STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER

CRESCENT VALLEY
HYDROGRAPHIC BASIN 4-054

CROP INVENTORY

2014

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ABSTRACT

This inventory represents the status and usage of all permitted and certificated groundwater rights for irrigation purposes located within Crescent Valley, Hydrographic Basin 4-054, for the year 2014. **Only those groundwater rights associated with irrigation purposes are represented in this report**. For a listing and summary of all other manners of use within the basin please refer to the Nevada Division of Water Resources Hydrographic Basin Summary.

The data presented are valid for the time period of this report and may vary from previously published figures as water rights within the basin are subject to administrative action, such as certification, cancellation, forfeiture or withdrawal on a continuing basis.

For the year 2014, the permitted and certificated groundwater rights for irrigation purposes totaled **2,448 acres** with a total duty of 8,720 acre-feet within Crescent Valley. An estimated **1,900 acres** were irrigated and 6,535 acre-feet were pumped during 2014.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	054, REGION 4
HYDROGRAPHIC BASIN NAME	CRESCENT VALLEY
COUNTIES	LANDER, EUREKA
MAJOR COMMUNITIES	CRESCENT VALLEY
DESIGNATED BASIN	DESIGNATED
DENIALS BASED UPON WATER AVAILABILITY	2636, IRR DLE DEN, 3/20/1981 2645, IRR DLE DEN, 5/14/1981 2838. IRR DENIED, 11/10/1983 4573, IRR DENIED, 10/13/1997
ESTIMATED IRRIGATION PUMPAGE 2014 (ACRE-FEET)	6,535*

STATE ENGINEER'S ORDERS

NO. 755 – DESIGNATION OF BASIN	MARCH 20, 1981
NO. 1082 – WELL SPACING	OCTOBER 6, 1993
NO. 1082-A – WELL SPACING	AUGUST 23, 2007
NO. 1189 – MINE DEWATERING	JUNE 4, 2008
NO. 1082-B – DEWATERING RULES	JANUARY 5, 2010

COMMITTED GROUNDWATER RESOURCE FOR IRRIGATION PURPOSES: 8,720 ACRE-FEET
DATE: DECEMBER 2014

NOTE: Committed groundwater resource data are accurate for December 2014. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could impact the duty, diversion rate and acreage associated with a given right. Be advised this report acknowledges that other manner of uses may be present in the basin; however, only those groundwater rights associated with irrigation purposes are represented in this report.

* Acreage represented in this report may have surface water rights appurtenant. This report acknowledges those acres with surface water rights but is not intended to quantify, nor present any definitive use of those surface water rights. The data represent only the pumping of groundwater and the acreage to which it is applied.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated to irrigation and described by the Office of the State Engineer, Nevada Division of Water Resources, and to estimate the amount of groundwater pumped for irrigation purposes within the Crescent Valley Hydrographic Basin 4-054, for the year 2014.

DESCRIPTION OF THE STUDY AREA

The Crescent Valley Hydrographic Basin is located in north central Nevada (Figure 1), and occupies approximately 752 square miles within Lander and Eureka Counties. The adjacent hydrographic basins are Carico Lake Valley (4-055) to the Southwest, Lower Reese River Valley (4-059) to the west, Whirlwind Valley (4-060) to the northwest, Boulder Flat (4-061) to the north, Mary's Creek Area (4-52) to the north-northeast, Pine Valley (4-053) to the east, and Grass Valley (10-138) to the south.

Crescent Valley is bounded to the north by the Humboldt River, to the northeast by the Dry Run Hills, to the east and southeast by the Cortez Mountains, to the south by the northern reaches of the Toiyabe Range, to the southwest by the Red Mountains, which blends into the western basin boundary of the Shoshone Range, where the Malpais Rim separates the northwestern basin boundary from that of Whirlwind Valley. The valley is approximately 27 miles wide by 48 miles long at the extremes, with basin elevations ranging from approximately 4,700 feet above mean sea level on the valley floor to over 8,500 feet above mean sea level in the surrounding mountains. Irrigation occurs primarily in the central lowlands of the basin (Figure 2).

GROUNDWATER LEVELS

Depths to groundwater in Crescent Valley are measured by multiple agencies on a semi-annual basis. Sites at which NDWR measures water levels and links to their data include:

054 N25 E46 13BDAD1	054 N26 E48 06BBAD1	054 N27 E46 13DCAA2
054 N25 E46 13DAAA1	054 N26 E48 06BBDD1	054 N27 E46 13DCDC1
054 N25 E46 13DBAB1	054 N26 E48 06BCAC1	054 N27 E46 13DCDC2
054 N26 E47 01ADDC1	054 N26 E48 06BCDB1	054 N27 E46 13DDCB2
054 N26 E48 05BCBA1	054 N26 E48 06BDAB1	054 N27 E46 14CDAD1
054 N26 E48 06AACB1	054 N26 E48 06BDBB1	054 N27 E46 23CCDD1
054 N26 E48 06AACB2	054 N26 E48 06CAAB1	054 N27 E46 23CCDD2
054 N26 E48 06ABCD1	054 N26 E48 31DDCB1	054 N27 E46 24ACCA1
054 N26 E48 06ACBC1	054 N26 E48 32CBCC1	054 N27 E46 24ACCA2
054 N26 E48 06ACBC2	054 N27 E46 12DDAD1	054 N27 E46 24ADBC1
054 N26 E48 06BACD1	054 N27 E46 13CDAB1	054 N27 E46 24ADBC2
054 N26 E48 06BADA1	054 N27 E46 13DABB1	054 N27 E46 24BADB1
054 N26 E48 06BADB1	054 N27 E46 13DCAA1	054 N27 E46 24BCAA1
054 N26 E48 06BBAA1		

Additional site and water level data can be found on the NDWR website at www.water.nv.gov/data/waterlevel. Groundwater level data have also been collected by the U.S. Geological Survey (USGS) and can be accessed through their website (http://nevada.usgs.gov).

METHODS TO ESTIMATE IRRIGATED ACREAGE

This report estimates the number of acres irrigated by the groundwater pumped under permits, certificates, and claims of vested right issued by the State Engineer. Table 1 and Figure 3 present the current and historic irrigated acreage and pumpage; Appendix A presents estimates detailed by certificate, permit, or vested claim number. The following methods were used to arrive at the estimated acreage:

- Field inspection of the place of use was conducted to estimate the number of acres under cultivation.
- In cases where field inspection of the place of use was not practical, aerial and/or satellite imagery were analyzed to determine acreages.

METHODS TO ESTIMATE PUMPAGE

This report estimates the amount of groundwater pumped under the permits and certificates issued by the Nevada State Engineer as well as claims of vested right in the Crescent Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters were in place, meter readings were taken and compared with previous data (if available).
- Where meters were not in place and the use was irrigation, pumpage was estimated by multiplying the number of hours the well was operated during the past year (determined from an hour meter reading or asking the water user) by the certificated diversion rate.
- Where there were no flow meters or other reliable options for estimating pumpage and the use was irrigation, pumpage was estimated by dividing the Net Irrigation Water Requirement (NIWR) for the crop grown by the efficiency of the irrigation method used, then multiplying by the number of acres irrigated. Irrigation efficiencies associated with three types of irrigation methods are: pivot at 85%; wheel line or other hand moved sprinklers at 75%; and flood at 60%. The pumpage amount estimated by this method was limited by the duty of the permit. For places where the groundwater rights are supplemental to surface water, groundwater use was estimated using the NIWR method above, but adjusted based on available surface water for the year. Evapotranspiration and NIWR data by basin can be found on the NDWR website at: http://water.nv.gov/mapping/et/et_general.cfm. This approach using the NIWR to estimate pumpage was not used in previous inventories, and pumpage estimates for 2014 and subsequent years may differ significantly from estimates of previous years.
- Where lands were irrigated by both surface water and groundwater, the surface water supply for the irrigation season was considered in estimating groundwater pumpage.

TABLES

Table 1. Crescent Valley historical irrigated acreage and pumpage data.

Year	2009	2010	2011	2012	2013	2014
Acres Irrigated	1,844	1,791	Not	1,761	1,920	1,900
Acre-Feet Pumped	7,160	6,948	Available	6,671	6,930	6,535

* The NIWR method to estimate pumpage was used starting in 2014; estimates may differ significantly from previous years.

FIGURES

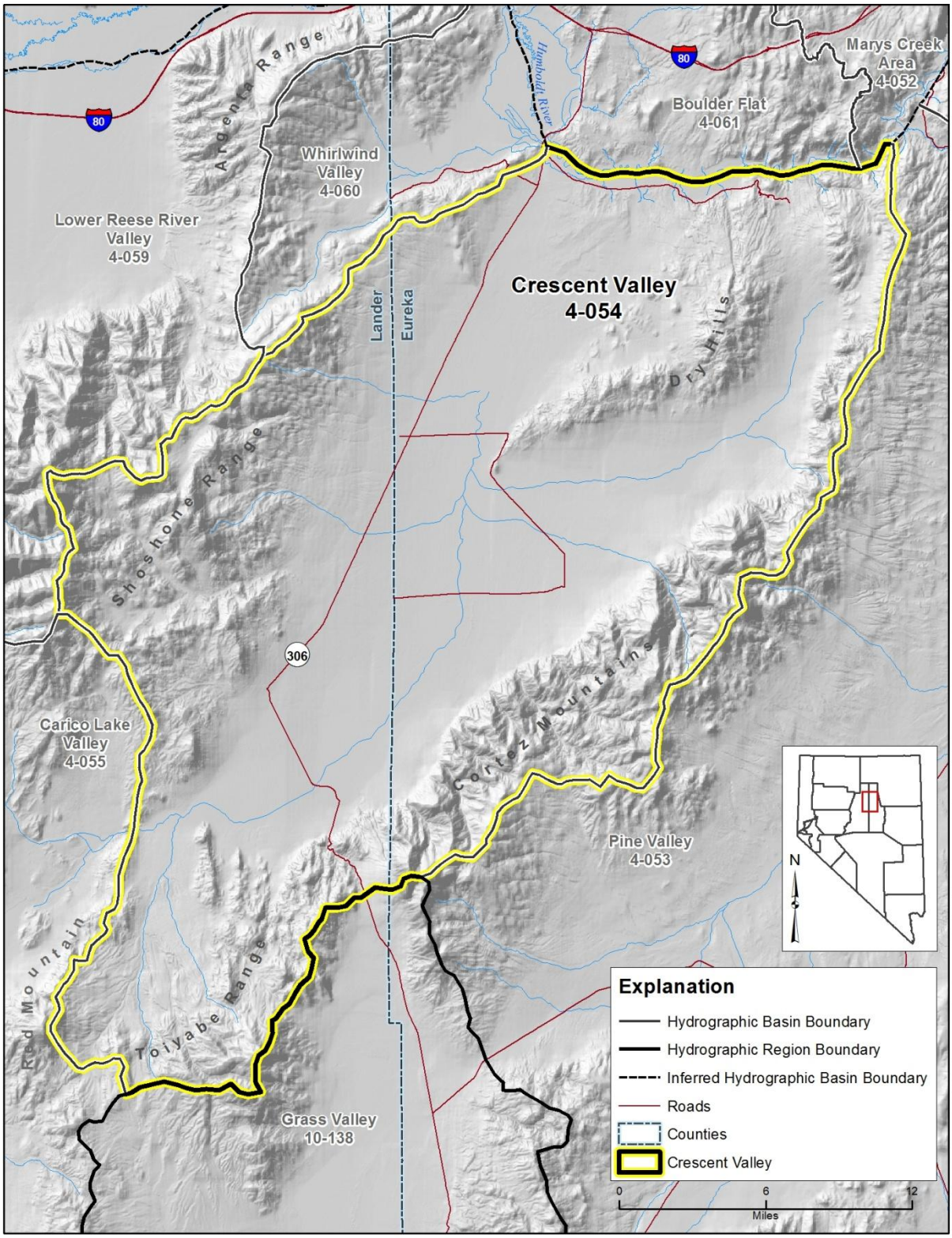

Figure 1. Physiographic map of Crescent Valley (Hydrographic Basin 4-054).

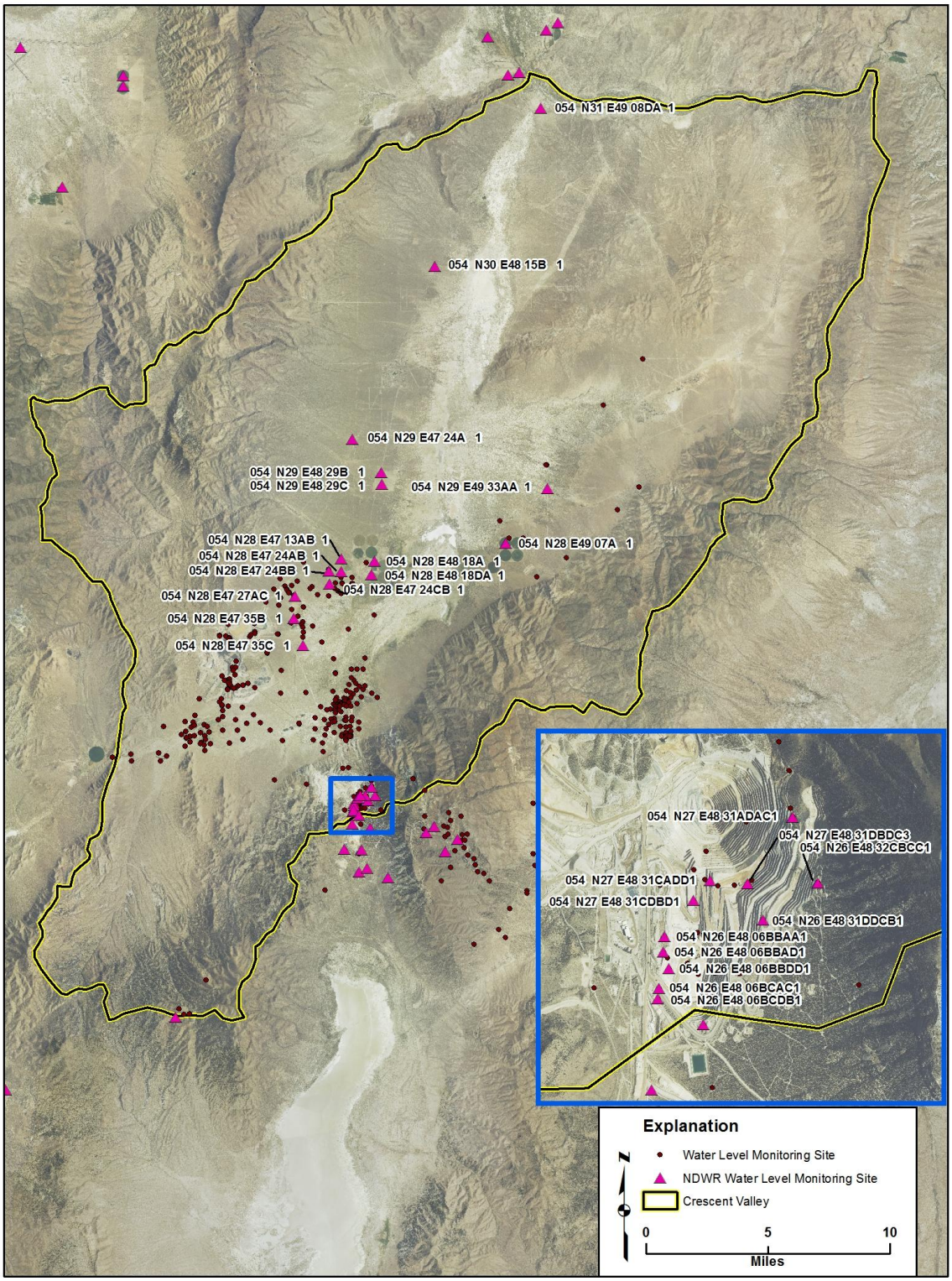

Figure 2. Map showing Crescent Valley water level monitoring sites.

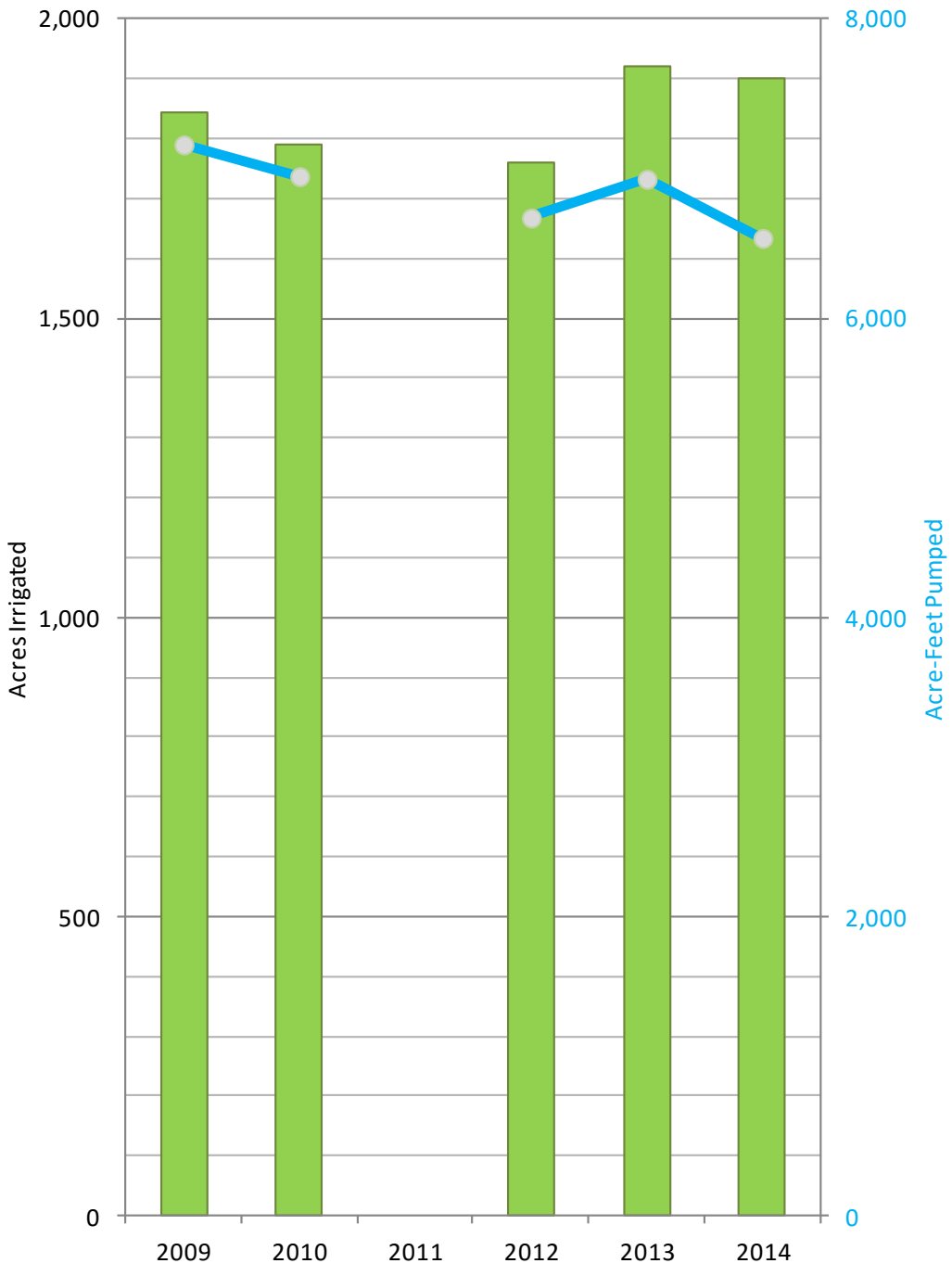

Figure 3. Graph showing Crescent Valley historical irrigated acreage and pumpage. The NIWR method to estimate pumpage was used starting in 2014; estimates may differ significantly from previous years.

APPENDIX A. 2014 CRESCENT VALLEY CROP INVENTORY.

EXPLANATION OF COLUMN HEADINGS

App No	The file number of the Application to Appropriate/Change Water or the Claim of Vested Right.
Status	Indicates the status of an application: Permit (PER), Certificated (CER), or a Claim of Vested Right (VST).
QQ	The quarter-quarter of the Section in which the point of diversion is located.
Q	The quarter of the Section in which the point of diversion is located.
Sec	The Section in which the point of diversion is located.
Twn	The Township in which the point of diversion is located.
Rng	The Range in which the point of diversion is located.
Sup	Indicates whether the groundwater right is part of a group of groundwater rights used to irrigate all or a portion of the same acreage (supplemental). A "Y" in this column signifies the groundwater right is supplemental to others.
Supplemental Application Number	The application number(s) of the water right(s) that are supplemental to one another.
Permitted Acres	The number of acres defined by the permit or certificate that are eligible to be irrigated.
Supplementally Adjusted Permitted Acres	The total supplementally adjusted number of acres that are eligible to be irrigated.
Permitted Duty Acre-Feet	The amount of water that may be pumped in a given year, or season, as defined by the permit, certificate, or claim of vested right. If there is a supplemental group, the total combined duty is listed as a supplementally adjusted duty.
Supplementally Adjusted Duty Acre-Feet	The supplementally adusted, total combined duty that may be pumped in a given year, or season, for a supplemental group of water rights, expressed in acre-feet. The supplementally adjusted, total combined duty is listed at the end of a supplemental group in **bold**.
Owner of Record	The owner of the water right as recorded in the records of the State Engineer. A water right may have more than one owner of record. Only the first, alphabetically, is listed in this table.
Crop Type	Indicates whether or not a crop was in production during the water year. If a crop was in production, the common name description of the plants under cultivation if given (e.g. alfalfa).

NIWR (ft)	Net Irrigation Water Requirement, defined to be equal to the annual crop evapotranspiration less the effective precipitation entering the root zone that is available for evaporation or transpiration.
Irrigation Method	The method by which the water is applied to the crop and ground (e.g. pivot).
Irrigated Acreage	The estimate of the number of acres irrigated associated with a particular water right.
Acreage Estimation Method	The method by which the number of acres irrigated was determined. F – Field inspection. I – Aerial or satellite imagery.
Acre-Feet Pumped	The estimate of the amount of water pumped under a particular water right, expressed in acre-feet. One acre-foot equals 325,851 gallons.
Pumpage Estimation Method	The method used to estimate the amount of water pumped. M – Totalizing meter readings. D – The estimate was made by multiplying the number of irrigated acres by the acre-feet per acre duty rate, as defined in the permit or certificate. N – NIWR method.

Crop Inventory and Groundwater Pumpage for Irrigation - Crescent Valley, Basin 054, 2014

App No	Status	QQ	Q	Sec	Twn	Rng	Sup	Supplemental Application Number	Permitted Acres	Supplimentally Adjusted Permitted Acres	Permitted Duty Acre-Feet	Supplimentally Adjusted Duty Acre-Feet	Owner of Record	Crop Type	NIWR (ft)	Irrigation Method	Irrigation Efficiency (%)	Irrigated Acres	Acreage Estimation Method	Acre-Feet Pumped	Pumpage Estimation Method
17977	CER	NE	SE	8	31N	49E		DHR-00169	24.20	**24.20**	72.60	**72.60**	J.B.B. INC	NO CROP	N/A	NO IRR EQUIP	n/a	0.00	F	0.00	N
																TOTAL:		**0.00**		**0.00**	
18570	CER	SW	NW	16	31N	50E		DHR-00153	179.22	**179.22**	537.66	**537.66**	ZEDA INC	NO CROP	N/A	NO IRR EQUIP	n/a	0.00	F	0.00	N
																TOTAL:		**0.00**		**0.00**	
18998	CER	NE	SE	33	29N	49E	Y	31855	117.10	**380.20**	468.40	**1520.00**	DANN, MARY	NO CROP	N/A		n/a	0.00	F	0.00	N
31855	CER	NE	SE	34	29N	49E	Y	18998	380.20		1520.00		DANN, MARY	NO CROP	N/A	FLOOD	60%	0.00	F	0.00	N
																TOTAL:		**0.00**		**0.00**	
79896	PER	SE	NE	31	27N	48E	Y	79896, 79897, 80130-80142		**1864.30**	114.00	**6589.62**	CORTEZ JOINT VENTURE								
79897	PER	SW	NE	6	26N	48E	Y	79896, 79897, 80130-80142			366.00		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	126.00	F	429.88	N
80130	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			1034.40		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	480.00	F	1637.65	N
80131	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			960.00		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	160.00	F	545.88	N
80132	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			480.00		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	378.00	F	1289.65	N
80133	PER	NW	NW	8	27N	47E	Y	79896, 79897, 80130-80142			274.00		CORTEZ JOINT VENTURE	GRAIN	2.3	PIVOT	85%	126.00	F	340.94	N
80134	PER	NW	NW	8	27N	47E	Y	79896, 79897, 80130-80142			206.00		CORTEZ JOINT VENTURE	CORN	2.4	PIVOT	85%	126.00	F	355.76	N
80135	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			74.00		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	126.00	F	429.88	N
80136	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			166.00		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	126.00	F	429.88	N
80137	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			369.27		CORTEZ JOINT VENTURE	ALFALFA	2.9	PIVOT	85%	126.00	F	429.88	N
80138	PER	SE	NW	8	27N	47E	Y	79896, 79897, 80130-80142			499.74		ZEDA INC					0.00	F	0.00	N
80139	PER	SE	NW	5	27N	47E	Y	79896, 79897, 80130-80142			2046.00		CORTEZ JOINT VENTURE	CORN	2.4	PIVOT	85%	126.00	F	355.76	N
80140	PER	SE	NW	5	27N	47E	Y	79896, 79897, 80130-80142			0.00		CORTEZ JOINT VENTURE					0.00	F	0.00	N
80141	PER	SE	NW	5	27N	47E	Y	79896, 79897, 80130-80142			0.00		CORTEZ JOINT VENTURE					0.00	F	0.00	N
80142	PER	SE	NW	5	27N	47E	Y	79896, 79897, 80130-80142			0.00		CORTEZ JOINT VENTURE					0.00	F	0.00	N
																TOTAL:		**1900.00**		**6534.82**	
								TOTAL:		**2447.92**		**8719.88**				**TOTAL:**		**1900.00**		**6534.82**	