarily as precipitation and is discharged primarily through evaporation and transpiration. Relatively small quantities of water enter the basin as surface flow and ground water underflow from the adjacent Carico Lake Valley at Rocky Pass, where Cooks Creek enters the southwestern end of Crescent Valley. Ground water generally flows northeasterly along the axis of the basin. The natural flow of ground water from Crescent Valley discharges into the Humboldt River between Rose Ranch and Beowawe. It is estimated that the average annual net discharge rate is approximately 700 to 750 acre-feet annually.

Many of the streams which drain snowmelt of rainfall from the mountains surrounding Crescent Valley do not reach the dry lake beds on the Valley floor: instead, they branch into smaller channels that eventually run dry. Runoff from Crescent Valley does not reach Humboldt River with the exception of Coyote Creek, an intermittent stream that flows north from the Malpais to the Humboldt River and several small ephemeral streams that flow north from the Dry Hills. Surface flow in the Carico Lake Valley coalesces into Cooks Creek, which enters Crescent Valley through Rocky Pass. Cooks Creek flows approximately 1 mile into Crescent Valley and then becomes dry (NDCNR, 1966).

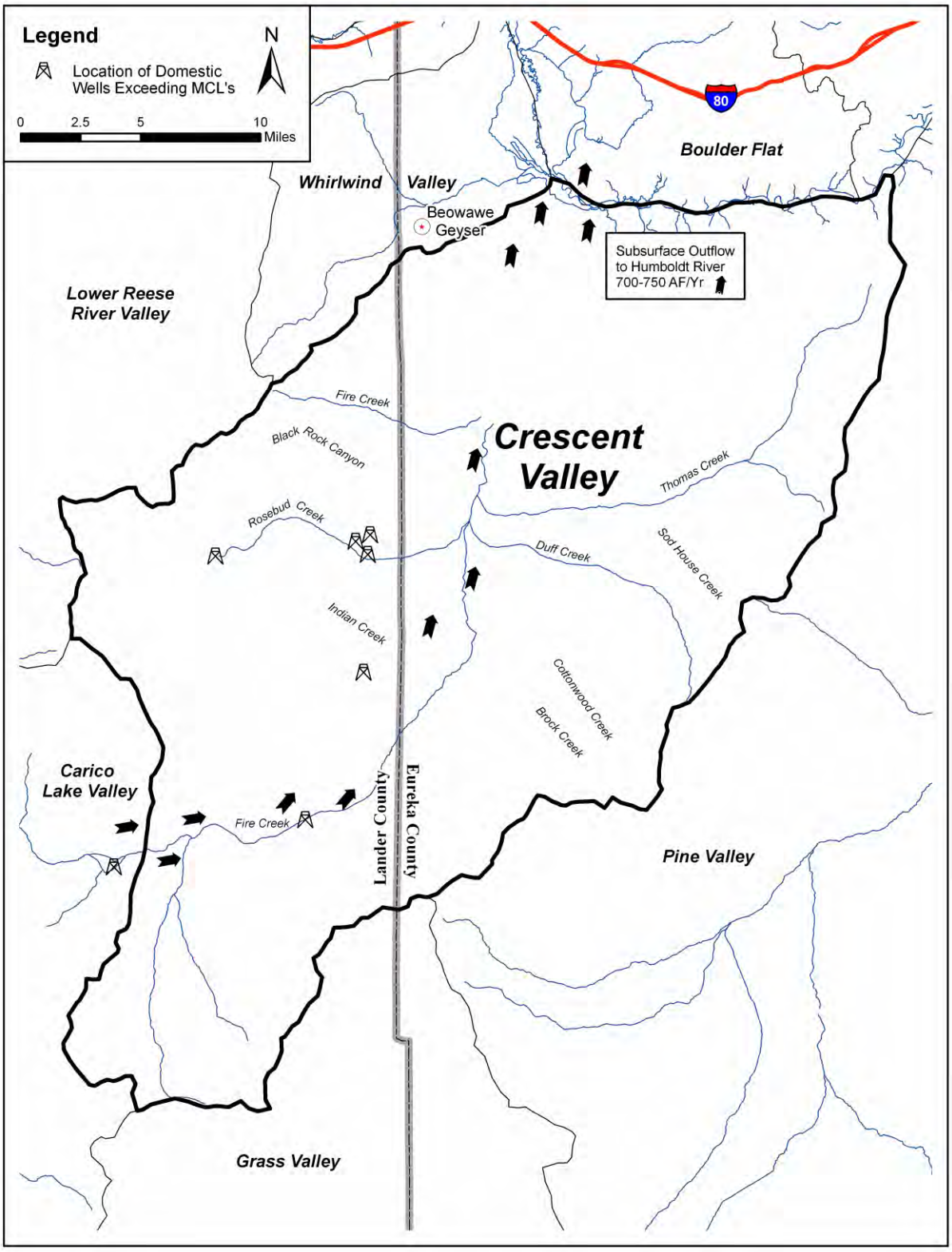
Ground water recharge to Crescent Valley occurs primarily from direct infiltration of precipitation and runoff. Seepage from streams that cross the alluvial fans around the margins of the basin is the primary route for recharge. Discharge is primarily through evapotranspiration. Other discharges from domestic, municipal, industrial, and agricultural uses, discharge from seeps and springs, and outflow to the Humboldt River.

Figure A54-1 shows major surface water features in Hydrographic Basin 54. Also shown are the locations of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory. Major streams include Cooks Creek, Frenchie Creek, Sod House Creek, Duff Creek, Brock Canyon, Fourmile Canyon, Mill Canyon, Thomas Creek, Fire Creek, Corral Canyon, Black Rock Canyon, Mud Spring Gulch, and Indian Creek. The Klondex Gold and Silver Mining Company will begin site development within the Fire Creek drainage in 2011.

Water Quality

Data on ground water quality in the Crescent Valley area is extensive. The alluvial water quality is generally good, meeting most of the primary and secondary drinking water standards, and is suitable for mining, irrigation, and stock uses. The average alluvial aquifer constituent concentrations do not exceed the relevant Nevada water quality standards with the exception of manganese (.082 mg/L). The maximum concentration in alluvial sample was above the drinking water standard for arsenic, chloride, fluoride, total dissolved solids (TDS), iron, manganese, mercury, thalium and pH.

Figure A54-1
Hydrographic Basin 54 – Crescent Valley



The bedrock water quality is generally similar to the alluvial aquifer, but with higher concentrations of mineral constituents. Recent water quality analysis of wells conducted by the Nevada State Health Laboratory shows water quality exceeded State standards for total dissolved solids (TDS), Iron, Barium, and Manganese (BLM, 2000).

Water Use in Crescent Valley

A summary of water resources is included in Table A54-1. Active water rights in the basin currently exceed the perennial yield mostly due to mining water use. As a result, the basin is closed to additional water appropriations permits. Most of the water rights are (surface and groundwater) currently used for mining purposes. The Basin is contained within Lander County and Eureka Counties. There are 23,994 acre-feet of water rights pending before the State Engineer. Surface water rights in Lander County are limited to about 309 acre-feet of water annually. Groundwater rights are shown in Table A54-2.

Table A54-1
2010 Water Use Basin 54

Groundwater		**Notes**
Designated Basin	Yes, 0-755	
Perennial Yield	16,000 af.	NDWR
Annual Duty:	90,999.14 af.	NDWR-see Table B54-2
Active Water Rights	67,005.03 af.	NDWR
Pending	23,994.10 af.	NDWR
Groundwater Quality	Generally Good	BLM 2000
Wells exceeding MCLs	5 SMCL for TDS	
Surface Water		
Total in Lander County	435.06	NDWR
Irrigation	206.58	
Stock	228.58	
Other	0.00	
Water Quality	Generally Good	BLM 2000
Surface Water Recharge	26,300 af.	
Public Water Systems	Town of Crescent Valley-Eureka County	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A54-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 54 (As of May 2010)

Use	Active	Pending	Total
Commercial	0.06	0.00	0.06
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	5,564.66	0.00	5,564.66
Mining	59,596.26	23,891.38	83,487.64
Municipal	260.61	0.00	260.61
Power Generation	0.00	0.00	0.00
Quasi-Municipal	1,230.63	0.00	1,230.63
Recreation	0.00	0.00	0.00
Stock Water	352.82	102.72	455.54
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	67,005.04	23,994.10	90,999.14

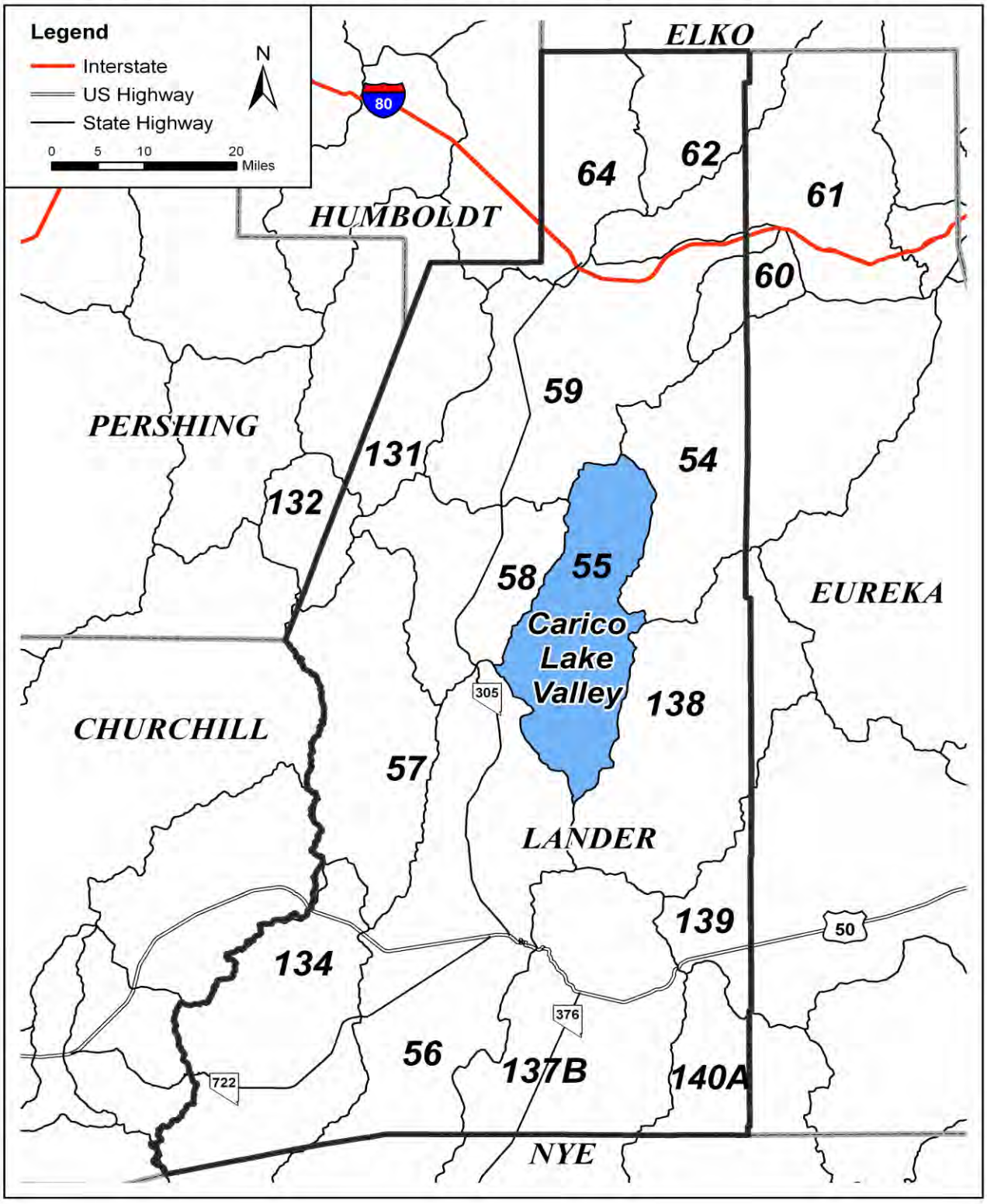
Nevada Division of Water Resources, 2010, CA-Carey Act

References for Basin 54:

Bureau of Land Management, *South Pipeline Project Final Environmental Impact Statement,* Battle Mountain Field Office, February, 2000.

Nevada Department of Conservation and Natural Resources, *Water Resource Reconnaissance Series Report 37,* Carson City, Nv., March 1966.

Appendix A
Hydrographic Basin 55: Carico Lake Valley



Basin 55- Carico Lake Valley

Carico Lake Valley lies northwest of Grass Valley. It is approximately 40 miles long and 10 miles wide and covers and area of about 380 square miles. Carico Lake Valley has surface and subsurface drainage through Rocky Pass into Crescent Valley. The principal drainage is northward into Crescent Valley. Some of the ground water from Carico Lake Valley rises to the surface at the gap at Rocky Pass and flows into Crescent Valley. Most of this surface-water outflow occurs during the non-growing season and averages about 200 to 300 acre-feet per year. In addition, ground-water underflow through Rocky Pass from Carico Lake Valley is estimated to be no larger than 300 acre-feet per year. About 3,000 acre-ft/yr of subsurface flow was estimated to enter Carico Lake Valley from the Upper Reese River Valley (NDCNR, 1966). Recent work by the USGS in WRIR 99-4272 to develop water budgets for the Carico Lake Valley found much higher rates of ground water recharge and outflow which could result in a higher perennial yield for the basin.

Figure A55-1 shows major surface water features in Hydrographic Basin 55 including major springs. Also shown are locations of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory. In Carico Lake Valley, the largest stream is Iowa Creek that has its source in the Toiyabe Range near Mt. Callaghan.

Water Quality

Data on water quality in the Carico Lake Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type. Water quality analysis of 1 domestic well showed water quality standards meeting minimum contaminant levels (MCLs).

Water Use

A summary of water resources is included in Table A55-1. The perennial yield in the basin is less than the active water duty. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. The Basin is contained entirely in Lander County. Surface water rights in Carico Lake Valley are about 4,100 acre-feet. Most are used for irrigation. Table A55-2 shows groundwater rights by manner of use.

Appendix A:
Hydrographic Basin 55: Carico Lake Valley

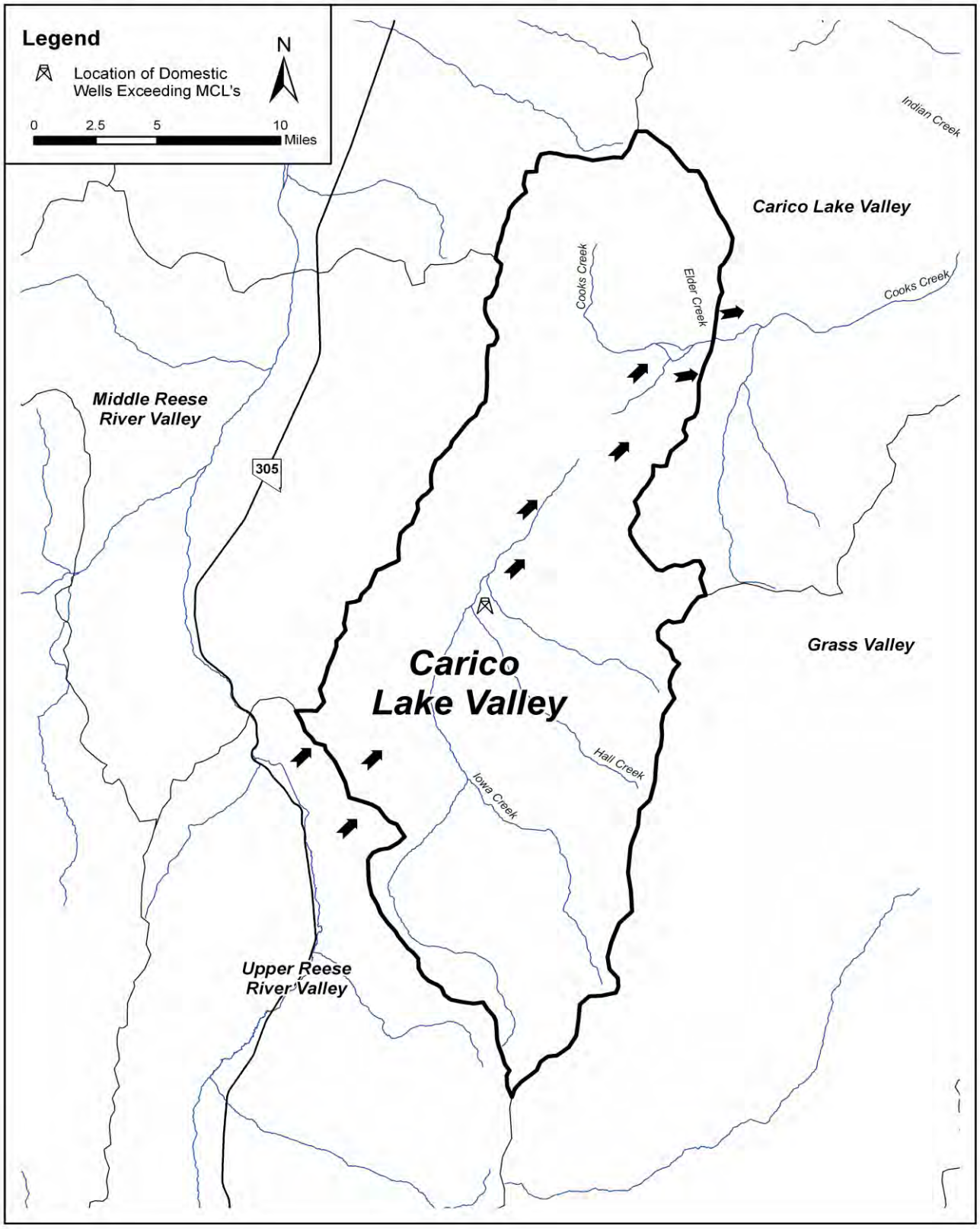


Table A55-1
2010 Water Resource Summary Basin 55

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	4,000.00 af.	NDWR
Annual Duty:	3,504.66 af	NDWR-see Table 55-2
Active Water Rights	3,504.66 af.	NDWR
Pending	0.0 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 37
Wells exceeding MCLs	0	
Surface Water		
Total in Lander County	4,119.73 af.	NDWR
Irrigation	2,603.14 af.	
Stock	124.11 af.	
Other-As Decreed	1,392.48 af.	
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 37
Surface Water Recharge	4,300 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A55-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 55 (As of May 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	53.80	0.00	53.80
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	2,202.40	0.00	2,202.40
Mining	1,143.05	0.00	1,143.05
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	104.96	0.00	104.96
Storage	0.00	0.00	0.00
Wild Life	0.45	0.00	0.45
Other/Decreed	0.00	0.00	0.00
	3,504.66	0.00	3,504.66

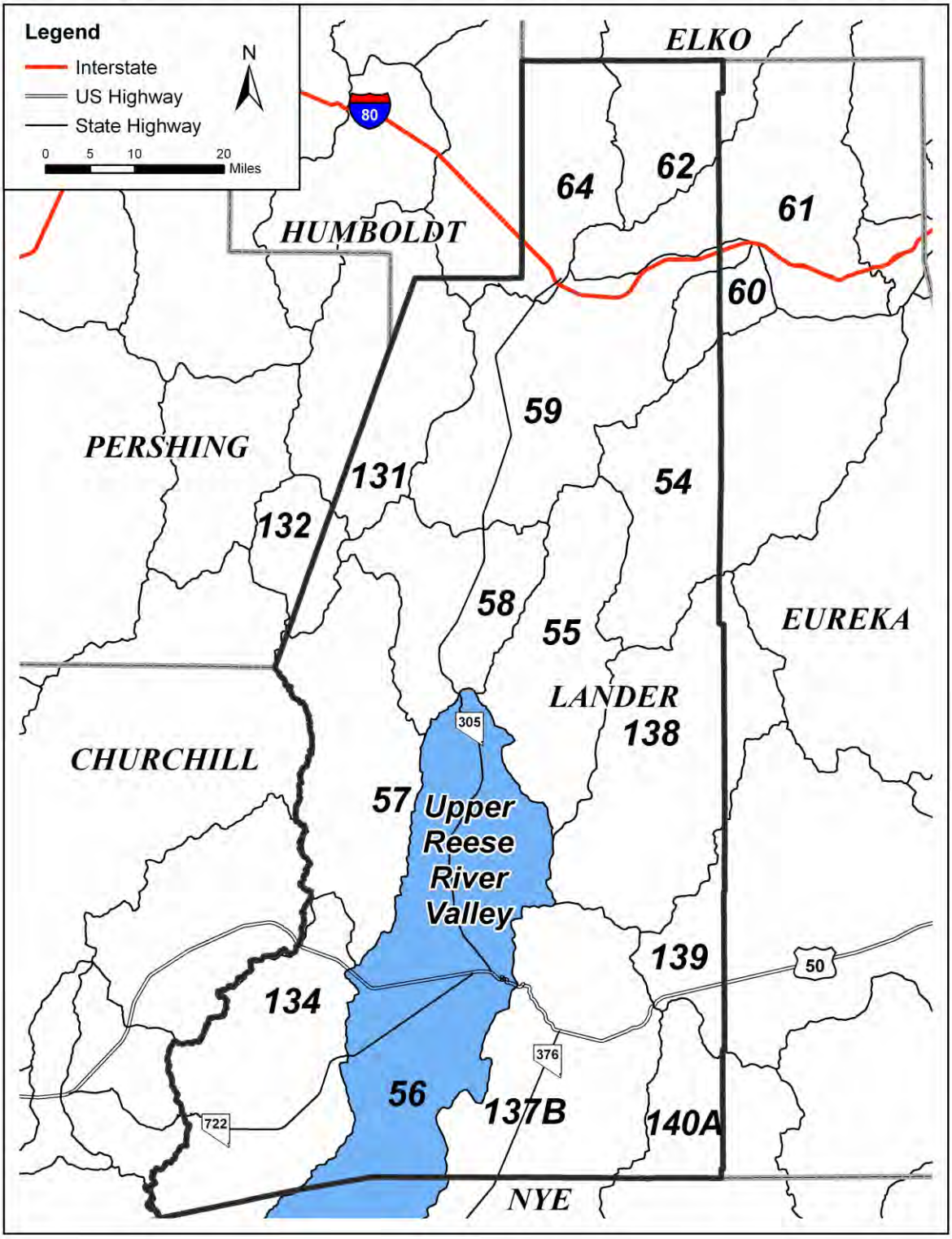
Nevada Division of Water Resources, 2010, CA-Carey Act

References for Basin 55:

Nevada Department of Conservation and Natural Resources, *Water Resource Reconnaissance Series Report 37,* Carson City, Nv., March 1966.

U.S. Geological Survey Water Resources Investigations Report 99-4272, *Water Budgets for Pine Valley, Carico Lake Valley, and Upper Reese River Valley Hydrographic Areas, Middle Humboldt River Basin, North-Central Nevada- Methods for Estimation and Results.* Carson City, 1999.

Appendix A
Hydrographic Basin 56: Upper Reese River Valley



Basin 56 – Upper Reese River Valley

Upper Reese River Valley is approximately 1,200 square miles and lies largely in Lander County. The very southern end extends about 20 miles into Nye County. Major surface water features in this basin are Reese River, Big Creek, Illinois, Clear, Stewart, Tierney, and Indian Creek on the south end. Italian, Silver, and Boone Creek drain the northern section of the Toiyabe Range. Bonita, Meadow, and Deep Creeks are the principal streams draining the Shoshone Mountains. The principal tributaries draining the Toiyabe Range are perennial in the canyons and on the upper parts of the alluvial apron. However, most of these actually reach the Reese River only during periods of high flow. The duration of through flow is reduced because of diversion for irrigation of the meadow areas along the streams. Overland flow from the Shoshone Mountains rarely reaches the channel of the Reese River, except after high-intensity storms.

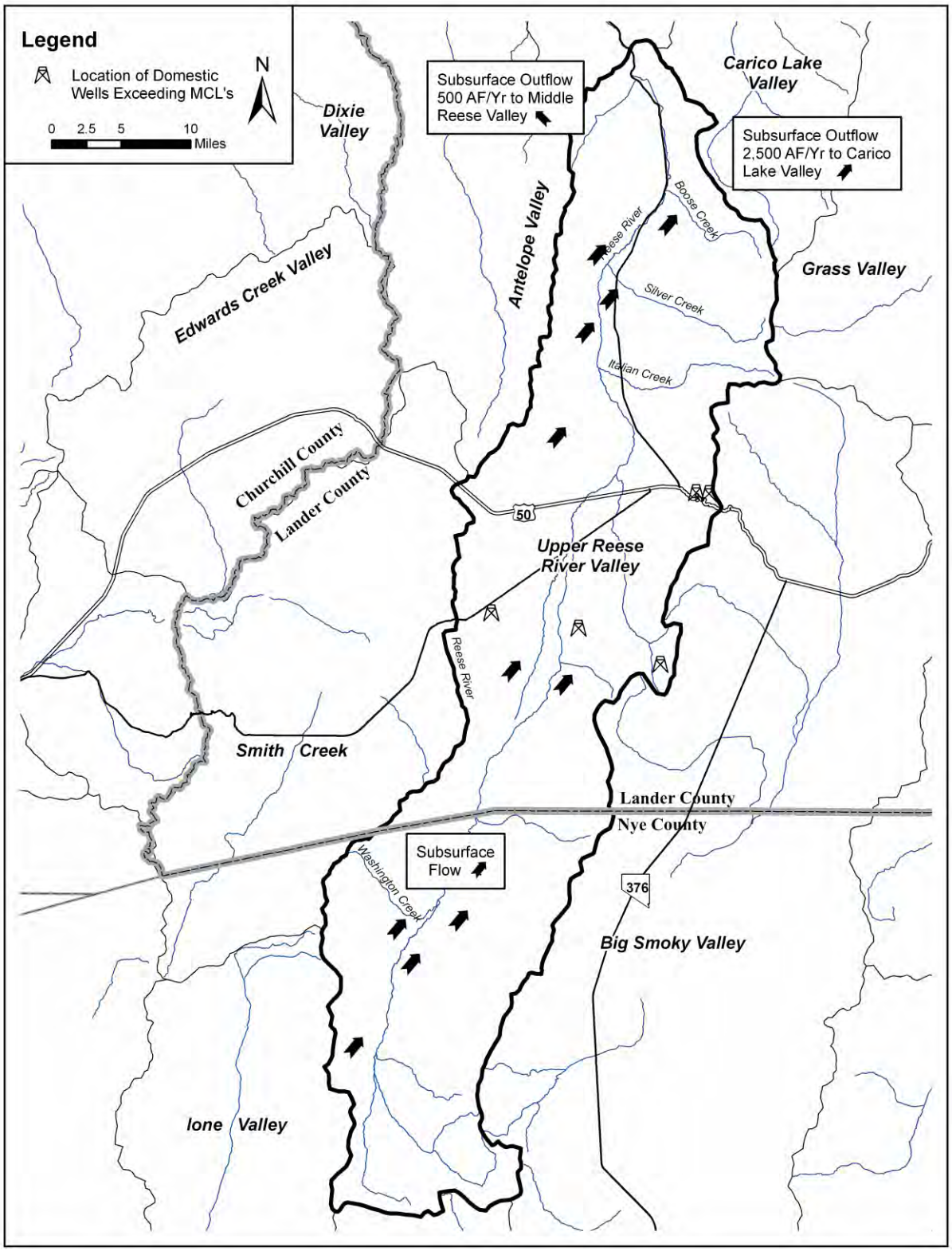
An estimated 3,000 acre-feet/year leaves hydrographic area as surface water through a narrow canyon in Reese River Valley. Most of the flow is during short periods of high-intensity rain or during the spring runoff. Other outflow includes about 3,000 acre-feet annually of subsurface flow to adjacent hydrographic areas, 500 acre-feet to the Middle Reese River and 2,500 acre-feet to Carico Lake Valley (NDCNR, 1965). Recent work by the USGS (Water-Resources Investigations Report 99-4272) found that ground water recharge could be nearly twice the original estimates and outflow from the Upper Reese River is more than 20,000 acre-feet/yr greater than early estimates. These findings could increase the estimates of perennial yield.

Figure A56-1 shows major surface water features in Hydrographic Basin 56 including major springs. Also shown is location of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis was performed by the Nevada State Health Laboratory.

Water Quality

Data on water quality in the upper Reese River Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type. Water quality analysis of 13 wells conducted by the Nevada State Health Laboratory shows that five of thirteen wells exceeded current standards (primary and secondary) for arsenic, total dissolved solids (TDS), or nitrates.

Figure A56-1
Hydrographic Basin 56 – Upper Reese River Valley



Water Use in the Upper Reese River Valley

A summary of water resources is included in Table A56-1. The active duty in the basin exceeds the perennial yield by approximately 1,500 acre-feet. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes.

Table A56-1
2010 Water Resource Summary Basin 56

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	37,000 af.	NDWR
Annual Duty:	38,573.17 af.	NDWR-see TableB56-2
Active Water Rights	38,561.45 af.	NDWR
Pending	11.72 af.	NDWR
Groundwater Quality	Suitable	USGS Report 96-4311
Wells exceeding MCLs	3 of 13	Arsenic, TDS, Nitrates
Surface Water		
Total in Lander County	21,528.02 af.	NDWR
Irrigation	18,830.90	
Mining	727.12	
Municipal	361.98	
Stock	95.13	
Decreed	1,508.65	
Other	4.24	
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 31
Surface Water Recharge	58,000 af.	
Public Water Systems		
Austin Town:		
Source	Groundwater	
Current Annual Use	48 million gallons	Sewer and Water District
Customers	120 Residential 41 Commercial/Ind.	Sewer and Water District
Per Capita Use-2009	355 gallons per day	
2009 Population	304	State Demographer.
Long Range Population	10,000	Table 3-3
Domestic Wells		
Total Lander County 2010	Less than 25	

More recent studies (USGS WRIR 99-4272) shows that estimates of ground-water recharge are more than twice Eakin and others' 1965. Total groundwater inflow was estimated to be 71,000 to 110,000 acre-feet with total outflow ranging from 59,000 to 62,000 acre-feet that is nearly 20,000 acre-feet more than previously estimated. As a result, perennial yield may increase. Table A56-2 provides a summary of groundwater rights by manner of use.

Austin is the largest population center in the Basin. Currently, the Lander County Sewer and Water District No. 2 serves approximately 161 customers and used approximately 48 million gallons (147 acre-feet) of water in 2009. Future water demand for the Town of Austin could more than double in the near future.

Table A56-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 56 (As of May 2010)

Use	Active	Pending	Total.
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	2,056.00	0.00	2,056.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	502.40	0.00	502.40
Irrigation	34,988.17	0.00	34,988.17
Mining	608.22	0.00	608.22
Municipal	43.98	0.00	43.98
Power Generation	0.00	0.00	0.00
Quasi-Municipal	298.79	0.00	298.79
Recreation	0.00	0.00	0.00
Stock Water	63.89	11.72	75.61
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
Total	38,561.45	11.72	38,573.17

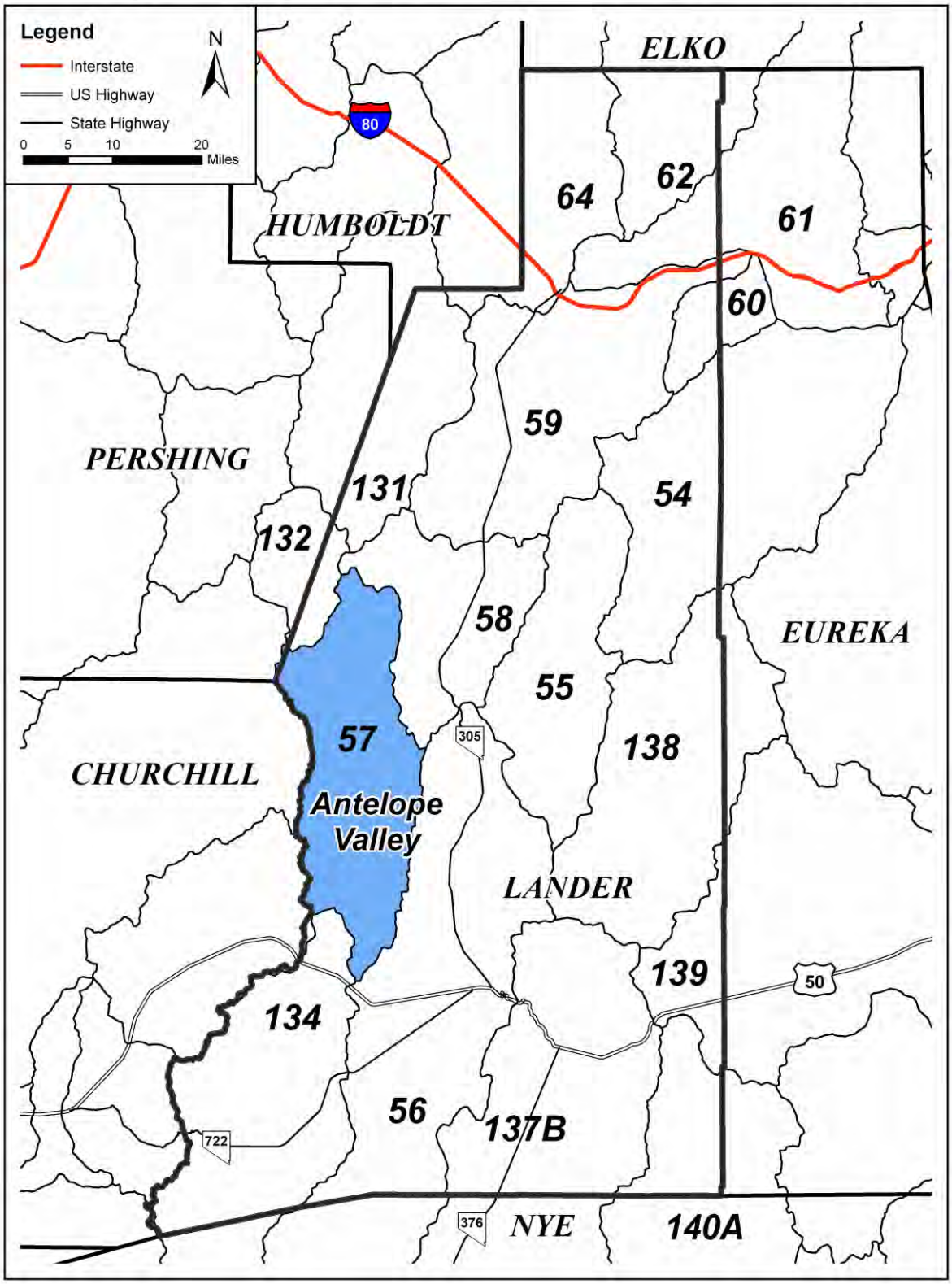
Source: Nevada Division of Water Resources, 2010, CA – Carey Act.

References for Basin 56:

Nevada Department of Conservation and Natural Resources, *Water Resource Reconnaissance Series Report 31,* Carson City, Nv., March 1965.

U.S. Geological Survey Water Resources Investigations Report 99-4272, *Water Budgets for Pine Valley, Carico Lake Valley, and Upper Reese River Valley Hydrographic Areas, Middle Humboldt River Basin, North-Central Nevada- Methods for Estimation and Results.* Carson City, 1999.

Appendix A
Hydrographic Basin 57: Antelope Valley



Basin 57-Antelope Valley

Antelope and Middle Reese River Valleys are located in west-central Lander County, Nevada. Antelope Valley is about 45 miles long and 12 miles wide and includes a drainage area of about 460 square miles. The long axis of the valley trends northward and is southwest and tributary of the Middle Reese River Valley. Middle Reese River Valley extends northward about 20 miles from the mouth of the Reese River Canyon. Reese River in this area is an ephemeral stream. Antelope Valley, an intermontane valley, is elongated in a northerly direction, and is a tributary to Reese River. It is a hydrologic and a drainage closed unit surrounded by mountains, except on the northeast side where ephemeral Cane Creek drains the valley through a narrow bedrock gap to Reese River. Approximately, 6,000 acre-feet of groundwater annually flows to middle Reese River Valley, annually (NDCNR, 1963).

The depth to water in the valley fill in Antelope Valley ranges from about 20 feet below land surface at the bedrock constriction to about 460 feet at the south end of the valley. The depth to water in the northern part of Antelope Valley where development of ground water for irrigation is occurring is much closer to the surface. A somewhat similar situation exists at the northern end of the Middle Reese River Valley. A constriction causes water to be near the surface.

No perennial streams occur in Antelope and Middle Reese River Valleys. Cane Creek and Reese River carry water only infrequently. The Reese River does contain a small perennial flow most of the time for a short distance below the Hot Springs Ranch. Antelope Valley and Upper Reese River Valley contributed a significant but unknown flood flow which flooded Battle Mountain in 1962. Antelope and Gilbert's Creeks and other ephemeral streams which drain the south part of Antelope Valley occasionally discharge water to Cane Creek. Figure A57-1 shows major surface water features in Hydrographic Basin 57 including major springs, and the location of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory.

Water Quality

Data on water quality in the Antelope Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases as water dissolves and retains soluble products of rock weathering and decomposition enroute to areas of discharge. Early water chemical analysis showed that the sodium hazard of groundwater is low, but it may have a medium to high salinity hazard. Most of the groundwater in the area is a calcium-bicarbonate type.

Water quality analysis of wells conducted by the Nevada State Health Laboratory show water quality exceeded State standards for TDS, Chlorides, and Nitrates.

Water Use in Antelope Valley

A summary of water resources is included in Table A57-1. Active water rights in the basin currently exceed the perennial yield by nearly 21,000 acre-feet. As a result, the basin is closed to additional water appropriations permits. All of the water (surface and groundwater) is currently used for irrigation purposes. The Basin is entirely contained within Lander County. Table A57-2 shows groundwater rights by manner of use.

Table A57-1
2010 Water Resource Summary Basin 57

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	9,000 afa.	NDWR
Annual Duty:	32,507.47 af.	NDWR-see Table A57-2
Active Water Rights	32,496.27 af.	NDWR
Pending	11.20 af.	NDWR
Groundwater Quality	Varies-poor quality in some areas	NDCNR Reconnaissance Series 19
Wells exceeding MCLs	4	
Surface Water		
Total in Lander County	1,767.02	NDWR
Irrigation	1,707.73	
Stock	68.04	
Other	21.05	
Water Quality	Varies from location to location some poor quality	NDCNR Reconnaissance Series 19
Surface Water Recharge	11,000 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 25	

Figure A57-1
Hydrographic Basin 57 – Antelope Valley

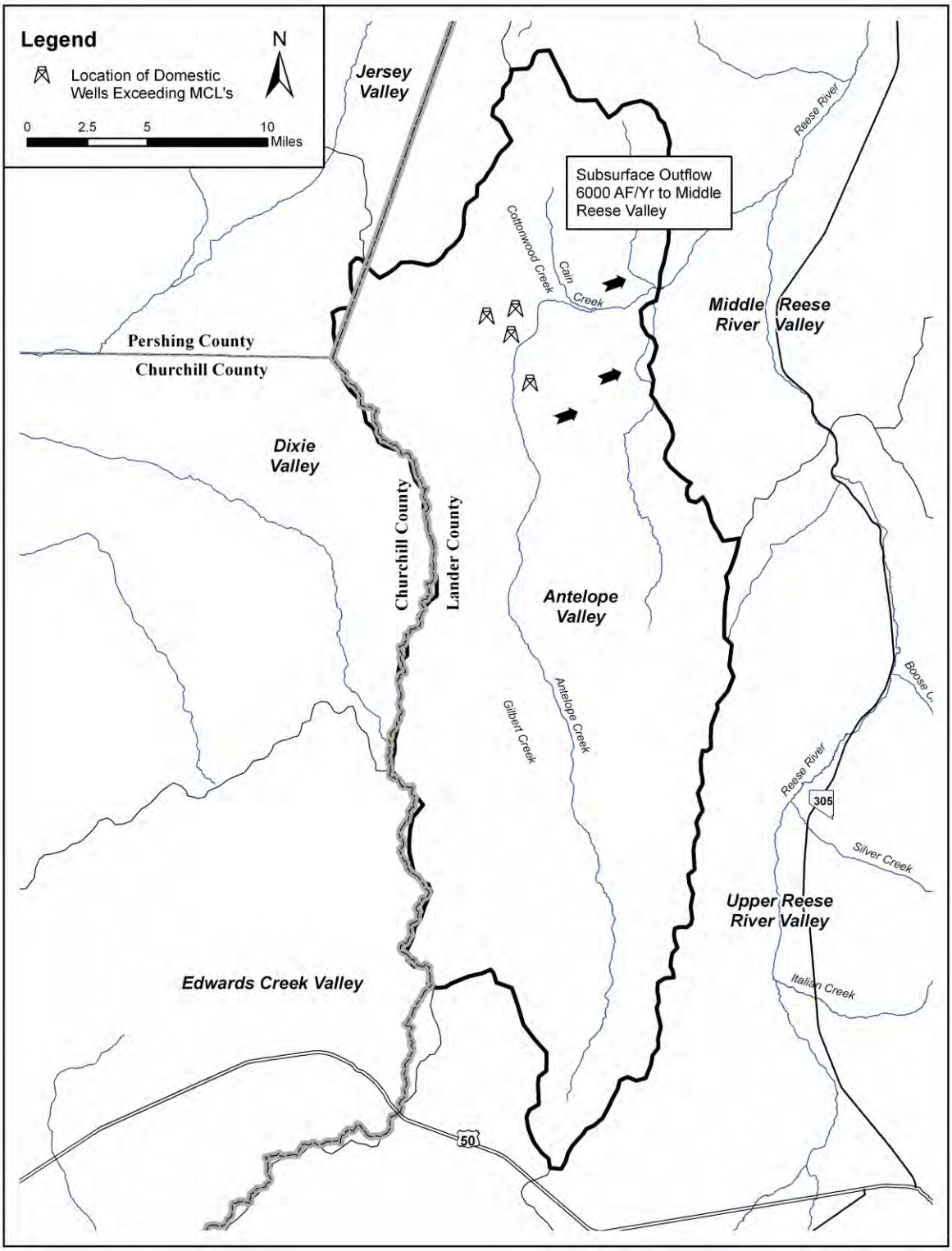


Table A57-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 57 (As of August 2010)

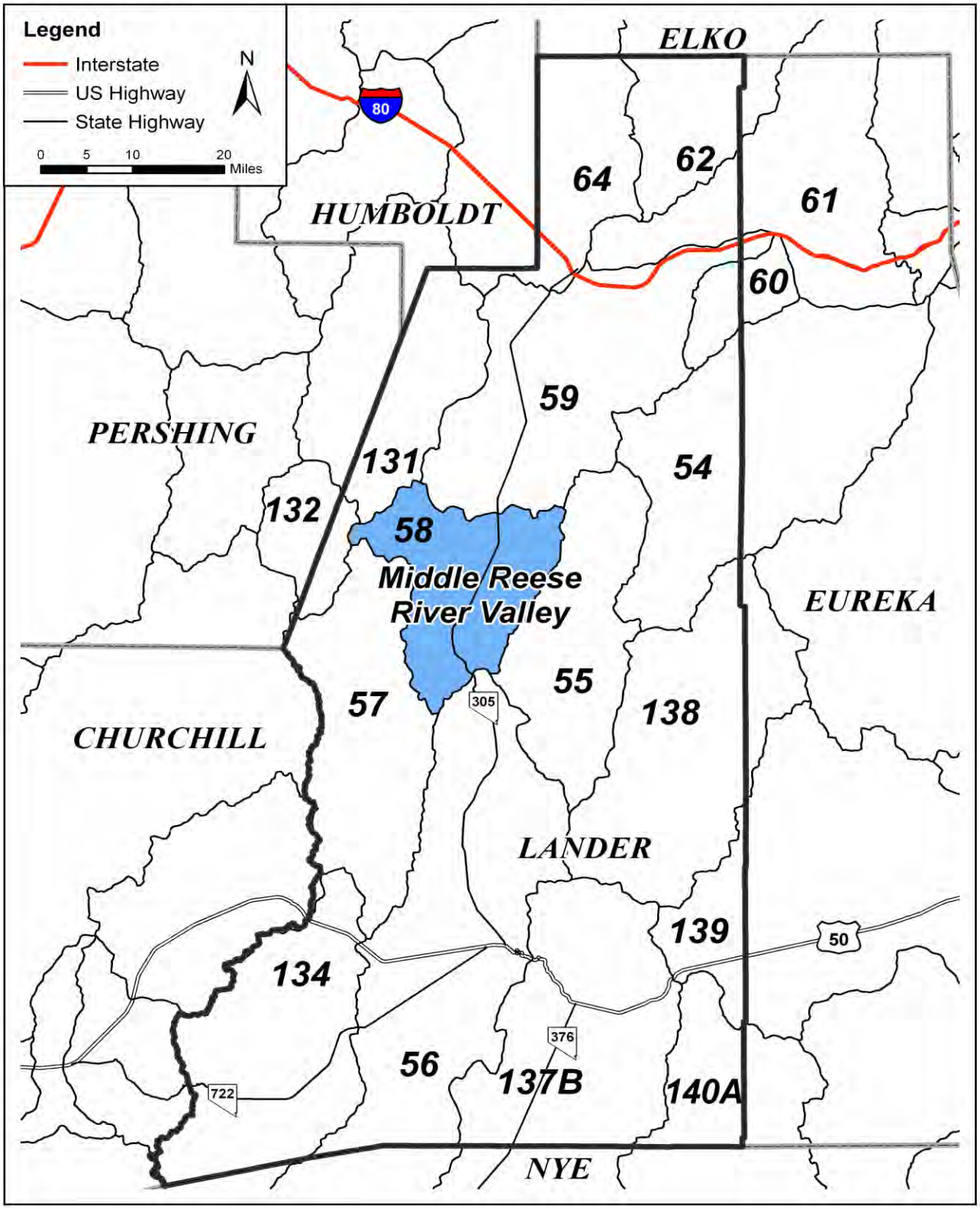
Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	1,216.48	0.00	1,216.48
Irrigation	31,231.64	0.00	31,231.64
Mining	0.00	0.00	0.00
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	48.15	11.20	59.35
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	32,496.27	11.20	32,507.47

Source: Nevada Division of Water Resources, 2010, CA-Carey Act.

References used for Basin 57:

Nevada Department of Conservation and Natural Resources, *Water Resource Reconnaissance Series Report 19,* Carson City, Nv., March 1963.

Appendix A
Hydrographic Basin 58: Middle Reese River Valley



Basin 58-Middle Reese River Valley

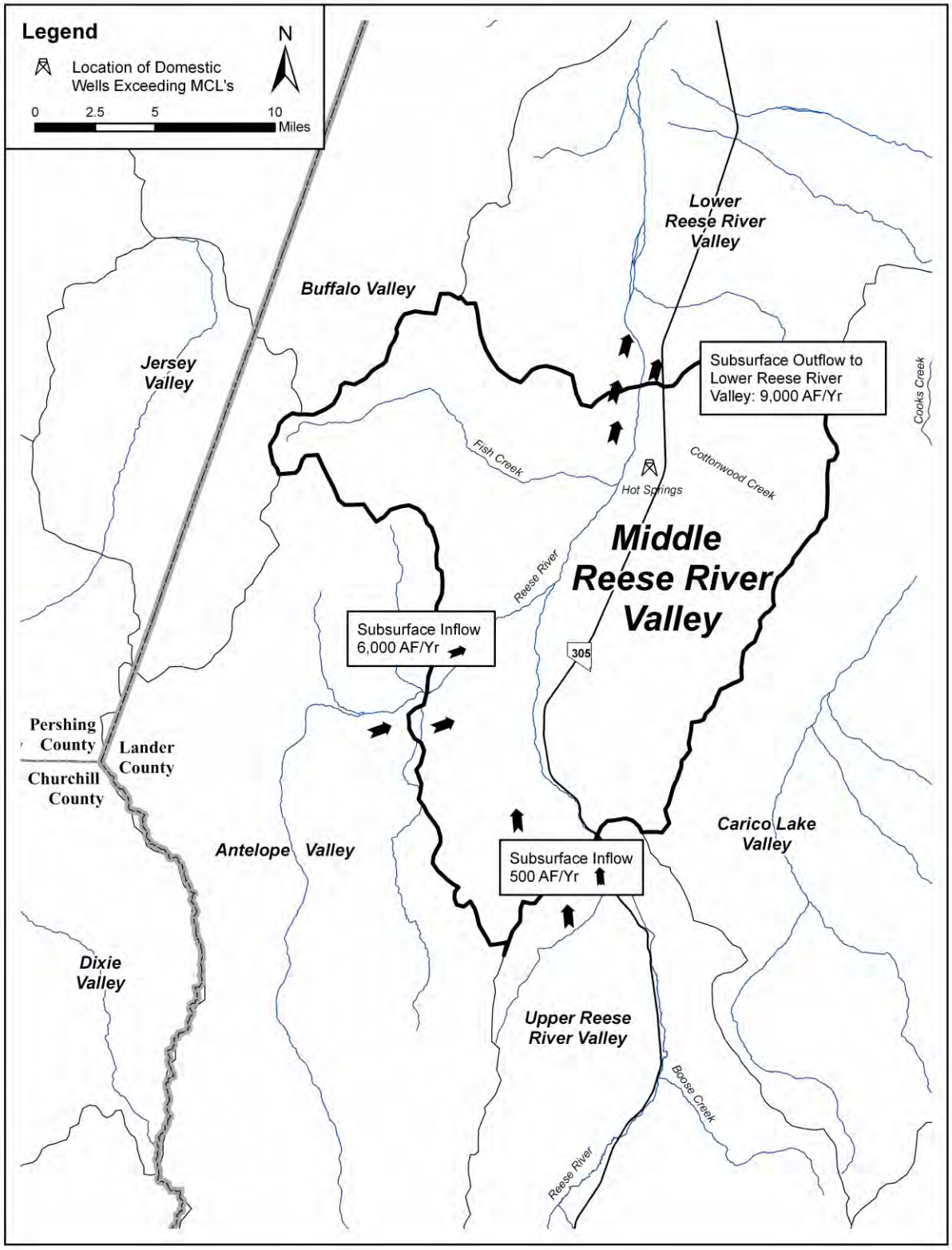
Antelope and Middle Reese River Valleys are located in west-central Lander County, Nevada. Antelope Valley is about 45 miles long and 12 miles wide and includes a drainage area of about 460 square miles. The long axis of the valley trends northward and is southwest and tributary of the Middle Reese River Valley. Middle Reese River Valley extends northward about 20 miles from the mouth of the Reese River Canyon. Reese River in this area is an ephemeral stream. Antelope Valley, an intermontane valley, is elongated in a northerly direction, and is tributary to Reese River. It is a hydrologically closed basin and the drainage unit surrounded by mountains, except on the northeast side where ephemeral Cane Creek drains the valley through a narrow bedrock gap to Reese River. Groundwater discharge by underflow through the valley fill from Antelope Valley to Middle Reese River valley and from Middle Reese River valley to Lower Reese River valley is the principal means of natural discharge. Underflow from Antelope Valley to Middle Reese River Valley and Middle Reese River Valley to Lower Reese River Valley is estimated to be 6,000 and 9,000 acre-feet per year, respectively (NDCNR, 1963).

No perennial streams occur in Middle Reese River Valleys. Cane Creek and Reese River carry water only infrequently. The Reese River does contain a small perennial flow most of the time for a short distance below the Hot Springs Ranch. Antelope Valley and Upper Reese River Valley contributed a significant but unknown 1962 flood flow which flooded Battle Mountain. Fish Creek in the Fish Creek Mountains is a perennial stream and Cottonwood Creek probably has some reaches that are perennial, but both streams are ephemeral in the lowlands. Figure A58-1 shows major surface water features in Hydrographic Basin 58 including major springs.

Water Quality

Data on water quality in the Middle Reese River Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases as water dissolves and retains soluble products of rock weathering and decomposition enroute to areas of discharge. Early water chemical analysis showed that the sodium hazard of groundwater is low, but it may have a medium to high salinity hazard. Most of the groundwater in the area is a calcium-bicarbonate type. Water quality analysis of wells conducted by the Nevada State Health Laboratory shows that one well exceeded state drinking water standards.

Figure A58-1
Hydrographic Basin A58 – Middle Reese River Valley



Water Use in the Middle Reese River Valley

A summary of water resources is included in Table A58-1. Active water rights in the basin currently exceed the perennial yield by more than 34,000 acre-feet (af). As a result, the basin is not open to additional water appropriations permits. All of the water (surface and groundwater) is currently used for irrigation purposes. The Basin is entirely contained within Lander County. Table A58-2 shows groundwater rights by manner of use.

Table A58-1
2010 Water Resource Summary Basin 58

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	14,000 af.	NDWR
Annual Duty:	48,492.03 af.	NDWR-see Table B58-2
Active Water Rights	48,492.03 af.	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-poor quality in some areas	NDCNR Reconnaissance Series 19
Wells exceeding MCLs	1	Flouride, Manganese
Surface Water		
Total in Lander County	3,017.40	NDWR
Irrigation	2,975.60	
Stock	41.80	
Other	0.00	
Water Quality	Varies from location to location some poor quality	NDCNR Reconnaissance Series 19
Surface Water Recharge	11,000 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 25	

Table A58-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 58 (As of August 2010)

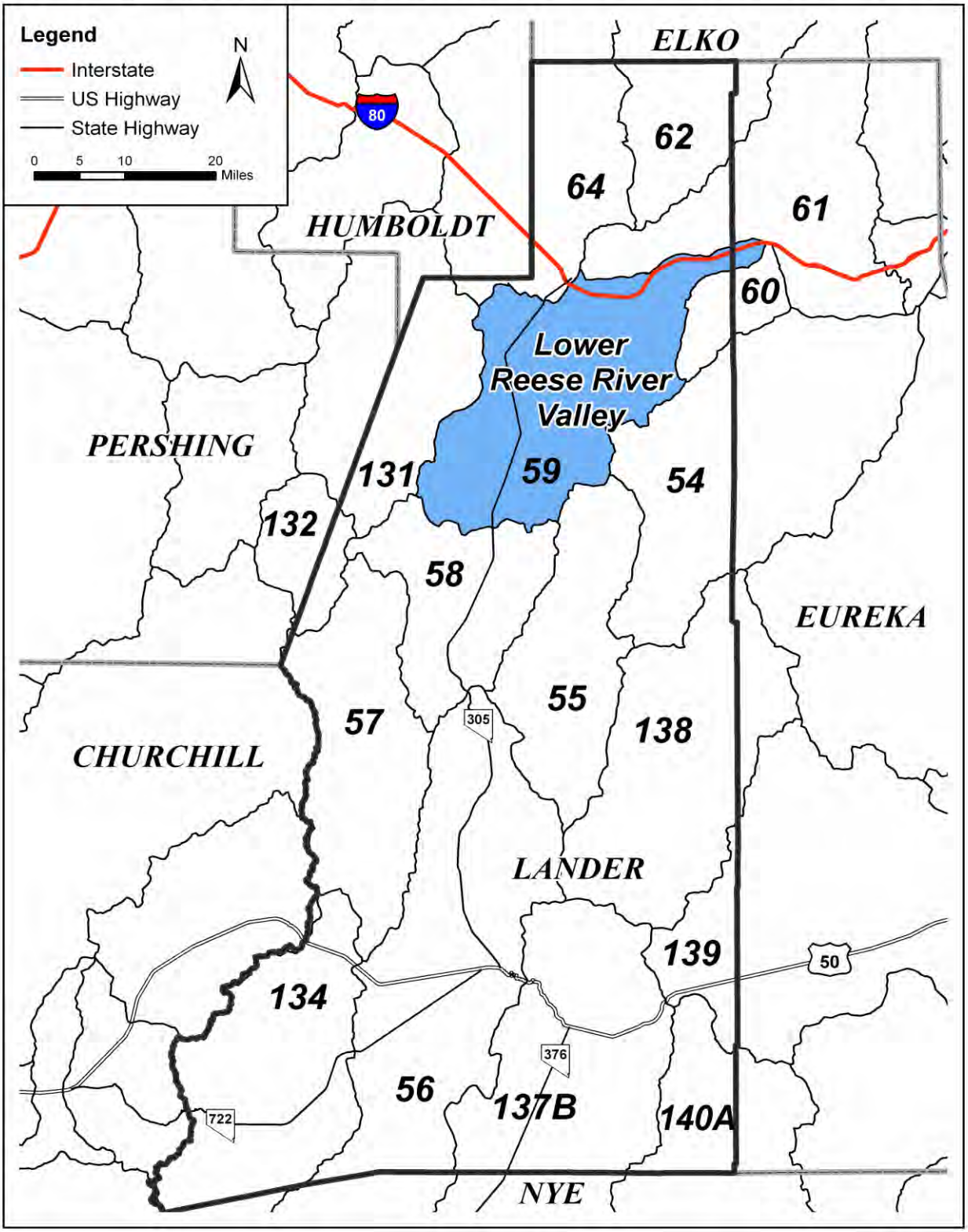
Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	8,181.63	0.00	8,181.63
Irrigation	40,234.73	0.00	40,234.73
Mining	0.00	0.00	0.00
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	75.67	0.00	75.67
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	48,492.03	0.00	48,492.03

Source: Nevada Division of Water Resources, 2010, CA-Carey Act.

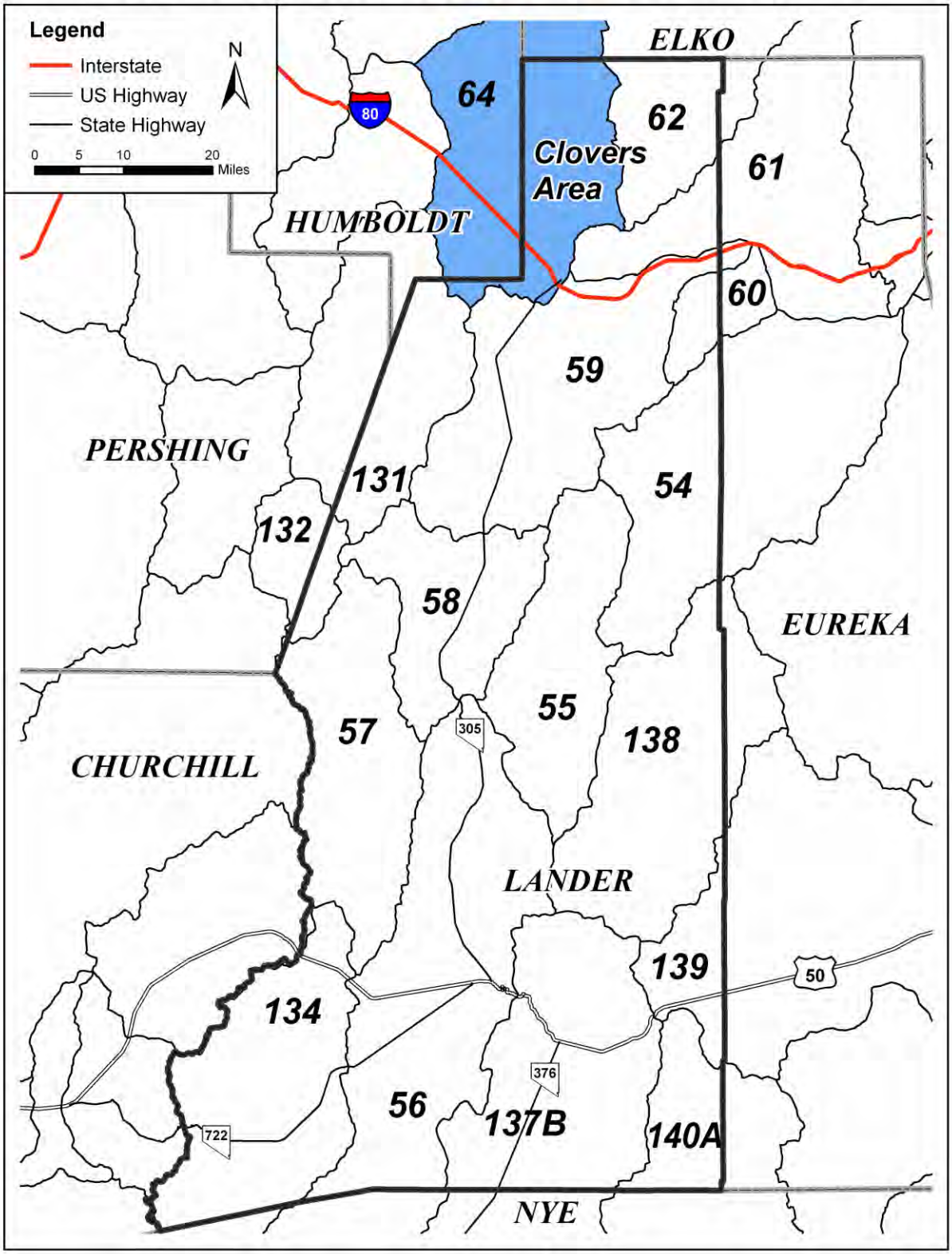
References used for Basin 58:

Nevada Department of Conservation and Natural Resources, *Water Resource Reconnaissance Series Report 19,* Carson City, Nv., March 1963.

Appendix A
Hydrographic Basin 59: Lower Reese River Valley



Appendix A
Hydrographic Basin 64: Clovers Area



Basin 59 -64 Clovers Area- Lower Reese River Valley

Three hydrographic basins, Lower Reese River Valley (59), Clovers Area (64), and Whirlwind Valley (61) bisect the Battle Mountain area. Most of area's population is centered in basins 59 and 64. The Town of Battle Mountain is primarily located in the very southeastern portion of Basin 64. A fairly large number of area residents, primarily those on domestic wells live southeast of Battle Mountain in Basin 59. Therefore, the information in this summary focuses primarily on the two basins where most of the area's current and future population is expected to live. Additionally, new municipal groundwater wells for Lander County Sewer and Water District #1 are being developed in Basin 59.

Major surface water features in the two basin include the Humboldt and Reese Rivers as well as several small drainages in the Shoshone Ranges which include Red Rock Canyon, Horse Canyon, Crippen Canyon, and Sheep Creek. Trout Creek, Mill Creek, Cottonwood Creek and Mill Creek are in the Lower Reese River Valley. They are perennial in the upper reaches. Mean stream flow for selected sites is shown in Table A59-1. There are several small creeks draining Battle Mountain such as Philadelphia and Galena Canyons. Most of these streams are ephemeral in the lower reaches and valley floors (Figure A59-1 and A64-1).

Table A59-1 Mean Annual Streamflow of Selected Streams in Battle Mountain Area

Measurement Site	Drainage Area Sq mi	Mean Discharge
Humboldt River	See USGS Website	270 cfs
Reese River *	See USGS Website	5,000 afa.

Source: U.S.G.S Professional Paper 1409-E, 1989. Humboldt River Chronology, 2000
Flow is largely dissipated on the flood plain before reaching the Humboldt River.

Water Quality

Data on water quality in the Basins away from the Humboldt River is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is moderate. High concentrations of dissolved solids may be high in and adjacent to areas of discharge by evapotranspiration. This may be modified if local recharge may be significant, such as in the flood plain of the Humboldt River. Recent analysis conducted by the Nevada State Health Laboratory shows that several wells southeast of Battle Mountain exceed primary and secondary maximum contaminant levels for Iron, total dissolved solids (TDS), Arsenic, Chloride, Magnesium, and Sulfate.

Under the arsenic standard, it is possible that water quality may exceed the 5 parts per billion proposed standard.

Figure A59-1
Hydrographic Basin 59 – Lower Reese River Valley

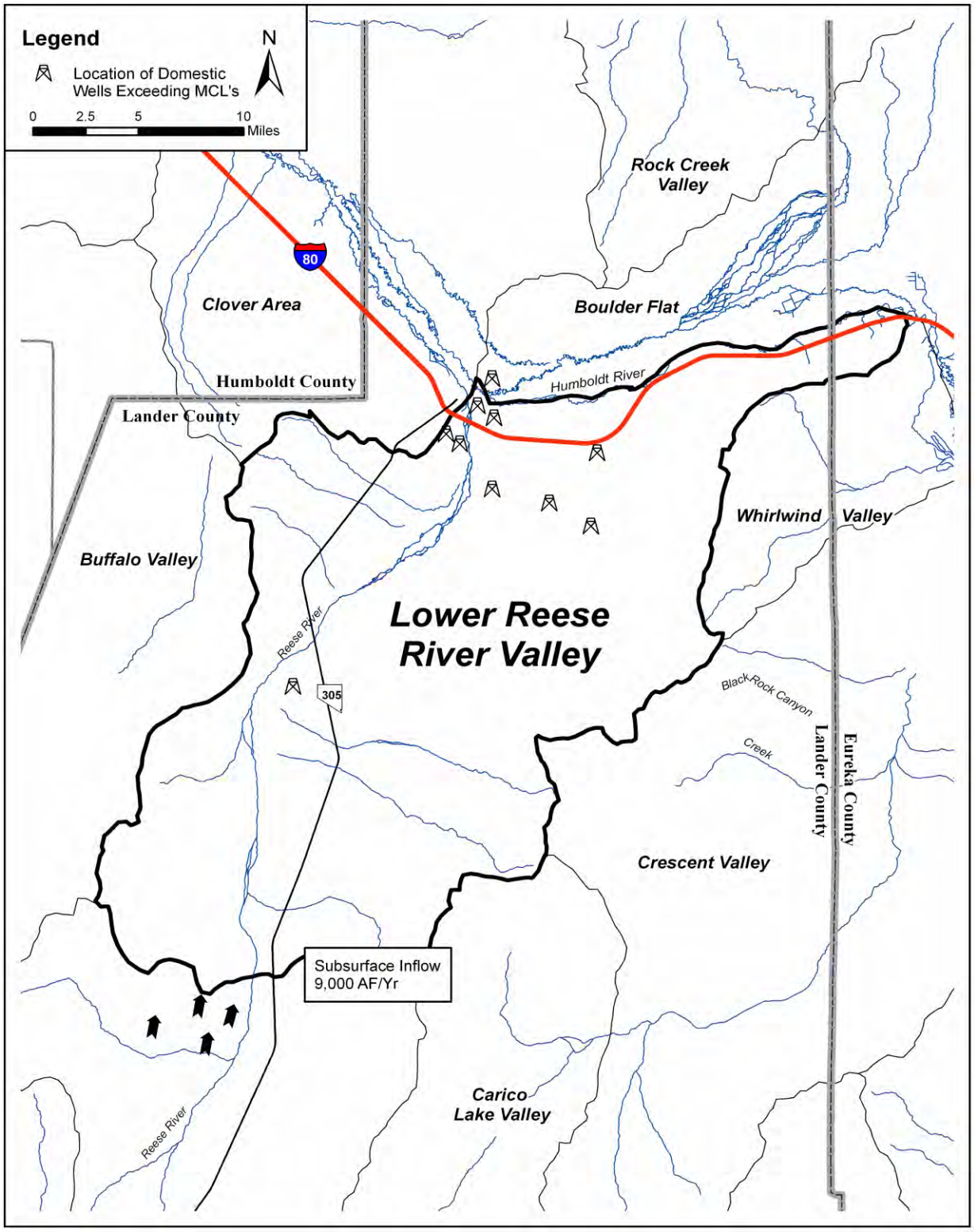
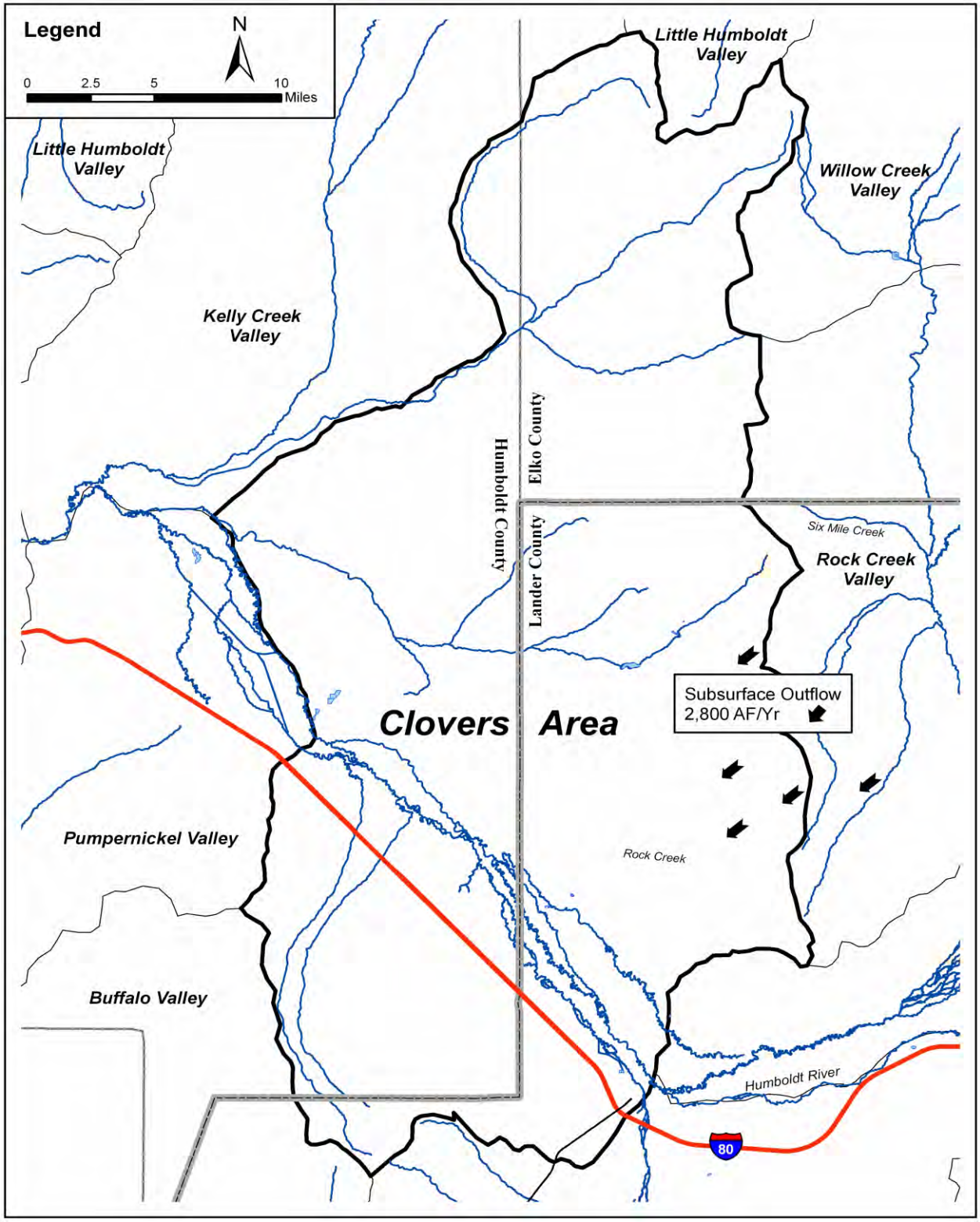


Figure A64-1
Hydrographic Basin 64 - Clovers Area



Water Use in Basins 59 and 64

A summary of water resources is included in Tables A59-2 and A64-1. The perennial yield of 40,000 acre-feet (af) in the Clovers Area includes that for Kelley Creek and Pumpernickel Valley Basins. Active groundwater rights in the Clovers Area is approximately 42,168 af. The Basin is closed to further appropriations with preferred uses of domestic, quasi-municipal, and municipal uses. Lower Reese River Valley is also designated with preferred uses for quasi-municipal, domestic, and municipal water. The perennial yield for Lower Reese River Valley is set at 20,000 af. Current ground water rights in the Lower Reese River Valley are approximately 37,768 af, a large portion of which (approximately 18,800 af./yr.) is mining water use.

Table A64-1
2010 Water Resource Summary Basin 64

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	40,000	NDWR
Annual Duty:	42,168.48 af.	NDWR-see Table B64-3
Active Water Rights	42,168.48 af.	NDWR
Pending	0 afa.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 28
Wells exceeding MCLs	0-none reported	
Surface Water		
Total in Lander County	12,613.73 af.	NDWR
Mining	2.73	
Irrigation	12,611	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 31
Surface Water Recharge	af.	
Public Water Systems	None	
Source	Groundwater	Rights also in Basin 59
Customers		
Per Capita Use 2000	232 gallons per day	
2010 population	4,000	
2030 Population	11,392-H, 8,419-M, 6,267-L	
2030 Projected Demand in afa.	3,126-H, 2,310-M, 1,720-L	
Domestic Wells		
Total Lander County 2010	Less than 514	

Table A59-2
2010 Water Resource Summary Basin 59

Groundwater		**Notes**
Designated Basin	Yes-Preferred Uses	
Perennial Yield	17,000	NDWR
Annual Duty:	25,575.88 afa.	NDWR-see Table B59-3
Active Water Rights	25,575.88 afa.	NDWR
Pending	0 afa.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 28
Wells exceeding MCLs	0-none reported	
Surface Water		
Total in Lander County	9,990.16 afa	NDWR
Irrigation	6,214.27	
Stock	220.65	
Domestic	1.01	
Environmental	2,503.51	
Mining	921.32	
Municipal	72.40	
Other	57.00	
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 31
Surface Water Recharge	afa.	
Public Water Systems	Town of Battle Mountain	Basin 64
Source:	Groundwater	Rights also in Basin 59
Domestic Wells		
Total Lander County 2010	Approximately 514	

Table A64-2 and A59-3 show groundwater rights by manner of use in Clovers and Lower Reese River Valley.

Table A59-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 64 (As of August 2010)

Use	Active	Pending	Total
Commercial	2.16	0.00	2.16
Construction	0.00	0.00	0.00
Domestic	5.73	0.00	5.73
Environmental	0.00	0.00	0.00
Industrial	400.07	0.00	400.07
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	15,521.74	0.00	15,521.74
Mining	18,800.78	0.00	18,800.78
Municipal	2,895.81	0.00	2,895.81
Power Generation	0.00	0.00	0.00
Quasi-Municipal	16.39	0.00	16.39
Recreation	0.00	0.00	0.00
Stock Water	125.58	6.72	132.30
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	37,768.26	6.72	37,774.98

Table A64-3 Groundwater Rights in Acre-Feet
By Manner of Use Basin 59 (As of August 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	40.51	0.00	40.51
Industrial	15,690.00	0.00	15,690.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	3,595.70	0.00	3,595.70
Irrigation	10,192.56	0.00	10,192.56
Mining	8,973.50	0.00	8,973.50
Municipal	2,895.81	0.00	2,895.81
Power Generation	0.00	0.00	0.00
Quasi-Municipal	26.66	0.00	26.66
Recreation	534.00	0.00	534.00
Stock Water	219.74	0.00	219.74
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	42,168.48		42,168.48

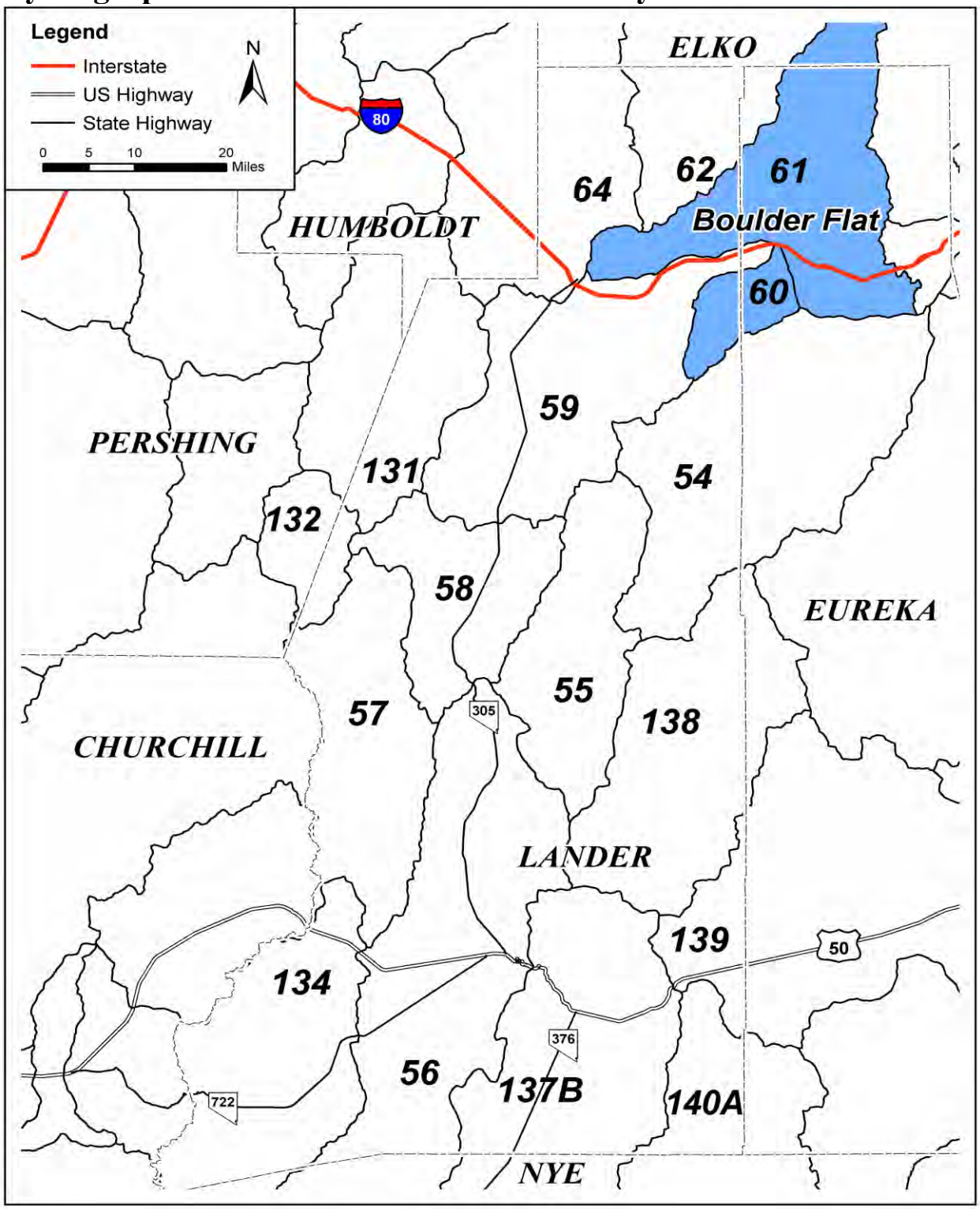
Source: Nevada Division of Water Resources, 2010, CA-Carey Act

References used for Basin 59 and 64:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 32,* Carson City, 1966.

U.S. Geological Survey Water Resources Investigations Report 96-4134, *Water Resources and Effects of Changes in Ground-Water Use Along the Carlin Trend, North-Central Nevada.,* Carson City, 1996.

Appendix A
Hydrographic Basin 60/61: Whirlwind Valley and Boulder Flat



Basin 60 and 61 - Boulder Flat and Whirlwind Valley

Boulder Creek Valley covers an area bounded to the north and west by the Sheep Creek Range and to the east by the Tuscarora Mountains. Groundwater flow in Rock Creek Valley and Boulder Flat flows southwest and west crossing hydrographic area boundaries to the Humboldt River and Clovers Area. There is an estimated 12,000 acre-feet subsurface outflow from Boulder Flat to the Clovers Area. Subsurface ground-water inflow to Boulder Flat from Crescent Valley and Whirlwind Valley has be estimated to be no more than a few hundred acre-feet per year (NDCNR, 1966).

In Whirlwind Valley aquifer recharge occurs from precipitation and limited infiltration and seepage from the ephemeral streams which drain to the Valley from the west. The direction of groundwater flow in the aquifers follows the local topography with a slight gradient to the northeast. The Beowawe geothermal system is in Whirlwind Valley. This system is one of the highest temperature hydrothermal areas in Nevada. The source of recharge to the Beowawe geothermal system is believed to be precipitation at higher elevations in the northern Shoshone Ranges to the north and west. Limited recharge may result from infiltration of ephemeral stream flow (BLM, 1996).

Rock Creek and its tributaries drain much of the area west of the Tuscarora Mountains. The headwaters of Rock Creek are in the unnamed mountain range on the northern side of Willow Creek Valley. Rock Creek is joined by Willow Creek and flows southward in a rugged canyon to Rock Creek Valley. Flows of each stream are influenced by irrigation diversions and releases from Willow Creek Reservoir. Rock Creek is then joined by Antelope Creek, cuts through the Sheep Creek Range by way of another rugged canyon, and enters Boulder Flat. Antelope Creek is an ephemeral stream except for two short reaches where baseflow is sustained by ground-water discharge. Rock Creek at the gaging station where it enters Boulder Flat discharges about 29,000 acre-feet/year. Rock Creek is joined by Boulder Creek in the lowlands between the Sheep Creek Range and the Argenta Rim and then enters the Humboldt River about 2 miles east of Battle Mountain. Rock Creek has no baseflow near the Humboldt River. Flow of the stream probably enters Humboldt River in years of above-normal runoff. Flow in Rock and Boulder Creeks is lost to infiltration through the stream channels and irrigation diversions and probably does not reach the Humboldt River in years of below-normal runoff (USGS, WRIR 96-4134).

Boulder Creek is ephemeral over most of its length. The only exception is a short reach near the headwaters where streamflow is sustained by discharge from springs and seeps. The flow probably never exceeds 1 cfs except during the snowmelt runoff or during intense storms.

In Whirlwind Valley basin most streams are ephemeral. Ground water outflow occurs to Humboldt River Valley and lower Crescent Valley. About 200 acre-feet annually is discharged from Whirlwind Valley. Figures A60-1 and A61-1 show major surface water features in the hydrographic basins.

Water Quality

Water in the Humboldt River between Carlin and Battle Mountain is a mixed-cation bicarbonate type when flows are less than 100 cubic feet a second. However, proportions of sodium increase downstream from Palisade. Water in Rock Creek is a sodium bicarbonate type. The higher portions of sodium in Rock Creek and in the river downstream from Palisades are related to the relative proportions of volcanic rocks in upstream areas. Groundwater in the area is generally a mixed-cation (calcium and sodium) bicarbonate type, with pH near neutral and dissolved –solids concentrations of about 200-600mg/L. Ground water from mineralized areas contains increased proportions of sulfate because the water has been in contact with sulfide minerals.

Ground water samples for the Mule Canyon Mine project show that wells were neutral to slightly alkaline with pH values ranging from 7.0 to 8.8. Groundwater temperatures ranged from 1.6 to 24.8 degrees celesius and total dissolved solids (TDS) concentrations ranged from 166 to 516 mg/l. Sodium or calcium were the dominant cations and bicarbonate or sulfate were the dominant anions. Nutrient levels were more variable with nitrate and nitrite concentrations range from <0.02 to 6.2 mg/l and phosphorus concentrations ranging from <0.005 to 1.9 mg/l (BLM, 1996).

Review of available water quality data shows that the geothermal waters in Whirlwind Valley are characterized by relatively high pH values, high temperatures, elevated concentrations of total dissolved solids (TDS), silica, fluoride, boron, and lithium, and relatively low nutrient levels.

Water Use in Boulder Valley and Whirlwind Valley

A summary of water resources for Boulder Flat and Whirlwind Valley are included in Tables A60-1 and A61-1. The perennial yield for both basins is 30,000 acre-feet per year. The basins are currently closed to additional water appropriations permits. Most groundwater is currently used for mining.

Figure A61-1
Hydrographic Basin 60/61: Whirlwind Valley and Boulder Flat

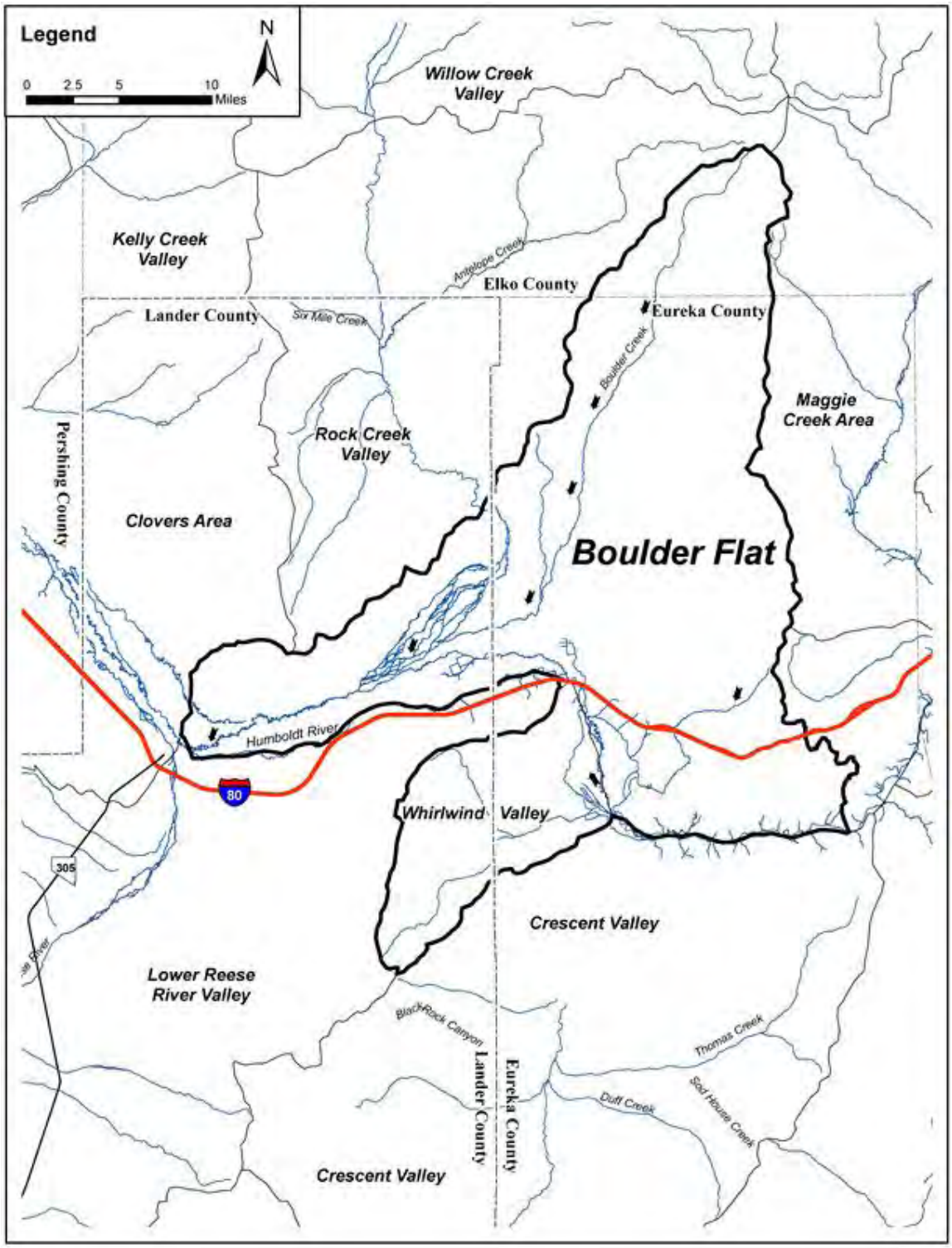


Table A60-1
2010 Water Resource Summary Basin 60

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	3,000 af.	NDWR
Annual Duty:	36,012.32 af.	NDWR-see Table B60-2
Active Water Rights	36,012.32 af.	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-suitable	BLM, 1996, NDCNR Rpt 32
Wells exceeding MCLs	0	None available
Surface Water Rights		
Total in Lander County	11.42	NDWR
Irrigation		
Stock	11.42	
Surface Water Recharge	NA	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A61-1
2010 Water Resource Summary Basin 61

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	30,000 af.	NDWR
Annual Duty:	136,278.55 af.	NDWR-see Table 61-2
Active Water Rights	110,160.77 af.	NDWR
Pending	26,117.78 af.	NDWR
Groundwater Quality	Varies-suitable	BLM, 1996
Wells exceeding MCLs	0	None available
Surface Water Rights		
Total in Lander County	2,456.45	NDWR
Irrigation	2,456.45	
Stock	0.0	
Surface Water Recharge	NA	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A60-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 60 (As of May 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	5,792.00	0.00	5,792.00
Irrigation ©	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	2,216.55	0.00	2,216.55
Mining	2,172.00	0.00	2,172.00
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	15.90	0.00	15.90
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	10,196.45	0.00	10,196.45

Table A61-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 61 (As of May 2010)

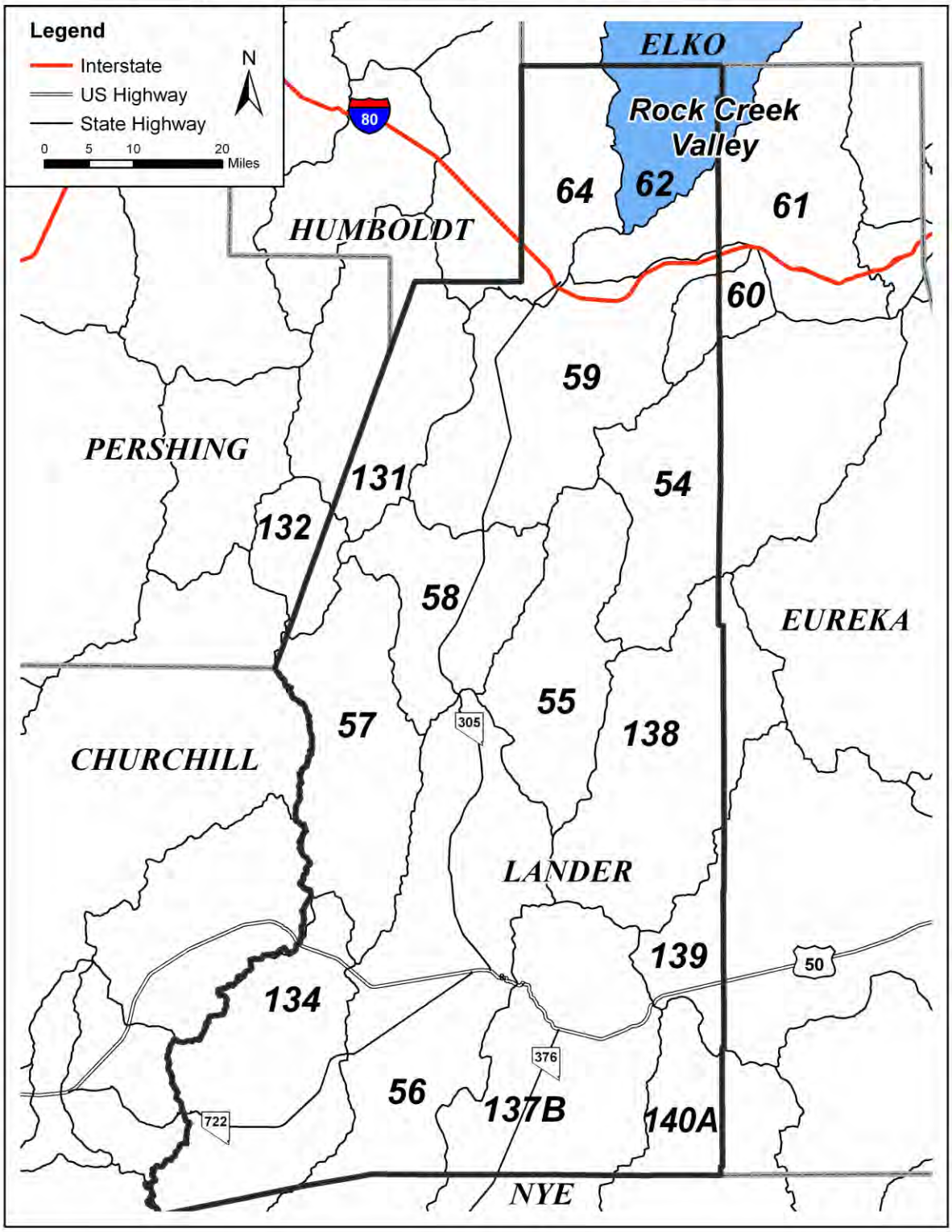
Use	Active	Pending	Total
Commercial	34.37	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	543.00	0.00	0.00
Industrial	9,372.88	0.00	395.46
Irrigation ©	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	39,333.29	26,114.16	109,746.19
Mining	22,772.20	0.00	25,536.99
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	9.30	0.00	9.30
Recreation	0.00	0.00	0.00
Stock Water	592.13	0.00	590.61
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	72,657.17	26,114.16	98,771.33

References used for Basin 60 and 61:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 32,* Carson City, 1966.

U.S. Geological Survey Water Resources Investigations Report 96-4134, *Water Resources and Effects of Changes in Ground-Water Use Along the Carlin Trend, North-Central Nevada.,* Carson City, 1996.

Appendix A
Hydrographic Basin 62: Rock Creek Valley



Basin 62 - Rock Creek Valley

Rock Creek Valley covers an area of about 450 square miles and is bounded to the north and west by unnamed mountain ranges and to the south and east by the Sheep Creek Range and Tuscarora Mountains. Groundwater flow in Rock Creek Valley and Boulder Flat flows southwest and west crossing hydrographic area boundaries, to the Humboldt River and Clovers Area. There is an estimated 2,800 acre-feet (af) of subsurface outflow from Rock Creek Valley to the Clovers Area.

Rock Creek and its tributaries drain much of the area west of the Tuscarora Mountains. The headwaters of Rock Creek are in the unnamed mountain range on the northern side of Willow Creek Valley (Figure A62-1). Rock Creek is joined by Willow Creek and flows southward in a rugged canyon to Rock Creek Valley. Flows of each stream are influenced by irrigation diversions and releases from Willow Creek Reservoir. Rock Creek is then joined by Antelope Creek, cuts through the Sheep Creek Range by way of another rugged canyon, and enters Boulder Flat. Antelope Creek is an ephemeral stream except for two short reaches where baseflow is sustained by ground-water discharge. Rock Creek at the gaging station where it enters Boulder Flat is about 29,000 acre-feet/year. Flow of the stream probably enters Humboldt River in years of above-normal runoff. Rock Creek is joined by Boulder Creek in the lowlands between the Sheep Creek Range and the Argenta Rim and then enters the Humboldt River about 2 miles east of Battle Mountain. Rock Creek has no baseflow near the Humboldt River. Flow in Rock and Boulder Creeks is lost to infiltration through the stream channels and irrigation diversions and probably does not reach the Humboldt River in years of below-normal runoff (NDCNR, 1966).

Water Quality

Water in the Humboldt River between Carlin and Battle Mountain is a mixed-cation bicarbonate type when flows are less than 100 cubic feet a second. However, proportions of sodium increase downstream from Palisade. Water in Rock Creek is a sodium bicarbonate type. The higher portions of sodium in Rock Creek and in the river downstream from Palisades are related to the relative proportions of volcanic rocks in upstream areas. Groundwater in the area is generally a mixed-cation (calcium and sodium) bicarbonate type, with pH near neutral and dissolved –solids concentrations of about 200-600mg/L. Ground water from mineralized areas contains increased proportions of sulfate because the water has been in contact with sulfide minerals (USGS WRIR 96-4134).

Water Use in Rock Creek Valley

A summary of water resources for Rock Creek Valley is included in Table A62-1. The perennial yield in the basin is only 3,000 acre-feet per year. The basin is currently open to additional water appropriations permits. Most groundwater is currently used for mining.

Figure A62-1
Hydrographic Basin 62 – Rock Creek Valley

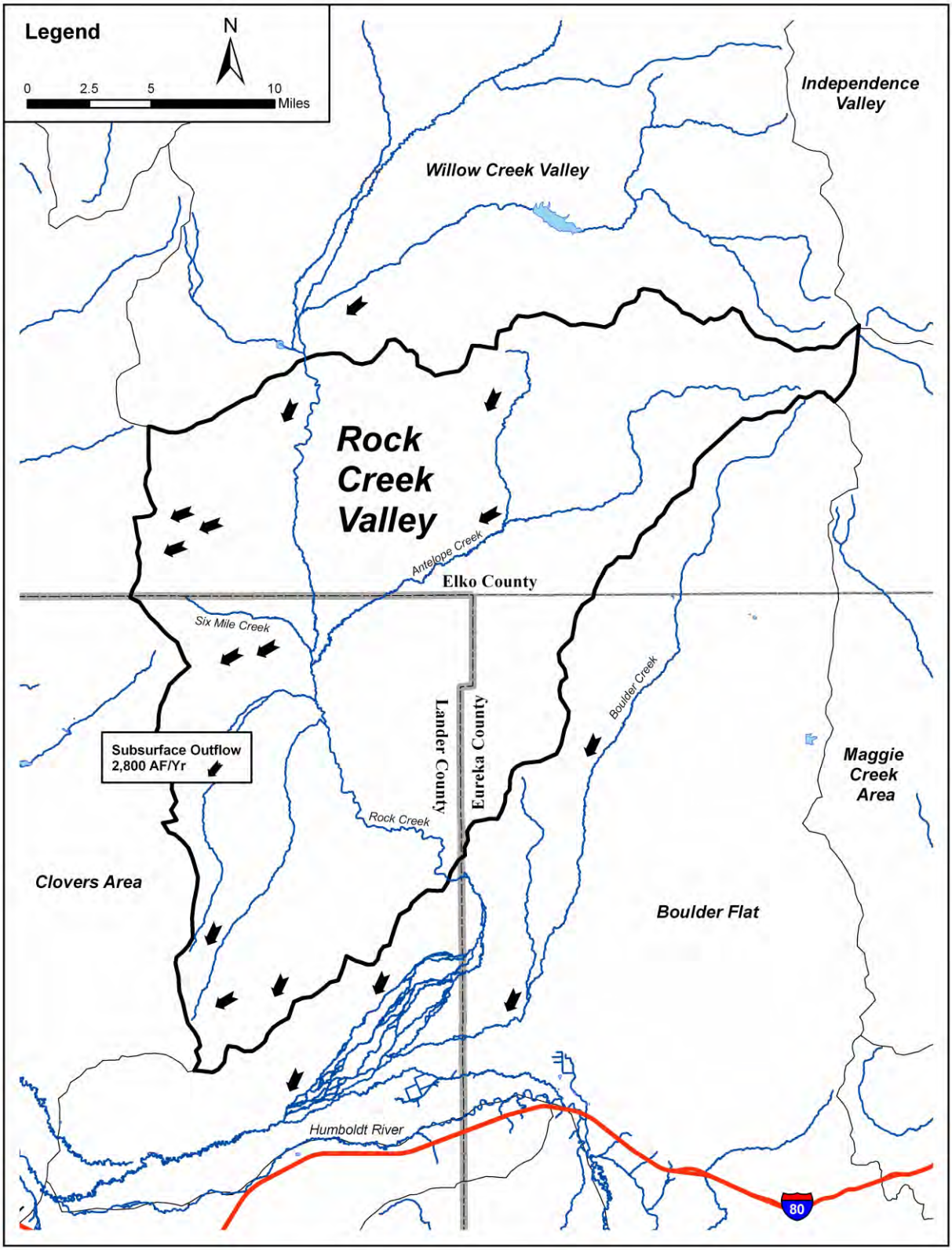


Table A62-1
2010 Water Resource Summary Basin 62

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	2,800.00 af.	NDWR
Annual Duty:	2,260.43 af.	NDWR-see Table B62-2
Active Water Rights	2,260.43 af	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-suitable	USGS Report 96-4134
Wells exceeding MCLs	0	None available
Surface Water Rights		
Total in Lander County	72.12	NDWR
Irrigation	0	
Stock	72.12	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 23
Surface Water Recharge	13,000 af.	USGS Report 96-4134
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A62-2 shows groundwater rights by manner of use in Rock Creek Valley.

Table A62-2 Groundwater Rights
By Manner of Use Basin 62 (As of August 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation ©	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	0.00	0.00	0.00
Mining	2,237.14	0.00	2,237.14
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	23.29	0.00	23.29
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	2,260.43	0.00	2,260.43

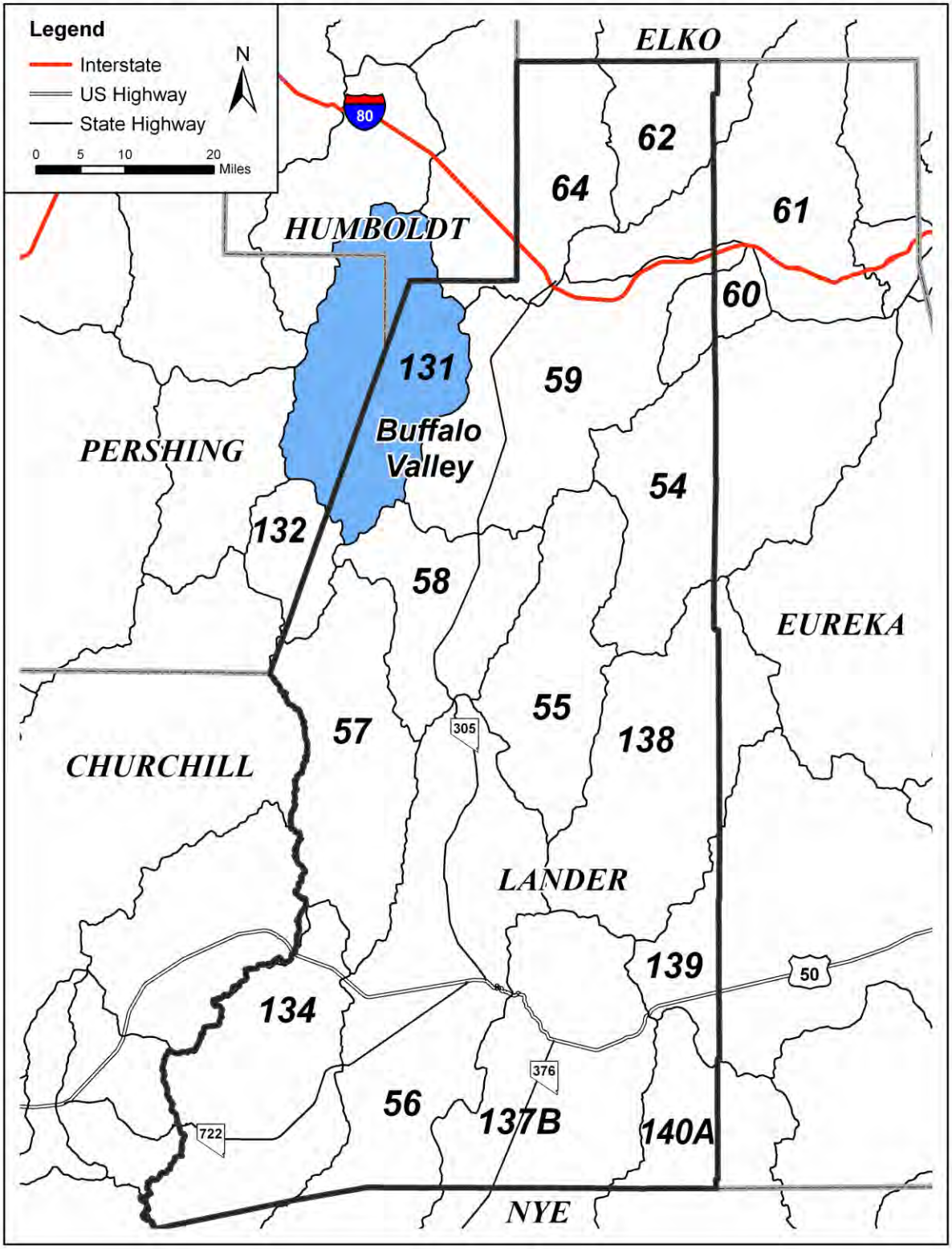
Source: Nevada Division of Water Resources, 2010

References used for Basin 60 and 61:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 32,* Carson City, 1966.

U.S. Geological Survey Water Resources Investigations Report 96-4134, *Water Resources and Effects of Changes in Ground-Water Use Along the Carlin Trend, North-Central Nevada.,* Carson City, 1996.

Appendix A
Hydrographic Basin 131: Buffalo Valley



Basin 131 - Buffalo Valley

Buffalo Valley is located in northwestern Lander County. Although it is adjacent to the Humboldt River, it is not part of that hydrologic system (See Figure A131-1). Buffalo Valley is a closed basin, and consequently does not contribute surface flow to the Humboldt River. Drainages within Buffalo Valley all feed into the playa in the southern part of the valley, where any remaining water eventually infiltrates the ground water flow system or is consumed by evapotranspiration.

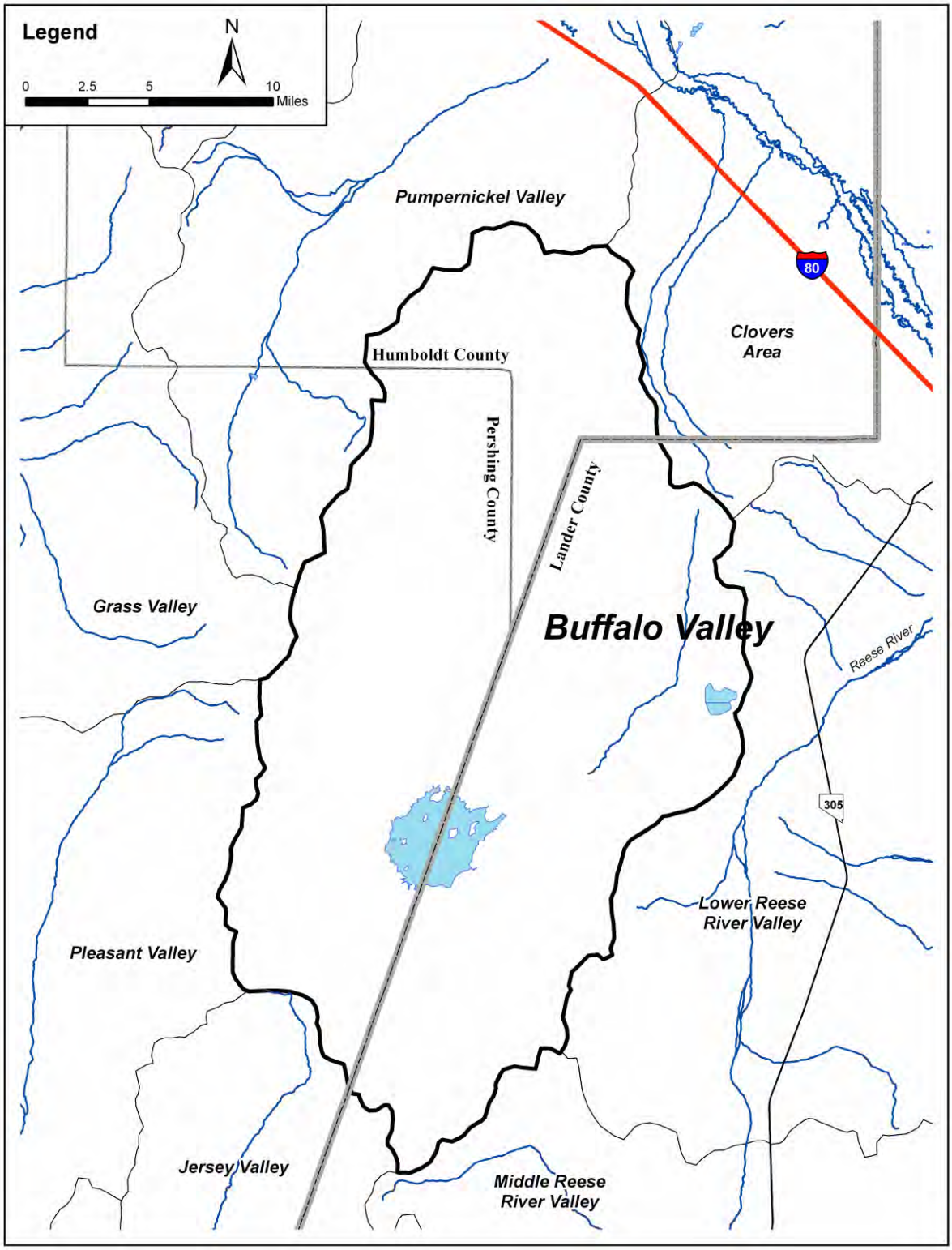
Streams within the Lander County portion of the basin include Willow Creek, Rocky Canyon, Timber, Canyon, Mill Canyon, and Upper Trenton Canyon, these are all predominately ephemeral drainages where surface flows occur as a result of runoff from snowmelt and the occasional thunderstorm. However, portions of two drainages are perennial: Willow Creek and Trenton Canyon. Base surface water flows are generally about 1 cubic feet per second (cfs) or less. Two small earthen dams with reservoirs are located along Willow Creek and provide water from appropriation and recreation.

Water Quality

The surface water quality show a wide range of composition. Samples taken from the northern part of the basin including several streams in the area generally had near-neutral to alkaline pH values (7.0 to 8.0) and total dissolved solids concentrations below the State of Nevada secondary drinking water standards. Metal concentrations in these surface water generally are low although sporadic exceedences of drinking water standards for arsenic, copper, fluoride, iron, manganese, or nickel were observed (BLM, 2001).

The chemical composition of ground water shows less variability than observed for the surface waters. The bulk of the pH determinations are between 5 and 8.5. Ground water concentrations of total dissolved solids exceeded the secondary drinking water standards of 500 milligrams per liter in samples collected throughout Buffalo Valley. The major components that make up total dissolved solids show a general shift from predominately bicarbonate in ground water with low total dissolved solids to mostly sulfate with high dissolved solids. This shift is similar to surface water. The primary exception to this trend is groundwater near the Battle Mountain Gold's Tailings Facility where chloride is a major component of total dissolved solids. The elevated concentrations of chloride, sodium, and sulfate in this area are a result of a solute plume originating from the Gold Tailings Facility. This plume is a result of an unlined disposal area that was used for copper and gold tailings intermittently from 1966 to 1993. The chloride plume is currently being managed under the State of Nevada Water Pollution Control Permit (BLM, 2001).

Figure A131-1
Hydrographic Basin 131 – Buffalo Valley



Water Use in Buffalo Valley

A summary of water resources is included in Table A131-1. Water rights in the basin currently exceed the perennial yield by nearly 12,000 acre-feet (af). As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for mining and milling. The Basin is contained within Lander County, Humboldt and Pershing Counties. Surface water rights in Lander County are limited to about 4,563.22 acre-feet of water, annually

Table A131-1
2010 Water Use Summary Basin 131

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	8,000 af.	NDWR
Annual Duty:	21,841.66 af.	NDWR-see Table B131-2
Active Water Rights	20,871.54 af.	NDWR
Pending	970.12 af.	NDWR
Groundwater Quality	Generally Good	BLM 2001
Wells exceeding MCLs	None Available	
Surface Water		
Total in Lander County	2,039.87	NDWR
Irrigation	143.53	
Mining	1,851.99	
Stock	44.35	
Other	0	
Water Quality	Generally Good-sporadic exceedence for arsenic, cadmium, copper, iron, manganese, and nickel	BLM 2001
Surface Water Recharge	2,400 af.	BLM, 2001
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A131-2 shows groundwater rights by manner of use. Mining water use accounts for the majority of water right use in the basin, particularly the Battle Mountain Gold Complex.

Table A131-2 Groundwater Rights in Acre-Feet
By Manner of Use (As of May 2010)

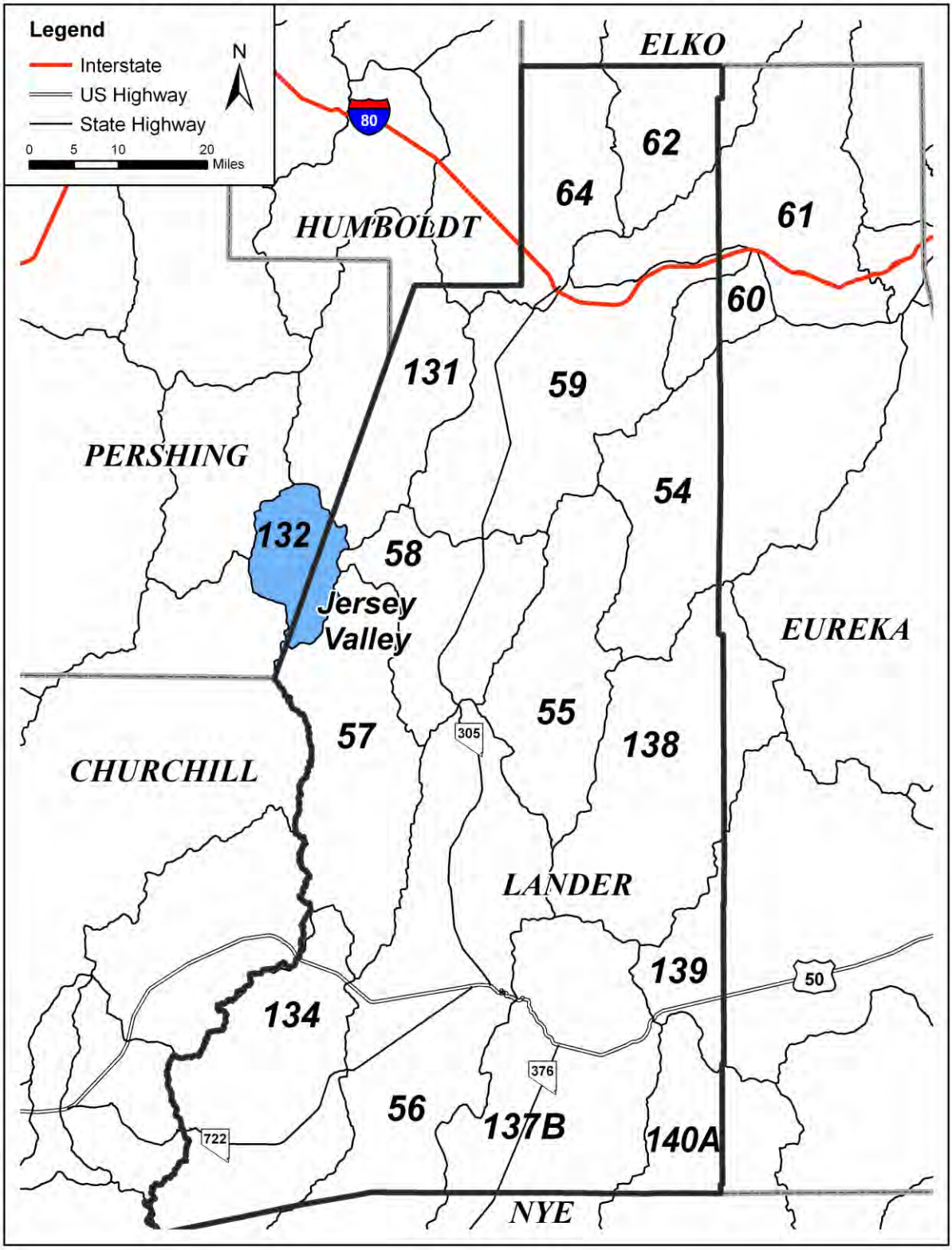
Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	3.62	0.00	3.62
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	4,947.88	0.00	4,947.88
Irrigation	2,560.00	0.00	2,560.00
Mining	13,197.14	970.12	14,167.26
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	162.90	0.00	162.90
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	20,871.54	970.12	21,841.66

Source: Nevada Division of Water Resources, 2010, CA-Carey Act

References for Basin 131:

Bureau of Land Management, *Phoenix Project Draft Environmental Impact Statement,* Battle Mountain Field Office, March, 2001.

Appendix A
Hydrographic Basin 132: Jersey Valley



Basin 132 - Jersey Valley

Jersey Valley is hydrologically connected to Dixie Valley. The Valley covers an area of about 165 square miles. Most of the Valley is located in Churchill County. Underflow of groundwater occurs from Jersey to Dixie Valley. Figure A132-1 shows major surface water features in Hydrographic Basin 139. Also shown is the location of wells where water chemistry analysis performed by the Nevada State Health Laboratory. In Jersey Valley, streams are largely ephemeral. Only about 800 acre-feet (af) of recharge occurs in Jersey Valley, it contributes about 5 percent of the average annual ground-water recharge for the Dixie Valley area. An estimated 500 acre-feet is subsurface outflow to Dixie Valley (USGS WRIR 95-4052).

Water Quality

Data on water quality in the Jersey Valley is not available.

Water Use in Jersey Valley

A summary of water resources for Jersey Valley is included in Table A132-1. The perennial yield in the basin is only 250 acre-feet per year. The basin is currently designated and not open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. Table A132-2 shows groundwater rights by manner of use.

Figure A132-1
Hydrographic Basin 132 – Jersey Valley

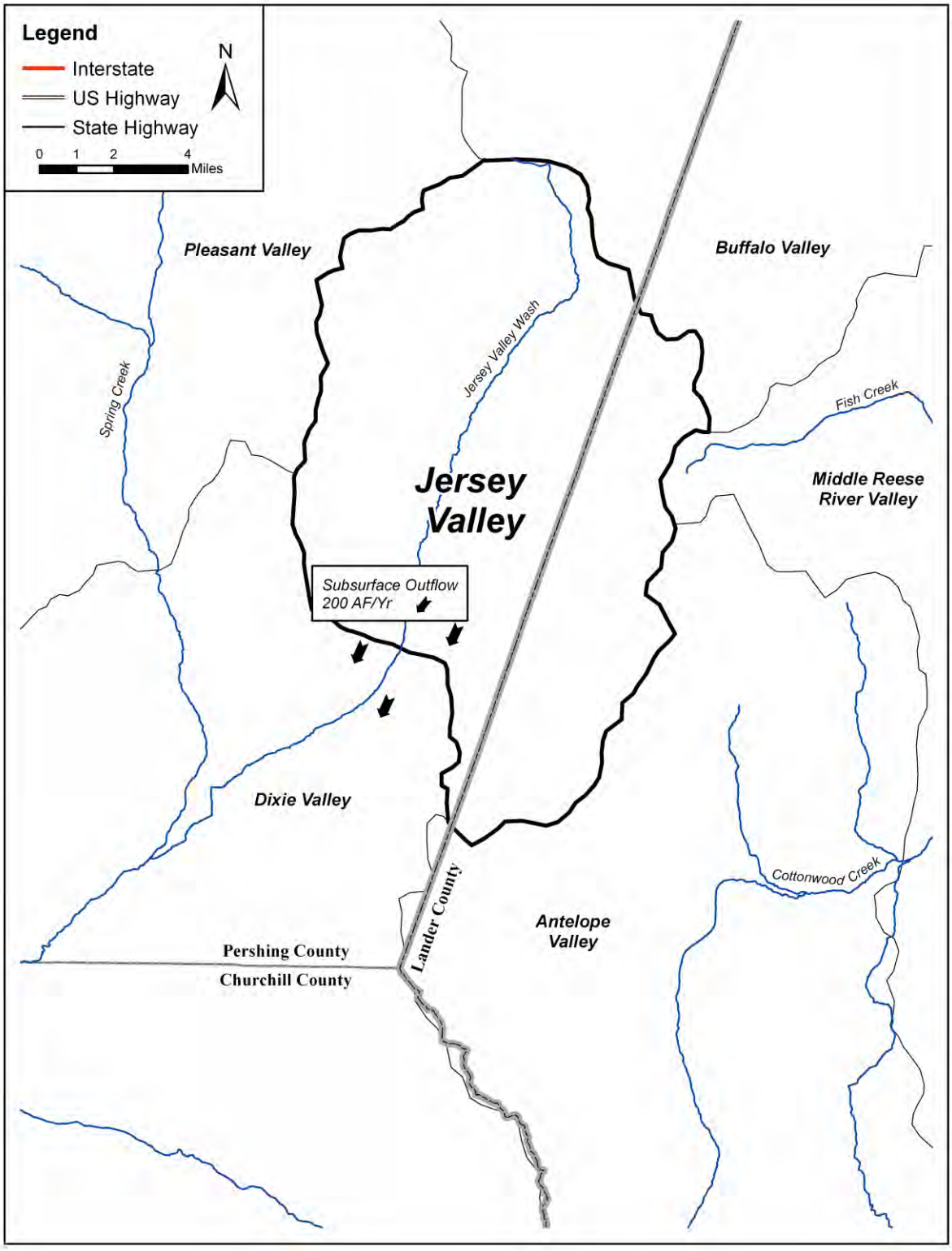


Table A132-1
Water Resource Summary Basin 132, 2010

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	250 af.	NDWR
Annual Duty:	27.25 af.	NDWR-see Table B132-1
Active Water Rights	27.25 af.	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 23
Wells exceeding MCLs	0	None available
Surface Water Rights		
Total in Lander County	33.60	NDWR
Irrigation	0	
Stock	33.60	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 23
Surface Water Recharge	800 af.	
Domestic Wells		
Total Lander County 2010	Less than 5	

Table A132-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 132 (As of May 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	0.00	0.00	0.00
Mining	0.00	0.00	0.00
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	27.25	0.00	27.25
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	27.25	0.00	27.25

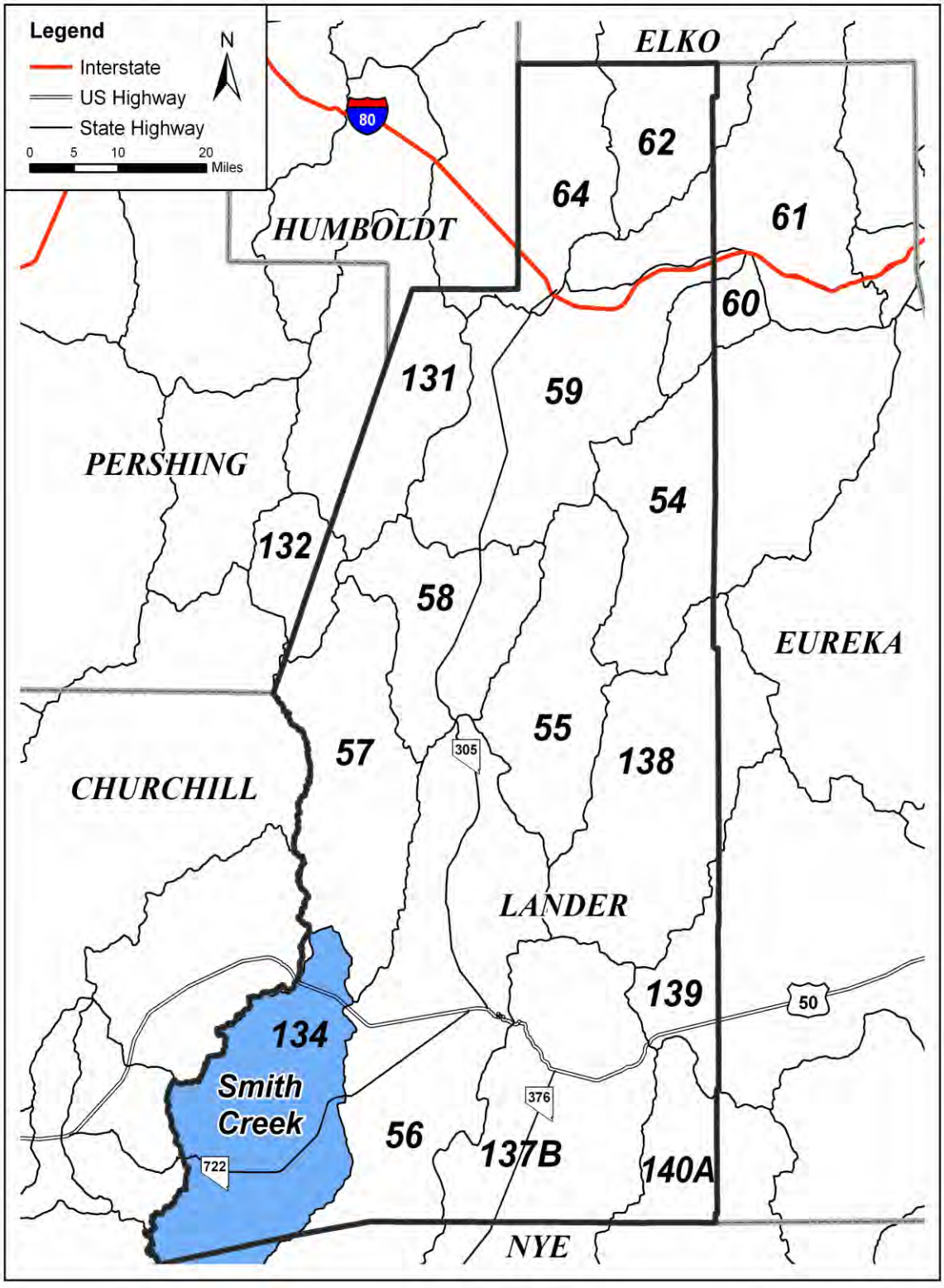
Source: Nevada Division of Water Resources., 2010, CA-Carey Act

References used for Basin 132:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 23,* Carson City, 1964.

U.S. Geological Survey Water Resources Investigations Report 95-4052, *Estimated Natural Ground-Water Recharge, Discharge, and Budget for the Dixie Valley Area, West-Central Nevada.* Carson City, Nv., 1995.

Appendix A
Hydrographic Basin 134: Smith Creek



Basin 134 – Smith Creek Valley

Smith Creek Valley encompasses 583 square miles. It is bounded on the west by the Desatoya Mountains, on the north by the New Pass Range, and on the east by the Shoshone Mountains (NDCNR, 1964). Figure A134-1 shows major surface water features in Hydrographic Basin 134, and the location of wells where water chemistry analysis was performed by the Nevada State Health Laboratory. Mean annual streamflow in acre-feet annually (afa) for selected streams in Lander County and Basin 134 (Table A134-1). Most streams in Smith Creek Valley are ephemeral. However, Smith, Campbell, Peterson, Park, and Schoonorer Creeks are perennial in the mountains.

Table A134-1 Mean Annual Streamflow of Selected Streams in Lander County-134

Measurement Site	Drainage Area Sq mi	Mean Annual Stream Flow in Af Streamflow Measurements	 Run-off Altitude Relationship
Smith Creek	See USGS	2,000 afa	2,060 afa.
Peterson Creek		330	740
Campbell Creek		230	950

Source: U.S.G.S Professional Paper 1409-E, 1989

Water Quality

Data on water quality in the Smith Creek Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type. Past drilling in the playa of Smith Creek shows that the groundwater is highly mineralized. Water quality analysis of 1 well shows water quality meets the current State drinking water standards.

Water Use in Smith Creek Valley

A summary of water resources is included in Table A134-2. The perennial yield in the basin currently exceeds the active water duty by nearly 8,000 acre-feet. About 3,200 acre-feet of groundwater rights is currently ready for action. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. The Basin is contained entirely in Lander County, therefore, all surface water diversion occur in the County. Table A134-3 shows groundwater rights by manner of use.

Figure A134-1
Hydrographic Basin 134 – Smith Creek

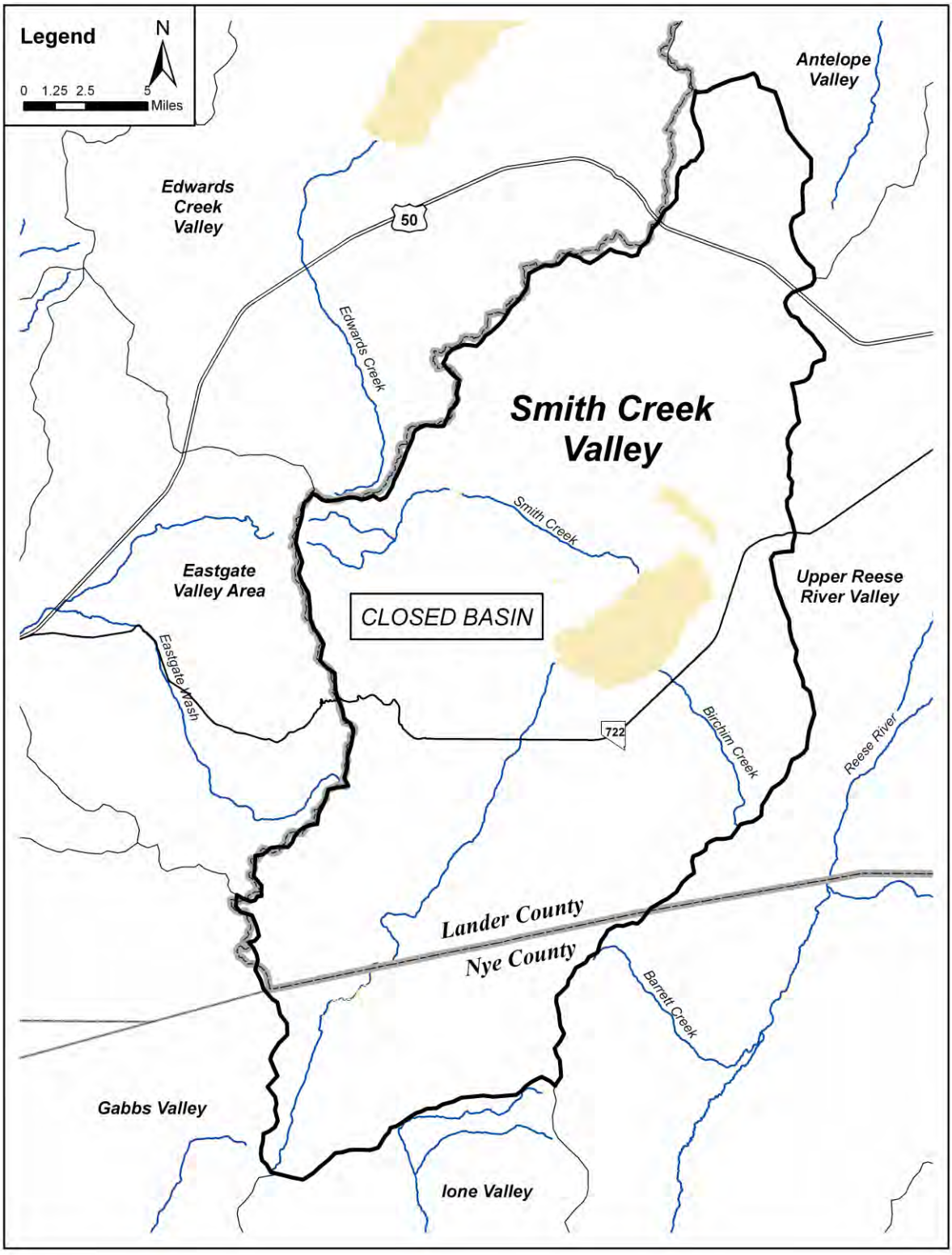


Table A134-2
2010 Water Resource Summary Basin 134

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	10,000 af.	NDWR
Annual Duty:	1,879.73 af.	NDWR-see Table B124-3
Active Water Rights	1,879.73 af.	NDWR
Pending	3,200.00 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 28
Wells exceeding MCLs	0	
Surface Water		
Total in Lander County	5,976.92 af	NDWR
Irrigation	5,756.39	
Stock	39.53	
Mining	181.00	
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 28
Surface Water Recharge	12,000 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A134-3 Groundwater Rights in Acre-Feet
By Manner of Use Basin 134 (As of August 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	713.36	2,560.00	3,273.36
Irrigation	1,114.97	640.00	1,754.97
Mining	6.69	0.00	6.69
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	44.71	0.00	44.71
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	1,879.73	3,200.00	5,079.73

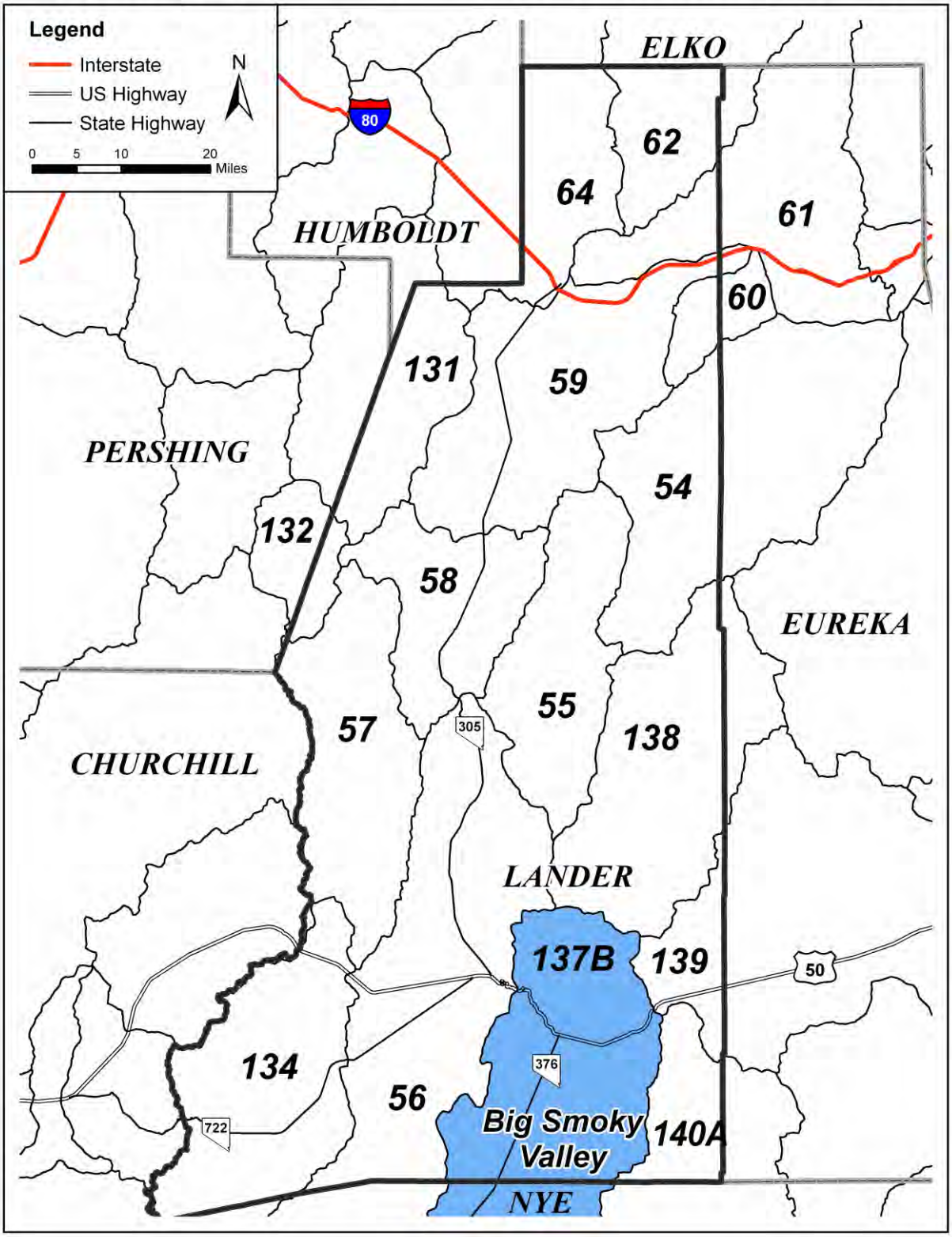
Source: Nevada Division of Water Resources, 2010, CA-Carey Act

References used for Basin 134:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 28,* Carson City, 1964.

U.S. Geological Survey Water Resources Professional Paper 1409-E, *Groundwater Hydrology and Simulated Effects of Development in Smith Creek Valley, A Hydrologically Closed Basin in Lander County, Nevada,* United States Government Printing Office, 1989.

Appendix A
Hydrographic Basin 137B: Big Smoky Valley



Basin 137B – Northern Big Smoky Valley

Northern Big Smoky Valley, in Lander and Nye Counties is a north-northeast trending, elongated basin encompassing about 1,300 square miles. The Valley floor is surrounded by mountains except in the south where it is separated from Tonopah Flat by a low ridge. Subsurface inflow may occur from Monitor Valley but there is insufficient evidence to confirm this connection. No evidence of subsurface outflows to the surrounding valleys has been reported. However, water levels in the Tonopah Flat area to the south are lower than in the basin, and the regional gradient to the bedrock is to the south. Some subsurface outflow may occur to the south into the Tonopah Flat area, approximately 2,000 acre-feet a year. (USGS, WRIR 96-4311). Table A137B-1 shows mean annual streamflow for selected streams in Lander County.

Figure A137B-1 shows major surface water features in Hydrographic Basin 137B, and the location of wells where water chemistry analysis showed that domestic wells did not meet state drinking water standards. A summary of water resources is shown in Table A137B-2.

Table A137B-1
Mean Annual Streamflow of Selected Streams in Lander County-137B

Measurement Site	Drainage Area Sq mi	Mean Annual Stream Flow Cubic Feet Sec.	Acre-Feet
Bowman Creek	7.0	2.5	1,800
Kingston Creek	23.4	9.9	7,200
Blakely Canyon Cr	1.0	.2	140
Globe Creek	2.0	.7	510
Sheep Canyon Cr.	2.8	.6	430
Tar Creek	2.2	.3	220
Birch Creek	17.5	2.2	1,600
Bade Creek	2.6	.4	290
Willow Creek	8.8	5.7	4,100

Source: USGS WRIR 96-4311.

Water Quality

The quality of water in most parts of northern Big Smoky Valley, as determined by previous studies, is suitable for irrigation, mining, stock watering, and domestic uses. Rush and Schroer (1970) reported analyses of water from 9 streams, 14 wells, and 10 springs, and Texler and others (1980) reported analysis of water from 5 streams, 3 wells, and 7 hot springs. Data collected and analyzed by the Nevada State Health Laboratory indicates that 2 wells out of ten wells exceeded the MCL for Iron.

Table A137B-3 shows groundwater rights by manner of use.

Figure A-137B-1
Hydrographic Basin 137B - Big Smoky Valley

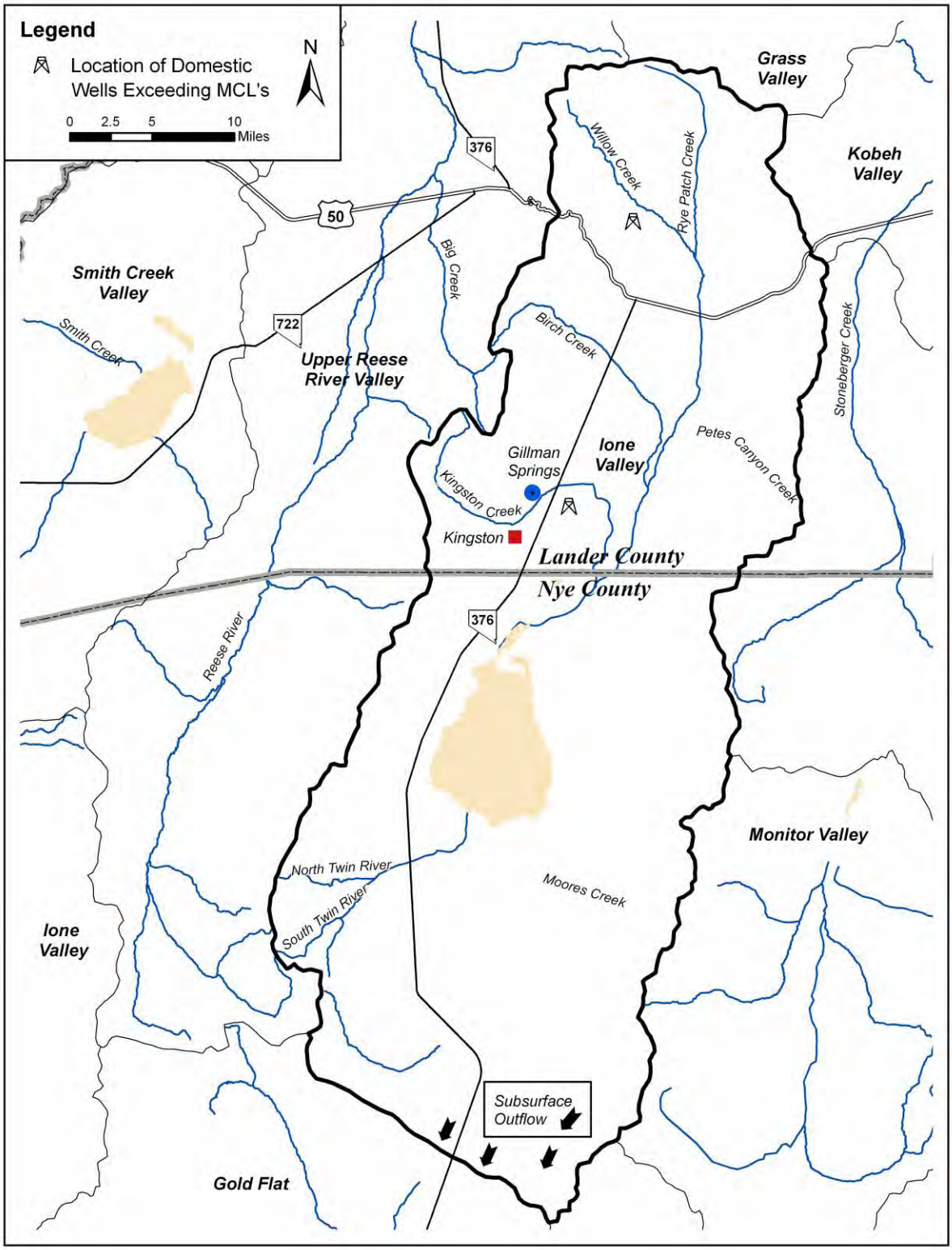


Table A137-2
2010 Water Resource Summary Basin 137B

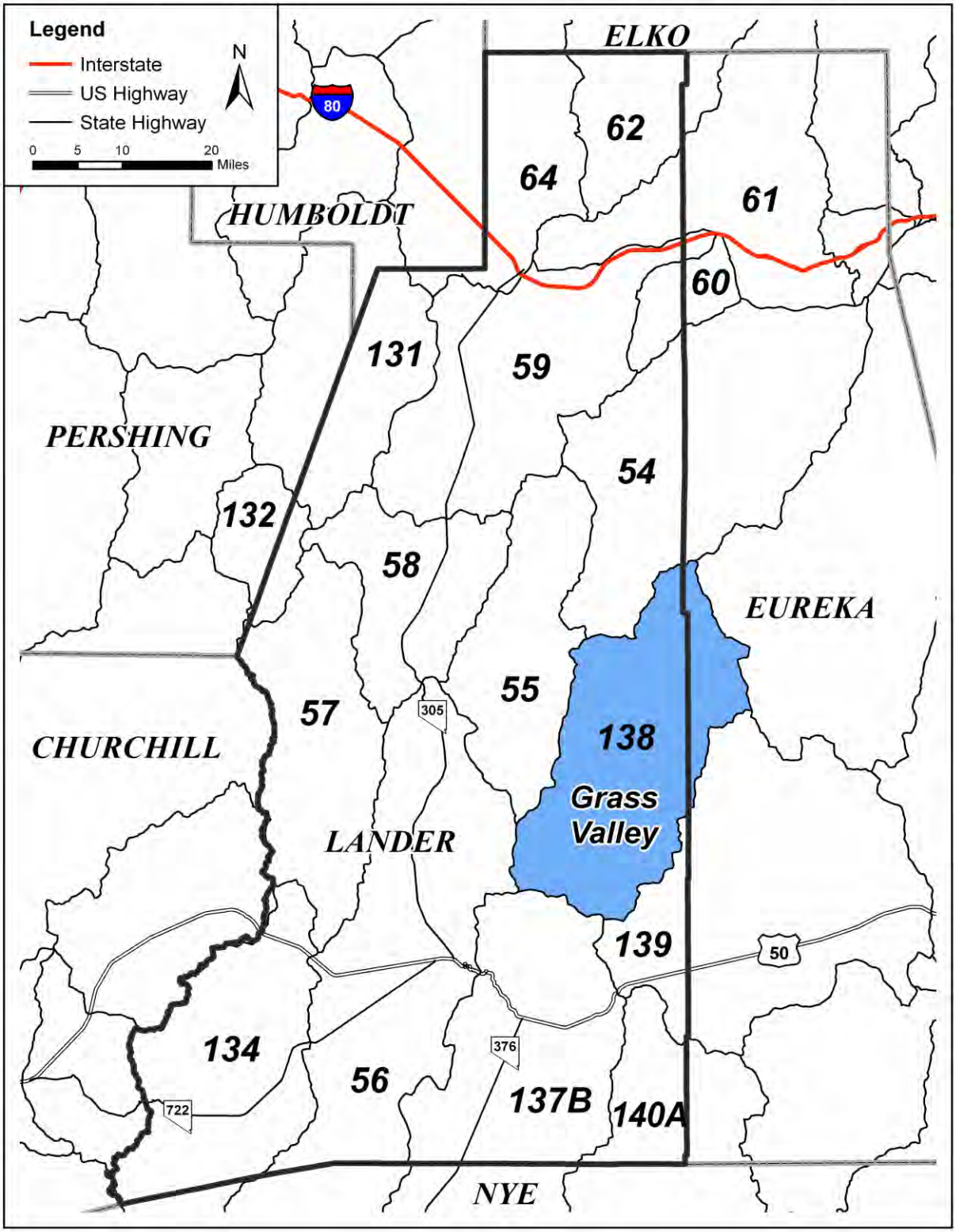
Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	65,000 af.	
Annual Duty:	90,281.00 af.	See Table B137-3
Active Water Rights	54,609.64 af.	
Pending	35,651.64 af.	
Groundwater Quality	Suitable	USGS Report 96-4311
Wells exceeding MCLs	2 of 16	Iron .& Fluoride
Surface Water		
Total Lander County	18,816.65 af.	NDWR
Irrigation	16,859.05	
Stock	463.89	
Other	33.60	
Domestic	24.80	
Storage	312.10	
Quasi-Municipal	1,123.21	
Water Quailty	Suitable	USGS Report 96-4311
Surface Water Recharge	74,000 af.	
Public Water Systems		
Town of Kingston:		
Source	Groundwater	Kingston Town Water Utility
Current Use	36,000,000 gallons/yr	
Customers	144 Active, 214 SOF	
Per Capita Use	200 gallons/day	
2010 Population	331	
Long-Term Growth Needs	15,000	
Gilman Springs		
Source	Groundwater	
Current Use	1800 gallons per day	
Per Capita Use	-	
2010 Population	100	
Domestic Wells		
Total Lander County 2010	Less than 50	

Table A137-3 Groundwater Rights in Acre-Feet
By Manner of Use Basin 137B (As of May 2010)

Use	Active	Pending	Total
Commercial	11.30	0.00	11.30
Construction	0.00	0.00	0.00
Domestic	3.65	0.00	3.65
Environmental	0.00	0.00	0.00
Industrial	0.00	14.30	14.30
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	1,078.37	14,400.00	15,478.37
Irrigation	36,484.62	21,229.57	57,714.19
Mining	14,976.20	0.00	14,976.20
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	1,855.16	0.00	1,855.16
Recreation	0.27	0.00	0.27
Stock Water	153.33	27.77	181.10
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	46.46	0.00	46.46
	54,609.36	35,671.64	90,281.00

Source: Nevada Division of Water Resources, 2010, CA-Carey Act

Appendix A
Hydrographic Basin 138: Grass Valley



Basin 138 - Grass Valley

Grass Valley is a topographically and hydrologically closed valley. The Valley is about 40 miles long, 18 miles wide, and covers an area of about 590 square miles bordered on the east and south by the Simpson Park Mountains, and on the west by the Toiyabe Range. Figure A138-1 shows major surface water features in Hydrographic Basin 138 and the location of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory. In Grass Valley, the largest stream is Skull Creek whose headwaters drain the northeast flank of Mt. Callaghan. Skull Creek and Steiner Creek are the principal tributaries of Callaghan Creek, which flows northward toward the Grass Valley playa (NDCNR, 1966).

Water Quality

Data on water quality in the Grass Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type. Water quality analysis of 1 well conducted by the Nevada State Health Laboratory showed water quality that meets current State standards.

Water Use in Grass Valley

A summary of water resources is included in Table A138-2. The perennial yield in the basin currently exceeds the active water duty by nearly 8,000 acre-feet. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. Most of the Basin is contained in Lander County. Approximately 2,700 acre-feet of surface water is used annually in Lander County portion of the Basin. Table A138-3 shows groundwater rights by manner of use.

Figure A138-1
Hydrographic Basin 138 – Grass Valley

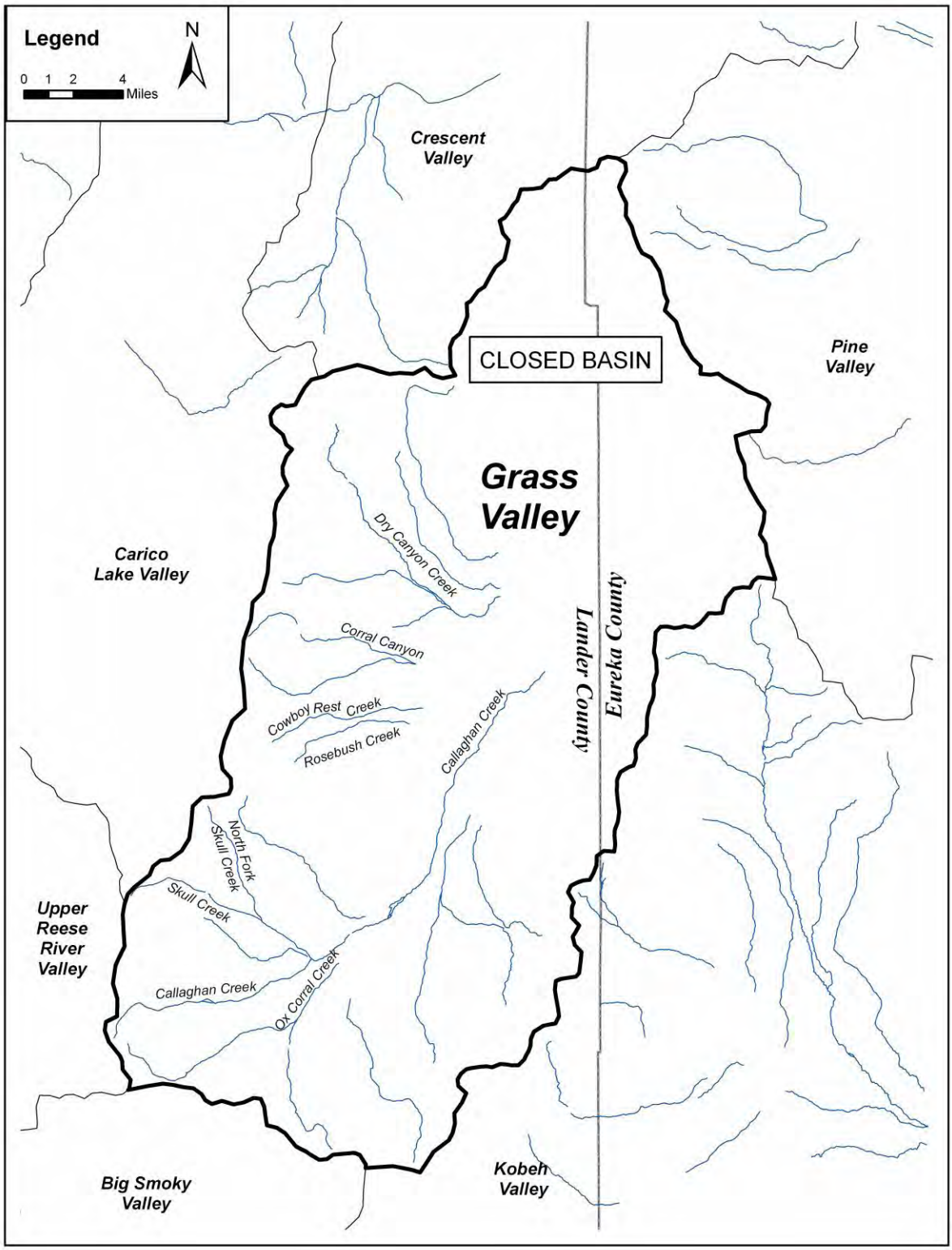


Table A138-2
2010 Water Resource Summary Basin 138

Groundwater		**Notes**
Designated Basin	No	
Perennial Yield	13,000 af.	NDWR
Annual Duty:	4,659.88 af.	NDWR-see Table B138-3
Active Water Rights	4,659.88 af.	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 37
Wells exceeding MCLs	0	
Surface Water		
Total in Lander County	2,726.00	NDWR
Irrigation	2,664.66	
Stock	77.40	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 31
Surface Water Recharge	13,000 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A138-3 Groundwater Rights in Acre-Feet
By Manner of Use Basin 138 (As of August 2010)

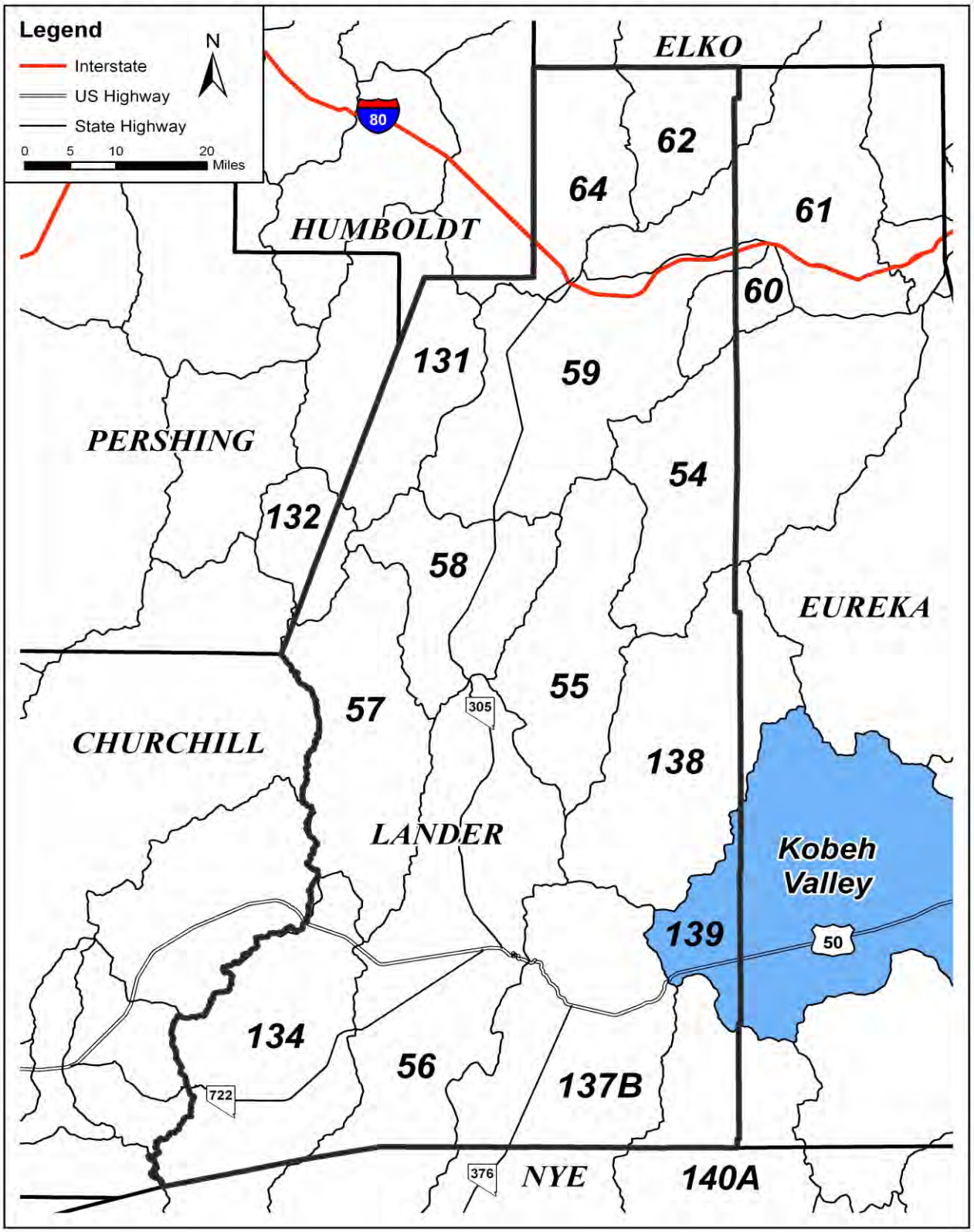
Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	4,464.48	0.00	4,464.48
Mining	94.83	0.00	94.83
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	4.48	0.00	4.48
Recreation	0.00	0.00	0.00
Stock Water	96.09	0.00	96.09
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	4,659.88	0.00	4,659.88

Source: Nevada Division of Water Resources, 2010, CA-Carey Act.

References used for Basin 138:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 37,* Carson City, 1966.

Appendix A
Hydrographic Basin 139: Kobeh Valley



Basin 139 - Kobeh Valley

Monitor and Kobeh Valleys are large open valleys draining to Diamond Valley. The Valley covers an area of about 875 square miles. Most of the Valley is located in Eureka County. Underflow of groundwater occurs from Monitor Valley to Koheh Valley. Figure A139-1 shows major surface water features in Hydrographic Basin 139 and the location of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory. In Kobeh Valley, the largest streams are Ackerman Canyon, Dry Canyon, and Stoneberger Creek. With the exception of periods of large runoff and intense storms, the flow of these creeks is probably absorbed locally on the alluvial apron or on the valley floors (NDCNR, 1964).

The principal springs in Kobeh Valley are those at Bean Flat, the Bartine Ranch, and Hay Ranch. The estimated total spring discharge in Kobeh Valley is on the order of 2,500 acre-feet per year. The discharge occurs primarily in Eureka County.

Water Quality

Data on water quality in the Kobeh Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type

Water Use in Kobeh Valley

A summary of water resources is included in Table A139-1. The perennial yield in the basin currently exceeds the active water duty by nearly 2,600 acre-feet. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. Most of the Basin is contained in Eureka County. Table A139-2 shows groundwater rights by manner of use.

Figure A139-1
Hydrographic Basin 139 – Kobeh Valley

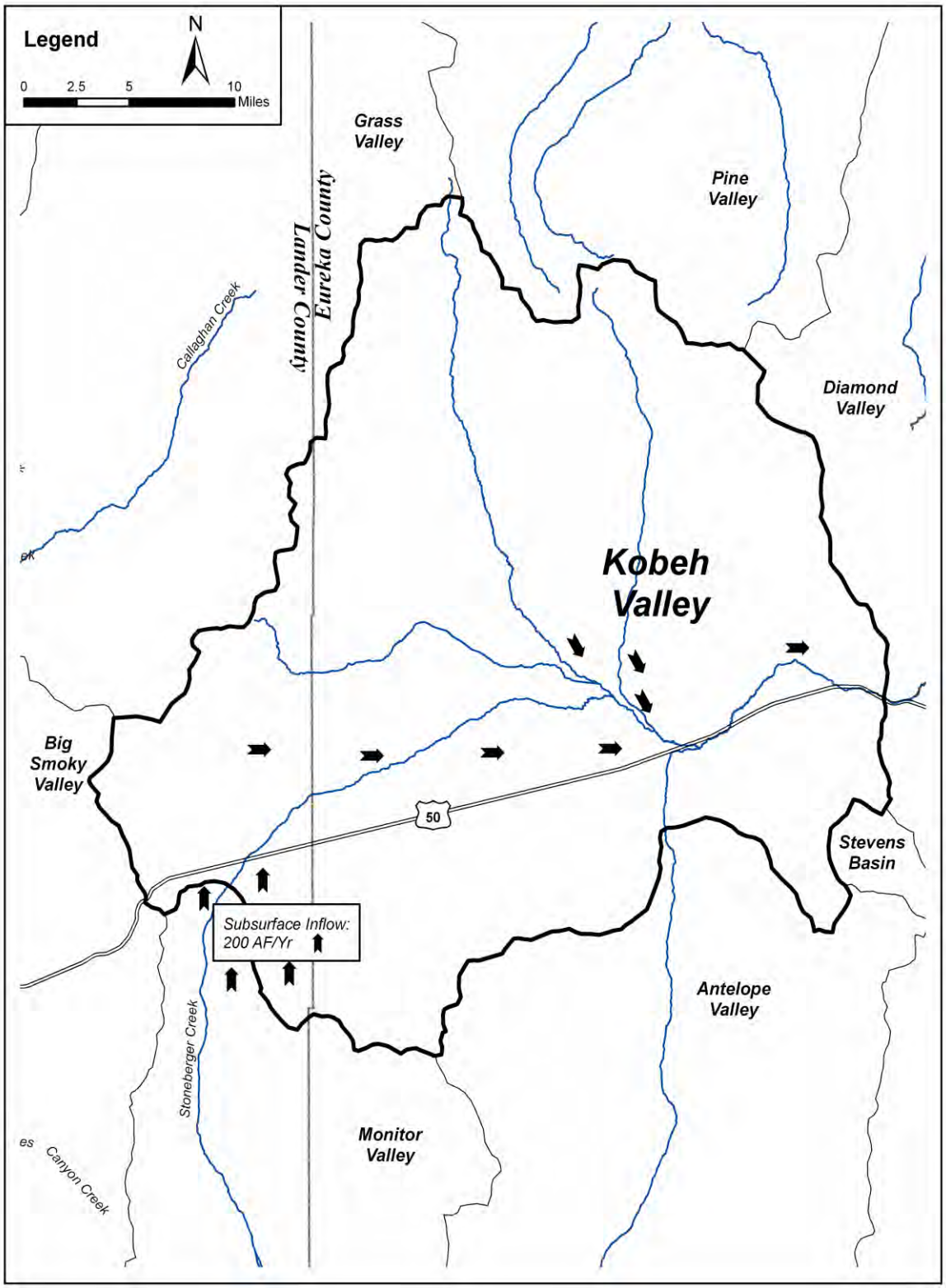


Table A139-1
2010 Water Resource Summary Basin 139

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	16,000 af.	NDWR
Annual Duty:	14,930.08 af.	NDWR-see Table B139-2
Active Water Rights	13,305.04 af.	NDWR
Pending	1,625.04 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 30
Wells exceeding MCLs	0	None available
Surface Water		
Total in Lander County	172.19 af.	NDWR
Irrigation	136.00	
Stock	46.19	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 30
Surface Water Recharge	17,000 fa.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table AB139-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 139 (As of May 2010)

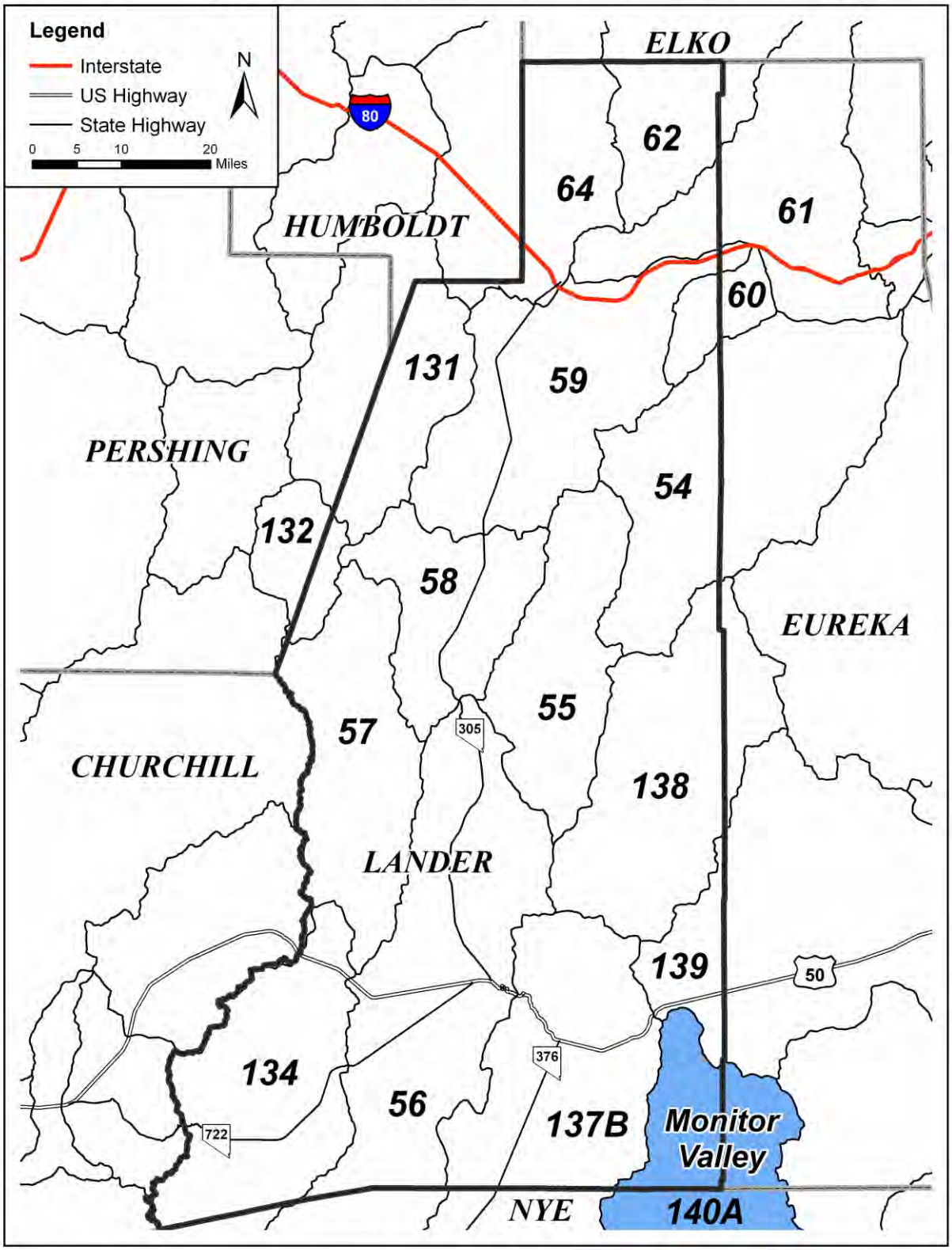
Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	1,044.08	0.00	1,044.08
Irrigation	11,300.00	1,625.04	12,925.04
Mining	722.11	0.00	722.11
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	238.85	0.00	238.85
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	13,305.04	1,625.04	14,930.08

Source: Nevada Division of Water Resources, 2010, CA-Carey Act.

References used for Basin 139:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 30,* Carson City, 1964.

Appendix A
Hydrographic Basin 140A: Monitor Valley



Basin 140A - Monitor Valley-Northern Part

Monitor and Kobeh Valleys are large open valleys draining to Diamond Valley. Monitor Valley covers an area of about 1,060 square miles. Most of the Valley is located in Nye County. Underflow of groundwater occurs from Monitor Valley to Koheh Valley. Figure A140-1 shows major surface water features in Hydrographic Basin 140A and location of domestic wells where groundwater quality did not meet state drinking water standards as shown in water chemistry analysis performed by the Nevada State Health Laboratory.

In Monitor Valley, the largest streams are Stoneberger, Willow, White Sage Canyon Creek. With the exception of periods of large runoff and intense storms, the flow of these creeks are probably absorbed locally on the alluvial apron or on the valley floors.

The principal springs in Monitor Valley Northern Portion are at Potts (Tps, 14 and 15 N., R. 47 E) and at Dianas Punch Bowl (T. 14 N., R. 47 E.); the estimated annual discharge is about 1,500 acre-feet. Most of these springs are hot, having a water temperature of about 140 degrees (NDCNR, 1964).

Water Quality

Data on water quality in the Monitor Valley is limited. The quality of water varies from place to place. However, in general, the dissolved-solids content is low in the recharge areas in the mountains and increases in the area of discharge in the lower parts of the valley. Most of the groundwater in the area is a calcium-bicarbonate type. There was no water quality analysis of wells on file with the Nevada State Health Laboratory for portions of the Valley in Lander County.

Water Use in Monitor Valley

A summary of water resources is included in Table A140-1. The perennial yield in the basin currently exceeds the active water duty by nearly 7,700 acre-feet. As a result, the basin is open to additional water appropriations permits. Most water (surface and groundwater) is currently used for irrigation purposes. Most of the Basin is contained in Nye County. Table A140-2 shows groundwater rights by manner of use.

Figure A140A-1
Hydrographic Basin 140A – Monitor Valley

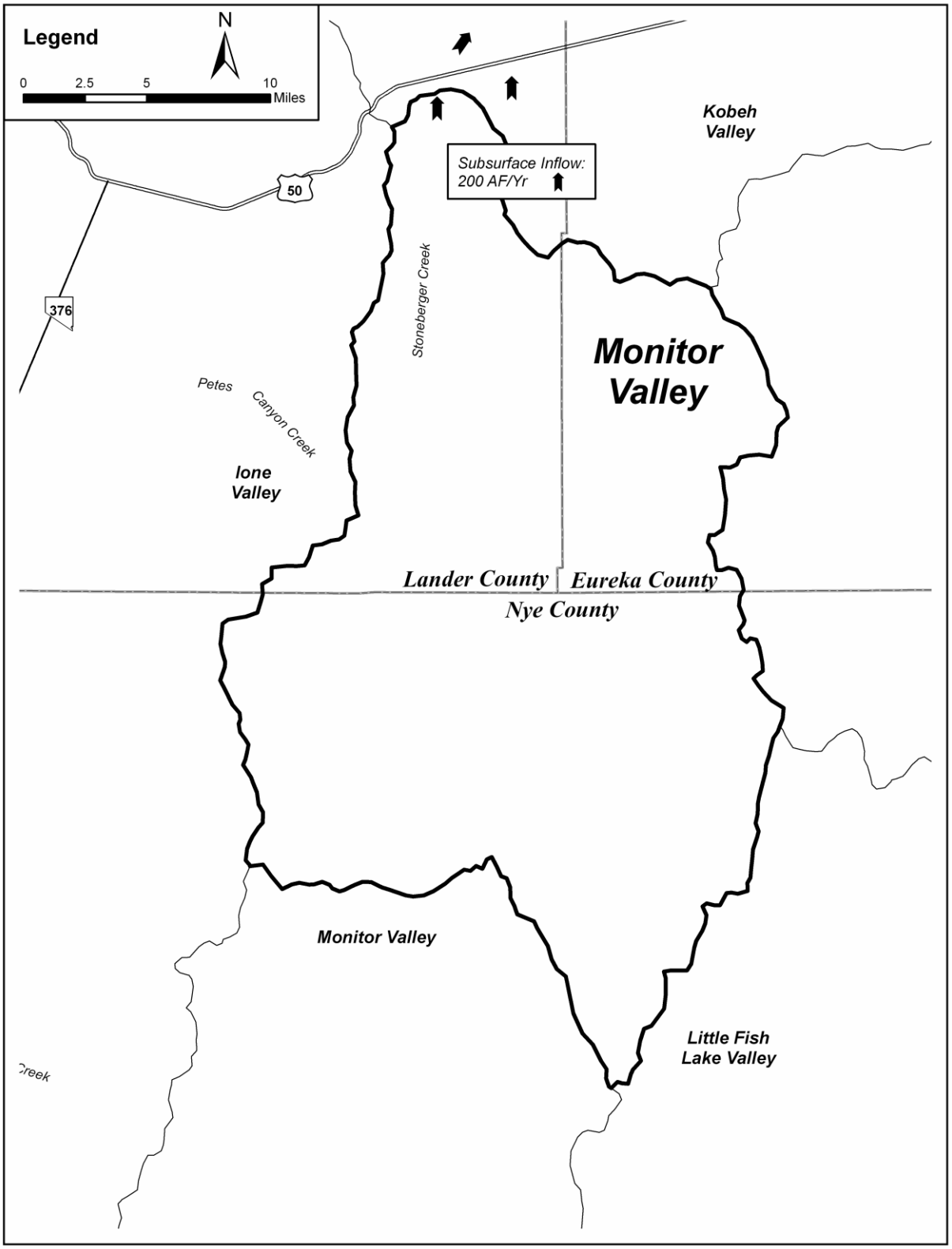


Table A140-1
2010 Water Resource Summary Basin 140A

Groundwater		**Notes**
Designated Basin	Yes	
Perennial Yield	8,000 af.	NDWR
Annual Duty:	280.78 af.	NDWR-see Table B140-2
Active Water Rights	280.78 af.	NDWR
Pending	0.00 af.	NDWR
Groundwater Quality	Varies-suitable	NDCNR Reconnaissance Series 30
Wells exceeding MCLs	0	None available
Surface Water Rights		
Total in Lander County	79.24	NDWR
Irrigation	0	
Stock	79.24	
Other		
Water Quality	Suitable-varies from location to location	NDCNR Reconnaissance Series 30
Surface Water Recharge	8,300 af.	
Public Water Systems	None	
Domestic Wells		
Total Lander County 2010	Less than 10	

Table A140-2 Groundwater Rights in Acre-Feet
By Manner of Use Basin 140A (As of May 2010)

Use	Active	Pending	Total
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	0.00	0.00	0.00
Industrial	0.00	0.00	0.00
Irrigation (CA)	0.00	0.00	0.00
Irrigation DLE	0.00	0.00	0.00
Irrigation	175.12	0.00	175.12
Mining	0.00	0.00	0.00
Municipal	0.00	0.00	0.00
Power Generation	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stock Water	105.66	0.00	105.66
Storage	0.00	0.00	0.00
Wild Life	0.00	0.00	0.00
Other/Decreed	0.00	0.00	0.00
	280.78	0.00	280.78

Source: Nevada Division of Water Resources, 2010, CA-Carey Act

References used for Basin 140:

Nevada Department of Conservation and Natural Resources, *Water Resources-Reconnaissance Series Report 30,* Carson City, 1964.