

Case No. 84739

IN THE SUPREME COURT OF THE STATE OF NEVADA

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Elizabeth A. Brown
Clerk of Supreme Court

ADAM SULLIVAN, P.E., NEVADA
STATE ENGINEER, et al.

Appellants,

vs.

LINCOLN COUNTY WATER
DISTRICT, et al.

JOINT APPENDIX

VOLUME 3 OF 49

IN THE OFFICE OF THE STATE ENGINEER

STATE OF NEVADA

1169A

ORDER

WHEREAS, on March 8, 2002, the State Engineer issued State Engineer's Order No. 1169.

WHEREAS, Order No. 1169 was issued after an administrative hearing was held before the Nevada State Engineer regarding protested Applications 54055 through 54059 held by the Las Vegas Valley Water District, and protested Applications 63272 through 63276 and 63867 through 63876 held by Coyote Springs Investment, LLC.

WHEREAS, Order No. 1169 indicated that there was insufficient information to determine if additional water was available for appropriation under the applications and additional study was needed in order to make that determination.

WHEREAS, pursuant to Order No. 1169, the State Engineer ordered that all applications pending and any new filings for the appropriation of water from the carbonate-rock aquifer system within Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (North) (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219), and Lower Moapa Valley (Basin 220) would be held in abeyance until further information was obtained by stressing the aquifer by pumping water under those water right permits already issued to appropriate water from the system.

WHEREAS, Order No. 1169 ordered that a study covering a minimum five-year period of time during which at least 50% of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years. The amount of water to be pumped was 8,050 acre-feet annually for two consecutive years.

WHEREAS, Order No. 1169 included as study participants those certain entities identified as having applications for additional water rights or as currently holding water rights in the referenced basins, specifically, the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company and Moapa Valley Water District.

WHEREAS, on April 18, 2002, the State Engineer issued State Engineer's Ruling No. 5115 that addressed Applications 54075 and 54076 then held by the Las Vegas Valley Water District in California Wash (Basin 218). Pursuant to Ruling No. 5115, the State Engineer indicated that additional information was necessary before large quantities of groundwater could be appropriated from California Wash. Application 54075 was approved subject to a monitoring program to be prepared in conjunction with the study ordered under Order No. 1169 and Application 54076 was held in abeyance until the Order No. 1169 study was completed.

WHEREAS, by letter dated April 16, 2010, the State Engineer granted the Moapa Band of Paiute Indians' request to participate in the Order No. 1169 study. The Moapa Band of Paiute Indians' reservation is located within California Wash. The letter noted that the intent of Ruling No. 5115 was to include California Wash within the study area as the current evidence strongly supports a hydrologic connection between California Wash and the other hydrographic basins included in Order No. 1169.

WHEREAS, by letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact resources at the Muddy River Springs. On June 22, 2010, the State Engineer held a meeting to discuss the pumping test and the Tribe's concerns.

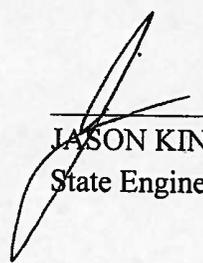
WHEREAS, by letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered and the pumping requirements of the Order No. 1169 study had not even begun. The State Engineer noted that the final reports ordered under Section 7 of Order No. 1169 and updating the groundwater model under Section 8 of the Order were only required after completion of the pumping test. However, the State Engineer indicated that decisions regarding future appropriations in the basins subject to Order No. 1169 could not be deferred indefinitely. Therefore, regardless of whether the 8,050 acre-foot minimum requirement was met or not, the study participants were ordered to comply with Sections 7 and 8 of Order No. 1169. The two-year pumping period was to commence when pumping and water export from well MX-5 commenced and the Section 7 report(s) were to be filed in the Office of the State Engineer within 180 days of completion of the first two years of pumping. The pumping test was expected to begin in August or September 2010 and actually began on November 15, 2010. The Southern Nevada Water Authority was also ordered to submit model simulation results showing the predicted effects of pumping both existing rights and current applications in Lower Meadow Valley Wash (Basin 205), Kane Springs Valley (Basin 206), Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (North) (Basin 217), California Wash (Basin 218), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219), and Lower Moapa Valley (Basin 220). The State Engineer notified all study participants that monitoring activities were to be in place no later than August 1, 2010.

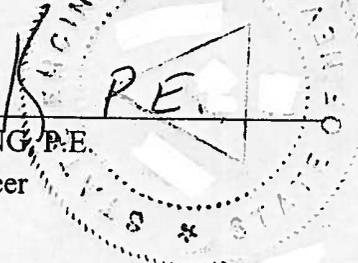
WHEREAS, the State Engineer has maintained information related to the pumping test on the Nevada Division of Water Resources website <http://water.nv.gov/mapping/order1169/> and can be viewed by any member of the public.

WHEREAS, the State Engineer believes that sufficient information has been obtained through the pumping test and related monitoring in order to make a determination on the applications pending in these basins.

NOW THEREFORE, the State Engineer orders:

1. The pumping test is declared completed as of December 31, 2012.
2. In recognition of the information that has already been provided pursuant to the pumping test, the provisions of Section 8 of Order No. 1169 that required an update of Exhibit No. 54 from the July 2001 hearing is hereby rescinded.
3. Any study participant, which includes the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District and Moapa Band of Paiute Indians, may file a report in the Office of the State Engineer in Carson City, Nevada, by June 28, 2013, addressing the information obtained from the study/pumping test, impacts of pumping under the pumping test and the availability of water pursuant to the pending applications.


JASON KING, P.E.
State Engineer



Dated at Carson City, Nevada

this 21st day of December, 2012

CERTIFICATE OF SERVICE

I hereby certify that a copy of Amended Order No. 1169 was served:

By U.S. certified mail, postage prepaid, on December 21, 2012, on the following:

Coyote Springs Investment, LLC
Attn.: Carl Savely
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Sparks, NV 89436
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Las Vegas Valley Water District
Attn.: John Entsminger
1001 S. Valley View Blvd., MS #485
Las Vegas, NV 89153
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#7106 7808 0630 0051 4378

Las Vegas Valley Water District
1001 S. Valley View Blvd., MS #485
Las Vegas, NV 89153
Certified Mail
#7106 7808 0630 0051 4262

Las Vegas Valley Water District
Attn.: Dana Walsh
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Las Vegas, NV 89153
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By U.S. regular mail, postage prepaid, on December 21, 2012, on the following:

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Flaherty and Donaldson
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Carson City, NV 89703

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Chemical Lime Company of Arizona
P.O. Box 363068
North Las Vegas, Nevada 89036

Ely Shoshone Tribe
#16 Shoshone Circle
Ely NV 89301

City of Caliente
Attn: Mayor
P.O. Box 1006
Caliente, NV 89008-1006

Charles F. Hilfenhaus, Jr.
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Las Vegas, NV 89108

Dry Lake Water, LLC
2701 N. Tenaya Way, Suite 200
Las Vegas, NV 89102

High Country News
Attn.: Matt Jenkins
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Berkeley, CA 81428

INMC Mortgage Holdings, Inc.
Construction Lending Division
155 N. Lake Ave. CLCA-B 11th Floor
Pasadena, CA 91101

Las Vegas Fly Fishing Club
2728 Tidewater Ct.
Las Vegas, NV 89117

Lionel Sawyer & Collins
Attn.: Brian H. Schusterman
50 W. Liberty Street, Suite 1100
Reno, NV 89501

Moapa Band of Paiute Indians
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P.O. Box 340
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Moapa Valley Water District
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Las Vegas, NV 89104

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Las Vegas, NV 89109

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Las Vegas, NV 89153

Southern Nevada Water Authority
Attn.: Jeff Johnson
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Las Vegas, NV 89153

Stewart Title of Nevada
Attn.: Linda Jones
3800 Howard Hughes Pkwy, Ste. 500
Las Vegas, NV 89109-0913

Taggart & Taggart, Ltd.
Attn.: Paul Taggart
108 N. Minnesota Street
Carson City, NV 89703

U.S. Bureau of Indian Affairs
Western Regional
Attn.: Barry Welch
2600 N. Central Avenue, 4th floor
Phoenix, AZ 85004

U.S. Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

U.S. Fish and Wildlife Service
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911 NE 11th Ave.
Portland, OR 97232-4181

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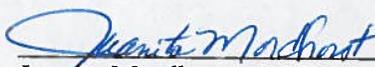
United States of America
National Park Service
Attn.: Bill Hansen
1201 Oakridge Dr., Suite 250
Fort Collins, CO 80525

U.S. National Park Service
Attn.: Gary Karst
601 Nevada Way
Boulder City, NV 89005

U.S. Department of the Interior
Office of the Solicitor
Attn.: Peter Fahmy
755 Parfet St., Suite 151
Lakewood, CO 80215

U.S. Department of the Interior
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Sacramento, CA 95825-1890

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Juanita Mordhorst, AAI
Division of Water Resources
Hearings Section

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

1169

ORDER

HOLDING IN ABEYANCE CARBONATE-ROCK AQUIFER SYSTEM GROUNDWATER APPLICATIONS PENDING OR TO BE FILED IN COYOTE SPRINGS VALLEY (BASIN 210), BLACK MOUNTAINS AREA (BASIN 215), GARNET VALLEY (BASIN 216), HIDDEN VALLEY (BASIN 217), MUDDY RIVER SPRINGS aka UPPER MOAPA VALLEY (BASIN 219), LOWER MOAPA VALLEY (BASIN 220), AND FOR FURTHER STUDY OF THE APPROPRIATION OF WATER FROM THE CARBONATE-ROCK AQUIFER SYSTEM, LINCOLN AND CLARK COUNTIES, NEVADA.

WHEREAS, the Nevada State Engineer is designated by the Nevada Legislature to perform the duties related to the management of the water resources belonging to the people of the State of Nevada.¹

WHEREAS, the State Engineer is empowered to make such reasonable rules and regulations as may be necessary for the proper and orderly execution of the powers conferred by law.²

WHEREAS, the State Engineer is empowered to conduct such studies as are necessary.³

WHEREAS, a large portion of the State of Nevada consisting of approximately 50,000 square miles of sparsely populated land is underlain by significant carbonate-rock sequences.⁴

WHEREAS, the carbonate-rock sequences contain groundwater aquifers, which are believed to contain significant, but undetermined, quantities of ground water.

WHEREAS, many persons or entities have filed water right applications requesting permission to appropriate substantial quantities of underground water from the carbonate-rock aquifer system.

WHEREAS, in 1984, the Water Resources Division of the United States Department of Interior, Geological Survey proposed a 10-year investigation of the entire Carbonate Terrane, which includes the carbonate-rock aquifers of the areas referenced above. This study was proposed because the water resources of the Carbonate Terrane were not well defined, the hydrology and geology of the area are complex, and data was sparse.⁵

¹ See, Nevada Revised Statutes chapters 532, 533, 534, 535 and 536.

² NRS § 532.120.

³ NRS § 532.165(1), 533.368 and 533.370(2).

⁴ Michael D. Dettinger, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988, Summary Report No. 1, United States Geological Survey, Department of Interior and Desert Research Institute, University of Nevada System, p. 3, 1989. See also, Memorandum dated August 3, 1984, from Terry Katzer, Nevada Office Chief, Water Resources Division, United States Department of Interior Geologic Survey, Carson City, Nevada, to Members of the Carbonate Terrane Study, Attachment p. 8, which indicates that the area underlain by significant carbonate-rock sequences in Nevada is over 40,000 square miles of sparsely populated land, and includes 106 hydrographic areas and basins.

⁵ Memorandum dated August 3, 1984, from Terry Katzer, Nevada Office Chief, Water Resources Division, United States Department of Interior Geologic Survey, Carson City, Nevada, to

WHEREAS, it has been known since 1984 that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, a significant period of study would be required, and that "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."⁶

WHEREAS, the United States Geological Survey has indicated that given the multiple possible avenues of hydrologic connection between the various aquifers and flow systems, and the uncertainties of recharge and discharge mechanisms and processes, an investigation of the hydrology of the carbonate-rock aquifer system in Nevada is undoubtedly a difficult undertaking.

WHEREAS, an investigation of the carbonate-rock aquifer system is additionally complicated by factors including:⁷

- basic hydrologic data such as groundwater levels in the basin-fill aquifers and the carbonate-rock aquifers, and reliable flow measurements for important springs and major streams are scarce or infrequently obtained in much of the area;
- secondary hydrologic and other data, such as hydraulic parameters, geophysical and geochemical, are lacking in many areas;
- the geometry, properties, and boundaries of the carbonate-rock and basin-fill reservoirs are generally unknown, and definition of these properties can be expensive and difficult;
- climatic conditions today are inadequately defined (particularly at higher altitudes) and conditions during the development of the flow paths within the deep-rock aquifers and flow paths within the carbonate-rock aquifer are even more uncertain;
- uncertainties and inaccuracies exist in current methods of estimating precipitation;
- uncertainties and inaccuracies exist in current methods of estimating groundwater inflow and recharge;
- uncertainties and inaccuracies exist in current methods of estimating groundwater outflow and evaporative discharge;
- only a small number of wells tap the deep carbonate-rock aquifer system;
- because there has been no significant historical pumping of ground water from the carbonate-rock aquifer system, groundwater models can only be used as a limited predictive tool for estimating the principle location and magnitude of the impacts of pumping ground water from the system;
- limited stresses on the water resources of the area under current development conditions allow hydrologists information only on the narrow band of system responses to natural conditions; and
- the relationship between geothermal systems and the deep carbonate-rock aquifers and groundwater flow systems is not well understood.

WHEREAS, in 1985, the Nevada Legislature authorized a program for the study and testing of the carbonate-rock aquifer system of eastern and southern Nevada. The program was a cooperative effort between the State of Nevada and the Federal Government. The overall plan for the program was to study the carbonate-rock aquifers of southern, east-central, and northeastern Nevada as separate phases of work, with a summary of findings to be prepared at the end of each

Members of the Carbonate Terrane Study.

⁶ Ibid.

⁷ Id., Attachment p. 7.

phase. A report, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988,⁸ summarized the findings of the first phase of the study, which assessed the resources of the carbonate-rock aquifers of southern Nevada. The summary brought together results from more than 20 technical reports produced during the study. The summary indicated that:

The rocks that compose the carbonate-rock aquifers are layers of limestone and dolomite that were deposited hundreds of millions of years ago in much of the eastern Great Basin. Subsequently, the carbonate rocks were much deformed; as a result, they no longer exist as continuous layers beneath the region. Instead, they have been pulled apart to form a few large areas of thick and relatively continuous carbonate rocks. Separating these areas are noncarbonate rocks, within which are isolated mountain-sized blocks of carbonate rock.

Beneath southern Nevada, the thick carbonate-rock layers are continuous enough to transmit ground water at regional scales only beneath a north-south "corridor" 60-90 miles wide that extends southward from east-central Nevada to and beyond the Spring Mountains area west of Las Vegas. Within this corridor are the two major regional flow systems of southern Nevada: the Ash Meadows-Death Valley system and the White River-Muddy River Springs system. These flow systems link the ground water beneath dozens of valleys and over distances exceeding 200 miles. Flow in these systems probably is concentrated along highly transmissive zones associated with (1) recently active faults and (2) confluences of flow near major warm-water springs. Outside of the corridor, the carbonate rocks are present primarily as isolated blocks that form aquifers of limited extent, recharged mostly by local precipitation.

* * *

Large-scale development (sustained withdrawals) of water from the carbonate-rock aquifers would result in water-level declines and cause the depletion of large quantities of stored water. Ultimately, these declines would cause reductions in the flow of warm-water springs that discharge from the regional aquifers. Storage in other nearby aquifers also might be depleted, and water levels in those other aquifers could decline. In contrast, isolated smaller ground-water developments, or developments that withdraw ground water for only a short time, may result in water-level declines and springflow reductions of manageable or acceptable magnitude.

Confidence in predictions of the effects of development, however, is low; and it will remain low until observations of the initial hydrologic results of development are analyzed. A strategy of staging developments gradually and adequately monitoring the resulting hydrologic conditions would provide information that eventually could be used to improve confidence in the predictions.⁹

WHEREAS, because assurances that the adverse effects of development will not overshadow the benefits cannot be made with a high degree of confidence, development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate

⁸ Michael D. Dettinger, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988, Summary Report No. 1, United States Geological Survey, Department of Interior and Desert Research Institute, University of Nevada System, Forward, 1989.

⁹ *Id.*, pp. 1-2.

monitoring in order to predict, through the use of a calibrated model, the effects of continued or increased development with a higher degree of confidence.

WHEREAS, staging development gradually means not developing the resources in one large step, but rather starting with small projects that are possibly augmented gradually if conditions and confidence warrant. This approach allows the effects of development to be observed and analyzed continually, so that the benefits and adverse effects of development can be judged and the effects reversed or mitigated if they prove to be detrimental to existing rights and the environment. This approach would hopefully avoid the havoc that could be created by the curtailment of water use by those who have come to rely on it if impacts occur requiring curtailment of the water use.

WHEREAS, the 1995 Water-Resources Investigations Report 91-4146¹⁰ estimates the total water budget of all southern Nevada aquifers from the natural recharge to the mountains and subsurface inflow to the study area¹¹ to be about 160,000 acre-feet annually, and discharges from major discharge areas to be about 77,000 acre-feet annually.¹²

WHEREAS, it is believed that all of the recharge and subsurface inflow cannot be captured for use.

WHEREAS, in July and August of 2001 nearly four weeks of public administrative hearings were conducted on applications filed by the Las Vegas Valley Water District (Applications 54055 - 54059, inclusive) and Coyote Springs Investment, LLC (Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive), which together request to appropriate approximately 135,000 acre-feet of water annually from the carbonate-rock aquifer system within the Coyote Springs Valley Hydrographic Basin.¹³

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that using the standard Maxey-Eakin technique for estimation of groundwater recharge from precipitation, the recharge for the Coyote Springs Valley, Muddy River Springs, Hidden Valley, Garnet Valley, Black Mountains and Lower Moapa Valley

¹⁰ Michael D. Dettinger, et al., Distribution of Carbonate-Rock Aquifers and the Potential for Their Development, Southern Nevada and Adjacent Parts of California, Arizona and Utah, U.S. Geological Survey, Water-Resources Investigations Report 91-4146, p. 50, 1995.

¹¹ The study area is defined on p. 5 of Water-Resources Investigations Report 91-4146 to be most of southern Nevada south of Tonopah and Pioche.

¹² Discharge areas are identified as Muddy River Springs 36,000 acre-feet annually (afa) of spring flow, Blue Point Spring 240 afa of spring flow, Rogers Spring 920 afa of spring flow, Frenchman Mountain 2,100 afa of underflow toward Colorado River, Pahrump Valley 18,000 afa of underflow to California, Ash Meadows 17,000 afa of spring flow and evapotranspiration, Amargosa Desert 3,000 afa of underflow to Death Valley, and Grapevine Canyon 400 afa of underflow to Death Valley. Water-Resources Investigations Report 91-4146 at 53.

¹³ It is noted that at the administrative hearing on Coyote Springs Investment, LLC Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive, the applicant indicated they are requesting the State Engineer "to issue the permits as requested but limit their full use until the monitoring and mitigation program is in effect." Transcript, public administrative hearing before the State Engineer, August 20, 2001, p. 58. However, the applicant further indicated that it requested that a minimum of four permits be issued, two in each county, with the second permit in each county to be used to stress the aquifer. Two permits for a total amount of 14,478 afa would be for development, two permits for a total amount of 14,478 afa would be to stress the aquifer under some temporary development. Transcript, public administrative hearing before the State Engineer, August 20, 2001, pp. 91-96. This is after the 27,504 afa requested by the Las Vegas Valley Water District.

areas combined is approximately 3,550 acre-feet annually. Using the modified Maxey-Eakin technique introduced at the administrative hearing (known as the Donovan-Katzer 2000 technique), the recharge is estimated at approximately 6,761 acre-feet annually for the combined areas.¹⁴

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that approximately 50,000 acre-feet of groundwater inflow comes into the Coyote Springs Valley from northern groundwater basins and approximately 53,000 acre-feet annually outflows¹⁵ from Coyote Springs Valley of which a portion may be available for capture from that groundwater underflow. While testimony presented indicated a belief that significant quantities of water may be available for capture from storage, it is unknown what quantity that would be and if any underground water could be appropriated without unreasonable and irreversible impacts.¹⁶

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that a portion of the ground water outflow from Coyote Springs Valley is believed to discharge at a rate of approximately 37,000 acre-feet annually at the Muddy River Springs area and approximately 16,000 to 17,000 acre-feet annually flows to groundwater basins further south.¹⁷ This 37,000 acre-feet is counted as part of the 53,000 acre-feet outflow from Coyote Springs Valley resulting in 16,000-17,000 acre-feet annual flow that bypasses the Muddy River Springs area.

WHEREAS, these referenced large springs located near the central part of the Upper Moapa Valley, which that collectively discharge approximately 37,000 acre-feet annually of underground water, are fully appropriated pursuant to the Muddy River Decree.¹⁸ It is believed that the source of water discharged originates mainly from the carbonate-rock aquifer system, but it is unknown if the discharge originates solely from the White River Flow System or is also influenced by discharge from the Meadow Valley Flow System or if there is influence from the alluvial aquifer.

WHEREAS, listed endangered and/or potential threatened species exist in the Muddy Springs/Muddy River area.

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that their own expert witnesses are unable to make a suggestion to the State Engineer as to what part of the water budget could be captured without a great deal of uncertainty, and that the question cannot be resolved without stressing the system.¹⁹

¹⁴ See, testimony of Terry Katzer and David Donovan; Exhibit 54, p. 4-25, public administrative hearing before the State Engineer, July 16-24, 2001.

¹⁵ Taking into account for 4,000 afa of in-basin recharge and 1,000 afa of evapotranspiration.

¹⁶ See, testimony of Terry Katzer and David Donovan, public administrative hearing before the State Engineer, July 16-24, 2001.

¹⁷ See, testimony of Terry Katzer and David Donovan, public administrative hearing before the State Engineer, July 16-24, 2001.

¹⁸ Judgment and Decree, In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

¹⁹ See, testimony of Terry Katzer and David Donovan, public administrative hearing before the State Engineer, June 16-24, 2001.

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that the State Engineer's ability to determine if development of the carbonate-rock aquifer system will impact existing rights is dependent on how the water rights are brought "on-line" and monitored.²⁰

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that little is known about the hydrologic connectivity between the groundwater basins, that virtually nothing is known about the mountain blocks, estimates of recharge to the area can vary by a factor of two, there is probably some connectivity between the water in the carbonate-rock aquifers and the alluvial groundwater basins,²¹ there is still little data available and not much has changed from the information known in 1984.

WHEREAS, the State Engineer has been provided several different models, which though based on little pumping data, all provide the State Engineer with different analyses, and which all indicate that the pumping of substantial amounts of carbonate-rock aquifer water will likely impact the sources of the Muddy River.

WHEREAS, the State Engineer has previously granted groundwater permits, which authorize use of underground water in the area underlain by the carbonate-rock aquifer system or directly from the carbonate-rock aquifer system in the following quantities:

Coyote Springs Valley (Basin 210)	16,300 acre-feet
Black Mountain (Basin 215)	10,216 acre-feet
Garnet Valley (Basin 216)	3,380 acre-feet
Hidden Valley (Basin 217)	2,200 acre-feet ²²
Muddy River Springs aka Upper Moapa Valley (Basin 219)	14,756 acre-feet
Lower Moapa Valley (Basin 220)	5,813 acre-feet 50,465 acre-feet

WHEREAS, of all the water rights issued from the carbonate-rock aquifer system, to date very few have actually been pumped.

WHEREAS, if 16,000 to 17,000 acre-feet is believed to by-pass the Muddy River Springs area, the water right permits already issued in Coyote Springs Valley alone equal the estimate of the amount of carbonate flow that by-passes the region and is not part of the flow discharged from the Muddy River Springs area.

WHEREAS, Nevada Revised Statute § 533.370(2)(b) provides that the State Engineer may postpone action on an application in areas where studies of water supplies are necessary.

WHEREAS, Nevada Revised Statute § 533.368 provides that if the State Engineer determines that a hydrological study, an environmental study or any other study is necessary before he makes a final determination on an application, and the applicant, a governmental agency or other person has not conducted such a study or the required study is not available, the State Engineer shall advise the applicant of the need for the study and the type of study required.

²⁰ *Ibid.*

²¹ *Ibid.*

²² This 2,200 acre-feet is combined with 2,200 acre-feet issued in Garnet Valley for a total of 2,200 afa between the two basins.

WHEREAS, Nevada Revised Statute § 533.368(4) provides that the State Engineer shall consult with the applicant and the governing body of the county or counties in which the point of diversion and place of use are located concerning the scope and progress of the study.

WHEREAS, the State Engineer believes it is prudent to work with a model, and the appropriate model will be determined in conjunction with the parties identified below who are responsible for participating in the study.

WHEREAS, the State Engineer does not believe it is prudent to issue any additional water rights to be pumped from the identified portions of the carbonate-rock aquifer until a significant portion of the water rights which have already been issued are pumped for a substantial period of time in order to determine if the pumping of those water rights will have any detrimental impacts on existing water rights or the environment.

NOW THEREFORE, the State Engineer orders:

1. All applications pending and any new filings for the appropriation of water from the carbonate-rock aquifer system in Coyote Springs Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs aka as Upper Moapa Valley (Basin 219), and Lower Moapa Valley (Basin 220) will be held in abeyance until further information is obtained by stressing the aquifer by those water right permits already issued to appropriate water from the carbonate-rock aquifer system.
2. While the studies proposed in 1985 were a beginning, those studies indicated that large-scale developments with sustained withdrawals of water from the carbonate-rock aquifers would result in water-level declines and depletion of stored water, but that isolated smaller groundwater developments or developments of limited duration may result in water-level declines and springflow reductions of manageable and acceptable magnitudes. However, very little additional information based on hard science has been produced since that time. Nevada Revised Statute § 533.368 provides the State Engineer with the authority to withhold action on pending applications and to advise the applicant of the need for additional study. The State Engineer finds that further hydrological study is needed before a final determination can be made on carbonate-rock aquifer system water right applications in the referenced basins.
3. The State Engineer, in conjunction with those identified below as applying for additional water rights and already having an interest in water rights permitted from the carbonate-rock aquifer system, or their successors in interest, will conduct a study to provide information on the effect of pumpage of those water rights which have already been issued from the carbonate-rock aquifer.

The entities that shall participate in the study must at a minimum include:

Las Vegas Valley Water District
Southern Nevada Water Authority
Coyote Springs Investment, LLC
Nevada Power Company
Moapa Valley Water District.

The study must cover a 5-year minimum period during which at least 50% of the water rights currently permitted in the Coyote Springs Valley groundwater basin are pumped for at least 2 consecutive years.

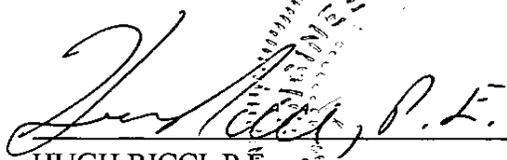
4. These referenced applicants or permittees shall bear the cost of the study, and a cash deposit divided pro rata among them will be required as set forth in NRS § 533.368(3) after a determination of the estimate of cost to complete the study.

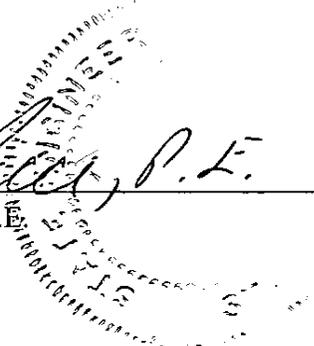
5. The State Engineer will arrange meetings between the State Engineer and the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, and Moapa Valley Water District, or their successors, and the governing bodies of the counties in which there are proposed points of diversion and places of use under their pending applications concerning the scope of the study.

6. The State Engineer orders the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Environmental Technologies, Inc., Chemical Lime Co., Nevada Cogeneration Associates, or their successors, who presently hold water rights authorized for appropriation from the carbonate-rock aquifer, to provide the other parties to the study and the State Engineer with data on a quarterly basis as to the rate at which water was diverted under the specific water right permits issued, total acre-feet diverted per month, and monthly water level measurements

7. After the study period, the Las Vegas Valley Water District; Southern Nevada Water Authority; Coyote Springs Investment, LLC; Nevada Power Company; and Moapa Valley Water District are ordered to file with the State Engineer, within 180 days of the end of the fifth consecutive year, a report as to the information obtained and any impacts seen to the groundwater or surfacewater resources of the carbonate-rock aquifer or alluvial aquifer systems from the pumping of those rights presently permitted.

8. At the end of the study period, the Las Vegas Valley Water District/Southern Nevada Water Authority will update Exhibit 54 from the July 2001 hearings in order to show the State Engineer the effects, if any, of the water it requested for appropriation under Applications 54055 - 54059, inclusive, as they are filed. The State Engineer will then make a determination if he has sufficient information to proceed with ruling on those applications for which hearings have already been conducted, i.e., Las Vegas Valley Water District (Applications 54055 - 54059, inclusive) and Coyote Springs Investment, LLC (Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive), and other applications pending for the appropriation of water from the carbonate-rock aquifer system.


HUGH RICCI, P.E.
State Engineer



Dated at Carson City, Nevada,

this 8th day of March, 2002

CERTIFICATE OF SERVICE

I, the undersigned, declare under penalty of perjury, that I am an employee of the Nevada Division of Water Resources, that I am over the age of eighteen (18) years, and that I am not a party to, nor interested in, this action. On this date, I mailed a true and correct copy of Nevada Division of Water Resources' Order No. 1169, addressed to the following:

Las Vegas Valley Water District
Attn: Kay Brothers
1001 S. Valley View
Las Vegas, NV 89153
Cert. Mail #7000 0520 0023 8555 9034

Coyote Springs Investment, L.L.C.
7755 Spanish Springs Road
Sparks, NV 89436
Cert. Mail #7000 0520 0023 8555 9041

C.S. Inc.
Judy Kuban
1625 Wendy Way
Reno, NV 89509
Cert. Mail #7000 0520 0023 8555 9058

Dry Lake Water, LLC
2701 North Tenaya Way, Suite 200
Las Vegas, NV 89128
Cert. Mail #7000 0520 0023 8555 9065

Bonneville Nevada Corp.
257 East 200 South, Suite 800
Salt Lake City, UT 84111
Cert. Mail #7000 0520 0023 8555 9072

C.O. Myers, Exec. Dir.
Nevada Cogeneration Ass.
P.O. Box 81378
Bakersfield, CA 93380
Cert. Mail #7000 0520 0023 8555 9089

Nevada Power Co.
Attn: Craig York
P.O. Box 230
Las Vegas, NV 89151-0001
Cert. Mail #7000 0520 0023 8555 9096

Oxford Energy of Nevada, Inc.
3510 Unocal Place
Santa Rosa, CA 95403
Cert. Mail #7000 0520 0023 8555 9102

James W. Adams
7439 La Palma Ave., Suite 234
Buena Park, CA 90620
Cert. Mail #7000 0520 0023 8555 9119

Stallion Sand & Gravel, LLC
624 Casa del Norte
North Las Vegas, NV 89031
Cert. Mail #7000 0520 0023 8555 9126

Moapa Band of Paiute Indians
P.O. Box 340
Moapa, NV 89025
Cert. Mail #7000 0520 0023 8558 4562

Moapa Valley Water District
P.O. Box 257
Logandale, NV 89021
Cert. Mail #7000 0520 0023 8558 4579

Three Kids Enterprises
4055 S. Spencer St., Suite 106
Las Vegas, NV 89119
Cert. Mail #7000 0520 0023 8558 4586

Sandia Construction Inc.
c/o Cameron Adams
Box 1297
Susanville, CA 96103
Cert. Mail #7000 0520 0023 8558 4593

Nevada Cogeneration Associates
420 N. Nellis Blvd., #A3-148
Las Vegas, NV 89110
Cert. Mail #7000 0520 0023 8558 4609

N. Burgess
420 N. Nellis Blvd., #A3-117
Las Vegas, NV 89110
Cert. Mail #7000 0520 0023 8558 4616

North Valley Holdings
500 Damonte Ranch Parkway, Suite 1056
Reno, NV 89511
Cert. Mail #7000 0520 0023 8558 4623

Michael Buschelman
P.O. Box 51371
Sparks, NV 89435
Cert. Mail #7000 0520 0023 8558 4630

William Penn
CMS Generation Co.
330 Town Center Drive, Ste. 1100
Dearborn, MI 48126
Cert. Mail #7000 0520 0023 8558 4647

Thomas Shelton
CMS Generation Co.
2154 Hastings Ct.
Santa Rosa, CA 95495-8577
Cert. Mail #7000 0520 0023 8558 4654

Wyman Engineering Consultants
P.O. Box 60473
Boulder City, NV 89006-0473
Cert. Mail #7000 0520 0023 8558 4661

John E. Hiatt
8180 Placid St.
Las Vegas, NV 89123
Cert. Mail #7000 0520 0023 8558 4678

City of Caliente
Attn: George T. Rowe, Mayor
P.O. Box 158
Caliente, NV 89008
Cert. Mail #7000 0520 0023 8558 4685

County of Nye
P.O. Box 1767
Tonopah, NV 89049
Cert. Mail #7000 0520 0023 8558 4692

Ely Shoshone Tribe
16 Shoshone Circle
Ely, NV 89301
Cert. Mail #7000 0520 0023 8558 4708

Lincoln County, Board of Commissioners
P.O. Box 90
Pioche, NV 89043
Cert. Mail #7000 0520 0023 8558 4715

Clark County Commissioners
500 S. Grand Central Parkway
Las Vegas, NV 89106-4506
Cert. Mail #7000 0520 0023 8558 4807

Muddy Valley Irrigation District
P.O. Box 160
Logandale, NV 89021
Cert. Mail #7000 0520 0023 8558 4722

U.S. Bureau of Indian Affairs
Attn: Barry Welch
P.O. Box 10
Phoenix, Az. 85001
Cert. Mail #7000 0520 0023 8558 4739

U.S.D.I., B.L.M.
Attn: Ben F. Collins, District Manager
P.O. Box 26569
Las Vegas, NV 89126
Cert. Mail #7000 0520 0023 8558 4746

U.S. Fish and Wildlife Service
911 NE 11th Ave.
Portland, OR 97232-4184
Cert. Mail #7000 0520 0023 8558 4753

U.S. National Park Service
Dan McGlothlin
1201 Oak Ridge Drive, Suite 250
Fort Collins, CO 80525
Cert. Mail #7000 0520 0023 8558 4760

Republic Environmental Technologies, Inc.
770 E. Sahara Ave.
Las Vegas, NV 89104
Cert. Mail #7000 0520 0023 8558 4777

Chemical Lime Co.
P.O. Box 3609
North Las Vegas, NV 89036
Cert. Mail #7000 0520 0023 8558 4784

Nevada Cogeneration Associates
420 N. Nellis Blvd., A3-148 and 117
Las Vegas, NV 89110
Cert. Mail #7000 0520 0023 8558 4791

Richard Berley/Mark Slonim
Ziontz, Chestnut, Varnell, Berley and Slonim
2101 4th Ave., Suite 1230
Seattle, WA 98121

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Kilpatrick, Johnston & Adler
412 North Division St.
Carson City, NV 89703

Ross de Lipkau
Marshall Hill Cassas & de Lipkau
P.O. Box 2790
Reno, NV 89505

Peter Fahmy
U.S. Dept. of Interior
755 Parfet St., Suite 151
Lakewood, CO 80215

Robert Marshall
Marshall Hill Cassas & deLipkau
P.O. Box 2790
Reno, NV 89505

Byron Mills
732 S. 6th St.
Las Vegas, NV 89101

Steve Palmer
Office of the Regional Solicitor
U.S. Dept. of Interior
2800 Cottage Way, Room E-2753
Sacramento, CA 95825-1890

Karen Peterson
Allison, MacKenzie, Hartman, et. al.
P.O. Box 646
Carson City, NV 89702

Peggy Twedt
Frank Flaherty
Dyer, Lawrence, Cooney & Penrose
2805 N. Mountain St.
Carson City, NV 89703

Harvey Whittemore
Carl Savely
Lionel, Sawyer & Collins
50 West Liberty St. Suite 1100
Reno, NV 89501

Don Winter
Agent C.S. Inc.
P.O. Box 35136
Las Vegas, NV 89133

Charles Cave
2325 W. Charleston Blvd.
Las Vegas, NV 89102

Dale Ferguson
Woodburn & Wedge
6100 Neil Road, Ste. 500
Reno, NV 89511

Mark Stock
Global Hydrologic Services, Inc.
561 Keystone Ave. #200
Reno, NV 89503

Linda Bowman
540 Hammil Lane
Reno, NV 89511

George Benesch
P.O. Box 3498
Reno, NV 89505

Dated this 8 day of March, 2002.



IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

1026

O R D E R

DESIGNATING AND DESCRIBING CALIFORNIA WASH
(BASIN NUMBER 218) GROUND WATER BASIN IN
CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the California Wash Ground Water Basin, Clark County, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Water).

T.14S., R.64E., M.D.B.&M.

That portion of Sections 23, 33, 34, 35 and 36 lying within the Natural Drainage Basin of California Wash.

T.14S., R.65E., M.D.B.&M.

All of Section 36 and that poriton of Sections 25, 26, 27, 30, 31, 32, 33, 34 and 35 lying within the Natural Drainage Basin of California Wash.

T.14S., R.66E., M.D.B.&M.

All of Sections 30, 31 and 32 and that portion of Sections 19, 20, 28, 29, 33 and 34 lying within the Natural Drainage Basin of California Wash.

T.15S., R.63E., M.D.B.&M.

That portion of Sections 12, 13, 23, 24, 25 and 36 lying within the Natural Drainage Basin of California Wash.

T.15S., R.64E., M.D.B.&M.

All of Sections 1, 2, 3, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35 and 36 and that portion of Sections 4, 5, 6, 7, 9, and 31 lying within the Natural Drainage Basin of California Wash.

T.15S., R.65E., M.D.B.&M.

All Sections.

T.15S., R.66E., M.D.B.&M.

All of Sections 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 31 and 32 and that portion of

Sections 2, 3, 11, 14, 23, 26, 27, 33 and 34 lying within the Natural Drainage Basin of California Wash.

T.16S., R.64E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 23, 24, 25, and 36 and that portion of Sections 5, 6, 8, 9, 15, 16, 22, 26, 27, 34 and 35 lying within the Natural Drainage Basin of California Wash.

T.16S., R.65E., M.D.B.&M.

All Sections.

T.16S., R.66E., M.D.B.&M.

All of Sections 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 29, 30, 31 and 32 and that portion of Sections 3, 4, 10, 11, 14, 15, 21, 22, 23, 28 and 33 lying within the Natural Drainage Basin of California Wash.

T.17S., R.64E., M.D.B.&M.

All of Sections 12, 13, 24, 25, and 36 and that portion of Sections 10, 11, 14, 15, 23, 26 and 35 lying within the Natural Drainage Basin of California Wash.

T.17S., R.65E., M.D.B.&M.

All Sections.

T.17S., R.66E., M.D.B.&M.

All of Sections 7, 8, 17, 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 9, 10, 15, 16, 22, 23, 26 and 35 lying within the Natural Drainage Basin of California Wash.

T.18S., R.64E., M.D.B.&M.

All of Sections 1, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 28, 34, 35 and 36 and that portion of Sections 2, 3, 4, 9, 10, 16, 20, 21, 29, 32 and 33 lying within the Natural Drainage Basin of California Wash.

T.18S., R.65E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 24, 25, 26 and 35 lying within the Natural Drainage Basin of California Wash.

T.18S., R.66E., M.D.B.&M.

All of Sections 3, 4 and 6 and that portion of Sections 2, 5, 7, 8, 9, 10, 11, 18 and 19 lying within the Natural Drainage Basin of California Wash.

T.19S., R.64E., M.D.B.&M.

All of Sections 1, 2, 3, 11 and 12 and that portion of Sections 4, 9, 10, 13, 14, 15 and 23 lying within the Natural Drainage Basin of California Wash.

T.19S., R.65E., M.D.B.&M.

All of Sections 3, 4, 5, and 6 and that portion of Sections 2, 7, 8, 9, 10, 11, 12, 14, 15 and 18 lying within the Natural Drainage Basin of California Wash.

A public hearing as required under NRS 534.030, in the matter of the designation of California Wash was held in Las Vegas, Nevada, on January 29, 1990. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of additional administration under the provisions of NRS Chapter 534.

The designated California Wash Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, quasi-municipal, industrial, commercial, mining, stockwater and wildlife purposes are to be considered a preferred use in California Wash.


R. MICHAEL TURNIPSEED, P.E.
State Engineer

Dated at Carson City, Nevada,

this 24th day of April, 1990

IN THE OFFICE OF THE STATE ENGINEER

OF THE STATE OF NEVADA

O R D E RDESIGNATING AND DESCRIBING GARNET VALLEY
(BASIN NUMBER 216) GROUND WATER BASIN IN
CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the Garnet Valley Ground Water Basin, Clark County, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Water).

T.15S., R.63E., M.D.B.&M.

That portion of Sections 23, 24, 25, 26, 35 and 36 lying within the Natural Drainage Basin of Garnet Valley.

T.15S., R.64E., M.D.B.&M.

That portion of Section 31 lying within the Natural Drainage Basin of Garnet Valley.

T.16S., R.61E., M.D.B.&M.

That portion of Sections 25 and 36 lying within the Natural Drainage Basin of Garnet Valley.

T.16S., R.62E., M.D.B.&M.

All of Section 31 and that portion of Sections 20, 21, 28, 29, 30, 32 and 33 lying within the Natural Drainage Basin of Garnet Valley.

T.16S., R.63E., M.D.B.&M.

All of Sections 1, 12, 13, 23, 24, 25, 26, 34, 35 and 36 and that portion of Sections 2, 10, 11, 14, 15, 22, 27, 28 and 33 lying within the Natural Drainage Basin of Garnet Valley.

T.16S., R.64E., M.D.B.&M.

All of Sections 7, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32 and 33 and that portion of Sections 5, 6, 8, 9, 15, 16, 22, 26, 27, 34 and 35 lying within the Natural Drainage Basin of Garnet Valley.

T.17S., R.61E., M.D.B.&M.

That portion of Sections 13, 24 and 25 lying within the

Natural Drainage Basin of Garnet Valley.

T.17S., R.62E., M.D.B.&M.

All of Sections 8, 17, 19, 20, 27, 34, 35 and 36 and that portion of Sections 7, 9, 16, 18, 21, 22, 23, 25, 26, 28, 29, 30 and 33 lying within the Natural Drainage Basin of Garnet Valley.

T.17S., R.63E., M.D.B.&M.

All of Sections 11, 12, 13, 14, 23, 24, 25, 26, 27, 31, 32, 33, 34, 35 and 36 and that portion of Sections 9, 10, 15, 16, 21, 22, 28, 29 and 30 lying within the Natural Drainage Basin of Garnet Valley.

T.17S., R.64E., M.D.B.&M.

All of Sections 7, 8, 9, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 10, 14, 15, 23, 26 and 35 lying within the Natural Drainage Basin of Garnet Valley.

T.18S., R.62E., M.D.B.&M.

All of Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and 24 and that portion of Sections 4, 5, 8, 9, 16, 17, 21, 22, 23, 25, 26 and 36 lying within the Natural Drainage Basin of Garnet Valley.

T.18S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 35 and 36 and that portion of Sections 31, 32, and 33 lying within the Natural Drainage Basin of Garnet Valley.

T.18S., R.64E., M.D.B.&M.

All of Sections 5, 6, 7, 8, 17, 18 and 19 and that portion of Sections 2, 3, 4, 9, 10, 16, 20, 21, 29, 30 and 31 lying within the Natural Drainage Basin of Garnet Valley.

T.19S., R.63E., M.D.B.&M.

That portion of Sections 1, 2, 3, 4, 11, and 12 lying within the Natural Drainage Basin of Garnet Valley.

T.19S., R.64E., M.D.B.&M.

That portion of Section 6 lying within the Natural Drainage Basin of Garnet Valley.

A public hearing as required under NRS 534.030, in the matter of the designation of Garnet Valley was held in Las Vegas, Nevada, on January 29, 1990. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of additional administration under the provisions of NRS Chapter 534.

The designated Garnet Valley Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, quasi-municipal, industrial, commercial, mining, stockwater and wildlife purposes are to be considered a preferred use in Garnet Valley.


R. MICHAEL TURNIPSEED, P.E.
State Engineer

Dated at Carson City, Nevada,

this 24th day of April, 1990

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

O R D E R

DESIGNATING AND DESCRIBING HIDDEN VALLEY (NORTH)
(BASIN NUMBER 217) GROUND WATER BASIN IN
CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the Hidden Valley (North) Ground Water Basin, Clark County, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Water).

T.15S., R.62E., M.D.B.&M.

All of Sections 35 and 36 and that portion of Sections 25, 26, 27, 32, 33 and 34 lying within the Natural Drainage Basin of Hidden Valley (North).

T.15S., R.63E., M.D.B.&M.

All of Sections 31, 32, 33 and 34 and that portion of Sections 22, 23, 26, 27, 28, 29, 30 and 35 lying within the Natural Drainage Basin of Hidden Valley (North).

T.16S., R.62E., M.D.B.&M.

All of Sections 1, 2, 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 34, 35 and 36 and that portion of Sections 3, 5, 7, 8, 18, 19, 20, 21, 28, 29, 30, 32 and 33 lying within the Natural Drainage Basin of Hidden Valley (North).

T.16S., R.63E., M.D.B.&M.

All of Sections 3, 4, 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 29, 30, 31 and 32 and that portion of Sections 2, 10, 11, 14, 15, 22, 27, 28 and 33 lying within the Natural Drainage Basin of Hidden Valley (North).

T.17S., R.62E., M.D.B.&M.

All of Sections 10, 11, 12, 13, 14, 15 and 24 and that portion of Sections 9, 16, 21, 22, 23, 25 and 26 lying within the Natural Drainage Basin of Hidden Valley (North).

T.17S., R.63E., M.D.B.&M.

All of Sections 7, 8, 17, 18, 19 and 20 and that portion of Sections 9, 10, 15, 16, 21, 22, 28, 29 and 30 lying within the Natural Drainage Basin of Hidden Valley (North).

A public hearing as required under NRS 534.030, in the matter of the designation of Hidden Valley (North) was held in Las Vegas, Nevada, on January 29, 1990. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of additional administration under the provisions of NRS Chapter 534.

The designated Hidden Valley (North) Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, quasi-municipal, industrial, commercial, mining, stockwater and wildlife purposes are to be considered a preferred use in Hidden Valley (North).


R. MICHAEL TURNIPSEED, P.E.
State Engineer

Dated at Carson City, Nevada,

this 24th day of April, 1990

All of Sections 7, 8, 17, 18, 19 and 20 and that portion of Sections 9, 10, 15, 16, 21, 22, 28, 29 and 30 lying within the Natural Drainage Basin of Hidden Valley (North).

A public hearing as required under NRS 534.030, in the matter of the designation of Hidden Valley (North) was held in Las Vegas, Nevada, on January 29, 1990. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of additional administration under the provisions of NRS Chapter 534.

The designated Hidden Valley (North) Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, quasi-municipal, industrial, commercial, mining, stockwater and wildlife purposes are to be considered a preferred use in Hidden Valley (North).


R. MICHAEL TURNIPSEED, P.E.
State Engineer

Dated at Carson City, Nevada,

this 24th day of April, 1990

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

O R D E R

DESIGNATING AND DESCRIBING THE MUDDY RIVER SPRINGS AREA
(BASIN NUMBER 219) GROUND WATER BASIN IN
CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the heretofore undesignated portion of the Muddy River Springs Area Ground Water Basin, Clark County, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Water).

T.11S., R.64E., M.D.B.&M.

All of Section 28 and that portion of Sections 15, 16, 20, 21, 22, 27, 29, 32, 33 and 34 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.12S., R.64E., M.D.B.&M.

All of Sections 16, 17, 20, 21, 28, 29, 33 and 34 and that portion of Sections 2, 3, 4, 5, 7, 8, 9, 10, 15, 18, 19, 22, 26, 27, 30, 31, 32 and 35 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.13S., R.63E., M.D.B.&M.

That portion of Sections 25 and 36 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.13S., R.64E., M.D.B.&M.

All of Sections 3, 4, 9, 10, 11, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35 and 36 and that portion of Sections 1, 2, 5, 8, 12, 17, 19, 20 and 30 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.13S., R.65E., M.D.B.&M.

All of Sections 17, 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 6, 7, 8, 9, 15, 16, 22, 23, 26, 35 and 36 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.13 1/2S., R.63E., M.D.B.&M.

That portion of Section 36 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.13 1/2S., R.64E., M.D.B.&M.

All Sections.

T.14S., R.63E., M.D.B.&M.

That portion of Sections 1, 12, 13, 24, 25, 35 and 36 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.14S., R.64E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31 and 32 and that portion of Sections 25, 33, 34, 35 and 36 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.14S., R.65E., M.D.B.&M.

All of Sections 3, 6, 7, 18, 19, 20, 28 and 29 and that portion of Sections 1, 2, 12, 26, 27, 30, 31, 32, 33 and 35 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.14S., R.66E., M.D.B.&M.

That portion of Section 19 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.15S., R.63E., M.D.B.&M.

That portion of Sections 1, 2 and 12 lying within the Natural Drainage Basin of the Muddy River Springs Area.

T.15S., R.64E., M.D.B.&M.

That portion of Sections 4, 5, 6, 7, 8 and 9 lying within the Natural Drainage Basin of the Muddy River Springs Area.

A public hearing as required under NRS 534.030, in the matter of the designation of Muddy River Springs Area was held in Moapa, Nevada, on January 30, 1990. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of

additional administration under the provisions of NRS Chapter 534.

The designated Muddy River Springs Area Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, quasi-municipal, industrial, commercial, mining, stockwater and wildlife purposes are to be considered a preferred use in the Muddy River Springs Area.


R. MICHAEL TURNIPSEED, P.E.
State Engineer

Dated at Carson City, Nevada,

this 24th day of April, 1990

ORDERDESIGNATING AND DESCRIBING THE BLACK MOUNTAINS AREA
(BASIN NUMBER 215) GROUND WATER BASIN IN
CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the Black Mountains Area Ground Water Basin, Clark County, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Water).

T.16S., R.67E., M.D.B.&M.

That portion of Section 36 lying within the natural drainage basin of Black Mountains Area.

T.16S., R.68E., M.D.B.&M.

All of Section 32 and that portion of Sections 29, 30, 31 and 33 lying within the natural drainage basin of Black Mountains Area.

T.17S., R.66E., M.D.B.&M.

All of Sections 25 and 36 and that portion of Sections 23, 24, 26 and 35 lying within the natural drainage basin of Black Mountains Area.

T.17S., R.66-1/2E., M.D.B.&M.

All of Sections 30 and 31 and that portion of Section 19 lying within the natural drainage basin of Black Mountains Area.

T.17S., R.67E., M.D.B.&M.

All of Sections 13, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 1, 11, 12, 14, 15, 16, 18, 19, 20 and 21 lying within the natural drainage basin of Black Mountains Area.

T.17S., R.68E., M.D.B.&M.

All of Sections 4, 5, 6, 7, 8, 9, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33 and 34, and that portion of Sections 3, 10, 11, 14, 24, 25, 35 and 36 lying within the natural drainage basin of Black Mountains Area.

T.18S., R.64E., M.D.B.&M.

That portion of Sections 29, 30, 31 and 32 lying within the natural drainage basin of Black Mountains Area.

T.18S., R.65E., M.D.B.&M.

All of Section 36 and that portion of Sections 24, 25, 26 and 35 lying within the natural drainage basin of Black Mountains Area.

T.18S., R.66E., M.D.B.&M.

All of Sections 1, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 2, 7, 8, 9, 10, 11, 18 and 19 lying within the natural drainage basin of Black Mountains Area.

T.18S., R.66-1/2E., M.D.B.&M.

All Sections.

T.18S., R.67E., M.D.B.&M.

All Sections.

T.18S., R.68E., M.D.B.&M.

All of Sections 3, 4, 5, 6, 7, 8, 9, 17, 18, 19, 20, 29, 30, 31 and 32, and that portion of Sections 2, 10, 11, 15, 16, 21, 28 and 33 lying within the natural drainage basin of Black Mountains Area.

T.19S., R.63E., M.D.B.&M.

All of Sections 13, 24, 25, 26, 35 and 36, and that portion of Sections 1, 11, 12, 14, 22, 23, 27, 28, 33 and 34 lying within the natural drainage basin of Black Mountains Area.

T.19S., R.64E., M.D.B.&M.

All of Sections 5, 7, 8, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 4, 6, 9, 10, 13, 14, 15 and 23 lying within the natural drainage basin of Black Mountains Area.

T.19S., R.65E., M.D.B.&M.

All of Sections 1, 12, 13, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 2, 7, 8, 9, 10, 11, 14, 15 and 18 lying within the natural drainage basin of Black Mountains Area.

T.19S., R.66E., M.D.B.&M.

All Sections.

T.19S., R.66-1/2E., M.D.B.&M.

All Sections.

T.19S., R.67E., M.D.B.&M.

All Sections.

T.19S., R.68E., M.D.B.&M.

All of Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31 and 32, and that portion of Sections 4, 9, 16, 21, 22, 28 and 33 lying within the natural drainage basin of Black Mountains Area.

T.20S., R.62E., M.D.B.&M.

That portion of Sections 24 and 25 lying within the natural drainage basin of Black Mountains Area.

T.20S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35 and 36, and that portion of Sections 4, 5, 7, 8, 17, 18, 19, 30 and 31 lying within the natural drainage basin of Black Mountains Area.

T.20S., R.64E., M.D.B.&M.

All Sections.

T.20S., R.65E., M.D.B.&M.

All Sections.

T.20S., R.66E., M.D.B.&M.

All Sections.

T.20S., R.66-1/2E., M.D.B.&M.

All Sections.

T.20S., R.67E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 35 and 36, and that portion of Sections 31, 32 and 33 lying within the natural drainage basin of Black Mountains Area.

T.20S., R.68E., M.D.B.&M.

All of Sections 6, 7, 18, 19, 30 and 31, and that portion of Sections 4, 5, 8, 17, 20, 29 and 32 lying within the natural drainage basin of Black Mountains Area.

T.21S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 34, 35 and 36, and that portion of Sections 5, 6, 8, 9, 16, 17, 20, 21, 28 and 33 lying within the natural drainage basin of Black Mountains Area.

T.21S., R.63-1/2E., M.D.B.&M.

All Sections.

T.21S., R.64E., M.D.B.&M.

All Sections.

T.21S., R.65E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21, and that portion of Sections 22, 23, 24, 26, 27, 28, 29, 30, 31 and 32 lying within the natural drainage basin of Black Mountains Area.

T.21S., R.66E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6 and 7, and that portion of Sections 8, 9, 10, 11, 12, 15, 16, 17, 18 and 19 lying within the natural drainage basin of Black Mountains Area.

T.21S., R.67E., M.D.B.&M.

That portion of Sections 1, 2, 3 and 4 lying within the natural drainage basin of Black Mountains Area.

T.21S., R.68E., M.D.B.&M.

That portion of Sections 5, 6 and 7 lying within the natural drainage basin of Black Mountains Area.

T.22S., R.63E., M.D.B.&M.

All of Section 1 and that portion of Sections 2, 3, 4, 11, 12 and 13 lying within the natural drainage basin of Black Mountains Area.

T.22S., R.63-1/2E., M.D.B.&M.

All of Sections 1 and 12 and that portion of Sections 13 and 36 lying within the natural drainage basin of Black Mountains Area.

T.22S., R.64E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 26, 27, 28 and 33, and that portion of Sections 18, 19, 20, 25, 29, 31, 32, 34, 35 and 36 lying within the natural drainage basin of Black Mountains Area.

T.22S., R.65E., M.D.B.&M.

All of Sections 7, 18 and 19 and that portion of Sections 5, 6, 8, 16, 17, 20, 29 and 30 lying within the natural drainage basin of Black Mountains Area.

T.23S., R.64E., M.D.B.&M.

That portion of Sections 3, 4, 5, 6 and 8 lying within the natural drainage basin of Black Mountains Area.

A public hearing, as required under NRS 534.030, in the matter of the designation of Black Mountains Area was held in Las Vegas, Nevada, on October 30, 1989. Based on information received at the hearing and other data and information available to the State Engineer, it is determined that this ground water basin is in need of additional administration under the provisions of NRS Chapter 534.

The designated Black Mountains Area Ground Water basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

In accordance with NRS 534.120, subsection 2, the irrigation of land using ground water is not considered to be a preferred use of the limited resource and applications to appropriate underground water for irrigation will be denied in the above described area. Further, appropriation of ground water for municipal, industrial, commercial and power generation purposes is to be considered a preferred use in the Black Mountains Area.



Peter G. Morros
State Engineer

Dated at Carson City, Nevada,
this 22nd day of NOVEMBER, 1989.

O R D E R

DESIGNATING AND DESCRIBING
THE COYOTE SPRING VALLEY (BASIN NUMBER 13-210)
GROUND WATER BASIN AND ALSO NOTICE OF
DESIGNATION OF PREFERRED USE OF A
LIMITED GROUND WATER RESOURCE IN
CLARK AND LINCOLN COUNTIES, NEVADA

The State Engineer finds that conditions warrant the designation of the Coyote Spring Valley Ground Water Basin, Clark and Lincoln Counties, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of NRS Chapter 534 (Conservation and Distribution of Underground Waters).

T.8S., R.63E., M.D.B.&M.

All of Sections 13, 24, 25, 26, 34, 35 and 36 and that portion of Sections 11, 12, 14, 22, 23, 27, 28 and 33 lying within the natural drainage basin of Coyote Spring Valley.

T.8S., R.64E., M.D.B.&M.

All of Sections 19, 20, 30 and 31 and that portion of Sections 7, 15, 16, 17, 18, 21, 28, 29 and 32 lying within the natural drainage basin of Coyote Spring Valley.

T.9S., R.61E., M.D.B.&M.

All of Sections 25, 35 and 36 and that portion of Sections 23, 24, 26, 27 and 34 lying within the natural drainage basin of Coyote Spring Valley.

T.9S., R.62E., M.D.B.&M.

All of Sections 12, 13, 14, 15, 21, 22, 23, 24, 25, 26, 27, 28, 31, 32, 33, 34, 35 and 36 and that portion of Sections 1, 2, 3, 9, 10, 16, 17, 19, 20, 29 and 30 lying within the natural drainage basin of Coyote Spring Valley.

T.9S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 and that portion of Sections 4, 5 and 6 lying within the natural drainage basin of Coyote Spring Valley.

T.9S., R.64E., M.D.B.&M.

All of Sections 5, 6, 7, 8, 17, 18, 19, 20, 30 and 31 and that portion of Sections 4, 9, 10, 16, 21, 28, 29 and 32 lying within the natural drainage basin of Coyote Spring Valley,.

T.10S., R.61E., M.D.B.&M.

All of Sections 1, 2, 11, 12, 13, 14, 23, 24, 25, 26, 35 and 36 and that portion of Sections 3, 10, 15, 22, 27 and 34 lying within the natural drainage basin of Coyote Spring Valley.

T.10S., R.62E., M.D.B.&M.

All Sections.

T.10S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 12, 13, 24, 25, 26, 35 and 36 lying within the natural drainage basin of Coyote Spring Valley.

T.10S., R.64E., M.D.B.&M.

That portion of Sections 5, 6 and 7 lying within the natural drainage basin of Coyote Spring Valley.,

T.11S., R.61E., M.D.B.&M.

All of Sections 1, 2, 11, 12, 13, 24, 25 and 36 and that portion of Sections 3, 10, 14, 15, 22, 23, 26 and 35 lying within the natural drainage basin of Coyote Spring Valley.

T.11S., R.62E., M.D.B.&M.

All Sections.

T.11S., R.63E., M.D.B.&M.

All of Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 and that portion of Section 1 lying within the natural drainage basin of Coyote Spring Valley.

T.11S., R.64E., M.D.B.&M.

All of Sections 7, 17, 18, 19, 30 and 31 and that portion of Sections 5, 6, 8, 9, 10, 15, 16, 20, 21, 29, 32 and 33 lying within the natural drainage basin of Coyote Spring Valley.

T.12S., R.61E., M.D.B.&M.

All of Sections 1, 12, 13, 25 and 36 and that portion of Sections 2, 11, 14, 23, 24, 26 and 35 lying within the natural drainage basin of Coyote Spring Valley.

T.12S., R.62E., M.D.B.&M.

All Sections.

T.12S., R.63E., M.D.B.&M.

All Sections.

T.12S., R.64E., M.,D.B.&M.

All of Section 6 and that portion of Sections 4, 5, 7, 8, 9, 18, 19, 30, 31 and 32 lying within the natural drainage basin of Coyote Spring Valley.

T.12½S., R.61E., M.D.B.&M.

All of Sections 36 and that portion of Section 35 lying within the natural drainage basin of Coyote Spring Valley.

T.12½S., R.62E., M.D.B.&M.

All of Sections 31, 32, 33, 34, 35 and 36 lying within the natural drainage basin of Coyote Spring Valley.

T.13S., R.61E., M.D.B.&M.

All of Sections 24, 25, 35 and 36 and that portion of Sections 1, 2, 12, 13, 14, 23, 26, 27 and 34 lying within the natural drainage basin of Coyote Spring Valley.

T.13S., R.62E., M.D.B.&M.

All Sections.

T.13S., R.63E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35 and that portion of Sections 25 and 36 lying within the natural drainage basin of Coyote Spring Valley.

T.13S., R.64E., M.D.B.&M.

All of Sections 6, 7 and 18 and that portion of Sections 5, 8, 17, 19, 20 and 30 lying within the natural drainage basin of Coyote Spring Valley.

T.13½S., R.63E., M.D.B.&M.

All of Sections 31, 32, 33, 34 and 35 and that portion of Section 36 lying within the natural drainage basin of Coyote Spring Valley.

T.14S., R.61E., M.D.B.&M.

All of Sections 1, 2, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 28, 29, 33, 34, 35 and 36 and that portion of Sections 3, 9, 10, 16, 17, 19, 20, 21, 30, 31 and 32 lying within the natural drainage basin of Coyote Spring Valley.

T.14S., R.62E., M.D.B.&M.

All Sections.

T.14S., R.63E., M.D.B.&M.

All of Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33 and 34 and that portion of Sections 1, 12, 13, 24, 25, 35 and 36 lying within the natural drainage basin of Coyote Spring Valley.

T.15S., R.61E., M.D.B.&M.

All of Sections 1, 2, 3, 10, 11, 12 and 13 and that portion of Sections 4, 5, 9, 14, 15, 16, 22, 23 and 24 lying within the natural drainage basin of Coyote Spring Valley.

T.15S., R.62E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24 and 28 and that portion of Sections 19, 25, 26, 27, 29, 30, 31, 32, 33 and 34 lying within the natural drainage basin of Coyote Spring Valley.

T.15S., R.63E., M.D.B.&M.

All of Sections 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20 and 21 and that portion of Sections 1, 2, 12, 13, 22, 23, 24, 27, 28, 29 and 30 lying within the natural drainage basin of Coyote Spring Valley.

T.16S., R.62E., M.D.B.&M.

That portion of Sections 3 and 5 lying within the natural drainage basin of Coyote Spring Valley.

A public hearing, as required under NRS 534.030, in the matter of the designation of Coyote Spring Valley Ground Water Basin was held in Las Vegas, Nevada, on August 13, 1985.

The designated Coyote Spring Valley Basin is depicted and defined on Nevada Division of Water Resources, State Engineer's office maps.

Most of the available ground water for Municipal, Power, Industrial and Domestic purposes occurs in the above described area. The safeguarding of the aforementioned limited water supply necessitates and demands that Municipal, Power, Industrial and Domestic use be declared a preferred use of the ground water resource pursuant to NRS 534.120.



Peter G. Morros
State Engineer

Dated at Carson City, Nevada,
this 21st day of AUGUST 1985.

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

O R D E R

DESIGNATING AND DESCRIBING THE
LOWER MEADOW VALLEY WASH (205)
GROUND WATER BASIN, CLARK AND
LINCOLN COUNTIES, NEVADA

The State Engineer finds that conditions warrant the designation of Lower Meadow Valley Wash Ground Water Basin, Clark and Lincoln Counties, Nevada, and by this Order designates the following described area of land as a ground water basin coming under the provisions of Chapter 534 NRS (Conservation and Distribution of Underground Waters).

T.3S., R.66E., M.D.B.&M.

Those portions of Sections 33, 34, 35 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.4S., R.65E., M.D.B.&M.

All of Sections 13, 23, 24, 25, 26, 27, 34, 35 and 36, and that portion of Sections 11, 12, 14, 15, 20, 21, 22, 28, 29, 32 and 33 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.4S., R.66E., M.D.B.&M.

All of Sections 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 1, 4, 5, 6 and 7 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.4S., R.67E., M.D.B.&M.

All of Sections 17, 18, 19, 20, 30 and 31, and that portion of Sections 6, 7, 8, 9, 16, 21, 28, 29 and 32 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.5S., R.65E., M.D.B.&M.

All of Sections 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 35 and 36, and that portion of Sections 4, 5, 8, 16, 17, 21, 28, 33 and 34 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.5S., R.66E., M.D.B.&M.

All Sections.

T.5S., R.67E., M.D.B.&M.

All of Sections 6, 7, 18, 19, 20, 29, 30, 31 and 32, and that portion of Sections 5, 8, 15, 16, 17, 21, 22, 28, 33, 34, 35 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.6S., R.65E., M.D.B.&M.

All of Sections 1, 2, 11, 12, and that portion of Sections 3, 10, 13, 14, 15, 24 and 25 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.6S., R.66E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35 and 36, and that portion of Sections 30 and 31 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.6S., R.67E., M.D.B.&M.

All of Sections 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 1, 2 and 3 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.6S., R.68E., M.D.B.&M.

All of Sections 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 24 and 25 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.6S., R.69E., M.D.B.&M.

Those portions of Sections 19, 30, 31, 32 and 33 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.7S., R.66E., M.D.B.&M.

All of Sections 1, 2, 3, 11, 12, 13 and 24, and that portion of Sections 4, 5, 6, 9, 10, 14, 15, 23, 25, 26, 35 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.7S., R.67E., M.D.B.&M.

All Sections.

T.7S., R.68E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35, and that portion of Sections 25 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.7S., R.69E., M.D.B.&M.

All of Sections 5, 6, 7 and 8, and that portion of Sections 4, 9, 10, 16, 17, 18, 19, 30 and 31 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.8S., R.66E., M.D.B.&M.

All of Sections 12, 13, 22, 23, 24, 25, 26, 27, 28, 33, 34, 35 and 36, and that portion of Sections 1, 2, 11, 14, 15, 16, 20, 21, 29, 31 and 32 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.8S., R.67E., M.D.B.&M.

All Sections.

T.8S., R.68E., M.D.B.&M.

All of Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, 28, 29, 30, 31 and 32, and that portion of Sections 1, 11, 12, 13, 24, 25, 26, 33, 34 and 35 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.8S., R.69E., M.D.B.&M.

That portion of Section 18 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.8½S., R.68E., M.D.B.&M.

All of Sections 31 and 32 and that portion of Section 33 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.9S., R.65E., M.D.B.&M.

All of Sections 25, 35 and 36, and that portion of Sections 13, 23, 24, 26, 27 and 34 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.9S., R.66E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 5, 7, 8 and 18 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.9S., R.67E., M.D.B.&M.

All Sections.

T.9S., R.68E., M.D.B.&M.

All of Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31 and 32, and that portion of Sections 4, 9, 16, 21, 28 and 33 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.10S., R.64E., M.D.B.&M.

All of Section 36, and that portion of Sections 24, 25, 26 and 35 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.10S., R.65E., M.D.B.&M.

All of Sections 1, 2, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, and that portion of Sections 3, 4, 8, 9, 17, 19 and 20 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.10S., R.66E., M.D.B.&M.

All Sections

T.10S., R.67E., M.D.B.&M.

All Sections.

T.10S., R.68E., M.D.B.&M.

All of Sections 5, 6, 7, 18, 19 and 30, and that portion of Sections 4, 8, 9, 17, 20, 28, 29, 31 and 32 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.11S., R.64E., M.D.B.&M.

All of Sections 1, 11, 12, 13, 14, 23, 24, 25, 26, 35 and 36, and that portion of Sections 2, 3, 10, 15, 22, 27 and 34 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.11S., R.65E., M.D.B.&M.

All Sections.

T.10½S., R.66E., M.D.B.&M.

All of Sections 31, 32, 33, 34, 35 and 36.

T.10½S., R.67E., M.D.B.&M.

All of Sections 31, 32, 33, 34, 35 and 36.

T.11S., R.66E., M.D.B.&M.

All Sections.

T.11S., R.67E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 33 and 34, and that portion of Sections 12, 13, 22, 23, 24, 26, 27, 35 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.11S., R.68E., M.D.B.&M.

That portion of Sections 6 and 7 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.12S., R.64E., M.D.B.&M.

All of Sections 1, 11, 12, 13, 14, 23, 24, 25 and 36, and that portion of Sections 2, 3, 10, 15, 22, 26, 27 and 35 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.11½S., R.65E., M.D.B.&M.

All of Sections 31, 32, 33, 34, 35 and 36.

T.12S., R.65E., M.D.B.&M.

All Sections.

T.12S., R.66E., M.D.B.&M.

All Sections.

T.12S., R.67E., M.D.B.&M.

All of Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 29, 30 and 31, and that portion of Sections 1, 12, 13, 22, 23, 24, 25, 26, 27, 28, 32 and 33 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.12S., R.68E., M.D.B.&M.

That portion of Sections 7 and 18 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.13S., R.64E., M.D.B.&M.

That portion of Sections 1, 2 and 12 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.13S., R.65E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 24 and 25, and that portion of Sections 6, 7, 8, 9, 15, 16, 22, 23, 26, 35 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.13S., R.66E., M.D.B.&M.

All of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32 and 33, and that portion of Sections 12, 13, 14, 22, 23, 27, 34 and 35 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.13S., R.67E., M.D.B.&M.

That portion of Sections 5, 6 and 7 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.14S., R.65E., M.D.B.&M.

That portion of Sections 1, 2, 12, 13 and 24 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.14S., R.66E., M.D.B.&M.

All of Sections 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17, 18, 21, 22, 23, 26, 27 and 35, and that portion of Sections 2, 11, 12, 13, 19, 20, 24, 25, 28, 29, 33, 34 and 36 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.14S., R.67E., M.D.B.&M.

That portion of Sections 18, 19 and 30 lying within the natural drainage basin of Lower Meadow Valley Wash.

T.15S., R.66E., M.D.B.&M.

That portion of Sections 1, 2 and 3 lying within the natural drainage basin of Lower Meadow Valley Wash.

The Lower Meadow Valley Wash is also delineated as Hydrographic Area No. 205 on a map titled "State of Nevada Water Resources and Inter-Basin Flows" prepared cooperatively by the Nevada Division of Water Resources and the Geological Survey, United States Department of the Interior and published in September, 1971.

That area of the Lower Meadow Valley Wash lying south of T.12S., within Clark County has a concentration of wells and numerous water rights. In accordance with NRS 534.120, subsection 2, the irrigation of land using underground water is not considered to be a preferred use of the limited underground water resource and applications to appropriate water for irrigation will be denied in those areas lying within T.13S., T.14S., T.15S., in the Lower Meadow Valley Wash drainage basin in Clark County.


Peter G. Morros
State Engineer

Dated at Carson City, Nevada, this
23rd day of NOVEMBER, 1982.

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

ORDER

DESIGNATING AND DESCRIBING
THE MUDDY RIVER SPRINGS AREA GROUND
WATER BASIN, CLARK COUNTY, NEVADA

The State Engineer finds that conditions warrant the designation of the Muddy River Springs Area Ground Water Basin, Clark County, Nevada and by this Order designates the following described area of land as a ground water basin coming under the provisions of Chapter 534 NRS (Conservation and Distribution of Under Ground Waters).

Sections 4, 5, 8, 9, 10, 11, 13, 14, 15, 16, 17, 21, 22, 23 and 24 and those portions of Sections 25 and 26 lying outside of the Moapa River Indian Reservation boundaries, all in T. 14 S., R. 65 E., M.D.B.&M.


Roland D. Westergard
State Engineer

Dated at Carson City, Nevada,
this 14th day of July, 1971

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
72218, 72219, 72220 AND 72221 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE KANE SPRINGS)
VALLEY HYDROGRAPHIC BASIN (206))
LINCOLN COUNTY, NEVADA.)

**RULING
5712**

GENERAL

I.

Application 72218 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cubic feet per second (cfs) of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically described as portions of T.8S., R.62E., T.8S., R.63E., T.8S., R.64E., T.9S., R.61E., T.9S., R.62E., T.9S., R.63E., T.9S., R.64E., T.10S., R.61E., all of T.10S., R.62E., portions of T.10S., R.63E., T.10S., R.64E., T.11S., R.61E., all of T.11S., R.62E., portions of T.11S., R.63E., T.11S., R.64E., T.12S., R.61E., all of T.12S., R.62E., all of T.12S., R.63E., portions of T.12S., R.64E., T.12.5S., R.61E., T.12.5S., R.62E., T.13S., R.61E., all of T.13S., R.62E., portions of T.13S., R.63E., T.13S., R.64E., T.13.5S., R.63E., T.14S., R.61E., all of T.14S., R.62E., portions of T.14S., R.63E., T.15S., R.61E., T.15S., R.62E., T.15S., R.63E., T.16S., R.62E., M.D.B. & M. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25, T.8S., R.65E., M.D.B.&M.¹

II.

Application 72219 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 31, T.9S., R.65E., M.D.B.&M.²

¹ File No. 72218, official records of the Office of the State Engineer. Exhibit No. 2, public administrative hearing before the State Engineer, April 4-6, 2006. Hereinafter the exhibits and transcript will be referred to solely by exhibit number or transcript page.

² Exhibit No. 3.

III.

Application 72220 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located within the SE¼ SW¼ of Section 6, T.11S., R.64E., M.D.B.&M.³

IV.

Application 72221 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located in the SE¼ SW¼ of Section 11, T.9S., R.65E., M.D.B.&M.⁴

V.

Applications 72218 and 72219 were timely protested by White Pine County; however, said protests were withdrawn prior to the administrative hearing.⁵

VI.

Applications 72218 and 72219 were timely protested by Wayne Lister, Ruby Lister and Bevan Lister on the grounds that:

1. Lincoln County Water District has no written adopted plan for the use of the water applied for under this permit. There is no city or town within the area of this permit.
2. We have long argued that moving water from one basin to another is detrimental to the originating basin.
3. Lincoln County Water District is supposed to be a local government entity protecting and planning for the benefit of the citizens of Lincoln County but in teaming up with Vidler they become merely speculative with the sole objective to make a profit.⁶

VII.

Applications 72218, 72219, 72220 and 72221 were timely protested by the United States Department of Interior, National Park Service ("NPS") on the grounds that:

³ Exhibit No. 4.

⁴ Exhibit No. 5.

⁵ Exhibit No. 6.

⁶ Exhibit No. 7.

1. There is no water available for appropriation because committed water resources exceed ground-water recharge.
2. The approval and development of the appropriation proposed by this application will impair the water rights of the United States, because:
 - A. The appropriation, in combination with other appropriations and withdrawals in Coyote Spring Valley will further reduce the discharge of the Muddy River. The United States' senior water right and other existing rights to the Muddy River would be impaired, if the appropriation is approved and developed.
 - B. The proposed appropriation, in combination with existing appropriations and pending applications in the White River ground-water flow system, if approved and developed, would reduce the discharge of Lake Mead NRA [National Recreation Area] springs, because of the large potential withdrawal rate. The drawdown caused by such large withdrawals would extend to capture ground water that naturally discharges through the springs.
 - C. The effects of the appropriation proposed by this application, when combined with other existing and proposed appropriations, could impair the senior water rights of the Lake Mead NRA more quickly and/or to a degree greater than the withdrawal proposed under this application alone.
3. The public interest would not be served, by granting a permit to this application, because:
 - A. The public interest would not be served by granting this application, because the water and water-related resources in the nationally important Lake Mead NRA would be diminished or impaired, as a result of the appropriation proposed by this application.
 - B. The land which the applicant proposes to withdraw the water is not owned by the applicant. [This protest claim only goes to Applications 72218 and 72219.]⁷

VIII.

Applications 72220 and 72221 were protested by the United States Department of Interior, Fish and Wildlife Service ("FWS") on the grounds that:

The proposed groundwater development threatens the biological and water resources under the jurisdiction of the US Fish and Wildlife Service in the White River Groundwater Flow System. Kane Springs Valley is located upgradient of Coyote Spring Valley and the Muddy River Area. Pumping of groundwater from the basin could reduce the groundwater influx to springs at Moapa Valley National Wildlife Refuge in the Muddy River Area. The combined perennial yield for Coyote Spring valley [sic] and Kane Springs Valley may be on the order of 2,600 acre-feet/yr as estimated in ground-water Resources Reconnaissance Series Report 25. Although there are no permits in Kane Springs Valley, there are at least 200,000

⁷ Exhibit No. 8.

acre-feet/yr of permitted and pending applications in Coyote Spring Valley, directly downgradient. An additional withdrawal would only add to the current exceedance of the perennial yield for the combined basins. Such a withdrawal of groundwater in excess of the perennial yield could result in reduced groundwater flow from Coyote Spring Valley to the Muddy River Area, or result in a reversed gradient causing groundwater outflow from Coyote Spring Valley to Kane Springs Valley. Senior water rights held by the Fish and Wildlife Service in the Moapa Valley National Wildlife refuge [sic] could be adversely impacted. Such an impact to the water rights and resources of the Moapa Valley National Wildlife refuge [sic] and environs could adversely impact threatened and endangered species including Moapa dace and Southwestern Willow Flycatcher; which depend on these water resources for survival. Water-dependent resources in Lower Meadow Valley Wash may be threatened by the proposed development too. The combined volume from all of these pending applications and permitted water rights exceeds all current estimates of the available water for appropriation in the White River Groundwater Flow System. Lacking more information to demonstrate that water is available for appropriation without adversely impacting existing water rights and water-related resources, these applications should be denied.⁸

IX.

By letter dated February 6, 2006, the NPS and FWS requested the State Engineer amend State Engineer's Order No. 1169 to include the Kane Springs Valley Hydrographic Basin within the provisions of the Order and included a request to hold these applications in abeyance until the pumping ordered in Coyote Spring Valley was completed and analyzed.⁹ The reasoning behind the request is that these agencies believe Kane Springs Valley and Coyote Spring Valley, while administratively classified as separate hydrographic basins, are actually a single distinct hydrologic drainage basin and should be managed as such. At the public administrative hearing on these applications, the Applicant and Protestant FWS presented a stipulation to resolve the FWS's protests.¹⁰ The resolution was also in lieu of statements made on behalf of the FWS in the February 6, 2006, letter that requested Kane Springs Valley be included in State Engineer's Order No. 1169.¹¹ Pursuant to the Stipulation, the FWS withdrew its protests and the parties requested that Exhibit A to the Stipulation be included as part of the terms and conditions of any applications that are granted. However, the NPS's request to include Kane Springs Valley Hydrographic Basin within the provisions of Order No. 1169 remains to be resolved.

⁸ Exhibit No. 9.

⁹ Exhibit No. 10.

¹⁰ Exhibit No. 116.

¹¹ Transcript, p. 12.

X.

After all parties of interest were duly noticed by certified mail, an administrative hearing was held with regard to the protested applications on April 4-6, 2006, at Carson City, Nevada, before representatives of the Office of the State Engineer.¹²

FINDINGS OF FACT

I.

The Listers protested the applications on the grounds that Lincoln County Water District has no written plan for the use of the water applied for and there is no city or town within the area of the applications. The State Engineer finds there is no requirement in Nevada water law for a written plan to be provided in furtherance of a water right application. The State Engineer finds water right applications are almost always filed for proposed projects that are planned, but not in existence, and the water cannot be used until the State Engineer grants a permit that authorizes the use of the water. As discussed in Section III below, the Nevada Legislature has provided the Lincoln County Water District with the authority to serve water to all real property located within the boundaries of Lincoln County. Nevada water law requires that an applicant provide evidence of an actual beneficial use for the water applied for¹³ and proof satisfactory to the State Engineer of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and his financial ability and reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.¹⁴ The State Engineer finds, as discussed below, that the Applicant provided substantial evidence of a project where the water applied for would be used and proof satisfactory of construction of the work to apply the water to the intended beneficial use with reasonable diligence and the financial ability and reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.

II.

The Listers' protests allege that they have long argued that moving water from one basin to another is detrimental to the originating basin. The State Engineer finds that Nevada water law specifically provides for the interbasin transfer of water provided the applicant meets all of the

¹² Exhibit No. 1.

¹³ NRS § 533.035.

¹⁴ NRS § 533.370.

necessary criteria found in the Nevada Revised Statutes, including but not limited to NRS §§ 533.370(5) and (6). Nevada Revised Statute § 533.370(6)(c) and (d) require the State Engineer to take into consideration whether the proposed action is environmentally sound as it relates to the basin from which the water is exported and whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported. The State Engineer finds Nevada water law requires the State Engineer to consider factors relevant to the originating basin, but specifically provides for the interbasin transfer of water.

III.

The Listers' protests allege that the Lincoln County Water District is supposed to be a local government entity protecting and planning for the benefit of the citizens of Lincoln County but, that in teaming up with Vidler Water Company, the Lincoln County Water District has become merely speculative with the sole objective to make a profit. In 2003, the Nevada Legislature enacted legislation that provided for the creation of the Lincoln County Water District.¹⁵ The special legislative act that created the Lincoln County Water District provided that its jurisdiction and service area are all the real property located within the boundaries of Lincoln County and authorized the Lincoln County Water District to sell water and water rights and to enter into agreements with a private entity or corporation for the transfer or delivery of any water right or water appropriated.¹⁶

The State Engineer finds the Nevada Legislature gave the Lincoln County Water District its authority. The State Engineer finds the Lincoln County Water District like any other applicant has to demonstrate a beneficial use for the water applied for under these applications and has to satisfy the other statutory requirements. The State Engineer finds if the Protestant Listers have an issue with the operation of the Lincoln County Water District that is a matter outside of the State Engineer's jurisdiction.

IV.

Through testimony and evidence, the Applicants' expert witnesses presented their interpretation of the geology and hydrogeology of the Kane Springs Valley and vicinity. They conclude that the northern portion of the valley is underlain by a volcanic caldera complex and,

¹⁵ Chapter 474, Statutes of Nevada 2003.

¹⁶ *Id.* at Sections 11(7), 11(11), and 11(12).

therefore, has low potential for regional ground-water flow. However, they interpreted the evidence as indicating that the southwestern portion of the basin is underlain by a significant thickness of carbonate rocks.¹⁷ The Applicants conducted a pumping test at their well KPW-1 and, based on the results of the test and their interpretation of the geology, concluded that there is the potential for considerable ground-water movement through the Paleozoic carbonate rocks in Kane Springs Valley.¹⁸ The Kane Springs Wash fault zone is oriented in a northeasterly direction, and is thought to both channel ground-water flow along its length from northeast to southwest, and to act as a barrier to ground-water flow across it from north to south. The witnesses also presented testimony supporting ground-water inflow into the Kane Springs Valley from the north.¹⁹

The State Engineer finds that the Applicants' interpretation of ground-water movement in the Kane Springs Valley from northeast to southwest and into Coyote Spring Valley, preferentially along the Kane Springs Wash fault zone, is generally consistent with the available data. The State Engineer further finds that the Applicants' pumping test supports the conclusion that there is considerable potential for ground-water flow in the carbonate rocks in the vicinity of well KPW-1. The State Engineer also finds that there was not sufficient evidence presented to support a determination of the potential for ground-water inflow into the Kane Springs Valley.

V.

The Applicants presented evidence to quantify subsurface inflow and outflow across the Kane Springs Valley Hydrographic Basin boundaries. The Applicants propose that ground water enters Kane Springs Valley from northern Coyote Spring Valley, passing through its western tip, and exits southwesterly back into Coyote Spring Valley. Local recharge is thought to combine with the inflow and exit the basin to the southwest. Since the water table is relatively deep in Kane Springs Valley and ET of ground water is negligible, virtually all ground-water discharge from the basin must occur via subsurface outflow.

Mr. Lewis applied Darcy's law to estimate the magnitude of the ground-water inflow into Kane Springs Valley Hydrographic Basin via a three-mile corridor on the western edge of Kane Springs Valley.²⁰ Darcy's law states the volume of flow is equal to aquifer transmissivity multiplied by aquifer width multiplied by the hydraulic gradient. He estimated transmissivity for

¹⁷ Transcript, pp. 43-47, 57; Exhibit No. 15, pp. 13-14; Exhibit No. 20, pp. 3-4.

¹⁸ Transcript, pp. 58-59, 62-63.

¹⁹ Exhibit No. 20, pp. 6-13.

²⁰ Exhibit No. 20, pp. 6-13.

the “bulk aquifer” from the pumping test performed at the well identified as KPW-1. He then multiplied that value by three on the assumption that the aquifer is three times thicker than penetrated by the test well. For a value of hydraulic gradient, Mr. Lewis used water levels in wells CSVM-3 and CE-VF-2, which are located near the center of Coyote Spring Valley.

The State Engineer finds the Applicants’ inflow analysis is overly interpretive and without sufficient supporting evidence. Inflow into the basin is proposed to occur through a three-mile wide zone on the western basin boundary. Flow direction is assumed to be from the north to south even though there are no local hydraulic head data to support the hypothesis of hydraulic gradient or flow direction. The Applicants’ witness used hydraulic data from the KPW-1 pumping test, which is located approximately six miles from the proposed inflow area. The hydraulic gradient is assumed to be equal to that between wells CSVM-3 and CE-VF-2 even though these wells are located six and 15 miles away, respectively, from the proposed inflow zone. Inflow through the three-mile wide corridor is proposed by the Applicants to be 13,000 acre-feet per year. This amount is approximately one-third of the total amount of regional flow from Pahrnagat and Delamar Valleys to Coyote Spring Valley of approximately 37,000 acre-feet per year.²¹ However, the proposed flow corridor into Kane Springs Valley is a relatively narrow zone at the corner of the basin. Geologic structures in the area of the proposed inflow corridor strike north northeasterly, and may have the effect of channeling flow along them parallel to the basin boundary, similar to the conceptual model of the Applicants along the Kane Spring and Willow Spring fault zones. Geologic cross-section B-B’ shows a thrust block of low-permeability basement rocks that would act to block potential inflow.²² The State Engineer finds that sufficient data does not exist to substantiate or reliably estimate subsurface flows into the Kane Springs Valley Hydrographic Basin and the Applicants’ inflow estimates are hereby discounted and not accepted.

The Applicants’ outflow analysis utilized two estimates of transmissivity from the KPW-1 pumping test. This analysis used a measured transmissivity of 50,000 gallons per day/foot (gpd/ft), which is thought to be representative of the regional carbonate aquifer and a transmissivity of 300,000 gpd/ft, which is thought to be representative of the local Willow Spring fault zone. The Applicants “scaled-up” the pumping test transmissivities to a basin scale by

²¹ State Engineer’s Office, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

²² Exhibit No. 15.

multiplying the values by three. Outflow is thought to occur in a southwesterly direction parallel to the axis of the Kane Springs Valley. The outflow corridor is estimated to be four-miles wide by 3,000 feet thick. They attribute one-half mile of the four-mile width to the fault zone and the remaining three and one-half miles to regional conditions, each having separate hydraulic gradients for their flow calculations. For the regional flow they used a gradient of 0.005, and for the structural zone they used a gradient of 0.0005. Total basin outflow was calculated to be 16,000 acre-feet per year.²³

The State Engineer finds several irregularities and inconsistencies with the Applicants' analysis. The Applicants' hydrologist used a hydraulic gradient of 0.005 for the regional component of flow based on the water levels in wells CSVM-3 and CE-VF-2, which are located near the center of Coyote Spring Valley, rather than using a hydraulic gradient of 0.0004 for the regional component of flow based on water levels in wells KPW-1 and CSVM-4, which are located at the outflow of Kane Springs Valley Hydrographic Basin and better situated to measure the applicable gradient.²⁴ The Applicant calculated the regional component of outflow to be 15,000 acre-feet per year using the hydraulic gradient of 0.005 as opposed to an outflow calculation of 1,250 acre-feet per year using the lower hydraulic gradient of 0.0004. The State Engineer finds that using the higher hydraulic gradient of 0.005 to compute outflow from Kane Springs Valley Hydrographic Basin rather than using the lower gradient of 0.0004 between KPW-1 and CSVM-4 is in error and inconsistent with the Applicants' documented conceptual view of the flow system.²⁵

The Applicants' estimate of outflow along the structural zone was computed separately using a transmissivity of 900,000 gpd/ft and a hydraulic gradient of 0.0005. The State Engineer finds the Applicant incorrectly approximated the hydraulic gradient to be 0.0005, and should have used a hydraulic gradient of 0.0004.²⁶ Based on the actual hydraulic gradient of 0.0004 the resulting basin outflow along the structural zone would then be 1,000 acre-feet per year. Adding the estimated outflow along the structural zone of 1,000 acre-feet per year to the regional flow of 1,250 acre-feet per year results in an estimated basin outflow of 2,250 acre-feet annually rather than the Applicants' calculation of 16,000 acre-feet annually.

²³ Exhibit No. 16.

²⁴ *Ibid.*, pp. 20 and 31.

²⁵ Exhibit No. 17, p 21.

²⁶ Exhibit No. 20, p. 11.

The State Engineer finds the Applicants' inflow and outflow analyses lack sufficient data to provide a reliable estimate of basin boundary flows. Furthermore, he finds the Applicants' conceptual analyses were overly interpretive and, in part, were inconsistent with their conceptual model of regional flow. The State Engineer finds that sufficient data were not collected or presented to substantiate the Applicants' estimate of subsurface flow into or out of the Kane Springs Valley Hydrographic Basin.

VI.

The Applicant presented a witness to address the geochemical framework of the Kane Springs Valley Hydrographic Basin and the White River flow system south of the Pahrnatag shear zone. The witness presented evidence on stable isotopes, major ion chemistry, and carbon-14 analyses.²⁷ In summary, the geochemical evidence supports the ground-water gradient data that indicates Kane Springs Valley ground water flows into Coyote Spring Valley and that, in general, water in the White River flow system flows from north to south and mixes with local recharge en route to discharge areas. The witness presented deuterium data collected from springs in Kane Springs Valley believed to represent local recharge water, springs in Pahrnatag Valley believed to represent regional carbonate water, and ground water from KPW-1 believed to represent a mix of local recharge water and regional carbonate water. Using a mixing equation the witness computed the percent of regional carbonate ground water from the KPW-1 deuterium sample to equal 77 percent.²⁸ If the same analysis is repeated using oxygen-18 instead of deuterium, the percent of regional carbonate ground water from the KPW-1 oxygen-18 sample equals 87 percent.²⁹ As previously discussed, the reinterpretation of the Applicants' subsurface outflow analysis resulted in approximately 2,250 acre-feet per year of basin outflow from the Kane Springs Valley Hydrographic Basin. The State Engineer finds applying the percentages of regional carbonate ground water from KPW-1 for both the deuterium and oxygen-18 samples, the local ground-water recharge component of the outflow would therefore be approximately 518 acre-feet per year and 293 acre-feet per year, respectively. These values appear to support the reconnaissance estimate of 500 acre-feet per year of recharge, however, it is recognized that the re-interpreted outflow is only an estimate, and its value is limited due to uncertain hydraulic parameters.³⁰

²⁷ Testimony of R. Glanzman; Exhibit No. 32.

²⁸ Exhibit No. 117, p. 10.

²⁹ Exhibit No. 34, Table 1, p. 2.

³⁰ State Engineer's Office, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

VII.

Testimony and evidence was presented in an attempt to support a determination that significantly more water is locally recharged in the Kane Springs Valley Hydrographic Basin than previously reported. The Applicants presented Mr. Walker, who possesses a background in range management, as a witness who used plant communities as a method to estimate precipitation. However, Mr. Walker also testified that the use of plant communities as a method to calculate recharge does not exist, and his methodology for calculating recharge is not used anywhere else in the United States.³¹ The Applicants then presented Mr. Lewis for the purpose of using Mr. Walker's estimation of precipitation for the establishment of new recharge estimates in the Kane Springs Valley Hydrographic Basin.³²

Reconnaissance investigations by the U.S.G.S. estimate the combined recharge for Kane Springs Valley, Coyote Spring Valley and the Muddy River Springs Area to be 2,600 acre-feet annually.³³ Recharge for Kane Springs Valley was further delineated in 1971 and was estimated to be 500 acre-feet per year.³⁴ The methods and estimates presented by the Applicants in Exhibit Nos. 29 and 30 used four estimates of precipitation. With each of the four estimates of precipitation, ground-water recharge was then estimated using two methods: a version of the well-known Maxey-Eakin technique and a water budget method. In total, the Applicants computed eight recharge estimates ranging from 5,300 to 14,155 acre-feet per year³⁵

One method for estimating precipitation tied plant communities to precipitation and elevation, and then used elevation zones to distribute precipitation throughout the basin. The second method used a spatial distribution of vegetative zones and their respective precipitation based on a United States Department of Agriculture, Natural Resource Conservation Service technical guide for ecological site descriptions.³⁶ A third precipitation method used PRISM³⁷

³¹ Transcript, pp. 244, 264.

³² Transcript, pp. 245-246.

³³ T.E. Eakin, *Ground-water Resources – Reconnaissance Series Report 25, Ground-water Appraisal of Coyote Spring and Kane Spring Valleys and Muddy River Springs Area, Lincoln and Clark Counties, Nevada*, State of Nevada, Department of Conservation and Natural Resources, United States Department of Interior, Geologic Survey, February 1964.

³⁴ Transcript, p. 253.

³⁵ Exhibit No. 16, p. 5.

³⁶ Exhibit No. 29, pp. 6, 15-17.

³⁷ PRISM – Parameter-elevation Regressions on Independent Slopes Model and is a method of spatially distributing precipitation.

modeled precipitation.³⁸ The last precipitation estimate was based on a local altitude-precipitation method developed by the Las Vegas Valley Water District.³⁹ For each of these precipitation estimates, Mr. Lewis applied both a numerical form of the Maxey-Eakin technique and water budget approach for estimating recharge.

However, Mr. Halford, as expert witness for the Protestant National Park Service, testified that the use of the Maxey-Eakin technique in each of these cases was in error,⁴⁰ because using the Maxey-Eakin recharge coefficients with any precipitation estimates other than the Hardman precipitation map is inappropriate. The Maxey-Eakin recharge coefficients are married to the Hardman map and cannot be used otherwise.⁴¹ Mr. Halford testified that if one is going to develop a new method of estimating recharge they must have the precipitation maps for the area of interest and controls on ground-water discharge, and then they can develop new recharge coefficients based on that information.⁴²

The Applicants also used a water-budget approach with each of the precipitation estimates to arrive at an estimate of recharge. In the approach for Kane Springs Valley Hydrographic Basin, it was estimated that recharge is equal to precipitation less the sum of evapotranspiration (ET), surface runoff and spring discharge. Surface runoff and spring discharge were each estimated to average a few hundred acre-feet annually; therefore, recharge was estimated to be approximately equal to precipitation minus ET. Due to the lack of ET measurements or estimates of ET in Kane Springs Valley, the Applicants used data from a United States Geologic Survey report on evapotranspiration in Ruby Valley, over 200 miles to the north.⁴³ Their evidence provides that a report prepared by Berger in 2001 reports an estimate of ET using the Bowen-ratio method for an upland-shrub non-phreatophytic plant community of 12 inches per year where annual precipitation was estimated to be 13 to 15 inches.⁴⁴ On that basis, the Applicants assume 12 inches per year of ET for areas receiving 13 to 15 inches of precipitation in Kane Springs Valley and 13 inches per year of ET for areas receiving greater than 15 inches per year of precipitation.

³⁸ Exhibit No. 29, p. 9.

³⁹ Exhibit No. 54, public administrative hearing before the State Engineer, July 16-20, 23-27, 2001, official records in the Office of the State Engineer.

⁴⁰ Transcript, pp. 489-520.

⁴¹ Transcript, p. 493.

⁴² Transcript, p. 495.

⁴³ Exhibit No. 29, p. 13.

⁴⁴ *Ibid.*

However, the State Engineer believes the Applicants misinterpreted and/or misapplied the data from the Berger 2001 report, which states that precipitation at the Ruby Lake National Wildlife Refuge site for the 2000 water year was only 7.74 inches, or 58 percent of the 1961 to 1990 30-year average of 13.3 inches.⁴⁵ During this same time period, ET at the upland-shrub site was 11.96 inches.⁴⁶ The report does not indicate what ET rates might be in the upland-shrub community during average precipitation years, although the data does support higher daily ET rates in the summer months when there was an increase in available soil moisture from precipitation.⁴⁷ In addition, the Applicants did not provide evidence suggesting that the ET rates in areas that receive greater than 15 inches per year would remain constant at 13 inches. The Applicants also did not address other factors that differ between Kane Springs Valley and Ruby Valley that could have an effect on ET rates such as differences in temperature, solar radiation, time and type of precipitation, and variable plant species distinct from those in Kane Springs Valley.

The State Engineer recognizes the difficulty in accurately estimating recharge and even the Applicants admit that estimates of recharge are extremely problematic as it is a parameter that cannot be measured directly.⁴⁸ The State Engineer agrees that recharge is a very difficult parameter to measure, and if it is used to determine perennial yield, the uncertainty in the estimates must be recognized and a conservative approach taken. Given the uncertainties inherent in estimating recharge and the validity in the testimony of the Protestant's expert stating that the recharge technique applied was in error and inappropriate, the State Engineer finds that the Applicants' evidence and testimony lack the scientific and practical basis to substantiate the proffered recharge of 5,000 to 14,000 acre-feet annually and are hereby discounted and not accepted. However, the State Engineer also recognizes that the current reconnaissance estimate of average annual recharge is probably low.

The Death Valley flow system area lies west and southwest of Kane Springs Valley. Because the Kane Springs Valley climate, latitude, geology and soil types are similar to the Death Valley flow system basins, it is reasonable to expect that similar precipitation amounts will result in

⁴⁵ D.L. Berger, M.J. Johnson, M.L. Tumbusch, *Estimates of Evapotranspiration from the Ruby Lake National Wildlife Refuge Area, Ruby Valley, Northeastern Nevada, May 1999-October 2000*, Water-Resources Investigations Report 01-4234, United States Department of Interior, Geological Survey, Nevada Division of Water Resources and the United States Department of Interior, Fish and Wildlife Service, 2001.

⁴⁶ *Id.* at 25.

⁴⁷ *Id.* at 20.

⁴⁸ Transcript, p. 267.

similar amounts of ground-water recharge. Recharge within the Death Valley regional flow system has been calibrated to measured discharge, and therefore provides a greater level of certainty than recharge estimates made without a comparative discharge.⁴⁹ Several basins within the Death Valley regional flow system have similar amounts of precipitation as Kane Springs Valley with the ground-water recharge in those basins ranging from 1% to 2% of total precipitation.⁵⁰ Recent estimates of precipitation in the Kane Springs Valley range from 120,000 to 140,000 acre-feet per year as opposed to the Hardman estimate of 80,000 acre-feet per year.⁵¹ Using a recharge to precipitation ratio of 1% to 2% as found in the Death Valley regional flow model for basins with similar amounts of precipitation, the recharge in Kane Springs Valley would be 1,200 to 2,800 acre-feet per year, which is substantially less than the Applicants' estimate of recharge of 5,000 to 14,000 acre-feet annually. This is a qualitative comparison, and is not proposed by the State Engineer to definitively estimate recharge in Kane Springs Valley, but serves as a barometer, for comparative purposes only, of recharge estimates in this area. The State Engineer finds recharge in Kane Springs Valley is uncertain, but is likely greater than the reconnaissance estimate of 500 acre-feet per year and less than the Applicant's estimates of 5,000 to 14,000 acre-feet per year.

VIII.

The perennial yield of a ground-water reservoir may be defined as the maximum amount of ground water that can be salvaged each year over the long term without depleting the ground-water reservoir. The perennial yield cannot be more than the natural recharge to a ground water basin and in some cases is less. In determining the amount of water available for appropriation in basins where outflow from one basin is part of the inflow to another basin, the State Engineer must take into consideration the amount of water appropriated in the upgradient basin and discount the amount from inflow into the downgradient basin. If the water appropriated in an upgradient basin is not deducted from the amount which discharges to the downgradient basin, it creates the potential for double accounting and regional over appropriation. Thus, the State Engineer is still able to manage the ground-water basins as they have been historically managed administratively, but also take into consideration the concerns that arise for ground-water basins that are hydrologically connected.

⁴⁹ Belcher, W., ed., 2004 Death Valley Regional Ground-Water Flow System, Nevada and California – Hydrogeologic Framework and Transient Ground-Water Flow Model, USGS SIR 2004-4205.

⁵⁰ Belcher, W., ed., 2004, Death Valley Regional Flow Model, USGS SIR 2004-4205.

⁵¹ Exhibit 16, p. 5.

The Applicants propose that ground water flows from upgradient basins through Kane Springs Valley into downgradient basins. In the case of the Kane Springs Valley Hydrographic Basin, the upgradient basin and the downgradient basin is the Coyote Spring Valley Hydrographic Basin. That is, ground water is proposed to flow from northern Coyote Spring Valley into Kane Springs Valley then back into Coyote Spring Valley. The Protestant NPS argues that the State Engineer should consider any inflow into Kane Springs Valley from the Coyote Spring Valley as previously allocated in Coyote Spring Valley and the subsequent outflow from Kane Springs Valley should be permitted to flow into Coyote Spring Valley in its entirety to meet the approximate 16,000 acre-feet per year of senior appropriated rights there. The majority of those senior water rights were issued with the intent to develop ground water from the White River regional carbonate-rock aquifer system. Given the unique hydrologic connection between the Kane Springs Valley Hydrographic Basin and the Coyote Spring Valley Hydrographic Basin, the development of ground water within Kane Springs Valley will ultimately affect water levels and flows in the White River regional carbonate-rock aquifer system. However, the State Engineer believes a small amount of water can be developed in the Kane Springs Valley and not unreasonably impact existing rights in the discharge areas of the White River carbonate-rock aquifer system, which are already fully appropriated. Well KPW-1 lies within 1,000 feet of Coyote Spring Valley and pumping simulations by the Applicant show a cone of depression extending well into Coyote Spring Valley. To further minimize potential effects on existing rights in the discharge areas of the White River carbonate-rock aquifer system, the State Engineer will limit the amount of ground water that can be pumped from wells in Kane Springs Valley near the boundary with Coyote Spring Valley. After careful consideration of the uncertainties regarding the ranges of ground-water recharge, quantification of subsurface inflows and outflows, the demonstrated connection of Kane Springs Valley with the White River Regional flow system, and senior appropriated rights in the down-gradient basins, the State Engineer finds that 1,000 acre-feet is a reasonable amount to allow for appropriation from Kane Springs Valley.

IX.

Nevada Revised Statute § 533.370(5) provides that an applicant provide proof satisfactory to the State Engineer of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and his financial ability and

reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence. Nevada Revised Statute § 533.375 provides that in the case of an application or multiple applications proposing to divert more than 10 cubic feet per second (such as the applications under consideration here) the State Engineer may require in the case of an incorporated company the submission of articles of incorporation, the names and places of residence of directors and officers and the amount of its authorized and paid-up capital. If the applicant is not an incorporated company, he may require a statement as to the name of the person proposing to construct the work, and a showing of facts necessary to enable him to determine whether the applicant has the financial ability to carry out the proposed work and whether the application has been made in good faith.

The Applicants presented the Chairwoman for the Lincoln County Water District, Rhonda Hornbeck, as a witness who testified that the Lincoln County Water District through its partner Vidler Water Company has an agreement with Coyote Springs Investment (CSI) to provide wholesale water to CSI's development. Additionally, the witness indicated they are working with the United States Department of Interior, Bureau of Land Management to gain a right of way to bring water from the wellhead down to the CSI property. The testimony indicated that a general improvement district is in place, as is a planned unit development.⁵² The Applicants provided evidence on the plan of development, which is a report that was submitted to the United States Department of Interior, Bureau of Land Management, that identifies how the ground water will be withdrawn, how the pipes will be installed, what equipment is needed to complete the well and addresses the pipeline project to deliver the water to the place where it will be used, and pipeline permitting is underway.⁵³

When questioned whether the Lincoln County Water District had the financial resources to place the water to beneficial use, the witness for the Lincoln County Water District provided several scenarios as to how those financial resources might be obtained, but did not provide any specific evidence of having the financial resources in place. The testimony indicated that the possibilities include: (1) floating a bond with its partner Vidler Water Company; (2) asking the State of Nevada

⁵² Transcript, pp. 388-389; Exhibit No. 41; Exhibit No. 122 (Agreement dated Oct. 17, 2005, between Coyote Springs Investment, LLC and Lincoln County Water District and Vidler Water Company - marked as an exhibit after the hearing when document was filed upon request of the State Engineer.)

⁵³ Transcript, p. 95; Exhibit No. 26.

for a low-interest loan; or (3) a development agreement with CSI, where CSI would pay for the infrastructure to place the water to beneficial use; however the witness then testified there is already an agreement in place with CSI paying the cost of infrastructure.⁵⁴

Dorothy-Timian Palmer, as a witness for the Applicants, testified that Vidler Water Company has already drilled a production well and a monitoring well and has spent a considerable amount of money on field work and analyses of that field work and has the financial ability to construct the work necessary to put the water to beneficial use.⁵⁵ The Agreement between CSI, the Lincoln County Water District and Vidler Water Company provides that CSI will purchase “all water available within the Kane Springs Basin.” “Upon payment in full of the purchase price of Kane Water, the DISTRICT and VIDLER will convey the Kane Water by Water Rights Deed to CSI and will partially assign to CSI certain rights and delegate to CSI certain obligations related to the underlying water rights permit(s).”⁵⁶ The Applicants only intend to develop the water to the wellhead and CSI will develop the infrastructure to deliver the water from the wellhead to the development.⁵⁷

Harvey Whittemore, as a witness for the Applicants, testified that within the CSI project there would be two separate general improvement districts. The one in Lincoln County has already been formed; however, the one in Clark County was to be formed in June 2006. The testimony indicated that the water rights already held by CSI will be assigned for the benefit of the general improvement districts and the Clark and Lincoln County Commissions will act as trustees for the general improvement districts. Mr. Whittemore indicated that the development is at a stage where all of the approvals necessary for the first phase of construction have been acquired with respect to Clark County. As to the Lincoln County portion of the project, it is still subject to the completion of a multi-species habitat conservation plan, as well as a number of additional approvals from federal agencies. The water rights at issue here would ultimately be owned by the developer CSI and then transferred to the Lincoln County General Improvement District.⁵⁸ CSI has already received approval in the form of parcel maps, zoning entitlement and development agreements for 49,000 units in Clark County and 110,000 units in Lincoln County.⁵⁹

⁵⁴ Transcript, pp. 392-393.

⁵⁵ Transcript, pp. 458-461.

⁵⁶ Exhibit No. 122.

⁵⁷ Transcript, pp. 412-415.

⁵⁸ Transcript, pp. 419-420.

⁵⁹ Transcript, pp. 427, 439; Exhibit Nos. 43, 44, 45.

The State Engineer finds the Applicants provided proof satisfactory to the State Engineer of an intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and a reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.

X.

Testimony and evidence indicate there are no permitted or certificated groundwater rights in Kane Springs Valley Hydrographic Basin.⁶⁰ However, the witness for the NPS testified that Kane Springs Valley Hydrographic Basin and Coyote Spring Valley are hydrographically and hydrologically one and the same basin. Approximately 16,100 acre-feet have been appropriated in Coyote Spring Valley and applications are pending for another 200,000 acre-feet annually. Therefore, there is no water available for appropriation.⁶¹ The State Engineer finds no water has been appropriated in Kane Springs Valley Hydrographic Basin and by limiting the quantity of water authorized for appropriation, the potential impacts to existing rights in down-gradient hydrographic basins will be minimized.

XI.

Nevada Revised Statute § 533.370(6) provides that in determining whether an application for an interbasin transfer of ground water must be rejected the State Engineer shall consider: (a) whether the applicant has justified the need to import water from another basin; (b) if the State Engineer determines that a plan for conservation of water is advisable for the basin into which the water is to be imported, whether the applicant has demonstrated that such a plan has been adopted and is effectively being carried out; (c) whether the proposed action is environmentally sound as it relates to the basin from which the water is exported; (d) whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported; and (e) any other factor the State Engineer determines is relevant.

Testimony was provided as to the extent of the project proposed in Coyote Spring Valley and estimates of the quantity of water necessary to carry out the project. That testimony satisfactorily addresses the provision of whether the applicant has justified the need to import water

⁶⁰ Transcript, pp. 208-209.

⁶¹ Transcript, pp. 589-594.

from another basin.⁶² Testimony was provided that indicated conservation measures are in place for the planned development similar to traditional development measures associated with development in southern Nevada that have been adopted and imposed,⁶³ and there is no evidence that the appropriation of water from Kane Springs Valley Hydrographic Basin will damage the environment of the valley.

Testimony was provided that indicated there is no private land within Kane Springs Valley Hydrographic Basin, rather all land within the valley is owned by the federal government; therefore, the use of the water will not unduly limit future growth and development in Kane Springs Valley Hydrographic Basin.⁶⁴

The State Engineer finds the evidence does not support rejection of the application for an interbasin transfer of water.

XII.

Witnesses for both the Applicants (Glanzman)⁶⁵ and the Protestant NPS (Van Liew)⁶⁶ agree that the discharge at Rogers and Blue Point Springs in the Lake Mead National Recreation Area is not entirely carbonate-rock aquifer discharge, but is composed of some local precipitation that infiltrates and mixes with the carbonate-rock aquifer water that is flowing toward land surface along fault structures. Mr. Glanzman testified that in general when water in the White River flow system flows from north to south it mixes with local recharge en route to discharge areas at the Muddy River Springs Area and Rogers Springs and Blue Point Springs.⁶⁷ Using isotopic data, Mr. Glanzman estimated that approximately 25% of the discharge at Rogers Springs and Blue Point Springs could be characterized as regional carbonate water. For purposes of his analysis, Mr. Glanzman considered water in the carbonate aquifer of Pahrangat Valley to be 100% carbonate water.^{68,69} Mr. Van Liew testified that discharge from the White River flow system appears to be predominantly at the Muddy River Springs, Rogers Springs and Blue Point Springs and raised the

⁶² Transcript, pp. 427-445.

⁶³ Transcript, pp. 428-429.

⁶⁴ Transcript, pp. 207-208.

⁶⁵ Transcript, pp. 115-203, 221-236.

⁶⁶ Transcript, pp. 523-621.

⁶⁷ Exhibit No. 34; Transcript, pp. 115 -203, 221-236.

⁶⁸ Transcript, pp. 137-138.

⁶⁹ Exhibit No. 117.

argument that there does not seem to be anywhere else for the ground water to flow. In addition, he doubted much water moved out to the Lake Mead area and testified that the ground-water gradient supports that conclusion.

The State Engineer finds there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs.

XIII.

By letter dated February 6, 2006, the NPS and FWS requested the State Engineer amend State Engineer's Order No. 1169 to include the Kane Springs Valley Hydrographic Area.⁷⁰ The reasoning behind the request is that these agencies believe Kane Springs Valley and Coyote Spring Valley, while administratively classified as separate hydrographic basins, are actually a single distinct hydrologic drainage basin and should be managed as such. However, during the public administrative hearing, the FWS indicated that the resolution of its protests pursuant to the Stipulation also goes to its statements in the February 6, 2006, letter. Thus, the Stipulation was presented in place of the FWS request to include Kane Springs Valley within the provisions of Order No. 1169.⁷¹ However, the request by the NPS to include the Kane Springs Valley Hydrographic Basin within the provisions of Order No. 1169 still remains. Thus, two separate agencies within the United States Department of Interior take different positions with regard to the request to include Kane Springs within the provisions of Order No. 1169.

The witness for the Protestant NPS testified as to various reports and information that all conclude that the discharge from the Muddy River Springs is regional in nature, that a sufficient quantity does not come from local recharge to support the discharge and that a substantial portion of the discharge of the region is concentrated in the Muddy River Springs Area.⁷² Citing to Exhibit No. 91, the witness noted that the writer of that report found that the "Coyote Springs Valley, Kane Springs Valley and the Muddy River Springs hydrographic areas (1,025 square miles) in southern Lincoln and Clark Counties have been combined for this report because the areas are hydrologically and topographically connected."⁷³ The faults in the area are believed to control the majority of

⁷⁰ Exhibit No. 10.

⁷¹ Transcript, pp. 12-13.

⁷² Transcript, pp. 530-581; *See*, Exhibit Nos. 87, 88, 91.

⁷³ Transcript, p. 533.

ground-water movement through the carbonate aquifer, including Kane Springs Wash fault zone, which the witness believes to be a conduit for flow to Coyote Spring Valley.⁷⁴ Additionally, the NPS witness believes that the Kane Springs Valley Hydrographic Basin and the Coyote Spring Valley are one hydrographic area.⁷⁵

A witness for the Applicants indicated that there is a presumption that the Kane Springs Wash fault zone is effectively a no-flow boundary such that water flowing into Kane Springs Valley Hydrographic Basin flows out of Kane Springs Wash into Coyote Spring Valley, and that the water that is recharged in Kane Springs Valley Hydrographic Basin flows into Coyote Spring Valley.⁷⁶ Additionally, evidence developed from the well pump test and analyzed in conjunction with other evidence, such as the implication of a flat gradient, indicates a relatively high transmissivity across the southern half of the study area, indicating a high potential for regional ground-water flow.⁷⁷

The State Engineer finds the evidence indicates a strong hydrologic connection between Kane Springs Valley and Coyote Spring Valley, specifically, that ground water flows from Kane Springs Valley into Coyote Spring Valley. However, carbonate water levels near the boundary between Kane Springs Valley and Coyote Spring Valley are approximately 1,875 feet in elevation, and in southern Coyote Spring Valley and throughout most of the other basins covered under Order No. 1169, carbonate-rock aquifer water levels are mostly between 1,800 feet and 1,825 feet. This marked difference in head supports the probability of a low-permeability structure or change in lithology between Kane Springs Valley and the southern part of Coyote Spring Valley. The State Engineer finds Order No. 1169 was issued to address the requests for the additional appropriation of water filed in Coyote Spring Valley, but the focus of the additional study ordered is the Muddy River Springs Area. The State Engineer finds there is not substantial evidence that the appropriation of a limited quantity of water in Kane Springs Valley Hydrographic Basin will have any measurable impact on the Muddy River Springs that warrants the inclusion of Kane Springs Valley in Order No. 1169. Therefore, the State Engineer denies the request to hold these applications in abeyance and include Kane Spring Valley within the provisions of Order No. 1169.

⁷⁴ Transcript, pp. 545-550.

⁷⁵ Transcript, pp. 589-591.

⁷⁶ Transcript, pp. 291, 303.

⁷⁷ Transcript, pp. 329-330.

XIV.

The Applicants requested that the State Engineer act on Applications 72220 and 72221 and grant them for a total combined duty of 5,000 acre-feet annually and hold Applications 72218 and 72219 in abeyance. The State Engineer finds that the total amount of 1,000 acre-feet annually of groundwater available to be appropriated in Kane Springs Valley Hydrographic Basin is less than the requested 5,000 acre-feet annually; therefore the State Engineer finds he will not hold any of the applications in abeyance.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁷⁸

II.

The State Engineer is prohibited by law from granting a permit to appropriate the public waters where:⁷⁹

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectible interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that to permit the appropriation of water in an amount greater than permitted under this ruling will conflict with existing rights and threaten to prove detrimental to the public interest.

RULING

The protests to the applications are hereby upheld in part and overruled in part. Application 72220 is hereby granted for a duty of 500 acre-feet annually. Applications 72218, 72219, and 72221 are hereby granted for a total combined duty of 500 acre-feet annually.

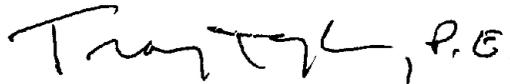
⁷⁸ NRS chapters 533 and 534.

⁷⁹ NRS 533.370(5).

Applications 72218, 72219, 72220, and 72221 are granted subject to:

1. The payment of statutory permit fees;
2. A monitoring plan to be approved by this office.

Respectfully submitted,



TRACY TAYLOR, P.E.
State Engineer

TT /jm

Dated this 2nd day of
February, 2007.

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS 74147,)
74148, 74149, AND 74150 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE KANE SPRINGS VALLEY)
HYDROGRAPHIC BASIN (206), LINCOLN)
COUNTY, NEVADA.)

RULING
5987

GENERAL

I.

Application 74147 was filed on April 10, 2006, by the Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cubic feet per second (cfs) of water from an underground source within the Kane Springs Valley Hydrographic Basin for municipal purposes within the Coyote Spring Valley Hydrographic Basin more specifically described as portions of T.8S., R.62E., T.8S., R.63E., T.8S., R.64E., T.9S., R.61E., T.9S., R.62E., T.9S., T.63E., T.9S., R.64E., T.10S., R.61E., all of T.10S., R.62E., portions of T.10S., R.63E., T.10S., R.64E., T.11S., R.61E., all of T.11S., R.62E., portions of T.11S., R.63E., T.11S., R.64E., T.12S., R.61E., all of T.12S., R.62E., all of T.12S., R.63E., portions of T.12S., R.64E., T.12.5S., R.61E., T.12.5S., R.62E., T.13S., R.61E., all of T.13S., R.62E., portions of T.13S., R.63E., T.13S., R.64E., T.13.5S., R.63E., T.14S., R.61E., all of T.14S., R.62E., portions of T.14S., R.63E., T.15S., R.61E., T.15S., R.62E., T.15S., R.63E., T.16S., R.62E., M.D.B.&M. The proposed point of diversion is described as being located in the SW¼ SE¼ of Section 25, T.8S., R.65E., M.D.B.&M.¹

II.

Application 74148 was filed on April 10, 2006, by the Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of water from an underground source within the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin as more specifically described above. The proposed point of diversion is described as being located in the SE¼ SW¼ of Section 31, T.9S., R.65E., M.D.B.&M.²

¹ File No. 74147, official records in the Office of the State Engineer.

² File No. 74148, official records in the Office of the State Engineer.

III.

Application 74149 was filed on April 10, 2006, by the Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of water from an underground source within the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin as more specifically described in Section I of this ruling. The proposed point of diversion is described as being located in the SE¼ SW¼ of Section 6, T.11S., R.64E., M.D.B.&M.³

IV.

Application 74150 was filed on April 10, 2006, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of water from an underground source within the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described in Section I of this ruling. The proposed point of diversion is described as being located in the SE¼ SW¼ of Section 11, T.9S., R.65E., M.D.B.&M.⁴

V.

Applications 74147, 74148, 74149 and 74150 were timely protested by the United States Department of Interior, Bureau of Indian Affairs, the Moapa Band of Paiute Indians and the United States Department of Interior, National Park Service on various grounds as summarized below.^{1,2,3,4}

The Bureau of Indians Affairs alleges that the proposed diversions will impact the water rights of the Moapa Band of Paiute Indians and other state-based water rights, there is no unappropriated water in the Kane Springs Valley Hydrographic Basin and the proposed applications could adversely affect the implementation and success of a Memorandum of Agreement with the United States Fish and Wildlife Service, Coyote Springs Investment, LLC, the Moapa Valley Water District and the Southern Nevada Water Authority designed to protect the Muddy River Springs environment and other regional water resources.

The Moapa Band of Paiute Indians protested the applications on the grounds that there is no unappropriated water in the source of supply, the proposed withdrawals would conflict with

³ File No. 74149, official records in the Office of the State Engineer.

⁴ File No. 74150, official records in the Office of the State Engineer.

existing rights, especially those of the Tribe, the proposed withdrawals would threaten to prove detrimental to the public interest, the proposed withdrawals would be inconsistent and subvert the Applicants' Stipulation to limit ground-water withdrawals under Permits 72218 through 72221, the proposed withdrawals would undermine the efficacy of the critically important Memorandum of Understanding recently entered into by the United States Fish and Wildlife Service, the Southern Nevada Water Authority, Coyote Springs Investment, LLC, the Moapa Valley Water District and the Tribe to maintain Muddy Springs flows to protect the endangered Moapa Dace.

The National Park Service protested the applications on the grounds that there is no water available for appropriation because the committed water resources exceed the ground-water recharge, the approval and development of the proposed appropriations will impair the water rights of the United States and the public interest would not be served by diminishing or impairing the water-related resources in the Lake Mead National Recreation Area.

FINDINGS OF FACT

I.

In State Engineer's Ruling No. 5712, dated February 2, 2007, the State Engineer addressed applications filed by these same Applicants to appropriate ground water from the Kane Springs Valley Hydrographic Basin.⁵ In that ruling, the State Engineer addressed the Applicants' argument regarding ground water availability in the Kane Springs Valley Hydrographic Basin and rejected the Applicants' argument and evidence for the appropriation of ground water above the quantity granted in that ruling. The State Engineer finds that with the issuance of State Engineer's Ruling No. 5712, there is no additional water available for appropriation in the Kane Springs Valley Hydrographic Basin.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁶

⁵ State Engineer's Ruling No. 5712, dated February 2, 2007, official records in the Office of the State Engineer.

⁶ NRS chapters 533 and 534.

II.

The State Engineer is prohibited by law from granting a permit to appropriate the public waters where:⁷

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectible interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional ground water available for appropriation in the Kane Springs Valley Hydrographic Basin; therefore, the granting of any appropriation under Applications 74147, 74148, 74149 or 74150 would conflict with existing rights and thus threaten to prove detrimental to the public interest.

RULING

Applications 74147, 74148, 74149 and 74150 are hereby denied on the grounds there is no unappropriated water in the source and to grant additional water rights would conflict with existing rights and threaten to prove detrimental to the public interest. No ruling is made on the merits of the protests.

Respectfully submitted,


TRACY TAYLOR, P.E.
State Engineer

TT /jm

Dated this 29th day of
April, 2009.

⁷ NRS 533.370(5).

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS 54055,)
54056, 54057, 54058, 54059, 63272, 63273,)
63274, 63275, 63276, 63867, 63868, 63869,)
63870, 63871, 63872, 63873, 63874, 63875 AND)
63876 FILED TO APPROPRIATE THE)
UNDERGROUND WATERS OF THE COYOTE)
SPRING VALLEY HYDROGRAPHIC BASIN)
(210), CLARK COUNTY AND LINCOLN)
COUNTY, NEVADA.)

RULING
#6254

GENERAL

I.

Applications 54055, 54056, 54057, 54058 and 54059 were filed on October 17, 1989, by the Las Vegas Valley Water District (LVVWD) to appropriate 6.0 cubic feet per second (cfs) under Applications 54055, 54056 and 54057 and 10 cfs under Applications 54058 and 54059 for a total of 27,510 acre-feet annually (afa) of groundwater from the Coyote Spring Valley Hydrographic Basin for municipal and domestic purposes. The proposed points of diversion are described as being located as follows:

Application 54055 within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 5, T.13S., R.63E., M.D.B.&M.

Application 54056 within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 32, T.13S., R.63E., M.D.B.&M.

Application 54057 within the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 16, T.14S., R.63E., M.D.B.&M.

Application 54058 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 1, T.13S., R.63E., M.D.B.&M.

Application 54059 within the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 19, T.13S., R.64E., M.D.B.&M.

The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County). Item 12 of the applications indicates that the water would be used within the LVVWD service

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area and may also be served to users within Lincoln County, Nye County and White Pine County.¹

II.

Applications 54055, 54056, 54057, 54058 and 54059 were timely protested by many people or entities.²

Application 54055 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, and Christopher Brown.³

Application 54056 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, Aerojet Nevada, and Charles F. Hilfenhaus, Jr.⁴

Application 54057 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, and Paula Engel.⁵

Application 54058 was timely protested by the Muddy Valley Irrigation Company, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S.

¹ File Nos. 54055 through 54059, official records in the Office of the State Engineer. Exhibit Nos. 2, 3, 4, 5 and 6, Public Administrative Hearing before the State Engineer, July 16-20, 23-24, August 31, 2001, official records in the Office of the State Engineer (LVVWD Hearing).

² File Nos. 54055 through 54059, official records in the office of the State Engineer and Exhibit Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22 LVVWD Hearing.

³ The Las Vegas Fly Fishing Club and Christopher Brown did not appear or participate in the hearing.

⁴ The Las Vegas Fly Fishing Club, Aerojet Nevada, and Charles F. Hilfenhaus, Jr. did not appear or participate in the hearing.

⁵ The Las Vegas Fly Fishing Club and Paula Engel did not appear or participate in the hearing.

Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, James H. Fincher, and Debra Richardson.⁶

Application 54059 was timely protested by the Muddy Valley Irrigation Company, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, James H. Fincher, Ely Shoshone Tribe, and Carolyn Morrison.⁷

The protests filed by the Federal agencies U.S. Department of Interior Bureau of Land Management, Fish and Wildlife Service and National Park Service were withdrawn by stipulation with the Applicant LVVWD.⁸ The protests by the Muddy Valley Irrigation Company were withdrawn,⁹ as were the protests by the Lincoln County Board of Commissioners, and White Pine County and the City of Ely, Nye County and Unincorporated Town of Pahrump.¹⁰

III.

The protests to Applications 54055, 54056, 54057, 54058 and 54059 by the Moapa Band of Paiute Indians are summarized as follows:¹¹

1. The applications seek to extract and export water from federal lands to which the LVVWD holds no interest; therefore, the State Engineer has no authority to issue a permit.
2. There are insufficient descriptions in the applications of the proposed works of diversion, costs of such works, time required to construct said works, and number of persons to be served.
3. It would be detrimental to the public interest to approve the applications before careful consideration of the environmental and socio-economic issues they raise. The State Engineer should require an independent assessment of these issues and obtain additional information on a water resource plan for the Las Vegas Valley.

⁶ The Las Vegas Fly Fishing Club, James H. Fincher, and Debra Richardson did not appear or participate in the hearing.

⁷ The Las Vegas Fly Fishing Club, James H. Fincher, Ely Shoshone Tribe and Carolyn Morrison did not appear or participate in the hearing.

⁸ Exhibit No. 24 LVVWD Hearing.

⁹ Exhibit No. 25 LVVWD Hearing.

¹⁰ File Nos. 54055 through 54059, official records in the Office of the State Engineer.

¹¹ Exhibit No. 10 LVVWD Hearing.

4. The proposed use, in combination with the other LVVWD applications, will conflict with existing rights, including the rights of the Moapa Band of Paiute Indians to the waters of the Muddy River and to groundwater under the Moapa Indian Reservation.
5. The proposed use is unlawful and threatens to prove detrimental to the public interest because the LVVWD lacks the financial resources and rights of entry to construct the necessary works and transport the water to the intended place of use.
6. Granting applications for massive amounts of water would conflict with federal law and policy regarding use or disposition of federal lands.
7. The quantities applied for exceed the annual recharge and safe yield and will result in groundwater mining resulting in adverse impacts on the location and quantity of water resources.
8. The use of the water will affect water quality and thus impair existing uses.
9. The use of the water will degrade wetlands and riparian habitats, including those on public lands in Death Valley National Monument, Great Basin National Park, Lake Mead National Recreation Area and national wildlife refuge units.
10. The use of the water will damage wetlands, springs, seeps and phreatophytes, which provide water and habitat for migratory species, other wildlife, grazing livestock and other existing uses.
11. The use of the water will jeopardize the existence of endangered and threatened species including, but not limited to, the desert tortoise, prevent or interfere with the conservation of such species, and take or harm such species.
12. The use of the water will impair environmental, scenic and recreational values that the State holds in trust for all of its citizens.
13. The use of the water will encourage waste and discourage reasonable conservation measures within the LVVWD's service area.
14. The use of the water will lead to regional air pollution (particularly carbon monoxide and particulates) in violation of law.

IV.

The protests to Applications 54055, 54056, 54057, 54058 and 54059 by the City of Caliente are summarized as follows:¹²

¹² Exhibit No. 9 LVVWD Hearing.

1. These applications, combined with the others filed at the same time, seek a combined appropriation of 804,195 acre-feet of groundwater and the diversion and the exportation of such a quantity of water will lower the static water level in Coyote Spring Valley, adversely affect the quality of the remaining groundwater and threaten springs, seeps and phreatophytes, which provide water and habitat critical to the survival of wildlife and grazing livestock.
2. There is insufficient water to support the applications.
3. The diversion and export of the water in the applied for quantity will deprive the area of origin of water needed to protect and enhance its environment and economic well being, and destroy environmental, ecological, scenic and recreational values the State holds in trust for all its citizens.
4. It would threaten to prove detrimental to the public interest to grant the applications in absence of comprehensive planning including, but not limited to, environmental impacts, costs and socio-economic considerations, and a water resource plan.
5. The use of the water will conflict with existing rights because it will exceed the safe yield of the basin and unreasonably lower the static water level and sanction water mining. The use of water under the applications will cause a drop in the water table and degrade water quality.
6. The use of the water will threaten to prove detrimental to the public interest in that it will likely jeopardize the continued existence of endangered and threatened species, will prevent and interfere with the conservation of those species, take or harm those species, and interfere with the purposes for which federal lands are managed under federal statutes including, but not limited to, the Federal Land Use Policy Act of 1976 [sic].
7. The approval of the applications will sanction and encourage the willful waste of water that has been allowed by the LVVWD.
8. The applications should be denied because the LVVWD has not obtained the necessary legal interest in the federal lands to extract, develop and transport the water from the proposed points of diversion to the place of use.
9. The use of the water will perpetuate and increase inefficient use of water in the LVVWD service area.
10. The LVVWD lacks the financial ability to develop the resource and transport it to the intended place of use.

11. The applications are deficient in that they fail to include a description of the place of use, works of diversion, estimated cost of the works and estimated time to place the water to beneficial use.
12. The use of the water will exceed the safe yield of the basin thereby adversely affecting phreatophytes and creating air pollution in violation of State and Federal laws.
13. The applications should not be granted as the LVVWD has failed to provide information for the State Engineer to sufficiently guard the public interest. The adverse effects cannot be properly evaluated without an independent, formal and publically-reviewable assessment of the cumulative impacts of the proposed extraction, mitigation measures, alternatives to the project and implementation of water management strategies.
14. The applications should be denied because the population projections are unrealistic and ignore constraints to growth.
15. The applications should be denied because the conservation programs instituted by the LVVWD are ineffective.
16. The applications should be denied because the cost of the project will result in rate increases that will reduce demand thereby rendering the project unnecessary.
17. The applications should be denied because it will allow the LVVWD to lock-up water resources for use beyond current planning horizons.
18. The applications should be denied because current trends in housing, plumbing fixtures standards and demographic patterns all suggest that simplistic water demand forecasts overstate future need.
19. The applications should be denied because the current per capita water consumption rate for LVVWD is too high and there are most cost-effective alternatives.

V.

Applications 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were filed on July 24, 1997, and February 24, 1998, by Aerojet General Corporation and assigned to Coyote Springs Investment, LLC (CSI) to appropriate 10.0 cfs, not to exceed 7,239 afa under each application of groundwater from the Coyote Spring Valley Hydrographic Basin for quasi-municipal purposes. The proposed points of diversion are described as being located as follows:

Application 63272 within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 12, T.12S., R.63E., M.D.B.&M.
Application 63273 within the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 12, T.12S., R.63E., M.D.B.&M.
Application 63274 within the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 15, T.13S., R.63E., M.D.B.&M.
Application 63275 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 11, T.13S., R.63E., M.D.B.&M.
Application 63276 within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 13, T.11S., R.63E., M.D.B.&M.
Application 63867 within the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 12, T.13S., R.63E., M.D.B.&M.
Application 63868 within the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 13, T.13S., R.63E., M.D.B.&M.
Application 63869 within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 11, T.13S., R.63E., M.D.B.&M.
Application 63870 within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 12, T.13S., R.63E., M.D.B.&M.
Application 63871 within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 13, T.13S., R.63E., M.D.B.&M.
Application 63872 within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 11, T.12S., R.63E., M.D.B.&M.
Application 63873 within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 25, T.12S., R.63E., M.D.B.&M.
Application 63874 within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 13, T.12S., R.63E., M.D.B.&M.
Application 63875 within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 36, T.11S., R.63E., M.D.B.&M.
Application 63876 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 22, T.11S., R.63E., M.D.B.&M.

The proposed place of use is described as being located within the S $\frac{1}{2}$ of Section 13, Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34 and 35 and W $\frac{1}{2}$ of Section 36, T.11S., R.63E., M.D.B.&M.; Lots 3 and 4, S $\frac{1}{2}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$ of Section 1, Lots 1, 2, 3 and 4, S $\frac{1}{2}$ N $\frac{1}{2}$ and S $\frac{1}{2}$ of Section 2, Lots 1, 2, 3 and 4, S $\frac{1}{2}$ N $\frac{1}{2}$ and S $\frac{1}{2}$ of Section 3, Sections 8, 10 and 11, and W $\frac{1}{2}$ W $\frac{1}{2}$ of Section 12, W $\frac{1}{2}$ of Section 13, Sections 14, 17, 20, N $\frac{1}{2}$ and SE $\frac{1}{4}$ of Section 23, W $\frac{1}{2}$ of Section 24, Section 25, E $\frac{1}{2}$ of Section 26 and Section 36, T.12S., R.63E., M.D.B.&M.; Lot 1, E $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$ SE $\frac{1}{4}$ and E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 1 and Sections 9 and 16, T.13S., R.63E., M.D.B.&M. The remarks section of Applications 63272 through 63276 indicate that the total duty of water sought under Applications 63272 through 63276 is 36,195 afa. The remarks section of Applications 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 indicate that the total duty of water sought under the applications is in addition to and non-supplemental to any water sought under Applications 63272 through 63276, which equates to an additional 72,390 afa for a total duty of 108,585 afa.¹³

¹³ Exhibit Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16, Public Administrative Hearing before the State Engineer, August 20-24, 27-28, 2001, official records in the Office of the State Engineer (CSI Hearing).

VI.

Applications 63272, 63273, 63275, and 63276 were timely protested by the following people or entities: U.S. Department of Interior National Park Service and Nevada Power Company.¹⁴

Applications 63273 and 63274 were timely protested by the U.S. Department of Interior National Park Service.¹⁵

Applications 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were timely protested by the following people or entities: U.S. Department of Interior National Park Service, Nevada Power Company, U.S. Department of Interior Bureau of Indian Affairs, U.S. Department of Interior Fish and Wildlife Service, Las Vegas Valley Water District and Moapa Valley Water District.¹⁶

Applications 63272, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were protested on various grounds summarized as follows:

1. The perennial yield of Coyote Spring Valley is about 2,000 afa from precipitation recharge. Groundwater inflow to Coyote Spring Valley is about 35,000 afa and originates from basins upgradient from the valley. Discharge from the valley is primarily by subsurface outflow (about 37,000 afa) to the Muddy River Springs Area and the Muddy River. Rights to the water in the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada. The committed resources in the area of Coyote Spring Valley and the Muddy River Springs Area nearly equal the estimated groundwater underflow in the area and recharge; thus, there is no water available for appropriation in Coyote Spring Valley or the Muddy River Springs Area.
2. Coyote Spring Valley is already over-appropriated.
3. The use of the water will impair the water rights of the United States by reducing the discharge of the Muddy River from which others hold senior water rights.
4. The use of the water will reduce the discharge of springs at Lake Mead National Recreation Area and impair water rights of the United States on those spring sources.

¹⁴ Exhibit Nos. 17, 18 and 19 CSI Hearing.

¹⁵ Exhibit No. 17 CSI Hearing.

¹⁶ Exhibit Nos. 20, 21, 22, 23, 24 and 25 CSI Hearing.

5. The use of the water will threaten to prove detrimental to the public interest in that the groundwater resources of Coyote Spring Valley will be mined and the water and water-related resources of the Lake Mead National Recreation Area will be impaired.
6. No further permits should be issued in the Coyote Spring Valley until an approved monitoring plan has been established.
7. The use of the water could impair the senior water rights of the Moapa Valley Water District in the downgradient basin (Muddy River Springs Area - Basin 219). The Moapa Valley Water District provides public water supplies from springs (Baldwin Spring Permit 28791, and Pipeline Jones Spring Permit 22739), and wells (MX well Permit 46932 and Arrow Canyon Well Permits 52520, 55450, and 58269) and use of water under the applications has the potential to impact the quantity and quality of these rights.
8. Granting the applications would not be in the public interest.
9. Model simulations suggest there may be an immediate and substantial impact on spring discharge from the proposed withdrawals with the effect especially pronounced at the Muddy River Springs. The results from the model suggest that even the current level of pumping of already permitted rights (8,600 afa permitted to Aerojet) will affect spring discharge at the Muddy River Springs.
10. The use of the water could impair the senior water rights of the U.S. Fish and Wildlife Service at the Moapa Valley National Wildlife Refuge, which is 10 to 20 miles east of the proposed points of diversion and at the Pahranaagat National Wildlife Refuge, which is 20 to 30 miles north of the proposed points of diversion. The springs that emerge at these national wildlife refuges are part of the White River Flow System, which is the same source of water the Applicant CSI proposes to appropriate and Coyote Spring Valley is physically and hydrologically connected to these regional springs.
11. The use of the water may damage habitat for species that are endangered or threatened under the Endangered Species Act or other species of concern; therefore, the use of the water would threaten to prove detrimental to the public interest. This includes the endangered Moapa dace, a minnow that is endemic to the headwaters of the Muddy River system, on the Moapa Valley National Wildlife Refuge, the endangered southwest willow flycatcher and the threatened bald eagle found at the Pahranaagat National Wildlife Refuge.

12. The use of the water could impact groundwater resources beneath the Moapa Indian Reservation and the surface waters of the Muddy River.
13. The use of the water will impair the rights of the U.S. National Park Service to the Muddy River and to the springs at the Lake Mead National Recreation Area.
14. The use of the water is not in the public interest because it would result in groundwater mining.
15. The use of the water is not in the public interest given the potential sale of existing water rights by the Applicant only to apply for new water rights is speculative and indicates the Applicant has no intention of applying the water to beneficial use.

VII.

By Notice of Pre-hearing Conference dated September 15, 2000, the State Engineer held a pre-hearing conference on October 25, 2000, in the matter of the above-referenced applications.

VIII.

After notice to all parties, the State Engineer held two separate hearings on the above-referenced applications. In the matter of the LVVWD Applications 54055 through 54059, the State Engineer held a public administrative hearing on July 16-20, 23-24, and August 31, 2001. In the matter of the CSI's Applications 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875, and 63876, the State Engineer held a public administrative hearing on August 20-24, 27 and 28, 2001.

FINDINGS OF FACT

I.

Order 1169 and 1169A

After the close of the above-referenced hearings, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required,

and “unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users.”¹⁷

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants’ own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.¹⁸ Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south. Additionally, the State Engineer found that another 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that by-passes the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet

¹⁷ State Engineer’s Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

¹⁸ Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. *See*, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

II.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites; two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

III.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) (who was not a party to the hearings or a protestant) and Center for Biological Diversity (CBD) (who also was not a party to the hearings or a protestant).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with

climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.¹⁹ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.²⁰ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.²¹

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE²² to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their

¹⁹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

²⁰ *Id.* at 26.

²¹ *Id.* at 57 - 58.

²² Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.²³

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Aparcar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{24,25} The model was updated to include pumping through 2012.²⁶ If the applications, which are the subject of this ruling, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown, and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less

²³ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

²⁴ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

²⁵ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

²⁶ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.²⁷

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.²⁸

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information for Coyote Spring Valley leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. They assert that the water budget information and pumping test results suggest that all available water in Coyote Spring Valley is appropriated and that the basin may currently be over-appropriated. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending

²⁷ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

²⁸ *Id.* at 84.

water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.²⁹

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.³⁰ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.³¹ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to MX-5 pumping. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.³²

²⁹ *Id.* at 5.

³⁰ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

³¹ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

³² Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.³³

The MBOP argues for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.³⁴ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.³⁵

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in

³³ *Id.* at 30.

³⁴ *Ibid.*

³⁵ *Id.* at 31.

Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Coyote Spring Valley pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane

Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in a small part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.

3. Most of the groundwater in Coyote Spring Valley flows to the Muddy River Springs Area, whose surface waters are fully appropriated. After pumping approximately 5,300 afa in the Coyote Spring Valley basin for just over two years, flows in some of the Muddy River springs decreased significantly, and the decrease in flow continued through the end of pumping. The results of the pumping test and opinions provided by the DOI Bureaus, the MBOP, GBWN and CBD are persuasive, and therefore the State Engineer finds that any additional pumping from the pending applications in addition to existing rights would result in a significant regional water-level decline and an associated decrease in spring and river flows, and would conflict with existing rights at the headwater springs to the Muddy River in a few years or less. There is no unappropriated water available in Coyote Spring Valley to satisfy the subject applications.

IV.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

In the eleven years since Order 1169 was issued, much additional hydrologic information has been made available, including publications by the U.S. Geological Survey and others. There have also been hearings before the Office of the State Engineer for water rights in nearby hydrographic basins. Technical exhibits and expert testimony in those hearings include hydrological analyses of the carbonate aquifers and water budgets in the Order 1169 basins. This information significantly expands on the available knowledge of the hydrology and water resources of the Lower White River Flow System in Coyote Spring Valley, the Muddy River Springs Area and the surrounding basins. In hearings held in the fall of 2011 concerning SNWA applications in Delamar Valley, Dry Lake Valley, and Cave Valley, several exhibits and expert testimony were presented that revise and update information presented at the Coyote Spring Valley water rights hearings.³⁶

³⁶ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

SNWA Exhibit No. 452 from the 2011 hearing on Delamar, Dry Lake and Cave valleys is an Excel workbook that is designed to estimate groundwater recharge for all of the basins contributing to the White River Flow System from the Muddy River Springs Area northward. The exhibit was accepted by the State Engineer with some revisions,³⁷ and basin recharge and interbasin flows are specified for both Coyote Spring Valley and the Muddy River Springs Area hydrographic basins. From that exhibit, the supply of water to the Coyote Spring Valley is estimated to be approximately 41,000 afa, of which, 39,000 is subsurface inflow from upgradient basins and 2,000 afa is derived from in-basin recharge. Prior to groundwater pumping in the region, all of this water flowed in the subsurface to the Muddy River Springs Area.

The total pre-development supply of water to the Muddy River Springs Area is estimated to be approximately 49,000 afa. The basin receives roughly 41,000 afa from subsurface inflow from Coyote Spring Valley, and an estimated 8,000 afa from the Lower Meadow Valley Wash. In-basin recharge is minimal. Discharge from the basin by surface flow is estimated to be 33,600 afa, evapotranspiration is approximately 6,000 afa, and subsurface outflow to downgradient basins is an estimated 9,900 afa.³⁸ It is noted here that during periods of flood, inflows and outflows can be significantly greater than average. Flood flows are not included in these calculations, in part because these sources are transitory and not amenable to capture and long-term supply.

For basins similar to Coyote Spring Valley, where there is no groundwater evapotranspiration and all of the groundwater flows in the subsurface to an adjacent basin, recent rulings have limited the perennial yield to the portion of recharge from precipitation in that basin that was not needed to satisfy rights in the immediate downgradient basin.³⁹ In State Engineer's Ruling Nos. 6165, 6166, and 6167, there was a consideration for how long it might take for an existing water right to be impacted, and the State Engineer found that where no significant effects would be felt for hundreds of years, the upgradient groundwater could be appropriated. Other early decisions of the State Engineer had allowed one-half of the total subsurface groundwater discharge to be appropriated as the perennial yield of such basins. State of Nevada

³⁷ State Engineer's Ruling No. 6166, dated March 22, 2012, pp. 72 – 73, official records in the Office of the State Engineer.

³⁸ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

³⁹ State Engineer's Ruling Nos. 6165, 6166, and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

Water Planning Report No. 3 lists the perennial yield of Coyote Spring Valley as 18,000 acre-feet, approximately one-half of the basin subsurface discharge.⁴⁰ One of the goals of the Order 1169 test was to determine the perennial yield of Coyote Spring Valley.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada that do not feature carbonate-rock aquifers, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. Therefore, because these basins share a unique and close hydrological connection and share virtually all of the same source and supply of water, unlike other basins in Nevada, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist.

V.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.⁴¹ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing rights for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is

⁴⁰ Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

⁴¹ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VI.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 16,200 acre-feet of senior groundwater rights in Coyote Spring Valley as well as approximately 33,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{42,43} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,⁴⁴ declined from 3.6 to 3.3 cfs during the test.⁴⁵ Baldwin and Jones Springs declined about 4% during the test.⁴⁶ The Muddy River at the Moapa gage did not display any decrease in flow,⁴⁷ although the

⁴² U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

⁴³ <http://waterdata.usgs.gov/nv/nwis/>.

⁴⁴ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

⁴⁵ <http://waterdata.usgs.gov/nv/nwis/>.

⁴⁶ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

⁴⁷ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.⁴⁸

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. As for the Muddy River, the State Engineer finds that evidence submitted by the DOI Bureaus and MBOP is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

VII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in the Coyote Spring Valley, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

⁴⁸ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁴⁹

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:⁵⁰

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Coyote Spring Valley Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Order 1169 basins. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent.

RULING

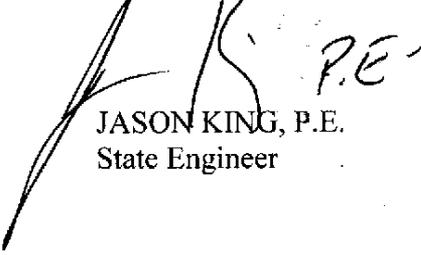
The protests to Applications 54055, 54056, 54057, 54058, 54059, 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875, and 63876 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which

⁴⁹ NRS Chapters 533 and 534.

⁵⁰ NRS § 533.370(2).

the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

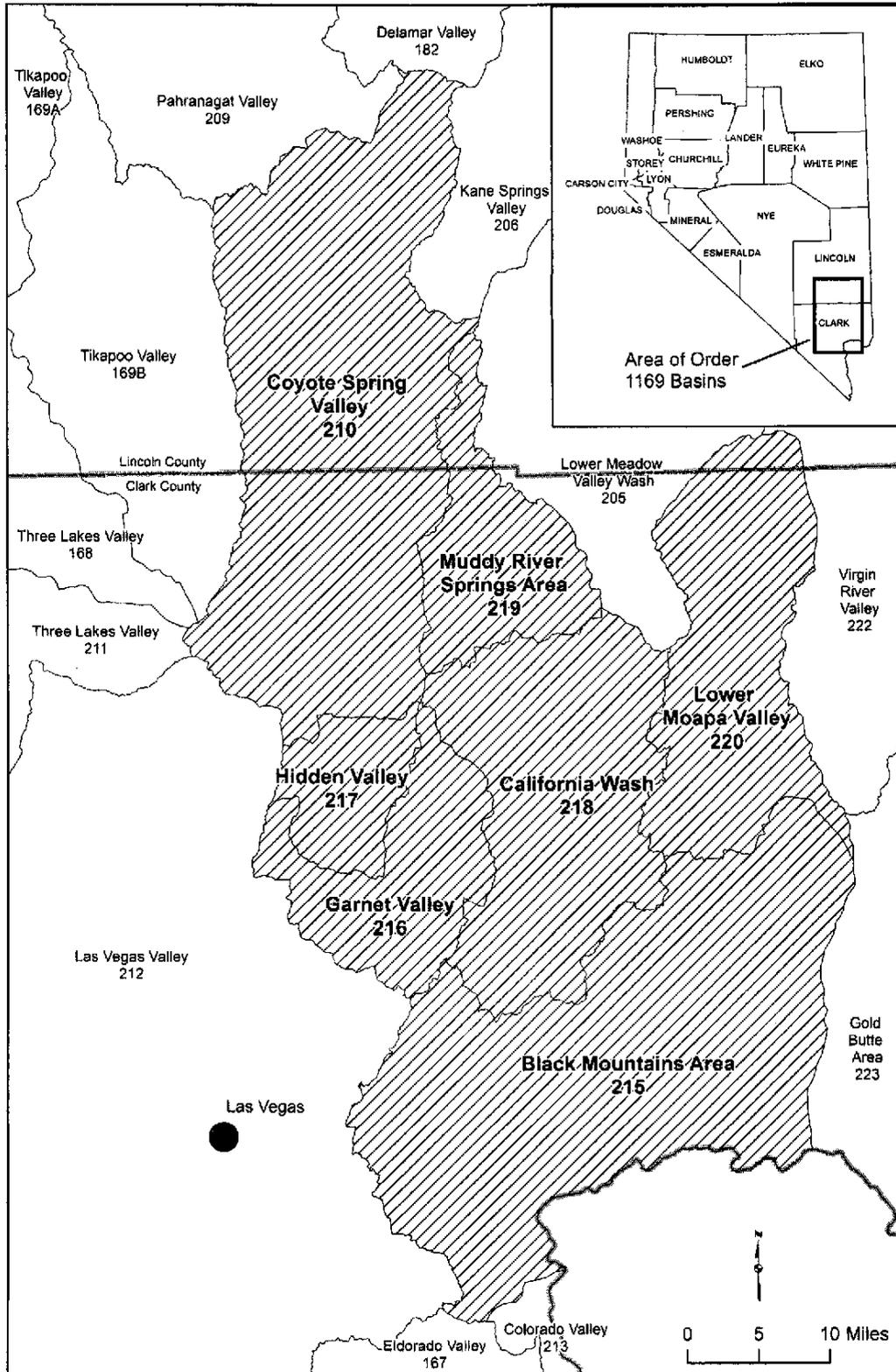
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 754

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
64039, 64186, 64187, 64188, 64189, 64190,)
64191, 64192, 67892, 71031, 72838, 72839,)
72840, 72841, 79296, 79297, 79298, 79299,)
79300, 79497, 79498 AND 79518 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE COYOTE SPRING)
VALLEY HYDROGRAPHIC BASIN (210),)
CLARK COUNTY AND LINCOLN)
COUNTY, NEVADA.)

RULING

#6255

GENERAL

I.

Application 64039 was filed on April 17, 1998, by Dry Lake Water, LLC to appropriate 10 cubic feet per second (cfs) of groundwater from the Coyote Spring Valley Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 28, T.14S., R.63E., M.D.B.&M. The proposed place of use is described as being within the Apex Industrial Park, which is described as being located within parts of Sections 32 and 33, T.17S., R.63E., parts of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35 and all of Sections 18 and 33, T.18S., R.63E., and parts of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 acre-feet annually (afa) under each application, but is requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.¹

II.

Application 64039 was timely protested by Nevada Power Company, the U.S. Department of Interior National Park Service (USNPS), Moapa Valley Water District (MVWD)

¹ File No. 64039, official records in the Office of the State Engineer.

and the U.S. Department of Interior Fish and Wildlife Service (USFWS) on various grounds summarized as follows:¹

1. The quantity of water requested is not available for appropriation.
2. Existing appropriations of groundwater exceed groundwater recharge.
3. The appropriation of the water would impair senior water rights held by the MVWD in the downgradient basin (Muddy River Springs Area Basin 219). The large magnitude of the requested appropriation will reduce the discharge of Baldwin Spring and Pipeline Jones Spring (Permits 28791 and 22739) and may decrease the production capacity of the MWVD's existing water supply wells at MX-5 (Permit 46932) and Arrow Canyon well (Permits 52520, 55450 and 58269).
4. Citing to State Engineer's Ruling No. 4542, Nevada Power asserts that the State Engineer has already recognized that: (1) recharge to the Coyote Spring Valley from precipitation above 6,000 feet is estimated at 1,900 acre-feet and, based on underflow to the Muddy River Springs Area, the perennial yield of Coyote Spring Valley is estimated at 18,000 acre-feet; (2) the carbonate-rock aquifer is the source of water for the Muddy River and springs in the Muddy River Springs Area and is recharge for the alluvial aquifer of the Muddy River Springs Area (Basin 219). At the time of the protest, Nevada Power asserted there were 28,272 afa already appropriated in Coyote Spring Valley; therefore, there was no water available for appropriation and permitting the appropriation of additional water would impair existing rights in the Muddy River Springs Area.
5. The USFWS protested the application on the grounds that use of the water may cause injury to the USFWS' water rights on the Moapa Valley National Wildlife Refuge and other senior water right holders in the Muddy River Springs Area.
6. Granting the application would damage habitat for species that are threatened or endangered under the Endangered Species Act.
7. The USNPS asserts that recharge from precipitation in Coyote Spring Valley is estimated at 2,000 afa, that inflow is estimated at 35,000 afa, and discharge from the valley is primarily by subsurface outflow (approximately 37,000 afa) to the Muddy River Springs Area and the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy

River Springs Area and tributaries. Citing to State Engineer's Ruling No. 4542, the USNPS asserts that the State Engineer has already found underflow from Coyote Spring Valley is tributary to the Muddy River. Additionally, that groundwater from the aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the USNPS and others.

8. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
9. It would not be in the public interest to approve an application where the applicant does not control the point of diversion or place of use.

III.

Applications 64186, 64187, 64188, 64189, 64190, 64191 and 64192 were filed on June 3, 1998, by Coyote Springs Investment, LLC to appropriate 10 cfs under each application, not to exceed 7,239 afa each, of groundwater from the Coyote Spring Valley Hydrographic Basin for quasi-municipal purposes. The proposed points of diversion are described as being located within the NW¼ SE¼ of Section 36, T.12S., R.63E., M.D.B.&M. The proposed place of use is described as being located within portions of Sections 13 and 36 and all of Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34 and 35, T.11S., R.63E., M.D.B.&M., portions of Sections 1, 2, 3, 12, 13, 23, 24, 26 and all of Sections 8, 10, 11, 14, 17, 20, 25, and 36, T.12S., R.63E., M.D.B.&M., and a portion of Section 1 and all of Sections 9 and 16, T.13S., R.63E., M.D.B.&M., containing 19,422.57 acres; within portions of Sections 19, 30 and 31, T.11S., R.63E., M.D.B.&M., portions of Sections 5, 6, 7, 9, 16, 18, 19, 21, 28, 29, 30, 32 and 33, T.12S., R.63E., M.D.B.&M., portions of Sections 1, 3, 4, 5, 8, 10, 15, 17, 20, 21, 22, 23, 24, 25 and 26, T.13S., R.63E., M.D.B.&M., a portion of Section 31, T.12S., R.64E., M.D.B.&M., and portions of Sections 6, 7 and 30 and all of Sections 18 and 19, T.13S., R.64E., M.D.B.&M., containing 9,633 acres; and portions of Sections 19, 30 and 31, T.11S., R.63E., M.D.B.&M., portions of Sections 5, 6, 9, 16, 21, 23, 26, 28 and 33 and all of Sections 15, 22, 27, 34 and 35, T.12S., R.63E., M.D.B.&M., and portions of Sections 1, 3, 4, 10, 15 and 22 and all of Sections 2, 11, 12, 13, 14, 23 and 24, T.23S., R.63E., M.D.B.&M., containing 13,767 acres.

The remarks section of the application indicates that the Applicant intends to use the water for a planned development of 42,800 acres for a variety of land use categories. Additionally, the remarks section provides that the total duty of water sought under the applications is in addition to and non-supplemental to any duty allowed under Permits 49414, 49660 through 49662 and 49978 through 49984, Applications 63272 through 63276 and Applications 63867 through 63876.²

IV.

Applications 64186, 64187, 64188, 64189, 64190, 64191 and 64192 were timely protested by Nevada Power Company, the U.S. Department of Interior National Park Service (USNPS), U.S. Department of Interior Bureau of Indian Affairs (USBIA) and the U.S. Department of Interior Fish and Wildlife Service (USFWS) on various grounds summarized as follows:²

1. The source of the water is the carbonate-rock aquifer and not the alluvial system and the quantity of water requested is not available for appropriation.
2. Existing appropriations of groundwater exceed the perennial yield of 19,900 acre-feet (groundwater recharge in Coyote Spring Valley from precipitation above 6,000 feet is estimated at 1,900 acre-feet and one-half of the underflow to Coyote Spring Valley is estimated at 18,000 acre-feet). At the time of the protest, Nevada Power asserted there were 28,272 afa already appropriated in Coyote Spring Valley; therefore, there was no water available for appropriation and permitting the appropriation of additional water would impair existing rights in the Muddy River Springs Area.
3. The USBIA asserts that it holds in trust senior federal reserved water rights in the Muddy River, which flows through the Moapa Band of Paiute Indian Reservation. Since many of the basins in eastern and southern Nevada are hydraulically connected through the carbonate-rock aquifer system, and the terminus of the White River Flow System, which is a regional carbonate groundwater flow system in southern Nevada is near the Tribe's reservation, its reserved rights may be impaired if discharge at the Muddy River Springs is impacted. Additionally, the USBIA claims that withdrawals of groundwater may result in significant reductions of flows in the carbonate-rock aquifer below the reservation, which would impact its claimed reserved rights to groundwater.

² File Nos. 64186, 64187, 64188, 64189, 64190, 64191 and 64192, official records in the Office of the State Engineer.

4. The USFWS protested the applications on the grounds that use of the water may cause injury to the USFWS' water rights in the Moapa Valley National Wildlife Refuge and other senior water right holders in the Muddy River Springs Area.
5. Granting the applications would damage habitat for species that are threatened or endangered under the Endangered Species Act.
6. The USNPS asserts that recharge from precipitation in Coyote Spring Valley is estimated at 2,000 afa, that inflow is estimated at 35,000 afa and discharge from the valley is primarily by subsurface outflow (approximately 37,000 afa) to the Muddy River Springs Area and the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source is the same as the source of the Muddy River and the springs in the Muddy River Springs Area and tributaries. Citing to State Engineer's Ruling No. 4542, the USNPS asserts that the State Engineer has already found underflow from Coyote Spring Valley is tributary to the Muddy River. Additionally, that groundwater from the aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River. Therefore, if the applications are approved they could reduce the discharge to the Muddy River and impair water rights held by the USNPS and others.
7. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

V.

Application 67892 was filed on August 8, 2001, by Dry Lake Water, LLC to appropriate 10 cfs of groundwater from the Coyote Spring Valley Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 28, T.14S., R.63E., M.D.B.&M. The proposed place of use is described as being located within the Apex Industrial Park, which is the same place of use as described under Application 64039. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in

five basins for 40,000 afa under each application, but is requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.³

VI.

Application 67892 was timely protested by Coyote Springs Investment, LLC (CSI), Moapa Band of Paiute Indians (MBOP), Las Vegas Valley Water District (LVVWD), Nevada Power Company and the U.S. Department of Interior Fish and Wildlife Service on various grounds summarized as follows:³

1. There is no unappropriated water in the basin and granting the applications would conflict with existing rights held by CSI.
2. The LVVWD asserts that existing permits and pending applications would over appropriate the groundwater basin, would potentially injure existing rights, and would not be in the best interest of the public.
3. The MBOP asserts that there is no water available in the quantities sought, the use of the water would conflict with and impair multiple existing water rights, including, but not limited to, the unquantified senior federally reserved rights of the MBOP in the waters of the Muddy River and groundwater underlying the MBOP's Reservation.
4. The MBOP and Nevada Power assert that granting the application would be detrimental to the public interest because the application appears redundant to applications previously filed by the Applicant.
5. Nevada Power asserts that granting the application would be detrimental to the public interest because the Applicant cannot demonstrate a beneficial use for the water as it had already secured sufficient water necessary to gain its subdivision approval and has not demonstrated its financial ability to place the water to beneficial use.
6. The MBOP asserts that the proposed export of water may be environmentally unsound for the basin of origin.

VII.

Application 71031 was filed on April 13, 2004, by Bedroc Limited to appropriate 0.35 cfs, not to exceed 200 afa, of groundwater from the Coyote Spring Valley Hydrographic Basin for commercial and domestic purposes. The proposed point of diversion is described as being located within the NW¹/₄ SE¹/₄ of Section 24, T.11S., R.62E., M.D.B.&M. The proposed place of use is described as being located within the SE¹/₄, SE¹/₂ NE¹/₄, E¹/₂ SW¹/₄ and SE¹/₄ NW¹/₄ of

³ File No. 67892, official records in the Office of the State Engineer.

Section 24, T.11S., R.62E., M.D.B.&M. The remarks section of the application indicates that the continued mining and milling has caused water to flow into the mining area and that ditches have been constructed to direct the water to a sump and pipeline to the place of use.⁴

VIII.

Applications 72838, 72839, 72840 and 72841 were filed on May 25, 2005, by Bedroc Limited to appropriate 200 afa of groundwater from the Coyote Spring Valley Hydrographic Basin for mining, milling and domestic purposes. The proposed points of diversion are described as being located as follows:

Application 72838 within the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 24, T.11S., R.62E., M.D.B.&M.

Application 73839 within the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 24, T.11S., R.62E., M.D.B.&M.

Application 72840 within the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 24, T.11S., R.62E., M.D.B.&M.

Application 72841 within the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 24, T.11S., R.62E., M.D.B.&M.

The proposed place of use is described as being located within the SE $\frac{1}{4}$, SE $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ and SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 24, T.11S., R.62E., M.D.B.&M. The remarks section of the applications indicate that the total combined duty of all its mining and milling applications will not exceed 200 afa.⁵

IX.

Applications 72838, 72839, 72840 and 72841 were timely protested by the USNPS on various grounds summarized as follows:⁵

1. The aquifers underlying the Coyote Spring Valley are part of the regional groundwater flow system (White River Flow System) that discharges through springs in the Muddy River Springs Area, which supply the base flow for the Muddy River.
2. The water budget for the Coyote Spring Valley is estimated at 36,000 to 37,000 afa and the perennial yield is estimated as 18,000 afa. Committed groundwater resources total approximately 16,300 afa and pending applications exceed 200,000 afa; therefore, there is no water available for appropriation.
3. The water resources of the Muddy River are appropriated and decreed and groundwater withdrawal will capture the groundwater that naturally discharges at the Muddy River Springs into the Muddy River; therefore, granting the applications will impair existing rights.

⁴ File No.71031, official records in the Office of the State Engineer.

⁵ File Nos.72838, 72839, 72840 and 72841, official records in the Office of the State Engineer.

4. Granting the applications will impair water rights of the USNPS, and therefore use of the water will threaten to prove detrimental to the public interest.

X.

Applications 79296, 79297, 79298, 79299 and 79300 were filed on January 28, 2010, by the Southern Nevada Water Authority (SNWA) to appropriate 6.0 cfs under Applications 79296, 79297, 79298 and 10 cfs under Applications 79299 and 79300 of groundwater from the Coyote Spring Valley Hydrographic Basin for municipal and domestic purposes. The proposed points of diversion are described as being located as follows:

Application 79296 within the SE¼ SW¼ of Section 5, T.13S., R.63E., M.D.B.&M.

Application 79297 within the SE¼ SE¼ of Section 32, T.13S., R.63E., M.D.B.&M.

Application 79298 within the SE¼ NW¼ of Section 16, T.14S., R.63E., M.D.B.&M.

Application 79299 within the NE¼ NE¼ of Section 1, T.13S., R.63E., M.D.B.&M.

Application 79300 within the NW¼ NW¼ of Section 19, T.13S., R.64E., M.D.B.&M.

The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County). The remarks section of the applications indicate that the water will be placed to beneficial use within the SNWA and Lincoln County Water District service territories. The approximate number of persons to be served is 2 million and is estimated to be 3.851 million by 2050.⁶

XI.

Applications 79296, 79297, 79298, 79299 and 79300 were timely protested by County of Inyo, California, Center for Biological Diversity, Defenders of Wildlife, Great Basin Water Network, and Moapa Band of Paiute Indians on various grounds summarized as follows:⁶

1. Granting the applications will reduce or eliminate the flows in springs and supplies of groundwater to eastern Inyo County, which are dependent upon recharge from the regional carbonate-rock aquifer.
2. There is insufficient unappropriated groundwater in the basin.
3. The proposed use will conflict impermissibly with existing water rights and protectable interests in domestic wells.

⁶ File Nos. 79296, 79297, 79298, 79299 and 79300, official records in the Office of the State Engineer.

4. Granting the applications will result in groundwater mining and threaten springs, seeps and phreatophytes, which provide water and habitat critical for wildlife and grazing livestock.
5. Granting the applications will deprive many areas of water needed to protect and enhance their environment and well being.
6. Granting the applications will threaten to prove detrimental to the public interest on environmental grounds and will be environmentally unsound for the basin of origin in that it will result in the drying out of springs, seeps, wetlands, etc. causing harm to habitat and wildlife, including threatened and endangered species.
7. Granting the applications will threaten to prove detrimental to the public interest as it will cause degradation of air quality, it will destroy recreational and aesthetic values, degrade water quality and degrade cultural resources.
8. The Applicant has failed to justify the need to import the water.
9. The Applicant has not implemented a sufficient water conservation plan.
10. The proposed action will unduly limit the future growth and development of the basin of origin.
11. The proposed action is not an appropriate long-term use of water.
12. The Applicant has not demonstrated the good faith intent or financial ability and reasonable expectation to actually construct the project and apply the water to beneficial use.

XII.

Applications 79497 and 79498 were filed on February 11, 2010, by the Clark County – Coyote Springs Water Resources General Improvement District to appropriate 1.5 cfs, not to exceed 750 afa, and 2.5 cfs, not to exceed 1,250 afa, respectively, of groundwater from the Coyote Spring Valley Hydrographic Basin for municipal and domestic purposes. The proposed points of diversion are described as being located as follows:

Application 79497 within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 10, T.13S., R.63E., M.D.B.&M.

Application 79498 within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 14, T.13S., R.63E., M.D.B.&M.

The proposed place of use is described as being located within portions of Sections 13, 19, 30, 31 and 36 and all of Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34 and 35, T.11S., R.63E., M.D.B.&M.; portions of Sections 1, 6, 7, 12, 13, 18, 19, 24, 29, 30 and 32 and all of Sections 2, 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, 17, 20, 21, 22, 23, 25, 26, 27, 28, 33, 34, 35 and

36, T.12.S., R.63E., M.D.B.&M.; a portion of Section 31, T.12S., R.64E., M.D.B.&M.; portions of Sections 5, 8, 17, 20, 21, 22, 23, 25 and 26 and all of Sections 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 16 and 24, T.13S., R.63E., M.D.B.&M.; and portions of Sections 6, 7 and 30 and all of Sections 18 and 19, T.13S., R.64E., M.D.B.&M.⁷

XIII.

Applications 79497 and 79498 were timely protested by the U.S. Department of Interior Bureau of Land Management, U.S. Department of Interior Fish and Wildlife Service, U.S. Department Interior National Park Service (USNPS) and Moapa Band of Paiute Indians on the various grounds as summarized as follows:⁷

1. There is no unappropriated water in the source of supply.
2. The proposed use of the water will conflict with existing rights both within Coyote Spring Valley and groundwater and surface water in nearby, but hydrologically connected, basins.
3. The proposed use of the water threatens to prove detrimental to the public interest because it will likely lower water levels in the Muddy River Springs area to the detriment of the Moapa dace, an endangered species.
4. The proposed use of the water will degrade habitat on land managed by the U.S. Bureau of Land Management and impair management of special status species habitat.
5. The aquifers underlying the Coyote Spring Valley are part of the regional groundwater flow system (White River Flow System) that discharges through springs in the Muddy River Springs Area, which supply the base flow for the Muddy River.
6. The water resources of the Muddy River are appropriated and decreed and groundwater withdrawal will capture the groundwater that naturally discharges at the Muddy River Springs into the Muddy River; therefore, granting the applications will impair existing rights.
7. Granting the applications will impair water rights of the USNPS, and therefore use of the water will threaten to prove detrimental to the public interest.
8. Groundwater from aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River.
9. There is no natural discharge in Coyote Spring Valley; therefore, there is no perennial yield to be appropriated.

⁷ File Nos.79497 and 79498, official records in the Office of the State Engineer.

10. A summary of existing groundwater rights for the six hydrographic areas down gradient of Coyote Spring Valley that are tributary to the Muddy River shows that existing rights exceed the resource.
11. The proposed use of the water will impair the water and water-related resources of the Lake Mead National Recreation Area.

XIV.

Application 79518 was filed on February 11, 2010, by the SNWA to appropriate 15 cfs, not to exceed 9,000 afa, of groundwater from the Coyote Spring Valley Hydrographic Basin for municipal and domestic purposes. The proposed point of diversion is described as being located within the NE¼ NE¼ of Section 26, T.13S., R.63E., M.D.B.&M. The proposed place of use is described as being located within Clark County as described in NRS §§ 243.035-243.040.⁸

XV.

Application 79518 was timely protested by County of Inyo, California, Center for Biological Diversity, Great Basin Water Network, Moapa Band of Paiute Indians and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁸

1. Granting the application will reduce or eliminate the flows in springs and supplies of groundwater to eastern Inyo County, which are dependent upon recharge from the regional carbonate-rock aquifer.
2. There is insufficient unappropriated groundwater in the basin.
3. The proposed use will conflict impermissibly with existing water rights and protectable interests in domestic wells.
4. Granting the application will result in groundwater mining and threaten springs, seeps and phreatophytes, which provide water and habitat critical for wildlife and grazing livestock.
5. Granting the application will deprive many areas of water needed to protect and enhance their environment and well being.
6. Granting the application will threaten to prove detrimental to the public interest on environmental grounds and will be environmentally unsound for the basin of origin in that it will result in the drying out of springs, seeps, wetlands, etc. causing harm to habitat and wildlife, including threatened and endangered species.

⁸ File No. 79518, official records in the Office of the State Engineer.

7. Granting the application will threaten to prove detrimental to the public interest as it will cause degradation of air quality, it will destroy recreational and aesthetic values, degrade water quality and degrade cultural resources.
8. The Applicant has failed to justify the need to import the water.
9. The Applicant has not implemented a sufficient water conservation plan.
10. The proposed action will unduly limit the future growth and development of the basin of origin.
11. The proposed action is not an appropriate long-term use of water.
12. The Applicant has not demonstrated the good faith intent or financial ability and reasonable expectation to actually construct the project and apply the water to beneficial use.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 64039, 64186, 64187, 64188, 64189, 64190, 64191, 64192, 67892, 71031, 72838, 72839, 72840, 72841, 79296, 79297, 79298, 79299, 79300, 79497, 79498 and 79518, there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on these applications is not required.

II.

Order 1169 and 1169A

On March 8, 2002, after the close of hearings on other applications to appropriate groundwater in the Coyote Spring Valley that were senior in priority to the ones under consideration in this ruling, the State Engineer issued State Engineer's Order No. 1169 (Order 1169). In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system,

substantial amounts of money would be required to develop the science, that a significant period of study would be required, and “unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users.”⁹

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants’ own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.¹⁰ Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that by-passes the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

⁹ State Engineer’s Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

¹⁰ Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. *See*, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the intended amount to be pumped in the study. There were a number of mechanical problems encountered

during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites: two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus Fish and Wildlife Service, National Park Service and Bureau of Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other

surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.¹¹ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter on 2005.¹² SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA said that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.¹³

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their

¹¹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

¹² *Id.* at 26.

¹³ *Id.* at 57 - 58.

analyses of impacts under the test were extensive. They used SeriesSEE¹⁴ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹⁵

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Apar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{16,17} The model was updated to include pumping through 2012.¹⁸ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were

¹⁴ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

¹⁵ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

¹⁶ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁷ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁸ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.¹⁹

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.²⁰

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. They assert that the water budget information and pumping test results suggest that all available water in Coyote Spring Valley is appropriated and that the basin may currently be over-appropriated. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior

¹⁹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

²⁰ *Id.* at 84.

water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.²¹

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.²² Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.²³ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to pumping at well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically

²¹ *Id.* at 5.

²² Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

²³ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²⁴

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.²⁵

The MBOP argues for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.²⁶ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁷

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

²⁴ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

²⁵ *Id.* at 30.

²⁶ *Ibid.*

²⁷ *Id.* at 31.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to

formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Coyote Spring Valley.

2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in a small part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.
3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists California Wash, and perhaps in Hidden and Garnet Valley. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather, they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a

determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

In the eleven years since Order 1169 was issued, much additional hydrologic information has been made available, including publications by the U.S. Geological Survey and others. There have also been hearings before the Office of the State Engineer for water rights in nearby hydrographic basins. Technical exhibits and expert testimony in those hearings include hydrological analyses of the carbonate aquifers and water budgets in the Order 1169 basins. This information significantly expands on the available knowledge of the hydrology and water resources of the Lower White River Flow System in Coyote Spring Valley, the Muddy River Springs Area and the surrounding basins. In hearings held in the fall of 2011 concerning SNWA applications in Delamar Valley, Dry Lake Valley, and Cave Valley, several exhibits and expert

testimony were presented that revise and update information presented at the Coyote Spring Valley water rights hearings.²⁸

SNWA Exhibit No. 452 from the 2011 hearing on Delamar, Dry Lake and Cave valleys is an Excel workbook that is designed to estimate groundwater recharge for all of the basins contributing to the White River Flow System from the Muddy River Springs Area northward. The exhibit was accepted by the State Engineer with some revisions,²⁹ and basin recharge and interbasin flows are specified for both Coyote Spring Valley and the Muddy River Springs Area hydrographic basins. From that exhibit, the supply of water to the Coyote Spring Valley is estimated to be approximately 41,000 afa, of which 39,000 is subsurface inflow from upgradient basins and 2,000 afa is derived from in-basin recharge. Prior to groundwater pumping in the region, all of this water flowed in the subsurface to the Muddy River Springs Area.

The total pre-development supply of water to the Muddy River Springs Area is estimated to be approximately 49,000 afa. The basin receives 41,000 afa from subsurface inflow from Coyote Spring Valley, and an estimated 8,000 afa from the Lower Meadow Valley Wash. In-basin recharge is minimal. Discharge from the basin by surface flow is estimated to be 33,600 afa, evapotranspiration is approximately 6,000 afa, and subsurface outflow to downgradient basins is an estimated 9,900 afa.³⁰ It is noted here that during periods of flood, inflows and outflows can be significantly greater than average. Flood flows are not included in these calculations, in part because these sources are transitory and not amenable to capture and long-term supply.

²⁸ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

²⁹ State Engineer's Ruling No. 6166, dated March 22, 2012, pp. 72 – 73, official records in the Office of the State Engineer.

³⁰ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the office of the State Engineer.

For basins similar to Coyote Spring Valley, where there is no groundwater evapotranspiration and all of the groundwater flows in the subsurface to an adjacent basin, recent rulings have limited the perennial yield to the portion of recharge from precipitation in that basin that was not needed to satisfy rights in the immediate downgradient basin.³¹ In State Engineer's Ruling Nos. 6165, 6166 and 6167, there was a consideration for how long it might take for an existing water right to be impacted, and the State Engineer found that where no significant effects would be felt for hundreds of years, the upgradient groundwater could be appropriated. Other early decisions of the State Engineer had allowed one-half of the total subsurface groundwater discharge to be appropriated as the perennial yield of such basins. State of Nevada Water Planning Report No. 3 lists the perennial yield of Coyote Spring Valley as 18,000 acre-feet, approximately one-half of the basin subsurface discharge.³² One of the goals of the Order 1169 test was to determine the perennial yield of Coyote Spring Valley.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada that do not feature carbonate-rock aquifers, all of the Order 1169 basins share virtually the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. Therefore, because these basins share a unique and close hydrological connection, and share virtually all of the same source and supply of water, unlike other basins in Nevada, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist.

³¹ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

³² Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, p. 25, Oct. 1971.

VI.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.³³ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing rights for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VII.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 16,200 acre-feet of senior groundwater rights in Coyote Spring Valley as well as approximately 33,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down

³³ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

from its average flow of 0.2 cfs prior to the test.^{34,35} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,³⁶ declined from 3.6 to 3.3 cfs during the test.³⁷ Baldwin and Jones Springs declined about 4% during the test.³⁸ The Muddy River at the Moapa gage did not display any decrease in flow,³⁹ although the MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.⁴⁰

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. As for the Muddy River, the State Engineer finds that evidence submitted by the DOI Bureaus and MBOP is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

VIII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that

³⁴ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

³⁵ <http://waterdata.usgs.gov/nv/nwis/>.

³⁶ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

³⁷ <http://waterdata.usgs.gov/nv/nwis/>.

³⁸ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³⁹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

⁴⁰ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in the Coyote Spring Valley, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁴¹

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:⁴²

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Coyote Spring Valley Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while

⁴¹ NRS Chapters 533 and 534.

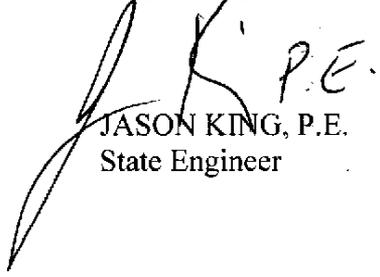
⁴² NRS § 533.370(2).

the use of the water under these applications may have a public benefit, removing the water from the springs would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent.

RULING

The protests to Applications 64039, 64186, 64187, 64188, 64189, 64190, 64191, 64192, 67892, 71031, 72838, 72839, 72840, 72841, 79296, 79297, 79298, 79299, 79300, 79497, 79498 and 79518 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

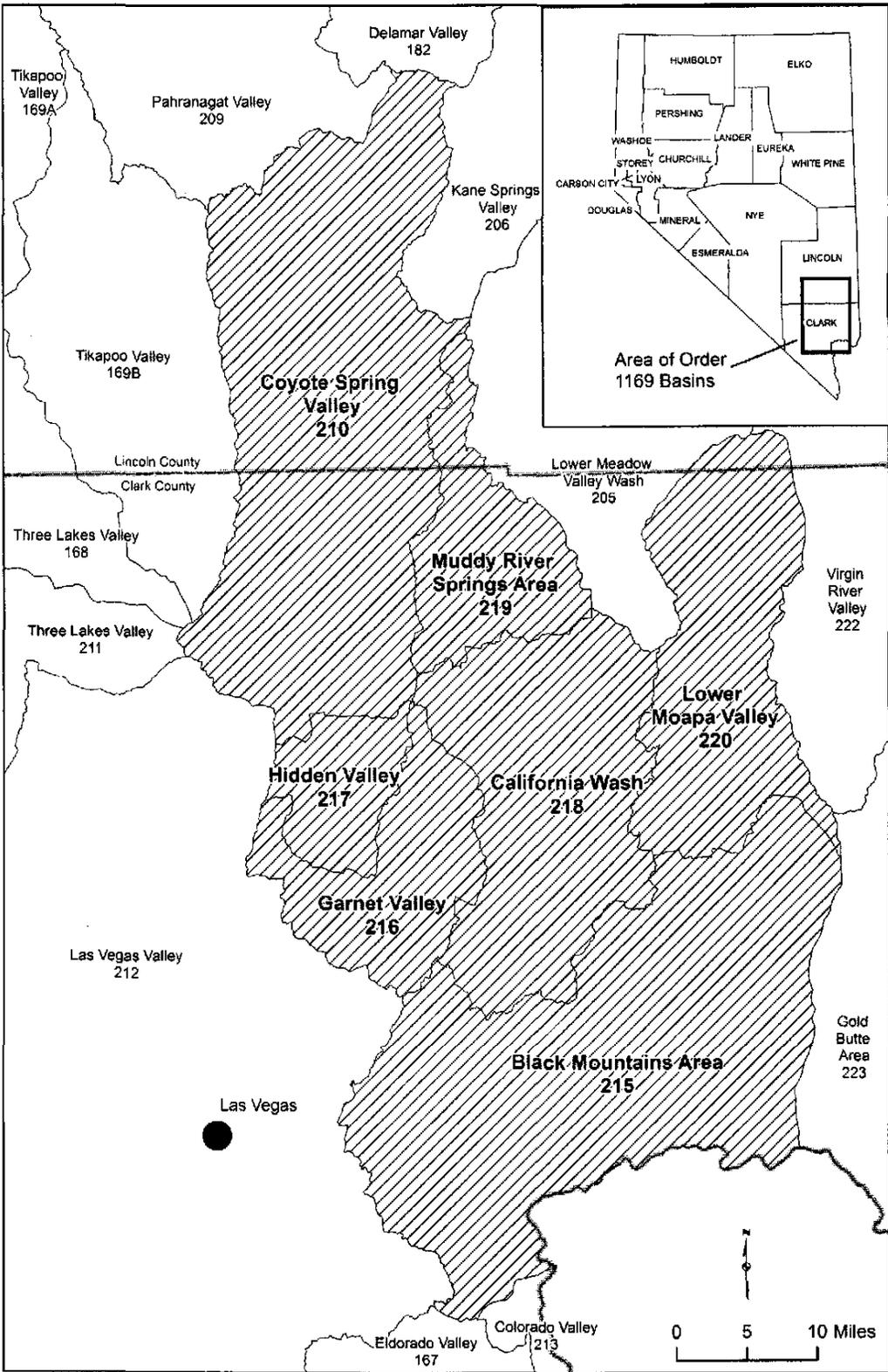
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
54130, 54484, 62996, 62998, 64040, 64045,)
64222, 64223, 67894, 79354, 79687, 79688,)
79689, 79691 AND 79903 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE GARNET VALLEY)
HYDROGRAPHIC BASIN (216), CLARK)
COUNTY, NEVADA.)

RULING
#6256

GENERAL

I.

Application 54130 was filed on October 30, 1989, by the Bonneville Nevada Corporation to appropriate 2.3 cubic feet per second (cfs) of groundwater from the Garnet Valley Hydrographic Basin for industrial (cogeneration power plant) use. The proposed point of diversion is described as being located within the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 34, T.18S., R.63E., M.D.B.&M. The proposed place of use is described as being located within portions of the SE $\frac{1}{4}$ NE $\frac{1}{4}$ and SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 34, T.18S., R.63E., M.D.B.&M.¹

II.

Application 54130 was timely protested by James W. Adams on the grounds that the application requested an appropriation of water 4.76 times the amount required for this size of a combined cycle cogeneration power plant and requested that the State Engineer reduce the amount allowed for appropriation if the application is approved.¹

III.

Application 54484 was filed on February 26, 1990, by Nevada Power Company to appropriate 2.0 cfs, not to exceed 1,000 acre-feet annually (afa) consumptive use, of groundwater from Garnet Valley Hydrographic Basin for industrial cooling purposes. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 2, T.18S., R.63E., M.D.B.&M. The proposed place of use is described as being located within the SE $\frac{1}{4}$, portions of the NE $\frac{1}{4}$ SW $\frac{1}{4}$ and SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 12, the NE $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, and portions of the NW $\frac{1}{4}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 13, the NE $\frac{1}{4}$, SE $\frac{1}{4}$ of Section 35, all of Sections 24, 25 and 36, T.17S., R.63E., M.D.B.&M., the SW $\frac{1}{4}$, SE $\frac{1}{4}$ of Section 7, all of

¹ File No. 54130, official records in the Office of the State Engineer.

Sections 18, 19, 30 and 31, T.17S., R.64E., M.D.B.&M., and the NE¼ of Section 2, and NW¼ of Section 1, T.18S., R.63E., M.D.B.&M.²

IV.

Application 62996 was filed on April 3, 1997, by Nevada Power Company to appropriate 8.35 cfs of groundwater (carbonate aquifer) from the Garnet Valley Hydrographic Basin for industrial cooling purposes. The proposed point of diversion is described as being located within the NE¼ NE¼ of Section 14, T.16S., R.63E., M.D.B.&M. The proposed place of use is described as being located within the SE¼ and a portion of the E½ SW¼ of Section 12, E½, SW¼, and a portion of the NW¼ of Section 13, Sections 24, 25 and 36, and the E½ of Section 35, T.17S., R.63E., M.D.B.&M., the NW¼ of Section 1 and the NE¼ of Section 2, T.18S., R.63E., M.D.B.&M., and the S½ of Section 7, Sections 18, 19, 30 and 31, T.17S., R.64E., M.D.B.&M.³

V.

Application 62996 was timely protested by the Moapa Valley Water District, U.S. Department of Interior Fish and Wildlife Service, and U.S. Department of Interior National Park Service on various grounds summarized as follows:³

1. The quantity of water requested far exceeds the water available for appropriation.
2. The committed groundwater resources of Hidden and Garnet valleys combined exceed the groundwater recharge.
3. The proposed use of the water will result in groundwater mining.
4. The proposed use of the water could impair the senior water rights held by the Moapa Valley Water District at Baldwin and Pipeline Jones springs and Lower Moapa Valley and could decrease the productivity of the District's existing wells in the Muddy River Springs Area.
5. The proposed use of the water could adversely impact the water chemistry of the groundwater system in the Muddy River Springs Area, California Wash and Lower Moapa Valley through interception of subsurface recharge to these basins.
6. The proposed use of the water is not in the public interest because northeastern Clark County already has a shortage of potable water supplies and is hard pressed to meet

² File No. 54484, official records in the Office of the State Engineer.

³ File No. 62996, official records in the Office of the State Engineer.

7. existing municipal demands and future growth and diversion of such a large quantity of water should not be allowed for a lower beneficial use.
8. The proposed use of the water may cause injury to the U.S. Fish and Wildlife Service's senior water rights on national wildlife refuges.
9. The proposed use of the water may threaten to prove detrimental to the public interest because it may threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act.
10. The U.S. National Park Service asserts that recharge from precipitation in Garnet Valley is estimated at 400 afa, inflow from Hidden Valley is estimated at 400 afa, committed resources are 930 afa, and discharge from the valley primarily by subsurface outflow is estimated at 800 afa to California Wash and the Muddy River. A small amount of subsurface inflow enters Garnet Valley from Coyote Spring Valley. The groundwater reservoirs of Hidden, Garnet and Coyote Spring valleys are tributary to the Muddy River. The rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
11. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

VI.

Application 62998 was filed on April 3, 1997, by Nevada Power Company to appropriate 8.35 cfs of groundwater (carbonate aquifer) from the Garnet Valley Hydrographic Basin for industrial cooling purposes. The proposed point of diversion is described as being located within the SW¼ NE¼ of Section 11, T.16S., R.63E., M.D.B.&M. The proposed place of use is the same as that described under Application 62996.⁴

VII.

Application 62998 was timely protested by the Moapa Valley Water District, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service on the same grounds as Application 62996.⁴

⁴ File No. 62998, official records in the Office of the State Engineer.

VIII.

Applications 64040 and 64045 were filed on April 17, 1998, by Dry Lake Water, LLC to appropriate 10 cfs of groundwater under each application from the Garnet Valley Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion under Application 64040 is described as being located within the NW¼ NW¼ of Section 29, T.17S., R.64E., M.D.B.&M. The proposed point of diversion under Application 64045 is described as being located within the NE¼ NE¼ of Section 32, T.17S., R.63E., M.D.B.&M. The proposed place of use is described as being within the Apex Industrial Park, which is described as being located within portions of Sections 32 and 33, T.17S., R.63E., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35 and all of Sections 18 and 33, T.18S., R.63E., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the applications indicate that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.⁵

IX.

Applications 64040 and 64045 were timely protested by Nevada Power Company, U.S. Department of Interior National Park Service, U.S. Department of Interior Fish and Wildlife Service on various grounds summarized as follows:⁵

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The committed groundwater resources of Hidden and Garnet valleys combined exceed the groundwater recharge.
3. The proposed use of the water will result in groundwater mining.
4. The proposed use of the water may cause injury to the U.S. Fish and Wildlife Service's senior water rights on national wildlife refuges.
5. The proposed use of the water may threaten to prove detrimental to the public interest because it may threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act.

⁵ File Nos. 64040 and 64045, official records in the Office of the State Engineer.

6. The U.S. National Park Service asserts that recharge from precipitation in Garnet Valley is estimated at 400 afa and inflow from Hidden Valley is estimated at 400 afa and discharge from the valley primarily by subsurface outflow is estimated at 800 afa to California Wash and the Muddy River. A small amount of subsurface inflow from Coyote Spring Valley may also enter Hidden and Garnet valleys. The groundwater reservoirs of Hidden, Garnet and Coyote Spring valleys are tributary to the Muddy River. The rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
7. The proposed use of water may cause injury to the U.S. Fish and Wildlife Service water rights on the Moapa Valley and Pahrnagat National Wildlife Refuges and other senior water right holders in the Muddy River Springs Area.
8. The proposed use of the water may threaten to prove detrimental to the public interest because it may damage habitat for species that are endangered or threatened under the Endangered Species Act.
9. Hidden and Garnet valleys are south of Coyote Spring Valley and the extreme southern end of the White River Flow System and there is very little groundwater flow in this area because almost all of the flow of the White River Flow System is discharged north of these valleys at the Muddy River Springs Area.
10. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

X.

Applications 64222 and 64223 were filed on June 12, 1998, by Nevada Power Company to appropriate 1.11 cfs, not to exceed 807 afa consumptive use, of groundwater (carbonate aquifer) under each application from the Garnet Valley Hydrographic Basin for industrial cooling purposes. The proposed point of diversion under Application 64222 is described as being located within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 9, T.17S., R.64E., M.D.B.&M. The proposed point of diversion under Application 64223 is described as being located within the NW $\frac{1}{4}$ SW $\frac{1}{4}$

of Section 10, T.17S., R.64E., M.D.B.&M. The proposed place of use is the same as that described under Application 62996.⁶

XI.

Applications 64222 and 64223 were timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:⁶

1. There is no water available for appropriation as the committed water resources exceed the groundwater recharge.
2. The proposed use of the water may cause injury to the water rights of the United States and others because it may reduce the discharge of the Muddy River.
3. The proposed use of the water could reduce the discharge of springs in the Lake Mead National Recreation Area.
4. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
5. It would not be in the public interest to approve an application when the Applicant does not appear to control both the proposed point of diversion and place of use.

XII.

Application 67894 was filed on August 8, 2001, by Dry Lake Water, LLC to appropriate 10 cfs of groundwater within the Garnet Valley Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion is described as being located within the NE¼ NE¼ of Section 32, T.17S., R.63E., M.D.B.&M. The proposed place of use is described as being within the Apex Industrial Park, which is described as being located within parts of Sections 32 and 33, T.17S., R.63E., parts of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35 and all of Sections 18 and 33, T.18S., R.63E., and parts of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.⁷

⁶ File Nos. 64222 and 64223, official records in the Office of the State Engineer.

⁷ File No. 67894, official records in the Office of the State Engineer.

XIII.

Application 67894 was timely protested by Coyote Springs Investment, LLC, Las Vegas Valley Water District, Moapa Band of Paiute Indians, Nevada Power Company, U.S. Department of Interior National Park Service on various grounds summarized as follows:⁷

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing rights in surrounding basins, including those rights held by Coyote Springs Investment, LLC, unquantified senior reserved rights of the Moapa Band of Paiutes to the waters of the Muddy River and groundwater under the Reservation, rights of Nevada Power and rights of the U.S. National Park Service.
3. The public interest would not be served by granting the application.
4. The application is duplicative and unnecessary because the Applicant has already secured the water necessary to gain its subdivision approval and the power plants at Apex Industrial Park already have a water supply.
5. The Applicant has not demonstrated the financial capability to develop the water and place it to beneficial use.
6. The proposed use of the water is environmentally unsound for the basin of origin.
7. Granting the application is contrary the approach adopted in State Engineer's Ruling No. 5008, which required gradual staged development.

XIV.

Application 79354 was filed on January 28, 2010, by the Southern Nevada Water Authority to appropriate 10 cfs of groundwater from the Garnet Valley Hydrographic Basin for municipal and domestic purposes. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 32, T.17S., R.63E., M.D.B.&M. The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County). The remarks section of the application indicates that the water will be placed to beneficial use within the SNWA and Lincoln County

Water District service territories. The approximate number of persons to be served is 2 million and is estimated to be 3.851 million by 2050.⁸

XV.

Application 79354 was timely protested by Center for Biological Diversity, Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service, U.S. Department of Interior Bureau of Land Management on various grounds summarized as follows:⁸

1. There is no unappropriated water in the proposed source of supply.
2. The proposed use will conflict impermissibly with existing water rights in both the Garnet Valley basin and with groundwater and surface water rights in nearby hydrologically connected areas.
3. The proposed use of the water will cause injury to the U.S. Fish and Wildlife Service's senior water rights on the Fish Springs and Moapa National Wildlife Refuges.
4. The proposed use will threaten to prove detrimental to the public interest on environmental grounds and will be environmentally unsound for the basin of origin in that it will result in the drying out of springs, seeps, wetlands, etc. causing harm to habitat and wildlife, including threatened and endangered species.
5. The U.S. National Park Service asserts that recharge from precipitation in Garnet Valley is estimated at 400 afa, inflow from Hidden Valley is estimated at 400 afa and discharge from the valley primarily by subsurface outflow is estimated at 800 afa to California Wash and the Muddy River. A small amount of subsurface inflow from Coyote Spring Valley may also enter Hidden and Garnet valleys. The groundwater reservoirs of Hidden, Garnet and Coyote Spring valleys are tributary to the Muddy River. The rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
6. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

⁸ File No. 79354, official records in the Office of the State Engineer.

7. The proposed use would be detrimental to the public interest on economic grounds and will unduly limit the future growth and development of the basin of origin.
8. The proposed use is not an appropriate long-term use of water.
9. The Applicant has failed to justify the need for the importing the water.
10. The Applicant has not implemented a sufficient water conservation plan.
11. The Applicant has not demonstrated the good faith intent or financial ability and reasonable expectation to actually construct the project and apply the water to beneficial use.
12. The proposed use will threaten to prove detrimental to the public interest because it will likely lower water levels in the Muddy River Springs Area to the detriment of the Moapa dace, an endangered species.
13. Granting the applications will result in groundwater mining and threaten springs, seeps and phreatophytes, which provide water and habitat critical for wildlife and grazing livestock.
14. Granting the applications will deprive many areas of water needed to protect and enhance their environment and well being.
15. Granting the applications will threaten to prove detrimental to the public interest as it will cause degradation of air quality, it will destroy recreational and aesthetic values, degrade water quality and degrade cultural resources.

XVI.

Applications 79687, 79688, 79689 and 79691 were filed on March 15, 2010, by Nevada Power Company d.b.a. NV Energy to appropriate 1.11 cfs not to exceed 807 afa, 8.35 cfs, 1.11 cfs not to exceed 807 afa, and 8.35 cfs, respectively, of groundwater from the Garnet Valley Hydrographic Basin for industrial cooling and other uses associated with power production and coal gasification purposes. The proposed points of diversion are described as being located as follows:

Application 79687 within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 9, T.17S., R.64E., M.D.B.&M.

Application 79688 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 14, T.16S., R.63E., M.D.B.&M.

Application 79689 within the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 10, T.17S., R.64E., M.D.B.&M.

Application 79691 within the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 11, T.16S., R.63E., M.D.B.&M.

The proposed place of use is described as being located within the SE¼, and a portion of the E½ SW¼ of Section 12, E½, SW¼, and a portion of the NW¼ of Section 13, Sections 24, 25 and 36, and the E½ of Section 35, T.17S., R.63E., M.D.B.&M., the NW¼ of Section 1, and the NE¼ of Section 2, T.18S., R.63E., M.D.B.&M., and the S½ of Section 7, Sections 18, 19, 30 and 31, T.17S., R.64.E., M.D.B.&M. The remarks section of the applications indicate that they are being filed solely as a result of the Nevada Supreme Court's decision in *Great Basin Water Network, et al. v. State Engineer*, 126 Nev. Adv. Op. 2 (January 28, 2010).⁹

XVII.

Applications 79687, 79688, 79689 and 79691 were timely protested by the Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior Bureau of Land Management, U.S. Department of Interior National Park Service on various grounds summarized as follows:⁹

1. There is no unappropriated water in the proposed source of supply.
2. The proposed use will conflict impermissibly with existing water rights in both the Garnet Valley basin and with groundwater and surface water rights in nearby hydrologically connected areas.
3. The proposed use will conflict with existing groundwater rights in Garnet Valley and groundwater and surface water rights in hydrologically connected basins in which the Moapa Band of Paiutes have an interest.
4. The proposed use of the water will cause injury to the U.S. Fish and Wildlife Service's senior water rights on the Fish Springs and Moapa National Wildlife Refuges.
5. The proposed use will threaten to prove detrimental to the public interest on environmental grounds and will be environmentally unsound for the basin of origin in that it will result in the drying out of springs, seeps, wetlands, etc. causing harm to habitat and wildlife, including threatened and endangered species.
6. The U.S. National Park Service asserts that recharge from precipitation in Garnet Valley is estimated at 400 afa, inflow from Hidden Valley is estimated at 400 afa and discharge from the valley primarily by subsurface outflow is estimated at 800 afa to California Wash and the Muddy River. A small amount of subsurface inflow from Coyote Spring Valley may also enter Hidden and Garnet valleys. The groundwater reservoirs of Hidden, Garnet and Coyote Spring valleys are tributary to the Muddy River. The rights

⁹ File Nos. 79687, 79688, 79689, 79691, official records in the Office of the State Engineer.

to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.

7. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
8. The proposed use will threaten to prove detrimental to the public interest because it will likely lower water levels in the Muddy River Springs Area to the detriment of the Moapa dace, an endangered species.

XVIII.

Application 79903 was filed on June 14, 2010, by Nevada Power Company d.b.a. NV Energy to appropriate 2.0 cfs of groundwater from the Garnet Valley Hydrographic Basin for industrial cooling and other uses associated with power production and coal gasification purposes. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 2, T.18S., R.63E., M.D.B.&M. The remarks section of the application indicates that it is re-filed for the water filed for under Application 54484. The proposed place of use is described as being located within the SE $\frac{1}{4}$, portions of the NE $\frac{1}{4}$ SW $\frac{1}{4}$ and SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 12, the NE $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, and portions of the NW $\frac{1}{4}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 13, the NE $\frac{1}{4}$ and SE $\frac{1}{4}$ of Section 35, all of Sections 24, 25 and 36, T.17S., R.63E., M.D.B.&M., SW $\frac{1}{4}$ and SE $\frac{1}{4}$ of Section 7, and all of Sections 18, 19, 30 and 31, T.17S., R. 64.E., M.D.B.&M., and the NE $\frac{1}{4}$ Section 2 and NW $\frac{1}{4}$ of Section 1, T.18S., R.63E., M.D.B.&M. The remarks section of the application indicates they are being filed solely as a result of the Nevada Supreme Court's decision in *Great Basin Water Network, et al. v. State Engineer*, 126 Nev. Adv. Op. 2 (January 28, 2010).¹⁰

XIX.

Application 79903 was timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:¹⁰

1. There is no unappropriated water in the source because existing committed resources exceed the groundwater recharge and perennial yield.

¹⁰ File No. 79903, official records in the Office of the State Engineer.

2. The proposed use of the water will reduce discharge from the Muddy River and impair the United States' senior water right and others because the proposed appropriation will reduce the discharge of the Muddy River.
3. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 54130, 54484, 62996, 62998, 64040, 64045, 64222, 64223, 67894, 79354, 79687, 79688, 79689, 79691 and 79903 there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on these applications is not required.

II.

Order 1169 and 1169A

In 2001 a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."¹¹

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that

¹¹ State Engineer's Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants' own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.¹² Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south, including Garnet Valley. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that bypasses the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. See, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy

¹² Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred

indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and

pumping wells. Barometric data were collected at three sites: two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.¹³ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.¹⁴ SNWA points out that the flows of the Muddy River at Moapa did not

¹³ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

¹⁴ *Id.* at 26.

decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.¹⁵

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE¹⁶ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found

¹⁵ *Id.* at 57 - 58.

¹⁶ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹⁷

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Apcar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{18,19} The model was updated to include pumping through 2012.²⁰ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.²¹

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet

¹⁷ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

¹⁸ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁹ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

²⁰ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

²¹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.²²

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.²³

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown

²² *Id.* at 84.

²³ *Id.* at 5.

due to MX-5 pumping extended only five miles from the MX-5 well.²⁴ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.²⁵ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to pumping at well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²⁶

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and

²⁴ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

²⁵ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

²⁶ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

these applications should be denied on the grounds that they would impact senior rights by the full amount.²⁷

The MBOP argue for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.²⁸ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁹

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

²⁷ *Id.* at 30.

²⁸ *Ibid.*

²⁹ *Id.* at 31.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Garnet Valley pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed

significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.

3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists California Wash, and perhaps in Hidden and Garnet valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

Groundwater recharge from precipitation in Garnet Valley has not been significantly revised since the original reconnaissance report and is estimated to be 400 afa.³⁰ Prior to groundwater development, groundwater from Hidden Valley flowed into Garnet Valley. Garnet Valley groundwater then flowed in the subsurface to California Wash and to the Black Mountains Area. Groundwater rights in the basin total approximately 3,366 afa, but Garnet Valley Permit 54073 for 2,200 afa is combined with Hidden Valley Permit 54074. Permit terms allow the duties of Permits 54073 and 54074 to a total of no more than 2,200 afa. In allowing the water issued under Permit 54073 to be combined with Permit 54074 in Hidden Valley, the State Engineer recognized the hydrologic connection between these basins.

For basins similar to Garnet Valley, where there is no groundwater evapotranspiration and all of the groundwater flows in the subsurface to an adjacent basin, recent rulings have limited the perennial yield to the portion of recharge from precipitation in that basin that was not needed to satisfy rights in the immediate downgradient basin.³¹ In State Engineer's Ruling Nos. 6165, 6166, and 6167, there was a consideration for how long it might take for an existing water right to be impacted, and the State Engineer found that where no significant effects would be felt for hundreds of years, the upgradient groundwater could be appropriated. Other early decisions of the State Engineer had allowed one-half of the total subsurface groundwater discharge to be appropriated as the perennial yield of such basins. State of Nevada Water Planning Report No. 3 lists the perennial yield of Garnet Valley as 400 acre-feet, which is equal to one-half of the

³⁰ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), 1968, p. 25.

³¹ State Engineer's Ruling Nos. 6165, 6166, and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

basin's pre-development subsurface discharge.³² The Applicants have argued that there is substantially more water available to appropriate in this basin.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. Therefore, because these basins share a unique and close hydrological connection, and share virtually all of the same source and supply of water, unlike other basins in Nevada, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. Current groundwater rights in the seven Order 1169 basins total approximately 49,000 acre-feet. For the five basins to be jointly managed, there are approximately 37,000 acre-feet of groundwater rights. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist in any of these basins.

VI.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.³³ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing rights for hundreds of years. In contrast, neither

³² Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

³³ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VII.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 3,366 acre-feet of senior groundwater rights in Garnet Valley as well as approximately 46,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{34,35} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,³⁶ declined from 3.6 to 3.3 cfs during the test.³⁷ Baldwin and Jones Springs declined about 4% during the test.³⁸ The Muddy River at the Moapa gage did not display any decrease in flow,³⁹ although the

³⁴ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

³⁵ <http://waterdata.usgs.gov/nv/nwis/>.

³⁶ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

³⁷ <http://waterdata.usgs.gov/nv/nwis/>.

³⁸ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³⁹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.⁴⁰

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. The State Engineer finds that evidence submitted by the DOI Bureaus is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

VIII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in Garnet Valley, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

⁴⁰ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁴¹

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:⁴²

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Garnet Valley Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent.

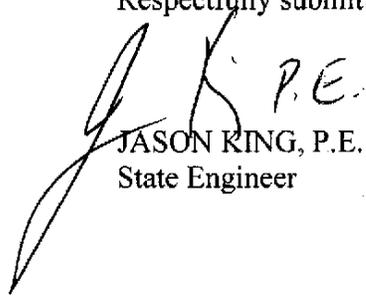
⁴¹ NRS Chapters 533 and 534.

⁴² NRS § 533.370(2).

RULING

The protests to Applications 54130, 54484, 62996, 62998, 64040, 64045, 64222, 64223, 67894, 79354, 79687, 79688, 79689, 79691 and 79903 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

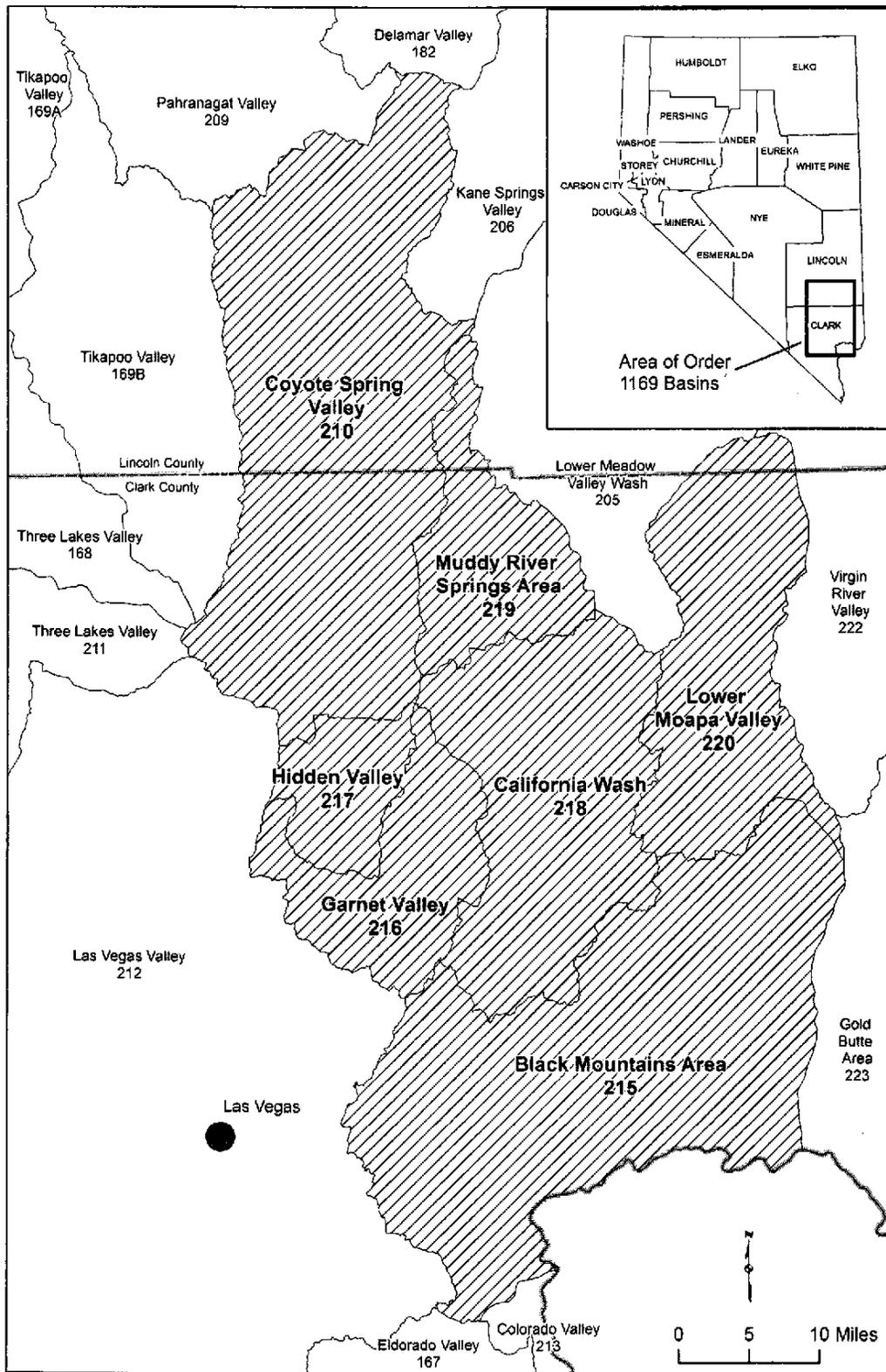
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January , 2014 .

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 815

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
62997, 62999, 64038, 66162, 67895, 68501,)
79355, 79692 AND 79693 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE HIDDEN VALLEY)
HYDROGRAPHIC BASIN (217), CLARK)
COUNTY, NEVADA.)

RULING
#6257

GENERAL

I.

Application 62997 was filed on April 3, 1997, by the Nevada Power Company to appropriate 5.57 cubic feet per second (cfs) of groundwater (carbonate aquifer) from the Hidden Valley Hydrographic Basin for industrial (cooling) purposes. The proposed point of diversion is described as being located within the NW¼ SE½ of Section 27, T.15S., R.63E., M.D.B.&M. The proposed place of used is described as being located within the SE¼ and a portion of E½ SW¼ of Section 12, and the E½, SW¼ and a portion of NW¼ of Section 13, Sections 24, 25 and 36 and the E½ of Section 35, T.17S., R.63E., M.D.B.&M., NW¼ of Section 1 and NE¼ of Section 2, T.18S., R.63E., M.D.B.&M., and the S½ of Section 7 and Sections 18, 19, 30 and 31, T.17S., R.64E., M.D.B.&M. The remarks section of the application indicates that the consumptive use of water for the entire Nevada Power Company well field is estimated to be 16,131 acre-feet annually (afa).¹

II.

Application 62997 was timely protested by the Moapa Valley Water District, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service on various grounds summarized as follows:¹

1. The quantity of water requested exceeds the legal availability of water as defined by the perennial yield.
2. The U.S. National Park Service asserts that recharge from precipitation in Hidden Valley is estimated at 400 afa, and discharge from the valley, primarily by subsurface outflow to

¹ File No. 62997, official records in the Office of the State Engineer.

Garnet Valley, is also estimated at 400 afa. A small amount of subsurface inflow may enter Hidden Valley from Coyote Spring Valley, but that the main body of groundwater in Coyote Spring Valley discharges through the Muddy River Springs Area and constitutes the base flow of the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, groundwater from the aquifers in Hidden Valley, Garnet Valley, and Coyote Spring Valley is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.

3. Committed groundwater resources in Hidden and Garnet valleys exceed the groundwater recharge for the basins and there is no water available for appropriation.
4. The proposed use of the water would constitute groundwater mining.
5. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
6. The proposed withdrawal could impair the senior water rights held by the Moapa Valley Water District on springs and wells situated hydraulically upgradient and downgradient of the Applicant's proposed points of diversion. The proposed use of the water has the potential to reduce the discharge rates at Baldwin and Pipeline Jones springs and to decrease production capacity from the Moapa Valley Water District's wells in the Muddy Springs area through the lowering of pumping levels.
7. The proposed use of the water could impact the water chemistry of the groundwater system of the Muddy Springs Area, California Wash, and Lower Moapa Valley through interception of subsurface recharge to these basins. The Moapa Valley Water District has senior water rights in the Muddy Springs Area and Lower Moapa Valley that could be impaired if the application is approved.
8. The proposed used is not in the public interest in that Northeastern Clark County is faced with a shortage of potable water supplies and is hard pressed to meet existing municipal water demands and future growth. The diversion of such a large amount with a lesser

beneficial use (industrial) would profit only Nevada Power Company and its shareholders and not the general public of Clark County.

9. The proposed use of the water may cause injury to the U.S. Fish and Wildlife Service's senior water rights on National Wildlife Refuges.
10. The proposed use of the water may threaten to prove detrimental to the public interest in that it may threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act.
11. Approval of the applications may threaten to prove detrimental to the public interest because the Applicant does not control the point of diversion or place of use.

III.

Application 62999 was filed on April 3, 1997, by the Nevada Power Company to appropriate 22.28 cfs of groundwater (carbonate aquifer) from the Hidden Valley Hydrographic Basin for industrial (cooling) purposes. The proposed point of diversion is described as being located within the NW¼ SE¼ of Section 29, T.16S., R.63E., M.D.B.&M. The proposed place of used is described as being located within the same place of use as described under Application 62997. The remarks section of the application indicates that the consumptive use of water for the entire Nevada Power Company well field is estimated to be 16,131 afa.²

IV.

Application 62999 was timely protested by the Moapa Valley Water District, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service on the same grounds summarized under Application 62997.²

V.

Application 64038 was filed on April 17, 1998, by Dry Lake Water, LLC to appropriate 10.0 cfs of groundwater from the Hidden Valley Hydrographic Basin for quasi-municipal use. The proposed point of diversion is described as being located within the NW¼ NE¼ of Section 16, T.16S., R.63E., M.D.B.&M. The proposed place of use is described as being located within portions of Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35, and all of Sections 18 and 33, T.18S., R.63E., M.D.B.&M., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S.,

² File No. 62999, official records in the Office of the State Engineer.

R.63E., M.D.B.&M. The remarks section of the application states that Dry Lake Water, LLC intends to be a distributor of water to the commercial and industrial developments in the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is actually requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.³

VI.

Application 64038 was timely protested by Nevada Power Company, U.S. Department of Interior Fish and Wildlife Service and U.S. Department of Interior National Park Service on various grounds summarized as follows:³

1. The quantity of water requested is not available for appropriation, especially considering the cumulative effect of all pending applications in this area.
2. Existing appropriations of groundwater exceed groundwater recharge.
3. The U.S. National Park Service asserts that recharge from precipitation in Hidden Valley is estimated at 400 afa and discharge from the valley, primarily by subsurface outflow to Garnet Valley, is also estimated at 400 afa. A small amount of subsurface inflow may enter Hidden Valley from Coyote Spring Valley, but that the main body of groundwater in Coyote Spring Valley discharges through the Muddy River Springs Area and constitutes the base flow of the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, groundwater from the aquifers in Hidden Valley, Garnet Valley, and Coyote Spring Valley is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
4. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

³ File No. 64038, official records in the Office of the State Engineer.

5. The proposed use of the water may cause injury to the U.S. Fish and Wildlife Service's senior water rights on National Wildlife Refuges.
6. The proposed use of the water may threaten to prove detrimental to the public interest in that it may threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act.
7. Approval of the applications may threaten to prove detrimental to the public interest because the Applicant does not control the point of diversion or place of use.

VII.

Application 66162 was filed on March 17, 2000, by Dry Lake Water, LLC to change the point of diversion and place of use of the water applied for under Application 64038. The proposed point of diversion is described as being located within the SW¼ SE¼ of Section 21, T.17S., R.63E., M.D.B.&M. The proposed place of use is described as being within portions of Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35, T.18S., R.63E., M.D.B.&M., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application states that Dry Lake Water, LLC intends to be a distributor of water to the commercial and industrial developments in the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is actually requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.⁴

VIII.

Application 66162 was timely protested by Nevada Power Company on the grounds that:⁴

1. There is no water available for appropriation and the basin may already be over-appropriated; therefore, the proposed use would result in groundwater mining.
2. This application is a change application on an application which has not been issued, which is also protested by Nevada Power Company.
3. The proposed use would threaten to prove detrimental to the public interest since it could result in over-appropriation from the carbonate aquifer.

⁴ File No. 66162, official records in the Office of the State Engineer.

IX.

Application 67895 was filed on August 8, 2001, by Dry Lake Water LLC to appropriate 10.0 cfs of groundwater from the Hidden Valley Hydrographic Basin for quasi-municipal use. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 21, T.17S., R.63E., M.D.B.&M. The proposed place of use and remarks to the application are the same as described in Application 64038.⁵

X.

Application 67895 was timely protested by the Moapa Band of Paiute Indians, Coyote Springs Investment, LLC, Las Vegas Valley Water District, Nevada Power Company and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁵

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing rights in surrounding basins, including those rights held by Coyote Springs Investment, LLC, Nevada Power Company, unquantified senior reserved rights of the Moapa Band of Paiutes to the waters of the Muddy River and groundwater under the Reservation and rights of the U.S. National Park Service.
3. The application is duplicative and unnecessary because the Applicant has already secured the water necessary to gain its subdivision approval and the power plants at Apex Industrial Park already have a water supply; therefore, the Applicant cannot demonstrate beneficial use of the water.
4. The Applicant has not demonstrated the financial capability to develop the water and place it to beneficial use.
5. The proposed use of the water is environmentally unsound for the basin of origin.
6. Granting the application is contrary the approach adopted in State Engineer's Ruling No. 5008, which required gradual staged development.
7. The proposed use of the water will threaten to prove detrimental to the public interest.
8. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

⁵ File No. 67895, official records in the Office of the State Engineer.

9. The application, or series of applications contemplates an interbasin transfer which may be unjustified under NRS § 533.370(4) [now NRS § 533.370(3)]. The proposed export of water may be environmentally unsound, and may impair the Moapa Band of Paiute's ability to put its own water rights to use.

XI.

Application 68501 was filed on February 15, 2002, by Dry Lake Water LLC to appropriate 10.0 cfs of groundwater from the Hidden Valley Hydrographic Basin for quasi-municipal use. The proposed point of diversion is described as being located within the SW¼ SE¼ of Section 21, T.17S., R.63E., M.D.B.&M. The proposed place of use is described as being located within portions of Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35, T.18S., R.63E. M.D.B.&M., and portions of sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application states that the total combined duty from this well and from that under Application 66162 will be no more than 7,240.2 afa consumptive use. The remarks further state that the application is not intended to appropriate new water but merely to provide reliability for the Applicant by allowing combined water usage in any proportion from the two wells for a consumptive use of 7,240.2 afa, and that the combined diversion rate under the two water rights will not exceed 10.0 cfs.⁶

XII.

Application 68501 was timely protested by Nevada Power Company, Las Vegas Valley Water District, U.S. Department of Interior Bureau of Land Management and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁶

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The U.S. National Park Service asserts that recharge from precipitation in Hidden Valley is estimated at 400 afa, and discharge from the valley, primarily by subsurface outflow to Garnet Valley, is also estimated at 400 afa. A small amount of subsurface inflow may enter Hidden Valley from Coyote Spring Valley, but that the main body of groundwater in Coyote Spring Valley discharges through the Muddy River Springs Area and

⁶ File No. 68501, official records in the Office of the State Engineer.

constitutes the base flow of the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, the groundwater from the aquifers in Hidden Valley, Garnet Valley, and Coyote Spring Valley is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.

3. The proposed use of the water will conflict with existing rights in surrounding basins, including those rights held by the U.S. National Park Service.
4. The application is duplicative and unnecessary because the Applicant has already secured the water necessary to gain its subdivision approval and the power plants at Apex Industrial Park already have a water supply; therefore, the Applicant cannot demonstrate beneficial use of the water.
5. The Applicant has not demonstrated the financial capability to develop the water and place it to beneficial use.
6. The proposed use of the water is environmentally unsound for the basin of origin and could impact the U.S. Bureau of Land Management's ability to manage wildlife habitat.
7. Granting the application is contrary the approach adopted in State Engineer's Order No. 1169, which places pending applications in abeyance while additional information is obtained.
8. The proposed use of the water will threaten to prove detrimental to the public interest.
9. There are springs and wells located on public land that could be impacted by the proposed use of the water.
10. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
11. Approval of the applications may threaten to prove detrimental to the public interest because the Applicant does not control the point of diversion or place of use.

XIII.

Application 79355 was filed on January 28, 2010, by the Southern Nevada Water Authority to appropriate 10.0 cfs of groundwater from the Hidden Valley Hydrographic Basin for municipal and domestic use. The proposed point of diversion is described as being located within the SW¹/₄ SW¹/₄ of Section 25, T.16S., R.62E., M.D.B.&M. The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County). The remarks section of the application indicates that the water will be placed to beneficial use within the service territories of the Southern Nevada Water Authority and Lincoln County Water District and indicates that the approximate number of persons to be served is 2 million and is estimated to be 3.851 million by 2050.⁷

In a letter from the agent for the Applicant, it was clarified that this application (among others) was filed by the Southern Nevada Water Authority in response to the Nevada Supreme Court's Decision in *Great Basin Water Network, et al. v. State Engineer, et al.*, which the agent interpreted as implying that applications filed prior to July 1, 2002, that had not been acted upon within one year, may be invalid. Therefore, this application was intended to be duplicative of an earlier filed application in the event the earlier application was deemed to be invalid.⁸

XIV.

Application 79355 was protested by the Center for Biological Diversity, the Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior Bureau of Land Management, U.S. Department of Interior National Park Service on various grounds summarize as follows:⁷

1. There is no unappropriated water at the source. There is insufficient water available in the proposed source of supply when added to water already appropriated in Hidden Valley and hydrologically connected basins within the same flow system. There is no

⁷ File No. 79355, official records in the Office of the State Engineer.

⁸ The agent indicated that an Exhibit A to his letter contained a chart of the corresponding earlier filed applications and protective applications; however, no Exhibit A was contained in file number 79335. The State Engineer's Office determined the corresponding earlier filed application was Application 54074. Application 57074 was granted on April 13, 2001, in State Engineer's Ruling No. 5008, dated March 20, 2001, and affirmed in State Engineer's Ruling No. 5143, dated July 22, 2002, official records in the Office of the State Engineer.

water available for appropriation in Hidden Valley where the perennial yield is 200 afa and there are currently 2,200 afa of committed groundwater resources.

2. The application and proposed use would conflict with existing water rights and protectable interests in domestic wells.
3. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, groundwater from the aquifers in Hidden Valley, Garnet Valley, and Coyote Spring Valley is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
4. The appropriation and export of water proposed in this application would be detrimental to the public interest on environmental grounds and would be environmentally unsound as it relates to the basin from which the export is proposed, including: (a) harm to wildlife, including threatened and endangered species, and wildlife habitat, (b) degradation of air quality, (c) destruction of recreational and aesthetic values, (d) degradation of water quality, and (e) degradation of cultural resources.
5. The appropriation and export of water proposed in this application would threaten to prove detrimental to the public interest on economic grounds and would unduly limit future growth and development in the basin from which the export is proposed and downgradient hydrologically connected basins.
6. The proposed action is not an appropriate long-term use of the water.
7. The Applicant has not justified the need to import water from another basin.
8. The Applicant has not implemented a sufficient conservation plan in the basin of use.
9. The Applicant has not demonstrated the good faith intent or financial ability and reasonable expectation to actually construct the works and apply the water to the intended beneficial use with reasonable diligence.
10. The proposed withdrawal conflicts with existing rights both within the groundwater basin at issue and also groundwater and surface water rights in nearby areas hydrologically

connected to the groundwater basin, including water rights in which the Moapa Band of Paiutes has an interest.

11. The proposed withdrawal threatens to prove detrimental to the public interest because it is likely to lower water levels in the Muddy Springs area to the detriment of the Moapa dace, an endangered species.
12. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
13. The proposed use of the water will cause injury to U.S. Fish and Wildlife Service's water rights on the Fish Springs National Wildlife Refuge and Moapa Wildlife Refuge.
14. The proposed use threatens to prove detrimental to the public interest because it is not likely compatible with the purposes of the national wildlife refuges. Granting the application will threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act and is therefore not in the public interest.

XV.

Application 79692 was filed on March 15, 2010, by the Nevada Power Company (d.b.a. NV Energy) to appropriate 5.57 cfs of groundwater (carbonate aquifer) from the Hidden Valley Hydrographic Basin for industrial cooling and other uses associated with power production and coal gasification. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 27, T.15S., R.63E., M.D.B.&M. The proposed place of used is described as being located within the SE $\frac{1}{4}$ and a portion of E $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 12 and the E $\frac{1}{2}$ and SW $\frac{1}{4}$, a portion of NW $\frac{1}{4}$ of Section 13, Sections 24, 25 and 36 and the E $\frac{1}{2}$ of Section 35, T.17S., R.63E., M.D.B.&M., the NW $\frac{1}{4}$ of Section 1 and NE $\frac{1}{4}$ of Section 2, T.18S., R.63E., M.D.B.&M., and the S $\frac{1}{2}$ of Section 7 and Sections 18, 19, 30 and 31, T.17S., R.64E., M.D.B.&M. The remarks section of the application states that the application was filed solely as the result of the decision by the Nevada Supreme Court in *Great Basin Water Network et al. v. State Engineer* on January 28, 2010. The Applicant currently holds Application 62997, and indicates that the application is not intended to be construed as a withdrawal of Application 62997, and requests that the date of filing of Application 79692 relate back to the filing date of Application 62997.⁹

⁹ File No. 79692, official records in the Office of the State Engineer.

XVI.

Application 79692 was timely protested by the Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service and U.S. Department of Interior Bureau of Land Management on various grounds summarized as follows:⁹

1. There is no unappropriated water at the source. There is insufficient water available in the proposed source of supply when added to water already appropriated in Hidden Valley and hydrologically connected basins within the same flow system. There is no water available for appropriation in Hidden Valley where the perennial yield is 200 afa and there are currently 2,200 afa of committed groundwater resources.
2. The application and proposed use would conflict with existing water rights and protectable interests in domestic wells and will exacerbate the groundwater mining that is likely already occurring in Hidden Valley.
3. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, the groundwater from the aquifers in Hidden Valley, Garnet Valley, and Coyote Spring Valley is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
4. The appropriation and export of water proposed in this application would be detrimental to the public interest on environmental grounds by degrading habitat on BLM managed lands.
5. The proposed withdrawal conflicts with existing rights both within the groundwater basin at issue, and also groundwater and surface water rights in nearby areas hydrologically connected to the groundwater basin, including water rights in which the Moapa Band of Paiutes has an interest.
6. The proposed withdrawal threatens to prove detrimental to the public interest because it is likely to lower water levels in the Muddy Springs area to the detriment of the Moapa dace, an endangered species.

7. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
8. The proposed use of the water will cause injury to U.S. Fish and Wildlife Service's water rights on the Fish Springs National Wildlife Refuge and Moapa Wildlife Refuge.
9. The proposed use threatens to prove detrimental to the public interest because it is not likely compatible with the purposes of the national wildlife refuges. Granting the application will threaten or damage habitat for species that are endangered, threatened or considered for future listing under the Endangered Species Act and is therefore not in the public interest.

XVII.

Application 79693 was filed by the Nevada Power Company (d.b.a. NV Energy) on March 15, 2010, to appropriate 22.28 cfs of groundwater (carbonate aquifer) from the Hidden Valley Hydrographic Basin for industrial cooling and other uses associated with power production and coal gasification. The proposed point of diversion is described as being located within the NW¼ SE¼ of Section 29, T.16S., R.63E., M.D.B.&M. The proposed place of used is described as being the same as that in Application 79692. The remarks section of the application states that the application was filed solely as the result of the decision by the Nevada Supreme Court in *Great Basin Water Network et al. v. State Engineer* on January 28, 2010. The Applicant currently holds Application 62999, and indicates that the application is not intended to be construed as a withdrawal of Application 62999, and requests that the date of filing of Application 79693 relate back to the filing date of Application 62999.¹⁰

XVIII.

Application 79693 was timely protested by the Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service and U.S. Department of Interior Bureau of Land Management on the same grounds asserted by them in protests to Application 79692.¹⁰

¹⁰ File No. 79693, official records in the Office of the State Engineer.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 62997, 62999, 64038, 66162, 67895, 68501, 79355, 79692 and 79693 there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on these applications is not required.

II.

Order 1169 and 1169A

In 2001, a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."¹¹

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity,

¹¹ State Engineer's Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants' own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.¹² Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south, including Hidden Valley. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that bypasses the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. See, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies

¹² Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred

indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's

headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites: two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.¹³ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after

¹³ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

the winter of 2005.¹⁴ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.¹⁵

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE¹⁶ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the

¹⁴ *Id.* at 26.

¹⁵ *Id.* at 57 - 58.

¹⁶ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹⁷

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Aparcar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{18,19} The model was updated to include pumping through 2012.²⁰ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order

¹⁷ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

¹⁸ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁹ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

²⁰ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.²¹

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.²²

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending

²¹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

²² *Id.* at 84.

water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.²³

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.²⁴ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.²⁵ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to pumping at well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be

²³ *Id.* at 5.

²⁴ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

²⁵ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²⁶

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.²⁷

The MBOP argue for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude the current flows of the Muddy River.²⁸ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁹

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the

²⁶ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

²⁷ *Id.* at 30.

²⁸ *Ibid.*

²⁹ *Id.* at 31.

Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Hidden Valley pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.
3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists California Wash, and perhaps in

Hidden and Garnet valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

Groundwater recharge from precipitation in Hidden Valley has not been significantly revised since the original reconnaissance report, and is estimated to be 400 afa.³⁰ There is no pumping in the basin, so all of this water flows in the subsurface to Garnet Valley. Only one

³⁰ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa - Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), 1968, p. 25.

groundwater right has been granted in the basin. Permit 54074 was issued to the LVVWD in 2001 for 2,200 afa. Permit terms allow the duty to be combined with another well in Garnet Valley under Permit 54073. In allowing the water issued under Permit 54074 to be combined with Permit 54073 in Garnet Valley, the State Engineer recognized the hydrologic connection between the basins.

For basins similar to Hidden Valley, where there is no groundwater evapotranspiration and all of the groundwater flows in the subsurface to an adjacent basin, recent rulings have limited the perennial yield to the portion of recharge from precipitation in that basin that was not needed to satisfy rights in the immediate downgradient basin.³¹ In State Engineer's Ruling Nos. 6165, 6166, and 6167, there was a consideration for how long it might take for an existing water right to be impacted, and the State Engineer found that where no significant effects would be felt for hundreds of years, the upgradient groundwater could be appropriated. Other early decisions of the State Engineer had allowed one-half of the total subsurface groundwater discharge to be appropriated as the perennial yield of such basins. State of Nevada Water Planning Report No. 3 lists the perennial yield of Hidden Valley as 200 acre-feet, which is equal to approximately one-half of the basin subsurface discharge.³² The Applicants have argued that there is substantially more water available to appropriate in this basin.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada that do not feature carbonate-rock aquifers, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. Therefore, because these basins share a unique and close hydrological connection, and share virtually all of the same source and supply of water, unlike other basins in Nevada, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in

³¹ State Engineer's Ruling Nos. 6165, 6166, and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

³² Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971, p.25.

the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. Current groundwater rights in the seven Order 1169 basins total approximately 49,000 acre-feet. For the five basins to be jointly managed, there are approximately 37,000 acre-feet of groundwater rights. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist in any of these basins.

VI.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.³³ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing right for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VII.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 2,200 acre-feet of senior groundwater rights in Hidden Valley as well as approximately 47,000 acre-feet of senior groundwater rights in

³³ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{34,35} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,³⁶ declined from 3.6 to 3.3 cfs during the test.³⁷ Baldwin and Jones Springs declined about 4% during the test.³⁸ The Muddy River at the Moapa gage did not display any decrease in flow,³⁹ although the MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.⁴⁰

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk

³⁴ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

³⁵ <http://waterdata.usgs.gov/nv/nwis/>.

³⁶ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

³⁷ <http://waterdata.usgs.gov/nv/nwis/>.

³⁸ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³⁹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

⁴⁰ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

of the region's water, is fully appropriated. The State Engineer finds that evidence submitted by the DOI Bureaus is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

VIII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in Hidden Valley, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁴¹

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:⁴²

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;

⁴¹ NRS Chapters 533 and 534.

⁴² NRS § 533.370(2).

- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Hidden Valley Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

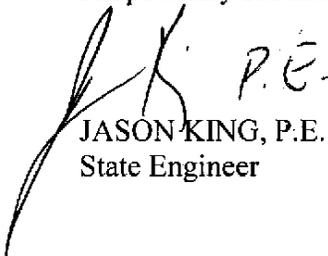
IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten the water resources upon which the endangered Moapa dace are dependent.

RULING

The protests to Applications 62997, 62999, 64038, 66162, 67895, 68501, 79355, 79692 and 79693 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

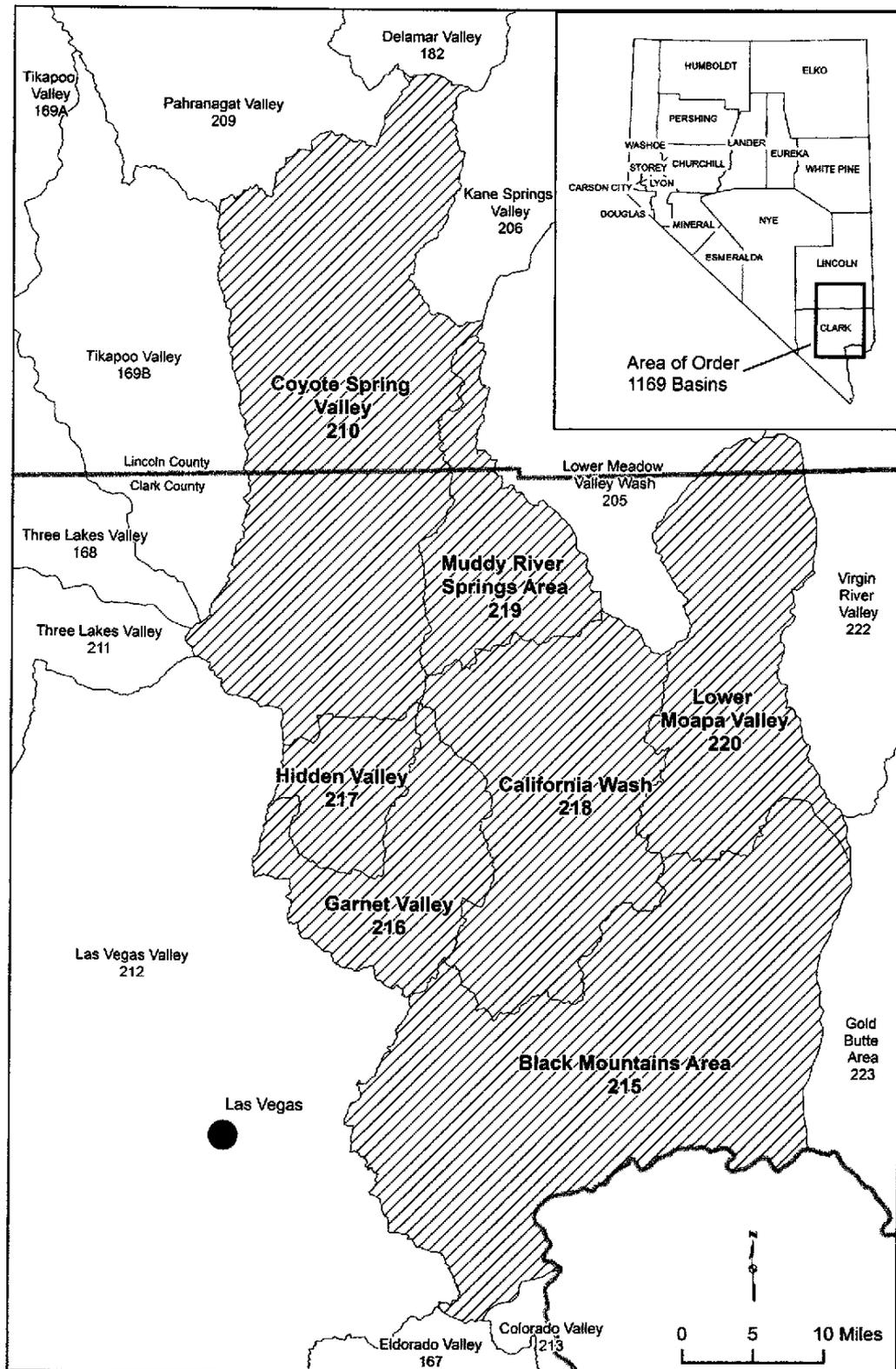
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 847

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
54076, 54634, 64037, 65197, 65944,)
65945, 65946, 65947, 65948, 65949,)
65954, 65955, 66473, 66474, 66475,)
66476, 67896 AND 79690 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE CALIFORNIA WASH)
HYDROGRAPHIC BASIN (218), CLARK)
COUNTY, NEVADA.)

RULING
#6258

GENERAL

I.

Application 54076 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 10 cubic feet per second (cfs) of groundwater from the California Wash Hydrographic Basin for municipal and domestic purposes. The application was assigned to the Moapa Band of Paiute Indians. The proposed point of diversion is described as being located within the NW¹/₄ NW¹/₄ of Section 16, T.15S., R.64E., M.D.B.&M. The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County).¹

II.

Application 54076 was timely protested by the U.S. Department of Interior Bureau of Land Management, Moapa Band of Paiute Indians,² Nye County, Toiyabe Chapter of the Sierra Club, Unincorporated Town of Pahrump, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service, Walter B. Galloway, White Pine County and City of Ely.

The application was protested on various grounds summarized as follows:¹

1. The application was one of the 146 applications to appropriate water filed by the Las Vegas Valley Water District, which combined seek 864,195 acre-feet annually (afa) of

¹ File No. 54076, official records in the Office of the State Engineer.

² The protest was filed prior to the application being assigned to the Moapa Band of Paiute Indians.

underground and surface water, and diversion of such a quantity of water would deprive the area of origin of water needed to protect and enhance its environment and economic well being, and would unnecessarily destroy environmental, ecological, scenic and recreational values the State holds in trust for its citizens.

2. The use of the water will exceed the annual recharge and safe yield of the basin and result in groundwater mining.
3. The use of the water will adversely affect water quality and thereby impair existing users.
4. The use of the water will degrade wetlands and riparian habitats on public lands and national wildlife refuge units.
5. The use of the water will jeopardize the existence of endangered and threatened species.
6. The applications should not be granted in the absence of comprehensive planning.
7. Approval of the applications would sanction and encourage the willful waste and inefficient use of water in the Las Vegas Valley.
8. The Las Vegas Valley Water District has not obtained rights-of-way from the U.S. Department of Interior Bureau of Land Management.
9. The Las Vegas Valley Water District lacks the financial capability for developing the project.
10. The application fails to include information, specifically, a description of statutorily the place of required use, the proposed works, the estimated cost of such works and the estimated time required to go to beneficial use.
11. The application fails to contain sufficient information for the State Engineer to safeguard the public interest and that a publicly-reviewable assessment must be done of the cumulative impacts of the proposed extraction, mitigation measures needed and alternatives to the proposed extraction.
12. The population projection numbers are unrealistic.
13. The application would allow the Las Vegas Valley Water District to "lock up" vital water resources for possible use in the distant future beyond current planning horizons.
14. The application substantially overstates future water demand needs.
15. Further study is needed because the potential effects are impossible to anticipate.
16. The granting of the application would destroy the economic and growth potential of the hydrographic basin.

17. The public interest will not be served if the water and water-related resources in the Death Valley National Monument and the Lake Mead National Recreation Area are diminished or impaired as a result of the appropriations.
18. The application will eventually reduce or eliminate the flows from springs, which are discharge areas for a regional groundwater flow system upon which the U.S. National Park Service claims senior appropriative and implied Federal reserved water rights.
19. The use of the water in combination with the other applications will conflict with existing rights, including the rights of the Moapa Band of Paiute Indians to the waters of the Muddy River and to groundwater underlying the Moapa Indian Reservation.
20. The proposed diversions are from the carbonate-rock province of Nevada that is typified by complex, interbasin, regional-flow systems that include both basin-fill and carbonate-rock aquifers along with interbasin flows that are poorly defined, and the diversions will reduce the interbasin flows, and modify the direction of groundwater movement in adjoining and hydraulically connected basins thereby reducing spring and stream flows.
21. The available scientific literature is not adequate to reasonably assure that the proposed diversions will not impact senior rights and water resources.
22. As of December 1988, the committed diversions in California Wash were 510 afa with an estimated perennial yield of 100 afa and the sum of the pending applications and the committed diversions will exceed the perennial yield of the groundwater basin; therefore, there is no water available for appropriation.
23. It is unclear whether the amount contemplated in the application is necessary and reasonably required for the proposed purposes.
24. The granting of the application will lower the water table, sanction water mining, degrade water quality, cause negative hydraulic gradient influences, threaten springs and seeps and phreatophytes, which provide water and habitat critical to the survival of wildlife including, endangered species and grazing livestock.
25. The application would create air contamination and pollution in violation of State and Federal statutes.
26. The application will cause water rates to go up thereby causing demand to go down thereby rendering the water unnecessary.
27. Previous applications from California Wash Hydrographic Basin have been denied.
28. The application will negatively impact Nevada's environment.

29. The Las Vegas Valley Water District has not shown a need for the water or that the project is feasible.

III.

Application 54634 was filed on April 6, 1990, by Nevada Power Company to appropriate 3.5 cfs, not to exceed 2,534 afa consumptive use, of groundwater from the California Wash Hydrographic Basin for industrial cooling and environmental control purposes. The proposed point of diversion is described as being located within the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 7, T.15S., R.66E., M.D.B.&M. The proposed place of use is described as being located within a portion of Section 5, T.15S., R.66E., M.D.B.&M. The remarks section of the application indicates that the water is to be used at the Reid Gardner Generating Station.³

IV.

Application 53634 was timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:³

1. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
2. The use of the water will eventually reduce or eliminate the flows of the Muddy River and springs within the Lake Mead National Recreation Area, which are discharge areas for the regional groundwater flow system and upon which the U.S. National Park Service holds water rights.
3. Lake Mead National Recreation Area has state permitted water rights upon springs and Muddy Creek (River) which will be impaired by the proposed use of the water.
4. The diversions proposed exceed the water available for appropriation

V.

Application 64037 was filed on April 17, 1998, by Dry Lake Water, LLC to appropriate 10 cfs of groundwater from the California Wash Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 33, T.17S., R.65E., M.D.B.&M. The proposed place of use is described as being within the Apex Industrial Park, which is described as being located within portions of Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35 and all of Sections 18 and 33, T.18S., R.63E.,

³ File No. 54634, official records in the Office of the State Engineer.

M.D.B.&M., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is actually requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.⁴

VI.

Application 64037 was timely protested by Nevada Power Company and the U.S. Department of Interior National Park Service on various grounds summarized as follows:⁴

1. The quantity of water requested is not available for appropriation.
2. Existing appropriations of groundwater exceed groundwater recharge.
3. The public interest would not be served by granting the application because it would result in over-appropriation of the carbonate-rock aquifer.
4. The U.S. National Park Service asserts that recharge from precipitation in California Wash is estimated at less than 100 afa, inflow is estimated at 800 afa and discharge from the valley is primarily by subsurface outflow to the Muddy River Springs Area and the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, groundwater from the aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
5. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
6. It would not be in the public interest to approve applications where the Applicant does not control the point of diversion or place of use.

VII.

⁴ File No. 64037, official records in the Office of the State Engineer.

Application 65197 was filed on June 14, 1999, by the Moapa Band of Paiute Indians to appropriate 0.5 cfs of groundwater from the California Wash Hydrographic Basin for commercial and domestic purposes. The proposed point of diversion is described as being located within the SE¼ NW¼ of Section 31, T.16S., R.65E., M.D.B.&M. The proposed place of use is described as being located within the SE¼ NW¼ of Section 31, T.16S., R.65E., M.D.B.&M. The remarks section of the application indicates that the water will be used to serve an existing commercial development and possible future development.⁵

VIII.

Application 65197 was timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:⁵

1. The quantity of water requested is not available for appropriation.
2. Existing appropriations of groundwater exceed groundwater recharge.
3. The public interest would not be served by granting the application because it would result in over-appropriation of the carbonate-rock aquifer.
4. The U.S. National Park Service asserts that recharge from precipitation in California Wash is estimated at less than 100 afa, inflow is estimated at 800 afa and discharge from the valley is primarily by subsurface outflow (approximately 37,000 afa) to the Muddy River Springs Area and the Muddy River. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Additionally, groundwater from the aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
5. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

⁵ File No. 65197, official records in the Office of the State Engineer.

IX.

Applications 65944, 65945, 65946, 65947, 65948, 65949, 65954 and 65955 were filed on January 28, 2000, by the Moapa Band of Paiute Indians to appropriate 6.0 cfs, not to exceed 3,500 afa, of groundwater under each application within the California Wash Hydrographic Basin for cooling water for power generation purposes. The proposed points of diversion are described as being located as follows:

- Application 65944 within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.
- Application 65945 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 22, T.16S., R.64E., M.D.B.&M.
- Application 65946 within the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.
- Application 65947 within the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.
- Application 65948 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.
- Application 65949 within the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.
- Application 65954 within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 34, T.16S., R.64E., M.D.B.&M.
- Application 65955 within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 34, T.16S., R.64E., M.D.B.&M.

The proposed place of use is described as being located within the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 14, T.16S., R.64E., M.D.B.&M. The remarks section of the applications indicate that 12 applications were filed within the Moapa Indian Reservation for a gas-fired power plant and that the total combined diversion applied for is 12 cfs, not to exceed 7,000 afa of consumptive use.⁶

X.

Applications 65944, 65945, 65946, 65947, 65948, 65949, 65954 and 65955 were timely protested by Dry Lake Water, LLC, Las Vegas Valley Water District, Moapa Valley Water District, Nevada Power Company (65944 only), U.S. Department of Interior National Park Service, U.S. Department of Interior Fish and Wildlife Service on various grounds summarized as follows:⁶

1. Dry Lake Water Company, LLC owns water rights with points of diversion within the Black Mountain Hydrographic Basin and is advancing applications in Basins 210 (Coyote Spring Valley), 215 (Black Mountains Area), 216 (Garnet Valley), 217 (Hidden Valley North), 218 (California Wash), and diversions under Applications 65944-65949 and 65954-65955 when combined with existing and pending applications will exceed the perennial yield of Basin 218.

⁶ File Nos. 65944, 65945, 65946, 65947, 65948, 65949, 65954 and 65955, official records in the Office of the State Engineer.

2. There is no unappropriated water at the source.
3. The proposed use of the water will conflict with existing rights in Basin 218 and surrounding basins, including those of Dry Lake Water, LLC, Las Vegas Valley Water District, Moapa Valley Water District, Nevada Power Co., U.S. National Park Service and U.S. Fish and Wildlife Service.
4. Recharge for the source of water in California Wash is subsurface flow from Coyote Spring Valley, which is just upgradient of the Muddy River Springs; therefore, the proposed use may impact the spring discharge at the Muddy River Springs.
5. The permitted and certificated rights in California Wash, Hidden Valley, Garnet Valley and the Muddy River Springs Area exceed the perennial yield of the system.
6. The Applicant should comply with Nevada water law for the appropriation of water.
7. The proposed use of the water will threaten to prove detrimental to the public interest.
8. The proposed use of the water may impact spring discharge in the Muddy River Springs Area.
9. Recharge in California Wash is estimated as less than 100 afa, and subsurface inflow is estimated at 800 afa with groundwater discharge to the Muddy River.
10. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Groundwater from the aquifers in Hidden Valley, Garnet Valley, California Wash and the Muddy River Springs Area is also tributary to the Muddy River. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U. S. National Park Service and others.
11. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

XI.

Applications 66473, 66474 and 66475 were filed on June 19, 2000, by the Moapa Band of Paiute Indians to appropriate 6 cfs, not to exceed 3,500 afa, of groundwater under each application from the California Wash Hydrographic Basin for cooling water for power generation purposes. The proposed points of diversion are described as being located as follows:

Application 66473 within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.

Application 66474 within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.

Application 66475 within the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 15, T.16S., R.64E., M.D.B.&M.

The proposed place of use is described as being located within the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 14, T.16S., R.64E., M.D.B.&M. The remarks section of the applications indicate that 12 applications were filed within the Moapa Indian Reservation for a gas-fired power plant and that the total combined diversion applied for is 12 cfs, not to exceed 7,000 afa of consumptive use.⁷

XII.

Applications 66473, 66474 and 66475 were timely protested by the Las Vegas Valley Water District, Nevada Power Company and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁷

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing rights in Basin 218 and surrounding basins, including those of Las Vegas Valley Water District, Nevada Power and U.S. National Park Service.
3. Recharge for the source of water in California Wash is subsurface flow from Coyote Spring Valley, which is just upgradient of the Muddy River Springs; therefore, the proposed use may impact the spring discharge at the Muddy River Springs.
4. The proposed appropriation will mine groundwater and capture groundwater that discharges to the Muddy River.
5. The Applicant should comply with Nevada water law for the appropriation of water.
6. The proposed use of the water will threaten to prove detrimental to the public interest.
7. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

⁷ File Nos. 66473, 66474 and 66475, official records in the Office of the State Engineer.

XIII.

Application 66476 was filed on June 19, 2000, by the Moapa Band of Paiute Indians to appropriate 1 cfs, not to exceed 724 afa, of groundwater from the California Wash Hydrographic Basin for commercial purposes. The proposed point of diversion is described as being located within the SW¼ NW¼ of Section 23, T.16S., R.64E., M.D.B.&M. The proposed place of use is described as being located within the NW¼ of Section 31, T.16S., R.65E., M.D.B.&M.⁸

XIV.

Application 66476 was timely protested by the Las Vegas Valley Water District, Nevada Power Company and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁸

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing rights in Basin 218 and surrounding basins, including those of Las Vegas Valley Water District, Nevada Power and U.S. National Park Service.
3. Recharge for the source of water in California Wash is subsurface flow from Coyote Spring Valley, which is just upgradient of the Muddy River Springs; therefore, the proposed use may impact the spring discharge at the Muddy River Springs.
4. The proposed appropriation will mine groundwater and capture groundwater that discharges to the Muddy River.
5. The Applicant should comply with Nevada water law for the appropriation of water.
6. The proposed use of the water will threaten to prove detrimental to the public interest.
7. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

XV.

Application 67896 was filed on August 8, 2001, by the Dry Lake Water, LLC to appropriate 10 cfs of groundwater from the California Wash Hydrographic Basin for quasi-municipal purposes. The proposed point of diversion is described as being located within the NE¼ NW¼ of Section 4, T.19S., R.64E., M.D.B.&M. The proposed place of use is described as being within the Apex Industrial Park, which is described as being located within portions of

⁸ File No. 66476, official records in the Office of the State Engineer.

Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35, T.18S., R.63E., M.D.B.&M., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park.⁹

XVI.

Application 67896 was timely protested by the Moapa Band of Paiute Indians, Nevada Power Company, Coyote Springs Investment, LLC and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁹

1. There is no unappropriated water at the source because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing rights in Basin 218 and surrounding basins, including those rights held by Coyote Springs Investment, LLC, unquantified senior reserved rights of the Moapa Band of Paiutes to the waters of the Muddy River and groundwater under the Reservation and rights of the U.S. National Park Service.
3. Based on the depth to water, recharge for this source is the carbonate-rock aquifer and it is reasonable to assume that the headwater source for recharge is Coyote Spring Valley Basin which is just upgradient from the Muddy River Springs Area.
4. The proposed appropriation will mine groundwater and capture groundwater that discharges to the Muddy River.
5. The application is duplicative and unnecessary because the Applicant has already secured the water necessary to gain its subdivision approval and the power plants at Apex Industrial Park already have a water supply.
6. The Applicant has not demonstrated the financial capability to develop the water and place it to beneficial use.
7. The proposed use of the water is environmentally unsound for the basin of origin.
8. Granting the application is contrary the approach adopted in State Engineer's Ruling No. 5008, which required gradual staged development.
9. The proposed use of the water will threaten to prove detrimental to the public interest.

⁹ File No. 67896, official records in the Office of the State Engineer.

10. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

XVII.

Application 79690 was filed on March 15, 2010, by Nevada Power Company to appropriate 3.5 cfs of groundwater within the California Wash Hydrographic Basin for industrial cooling, environmental control and other related power production purposes. The proposed point of diversion is described as being located within the SE¼ NW¼ of Section 7, T.15S., R.66E., M.D.B.&M. The proposed place of use is described as being located within a portion of Section 5, T.15S., R.66E., M.D.B.&M. The remarks section of the application indicates that the water is to be used at the Reid Gardner Generating Station, but was filed solely as a result of the Nevada Supreme Court's decision in *Great Basin Water Network, et al. v. State Engineer*, 126 Nev. Adv. Op. 2 (January 28, 2010).¹⁰

XVIII.

Application 79690 was timely protested by the Moapa Band of Paiute Indians, U.S. Department of Interior Fish and Wildlife Service, U.S. Department of Interior National Park Service, U.S. Department of Interior Bureau of Land Management on various grounds summarized as follows:¹⁰

1. There is no unappropriated water in the source of supply because committed water resources exceed the natural groundwater recharge.
2. The proposed use of the water will conflict with existing groundwater rights both within the California Wash and with existing surface water and groundwater rights in nearby areas that are hydrologically connected to the groundwater basin.
3. The proposed use threatens to prove detrimental to the public interest because it will lower water levels in the Muddy River Springs Area to the detriment of the Moapa dace, an endangered species.
4. The proposed use of the water will cause injury to U.S. Fish and Wildlife Service senior water rights on the Fish Springs National Wildlife Refuge and the Moapa National Wildlife Refuge.
5. The proposed use of the water will threaten to prove detrimental to the public interest because it is not compatible with the purposes of the national wildlife refuges and will

¹⁰ File No. 79690, official records in the Office of the State Engineer.

- threaten or cause damage to habitat for species that are endangered, threatened or considered for future listing.
6. Under natural conditions groundwater is believed to flow eastward from Garnet Valley to California Wash and eventually to the Muddy River.
 7. Rights to the use of the water of the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada in the case of *Muddy Valley Irrigation Company vs. Moapa Salt Lake Produce Company* and there is no water available for appropriation as the source of the Muddy River is the springs in the Muddy River Springs Area and tributaries. Therefore, if the application is approved it could reduce the discharge to the Muddy River and impair water rights held by the U.S. National Park Service and others.
 8. The proposed use of the water would result in groundwater mining.
 9. Information developed by Page and others in 2005 and 2006 shows there is a potential continuous flow path in carbonate rocks extending from the general area of Hidden Valley (North), beneath Garnet Valley and California Wash, all the way to the Paleozoic rocks that comprise the Muddy Mountains from which Rogers and Blue Point Springs in the Lake Mead National Recreation Area emanate. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the state Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 54076, 54634, 64037, 65197, 65944, 65945, 65946, 65947, 65948, 65949, 65954, 65955, 66473, 66474, 66475, 66476, 67896 and 79690 there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on these applications is not required.

II.

Order 1169 and 1169A

In 2001, a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."¹¹

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants' own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges

¹¹ State Engineer's Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

at the Muddy River Springs, which is appropriated under the Muddy River Decree.¹² Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south, including California Wash. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that bypasses the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. See, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water

¹² Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites: two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted

by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.¹³ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.¹⁴ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.¹⁵

¹³ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

¹⁴ *Id.* at 26.

¹⁵ *Id.* at 57 - 58.

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE¹⁶ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹⁷

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Apar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent

¹⁶ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

¹⁷ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{18,19} The model was updated to include pumping through 2012.²⁰ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.²¹

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.²²

¹⁸ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁹ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

²⁰ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

²¹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

²² *Id.* at 84.

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.²³

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.²⁴ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average

²³ *Id.* at 5.

²⁴ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.²⁵ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. It asserts that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to MX-5 pumping. In other words, they recognize no water-level decline in California Wash that is attributable to pumping at well MX-5.

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.²⁶

The MBOP argue for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.²⁷ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁸

²⁵T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

²⁶ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 30, June 28, 2013, official records in the Office of the State Engineer.

²⁷ *Ibid.*

²⁸ *Id.* at 31.

MBOP also argues for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²⁹ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation in California Wash.³⁰ They argue for upwelling groundwater beneath the reservation on the basis of several lines of evidence, including water temperatures, paleo-discharge sites (tufa mounds), a decrease in hydrostatic head to the southeast, and hydrochemical mass balance. Groundwater flux of several thousand afa toward the Colorado or Virgin River is likely, even though no major springs were documented prior to Lake Mead's filling.³¹

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

²⁹ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

³⁰ *Id.* at 31.

³¹ *Id.* at 17.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to

formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in California Wash pursuant to the applications.

2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.
3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists in California Wash, and perhaps in Hidden and Garnet valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing

records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

Groundwater recharge from precipitation in California Wash has not been significantly revised since the original reconnaissance report, and is estimated to be less than 100 afa.³² Prior to groundwater development, groundwater from Garnet Valley and the Muddy River Springs Area flowed into California Wash. It is estimated that 10,000 afa of inflow occurs in the Quaternary sediments adjacent to the Muddy River where it enters the basin.³³ California Wash probably received the majority of the outflow of natural recharge from Garnet Valley. The

³² F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p.25, 1968.

³³ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

amount of groundwater exiting the basin as deep carbonate underflow is unclear. MBOP argues that a significant amount of water upwells from the deep carbonate aquifer as “new” water. Their submitted technical report³⁴ and other reports in the Office of the State Engineer indicate temperature and light stable isotope values for carbonate groundwater in California Wash is essentially the same as carbonate water in adjacent basins.^{35,36} They argue that trace element geochemistry of California Wash groundwater cannot be derived from Muddy River Spring water. However, it is not necessary to demonstrate that California Wash groundwater followed an identical flow path as groundwater in adjacent basins or that is geochemically identical to water that discharges at the Muddy River springs. Instead, what matters the most for this analysis is whether groundwater in California Wash is hydrologically connected, and whether that water can be withdrawn without effects propagating quickly throughout the other Order 1169 basins and impacting the Muddy River Springs. Because water levels and water-level changes in California Wash, Coyote Spring Valley, the Muddy River Springs Area, and Hidden and Garnet valleys are nearly identical, the State Engineer believes that groundwater withdrawal in any of the five basins will have a similar effect on the whole hydrologic system. The MBOP’s final argument is that a southeasterly gradient demonstrates flow in that direction, toward Lake Mead. A southeasterly gradient really only demonstrates a potential for flow. The magnitude of flow is unknown, and no hydrologic study has satisfactorily quantified the subsurface flow from California Wash to the Black Mountains Area Hydrographic Basin.

For basins similar to California Wash, where there is a through-going perennial stream, recent rulings have limited the perennial yield to the recharge from precipitation in that basin.³⁷ Recharge from precipitation in California Wash is estimated to be less than 100 afa.³⁸ Earlier rulings of the State Engineer often established perennial yield on the basis of evapotranspiration within a basin. The perennial yield of California Wash was established in a USGS Open File Report 78-768 at 2,200 afa. How that figure was derived is not entirely clear, although the table

³⁴ Johnson, C., et al., *Hydrogeologic and Groundwater Modeling Analyses for the Moapa Paiute Energy Center*. 2001, official records in the Office of the State Engineer.

³⁵ Thomas, J.M. and Mihevc, T.M., *Evaluation of Groundwater Origins, Flow Paths, and Ages in East-Central and Southeastern Nevada*, Desert Research Institute Publication No. 41253, Appendix 1, 2011.

³⁶ Thomas, J.M., Calhoun, S.C., and Apambire, W.B., *A Deuterium Mass-balance Interpretation of Ground Water Sources and Flows in Southeastern Nevada*, Desert Research Institute Publication No. 41169, 2001, 46 pp.

³⁷ State Engineer’s Ruling Nos. 5747 and 5823, dated June 27, 2007, and March 18, 2008, official records in the Office of the State Engineer.

³⁸ Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, p. 50, Oct. 1971.

footnotes indicate the value was partially determined by irrigated acreage.³⁹ Water Resource Reconnaissance Report 50 did not estimate a perennial yield for the basin, although it did estimate perennial yield for adjacent basins.⁴⁰ Water Planning Report No. 3 lists no perennial yield for the basin either, but does recognize a system yield of 36,000 acre-feet.⁴¹ System yield is the combined surface water and groundwater resource, and is shared with other basins along the Muddy River. Current groundwater rights in California Wash total approximately 3,068 afa.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. The DOI Bureaus Order 1169 reports outline the supporting evidence why pumping in California Wash will lower water levels throughout the area and will result in decreased flow in the Muddy River Springs and the Muddy River. The MBOP reports argue otherwise. They argue that there was no water-level decline in wells in California Wash due to Order 1169 pumping, or from other pumping in Coyote Spring Valley or the Muddy River Springs Area.

Specifically, MBOP argues:

1. A southern flow field exists in California Wash, Hidden Valley and Garnet Valley that is hydrologically disconnected from the carbonate aquifer in Coyote Spring Valley and the Muddy River Springs Area.

A review of published geologic maps at the location indicated by the MBOP does not delineate any faults or other structures coincident with the feature.⁴² A southern flow field is not generally recognized in other peer-reviewed publications. No credible evidence was put forward establishing the location, mechanism or hydraulic properties for the feature represented in their report.

³⁹ Nowlin, J.O., *Ground-Water Quality in Nevada – A Proposed Monitoring Program*, USGS Open-File Report 78-768, 1986.

⁴⁰ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 50, 1968.

⁴¹ Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, p. 25, Oct. 1971.

⁴² Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 2, June 28, 2013, official records in the Office of the State Engineer.

2. Water-level changes in California Wash are due to changes in crustal loading associated with rising and falling Lake Mead.

Evidence submitted by the DOI Bureaus is more credible than that presented by the MBOP and is accepted by the State Engineer. The arguments that Lake Mead water storage changes are responsible for water-level changes in California Wash are not credible. The argument that annual groundwater-level fluctuations in California Wash are 10% of annual detrended water-level fluctuations in Lake Mead does not have sufficient technical support. Their Figure 14 shows that the relationship does not hold for 2010 through 2012.⁴³ The State Engineer finds this argument to be overly complex. The graph in Figure 14 shows a correlation of water level in the carbonate aquifer to “detrended” water level in Lake Mead, but they do not provide a quantitative analysis. A correlation could just as easily be made between carbonate water levels and air temperature, but that does not mean that air temperature changes caused water-level changes in the carbonate aquifer. Pumping stress in the carbonate aquifer at Apex, Muddy River Springs and Coyote Spring Valley also coincide with water-level changes throughout the region. To ignore the immediate effect of nearby pumping and attribute water-level changes in the carbonate aquifer to water levels in a reservoir 30 miles away is difficult to accept. Water-level changes associated with annually cyclical pumping in the underlying carbonate aquifer is more likely and is in agreement with the evidence and reports submitted by the DOI Bureaus. The State Engineer finds that annual water-level fluctuations are the result of local pumping stresses in the carbonate aquifer and discounts the analyses of the MBOP.

3. Geochemical and isotopic data indicate that Reservation waters are distinct from Muddy River Spring waters.

MBOP’s technical report⁴⁴ is somewhat out of date. More recent light stable isotope data indicate that the carbonate groundwater in California Wash is essentially the same as carbonate water in adjacent basins and in the Muddy River Springs.⁴⁵ The geochemical evidence shows that groundwater on the reservation has a somewhat different geochemical signature from waters elsewhere in the region, but that difference alone is not evidence that those waters can be

⁴³ *Id.* at 18.

⁴⁴ Johnson, C., et al., *Hydrogeologic and Groundwater Modeling Analyses for the Moapa Paiute Energy Center*. 2001, official records in the Office of the State Engineer.

⁴⁵ Thomas, J.M. and Mihevc, T.M., *Evaluation of Groundwater Origins, Flow Paths, and Ages in East-Central and Southeastern Nevada*, Desert Research Institute Publication No. 41253, Appendix 1, 2011.

developed without causing widespread effects throughout the carbonate aquifer and impacts to Muddy River spring flows.

4. Water temperatures in Reservation wells are characterized as abnormal,⁴⁶ and suggestive of deep circulation and upwelling.

Water temperature in the Reservation wells was measured at approximately 30°C. Carbonate wells in Coyote Spring Valley range from 28 to 35°C, and the spring temperatures range from 30 to 33°C.⁴⁷ Reservation water temperatures are not abnormal compared to the carbonate waters in the region, and therefore, do not support an argument of a separate source.

5. Approximately 9,500 afa of groundwater upwells in the area of the Reservation. The water supply to the southern flow field is in the range of 15,000 to 20,000 afa.

Neither of the MBOP's flow estimates is based on measurements. Rather, they are highly speculative estimates not supported by evidence. MBOP admits "*the outflow boundaries of the SFF in the Apex area have not been sufficiently well-characterized for outflow locations to be identified or confident estimates of outflow flux to be made.*"⁴⁸

6. A southeasterly hydraulic gradient supports flow in that direction.

The presence of a southeasterly hydraulic gradient would support the potential for flow in that direction, but the amount of flow is dependent on the hydraulic properties of the area. No evidence was presented on this issue, and the magnitude of flux is unknown.

The MBOP recommends that the southern flow field be evaluated with a pumping test similar to the Order 1169 test, and believes it may be feasible to mine carbonate groundwater in the southern flow field without impacting the springs or Muddy River. The State Engineer disagrees, and finds that data from the Order 1169 test and reports from the DOI Bureaus are persuasive and demonstrate that there is no separate supply of water in California Wash that could be developed without impacting regional water levels and the Muddy River Springs.

Therefore, because these basins share a unique and close hydrological connection, and share the same source and supply of water, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet.

⁴⁶ Johnson, C., et al., *Hydrogeologic and Groundwater Modeling Analyses for the Moapa Paiute Energy Center*. P. 17, 2001, official records in the Office of the State Engineer.

⁴⁷ Thomas, J.M. and Mihevc, T.M., *Evaluation of Groundwater Origins, Flow Paths, and Ages in East-Central and Southeastern Nevada*, Desert Research Institute Publication No. 41253, Appendix 1, 2011.

⁴⁸ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 27, June 28, 2013, official records in the Office of the State Engineer.

Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. Current groundwater rights in the seven Order 1169 basins total approximately 49,000 acre-feet. For the five basins that will be jointly managed, there are approximately 37,000 acre-feet of groundwater rights. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist in any of these basins.

VI.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.⁴⁹ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing rights for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VII.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 3,068 acre-feet of senior groundwater rights in California Wash as well as approximately 46,000 acre-feet of senior groundwater rights

⁴⁹ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{50,51} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,⁵² declined from 3.6 to 3.3 cfs during the test.⁵³ Baldwin and Jones Springs declined about 4% during the test.⁵⁴ The Muddy River at the Moapa gage did not display any decrease in flow,⁵⁵ although the MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.⁵⁶

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. The State Engineer finds that evidence submitted by the DOI Bureaus is convincing that pumping of groundwater under the pending applications in

⁵⁰ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

⁵¹ <http://waterdata.usgs.gov/nv/nwis/>.

⁵² In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

⁵³ <http://waterdata.usgs.gov/nv/nwis/>.

⁵⁴ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

⁵⁵ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

⁵⁶ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

The State Engineer does not agree with the position of the MBOP that there is a separate and distinct southern groundwater flow field in California Wash and adjacent basins that can be developed without impacting the Muddy River Springs. As discussed in the Perennial Yield section above, the State Engineer finds their evidence and recommendations are not persuasive and are not accepted. No fault or other hydrogeologic flow barrier is shown on published geologic maps at the location indicated by the MBOP.⁵⁷ Water-level decline in California Wash due to pumping of well MX-5 during the Order 1169 pumping test was approximately one foot. The State Engineer accepts the evidence of the DOI Bureaus and discounts the evidence put forth by the MBOP in their Order 1169 reports and attachments. Groundwater temperature in wells on the MBOP reservation and adjacent areas do not support local upwelling. Water temperatures at most of the carbonate wells and springs are warm, between 28 and 34°C. These warm temperatures are characteristic of the carbonate aquifer throughout all of the Southern White River Flow System,⁵⁸ and are not unique to California Wash area wells. Isotopes of hydrogen (deuterium) and oxygen (¹⁸O) are nearly identical in these basins. Deuterium concentrations (δD) of -99‰ +/- 2‰ occur in groundwater in Coyote Spring Valley and the Muddy River Springs, whereas δD in the Sheep Range are -92‰ and in Pahrnagat Valley carbonate springs are about -109‰.⁵⁹ The measurement precision for δD is +/- 1‰.⁶⁰ MBOP argues that the δD in Reservation wells of -99.0‰ is significantly different than δD of -97‰ to -101‰ in Coyote Spring Valley and Muddy River Springs Area and supports a separate flow path to the Reservation. More recent data indicate the δD of Upper Moapa Valley and the springs are precisely the same as δD in the Reservation wells at -99‰.⁶¹ The concept of local upwelling on the Reservation lacks credible support. The MBOP's own analysis demonstrates that vertical fluid potential change has not been detected in the 14 wells drilled on the Reservation and nearby

⁵⁷ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 2, June 28, 2013, official records in the Office of the State Engineer.

⁵⁸ Thomas, J.M. and Mihevc, T.M., *Evaluation of Groundwater Origins, Flow Paths, and Ages in East-Central and Southeastern Nevada*, Desert Research Institute Publication No. 41253, 2011.

⁵⁹ *Ibid.*

⁶⁰ *Id.* at 5.

⁶¹ *Id.* at 15.

areas.⁶² The presence of extinct spring mounds on the Reservation is good evidence that numerous discharge sites once existed, but this is just a sign of a previous wetter climate. Discharge no longer occurs at these locations. The MBOP argues for 10,000 to 20,000 afa groundwater inflow into the southern flow field, but there is no measurable discharge from the basin and this flux is purely speculative. The southeasterly hydraulic gradient supports the potential for flow in that direction, but there is no data that quantifies the magnitude of southeasterly flow. There is no conclusive evidence that 15,000 to 20,000 acre-feet⁶³ or 9,500 acre-feet⁶⁴ of groundwater upwells into California Wash and flows in the subsurface to down-gradient basins, and the arguments put forth by MBOP are not convincing. Therefore, the State Engineer finds he is not convinced and the evidence does not support that additional groundwater can be appropriated in California Wash without conflicting with senior rights in the Muddy River Springs Area and the other Order 1169 basins.

VIII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in California Wash, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

⁶² Johnson, C., et al., *Hydrogeologic and Groundwater Modeling Analyses for the Moapa Paiute Energy Center*. p. 17, 2001, official records in the Office of the State Engineer.

⁶³ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p 26, June 28, 2013, official records in the Office of the State Engineer.

⁶⁴ Johnson, C., et al., *Hydrogeologic and Groundwater Modeling Analyses for the Moapa Paiute Energy Center*. p. 4, 2001, official records in the Office of the State Engineer.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.⁶⁵

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:⁶⁶

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the California Wash Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent.

RULING

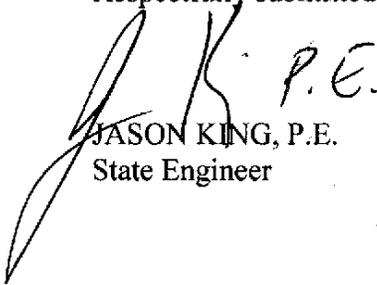
The protests to Applications 54076, 54634, 64037, 65197, 65944, 65945, 65946, 65947, 65948, 65949, 65954, 65955, 66473, 66474, 66475, 66476, 67896 and 79690 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to

⁶⁵ NRS Chapters 533 and 534.

⁶⁶ NRS § 533.370(2).

the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

Respectfully submitted,

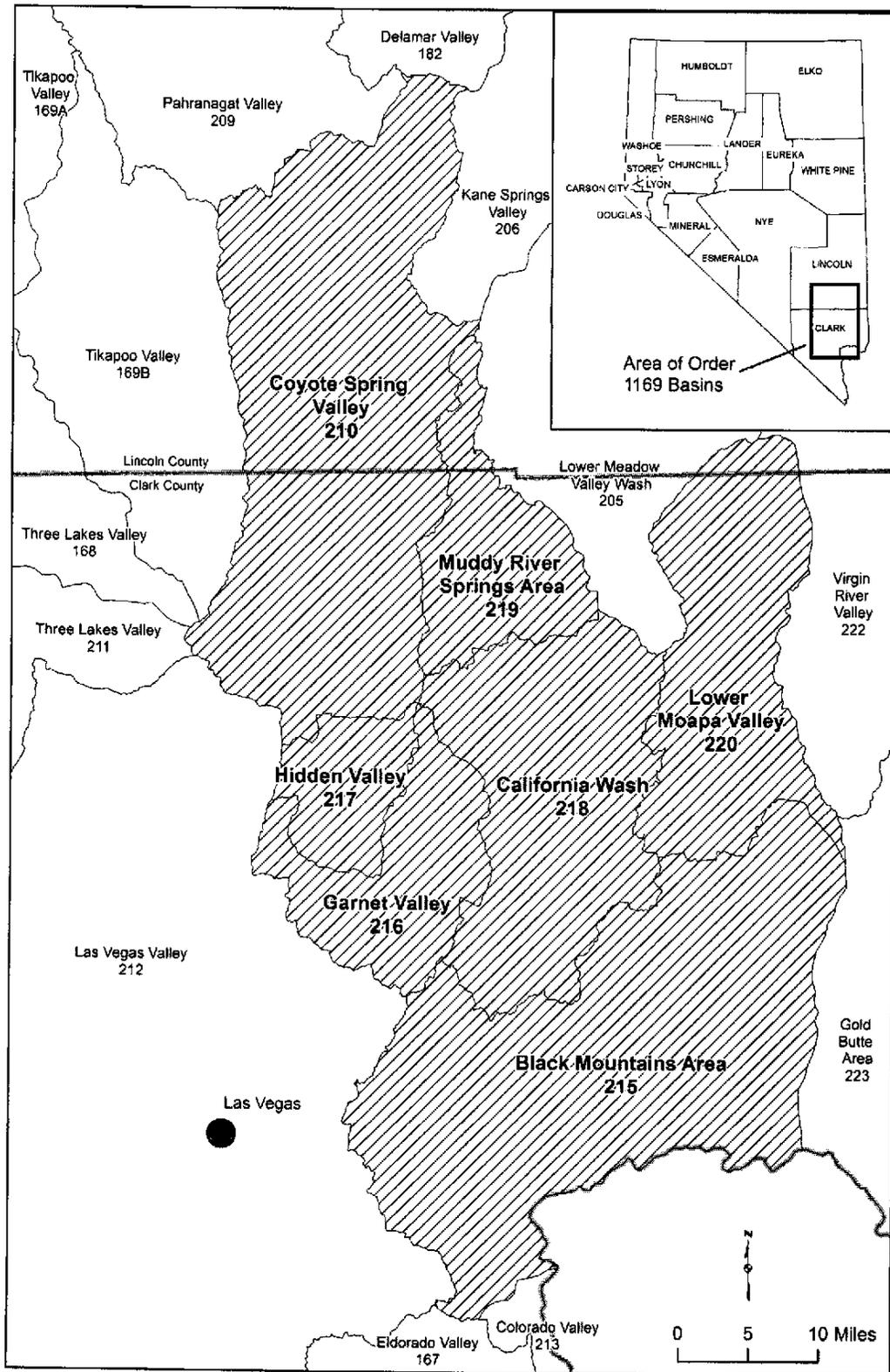


JASON KING, P.E.
State Engineer

Dated this 29th day of

January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 884

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATION 59369 FILED)
TO APPROPRIATE THE UNDERGROUND WATERS)
OF THE MUDDY RIVER SPRINGS AREA AKA)
UPPER MOAPA VALLEY HYDROGRAPHIC BASIN)
(219), CLARK COUNTY, NEVADA.)

RULING
#6259

GENERAL

I.

Application 59369 was filed on November 5, 1993, by the Moapa Valley Water District to appropriate 10.0 cubic feet per second (cfs), not to exceed 7,240 acre-feet annually (afa), of groundwater from the Muddy River Springs Hydrographic Basin for municipal use. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 33, T.13 $\frac{1}{2}$ S., R.64E., M.D.B.&M. The proposed place of use is described as being located within Sections 5, 6, 8, 9, 13, 14, 15, 16, 23, 24, 25, 26, 35 and 36, T.14S., R.65E., M.D.B.&M.; Sections 15, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, T.14S., R.66E., M.D.B.&M.; Sections 1, 2, 3, 4, 5, 6, 9 and 12, T.15S., R.66E., M.D.B.&M.; Sections 6, 7, 8, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35 and 36, T.15S., R.67E., M.D.B.&M.; Section 31, T.15S., R.68E., M.D.B.&M.; Sections 1, 2, 3, 10, 11, 12, 13, 14, 24 and 25, T.16S., R.67E., M.D.B.&M.; and Sections 6, 7, 8, 17, 18, 19, 20, 30 and 31, T.16S., R.68E., M.D.B.&M. The remarks section of the application indicates that the water will be used to help serve 6,000 residents of the Moapa Valley and that the development of new water resources is necessary to meet anticipated shortfalls.¹

II.

The application was timely protested by the U.S. Department of Interior Bureau of Indian Affairs, U.S. Department of Interior Fish and Wildlife Service and U.S. Department of Interior National Park Service on various grounds summarized as follows:¹

1. The water sought to be appropriated conflicts with senior reserved water rights held by the United States on behalf of the Moapa Valley Paiute Tribe.

¹ File No. 59369, official records in the Office of the State Engineer.

2. Use of the water could conflict with and impair the value of Indian reserved water rights and adversely affect the availability of water for present and future uses.
3. The cumulative impact of all pending applications has not been addressed and until such time, approval of this application is not in the public interest.
4. Use of the water will cause a lowering of the water level and desecration of riparian habitats, which would adversely affect wildlife and grazing livestock and likely jeopardize endangered and/or threatened species and is therefore not in the public interest.
5. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
6. Use of the water will eventually reduce or eliminate the flows of springs and the Muddy River and springs within the Lake Mead National Recreation Area, which are discharge areas for regional groundwater flow systems, which will impair the senior water rights, water resources and water-related resources of the U.S. National Park Service.
7. It is unclear whether the quantity applied for along with other pending applications is necessary and reasonably required for municipal use.
8. The application does not clearly indicate the place of use, description of proposed works, estimated costs of works, number and types of units to be served or annual consumptive use.
9. Use of the water may threaten to prove detrimental to the public interest because it may adversely affect the resident and migratory fish and wildlife species and their habitats within the Moapa Valley, including the Muddy River, its headwater springs, their outflow channels and the Moapa National Wildlife Refuge, which contains endangered and/or threatened species.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Application 59369 there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on this application is not required.

II.

Order 1169 and 1169A

In 2001, a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."²

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicant's own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges

² State Engineer's Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

at the Muddy River Springs, which is appropriated under the Muddy River Decree.³ Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south, including Hidden Valley. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that bypasses the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. See, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer, which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water

³ Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites; two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.⁴ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.⁵ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane

⁴ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

⁵ *Id.* at 26.

Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.⁶

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE⁷ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the

⁶ *Id.* at 57 - 58.

⁷ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.⁸

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Aparcar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{9,10} The model was updated to include pumping through 2012.¹¹ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.¹²

⁸ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

⁹ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁰ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹¹ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹² U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.¹³

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.¹⁴

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base

¹³ *Id.* at 84.

¹⁴ *Id.* at 5.

flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.¹⁵ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.¹⁶ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to pumping at well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.¹⁷

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the

¹⁵ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

¹⁶ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

¹⁷ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.¹⁸

The MBOP argue for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude the current flows of the Muddy River.¹⁹ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁰

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against

¹⁸ *Id.* at 30.

¹⁹ *Ibid.*

²⁰ *Id.* at 31.

granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Muddy River Springs Area pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley.

Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.

3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists California Wash, and perhaps in Hidden and Garnet valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply.

For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of water availability. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

In the eleven years since Order 1169 was issued, much additional hydrologic information has been made available, including publications by the U.S. Geological Survey and others. There have also been hearings before the Office of the State Engineer for water rights in nearby hydrographic basins. Technical exhibits and expert testimony in those hearings include hydrological analyses of the carbonate aquifers and water budgets in the Order 1169 basins. This information significantly expands on the available knowledge of the hydrology and water resources of the Lower White River Flow System in Coyote Spring Valley, the Muddy River Springs Area and the surrounding basins. In hearings held in the fall of 2011 concerning SNWA applications in Delamar Valley, Dry Lake Valley, and Cave Valley, several exhibits and expert testimony were presented that revise and update information presented at the Coyote Spring Valley water rights hearings.²¹

SNWA Exhibit No. 452 from the 2011 hearing on Delamar, Dry Lake and Cave valleys, is an Excel workbook that is designed to estimate groundwater recharge for all of the basins contributing to the White River Flow System from the Muddy River Springs Area northward.

²¹ SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

The exhibit was accepted by the State Engineer with some revisions,²² and basin recharge and interbasin flows are specified for both Coyote Spring Valley and the Muddy River Springs Area hydrographic basins. From that exhibit, the supply of water to the Muddy River Springs Area is estimated to be approximately 50,000 afa, almost all of which is subsurface inflow from upgradient basins and approximately 50 afa is derived from in-basin recharge from precipitation. An estimated 4,000 to 6,000 afa transpires from vegetation in the basin, and the remainder exits via the Muddy River, wells, or subsurface outflow. Prior to groundwater development, the Muddy River flows at the Moapa Gage were approximately 34,000 afa.²³

The perennial yield of the Muddy River Springs Area Hydrographic Basin was established in 1971 at 37,000 afa.²⁴ Where 37,000 afa was the total estimated discharge of the Muddy River (surface flow plus plant evapotranspiration), all of the water was appropriated. Because the Muddy River was already fully appropriated, clearly the full perennial yield could not be appropriated without conflicting with those senior rights. At the time Order 1169 was issued, groundwater appropriations in the basin totaled about 14,700 afa. Currently there are 14,535 acre-feet of groundwater rights appropriated in the basin.²⁵

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. These basins share a unique and close hydrological connection, and share virtually all of the same source and supply of water, unlike other basins in Nevada. In the future, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. Current groundwater rights in the seven Order 1169 basins total approximately 49,000 acre-feet. For the five basins to be jointly managed, there are

²² State Engineer's Ruling No. 6166, dated March 22, 2012, pp. 72 – 73, official records in the Office of the State Engineer.

²³ Eakin, T.E., *Ground-water Appraisal of Coyote Spring and Kane Spring Valleys and Muddy River Springs Area Lincoln and Clark Counties, Nevada*, Groundwater Resources - Reconnaissance Series Report 25, p. 14, 1964.

²⁴ Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, p. 25, Oct. 1971.

²⁵ Official records of the Office of the State Engineer.

approximately 37,000 acre-feet of groundwater rights. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist in any of the basins.

VI.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.²⁶ These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing right for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

VII.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 14,535 acre-feet of senior groundwater rights in the Muddy River Springs Area as well as approximately 34,000 acre-feet of senior groundwater rights in the other Order 1169 basins. Moapa Valley Water District's groundwater rights in the basin total 6,792 acre-feet. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

²⁶ State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{27,28} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,²⁹ declined from 3.6 to 3.3 cfs during the test.³⁰ Baldwin and Jones Springs declined about 4% during the test.³¹ The Muddy River at the Moapa gage did not display any decrease in flow,³² although the MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.³³

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. The State Engineer finds that evidence submitted by the DOI Bureaus is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

²⁷ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

²⁸ <http://waterdata.usgs.gov/nv/nwis/>.

²⁹ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

³⁰ <http://waterdata.usgs.gov/nv/nwis/>.

³¹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³² Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013.

³³ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

There are some domestic wells in the Muddy River Springs Area. Even though proposed pumping would conflict with existing surface water rights, the groundwater decline due to projected pumping at the nearest wells would be less than 50 feet after 100 years of pumping.³⁴ The State Engineer finds that the applications would not conflict with existing domestic wells.

VIII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in the Muddy River Springs Area would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.³⁵

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:³⁶

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or

³⁴ Tetra Tech, September 28, 2012, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*. References provided along with the DOI Report, official records in the Office of the State Engineer.

³⁵ NRS Chapters 533 and 534.

³⁶ NRS § 533.370(2).

- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Muddy River Springs Area Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

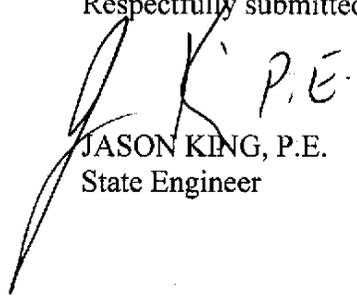
IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten the water resources upon which the endangered Moapa dace are dependent.

RULING

The protests to Application 59369 are hereby upheld in part and the application is hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

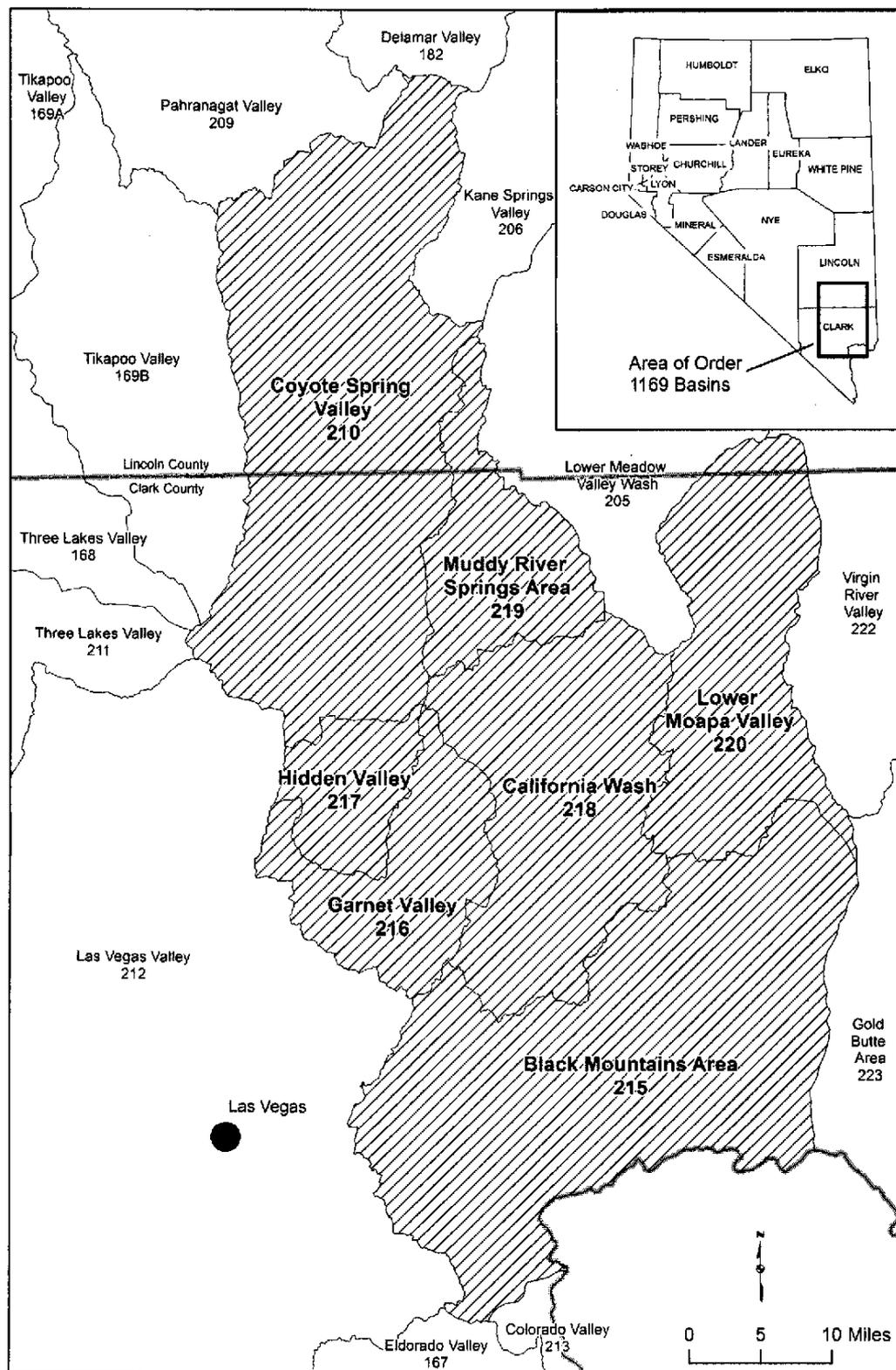
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 905

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS 58592, 58593,)
58594, 64041 AND 67893 FILED TO APPROPRIATE)
THE UNDERGROUND WATERS OF THE BLACK)
MOUNTAINS AREA HYDROGRAPHIC BASIN)
(215), CLARK COUNTY, NEVADA.)

RULING
#6260

GENERAL

I.

Application 58592 was filed on March 9, 1993, by Nevada Cogeneration Associates #1 and Nevada Cogeneration Associates #2 to appropriate 0.274 cubic feet per second (cfs) of groundwater from the Black Mountains Area Hydrographic Basin for industrial cogeneration power plant use. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 13, T.19S., R.63E., M.D.B.&M. The proposed place of use is described as being located within a portion of the SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ and NE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 7, T.20S., R.64E., M.D.B.&M., and a portion of the SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 34, T.18S., R.63E., M.D.B.&M. The remarks section of the application indicates that the annual consumptive use is anticipated to be 1.15 cfs continuous flow, or 1,665 acre-feet annually (afa) under Applications 58592, 58593 and 58594. However, other information in the application file indicates that the total quantity of water applied for under this and related Applications 58593 and 58594 is 200 afa for a total quantity of water under these applications and their existing water right (Permit 55271) for 1,865 afa. Information in the application file indicates that the proposed well under this and related Applications 58593 and 58594 will perforate the carbonate-rock aquifer.¹

II.

Application 58592 was timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:¹

1. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

¹ File No. 58592, official records in the Office of the State Engineer.

2. The proposed use of the water will eventually reduce or eliminate the flow of springs in the Lake Mead National Recreation Area and the U.S. National Park Service's senior water rights, water resources and water-related attributes would be impaired.
3. The proposed use of the water will impair the U.S. National Park Service's state permitted water right for Roger's Spring.
4. It is unclear how much water is being applied for or would be consumptively used.
5. There is no unappropriated water as committed resources exceed the system yield and not all water accounted for in the perennial yield may be available for appropriation.
6. The effects of this appropriation alone, or when combined with applications by the Las Vegas Valley Water District for groundwater, will impair the senior reserved rights, water resources and water-related attributes of the Lake Mead National Recreation Area.

III.

Application 58593 was filed on March 9, 1993, by Nevada Cogeneration Associates #1 and Nevada Cogeneration Associates #2 to appropriate 0.274 cfs of groundwater from the Black Mountains Area Hydrographic Basin for industrial cogeneration power plant use. The proposed point of diversion is described as being located within the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 13, T.19S., R.63E., M.D.B.&M. The proposed place of use is the same as described on Application 58592. The remarks are the same as described under Application 58592, except the continuous flow is stated at 2.3 cfs instead of 1.15 cfs.²

IV.

Application 58593 was timely protested by the U.S. Department of Interior National Park Service on the same grounds as Application 58592.²

V.

Application 58594 was filed on March 9, 1993, by Nevada Cogeneration Associates #1 and Nevada Cogeneration Associates #2, to appropriate 0.274 cfs of groundwater from the Black Mountains Area Hydrographic Basin for industrial cogeneration power plant use. The proposed point of diversion is described as being located within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 13, T.19S., R.63E., M.D.B.&M. The proposed place of use and remarks are the same as described under Application 58592.³

² File No. 58593, official records in the Office of the State Engineer.

³ File No. 58594, official records in the Office of the State Engineer.

VI.

Application 58594 was timely protested by the U.S. Department of Interior National Park Service on the same grounds as Application 58592.³

VII.

Application 64041 was filed on April 17, 1998, by Dry Lake Water, LLC to appropriate 10.0 cfs of groundwater from the Black Mountains Area Hydrographic Basin for quasi-municipal use. The proposed point of diversion is described as being located within the NE¼ NW¼ of Section 36, T.19S., R.63E., M.D.B.&M. The proposed place of use is described as being located within portions of Sections 32 and 33, T.17S., R.63E., M.D.B.&M., portions of Sections 3, 4, 5, 8, 9, 10, 11, 13, 14, 17, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34 and 35 and all of Sections 18 and 33, T.18S., R.63E., M.D.B.&M., and portions of Sections 2, 3, 4, 5, 6, 7, 8 and 9, T.19S., R.63E., M.D.B.&M. The remarks section of the application indicates that Dry Lake Water, LLC intends to be a distributor of water to commercial and industrial developments within the Apex Industrial Park. Additionally, the remarks section informs that the Applicant has applied for water rights in five basins for 40,000 afa under each application, but is actually requesting a total of 40,000 afa from all six applications and that the Applicant seeks to tap the deep carbonate aquifer.⁴

VIII.

Application 64041 was timely protested by Nevada Power Company and U.S. Department of Interior National Park Service on various grounds summarized as follows:⁴

1. The total annual duty this application seeks is 7,239 afa. This basin may already be overappropriated and granting 10 cfs from the carbonate aquifer could result in groundwater mining. The public interest is not served by granting the application since it could result in overappropriation from the carbonate-rock aquifer.
2. There is no water available for appropriation because committed resources exceed groundwater recharge.
3. The National Park Service asserts that recharge from precipitation in the Black Mountains Area is estimated at less than 100 afa, inflow is estimated at 1,200 afa from the Las Vegas Valley and discharge from the valley is primarily by subsurface outflow to Lake Mead.

⁴ File No. 64041, official records in the Office of the State Engineer.

4. Committed groundwater resources in the Black Mountains Area are 6,200 afa, which greatly exceeds the recharge rate resulting in withdrawals from storage and groundwater mining.
5. The proposed use will impair the water rights of the United States by reducing the flow of the Muddy River and discharge of Lake Mead National Recreation Area springs.
6. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.
7. It would threaten to be detrimental to the public interest to approve the application when the Applicant does not control the point of diversion and place of use.

IX.

Application 67893 was filed on August 8, 2001, by Dry Lake Water, LLC to appropriate 10.0 cfs of groundwater from the Black Mountains Area Hydrographic Basin for quasi-municipal use. The proposed point of diversion is described as being located within the NE¼ NW¼ of Section 36, T.19S., R.63E., MDB&M. The proposed place of use and remarks are the same as described under Application 64041.⁵

X.

Application 67893 was timely protested by Coyote Springs Investment, LLC, Las Vegas Valley Water District, the Moapa Band of Paiute Indians and Nevada Power Company on various grounds summarized as follows:⁵

1. Existing groundwater permits in addition to pending applications would overappropriate the basin, which could potentially injure prior rights and is not in the best interest of the public.
2. The proposed use of the water will conflict with existing rights in Basin 218 and surrounding basins, including those rights held by Coyote Springs Investment, LLC, unquantified senior reserved rights of the Moapa Band of Paiutes to the waters of the Muddy River and groundwater under the Reservation and rights of the U.S. National Park Service and Nevada Power Company. Coyote Springs Investment, LLC has existing permits and pending senior priority applications in Coyote Spring Valley (Basin 210). The granting of this application from the same underground source (carbonate-rock aquifer) would interfere with and adversely affect existing rights.

⁵ File No. 67893, official records in the Office of the State Engineer.

3. The application is duplicative and unnecessary because the Applicant has already secured the water necessary to gain its subdivision approval and the power plants at Apex Industrial Park already have a water supply.
4. The Applicant has not demonstrated the financial capability to develop the water and place it to beneficial use.
5. Granting the application is contrary the approach adopted in State Engineer's Ruling No. 5008, which required gradual, staged development.
6. The application or series of applications contemplates an interbasin transfer which may be unjustified under NRS § 533.370(4) [now NRS § 533.370(3)]. The proposed export of water may be environmentally unsound and impair the Moapa Band of Paiute Indian's ability to put its own water rights to use.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 58592, 58593, 58594, 64041 and 67893 there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on these applications is not required.

II.

Order 1169 and 1169A

In 2001, a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the

development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users.”⁶

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants’ own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.⁷ Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south, including Black Mountains Area. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that by-passes the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

⁶ State Engineer’s Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

⁷ Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. *See*, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems

encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites: two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other

surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.⁸ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.⁹ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.¹⁰

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

⁸ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

⁹ *Id.* at 26.

¹⁰ *Id.* at 57 - 58.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE¹¹ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹²

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Apar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{13,14} The model was updated to include pumping through

¹¹ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

¹² U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

¹³ Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁴ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

2012.¹⁵ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.¹⁶

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.¹⁷

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

¹⁵ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁶ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

¹⁷ *Id.* at 84.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.¹⁸

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.¹⁹ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.²⁰ MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have

¹⁸ *Id.* at 5.

¹⁹ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

²⁰ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, p. 264 (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), 1966.

resulted in the water-level decline on the MBOP reservation that others have attributed to pumping from well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²¹

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.²²

The MBOP argues for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.²³ They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²⁴

²¹ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

²² *Id.* at 30.

²³ *Ibid.*

²⁴ *Id.* at 31.

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Black Mountains Area pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Spring Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.
3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional

water is available to appropriate in the basins. The DOI Bureaus, Great Basin Water Network and Center for Biological Diversity agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists in California Wash, and perhaps in Hidden and Garnet Valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

The United States Geological Survey in conjunction with the Nevada Division of Water Resources estimates recharge from precipitation to the Black Mountains Area as being less than 100 afa.²⁵ Subsurface inflow to the Black Mountains Area has been estimated as ranging from less than 400 afa²⁶ to as much as 1,200 afa.²⁷ Estimated evapotranspiration in the Black Mountains Area (discharge) is estimated at 1,200 afa.²⁸ The State Engineer has accepted a perennial yield for the Black Mountain Area of 1,300 afa. There are currently 5,798 acre-feet of committed groundwater rights in the basin.²⁹

The Black Mountains Area was included in Order 1169 because in the northwest portion of the basin where these pending applications are located, the area is underlain by the regional carbonate aquifer. The water table in the location of these applications was monitored during the Order 1169 test. Water levels in this basin are virtually the same as water levels in Garnet Valley, California Wash and the Muddy River Springs Area. The hydrograph of well BMDL-2 shows accelerated water-level decline during the pumping test and supports the argument that it is part of the regional flow system.³⁰ The DOI Bureaus' reports exclude the Black Mountains Area from the five-basin area that they believe should be managed jointly. However, the hydrogeology, water levels and water-level changes at the location of the pending applications are consistent with the carbonate aquifer in the five-basin area,³¹ and it is clear to the State Engineer that this northwestern portion of the Black Mountains Area Hydrographic Basin lies within the regional carbonate aquifer. Except for the northwest portion of Black Mountains Area, the basin is not underlain by the regional carbonate aquifer, and water levels are significantly lower. Water supply in the basin is limited to local recharge of less than 100 afa from precipitation within the basin or to inflow along the Las Vegas Wash to the south.

²⁵ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 25, 1968.

²⁶ *Id.* at 26.

²⁷ Geraghty & Miller, Inc., *Hydrologic Evaluation on the Impact of Groundwater Withdrawals from the Nevada Cogeneration Associates Well Field Black Mountains Hydrographic Area, Nevada*, p. 6, August 1994. File No. 58592, official records in the Office of the State Engineer.

²⁸ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 35, 1968.

²⁹ Official records of the Office of the State Engineer.

³⁰ Official records of the Office of the State Engineer, <http://water.nv.gov/data/waterlevel/>.

³¹ Geraghty & Miller, Inc., *Hydrogeologic Evaluation on the Impact of Groundwater Withdrawals from the Nevada Cogeneration Associates Well Field Black Mountains Hydrographic Area, Nevada*, August 1994. File No. 58592 official records in the Office of the State Engineer.

The northwestern portion of the Black Mountains Area is within the regional carbonate aquifer. The total water supply of the regional carbonate aquifer is estimated at approximately 50,000 afa. Groundwater rights total about 49,000 acre-feet and the Muddy River and springs, which utilize the same water, are fully appropriated with approximately 30,000 afa of water rights. Therefore, the State Engineer finds there is no unappropriated water available to grant the pending applications. Even if these applications were moved to a part of the Black Mountains Area that is outside of the regional carbonate aquifer, there would be no unappropriated water available, as the established perennial yield of 1,300 afa is fully allocated.

VI.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 5,798 acre-feet of senior groundwater rights already appropriated in the Black Mountains Area and another 43,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.^{32,33} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,³⁴ declined from 3.6 to 3.3 cfs during the test.³⁵ Baldwin and Jones Springs declined about 4% during the

³² U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

³³ <http://waterdata.usgs.gov/nv/nwis/>.

³⁴ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

³⁵ <http://waterdata.usgs.gov/nv/nwis/>.

test.³⁶ The Muddy River at the Moapa gage did not display any decrease in flow,³⁷ although the MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.³⁸

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and that water level decline was measurable in the northwestern Black Mountains Area near the pending applications. It is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. The State Engineer finds that evidence submitted by the DOI Bureaus is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

VII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of these applications in the Black Mountains Area, which is directly connected to the regional aquifer in the Order 1169 area, would impair

³⁶ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³⁷ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

³⁸ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and of the subject matter of this action and determination.³⁹

II.

The State Engineer is prohibited by law from granting an application to appropriate the public waters where:⁴⁰

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that the committed groundwater resources of the Black Mountains Hydrographic Area exceeds the groundwater basin's estimated perennial yield. The State Engineer concludes that the approval of Applications 58592, 58593, 58594, 64041 and 67893 would add to the imbalance of the quantity of existing rights to perennial yield and would conflict with existing rights and thereby threaten to prove detrimental to the public interest.

IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Muddy River Springs Area. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten the water resources upon which the endangered Moapa dace are dependent.

³⁹ NRS Chapters 533 and 534.

⁴⁰ NRS § 533.370(2).

RULING

The protests to Applications 58592, 58593, 58594, 64041 and 67893 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

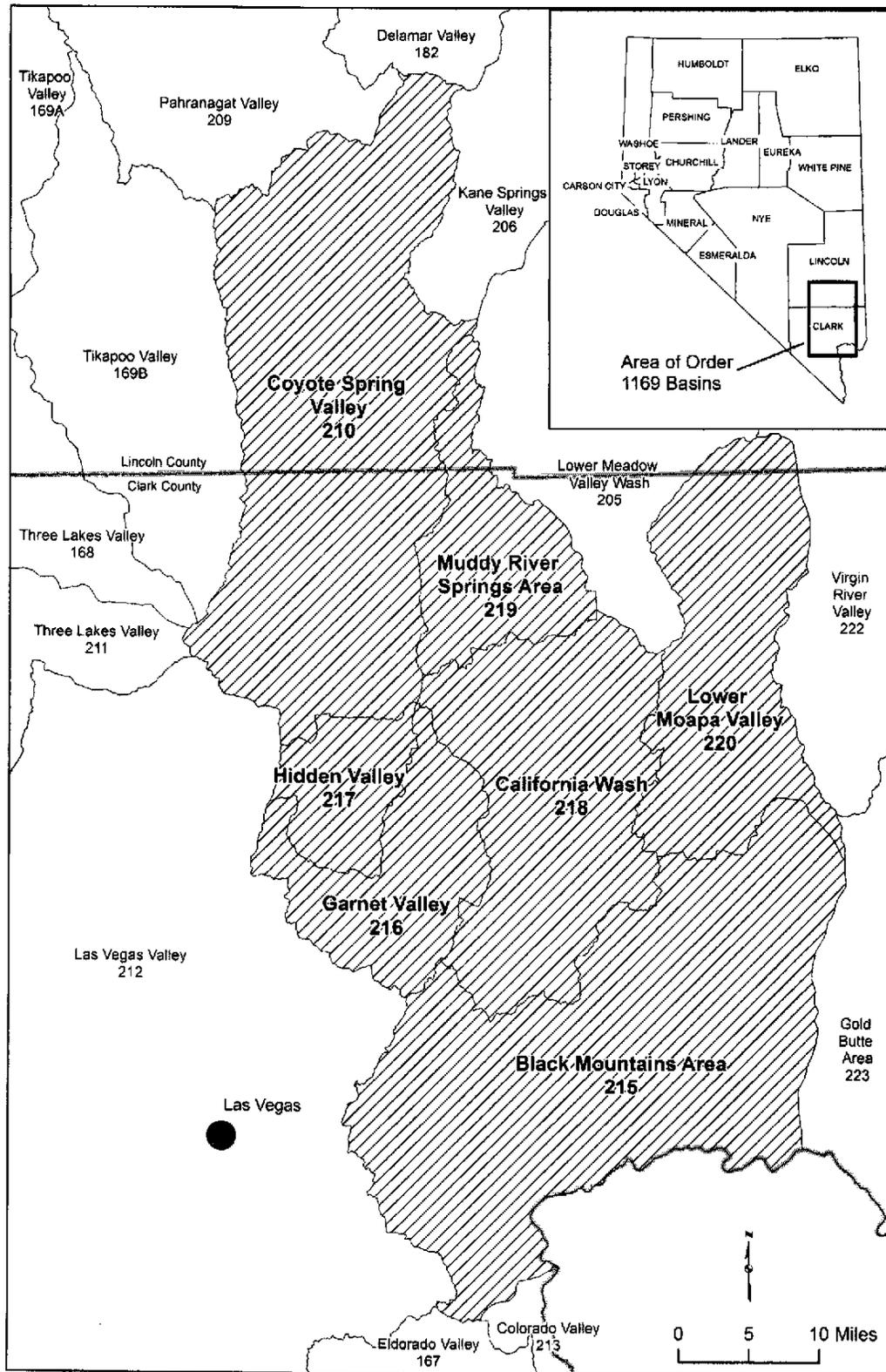
Respectfully submitted,



JASON KING, P.E.
State Engineer

Dated this 29th day of
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 928

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
59368, 59370, 59371 AND 81019 FILED TO)
APPROPRIATE THE UNDERGROUND)
WATERS OF THE LOWER MOAPA)
VALLEY HYDROGRAPHIC BASIN (220),)
CLARK COUNTY, NEVADA.)

RULING
#6261

GENERAL

I.

Application 59368 was filed on November 5, 1993, by the Moapa Valley Water District to appropriate 10.0 cubic feet per second (cfs), not to exceed 7,240 acre-feet annually (afa), of groundwater from the Lower Moapa Valley Hydrographic Basin for municipal use. The proposed point of diversion is described as being located within the NW¹/₄ NW¹/₄ of Section 10, T.13S., R.67E., M.D.B.&M. The proposed place of use is described as being located within Sections 5, 6, 8, 9, 13, 14, 15, 16, 23, 24, 25, 26, 35 and 36, T.14S., R.65E., M.D.B.&M., Sections 15, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36, T.14S., R.66E., M.D.B.&M., Sections 1, 2, 3, 4, 5, 6, 9 and 12, T.15S., R.66E., M.D.B.&M., Sections 6, 7, 8, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 34, 35 and 36, T.15S., R.67E., M.D.B.&M., Section 31, T.15S., R.68E., M.D.B.&M., Sections 1, 2, 3, 10, 11, 12, 13, 14, 24 and 25, T.16S., R.67E., M.D.B.&M., and Sections 6, 7, 8, 17, 18, 19, 20, 30 and 31, T.16S., R.68E., M.D.B.&M. The remarks section of the application indicates that the water will be used to help serve 6,000 residents of the Moapa Valley and the development of new water resources is necessary to meet anticipated shortfalls.¹

II.

Application 59368 was timely protested by the U.S. Department of Interior Bureau of Indian Affairs and U.S. Department of Interior National Park Service on various grounds summarized as follows:¹

1. The water sought to be appropriated conflicts with senior reserved water rights held by the United States on behalf of the Moapa Valley Paiute Tribe.

¹ File No. 59368, official records in the Office of the State Engineer.

2. Use of the water could conflict with and impair the value of Indian reserved water rights and adversely affect the availability of water for present and future uses.
3. The cumulative impact of all pending applications has not been addressed and until such time, approval of this application is not in the public interest.
4. Use of the water will cause a lowering of the water level and desecration of riparian habitats, which would adversely affect wildlife and grazing livestock and likely jeopardize endangered and/or threatened species and is therefore not in the public interest.
5. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area and Death Valley National Monument.
6. Use of the water will eventually reduce or eliminate the flows of the Muddy River and springs within the Lake Mead National Recreation Area, which are discharge areas for regional groundwater flow systems, which will impair the senior water rights, water resources and water-related resources of the U.S. National Park Service.

III.

Application 59370 was filed on November 5, 1993, by the Moapa Valley Water District to appropriate 5.0 cfs, not to exceed 3,620 afa, of groundwater from the Lower Moapa Valley Hydrographic Basin for municipal use. The proposed point of diversion is described as being located within the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 32, T.15S., R.67E., M.D.B.&M. The proposed place of use and remarks are the same as described under Application 59368.²

IV.

Application 59370 was timely protested by the U.S. Department of Interior Bureau of Indian Affairs and U.S. Department of Interior National Park Service on the same grounds as asserted under their protests to Application 59368.²

V.

Application 59371 was filed on November 5, 1993, by the Moapa Valley Water District to appropriate 5.0 cfs, not to exceed 3,620 afa, of groundwater from the Lower Moapa Valley Hydrographic Basin for municipal use. The proposed point of diversion is described as being located within the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 19, T.15S., R.67E., M.D.B.&M. The proposed place of use and remarks are the same as described under Application 59368.³

² File No. 59370, official records in the Office of the State Engineer.

³ File No. 59371, official records in the Office of the State Engineer.

VI.

Application 59371 was timely protested by the U.S. Department of Interior Bureau of Indian Affairs and U.S. Department of Interior National Park Service on the same grounds as asserted under their protests to Application 59368.³

VII.

Application 81019 was filed on July 29, 2011, by Chaparral Limestone and Cement Company, LLC to appropriate 0.139 cfs, not to exceed 100 afa, of groundwater from the Lower Moapa Valley Hydrographic Basin for mining and milling use. The proposed point of diversion is described as being located within Lot 3 of Section 5, T.15S., R.67E., M.D.B.&M. The proposed place of use is described as being located within portions of Government Lots 2, 3 and 4 and the SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ and SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 5, T.15S., R.67E., M.D.B.&M.⁴

VIII.

Application 81019 was timely protested by the U.S. Department of Interior National Park Service on various grounds summarized as follows:⁴

1. There is no unappropriated water available because the committed groundwater resources already exceed the resource, and the Muddy River, its source of supply, and tributaries, are fully appropriated.
2. The proposed use of the water will impair the rights of the United States because it will reduce the discharge of the Muddy River, and the proposed appropriation will reduce the discharge of the Lake Mead National Recreation Area springs by capturing groundwater that naturally discharges at the springs.
3. It would not be in the public interest to impair the water and water-related resources of the Lake Mead National Recreation Area.

FINDINGS OF FACT

I.

Nevada Revised Statute (NRS) § 533.365(4) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of the state of Nevada. The State Engineer finds that in the case of Applications 59368, 59370, 59371 and 81019 there is sufficient information contained within the records of the Office of the State

⁴ File No. 81019, official records in the Office of the State Engineer

Engineer to gain a full understanding of the issues and a hearing on this application is not required.

II.

Order 1169 and 1169A

In 2001, a hearing was held on various applications in Coyote Spring Valley. Following the hearing, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required, and "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."⁵

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits, and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicant's own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

The Order noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and that approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges

⁵ State Engineer's Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

at the Muddy River Springs, which is appropriated under the Muddy River Decree.⁶ Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins further south, including Hidden Valley. Additionally, the State Engineer found that 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that bypasses the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. See, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it is well established that the spring discharge in the Muddy River Springs Area is produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water

⁶ Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

III.

Order 1169 and 1169A Pumping Test

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the initially intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites; two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

IV.

Pumping Test Reports

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted

by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureau of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD).

1. Southern Nevada Water Authority

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.⁷ A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.⁸ SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.⁹

⁷ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

⁸ *Id.* at 26.

⁹ *Id.* at 57 - 58.

2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

The DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE¹⁰ to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.¹¹

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Aparcar units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent

¹⁰ Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-In*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

¹¹ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.^{12,13} The model was updated to include pumping through 2012.¹⁴ If the applications, which are the subject of Ruling No. 6254, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.¹⁵

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.¹⁶

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information leads to the conclusion that there is no water available for new appropriation within the five-basin area

¹² Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹³ Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁴ Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

¹⁵ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

¹⁶ *Id.* at 84.

delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.¹⁷

4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.¹⁸ Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.¹⁹ MBOP asserts that some of the regional water-level decline during the period of the

¹⁷ *Id.* at 5.

¹⁸ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

¹⁹ T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to pumping at well MX-5. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. This barrier extends from just north of Garnet Valley through the Muddy River Springs to the northern edge of the Lower Moapa Valley Hydrographic Area. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.²⁰

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.²¹

The MBOP argue for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude the current flows of the Muddy River.²² They indicate that the water-resource potential of the

²⁰ Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

²¹ *Id.* at 30.

²² *Ibid.*

southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.²³

5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they

²³ *Id.* at 31.

assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Lower Moapa Valley pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in the northwestern part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area, Hidden Valley and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguished these basins from other basins in Nevada.

3. As to the availability of water pursuant to pending applications, the request in Order 1169A referred to pending applications in Coyote Spring Valley that were addressed in Ruling No. 6254. Several of the respondents also replied with an opinion concerning available groundwater in the remainder of the Order 1169 basins. As discussed above, the parties were not unanimous in their interpretation of the test and whether additional water is available to appropriate in the basins. The DOI Bureaus, GBWN and CBD agree that there is no unappropriated groundwater in any of the basins. The MBOP found there is no additional water available to appropriate in Coyote Spring Valley or Muddy River Springs Area, but that unappropriated water exists California Wash, and perhaps in Hidden and Garnet valleys. They are silent on the Black Mountains Area and Lower Moapa Valley. The SNWA did not directly answer the question; rather they suggest groundwater might be developed in western or northern Coyote Spring Valley. The results of the pumping test, together with the submitted technical reports and existing records of the State Engineer's office have provided sufficient information to make a determination on the availability of water pursuant to pending applications in all of the Order 1169 basins.

V.

Perennial Yield

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to

adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

For basins similar to Lower Moapa Valley, where there is a through-going perennial stream, recent rulings have limited the perennial yield to the recharge from precipitation that occurs in that basin.²⁴ Earlier estimates of perennial yield were based on the total amount of evapotranspiration in the basin, but this is more accurately classified as part of the system yield, which includes a combination of available surface water and groundwater.

The total pre-development supply of water to Lower Moapa Valley is estimated to be approximately 34,000 afa. Virtually the entire source of this supply is the Muddy River as measured at the Glendale gage. Recharge from precipitation in the basin is estimated to be less than 50 afa, and subsurface groundwater inflow is minimal.²⁵ No additional perennial yield was established as a result of the Order 1169 pumping test. The State Engineer finds that there is no water available for appropriation in Lower Moapa Valley.

VI.

Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 5,776 acre-feet of senior groundwater rights already appropriated in the Lower Moapa Valley and another 43,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down

²⁴ State Engineer's Ruling Nos. 5747 and 5823, dated June 27, 2007 and March 18, 2008, respectively, official records in the Office of the State Engineer.

²⁵ F. Eugene Rush, *Water-Resources Appraisal of the Lower Moapa – Lake Mead Area, Clark County, Nevada*, Water Resources-Reconnaissance Series Report 50, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), pp. 25-26, 1968.

from its average flow of 0.2 cfs prior to the test.^{26,27} The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,²⁸ declined from 3.6 to 3.3 cfs during the test.²⁹ Baldwin and Jones springs declined about 4% during the test.³⁰ The Muddy River at the Moapa gage did not display any decrease in flow,³¹ although the MBOP report points out that total flux of the system is variable, and argue that flows in the river would have been even higher if Order 1169 pumping had not occurred.³²

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. As for the Muddy River, the State Engineer finds that evidence submitted by the DOI Bureaus and MBOP is convincing, and that additional pumping of groundwater in the regional carbonate aquifer in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

The MVWD argues that their applications should be granted because those locations are not in the regional carbonate aquifer and pumping there will not impact the Muddy River springs or the Muddy River in the area where the Moapa dace reside.³³ Their arguments are based on established hydrogeology and are fundamentally sound. The State Engineer does not disagree with those arguments; however, there remains the issue of whether water is available at the

²⁶ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

²⁷ <http://waterdata.usgs.gov/nv/nwis/>.

²⁸ In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service (USFWS), Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

²⁹ <http://waterdata.usgs.gov/nv/nwis/>.

³⁰ U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

³¹ Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013.

³² Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

³³ Moapa Valley Water District, *Basin 220 Analysis of Applications Held in Abeyance by Order 1169, 2013*, official records in the Office of the State Engineer.

source of supply. There is only a small amount of water in the basin that is not supplied by the Muddy River. In-basin recharge from precipitation is estimated to be less than 50 afa. Even if that estimate is off by an order of magnitude, the basin is still fully appropriated. Pumped groundwater must therefore either capture surface flows of the Muddy River or remove water from aquifer storage. If the water is derived primarily from storage, then water-level declines will result, and will continue in perpetuity, resulting in a conflict with other groundwater rights in Lower Moapa Valley. If the water ultimately comes from the Muddy River through increased infiltration, then there will be a conflict with existing rights in Lower Moapa Valley because the Muddy River is fully appropriated.

VII.

Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict existing water rights, threatens to prove detrimental to the public interest.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.³⁴

II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:³⁵

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

³⁴ NRS Chapters 533 and 534.

³⁵ NRS § 533.370(2).

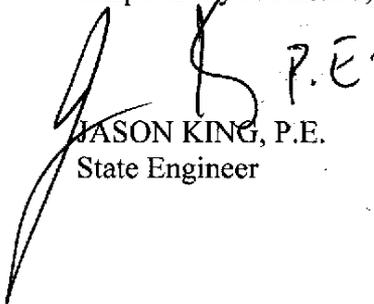
III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Lower Moapa Valley Hydrographic Basin without conflicting with existing water rights.

RULING

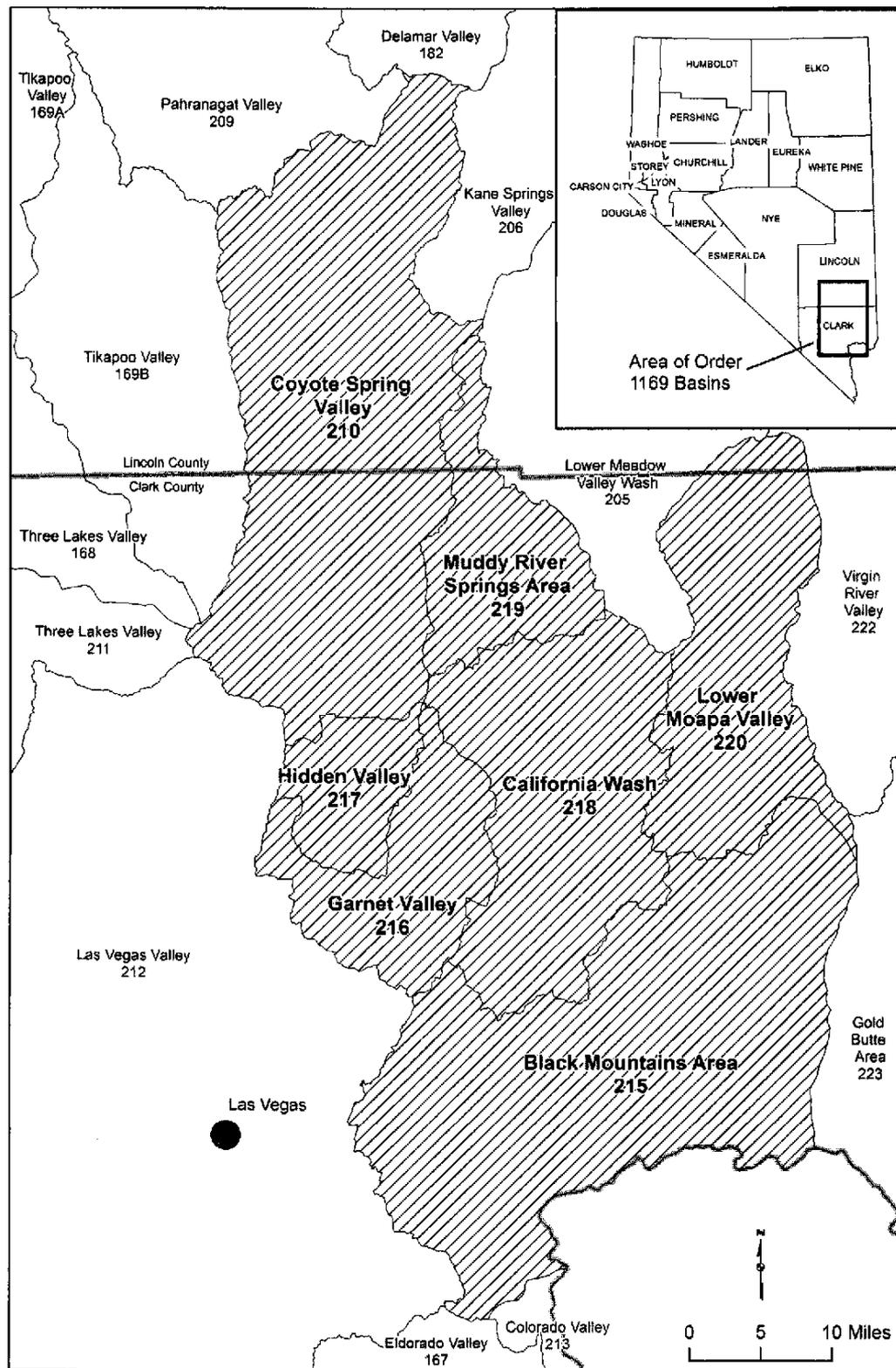
The protests to Applications 59368, 59370, 59371 and 81019 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in Lower Moapa Valley and, therefore, the proposed use of the water would threaten to prove detrimental to the public interest. No ruling is made on the merits of the remaining protest grounds.

Respectfully submitted,

 P.E.
JASON KING, P.E.
State Engineer

Dated this 29th day of

January, 2014.



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

SE ROA 948

Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('205')

Run Date: 8/22/2019 9:20:21 AM

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION					Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN	RNG							
205	10662		3404	12/9/1936	CER	SPR	SW	NW	33	06S	67E	0.003	STK		12/9/1936	2.178919	LI	RANKIN, RICHARD AND MEREDITH 50%
205	10192		2383	12/14/1937	CER	STR	SW	NE	27	09S	67E	0.461	IRR		11/11/1927	333	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	10416			8/28/1939	CAN	OSW	E2	SW	36	12S	65E	0.1	MM		8/28/1939	0	LI	QUIST, EARNEST L.
205	10613			1/27/1941	WDR	UG	NE	NE	35	04S	66E	1	IRR		1/27/1941	0	LI	CONAWAY, JOHN H.
205	10614		3211	1/27/1941	CER	UG	SE	NW	25	04S	66E	0.408	IRR		1/27/1941	147.83	LI	RAINBOW LAND & CATTLE COMPANY, LLC
205	10620			2/14/1941	CAN	UG	NW	SE	07	04S	67E	1.5	IRR		2/14/1941	0	LI	DUFFIN, PRESS JR.
205	10645		2641	4/10/1941	CER	UG	SE	SE	15	09S	67E	0.00899999	STK		4/10/1941	6.44469	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	10652		2642	4/24/1941	CER	SPR	NW	NW	34	08S	66E	0.008	STK		4/24/1941	6.383312	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	10653		2643	4/24/1941	CER	SPR	SW	SE	34	08S	66E	0.008	STK		4/24/1941	6.383312	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	10655		2611	4/30/1941	CER	SPR	NW	NE	19	04S	66E	0.007	STK		4/30/1941	5.063685	LI	CORP PRESIDING BISHOP CHURCH JC LDS
205	10656		2612	4/30/1941	CER	SPR	SE	NW	34	04S	65E	0.008	STK		4/30/1941	5.800221	LI	CORP PRESIDING BISHOP CHURCH JC LDS
205	10662		3052	5/14/1941	CER	UG	NW	SW	08	04S	67E	1	MUN		5/14/1941	10	LI	CALIENTE-CITY
		CHANGED BY: 35309				CAN	UG											
		CHANGED BY: 83307				PER	UG											
205	10663			5/14/1941	WDR	UG	SW	NE	08	04S	67E	1	MUN		5/14/1941	0	LI	CALIENTE PUBLIC UTILITIES
205	10862		2680	9/14/1942	CER	SPR	NE	NW	11	05S	65E	0.003	STK		9/14/1942	2.240297	LI	JERRY JOHNSTON OR JANET LIND
205	10886			10/21/1942	CAN	SPR	NE	SW	36	12S	65E	3	MM		10/21/1942	0	LI	SMITH, BENJ. H.
205	10897		2770	12/3/1942	CER	SPR	NE	SW	18	06S	66E	0.016	STK		12/3/1942	11.20148 5	LI	CORP PRESIDING BISHOP CHURCH JC LDS
205	10899		2689	12/15/1942	CER	OSW	NE	NW	14	05S	65E	0.00899999	STK		12/15/1942	6.506068	LI	JERRY JOHNSTON OR JANET LIND

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION					Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN	RNG							
205	10922		2712	2/15/1943	CER	SPR	NE	SW	21	05S	66E	0.006	STK		2/15/1943	4.480594	LI	JERRY JOHNSTON OR JANET LIND
205	10923		2713	2/15/1943	CER	SPR	SE	SE	07	05S	66E	0.001	STK		2/15/1943	1.135493	LI	JERRY JOHNSTON OR JANET LIND
205	10924		2714	2/15/1943	CER	SPR	SE	SE	17	05S	66E	0.002	STK		2/15/1943	1.779962	LI	JERRY JOHNSTON OR JANET LIND
205	10929			2/24/1943	CAN	STR						0	STK		2/24/1943		LI	FLESHER, WILLIAM H.
205	11040		3020	12/20/1943	CER	SPR	SE	SE	18	06S	66E	0.003	STK		12/20/1943	2.547187	LI	BRADSHAW, R.J.
205	11044			1/5/1944	WDR	STR	SE	SE	23	06S	67E	0.125	STK		1/5/1944	0	LI	FLESHER, W.H.
205	11546			4/9/1946	DEN	UG	NW	SW	35	14S	66E	1.5	IRR		4/9/1946	0	CL	GUBLER, HELEN
205	11581		3720	5/24/1946	ABR	UG	SW	NW	08	04S	67E	0.6	DOM		5/24/1946	0	LI	CALIENTE-CITY
						CHANGED BY: 83308	PER	UG										
205	1208			12/11/1908	CAN	SPR				08S	67E	4	IRR	Y	12/11/1908	0	LI	BRANEN, W.F.
205	12282		3839	2/26/1948	CER	UG	SE	SE	35	14S	66E	2.69	IRR		2/26/1948	570	CL	WTC WATER HOLDINGS L.L.C.
205	12310			3/3/1948	DEN	STR	NW	SW	35	14S	66E	1.5	IRR		3/3/1948	0	CL	GUBLER, HELEN
205	13030			8/24/1949	CAN	OSW	SW	SW	11	08S	67E	1	IRR		8/24/1949	0	LI	HENRIE, PAUL STEWART
205	14636		4516	11/24/1952	ABR	STR	SW	SE	36	12S	65E	2	IRR		11/24/1952	0	LI	STUART, ROBERT B.
						CHANGED BY: 61289T	EXP	STR										
						CHANGED BY: 62397	ABR	STR										
205	15294			9/8/1953	WDR	UG	NW	NE	35	14S	66E	8	IRD		9/8/1953	0	CL	HAIL, J.A.
205	15513		4830	2/23/1954	CER	SPR	SW	NW	25	12S	65E	0.6	IRR		2/23/1954	148.65	LI	LEWIS, RICHARD C. FAMILY REV TRUST I
						CHANGED BY: 72919	WDR	SPR										
205	1555			12/14/1909	CAN	STR	NW	NE	12	10S	67E	0	PWR	Y	12/14/1909	0	LI	OVERTON MILLING AND POWER CO
205	16121			2/18/1955	CAN	UG	NW	SW	12	12S	65E	5	IRR		2/18/1955	0	LI	GRAHAM, BEN
205	17135			12/28/1956	CAN	UG	NE	SW	12	12S	65E	2	IRR		12/28/1956	0	LI	FERREE, KENNETH BERNARD
205	17240			4/15/1957	CAN	UG	S2	NW	01	12S	65E	2	IRR		4/15/1957	0	LI	O'BRIEN, JACK J. JR

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record	
							Qtr-Qtr	Qtr	SEC	TWN								RNG
205	17550			4/28/1958	CAN	UG	NE	NE	07	04S	67E	2	MUN		4/28/1958	0	LI	CALIENTE-CITY
205	17597			7/7/1958	CAN	STR	SW	NW	24	12S	65E	3	IRD		7/7/1958	0	LI	BUNKER, LORIN F.
205	17606			7/14/1958	CAN	UG	NW	SE	07	04S	67E	0.45	IRR		7/14/1958	0	NY	YOUNG, RONAL T.
205	17679			10/2/1958	WDR	STR	NW	NE	19	13S	66E	6	IRR		10/2/1958	0	CL	WERTZ, JESSE L.
205	17680			10/2/1958	ABR	UG	NE	NW	19	13S	66E	3.5	IRD		10/2/1958	0	CL	COLE, NELDA
						CHANGED BY: 22358	CAN	UG										
						CHANGED BY: 23092	ABR	UG										
205	17722			11/19/1958	WDR	STR	SW	NW	24	12S	65E	1.7	IRR		11/19/1958	0	LI	BUNKER, F. LORIN
205	17749		6390	12/15/1958	CER	UG	NE	NW	13	12S	65E	2	IRR		12/15/1958	30	LI	ROBERT C. LEWIS & VIVIAN C. LEWIS, CO-TRUSTEES OF THE ROBERT C. & VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990
						CHANGED BY: 66334	ABR	UG										
205	17871			3/4/1959	CAN	SPR	SW	NW	13	12S	65E	1	IRR		3/4/1959	800	LI	BREEDLOVE, MILDRED M.
205	17905			3/25/1959	CAN	UG	SW	SE	09	14S	65E	1	IRR		3/25/1959		CL	TAYLOR, M.W.
205	17907			3/26/1959	CAN	SPR	SE	NW	13	12S	65E	1	IRR		3/26/1959	0	LI	BREEDLOVE, MILDRED M.
205	17921		5201	3/31/1959	CER	UG	NW	SE	07	04S	67E	0.45	IRR		3/31/1959	80.95	LI	AVERY, NOLAN AND TEVA
						CHANGED BY: 80488	CAN	UG										
						CHANGED BY: 88981	RFA	UG										
205	18175			7/31/1959	CAN	UG	SE	SW	12	12S	65E	2	IRR		7/31/1959	900	LI	CHAMBERS, WILLIAM HENRY
205	18311			9/3/1959	CAN	UG	NE	NW	08	04S	67E	1	QM		9/3/1959		LI	ALLEC, JOE
205	18419			11/9/1959	ABR	STR	SW	NW	14	08S	67E	5.5	IRD		11/9/1959	0	LI	BRADSHAW, DONALD LEE
						CHANGED BY: 23817	ABR	STR										
205	1853			10/24/1910	CAN	SPR	SE	SE	36	12S	65E	60	IRR	Y	10/24/1910	0	LI	SPRUNT, JAMES P.
205	18910		7014	6/8/1960	CER	UG	NE	NW	18	04S	67E	2.225	IRR	Y	6/8/1960	551.22	LI	H.H. LAND AND CATTLE COMPANY

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION					Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN	RNG							
205	19153		6391	8/26/1960	CER	UG	NE	NW	12	12S	65E	2	IRD	8/26/1960	30	LI	ROBERT C. LEWIS & VIVIAN C. LEWIS, CO-TRUSTEES OF THE ROBERT C. & VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990	
		CHANGED BY: 66335			ABR	UG												
205	19154			8/26/1960	DEN	UG	NW	NW	01	12S	65E	2	IRD	8/26/1960	0	LI	TUSSING, WILLIAM	
205	19201			9/15/1960	DEN	UG	SE	SW	20	13S	66E	6	IRD	9/15/1960	0	CL	THOMPSON, OMER	
205	19317			11/3/1960	CAN	UG	SW	SW	36	14S	66E	2	IRD	11/3/1960		CL	BULLARD, MRS.R. L.	
205	19377			12/8/1960	PER	UG	NE	SE	07	04S	67E	2	MUN	Y	12/8/1960	1448	LI	CALIENTE PUBLIC UTILITIES
		CHANGED BY: 83309			WDR	UG												
205	20212		6030	12/26/1961	CER	UG	SW	NW	11	09S	67E	4.22	IRR	Y	12/26/1961	807.85	LI	LEWIS, ROBERT C. & VIVIAN
		CHANGED BY: 66336			DEN	UG												
205	20280			2/6/1962	CAN	UG	NW	NE	20	07S	67E	4	IRR	2/6/1962	0	LI	SCHLARMAN, OLIVER	
205	20298			2/16/1962	CAN	SPR	NE	NW	13	12S	67E	0.003	STK	2/16/1962	1.779962	LI	BREEDLOVE, MILDRED	
205	20299			2/16/1962	CAN	SPR	SW	SE	03	12S	67E	0.004	STK	2/16/1962	0	LI	BREEDLOVE, MILDRED	
205	20744			9/24/1962	WDR	UG	NE	SW	35	14S	66E	3.5	PWR	9/24/1962	0	CL	NEVADA POWER COMPANY	
205	20782			10/16/1962	WDR	UG	NE	SW	35	14S	66E	3.5	PWR	10/16/1962	0	CL	NEVADA POWER COMPANY	
205	20783			10/16/1962	WDR	UG	NE	SW	35	14S	66E	3.5	PWR	10/16/1962	0	CL	NEVADA POWER COMPANY	
205	20784			10/16/1962	WDR	UG	NE	SW	35	14S	66E	3.5	PWR	10/16/1962	0	CL	NEVADA POWER COMPANY	
205	20881			12/7/1962	CAN	UG	NE	SW	17	07S	67E	0.002	STK	12/7/1962	0	LI	RACHAEL SCHLARMAN ESTATE	
205	20882			12/7/1962	CAN	UG	NW	NE	20	07S	67E	1.7	IRR	12/7/1962	0	LI	DIELMAN, ROGER H.	
205	21443		7304	8/6/1963	CER	UG	NE	SE	22	09S	67E	2.5	IRR	8/6/1963	153.2	LI	LEWIS, ROBERT C. & VIVIAN	
		CHANGED BY: 66337			ABR	UG												
205	2152			7/24/1911	CAN	STR		LT06	06	13S	66E	250	IRR	Y	7/24/1911		CL	FERRY, WILLIAM MONTAGUE
205	21586		6988	10/17/1963	CER	UG	NW	SW	21	07S	67E	1.5	IRR	10/17/1963	157.2	LI	RAINBOW RANCH, INC.	
205	21926			4/6/1964	ABR	UG	SW	NE	19	13S	66E	3.4	IRR	4/6/1964	0	CL	COLE, NELDA	

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN							
CHANGED BY: 23091					WDR	UG											
205	22046			6/15/1964	CAN	UG	SE	SW	21	07S	67E	1	IRR	6/15/1964	0	LI	BRADSHAW, JAMES W.
205	22047		6989	6/15/1964	CER	STR	NW	NE	20	07S	67E	1.5	IRR	6/15/1964	157.2	LI	RAINBOW RANCH, INC.
205	22149		6827	7/29/1964	CER	STR	SW	NW	25	12S	65E	1.35	IRD	7/29/1964	100	LI	RICHARD C. LEWIS FAMILY REVOCABLE TR
CHANGED BY: 72920					WDR	STR											
205	22163			8/5/1964	WDR	UG	SE	SW	26	14S	66E	3.5	PWR	8/5/1964	0	CL	NEVADA POWER CO.
205	22164			8/5/1964	WDR	UG	SW	SE	22	14S	66E	3.5	PWR	8/5/1964	0	CL	NEVADA POWER CO.
205	22358			12/14/1964	CAN	UG	NE	NW	19	13S	66E	3.5	IRD	10/2/1958	0	CL	COLE, NELDA
205	22585			5/14/1965	ABR	UG	SW	SE	22	14S	66E	3.5	IND	5/14/1965	0	CL	NEVADA POWER COMPANY
CHANGED BY: 44318					CER	UG											
CHANGED BY: 45218					CER	UG											
205	22586			5/14/1965	ABR	UG	SE	SW	26	14S	66E	3.5	IND	5/14/1965	0	CL	NEVADA POWER CO.
CHANGED BY: 44314					CAN	UG											
CHANGED BY: 44317					CER	UG											
CHANGED BY: 45219					CER	UG											
205	22587			5/14/1965	ABR	UG	NE	SW	35	14S	66E	3.5	IND	5/14/1965	0	CL	NEVADA POWER CO.
CHANGED BY: 44313					CER	UG											
CHANGED BY: 45220					CER	UG											
205	22588			5/14/1965	CAN	UG	NE	SW	35	14S	66E	3.5	IND	5/14/1965	0	CL	NEVADA POWER COMPANY
205	22589			5/14/1965	ABR	UG	NE	SW	35	14S	66E	3.5	IND	5/14/1965	0	CL	NEVADA POWER COMPANY
CHANGED BY: 44315					CER	UG											
CHANGED BY: 44316					CER	UG											
205	2291			12/18/1911	DEN	OSW			11	06S	66E	250	IRR	12/18/1911	0	LI	BRADSHAW, JAMES W.

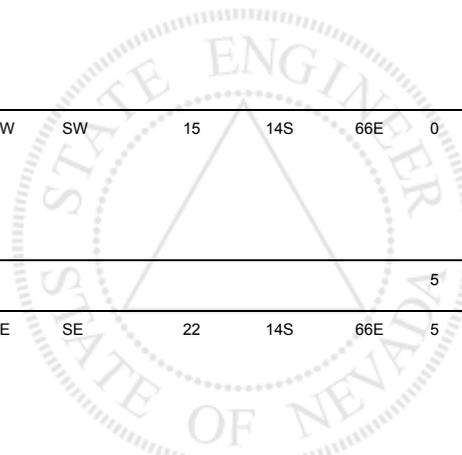
Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION			Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record		
							Qtr-Qtr	Qtr	SEC								TWN	RNG
205	22919		7582	1/13/1966	ABR	UG	NE	NE	19	13S	66E	1	IRR	1/13/1966	0	CL	INFINITON LLC	
		CHANGED BY: 70315T			WDR	UG												
		CHANGED BY: 50855			CAN	UG												
		CHANGED BY: 69259			ABR	UG												
205	2306			1/6/1912	ABR	STR	SE	NE	22	08S	67E	1.6	IRR	Y	1/6/1912		LI	HENRIE, ETHEL S.
		CHANGED BY: 6506			CAN	STR												
205	2307			1/6/1912	CAN	STR	NW	SW	23	09S	67E	10	IRR	Y	1/6/1912	0	LI	MABEY, CLARENCE
205	23091			4/7/1966	WDR	UG	NE	NW	19	13S	66E	3.4	IRR		4/6/1964	0	CL	COLE, NELDA
205	23092		7655	4/7/1966	ABR	UG	NE	NW	19	13S	66E	0.9	IRR		10/2/1958	0	CL	COLE, CHARLES WAYNE
		CHANGED BY: 63410			ABR	UG												
		CHANGED BY: 63411T			EXP	UG												
205	23477			11/4/1966	CAN	UG	NW	NW	25	12S	65E	2	IRR		11/4/1966	0	LI	LEAVITT, ART
205	23817		6657	4/17/1967	ABR	STR	SE	NW	23	08S	67E	5.5	IRR		11/9/1959	0	LI	JENSEN'S PALISADE INC.
		CHANGED BY: 39805			CAN	STR												
		CHANGED BY: 48491			CER	STR												
205	23933			6/12/1967	PER	UG	SW	NW	08	04S	67E	6	MUN	Y	6/12/1967	325	LI	CALIENTE-CITY
		CHANGED BY: 80043T			EXP	UG												
		CHANGED BY: 81130T			EXP	UG												
		CHANGED BY: 83310			WDR	UG												
		CHANGED BY: 78984			WDR	UG												
205	24461		7822	5/3/1968	CER	UG	NE	NW	08	04S	67E	0.35	IRR		5/3/1968	26.35	LI	DUESCO
205	2499			9/4/1912	DEN	STR	SE	SE	25	12S	66E	2	IRR		9/4/1912	0	LI	NEFF RANCHING COMPANY
205	25471		8472	2/20/1970	CER	UG	NE	SW	22	14S	66E	0.5	IRR		2/20/1970	90	CL	DANIEL BRYCE OMER AND B L & J INC

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205	25748			8/7/1970	CAN	UG	SW	NW	08	04S	67E	6	MUN		8/7/1970		LI	CALIENTE, CITY OF
205	25775			8/24/1970	CAN	UG	SW	NW	22	14S	66E	2.7	IRR		8/24/1970	0	CL	HENRIE, PAUL S.
205	25776			8/24/1970	CAN	UG	NW	NW	22	14S	66E	2.7	IRR		8/24/1970	0	CL	HENRIE, PAUL S.
205	25777			8/24/1970	CAN	UG	SW	NW	22	14S	66E	2.7	IRR		8/24/1970	0	CL	HENRIE, PAUL S.
205	25918			1/25/1971	CAN	STR	NE	SW	18	13S	66E	5.4	IRR		1/25/1971	0	CL	COLE, NELDA
205	25919			1/25/1971	CAN	UG	NW	NW	22	14S	66E	2.7	IRR		1/25/1971	800	CL	HENRIE, PAUL S.
205	25920			1/25/1971	CAN	UG	SW	NW	22	14S	66E	2.7	IRR		1/25/1971	800	CL	HENRIE, PAUL S.
205	25921			1/25/1971	CAN	UG	SW	NW	22	14S	66E	2.7	IRR		1/25/1971	800	CL	HENRIE, SUZY
205	25922			1/25/1971	ABR	UG	NE	NW	27	14S	66E	0.5	IRR		1/25/1971	0	CL	CUTLER, HUBERT K.
		CHANGED BY: 33056			CER	UG												
205	25970			2/18/1971	PER	UG	SW	NW	08	04S	67E	6	MUN	Y	2/18/1971	0	LI	CALIENTE-CITY
		CHANGED BY: 83311			WDR	UG												
205	26382		8486	10/26/1971	CER	UG	NE	SW	22	14S	66E	0.5	IRR		10/26/1971	90	CL	WRIGHT, LEONARD E.
205	26689			4/26/1972	CAN	UG	NE	NW	19	13S	66E	5.4	IRR		4/26/1972	0	CL	COLE, MRS. NELDA
205	2670			3/29/1913	CAN	STR	SW	NW	24	12S	65E	1.5	IRR		3/29/1913	0	LI	MERCER, IDA BELL
205	26770		8216	6/14/1972	CER	UG	NW	NE	27	14S	66E	0.5	IRR		6/14/1972	94	CL	DEY, WAYNE K. AND LINDA
		CHANGED BY: 82662			CER	UG												
205	2681			4/10/1913	CAN	STR	NW	NE	34	05S	66E	0.4	IRR	Y	4/10/1913		LI	REED, CLARK D.
205	26990			9/18/1972	ABR	UG	SW	NE	27	14S	66E	0.07	IRR		9/18/1972	0	CL	EMBRY, VELDA
		CHANGED BY: 45540			CER	UG												
205	26991			9/18/1972	CAN	UG	SW	NE	27	14S	66E	0.07	IRR		9/18/1972	0	CL	PAYTAS, DENNIS ROBERT
205	26992			9/18/1972	CAN	UG	NE	NE	27	14S	66E	0.12	IRR		9/18/1972	0	CL	SCHLARMAN, HENRY J.
205	26993			9/18/1972	ABR	UG	NE	NE	27	14S	66E	0.13	IRR		9/18/1972	0	CL	SCHLARMAN, HENRY J.

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		CHANGED BY: 35757			CER	UG												
205	27264			2/5/1973	CAN	UG	NW	NW	27	14S	66E	0.375	IRR		2/5/1973	0	CL	COLE, JOE
205	27276		8889	2/8/1973	CER	UG	SE	NE	27	14S	66E	1	IRR		2/8/1973	45	CL	BENNINGHOFF 1990 TRUST
		CHANGED BY: 45010			ABR	UG												
		CHANGED BY: 50604			CAN	UG												
		CHANGED BY: 50972			ABR	UG												
		CHANGED BY: 85293			PER	UG												
		CHANGED BY: 85294			PER	UG												
		CHANGED BY: 82894			PER	UG												
205	2752			7/7/1913	DEN	STR			20	05S	66E	1	IRR	Y	7/7/1913	0	LI	BLACK, PARLEY
205	27644			7/20/1973	CAN	UG	NE	NW	19	13S	66E	5.4	IRR		7/20/1973	0	CL	COLE, MRS. NELDA
205	27645			7/20/1973	CAN	UG	NW	NW	27	14S	66E	0.1	IRR		7/20/1973	0	CL	BALLOW, JOE C.
205	27903		8497	11/15/1973	ABR	UG	NE	SE	27	14S	66E	0.4	IRR		11/15/1973	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 50605			CAN	UG												
		CHANGED BY: 50973			WDR	UG												
		CHANGED BY: 57584			ABR	UG												
205	27904		9027	11/15/1973	ABR	UG	SW	SW	35	14S	66E	0.4	IRR	Y	11/15/1973	0	CL	MOAPA MISSION
		CHANGED BY: 66976			PER	UG												
205	27905			11/15/1973	CAN	UG	NW	SW	35	14S	66E	0.8	IRR		11/15/1973	0	CL	LEWIS, PAUL
205	27970			12/24/1973	CAN	UG	NW	NE	27	14S	66E	0.25	IRR		12/24/1973	0	CL	PERKINS, ROBERT
205	28185			3/13/1974	CAN	SPR	NW	SW	12	07S	66E	0.016	STK		3/13/1974	0	LI	BRADSHAW INC.
205	28285		8790	4/24/1974	CER	UG	NE	NE	27	14S	66E	0.03	IRR		4/24/1974	8.75	CL	FOLEY, ROBERT R.
205	28321			5/13/1974	CAN	STR	NE	SW	18	13S	66E	5.4	IRR		5/13/1974	0	CL	COLE, NELDA

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205	28327			5/15/1974	CAN	UG	NE	SW	09	10S	67E	1.5	IRR	5/15/1974	400	LI	GUINN, ROBERT
205	28557			8/1/1974	CAN	UG	SW	NW	18	04S	67E	0.002	DOM	8/1/1974	1.994785	LI	SUMMA CORPORATION
205	28558		9055	8/1/1974	CER	UG	SE	SE	13	04S	66E	2	IRR	Y 8/1/1974	439.73	LI	H.H. LAND AND CATTLE COMPANY
205	28559		9056	8/1/1974	CER	UG	SE	NW	18	04S	67E	2.5	IRR	8/1/1974	245.03	LI	H.H. LAND AND CATTLE COMPANY
205	28560		9057	8/1/1974	CER	UG	SW	SW	18	04S	67E	2.4	IRR	8/1/1974	114.14	LI	H.H. LAND AND CATTLE COMPANY
205	2873		237	1/10/1914	CER	STR	NE	NW	08	04S	67E	0.14	IRR	Y 1/10/1914	42.49	LI	H.H. LAND AND CATTLE COMPANY
205	2921			3/23/1914	WDR	STR	SE	SE	01	13S	65E	100	IRR	Y 3/23/1914	0	CL	DOUGLAS, W.B.
205	2922			3/24/1914	DEN	STR	NW	SE	11	06S	67E	0	IRR	Y 3/24/1914	100000	LI	GREAT WESTERN LAND, WATER & POWER CO
205	29338		9059	4/8/1975	CER	UG	SE	NE	24	04S	66E	1.34	IRR	4/8/1975	353.62	LI	H.H. LAND AND CATTLE COMPANY
205	29606		10964	8/27/1975	CER	UG	SW	NW	26	14S	66E	1	IRR	8/27/1975	197	CL	ROBERT C. LEWIS AND VIVIAN C. LEWIS CO-TRUSTEES OF THE ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990
		CHANGED BY: 66338			RFA	UG											
205	29607		9303	8/27/1975	ABR	UG	NE	SE	27	14S	66E	0.83	IRR	8/27/1975	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 50974			ABR	UG											
		CHANGED BY: 50606			CAN	UG											
205	29618		9304	8/28/1975	ABR	UG	NE	SE	27	14S	66E	0.36	IRR	8/28/1975	0	CL	LEWIS, ROBERT C. AND VIVIAN
		CHANGED BY: 50607			CAN	UG											
		CHANGED BY: 50975			ABR	UG											
205	29619		9696	9/2/1975	CER	UG	NW	SW	35	14S	66E	0.074	IRR	9/2/1975	26.85	CL	LEAVITT, DIANNE
205	29632		9382	9/8/1975	CER	UG	NW	SW	35	14S	66E	0.37	IRR	9/8/1975	48	CL	PULSIPHER, BILLY H.
205	29834		10491	12/4/1975	CER	UG	SE	SW	07	04S	67E	0.111	IRR	12/4/1975	5.34	LI	JORDAN VALLEY, LLC
		CHANGED BY: 72708			CER	UG											
205	30295			6/1/1976	CAN	UG	NE	NW	19	13S	66E	4.7	IRR	6/1/1976	0	CL	COLE, CHARLES WAYNE
205	30296			6/1/1976	ABR	UG	NE	NW	19	13S	66E	2.68	IRR	6/1/1976	0	CL	COLE, CHARLES WAYNE

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		CHANGED BY: 56551			ABR	UG											
205	30725			10/8/1976	ABR	UG	NW	NW	04	14S	66E	2	IRD	10/8/1976	0	CL	LEWIS, VIVIAN
		CHANGED BY: 46166			ABR	UG											
205	30726			10/8/1976	DEN	UG	SE	SE	04	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VLY. FARM LANDS IRR. CO.
205	30727			10/8/1976	DEN	UG	NW	NW	09	14S	66E	5	IRC	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	30728			10/8/1976	DEN	UG	SW	SW	10	14S	66E	5	IRD	10/8/1976	0	CL	COMPANY
205	30729			10/8/1976	ABR	UG	SW	SE	15	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LAND IRRIGATION
		CHANGED BY: 50976			ABR	UG											
		CHANGED BY: 50608			CAN	UG											
205	30730			10/8/1976	ABR	UG	NW	SW	15	14S	66E	0	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIGATION
		CHANGED BY: 50609			CAN	UG											
		CHANGED BY: 50977			ABR	UG											
205	30731			10/8/1976	DEN	UG						5	IRD	10/8/1976	0	CL	MEADOW VLY FARM LANDS IRRIGATION CO.
205	30732			10/8/1976	ABR	UG	NE	SE	22	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LAND IRRIGATION
		CHANGED BY: 50610			CAN	UG											
		CHANGED BY: 50978			ABR	UG											
205	30733			10/8/1976	DEN	UG	NW	NW	26	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	30734			10/8/1976	ABR	UG	SW	SW	26	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRR. CO.
		CHANGED BY: 50611			CAN	UG											
		CHANGED BY: 50979			ABR	UG											
205	30735			10/8/1976	DEN	UG	SE	SW	26	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	30736			10/8/1976	DEN	UG	SE	NE	35	14S	66E	5	IRD	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	31044		10371	1/31/1977	CER	UG	SE	SE	24	04S	66E	0.15	IRR	1/31/1977	29.55	LI	H.H. LAND AND CATTLE COMPANY



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205	31045		10372	1/31/1977	CER	UG	SE	SE	13	04S	66E	0.34	IRR	Y	1/31/1977	72.91	LI	H.H. LAND AND CATTLE COMPANY
205	31098		9840	2/14/1977	CER	UG	NE	NW	14	09S	67E	3.75	IRR	Y	2/14/1977	290.52	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66339			ABR	UG												
205	31116			2/17/1977	ABR	UG	SW	NW	02	05S	66E	3.34	IRR		2/17/1977	0	LI	TENNILLE, JAMES B. JR.
		CHANGED BY: 45945			CER	UG												
205	31315			4/11/1977	ABR	UG	NW	NW	02	15S	66E	0.25	IRR		4/11/1977	0	CL	EWING, JAMES L.
		CHANGED BY: 49298			CER	UG												
205	31620			5/11/1977	DEN	UG	NW	NW	29	13S	66E	4	IRR		5/11/1977	0	CL	HAWORTH, JERRY L.
205	31621			5/11/1977	DEN	UG	SE	NW	29	13S	66E	4	IRR		5/11/1977	0	CL	STROUD, A. ALLEN
205	31622			5/11/1977	DEN	UG	SW	SW	20	13S	66E	4	IRR		5/11/1977	0	CL	STROUD, A. ALLEN
205	31623			5/11/1977	DEN	UG	NE	NW	32	13S	66E	4	IRR		5/11/1977	0	CL	STROUD, A. ALLEN
205	31624			5/11/1977	DEN	UG	NW	SW	33	13S	66E	4	IRR		5/11/1977	0	CL	HAWORTH, JAMES S.
205	31625			5/11/1977	DEN	UG	NW	SE	32	13S	66E	4	IRR		5/11/1977	0	CL	HAWORTH, JAMES S.
205	31626			5/11/1977	DEN	UG	SW	NW	33	13S	66E	4	IRR		5/11/1977	800	CL	HAWORTH, JERRY L.
205	31627			5/11/1977	DEN	UG	NE	SW	29	13S	66E	4	IRR		5/11/1977	800	CL	HAWORTH, JERRY L.
205	31628			5/11/1977	DEN	UG	NW	NE	32	13S	66E	0	IRR		5/11/1977	0	CL	HAWORTH, JAMES S.
205	31629			5/11/1977	DEN	UG	SW	NE	32	13S	66E	2	IRR		5/11/1977	400	CL	STROUD, A. ALLEN
205	3169			11/12/1914	CAN	STR	SE	SW	15	14S	66E	1.6	IRR	Y	11/12/1914		CL	POWERS, W.J.
205	31954			6/6/1977	CAN	UG		SW	33	13S	66E	3	IRR		6/6/1977	0	CL	PERKINS, KATHY
205	31955			6/6/1977	CAN	UG		NW	33	13S	66E	3	IRR		6/6/1977	0	CL	PERKINS, TIM
205	31982			6/9/1977	CAN	UG	NW	SE	18	13S	66E	3	IRR		6/9/1977	0	CL	SCHOLL, BEVERLY J.
205	32059			6/13/1977	CAN	UG	SW	NW	22	14S	66E	3	IRR		6/13/1977	77.5	CL	HUGHES, LARRY ROGER
		CHANGED BY: 47637			CAN	UG												

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205	32060			6/13/1977	ABR	UG	SW	NW	22	14S	66E	3	IRR	6/13/1977	0	CL	LEWIS, RICHARD CLARENCE	
		CHANGED BY: 50980			ABR	UG												
		CHANGED BY: 50612			CAN	UG												
205	32061			6/13/1977	ABR	UG	SW	NW	22	14S	66E	3	IRR	6/13/1977	0	CL	LEWIS, ROBERT C. AND VIVIAN C.	
		CHANGED BY: 50981			WDR	UG												
		CHANGED BY: 50613			CAN	UG												
		CHANGED BY: 51283			ABR	UG												
205	32450			6/29/1977	WDR	UG				08S	67E	6	IRC	6/29/1977	0	LI	GRAY'S MEADOW VALLEY FARMS	
205	32752			7/8/1977	CAN	UG	SW	NW	07	13S	66E	3	IRR	7/8/1977	0	CL	KEBLINGER, ROBERT	
205	32763			7/11/1977	CAN	UG	SE	NW	18	13S	66E	0	IRR	7/11/1977	0	CL	SCHOLL, JAMES L. JR.	
205	32764			7/11/1977	CAN	UG	NE	NE	30	13S	66E	0	IRR	7/11/1977	0	CL	KEBLINGER, PATRICIA	
205	32809			7/14/1977	DEN	UG	NW	SW	29	13S	66E	2.8	IRR	7/14/1977	0	CL	MUNOZ, ALFRED V.	
205	32911			7/25/1977	DEN	UG	NW	NW	04	14S	66E	2.8	IRR	7/25/1977	0	CL	STOKKE, EARTHA A.	
205	32912			7/25/1977	DEN	UG	NE	NE	05	14S	66E	2.8	IRR	7/25/1977	0	CL	KJERSTEN, MARLENE E.	
205	32915			7/26/1977	CAN	UG	NW	NE	18	13S	66E	2	IRR	7/26/1977	0	CL	WALKER, JAY DEE	
205	32948			7/28/1977	DEN	UG	NW	NW	30	11S	66E	2.7	IRR	7/28/1977	0	LI	GRAY, MARGARET V.	
205	32949			7/28/1977	DEN	UG	SE	SW	19	11S	66E	2.7	IRR	7/28/1977	0	LI	SCHOBER, MARJORIE L.	
205	3295		1392	3/8/1915	CER	SPR	NE	SW	26	10S	65E	0.012	STK	Y	1/1/1913	8.89981	LI	HIKO LAND AND CATTLE CO.
205	33055		13469	8/5/1977	CER	UG	NE	NW	27	14S	66E	0.267	IRR	8/5/1977	9.999999 9046325 7	CL	BRINKERHOFF, REE & KATRINA	
		CHANGED BY: 68621			CAN	UG												
		CHANGED BY: 62874			CER	UG												
		CHANGED BY: 71023			CER	UG												
		CHANGED BY: 71024			ABR	UG												

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		CHANGED BY: 65761			CER	UG											
205	33056		9307	8/5/1977	CER	UG	NE	NW	27	14S	66E	0.5	IRR	1/25/1971	66	CL	CUTLER, HAROLD K.
		CHANGED BY: 43743			CAN	UG											
		CHANGED BY: 44240			CAN	UG											
		CHANGED BY: 67339			DEN	UG											
205	33162			8/15/1977	CAN	UG	NW	NW	36	12S	65E	2.5	IRR	8/15/1977	0	LI	LESTER, MURL STUART
205	33166			8/15/1977	WDR	UG	NE	SW	32	13S	66E	3	IRR	8/15/1977	0	CL	JOHNSON, CHARLEY R.
205	33195			8/18/1977	CAN	UG	NE	NE	12	13S	65E	2.5	IRR	8/18/1977	0	CL	GLASS, DARRELL LEE
205	33248			8/22/1977	CAN	UG	SE	NW	07	13S	66E	4	IRR	8/22/1977	0	CL	DEWITT, RANDALL
205	33249			8/22/1977	DEN	UG	NW	NW	14	08S	67E	2.7	IRR	8/22/1977	0	LI	GRAY, JOHN F.
205	33250			8/22/1977	DEN	UG	NW	NW	23	08S	67E	2.7	IRR	8/22/1977	0	LI	GRAY, FLORENE
205	33251			8/22/1977	DEN	UG	NW	NE	36	11S	65E	2.7	IRC	8/22/1977	0	LI	GRAY, ROSS A.
205	33252			8/22/1977	DEN	UG	NE	SE	25	11S	65E	2.7	IRC	8/22/1977		LI	GRAY, JEAN M.
205	33253			8/22/1977	DEN	UG	NW	SW	14	09S	67E	2.7	IRC	8/22/1977		LI	KOONTZ, ROSS
205	33254			8/22/1977	CAN	UG	NW	SE	36	11S	65E	2.7	IRC	8/22/1977	0	LI	GRAY, T.P.
205	33255			8/22/1977	CAN	UG	NE	NW	01	12S	65E	2.7	IRC	8/22/1977	0	LI	GRAY, GEORGIA O.
205	33269			8/22/1977	CAN	UG	NW	NW	05	14S	66E	5	IRR	8/22/1977	0	CL	MEADOW VALLEY ASSOCIATION
205	33270			8/22/1977	CAN	UG	NW	NW	24	12S	66E	5	IRR	8/22/1977	0	LI	MEADOW VALLEY ASSOCIATION
205	33271			8/22/1977	CAN	UG	NE	NE	30	13S	66E	0	IRR	8/22/1977	0	CL	MEADOW VALLEY ASSOCIATION
205	33308			8/23/1977	CAN	UG	NW	SW	20	13S	66E	3	IRR	8/23/1977	0	CL	KIMBALL, DEBORAH
205	33314			8/23/1977	CAN	UG	NW	NW	29	13S	66E	2.8	IRR	8/23/1977	0	CL	TOLLESTRUP, MARY
205	33354			8/26/1977	CAN	UG			32	14S	66E	3	IRR	8/26/1977	800	CL	BAKER, ANTHONY P.
205	33388			8/29/1977	DEN	UG	NW	SE	29	13S	66E	3	IRR	8/29/1977	0	CL	GREENE, O. BARRY

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205	33700			9/22/1977	CAN	UG	NE	SW	07	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, JAMES C.
205	33701			9/22/1977	CAN	UG	NW	SE	18	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, LAURA
205	33702			9/22/1977	CAN	UG	SE	NW	07	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, ROCK C.
205	33703			9/22/1977	CAN	UG	SW	NE	07	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, MARY
205	33704			9/22/1977	CAN	UG	NW	SE	13	14S	65E	2.7	IRC	9/22/1977	100	CL	KOSTAL, HARRIET GRACE
205	33705			9/22/1977	CAN	UG	NW	NW	13	14S	65E	2.7	IRC	9/22/1977	100	CL	KOSTAL, KATHY ANNE
205	33706			9/22/1977	CAN	UG	NW	NE	13	14S	65E	2.7	IRR	9/22/1977	100	CL	KOSTAL, ARTHUR H.
205	33707			9/22/1977	CAN	UG	NW	SW	18	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, ELIZABETH J.
205	33708			9/22/1977	CAN	UG	NW	SE	07	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, JAMES P.
205	33709			9/22/1977	CAN	UG	NW	NW	18	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, MARCELLINA CELLINI
205	33710			9/22/1977	CAN	UG	NW	NE	18	14S	66E	2.7	IRC	9/22/1977		CL	UNGARO, MARK CURRAN
205	33711			9/22/1977	CAN	UG	NW	NW	19	14S	66E	2.7	IRC	9/22/1977		CL	KONYS, MARK
205	33712			9/22/1977	CAN	UG		NE	19	14S	66E	2.7	IRC	9/22/1977		CL	KONYS, JAMES J.
205	33713			9/22/1977	CAN	UG	NW	SE	19	14S	66E	2.7	IRC	9/22/1977		CL	KONYS, ROBERT E.
205	33714			9/22/1977	CAN	UG		SW	19	14S	66E	2.7	IRC	9/22/1977		CL	KONYS, SUE
205	33715			9/22/1977	CAN	UG	NW	SE	28	14S	66E	2.7	IRC	9/22/1977		CL	ROSZYK, ALAN
205	33716			9/22/1977	CAN	UG	SW	NE	28	14S	66E	2.7	IRC	9/22/1977		CL	GOMAN, NICK C.
205	33717			9/22/1977	CAN	UG		SW	13	14S	65E	2.7	IRR	9/22/1977	100	CL	KOSTAL, CANDICE LYNN
205	33857			9/28/1977	CAN	UG		NE	12	14S	65E	2.7	IRR	9/28/1977	0	CL	ZAPPULLA, JOSEPH G.
205	33858			9/28/1977	CAN	UG		SE	01	14S	65E	2.7	IRR	9/28/1977	0	CL	ALLEN, HANNA JO
205	33861			9/28/1977	CAN	UG		SE	12	14S	65E	2.7	IRR	9/28/1977	100	CL	KELLEY, RICHARD D.
205	33889			9/30/1977	DEN	UG	SE	NW	01	14S	65E	2.7	IRR	9/30/1977	0	CL	GRANTHAM, MEL M.
205	3398			5/17/1915	CAN	UG	NW	NW	27	14S	66E	3.2	IRR	5/17/1915		CL	THRESHER, JOSEPH E.

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205	34171			11/14/1977	CAN	UG		NW	34	14S	66E	2.7	IRR		11/14/1977	0	CL	BARRETT, HERBERT L.
205	34172			10/14/1977	CAN	UG		NE	33	14S	66E	2.7	IRR		10/14/1977		CL	GOODIELL, ALFRED E.
205	34611		19742	11/14/1977	CER	UG	SW	SW	14	09S	67E	1.7	IRR	Y	10/11/2012	161.45	LI	SCOTT, CATHERINE S.
		CHANGED BY: 66285			WDR	UG												
		CHANGED BY: 75443			CAN	UG												
		CHANGED BY: 75826			ABR	UG												
205	34817			1/3/1978	ABR	UG	NE	SE	27	14S	66E	1	IRR		1/3/1978	0	CL	LEWIS, ROBERT C. AND VIVIAN
		CHANGED BY: 50982			ABR	UG												
		CHANGED BY: 50614			CAN	UG												
205	35309			4/18/1978	CAN	UG	NW	SW	08	04S	67E	1	MUN		5/14/1941	0	LI	CALIENTE PUBLIC UTILITIES
205	35434			5/15/1978	DEN	UG	NW	NW	25	12S	65E	2.67	IRR		5/15/1978	0	LI	MOSS, JAMES W.
205	35526			6/12/1978	CAN	UG	SW	SE	35	14S	66E	0.18	IRR		6/12/1978	125	CL	HESTER, VERA A.
205	35588			7/3/1978	ABR	UG	NW	SW	08	04S	67E	3	MUN		7/3/1978	0	LI	CALIENTE PUBLIC UTILITIES
		CHANGED BY: 49892			ABR	UG												
		CHANGED BY: 49893			CER	UG												
205	35589			7/3/1978	CAN	UG	SW	SW	22	14S	66E	0.67	IRR		7/3/1978	100	CL	WHIPPLE, J. LYNN
205	35655			7/24/1978	DEN	UG	NW	NE	18	13S	66E	2.7	IRC		7/24/1978		CL	WALKER, JAY DEE
205	35756			8/17/1978	ABR	UG	NE	NE	27	14S	66E	0.13	IRR		8/17/1978	0	CL	SCHLARMAN, HENRY J. AND SOPHIA
		CHANGED BY: 50615			CAN	UG												
		CHANGED BY: 50983			ABR	UG												
205	35757		10753	8/17/1978	CER	UG	NE	NE	27	14S	66E	0.13	IRR		9/18/1972	73.59999 99	CL	WRIGHT, J. & R. & LYMAN, SHARI
205	3590			9/27/1915	CAN	SPR	NE	SE	34	09S	67E	0	STK	Y	9/27/1915	0	LI	HENRIE, R.P.
205	35904			9/21/1978	CAN	UG	NW	NW	27	14S	66E	0.375	IRR		9/21/1978	75	CL	COLE, JOE

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205	36093			10/24/1978	DEN	UG	SW	NE	18	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, MARK CURRAN
205	36094			10/24/1978	DEN	UG	SE	NW	18	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, MARCELLINA CELLINI
205	36095			10/24/1978	DEN	UG	NW	SE	18	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, LAURA E.
205	36096			10/24/1978	DEN	UG	NW	SE	07	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, JAMES
205	36097			10/24/1978	DEN	UG	NE	SW	18	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, ELIZABETH J.
205	36098			10/24/1978	DEN	UG	SW	NE	07	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, MARY
205	36099			10/24/1978	DEN	UG	NE	SW	07	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, JAMES C.
205	36100			10/24/1978	DEN	UG	SE	NW	07	14S	66E	2.7	IRC		10/24/1978	100	CL	UNGARO, ROCK C.
205	36285			12/13/1978	ABR	STR	NE	SW	18	13S	66E	5.4	IRR		7/7/2000	0	CL	INFINITON LLC
		CHANGED BY: 69337			ABR	STR												
205	36895			3/6/1979	CAN	UG	NW	SW	12	12S	65E	3	IRD		3/6/1979	0	LI	DUNN, LYNN P.
205	37171			3/26/1979	CAN	UG						7	IRC		3/26/1979		LI	DOBSON, RONALD W.
205	37172			3/26/1979	CAN	UG						7	IRC		3/26/1979		LI	DOBSON, LOIS L.
205	37173			3/26/1979	CAN	UG						7	IRC		3/26/1979		LI	DOBSON, HARLON S.
205	37174			3/26/1979	CAN	UG						7	IRC		3/26/1979		LI	JONES, CLARENCE H.
205	37175			3/26/1979	CAN	UG						7	IRC		3/26/1979		LI	JONES, JUDY L.
205	37198			3/26/1979	DEN	UG	SW	NW	28	14S	66E	5.4	IRD		3/26/1979	0	CL	GORMAN, NICK C.
205	37203			3/26/1979	DEN	UG	NE	SW	23	14S	66E	5.4	IRD		3/26/1979	0	CL	EARL, DORIS
205	37204			3/26/1979	DEN	UG	NE	NW	26	14S	66E	5.4	IRD		3/26/1979	0	CL	EARL, LEE M.
205	37205			3/26/1979	DEN	UG	NE	NE	04	14S	66E	5.4	IRD		3/26/1979	1600	CL	LEAVITT, MICHAEL E.
205	37210			3/26/1979	DEN	UG	NE	NE	35	14S	66E	5.4	IRD		3/26/1979	1600	CL	LEAVITT, GERALD N.
205	37212			3/26/1979	DEN	UG	SW	SE	27	14S	66E	5.4	IRD		3/26/1979	1600	CL	LEAVITT, ELEANORA E.
205	37213			3/26/1979	DEN	UG	NW	NW	23	14S	66E	5.4	IRD		3/26/1979	1600	CL	WITTWER, NELLIE

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205	37214			3/26/1979	DEN	UG	NW	NW	04	14S	66E	5.4	IRD	3/26/1979	1600	CL	JOSEPH, BERNARD
205	37254			3/27/1979	DEN	UG	NE	NE	09	14S	66E	5.4	IRD	3/27/1979		CL	LEAVITT, J. ROBERT CARLETON
205	37256			3/27/1979	DEN	UG	NE	NW	09	14S	66E	5.4	IRD	3/27/1979		CL	LEAVITT, VAUGHN K.
205	37313			3/29/1979	CAN	UG	NE	NW	13	12S	65E	9	IRD	3/29/1979		LI	BREEDLOVE, C.P.
205	37328			3/29/1979	CAN	UG	SW	SW	36	11S	65E	7	IRD	3/29/1979	0	LI	BULGER, CAROLYN
205	37329			3/29/1979	CAN	UG			12	12S	65E	7	IRR	3/29/1979		LI	THOMPSON, PAUL R.
205	37330			3/29/1979	CAN	UG			12	12S	65E	7	IRR	3/29/1979		LI	SCARPATI, RALPH L.
205	37331			3/29/1979	CAN	UG	NW	NW	01	12S	65E	7	IRR	3/29/1979		LI	THOMPSON, MARY V.
205	37332			3/29/1979	CAN	UG	NW	NW	01	12S	65E	7	IRR	3/29/1979		LI	SCARPATI, JOHN W.
205	37333			3/29/1979	CAN	UG	SE	SE	11	12S	65E	7	IRR	3/29/1979		LI	THOMPSON, WM. T.
205	37334			3/29/1979	CAN	UG	NW	NW	36	11S	65E	7	IRD	3/29/1979	0	LI	THOMPSON, KAY F.
205	37399			3/30/1979	CAN	UG	NW	NW	10	14S	66E	8	IRD	3/30/1979		CL	STROUD, A. ALLEN
205	3747			12/20/1915	CAN	SPR	NE	NE	18	05S	66E	1	MM	12/20/1915		LI	TAYLOR, JOSEPH W.
205	37565			4/2/1979	DEN	UG	NE	SW	12	12S	65E	5	IRD	4/2/1979	0	LI	JENSEN, RAYMOND
205	37566			4/2/1979	DEN	UG	SE	NW	01	12S	65E	5	IRD	4/2/1979	0	LI	JENSEN, JACK D.
205	3761			12/30/1915	DEN	STR	SW	NE	05	14S	66E	3.2	IRR	12/30/1915	0	CL	VAN HORN, WILLIAM H.
205	3762			1/3/1916	CAN	SPR	NE	SE	34	09S	67E	0.05	STK	1/3/1916		LI	HENRIE, R.P.
205	37652			4/3/1979	DEN	UG	NW	NW	10	14S	66E	5.4	IRD	4/3/1979		CL	ROSENHAN, KATHLEEN
205	3778			1/13/1916	DEN	STR	SW	NE	05	14S	66E	3.2	IRR	1/13/1916	0	CL	POWERS, WILLIAM J.
205	37868			4/10/1979	CAN	UG	NE	SE	12	12S	65E	5.7	IRD	4/10/1979	0	LI	MOYLES, JAMES R.
205	37871			4/10/1979	CAN	UG	NW	SW	13	12S	65E	5.7	IRD	4/10/1979	0	LI	PLEYTE, JACK C.
205	37929			4/16/1979	DEN	UG	NE	NW	15	14S	66E	5.4	IRD	4/16/1979		CL	ROSENHAN, MAX
205	3797			2/15/1916	DEN	STR	SW	SW	14	09S	67E	3	IRR	2/15/1916	0	LI	RAPPLEYE, EZRA T. JR

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205	38060			4/30/1979	CAN	UG	SW	NW	10	14S	66E	5	IRD	4/30/1979	700	CL	STEWART, THERON D.
205	38061			4/30/1979	CAN	UG	SE	SW	10	14S	66E	5	IRD	4/30/1979	800	CL	STEWART, THERON D.
205	38062			4/30/1979	CAN	UG	SW	SE	22	14S	66E	2	IRD	4/30/1979	400	CL	STEWART, MARK A.
205	38063			4/30/1979	CAN	UG	SW	SW	23	14S	66E	2	IRD	4/30/1979	400	CL	STEWART, MARK A.
205	38064			4/30/1979	CAN	UG	SW	NW	26	14S	66E	2	IRD	4/30/1979	400	CL	STEWART, MARK A.
205	38065			4/30/1979	DEN	UG	NE	NE	09	14S	66E	5	IRD	4/30/1979	1600	CL	DRISCOLL DAVID E.
205	38066			4/30/1979	DEN	UG	NW	NW	09	14S	66E	5	IRD	4/30/1979	1600	CL	DRISCOLL DAVID E.
205	38067			4/30/1979	DEN	UG	NW	NE	09	14S	66E	5	IRD	4/30/1979		CL	DRISCOLL, DAVID E.
205	38068			4/30/1979	DEN	UG	NE	SE	22	14S	66E	5	IRD	4/30/1979		CL	STEWART,DANA H.
205	38069			4/30/1979	DEN	UG	NE	NE	22	14S	66E	5	IRD	4/30/1979		CL	STEWART, DANA H.
205	38070			4/30/1979	DEN	UG	SE	NE	22	14S	66E	5	IRD	4/30/1979		CL	STEWART, DANA H.
205	38071			4/30/1979	DEN	UG	SE	SW	09	14S	66E	5	IRD	4/30/1979	0	CL	STEWART, BRENT D.
205	38072			4/30/1979	DEN	UG	SE	SE	09	14S	66E	5	IRD	4/30/1979	0	CL	STEWART, BRENT W.
205	38073			4/30/1979	DEN	UG	NW	SW	09	14S	66E	5	IRD	4/30/1979		CL	STEWART, BRENT D.
205	38091			5/3/1979	ABR	UG	SE	NE	27	14S	66E	0.2	IRR	5/3/1979	0	CL	LEWIS, MRS. VIVIAN
		CHANGED BY: 50984			ABR	UG											
		CHANGED BY: 50616			CAN	UG											
205	38333			6/15/1979	DEN	UG	NE	NE	29	14S	66E	5.4	IRD	6/15/1979		CL	GESSLER, EARL N.
205	38589			7/18/1979	CAN	UG	NE	SW	09	14S	66E	0	IRD	7/18/1979		CL	KNEPPER, TOM R. JR.
205	38604			7/20/1979	DEN	UG	SE	NE	17	14S	66E	6	IRD	7/20/1979		CL	BOATMAN, MARILYN
205	38605			7/20/1979	CAN	UG	NW	NE	08	14S	66E	6	IRD	7/20/1979		CL	SUMPTER, HELEN F.
205	38606			7/20/1979	CAN	UG	NW	NE	09	14S	66E	6	IRD	7/20/1979		CL	SUMPTER, CHARLES G.
205	38607			7/20/1979	DEN	UG	NW	NW	09	14S	66E	6	IRD	7/20/1979		CL	SUMPTER, JEFFERY LYNN

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205	38608			7/20/1979	DEN	UG	SE	SW	16	14S	66E	6	IRD	7/20/1979	0	CL	BATDORF, JOHN W.
205	38609			7/20/1979	DEN	UG	NE	NW	21	14S	66E	6	IRD	7/20/1979		CL	DUGGAN, DAVID
205	38610			7/20/1979	DEN	UG	NW	NE	04	14S	66E	6	IRD	7/20/1979	0	CL	HUGHES, LISA
205	38611			7/20/1979	DEN	UG	SW	NW	10	14S	66E	6	IRD	7/20/1979		CL	DUGGAN, ANN C.
205	38612			7/20/1979	DEN	UG	SW	NW	04	14S	66E	6	IRD	7/20/1979		CL	DUGGAN, JONATHAN
205	38613			7/20/1979	DEN	UG	SW	SW	15	14S	66E	6	IRD	7/20/1979	0	CL	DUGGAN, MATTHEW
205	38614			7/20/1979	CAN	UG		SE	21	14S	66E	6	IRD	7/20/1979	0	CL	SUHRING, LUCILE C.
205	38615			7/20/1979	CAN	UG	SW	SW	33	13S	66E	2.7	IRC	7/20/1979		CL	TORKELSON, INEZ
205	38616			7/20/1979	DEN	UG	SE	SW	32	13S	66E	6	IRC	7/20/1979		CL	DUGGAN, ERIC
205	38617			7/20/1979	DEN	UG	NE	NE	22	14S	66E	6	IRD	7/20/1979	0	CL	ESPINOZA, JORI
205	38618			7/20/1979	CAN	UG	NW	NE	05	14S	66E	6	IRD	7/20/1979	0	CL	AMBROSE, TRACY
205	38648			7/23/1979	CAN	UG	NW		04	14S	66E	0	IRD	7/23/1979	0	CL	KNEPPER, THOMAS R. SR.
205	38664			7/25/1979	DEN	UG	NE	SE	16	14S	66E	6	IRD	7/25/1979	0	CL	MORRISON, CALVIN Q.
205	38671			7/25/1979	DEN	UG	NW	NE	26	14S	66E	6	IRD	7/25/1979	0	CL	KOFOED, EARL B.
205	38672			7/25/1979	DEN	UG	SE	SE	22	14S	66E	6	IRD	7/25/1979	0	CL	DOBBS, ALENE K.
205	38673			7/25/1979	CAN	UG	NE	NW	35	14S	66E	6	IRD	7/25/1979	0	CL	DIBELLA, JANIE L.
205	39387		10736	10/24/1979	CER	UG	SW	SW	07	13S	66E	0.09	QM	10/24/1979	4.480594	CL	LOS ANGELES & SALT LAKE RAILROAD CO.
205	39805			11/21/1979	CAN	STR	NW	SW	11	08S	67E	5.5	IRR	11/9/1959	0	LI	JENSEN'S PALISADE INC.
205	40262			1/8/1980	DEN	UG	NW	NE	18	07S	67E	4	IRD	1/8/1980	0	LI	BRADSHAW, BARBARA
205	40394			1/23/1980	CAN	UG	NE	W2	29	13S	66E	5.4	IRC	1/23/1980		CL	BROWN, MARVIN E.
205	40395			1/23/1980	DEN	UG	NE	NE	04	14S	66E	5.4	IRD	1/23/1980	0	CL	WARD, STEVE E.
205	40396			1/23/1980	CAN	UG	NE	SW	32	13S	66E	5.4	IRC	1/23/1980		CL	WARD, ELAINE A.
205	40397			1/23/1980	DEN	UG	SE	NE	21	14S	66E	5.4	IRD	1/23/1980	0	CL	GUIN, JAMES W.

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205	40398			1/23/1980	DEN	UG	NE	SE	21	14S	66E	5.4	IRD	1/23/1980	0	CL	GUIN, BARBARA J.
205	40399			1/23/1980	DEN	UG	SW	NW	22	14S	66E	5.4	IRD	1/23/1980	0	CL	GUIN, ARCHIE D.
205	40553			2/19/1980	DEN	UG	NW	SE	09	14S	66E	6.2	IRD	2/19/1980	0	CL	SUMPTER, CHARLES G.
205	40554			2/19/1980	DEN	UG	NW	SE	08	14S	66E	6	IRD	2/19/1980	0	CL	SUMPTER, HELEN F.
205	40555			2/19/1980	DEN	UG	NW	SE	05	14S	66E	6	IRD	2/19/1980	0	CL	AMBROSE, TRACY L.
205	40772			2/28/1980	CAN	UG	SE	SE	17	14S	66E	6	IRD	2/28/1980	0	CL	BOATMAN, MARILYN
205	40773			2/28/1980	CAN	UG	SE	NW	16	14S	66E	6	IRD	2/28/1980	0	CL	BATDORF, JOHN W.
205	40791			3/3/1980	DEN	UG	NE	NE	16	14S	66E	6	IRD	3/3/1980	0	CL	MORRISON, CALVIN Q.
205	40792			3/3/1980	DEN	UG	NW	SW	09	14S	66E	6	IRD	3/3/1980	0	CL	SUMPTER, JEFFREY LYNN
205	40796			3/3/1980	DEN	UG	NE	NW	35	14S	66E	6	IRD	3/3/1980	0	CL	DI BELLA, JANIE L.
205	40798			3/3/1980	DEN	UG	SE	SW	26	14S	66E	6	IRD	3/3/1980	0	CL	KOFOED, EARL B.
205	40799			3/3/1980	DEN	UG	SW	SW	23	14S	66E	6	IRD	3/3/1980		CL	DOBBS, ALENE K.
205	40834			3/5/1980	DEN	UG	SW	SE	32	13S	66E	6	IRC	3/5/1980		CL	DUGGAN, ERIC
205	40835			3/5/1980	DEN	UG	SW	SW	10	14S	66E	6	IRD	3/5/1980	0	CL	DUGGAN, ANN C.
205	40836			3/5/1980	DEN	UG	NW	SW	04	14S	66E	6	IRD	3/5/1980	0	CL	DUGGAN, JONATHAN
205	40837			3/5/1980	DEN	UG	SW	SW	15	14S	66E	6	IRD	3/5/1980	0	CL	DUGGAN, MATTHEW
205	40838			3/5/1980	DEN	UG	NE	SE	15	14S	66E	6	IRD	3/5/1980	0	CL	ESPINOZA, JORI
205	40839			3/5/1980	DEN	UG	SW	SE	33	13S	66E	6	IRC	3/5/1980		CL	TORKELSON, INEZ
205	40840			3/5/1980	DEN	UG	NW	SE	04	14S	66E	6	IRD	3/5/1980	0	CL	HUGHES, LISA
205	40841			3/5/1980	DEN	UG	NE	NE	21	14S	66E	6	IRD	3/5/1980	0	CL	DUGGAN, DAVID
205	40903			3/17/1980	ABR	UG	SE	NE	01	13S	65E	1	IRR	3/17/1980	0	CL	STUART, ROBERT B.
		CHANGED BY: 61408T			EXP	UG											
		CHANGED BY: 62398			WDR	UG											

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205	40909			3/18/1980	CAN	UG	NW	SW	13	14S	65E	5.4	IRD		3/18/1980	CL	LOISELLE, ROGER	
205	40996			4/1/1980	CAN	UG	SE	SE	15	09S	67E	4.8	IRR		4/1/1980	LI	WOOD, MICHAEL LESLIE	
205	40998		14226	4/1/1980	CER	SPR	NE	NE	19	04S	67E	0.003	REC		7/18/1994	2.424431	LI	NEVADA-PARKS DIVISION
205	40999		14903	4/1/1980	CER	SPR	NE	NE	19	04S	67E	0.011	REC		4/1/1980	8.040518	LI	NEVADA-PARKS DIVISION
205	41000		14904	4/1/1980	CER	SPR	NE	NE	19	04S	67E	0.007	REC		4/1/1980	4.848862	LI	NEVADA-PARKS DIVISION
205	42380			9/4/1980	DEN	UG	SE	SE	15	09S	67E	12	IRD		9/4/1980		LI	WOOD, MICHAEL LESLIE
205	42381			9/4/1980	DEN	UG	SE	SE	15	09S	67E	12	IRD		9/4/1980		LI	WOOD, MICHAEL LESLIE
205	42382			9/4/1980	DEN	UG	SE	SE	15	09S	67E	12	IRD		9/4/1980		LI	WOOD, MICHAEL LESLIE
205	42682			10/17/1980	CAN	STR	SW	SE	36	06S	66E	0	IRR		10/17/1980	0	LI	BRADSHAW INC.
205	42751			10/30/1980	CAN	UG	NW	NW	17	14S	66E	5	IRD		10/30/1980		CL	WITTWER, NETTIE E.
205	42762			11/3/1980	DEN	UG	SE	SE	15	09S	67E	12	IRD		11/3/1980		LI	WOOD, MICHAEL LESLIE
205	4338		1569	3/2/1917	CER	RES	SW	SW	17	07S	68E	0.015	STK		3/2/1917	4.695417	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	4339		1570	3/2/1917	CER	RES	SE	SW	05	07S	68E	0.015	STK	Y	3/2/1917	4.695417	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	4340		426	3/2/1917	CER	STR	SE	SE	23	06S	67E	0.025	STK	Y	3/2/1917	6.782269	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	4341		1571	2/2/1917	CER	SPR	NW	NW	18	06S	68E	0.017	STK	Y	2/2/1917	6.321934	LI	BARNES, DAVE L.
205	43530			4/14/1981	CAN	UG	SE	NW	17	14S	66E	6	IRD		4/14/1981	0	CL	MORRISON, CHARLES ALAN
205	43531			4/14/1981	CAN	UG	NE	SW	17	14S	66E	6	IRD		4/14/1981		CL	MORRISON, CHARLES ALAN
205	43532			4/14/1981	CAN	UG	SE	NE	18	14S	66E	6	IRD		4/14/1981		CL	MORRISON, CHARLES ALAN
205	43545			4/15/1981	CAN	UG	SE	NE	18	14S	66E	6	IRD		4/15/1981		CL	MORRISON, KRISTI
205	43546			4/15/1981	CAN	UG	SE	SE	18	14S	66E	6	IRD		4/15/1981		CL	MORRISON, KRISTI
205	43547			4/15/1981	CAN	UG	NW	NE	29	14S	66E	6	IRD		4/15/1981		CL	MORRISON, CHARLES ALAN
205	43548			4/15/1981	CAN	UG	SE	SW	20	14S	66E	6	IRD		4/15/1981		CL	MORRISON, CHARLES ALAN
205	43743			5/15/1981	CAN	UG	NW	NW	27	14S	66E	0.003	IRR		8/5/1977	2.5	CL	LEARNED, BENJAMIN

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205	43822			6/2/1981	DEN	UG	NE	NW	19	13S	66E	5.4	IRR		6/2/1981	0	CL	COLE, NELDA (MRS.)
205	43850			6/8/1981	CAN	UG	SE	SE	32	13S	66E	0.02	MM		6/8/1981	11.50837 5	CL	TEMPLE & BRECHAN
205	44159			7/15/1981	DEN	UG	SE	NE	27	05S	66E	0.33	IRD		7/15/1981	0	LI	BALLOW, JOE C.
205	44160			7/15/1981	DEN	STR	SE	SE	29	05S	66E	0.25	IRD		7/15/1981	0	LI	BALLOW, JOE C.
205	44161			7/15/1981	DEN	STR	NW	NE	32	05S	66E	0.25	IRD		7/15/1981	0	LI	BALLOW, JOE C.
205	44212			7/30/1981	CAN	UG	NW	NE	20	07S	67E	0.305	IRR		7/30/1981	0	LI	HARVEY, CAROLINE
		CHANGED BY: 58003			CER	UG												
205	44240			8/6/1981	CAN	UG	NW	SE	27	14S	66E	0.028	IRR		1/25/1971	20	CL	LEWIS, ROBERT C.
205	44313		12946	8/19/1981	CER	UG	SE	NW	35	14S	66E	0.83	IND	Y	5/14/1965	458.0947 03	CL	NEVADA POWER CO.
205	44314			8/19/1981	CAN	UG	NE	SW	35	14S	66E	2.67	IND		5/14/1965	1933.038 732	CL	NEVADA POWER CO.
205	44315		12947	8/19/1981	CER	UG	SW	SW	26	14S	66E	1.1	IND	Y	5/14/1965	648.1516 8	CL	NEVADA POWER COMPANY
205	44316		12949	8/19/1981	CER	UG	NW	SE	35	14S	66E	1.92	IND	Y	5/14/1965	942.9809 03	CL	NEVADA POWER COMPANY
205	44317		12950	8/19/1981	CER	UG	SE	NW	35	14S	66E	0.16	IND	Y	5/14/1965	88.29225 3	CL	NEVADA POWER CO.
205	44318		12951	8/19/1981	CER	UG	SE	NW	35	14S	66E	0.79	IND	Y	5/14/1965	571.9508 93	CL	NEVADA POWER COMPANY
205	44719			10/29/1981	CAN	UG		SW	17	05S	66E	0.005	STK		10/29/1981	0	LI	BLM
205	45010			11/2/1981	ABR	UG	NE	SE	27	14S	66E	0.305	IRR		2/8/1973	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 56489			ABR	UG												
205	45077			11/23/1981	CAN	UG	NE	SW	26	14S	66E	0	IRD		11/23/1981	0	CL	BINGHAM, JACOB DAVID
205	45078			11/23/1981	CAN	UG	NE	SW	27	14S	66E	0	IRD		11/23/1981	0	CL	AHLSTROM, FRED
205	45218		12955	1/14/1982	CER	UG	SW	SE	22	14S	66E	1.27	IND	Y	5/14/1965	715.9743 7	CL	NEVADA POWER COMPANY
205	45219		11186	1/14/1982	CER	UG	SE	SW	26	14S	66E	0.67	IND	Y	5/14/1965	485.08	CL	NEVADA POWER CO.
205	45220		11187	1/14/1982	CER	UG	NE	SW	35	14S	66E	2.67	IND	Y	5/14/1965	1933.08	CL	NEVADA POWER CO.
205	45540		10555	4/15/1982	CER	UG	SW	NE	27	14S	66E	0.07	IRR		9/18/1972	15.1	CL	EMBRY, MILTON

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205	45861			6/18/1982	WDR	UG	NW	NE	06	14S	66E	5.4	IRR		6/18/1982	0	CL	EARL, HAROLD
205	45945		10739	7/16/1982	CER	UG	SW	NW	02	05S	66E	2.37	IRR		2/17/1977	334.5	LI	325 EAST FOURTH ST
205	46086			8/23/1982	DEN	UG	SW	NE	33	13S	66E	1.8	MM		8/23/1982	0	CL	BLUE CACTUS MINING CO. INC.
205	46166			9/23/1982	ABR	UG	NE	SE	27	14S	66E	2	IRD		10/8/1976	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 50985			ABR	UG												
		CHANGED BY: 50617			CAN	UG												
205	46512			1/10/1983	CAN	UG	SW	SW	25	12S	65E	2.228	MM		1/10/1983	20.07060 6	LI	GREAT BASIN MINES, INC.
205	4698			11/12/1917	CAN	SPR				04S	65E	0.025	STK	Y	11/12/1917	0	LI	GARDNER RANCH CO.
205	47085			7/19/1983	DEN	UG	SW	SW	30	12S	66E	5	MM		7/19/1983		LI	LABYRINTH CORPORATION
205	47109			7/27/1983	ABR	UG	SW	SW	31	12S	66E	3	MM		2/28/1986	0	LI	BLUE STAR MINING INC.
		CHANGED BY: 49785			CAN	UG												
205	4711			11/19/1917	DEN	SPR				05S	64E	0.1	STK		11/19/1917	0	LI	JONES, JOS.
205	47305			10/5/1983	DEN	STR	NW	SW	26	14S	66E	10	IRD		10/5/1983	1600	CL	LEWIS, ROBERT C.
205	47637			2/1/1984	CAN	UG	NW	SW	22	14S	66E	1	IRR		6/13/1977	137.5	CL	HUGHES, LARRY ROGER
205	47798		13579	3/14/1984	CER	SPR	NE	NW	22	06S	67E	0.01	QM		3/14/1984	2.209608	LI	JOHNSTON, THOMAS C.
205	47799		13580	3/14/1984	CER	UG	NW	NE	22	06S	67E	0.2	MM		3/14/1984	6.404794 3	LI	JOHNSTON, THOMAS C.
205	48074			6/1/1984	DEN	UG	SE	SW	09	14S	66E	0.3	MM		6/1/1984		CL	COOK INTERNATIONAL INVESTMENTS, INC.
205	48075			6/1/1984	DEN	UG	SE	NE	08	14S	66E	0.3	MM		6/1/1984		CL	NEVADA NATIONAL MINING CORPORATION
205	48491		13250	10/16/1984	CER	STR	NW	NW	11	08S	67E	5.5	IRR		11/9/1959	862.09	LI	LEWIS, ROBERT C. & VIVIAN
205	48493			10/16/1984	CAN	UG	NE	NW	08	04S	67E	0.21	IRR		10/16/1984	58.65	LI	BARNETT, RONALD
205	49062			5/20/1985	CAN	UG			19	13S	66E	0	MM		5/20/1985	0	CL	HI-TECH CORPORATION
205	49079		13354	5/23/1985	CER	UG	NE	SW	09	10S	67E	0.87	IRR		5/23/1985	140	LI	BRUNDY, SALLY M.
205	49131			6/12/1985	CAN	UG	SE	SE	26	14S	66E	0	IND		6/12/1985	0	CL	NEVADA POWER COMPANY

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205	49132			6/12/1985	CAN	UG	SW	NW	24	12S	65E	0	IND		6/12/1985	0	LI	NEVADA POWER COMPANY
205	49133			6/12/1985	CAN	UG	SW	SW	13	12S	65E	0	IND		6/12/1985	0	LI	NEVADA POWER COMPANY
205	49298		12802	8/22/1985	CER	UG	NW	NW	02	15S	66E	0.25	IRR		4/11/1977	58	CL	EWING INVESTMENTS
		CHANGED BY: 70518			WDR	UG												
		CHANGED BY: 70500			CER	UG												
		CHANGED BY: 73735			CER	UG												
205	49333			9/4/1985	DEN	UG	NE	SW	18	13S	66E	1	MM		9/4/1985		CL	DEREFIELD ASSOCIATES
205	49334			9/4/1985	DEN	UG	NE	SW	18	13S	66E	1	MM		9/4/1985	0	CL	DEREFIELD ASSOCIATES
205	49429			10/3/1985	CAN	UG	SE	SE	18	13S	66E	3	MM		10/3/1985	1630.445 192	CL	SIERRA MINERALS, INC.
205	49430			10/3/1985	CAN	UG	NW	SE	18	13S	66E	3	MM		10/3/1985	1630.445 192	CL	SIERRA MINERALS, INC.
205	49431			10/3/1985	CAN	UG	SE	SE	18	13S	66E	3	MM		10/3/1985	1630.445 192	CL	SIERRA MINERALS, INC.
205	4974		631	3/23/1918	CER	STR	SE	SW	17	07S	67E	0.083	IRR	Y	3/23/1918	30.1	LI	DIELEMAN, ROGER J.
205	49784			3/25/1986	CAN	UG	SE	SW	06	13S	66E	1	MM		3/25/1986	676.1400 48	CL	ROARING SPRINGS RANCH CO
205	49785			3/25/1986	CAN	UG	NW	SE	07	13S	66E	3	MM		2/28/1986	279.2699	CL	BLUE STAR MINING INC
205	4983			3/29/1918	DEN	STR	SW	SW	14	09S	67E	2.5	IRR	Y	3/29/1918		LI	WILLIAMS, EMMERSON F.
205	49856			4/29/1986	CAN	STR	NW	SW	07	13S	66E	1	MM		4/29/1986	676.1400 48	CL	ROARING SPRINGS RANCH
205	49892			5/23/1986	ABR	UG	SW	NE	08	04S	67E	1.5	MUN		7/18/1991	0	LI	CALIENTE-CITY
		CHANGED BY: 83312			PER	UG												
205	49893		14323	5/23/1986	CER	UG	SW	NE	08	04S	67E	1.45	MUN		7/18/1991	661	LI	CALIENTE PUBLIC UTILITIES
		CHANGED BY: 59395T			EXP	UG												
205	49894			5/27/1986	WDR	SPR	SW	SW	22	06S	67E	0.3	MM		5/27/1986	0	LI	FISCHER-WATT MINING
205	49895			5/27/1986	WDR	UG	NE	SW	22	06S	67E	0.3	MM		5/27/1986		LI	FISCHER-WATT MINING
205	49906			6/6/1986	CAN	UG	SW	NE	08	14S	66E	0.3	MM		6/6/1986	109.9893 76	CL	NEVTEX

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205	50604			2/17/1987	CAN	UG	SE	NE	27	14S	66E	1	IRR		2/8/1973		CL	LEWIS, ROBERT C.
205	50605			2/17/1987	CAN	UG	NE	SE	27	14S	66E	0.4	IRR		11/15/1973	125	CL	LEWIS, PAUL
205	50606			2/17/1987	CAN	UG	NE	SE	27	14S	66E	1	IRR		8/27/1975		CL	LEWIS, ROBERT C.
205	50607			2/17/1987	CAN	UG	NE	SE	27	14S	66E	0.4	IRR		10/28/1975		CL	LEWIS, ROBERT C.
205	50608			2/17/1987	CAN	UG	SW	SE	15	14S	66E	5	IRR		10/8/1976		CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	50609			2/17/1987	CAN	UG	NW	SW	15	14S	66E	5	IRR		10/8/1976		CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	50610			2/17/1987	CAN	UG	NE	SE	22	14S	66E	5	IRR		10/8/1976		CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	50611			2/17/1987	CAN	UG	SW	SW	26	14S	66E	5	IRR		10/8/1976		CL	MEADOW VALLEY FARM LANDS IRR. CO.
205	50612			2/17/1987	CAN	UG	SW	NW	22	14S	66E	3	IRR		6/13/1977		CL	RICHARD, PAUL C.
205	50613			2/17/1987	CAN	UG	NW	NW	22	14S	66E	3	IRR		6/13/1977		CL	LEWIS, ROBERT C.
205	50614			2/17/1987	CAN	UG	NE	SE	27	14S	66E	1	IRR		1/3/1978		CL	LEWIS, ROBERT C.
205	50615			2/17/1987	CAN	UG	NE	NE	27	14S	66E	0.13	IRR		8/17/1978		CL	LEWIS, ROBERT C.
205	50616			2/17/1987	CAN	UG	SE	NE	27	14S	66E	0.2	IRR		5/3/1979		CL	LEWIS, ROBERT C.
205	50617			2/17/1987	CAN	UG	NE	SE	27	14S	66E	5	IRR		10/8/1976		CL	LEWIS, ROBERT C.
205	50850			4/23/1987	CAN	UG	SE	SW	12	13S	65E	0.5	MM		4/23/1987	361.9767 55	CL	BLACK CANYON MINING CO.
205	50855			4/27/1987	CAN	UG	NE	NE	19	13S	66E	1	MM		1/13/1966	0	CL	COLE, CHARLES W.
205	50972			5/29/1987	ABR	UG	SE	NE	27	14S	66E	0.195	IRR		2/8/1973	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 56488			ABR	UG												
205	50973			5/29/1987	WDR	UG	NE	SE	27	14S	66E	0.4	IRR		11/15/1973	289.52	CL	LEWIS, PAUL
205	50974			5/29/1987	ABR	UG	NE	SE	27	14S	66E	0.83	IRR		8/27/1975	0	CL	LEWIS, VIVIAN
		CHANGED BY: 56487			WDR	UG												
205	50975			5/29/1987	ABR	UG	NE	SE	27	14S	66E	0.36	IRR		10/28/1975	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 56486			ABR	UG												

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205	50976			5/29/1987	ABR	UG	SW	SE	15	14S	66E	5	IRR	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIG. CO.
		CHANGED BY: 56481			ABR	UG											
205	50977			5/29/1987	ABR	UG	NW	SW	15	14S	66E	5	IRR	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIG. CO.
		CHANGED BY: 56480			ABR	UG											
205	50978			5/29/1987	ABR	UG	NW	SE	22	14S	66E	5	IRR	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIG. CO.
		CHANGED BY: 52574			ABR	UG											
205	50979			5/29/1987	ABR	UG	SW	SW	26	14S	66E	5	IRR	10/8/1976	0	CL	WHITNEY, MARY
		CHANGED BY: 60336			CER	UG											
		CHANGED BY: 56479			ABR	UG											
205	50980			5/29/1987	ABR	UG	SW	NW	22	14S	66E	3	IRR	6/13/1977	0	CL	LEWIS, KIM E.
		CHANGED BY: 56477			ABR	UG											
205	50981			5/29/1987	WDR	UG	NW	NW	22	14S	66E	3	IRR	6/13/1977	2171.39	CL	LEWIS, ROBERT C.
205	50982			5/29/1987	ABR	UG	NE	SE	27	14S	66E	1	IRR	1/3/1978	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 56485			ABR	UG											
205	50983			5/29/1987	ABR	UG	NE	NE	27	14S	66E	0.13	IRR	8/17/1978	0	CL	WILLIAMS, LARRY & SUSAN
		CHANGED BY: 56484			ABR	UG											
		CHANGED BY: 63836			CER	UG											
205	50984			5/29/1987	ABR	UG	SE	NE	27	14S	66E	0.2	IRR	5/3/1979	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 56483			ABR	UG											
205	50985			5/29/1987	ABR	UG	NE	SE	27	14S	66E	2	IRR	10/8/1976	0	CL	LEWIS, VIVIAN
		CHANGED BY: 56482			ABR	UG											
205	51283			9/8/1987	ABR	UG	NW	NW	22	14S	66E	3	IRR	6/13/1977	0	CL	LEWIS, KIM E.
		CHANGED BY: 56677			ABR	UG											

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
205	5224			8/22/1918	CAN	SPR	SW	NE	22	09S	67E	4.8	IRR	Y	8/22/1918	0	LI	MABEY, CLARENCE
205	52414		12838	8/12/1988	CER	SPR	NE	SW	03	05S	66E	0.003	STK		8/12/1988	2.363053	LI	TENNILLE, JAMES B. JR.
205	52415		12839	8/12/1988	CER	SPR	NE	SW	09	05S	66E	0.001	STK		8/12/1988	0.767225	LI	JERRY JOHNSTON OR JANET LIND
205	52416		12840	8/12/1988	CER	SPR	SW	NE	18	05S	66E	0.002	STK		8/12/1988	1.565139	LI	JERRY JOHNSTON OR JANET LIND
205	52417		12841	8/12/1988	CER	SPR	SW	SE	23	05S	65E	0.001	STK		8/12/1988	0.797914	LI	JERRY JOHNSTON OR JANET LIND
205	52574			9/29/1988	ABR	UG	SW	NE	22	14S	66E	5	IRR		10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIGATION
		CHANGED BY: 56478			ABR	UG												
205	5401			2/26/1919	CAN	SPR				11S	65E	0.1	STK	Y	2/26/1919	0	LI	C.I. WADSWORTH & BROS.
205	54035			10/17/1989	WDR	UG	SE	NE	08	14S	66E	6	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
205	54105			10/23/1989	WDR	UG	NE	SE	09	08S	68E	10	MUN		10/23/1989	0	LI	LAS VEGAS VALLEY WATER DISTRICT
205	5426			3/17/1919	CAN	OSW	SE	NW	09	14S	66E	3.2	IRR	Y	3/17/1919	0	CL	DROGE, JOHN C.
205	5461		2017	4/25/1919	CER	OSW	NE	NE	03	09S	67E	0.388	IRR	Y	4/25/1919	280	LI	LEWIS, ROBERT C. & VIVIAN
205	55876			2/25/1991	CAN	SPR	NE	NE	12	04S	66E	0.004	QM		2/25/1991	3.19	LI	ROWE, DOROTHEA M.
205	55877		17710	2/25/1991	CER	SPR	NE	NE	12	04S	66E	0.006	QM		2/25/1991	0.94	LI	ROWE, GEORGE T.
205	55878			2/25/1991	WDR	SPR	NE	NE	12	04S	66E	0.001	QM		2/25/1991	0.8	LI	ROWE, DOROTHEA M.
205	55879		17711	2/25/1991	CER	SPR	SE	SE	01	04S	66E	0.002	QM		2/25/1991	1.59	LI	LEE, CHARLIE & LAVETTE
205	56477			6/24/1991	ABR	UG	SW	NW	22	14S	66E	3	IRR	Y	6/13/1977	0	CL	GLENDALE OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 79946			CER	UG												
		CHANGED BY: 66977			PER	UG												
205	56478		15552	6/24/1991	ABR	UG	SW	NE	22	14S	66E	1.025	IRR	Y	10/8/1976	0	CL	DAY MARITAL AND FAMILY TRUST
		CHANGED BY: 66978			PER	UG												
205	56479		15553	6/24/1991	ABR	UG	SW	SW	26	14S	66E	1.17	IRR	Y	10/8/1976	0	CL	MEADOW VALLEY FARM LANDS IRRIGATION COMPANY
		CHANGED BY: 66980			PER	UG												

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							Qtr-Qtr	Qtr	SEC TWN RNG									
		CHANGED BY: 85482			PER	UG												
205	56480		15848	6/24/1991	ABR	UG	NW	SW	15	14S	66E	5	IRR	Y	10/8/1976	0	CL	GLENDALE OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66981			PER	UG												
205	56481		15554	6/24/1991	ABR	UG	SW	SE	15	14S	66E	0.613	IRR	Y	10/8/1976	0	CL	GLENDALE OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66982			PER	UG												
205	56482			6/24/1991	ABR	UG	NE	SE	27	14S	66E	2	IRR	Y	10/8/1976	0	CL	MOAPA ALLIANCE BUSINESS TRUST
		CHANGED BY: 66993			PER	UG												
205	56483			6/24/1991	ABR	UG	SE	NE	27	14S	66E	0.2	IRR		5/3/1979	0	CL	LEWIS, VIVIAN
		CHANGED BY: 65138			ABR	UG												
205	56484			6/24/1991	ABR	UG	NE	NE	27	14S	66E	0.13	IRR		8/17/1978	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 65137			ABR	UG												
205	56485			6/24/1991	ABR	UG	NE	SE	27	14S	66E	1	IRR	Y	1/3/1978	0	CL	MOAPA PIONEERS 1919 TRUST
		CHANGED BY: 66987			PER	UG												
205	56486			6/24/1991	ABR	UG	NE	NE	27	14S	66E	0.36	IRR	Y	10/28/1975	0	CL	LEWIS, ROBERT C. & VIVIAN
		CHANGED BY: 72922			WDR	UG												
		CHANGED BY: 77119			WDR	UG												
		CHANGED BY: 66983			PER	UG												
		CHANGED BY: 85620			PER	UG												
205	56487			6/24/1991	WDR	UG	NE	NE	27	14S	66E	0.83	IRR	Y	8/27/1975	135	CL	LEWIS, ROBERT C.
		CHANGED BY: 72923			WDR	UG												
		CHANGED BY: 77120			WDR	UG												
		CHANGED BY: 66989			WDR	UG												
		CHANGED BY: 85640			WDR	UG												

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
205	56488			6/24/1991	ABR	UG	SE	NE	27	14S	66E	0.195	IRR		2/8/1973	0	CL	LEWIS, VIVIAN
		CHANGED BY: 63481			CER	UG												
		CHANGED BY: 65136			ABR	UG												
205	56489		15555	6/24/1991	ABR	UG	NE	SE	27	14S	66E	0.305	IRR	Y	2/8/1973	21.337	CL	LEWIS, ROBERT AND VIVIAN
		CHANGED BY: 66984			PER	UG												
		CHANGED BY: 85427			PER	UG												
205	56551		13796	7/19/1991	ABR	UG	NW	NE	19	13S	66E	2.68	IRR		6/1/1976	0	CL	BARR L.L.C., A NV LIM. LIABILITY CO.
		CHANGED BY: 69260			ABR	UG												
		CHANGED BY: 69261T			EXP	UG												
205	56677		15556	8/16/1991	ABR	UG	NW	NW	22	14S	66E	1.97	IRR	Y	6/13/1977	0	CL	GLENDALE OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66990			PER	UG												
205	56689			8/20/1991	PER	EFF	SW	SE	07	04S	67E	0.62	STO		8/20/1991	221	LI	CALIENTE-CITY
205	56689S01		17794	8/8/1994	CER	EFF	SE	SE	13	04S	66E	0.62	IRR		8/8/1994	221	LI	CALIENTE-CITY
205	5684			8/21/1919	DEN	SPR	NE	SE	34	09S	67E	0.4	IRR	Y	8/21/1919	125	LI	HENRIE, ETHEL S.
205	5702			9/2/1919	CAN	STR	SW	SE	04	10S	67E	1.6	IRR		9/2/1919		LI	REES, MATHEW D.
205	57584			5/4/1992	ABR	UG	NE	SE	27	14S	66E	0.4	IRR		11/15/1973	0	LI	LEWIS, VIVIAN C.
		CHANGED BY: 65139			ABR	UG												
205	5792			10/6/1919	DEN	STR	NW	NW	14	08S	67E	0.3	IRR	Y	10/6/1919	0	LI	HUSTON, A.W.
205	58003		14121	8/25/1992	CER	UG	NW	NE	20	07S	67E	1.67	IRR		7/30/1981	271.55	LI	DIELEMAN, ROGER J.
205	58026		14244	8/31/1992	CER	UG	NW	NE	20	07S	67E	0.006	STK		8/31/1992	4.480594	LI	DIELEMAN, ROGER J.
205	58786			4/23/1993	WDR	UG	SE	SE	13	04S	66E	0.022	MUN		4/23/1993		LI	CALIENTE-CITY
205	58908E			6/7/1993	PER	UG	NW	SW	08	04S	67E	0.056	ENV		6/7/1993	40.32534 6	LI	EIZMAN'S SERVICES
205	5912			12/19/1919	CAN	OSW	NE	NE	03	09S	67E	2	IRR	Y	12/19/1919	800	LI	BUNKER, ROBERT E.

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
205	5913			12/19/1919	CAN	OSW	NE	NE	03	09S	67E	2	IRR	Y	12/19/1919	800	LI	BUNKER, MARTIN A.
205	5914		1155	12/19/1919	CER	SPR	SW	SE	03	12S	67E	0.004	STK	Y	12/19/1919	1.503761	LI	MONFORT, ROY D.
205	5916		2643	12/19/1919	CER	SPR	NE	SW	11	12S	67E	0.003	STK	Y	12/19/1919	2.240297	LI	ATKIN, ANTHONY
205	5917		1157	12/19/1919	CER	SPR	NE	NW	13	12S	67E	0.003	STK	Y	12/19/1919	2.240297	LI	ATKINS, ANTHONY
205	59395T			11/18/1993	EXP	UG	SE	SE	13	04S	66E	0.022	MUN		7/3/1978	0.030689	LI	CALIENTE PUBLIC UTILITIES
205	5941			1/8/1920	CAN	OSW	SW	SW	14	09S	67E	1	IRR	Y	1/8/1920	400	LI	HUSTON, PEARL
205	5942		1687	1/8/1920	CER	OSW	NW	NW	23	09S	67E	0.375	IRR	Y	1/8/1920	271	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	5957			1/23/1920	CAN	STR	NE	NE	27	08S	67E	0.8	IRR		1/23/1920	0	LI	HENRIE, ETHEL S.
205	60336		16583	8/9/1994	CER	UG	SE	NE	34	14S	66E	0.063	IRR		10/8/1976	20	CL	PULSIPHER, DUSTY
205	60447E			9/13/1994	PER	UG	NW	SW	08	04S	67E	0.089	OTH		9/13/1994	64.51	LI	EIZMAN'S SERVICE
205	60879			1/30/1995	WDR	STR	NW	SE	01	07S	66E	3.968	IRR		1/20/1976	793.5	LI	BRADSHAW, INC.
		CHANGED BY: 66613			WDR	STR												
205	6102			5/7/1920	CAN	STR	SW	SW	35	05S	66E	0.75	IRR		5/7/1920		LI	MCGUFFIE, JOSEPH
205	61081		16811	3/28/1995	CER	UG	SW	NW	02	05S	66E	0.05	COM		3/28/1995	3	LI	NARCONON SOUTHERN CALIFORNIA
205	61165			4/24/1995	DEN	UG	SE	SE	01	13S	65E	6	IND		4/24/1995		CL	RIVERS END SAND AND GRAVEL
205	61271			5/31/1995	DEN	UG		LT07	06	13S	66E	2	IND		5/31/1995		CL	RIVERS END SAND & GRAVEL CO.
205	61272			5/31/1995	DEN	UG	SE	SE	01	13S	65E	2	IND		5/31/1995		CL	RIVERS END SAND & GRAVEL CO.
205	61289T			6/7/1995	EXP	STR	SW	SE	36	12S	65E	2	IND		11/24/1952	145	CL	STUART, ROBERT B.
205	61408T			7/18/1995	EXP	UG	SE	SE	01	13S	65E	1	IND		3/17/1980	145	CL	STUART, ROBERT B.
205	62396			8/20/1996	WDR	UG	SE	NE	01	13S	65E	2	IND		8/20/1996	0	CL	JOAN E. STUART
205	62397			8/20/1996	ABR	STR	SW	SE	36	12S	65E	2	IND		11/24/1952	0	LI	JOAN E. STUART
		CHANGED BY: 76055			CER	STR												
205	62398			8/20/1996	WDR	UG	SE	NE	01	13S	65E	1	IND	Y	3/17/1980	145	CL	JOAN E. STUART

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
CHANGED BY: 76056						WDR	UG											
205	62874		15428	2/24/1997	CER	UG	NE	NW	02	15S	66E	0.032	IRR	8/5/1977	5	CL	GRADY, DONALD H.	
205	63175			6/12/1997	CAN	UG	SW	NE	22	06S	67E	0.001	OTH	6/12/1997	0.552402	LI	ROYAL STANDARD MINERALS, INC.	
205	63219			7/2/1997	WDR	UG	SE	SE	32	13S	66E	0.78	MM	7/2/1997	0	CL	W & S SAND	
205	63379			8/28/1997	DEN	UG	SW	SW	07	13S	66E	6	MUN	Y	8/28/1997	4344	CL	MOAPA VALLEY WATER DISTRICT
205	63380			8/28/1997	DEN	UG	SE	SE	26	12S	65E	6	MUN	Y	8/28/1997	4344	CL	MOAPA VALLEY WATER DISTRICT
205	63381			8/28/1997	DEN	UG	NE	NE	12	13S	65E	6	MUN	Y	8/28/1997	4344	CL	MOAPA VALLEY WATER DISTRICT
205	63410			9/5/1997	ABR	UG	NE	NW	19	13S	66E	0.9	COM		10/2/1958	0	CL	INFINITON LLC
CHANGED BY: 69262						ABR	UG											
CHANGED BY: 69263T						EXP	UG											
205	63411T			9/5/1997	EXP	UG	NE	NW	19	13S	66E	0.9	COM		10/2/1958	124.05	CL	BARR L.L.C.
205	6346			12/2/1920	CAN	SPR	SW	SW	14	06S	66E	0.003	STK	Y	12/2/1920	0	LI	SAWYER, WM.
205	6347			12/2/1920	CAN	SPR	SE	SE	14	06S	66E	0.003	STK	Y	12/2/1920	0	LI	STEELE, JOE
205	63481		17712	10/6/1997	CER	UG	NW	NW	27	14S	66E	0.028	IRR	2/8/1973	17.5	CL	COX BURTON & MARY ANN	
CHANGED BY: 66991						WDR	UG											
CHANGED BY: 77117						ABR	UG											
205	6374			1/14/1921	CAN	SPR	NE	SE	02	06S	66E	0.1	STK	Y	1/14/1921	0.552402	LI	MCGUFFIE, J.W.
205	6375			1/14/1921	CAN	SPR	SW	NE	02	06S	66E	0.1	STK	Y	1/14/1921	0.552402	LI	REECE, HARVEY M.
205	63810			2/6/1998	DEN	UG	SE	SE	03	09S	67E	4.456	MM		2/6/1998	0	LI	HERZOG CONTRACTING CORP.
205	63836		19587	2/13/1998	CER	UG	NE	NE	27	14S	66E	0.033	IRR	8/17/1978	20.9	CL	WILLIAMS, LARRY AND SUSAN	
CHANGED BY: 83295						PER	UG											
205	6396		786	2/5/1921	CER	SPR	SE	NE	27	06S	67E	0.1	MM		2/5/1921	18.1	LI	AUSTEN, P.S.
205	6418			3/7/1921	DEN	STR	SE	SE	36	12S	65E	16	IRR	Y	3/7/1921	0	LI	SAIN, RENA K.

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
205	6422			3/17/1921	DEN	STR	NE	SE	19	13S	66E	17	IRR	Y	3/17/1921	0	CL	HEWITT, JOHN R.
205	6425			3/21/1921	CAN	SPR						0.001	STK	Y	3/21/1921		LI	PLATT, GEORGE
205	6493		1499	6/20/1921	CER	STR	SW	NW	20	07S	68E	0.04	IRR	Y	6/20/1921	14.65	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST DATED
205	6496			6/22/1921	WDR	SPR	NW	NE	33	05S	67E	0.1	STK	Y	6/22/1921		LI	MACKIE, A.J.
205	6498			6/22/1921	CAN	SPR	NE	SW	28	05S	67E	0.1	STK	Y	6/22/1921		LI	MACKIE, A.J.
205	6506			7/11/1921	CAN	STR	SW	NE	34	07S	67E	1	IRR	Y	1/6/1912	160	LI	HENRIE, ETHEL S.
205	6507			7/11/1921	DEN	STR	SW	NW	35	07S	67E	1	IRR	Y	7/11/1921	400	LI	HENRIE, ETHEL S.
205	65136			5/24/1999	ABR	UG	NW	SE	22	14S	66E	0.167	IRR	Y	2/8/1973	0	CL	LEWIS, ROBERT C. & VIVIAN
		CHANGED BY: 68859			WDR	UG												
		CHANGED BY: 66985			PER	UG												
205	65137			5/24/1999	ABR	UG	NW	SE	22	14S	66E	0.098	IRR	Y	8/17/1978	0	CL	MOAPA MISSION, LLC
		CHANGED BY: 68860			WDR	UG												
		CHANGED BY: 66979			PER	UG												
205	65138			5/24/1999	ABR	UG	SW	SW	26	14S	66E	0.2	IRR	Y	5/3/1979	0	CL	MOAPA MISSION
		CHANGED BY: 66986			PER	UG												
205	65139			5/24/1999	ABR	UG	SW	SW	26	14S	66E	0.4	IRR	Y	11/15/1973	0	CL	LEWIS, ROBERT C.
		CHANGED BY: 66988			WDR	UG												
		CHANGED BY: 72921			WDR	UG												
		CHANGED BY: 77121			WDR	UG												
		CHANGED BY: 85619			PER	UG												
205	6530			8/6/1921	CAN	STR	NW	SW	24	12S	65E	1.5	IRR	Y	8/6/1921	0	LI	HAMILTON, W.B.
205	6558			9/1/1921	CAN	OSW	NW	SW	14	09S	67E	1	IRR	Y	9/1/1921	400	LI	LYMAN, BERT
205	65761		16719	12/27/1999	CER	UG	NW	NW	02	15S	66E	0.0388	IRR		8/5/1977	6	CL	BRINKERHOFF, REE & KATRINA

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
205	6591			11/25/1921	DEN	SPR					0.25	STK	Y	11/25/1921	LI	CULVERWELL, CHAS.		
205	66285			4/12/2000	WDR	UG	SW	SW	14	09S	67E	0.723	OTH		11/14/1977	LI	SCOTT, DEED	
205	66334			5/5/2000	ABR	UG	NE	NW	13	12S	65E	1.67	IRR		12/15/1958	0	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66997			PER	UG												
205	66335			5/5/2000	ABR	UG	NE	NW	12	12S	65E	1.67	IRR		8/26/1960	0	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66996			PER	UG												
205	66336			5/5/2000	DEN	UG	NE	NW	13	12S	65E	4.19	IRR		12/26/1961		LI	LEWIS, VIVIAN (C/O)
		CHANGED BY: 66998			WDR	UG												
205	66337			5/5/2000	ABR	UG	NE	NW	13	12S	65E	1.68	IRR		8/6/1963	312.75	LI	MOAPA ALLIANCE BUSINESS TRUST
		CHANGED BY: 66994			PER	UG												
205	66338			5/5/2000	RFA	UG	NE	NW	13	12S	65E	0.97	IRR		8/27/1975	0	LI	ROBERT C. LEWIS AND VIVIAN C. LEWIS, CO-TRUSTEES OF THE ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990
		CHANGED BY: 66995			WDR	UG												
205	66339			5/5/2000	ABR	UG	NE	NW	13	12S	65E	2.765	IRR		2/14/1977	0	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST
		CHANGED BY: 66992			PER	UG												
		CHANGED BY: 66999			PER	UG												
205	66613			7/26/2000	WDR	STR	SW	SE	01	07S	66E	3.968	IRR		1/20/1976		LI	BRADSHAW, INC.
205	66976			12/4/2000	PER	UG	NE	SW	01	12S	65E	0.4	MUN	Y	11/15/1973	192.5	LI	MOAPA MISSION, LLC
205	66977			12/4/2000	PER	UG	NE	SW	01	12S	65E	2.73	MUN	Y	6/13/1977	250.4	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST
205	66978			12/4/2000	PER	UG	SE	SW	01	12S	65E	1.025	MUN	Y	10/8/1976	600	LI	MOAPA ALLIANCE BUSINESS TRUST
205	66979			12/4/2000	PER	UG	NW	NW	12	12S	65E	0.098	MUN	Y	8/17/1978	70.59	LI	MOAPA MISSION, LLC
205	66980			12/4/2000	PER	UG	NW	NW	12	12S	65E	1.155	MUN	Y	10/8/1976	395	LI	MOAPA ALLIANCE BUSINESS TRUST
205	66981			12/4/2000	PER	UG	NE	NW	12	12S	65E	1.85	MUN	Y	10/8/1976	310	LI	GLENDAL OC IRREVOCABLE BUSINESS
205	66982			12/4/2000	PER	UG	SW	NW	12	12S	65E	0.613	MUN	Y	10/8/1976	270	LI	GLENDAL OC IRREVOCABLE BUSINESS TRUST

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205	66983			12/4/2000	PER	UG	SW	NW	12	12S	65E	0.347	MUN	Y	10/28/1975	130	LI	MOAPA PIONEERS 1919 TRUST DATED THE 4TH DAY OF JANUARY, 2010
205	66984			12/4/2000	PER	UG	SW	NW	12	12S	65E	0.158	MUN	Y	2/8/1973	22.913	LI	MOAPA MISSION, LLC
205	66985			12/4/2000	PER	UG	SW	NW	12	12S	65E	0.167	MUN	Y	2/8/1973	8.25	LI	MOAPA PIONEERS 1919 TRUST DATED THE 4TH DAY OF JANUARY, 2010
205	66986			12/4/2000	PER	UG	SW	NW	12	12S	65E	0.2	MUN	Y	5/3/1979	25	LI	MOAPA MISSION, LLC
205	66987			12/4/2000	PER	UG	NW	SW	12	12S	65E	1	MUN	Y	1/3/1978	375	LI	MOAPA PIONEERS 1919 TRUST DATED THE 4TH DAY OF JANUARY, 2010
205	66988			12/4/2000	WDR	UG	NW	SW	12	12S	65E	0	MUN		11/15/1973	125	LI	MOAPA VALLEY WATER DISTRICT
205	66989			12/4/2000	WDR	UG	SW	SW	12	12S	65E	0	MUN		8/27/1975	0	LI	MOAPA VALLEY WATER DISTRICT
205	66990			12/4/2000	PER	UG	SW	SW	12	12S	65E	1.97	MUN	Y	6/13/1977	300	LI	GLENDALE OC IRREVOCABLE BUSINESS TRUST
205	66991			12/4/2000	WDR	UG	SW	SW	12	12S	65E	0.028	MUN		2/8/1973	20	LI	MOAPA VALLEY WATER DISTRICT
205	66992			12/4/2000	PER	UG	NE	NW	13	12S	65E	1.3825	MUN	Y	2/14/1977	409.24	LI	GLENDALE OC IRREVOCABLE BUSINESS TRUST
205	66993			12/4/2000	PER	UG	NE	NW	13	12S	65E	2	MUN	Y	10/8/1976	450	LI	MOAPA ALLIANCE BUSINESS TRUST
205	66994			12/4/2000	PER	UG	SW	NW	13	12S	65E	1.68	MUN	Y	8/6/1963	312.75	LI	MOAPA ALLIANCE BUSINESS TRUST
205	66995			12/4/2000	WDR	UG	NW	NW	25	12S	65E	0.97	MUN		8/27/1975	192	LI	MOAPA VALLEY WATER DISTRICT
205	66996			12/4/2000	PER	UG	NW	NW	25	12S	65E	1.67	MUN	Y	8/26/1960	110	LI	GLENDALE OC IRREVOCABLE BUSINESS TRUST
205	66997			12/4/2000	PER	UG	NW	NW	25	12S	65E	1.67	MUN	Y	12/15/1958	155	LI	GLENDALE OC IRREVOCABLE BUSINESS TRUST
205	66998			12/4/2000	WDR	UG	SW	NW	25	12S	65E	4.19	MUN		12/26/1961	802.86	LI	MOAPA VALLEY WATER DISTRICT
205	66999			12/4/2000	PER	UG	SW	SW	25	12S	65E	1.3825	MUN	Y	2/14/1977	409.24	LI	GLENDALE OC IRREVOCABLE BUSINESS TRUST
205	6702			6/19/1922	WDR	SPR	SW	NW	01	06S	66E	0.1	MM	Y	6/19/1922	72.11915	LI	AMERICAN CLAY COMPANY
205	67339			3/15/2001	DEN	UG	NE	NW	27	14S	66E	0.057	IRR		1/25/1971	0	CL	PETERSON, CATHY
205	67435			4/18/2001	DEN	UG	SW	NW	24	12S	65E	0.89	IND		1/1/1925	0	LI	UNION PACIFIC RAILROAD COMPANY
205	67436			4/18/2001	DEN	UG	NW	NW	03	10S	67E	0.246	IND		1/1/1925	0	LI	UNION PACIFIC RAILROAD COMPANY
205	6758			9/6/1922	CAN	STR	SE	SE	10	09S	67E	0.8	IRR	Y	9/6/1922	400	LI	CONK., WALTER B.

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205	67687			6/19/2001	WDR	EFF	NW	SW	28	14S	66E	10	IRR		6/19/2001	0	CL	ROBERT C.& VIVIAN LEWIS 1990 F.TRUST
205	68621			3/18/2002	CAN	UG	NW	SE	27	14S	66E	0.0484	IRR		8/5/1977	7.5	CL	CROWEL, DIANE MARIE
205	6871			3/10/1923	WDR	STR	NW	SE	25	04S	66E	0.15	IRR	Y	3/10/1923		LI	CONAWAY, JOHN H.
205	6872			3/10/1923	WDR	STR	NW	SE	25	04S	66E	0.12	IRR	Y	3/10/1923		LI	CONAWAY, EMMA
205	6876			3/30/1923	CAN	STR						0	IRR	Y	3/30/1923	0	LI	TENNILLE, THOMAS C.
205	6877			4/4/1923	DEN	STR	NW	SW	14	09S	67E	1.6	IRR	Y	4/4/1923	0	LI	HILBURN, A.L.
205	68859			6/3/2002	WDR	UG	NE	SE	27	14S	66E	0.1674	IRR		2/8/1973	8.25	CL	LEWIS, ROBERT C. & VIVIAN
205	68860			6/3/2002	WDR	UG	SW	SW	26	14S	66E	0.13	IRR		8/17/1978	94.116	CL	LEWIS, ROBERT C. & VIVIAN
205	6900			5/16/1923	WDR	STR	NW	SW	17	10S	67E	1.2	IRR		5/16/1923	0	LI	HILVURN, ALBERT LEE
205	69259			10/18/2002	ABR	UG	SE	NE	19	13S	66E	1	COM		1/13/1966	0	CL	DIAMOND WATER, LLC
		CHANGED BY: 75193			PER	UG												
205	69260			10/18/2002	ABR	UG	SE	NE	19	13S	66E	2.54	COM		6/1/1976	0	CL	DIAMOND WATER, LLC
		CHANGED BY: 73067T			WDR	UG												
		CHANGED BY: 71341T			EXP	UG												
		CHANGED BY: 73906T			EXP	UG												
		CHANGED BY: 75192T			EXP	UG												
		CHANGED BY: 73068			PER	UG												
		CHANGED BY: 75194			PER	UG												
		CHANGED BY: 73834			PER	UG												
205	69261T			10/18/2002	EXP	UG	SE	NE	19	13S	66E	0	COM		6/1/1976	0	CL	INFINITON LLC
205	69262			10/18/2002	ABR	UG	SE	NE	19	13S	66E	0.9	COM		10/2/1958	0	CL	DIAMOND WATER, LLC
		CHANGED BY: 73069			PER	UG												
205	69263T			10/18/2002	EXP	UG	SE	NE	19	13S	66E	0	COM		10/2/1958	0	CL	INFINITON LLC

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205	69337			11/26/2002	ABR	STR	NW	NE	19	13S	66E	0	COM		7/7/2000	0	CL	DIAMOND WATER, LLC
		CHANGED BY: 75195			PER	STR												
205	6939			7/14/1923	CAN	STR	SW	SE	36	12S	65E	0.81	IRR	Y	7/14/1924	0	LI	HUNTSMAN, EDWIN S.
205	7001			11/14/1923	CAN	SPR	NE	SW	06	12S	67E	0.25	STK	Y	11/14/1923		LI	CULVERWELL, CHARLES
205	70260			7/23/2003	PER	STR	SW	SE	01	07S	66E	3.971	IRR		1/1/1890	793.5	LI	RTT GOLD, LLC
205	70315T			8/18/2003	WDR	UG	SE	NE	19	13S	66E	1	COM		1/13/1966	0	CL	INFINITON, LLC
205	70406			9/15/2003	PER	UG	SW	NW	24	12S	65E	0.89	MUN		1/1/1925	399.07	LI	LINCOLN COUNTY WATER DISTRICT
205	70407			9/15/2003	PER	UG	NW	NW	03	10S	67E	0.2362	MUN		1/1/1904	170.99	LI	LINCOLN COUNTY WATER DISTRICT
205	70500		17512	10/6/2003	CER	UG	NE	SE	34	14S	66E	0.017	IRR	Y	4/11/1977	5	CL	DREYFUS, ROBERT AND SUSAN
205	70518			10/20/2003	WDR	UG	NW	NW	02	15S	66E	0.0111	IRR		4/11/1977	8	CL	EWING INVESTMENTS
205	71023		17581	4/9/2004	CER	UG	NE	NW	02	15S	66E	0.0349	IRR		8/5/1977	5.4	CL	GRADY, D. SHAWN AND/OR TERI
205	71024			4/9/2004	ABR	UG	NE	NW	02	15S	66E	0.0484	IRR		8/5/1977	0	CL	COX, H. BRUCE & SUE ANN
		CHANGED BY: 75031			PER	UG												
205	71341T			6/17/2004	EXP	UG	SE	NE	19	13S	66E	2.54	COM		6/1/1976	711.8	CL	DIAMOND WATER, LLC
205	7231			10/23/1924	CAN	STR	NW	NW	25	12S	65E	5	IRR	Y	10/23/1924	0	LI	BUNKER, ELOISE
205	72707		17625	5/6/2005	CER	UG	NE	NE	35	04S	66E	0.4	IRR	Y	5/6/2005	75	LI	AMES, JEFFREY A. AND LISA K.
205	72708		17626	5/6/2005	CER	UG	NE	NE	35	04S	66E	0.103	IRR	Y	5/6/2005	75	LI	AMES, JEFFREY A. AND LISA K.
205	72919			6/13/2005	WDR	SPR	NW	SW	24	12S	65E	0.6	IRR		2/23/1954	0	LI	LEWIS, ROBERT C. & VIVIAN
205	72920			6/13/2005	WDR	STR	NW	SW	24	12S	65E	1.35	IRR		7/29/1964	0	LI	LEWIS, ROBERT C. & VIVIAN
205	72921			6/13/2005	WDR	UG	NE	SE	27	14S	66E	0.4	IRR		11/15/1973	125	CL	LEWIS, ROBERT C. & VIVIAN
205	72922			6/13/2005	WDR	UG	NE	SE	27	14S	66E	0.0069	IRR		10/28/1975	5	CL	LEWIS, ROBERT C. & VIVIAN
205	72923			6/13/2005	WDR	UG	NE	SE	27	14S	66E	0	IRR		8/27/1975	0	CL	LEWIS, ROBERT C. & VIVIAN
205	73067T			7/19/2005	WDR	UG	SE	NE	19	13S	66E	0.5	COM		6/1/1976	140	CL	DIAMOND WATER, LLC

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205	73068			7/19/2005	PER	UG	SE	NE	19	13S	66E	0.5	COM	Y	6/1/1976	140	CL	DIAMOND WATER, LLC
205	73069			7/19/2005	PER	UG	SE	NE	19	13S	66E	0.9	COM	Y	10/2/1958	159.2	CL	DIAMOND WATER, LLC
205	73340		21177	10/17/2005	CER	UG	NW	NE	19	04S	67E	0.067	REC		10/17/2005	3	LI	NEVADA-PARKS DIVISION
205	73735		17841	1/20/2006	CER	UG	NE	SE	34	14S	66E	0.04	IRR	Y	4/11/1977	12	CL	DREYFUS, ROBERT AND SUSAN
205	73789			2/2/2006	CAN	OSW	SW	NE	35	04S	66E	0.3955	IRR		12/31/1877	79	LI	DUNNING, DANNIEL & JANICE
205	73834			2/13/2006	PER	UG	NE	NE	19	13S	66E	1.52	COM	Y	6/1/1976	355.9	CL	DIAMOND WATER, LLC
205	73906T			2/28/2006	EXP	UG	NE	NE	19	13S	66E	1.52	COM		6/1/1976	355.9	CL	DIAMOND WATER, LLC
205	75031			11/6/2006	PER	UG	NE	NW	27	14S	66E	0.0484	IRR		8/5/1977	7.5	CL	COX, H. BRUCE & SUE ANN
205	75192T			12/15/2006	EXP	UG	NE	NE	19	13S	66E	0.52	COM		6/1/1976	215.9	CL	DIAMOND WATER, LLC
205	75193			12/15/2006	PER	UG	NW	NE	19	13S	66E	1	COM	Y	1/13/1966	140	CL	DIAMOND WATER, LLC
					CHANGED BY: 76132T		EXP	UG										
205	75194			12/15/2006	PER	UG	NE	NE	19	13S	66E	0.52	COM	Y	6/1/1976	215.9	CL	DIAMOND WATER, LLC
205	75195			12/15/2006	PER	STR	SE	NE	19	13S	66E	5.4	COM		7/7/2000	1100	CL	DIAMOND WATER, LLC
205	75443			3/15/2007	CAN	UG	SE	SW	14	09S	67E	0.6	IRR		11/14/1977	0	LI	SCOTT, CATHERINE
205	75826			5/30/2007	ABR	UG	SE	SW	14	09S	67E	0.6	IRR	Y	11/14/1977	0	LI	DEED D. SCOTT AND CATHERINE S. SCOTT
					CHANGED BY: 83748		PER	UG										
205	76055		18551	7/11/2007	CER	STR	SW	SE	36	12S	65E	2	WLD		11/24/1952	145	LI	BLM
205	76056			7/11/2007	WDR	UG	SE	NE	01	13S	65E	1	WLD		3/17/1980	145	CL	JOAN E. STUART
205	76132T			8/3/2007	EXP	UG	NE	NE	19	13S	66E	1	COM		1/13/1966	140	CL	DIAMOND WATER, LLC
205	77117			6/9/2008	ABR	UG	SE	SE	34	14S	66E	0.0035	IRR		2/8/1973	0	CL	DIUGUARDI, MICHAEL N. AND DIANE M
					CHANGED BY: 85564		CER	UG										
					CHANGED BY: 88001		PER	UG										
205	77119			6/9/2008	WDR	UG	SW	SW	26	14S	66E	0	IRR		10/28/1975	5	CL	ROBERT C. & VIVIAN LEWIS

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205	77120			6/9/2008	WDR	UG	NE	SE	27	14S	66E	0.83	IRR		10/28/1975	135	CL	ROBERT C. & VIVIAN LEWIS
205	77121			6/9/2008	WDR	UG	SW	SW	26	14S	66E	0	IRR		11/15/1973	125	CL	ROBERT C. & VIVIAN LEWIS
205	7856			8/21/1926	WDR	STR	SE	NW	01	13S	65E	0.021	IRR	Y	8/21/1926	0	CL	MUDDY VALLEY IRRIGATION CO.
205	78984			10/21/2009	WDR	UG	SW	NE	08	04S	67E	1	MUN		6/12/1967	325	LI	CALIENTE CITY
205	792			1/17/1908	CAN	SPR				06S	68E	0	MM	Y	1/17/1908	0	LI	SMITH, PHIL K.
205	79632			2/22/2010	RFP	UG	SW	SW	07	13S	66E	6	MUN		2/22/2010	4344	CL	MOAPA VALLEY WATER DISTRICT
205	79633			2/22/2010	RFP	UG	NE	NE	12	13S	65E	6	MUN		2/22/2010	4344	CL	MOAPA VALLEY WATER DISTRICT
205	79634			2/22/2010	RFP	UG	NE	SE	26	12S	65E	6	MUN		2/22/2010	4344	CL	MOAPA VALLEY WATER DISTRICT
205	797			1/25/1908	CAN	SPR			06	07S	66E	0	STK	Y	1/25/1908	0	LI	RYAN, PATRICK
205	798			1/25/1908	CAN	SPR				04S	66E	0	STK	Y	1/25/1908	0	LI	CONWAY, JOSEPH
205	79946		18054	6/17/2010	CER	UG	SW	NW	22	14S	66E	0.27	IRR		6/13/1977	24.6	CL	WOLFLEY, TARA L. AND MATTHEW D. W&H
205	80043T			7/27/2010	EXP	UG	SW	NE	08	04S	67E	0.5	MUN		6/12/1967	10	LI	CALIENTE-CITY
205	80488			1/24/2011	CAN	UG	NE	NE	35	04S	66E	0.107	IRR		3/31/1959	25	LI	YOUNG, RONAL CHAD AND BRENDA
205	81130T			8/29/2011	EXP	UG	SW	NE	08	04S	67E	1	MUN	Y	6/12/1967	325	LI	CALIENTE-CITY
205	8181			6/20/1927	CAN	STR	SW	NW	23	08S	67E	1.6	IRR	Y	6/20/1927	0	LI	LYMAN, BERT
205	8205			6/29/1927	CAN	OSW	SE	SW	36	12S	65E	0.81	IRR	Y	6/29/1927	0	LI	BUNKER, JOHN M.
205	82662		20101	3/25/2013	CER	UG	NW	NW	27	14S	66E	0.0053	IRR		6/14/1972	1	CL	LEARNED, BENJAMIN L. OR BEVERLY J.
205	82894			6/12/2013	PER	UG	SE	NE	27	14S	66E	0.0345	IRR	Y	2/8/1973	5	CL	WOLFLEY, JARED M. & LISA A.
205	83295			12/5/2013	PER	UG	SE	NE	27	14S	66E	0.0036	IRR	Y	8/17/1978	2.629	CL	WOLFLEY, JARED M. AND LISA A.
205	83307			12/12/2013	PER	UG	SW	NE	08	04S	67E	0.978	MUN		5/14/1941	395	LI	CALIENTE-CITY
205	83308			12/12/2013	PER	UG	SW	NE	08	04S	67E	0.6	MUN		5/24/1946	104	LI	CALIENTE-CITY
205	83309			12/12/2013	WDR	UG	SW	NE	08	04S	67E	2	MUN		12/8/1960	1448	LI	CALIENTE PUBLIC UTILITIES
205	83310			12/12/2013	WDR	UG	SW	NE	08	04S	67E	6	MUN		6/12/1967	0	LI	CALIENTE-CITY

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205	83311			12/12/2013	WDR	UG	SE	NE	12	04S	66E	6	MUN		2/18/1971	0	LI	CALIENTE-CITY
205	83312			12/12/2013	PER	UG	SE	NE	12	04S	66E	1.5	MUN		7/18/1991	1085.93	LI	CALIENTE - CITY OF
205	8359		1895	10/22/1927	CER	OSW	SE	NW	17	10S	67E	0.225	IRR	Y	10/22/1927	162	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990
205	83748			4/18/2014	PER	UG	SW	SW	14	09S	67E	0.6	IRR		11/14/1977	141.18	LI	SCOTT, DEED D. AND CATHERINE S.
205	8381			11/11/1927	ABR	STR	NW	NW	34	09S	67E	0.461	IRR	Y	11/11/1927	0	LI	AVERETT, MARY J.
		CHANGED BY: 10192			CER	STR												
205	845			3/4/1908	CAN	SPR				06S	67E	0	STK	Y	3/4/1908	0	LI	CARSON, RALPH
205	85293			7/10/2015	PER	UG	NE	SE	27	14S	66E	0.086	IRR	Y	2/8/1973	12.5	CL	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	85294			7/10/2015	PER	UG	NE	SE	27	14S	66E	0.069	IRR	Y	2/8/1973	10	CL	LEWIS, ROBERT C. AND VIVIAN
205	85427			9/9/2015	PER	UG	NE	SE	27	14S	66E	0.147	IRR	Y	2/8/1973	21.5	CL	LEWIS, ROBERT C. AND VIVIAN
205	85482			10/1/2015	PER	UG	SW	SW	26	14S	66E	0.015	IRR	Y	10/8/1976	5	CL	MEADOW VALLEY FARM LANDS IRRIGATION COMPANY
205	8553		2062	6/3/1928	CER	STR	NW	SW	20	07S	68E	0.016	STK	Y	6/3/1928	11.20148 5	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	85564		20827	10/26/2015	CER	UG	NW	SE	27	14S	66E	0.0014	IRR		2/8/1973	1	CL	DIUGUARDI, MICHAEL N. AND DIANE M.
205	85619			11/2/2015	PER	UG	NE	SE	27	14S	66E	0.4	IRR	Y	11/15/1973	125	CL	LEWIS, ROBERT C. AND VIVIAN
205	85620			11/2/2015	PER	UG	SW	SW	26	14S	66E	0.013	IRR	Y	10/28/1975	5	CL	LEWIS, ROBERT C. AND VIVIAN
205	85640			11/6/2015	WDR	UG	NE	SE	27	14S	66E	0.83	IRR		8/27/1975	135	CL	LEWIS, ROBERT C. AND VIVIAN
205	88001			5/22/2018	PER	UG	SW	SW	26	14S	66E	0.002	IRR		2/8/1973	1.5	CL	PAUL AND LUO JEANNE LEWIS 2000 TRUST
205	88981			6/6/2019	RFA	UG	NE	NE	35	04S	66E	0.107	IRR		3/31/1959	25	LI	YOUNG, RONALD CHAD AND BRENDA
205	9196		2345	1/4/1930	CER	OSW	SE	SE	04	10S	67E	0.28	IRR	Y	1/4/1930	134	LI	WEBER, WILLIAM R AND BUNDY, SALLY M
205	9266			5/31/1930	CAN	OSW	SW	NW	19	10S	67E	1.6	IRR		5/31/1930	0	LI	SPENCER, LETITIA VIOLET
205	9343			9/29/1930	CAN	STR	SW	SE	36	12S	65E	3	IRR	Y	9/29/1930	0	LI	STUART, BRADLEY R.
205	9439			4/20/1931	CAN	STR	NE	NE	02	09S	67E	1	IRD	Y	4/20/1931	0	LI	CONDIFF, W.A.
205	9466		1945	6/5/1931	CER	OSW	SE	NW	17	10S	67E	0.321	IRR		6/5/1931	233	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
205	9565		1946	12/14/1931	CER	STR	SW	NW	14	08S	67E	0.015	STK		12/14/1931	11.29355 2	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	9566		1947	12/14/1931	CER	OSW	NE	SW	24	10S	66E	0.016	STK		12/14/1931	11.20148 5	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	9567		1948	12/14/1931	CER	OSW	SW	NE	17	10S	67E	0.015	STK	Y	12/14/1931	11.20148 5	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	9568		1949	12/14/1931	CER	STR	NW	NW	26	08S	67E	0.015	STK		12/14/1931	11.20148 5	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	9664			5/31/1933	WDR	STR	SE	NE	28	07S	67E	0.08	IRR		5/31/1933	40	LI	MARIGER, VIVIAN K.
205	9857		2342	4/24/1935	CER	STR	NW	SE	15	05S	66E	0.433	IRR	Y	4/24/1935	210	LI	BLACK, PARLEY SR.
205	9897			9/11/1935	CAN	OSW	SE	SW	36	12S	65E	2	MM	Y	9/11/1935	0	LI	BIRNIE, ZOE
205	9916			12/13/1935	CAN	OSW	SE	SW	33	06S	65E	0.25	MM	Y	12/13/1935	181.0037 22	LI	RYAN, JAMES
205	9935		2483	2/1/1936	CER	STR	NW	NE	25	04S	66E	0.167	IRR	Y	2/1/1936	71	LI	RAINBOW LAND & CATTLE COMPANY, LLC
205	9988		2401	5/11/1936	CER	STR	NE	NE	13	06S	65E	0.25	MM	Y	5/11/1936	32.26	LI	CALIENTE CYANIDING CO.
205	R04287			5/3/1985	RES	SPR	SW	NE	17	05S	66E	0.001	OTH			0	LI	BLM
205	R04289			5/3/1985	RES	SPR	NE	SW	14	06S	68E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04294			5/3/1985	RES	SPR	SE	SW	22	06S	67E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04295			5/3/1985	RES	SPR	SE	SW	03	05S	65E	0.001	WLD		4/17/1926	0	LI	BLM
205	R04296			5/3/1985	RES	SPR	SW	NE	06	05S	66E	0.005	OTH			0	LI	BLM
205	R04297			5/3/1985	RES	SPR	NE	SW	36	04S	65E	0.002	OTH		4/17/1926	0	LI	BLM
205	R04309			5/3/1985	RES	SPR	NE	NW	22	06S	67E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04311			5/3/1985	RES	SPR	NW	NE	23	10S	66E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04312			5/3/1985	RES	SPR	NW	NE	31	06S	69E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04313			5/3/1985	RES	SPR	NE	SW	17	07S	68E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04314			5/3/1985	RES	SPR	SE	NE	33	04S	66E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04315			5/3/1985	RES	SPR	NW	SW	21	11S	67E	0.001	OTH		4/17/1926	0	LI	BLM
205	R04318			5/3/1985	RES	SPR	SE	SW	33	06S	67E	0.001	OTH		4/17/1926	0	LI	BLM

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205	R04319			5/3/1983	RES	SPR	NE	SE	06	07S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04320			5/3/1985	RES	SPR	SE	SW	01	07S	67E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04321			5/3/1985	RES	SPR	NW	SE	23	05S	65E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04322			5/3/1985	RES	SPR	SW	NE	18	05S	66E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04323			5/3/1985	RES	SPR	SW	NE	13	04S	66E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04324			5/3/1985	RES	SPR	NE	SE	07	06S	66E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04325			5/3/1985	RES	SPR	NE	SE	07	06S	66E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04326			5/18/1985	RES	SPR	NW	SE	27	07S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04327			5/3/1985	RES	SPR	NW	NE	07	07S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04328			5/3/1985	RES	SPR	SE	SW	08	07S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04329			5/3/1985	RES	SPR	NE	SW	07	07S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04330			5/3/1985	RES	SPR	NE	SE	05	07S	68E	0.002	OTH	4/17/1926	0	LI	BLM
205	R04331			5/3/1985	RES	SPR	SW	NW	04	07S	68E	0.002	OTH	4/17/1926	0	LI	BLM
205	R04332			5/3/1985	RES	SPR	SW	SE	07	06S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04333			5/3/1985	RES	SPR	NW	SW	21	06S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04334			5/3/1985	RES	SPR	SE	NW	29	06S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04335			5/3/1985	RES	SPR	SE	NW	12	07S	67E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04337			7/18/1985	RES	SPR	SW	NW	28	05S	66E	0.006	OTH		0	LI	BLM
205	R04338			5/3/1985	RES	SPR	SE	NE	33	05S	67E	0.001	OTH		0	LI	BLM
205	R04340			5/3/1985	DEN	SPR	SE	SW	13	06S	66E	0	OTH	4/17/1926		LI	BLM
205	R04341			5/3/1985	RES	SPR	NE	SW	14	06S	68E	0.001	OTH	4/17/1926	0	LI	BLM
205	R04342			5/3/1985	RES	SPR	SE	SW	11	06S	65E	0.001	OTH		0	LI	BLM
205	R09415			4/6/2004	RES	SPR	NE	NE	02	12S	67E	0.0015	STK	4/6/2004	0	LI	BLM

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205	V00804			10/31/1910	VST	SPR	NW	SE	32	04S	66E	0	STK	1/1/1885	LI	CONWAY, JOSEPH	
205	V01076			12/16/1911	DEC	OSW	NW	SE	25	04S	66E	1.647	DEC	12/31/1877	329	LI	AMES, JEFFREY A. AND LISA K.
		CHANGED BY: 73789			CAN	OSW											
205	V01129			8/12/1912	DEC	STR	NW	NW	03	10S	67E	0.25	DEC	1/1/1905	0	LI	SAN PEDRO, LOS ANGELES & SALT LAKE R
205	V01130			8/16/1912	VST	UG	SW	NW	24	12S	65E	0.25	COM		0	LI	SAN PEDRO, LOS ANGELES & SALT LAKE R
205	V01229			2/20/1913	DEC	UG	NE	SW	07	07S	67E	0.25	DEC	1/1/1904	0	LI	SAN PEDRO, LOS ANGELES & SALT LAKE R
205	V01245			5/22/1913	DEC	STR	SE	NE	27	05S	66E	0.913	DEC	1/1/1873	182.4	LI	REBEL ROCK RANCH, LLC
205	V01262			9/6/1913	DEC	STR	SE	SE	34	04S	66E	1.693	DEC	1/1/1880	338.5	LI	325 EAST FOURTH ST
205	V01439			1/5/1916	VST	SPR	SW	SW	14	10S	66E	0.2	STK	1/1/1895	0	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	V01440			1/5/1916	VST	SPR	SW	NW	09	10S	66E	0.2	STK	1/1/1896	0	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	V01441			1/5/1916	VST	SPR	SE	SE	02	10S	65E	0.2	STK	1/1/1897	0	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	V01448			2/7/1916	VST	SPR	SW	SW	01	06S	67E	0.1	STK	1/1/1895	0	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST DATED JUNE 20, 1990
205	V01503			4/21/1917	VST	SPR	NW	NW	32	06S	68E	0.1	STK	1/1/1900	0	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	V01557			3/9/1918	DEC	STR	SW	SW	26	07S	67E	1.7	DEC	1/2/1870	340	LI	ROBERT C. AND VIVIAN C. LEWIS 1990 TRUST
205	V01618			1/1/1919	DEC	STR		NE	32	14S	66E	0.046	OTH	12/31/1904	0	CL	LOS ANGELES & SALT LAKE RAILROAD CO.
205	V01628			6/23/1919	VST	SPR	SW	SW	36	06S	66E	0.05	STK	1/1/1894	0	LI	DUFFIN, MARNIE RYAN
205	V01632			7/15/1919	VST	SPR	NW	NE	12	06S	65E	0.1	STK	1/1/1894	0	LI	DUFFIN, MAMIE RYAN
205	V01704			6/1/1920	DEC	STR	NW	SW	35	04S	66E	3.478	DEC	1/1/1880	695.5	LI	325 EAST FOURTH ST
205	V02274			10/26/1933	ABR	STR	SE	NE	12	07S	66E	3.971	DEC	1/1/1890	0	LI	BRADSHAW, INC.
		CHANGED BY: 60879			WDR	STR											
		CHANGED BY: 70260			PER	STR											
205	V02320			9/14/1942	VST	STR	SE	NE	03	05S	65E	0.25	STK	1/1/1900	0	LI	JERRY JOHNSTON OR JANET LIND
205	V02321			9/14/1942	VST	SPR	NE	SW	12	05S	65E	0.025	STK	1/1/1900	0	LI	CORP PRESIDING BISHOP CHURCH JC LDS

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205	V04345			5/9/1985	DEC	SPR	NE	SW	12	07S	66E	3.971	DEC	12/31/1889	793.5	LI	RTT GOLD, LLC
205	V04346			5/13/1985	VST	SPR	N2	N2	34	07S	68E	0.033	STK	1/1/1875	0	LI	PETERSON, JOY
205	V04347			5/13/1985	VST	SPR	SW	SW	01	07S	68E	0.02	STK	1/1/1885	0	LI	PETERSON, JOY
205	V04348			5/13/1985	VST	SPR	NW	NE	31	06S	69E	0.02	STK	1/1/1875	2.792699	LI	PETERSON, JOY
205	V04349			5/13/1985	VST	SPR	NW	NW	25	06S	68E	0.022	STK	1/1/1875	0	LI	PETERSON, JOY
205	V04350			5/13/1985	VST	SPR	NE	SW	14	06S	68E	0.022	STK	1/1/1875	0	LI	PETERSON, JOY
205	V04356			5/17/1985	VST	STR	SE	SE	04	10S	67E	0	IRR	1/1/1930	150	LI	BRUNDY, SALLY M.
205	V04357			5/17/1985	VST	STR	SE	SE	04	10S	67E	0.28	STK		0	LI	BRUNDY, SALLY M.; WEBER, WILLIAM R.
205	V04365			5/20/1985	DEC	UG	NE	SW	07	07S	67E	0.02	DEC	1/1/1910	0	LI	LESSEE- UNION PACIFIC RAILROAD CO.
205	V04366			5/20/1985	DEC	UG	NW	NW	03	10S	67E	0.0138	DEC	1/1/1904	10	LI	LINCOLN COUNTY & VIDLER WATER
		CHANGED BY: 67436			DEN	UG											
		CHANGED BY: 70407			PER	UG											
205	V04367			5/20/1985	DEC	UG	SW	NW	24	12S	65E	0	COM	1/1/1925	0	LI	VIDLER WATER CO & LINCOLN COUNTY
		CHANGED BY: 67435			DEN	UG											
		CHANGED BY: 70406			PER	UG											

Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('206')

Run Date: 8/22/2019 8:41:34 AM

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
206	10346		2702	3/20/1939	CER	SPR	NE	SE	30	07S	66E	0.003	STK		3/20/1939	1.626517	LI	RANKIN, RICHARD AND MEREDITH 50%
206	11139		3083	7/12/1944	CER	SPR	NE	SW	29	07S	65E	0.00625	STK		7/12/1944	4.48	LI	CHURCH OF JC OF LSD
206	11427		3355	11/16/1945	CER	SPR	NE	SE	24	08S	65E	0.003	STK		11/16/1945	2.178919	LI	LDS
206	21662			11/26/1963	CAN	UG	SE	SE	12	07S	65E	0	STK		11/26/1963		LI	STEWART, C.D.
206	27926			11/29/1973	CAN	SPR		SW	09	09S	65E	0.016	STK		11/29/1973	11.20148 5	LI	SUMMA CORPORATION
206	27927			11/29/1973	CAN	RES		NE	14	09S	64E	0.016	STK		11/29/1973	11.23217 4	LI	SUMMA CORPORATION
206	2923			3/24/1914	DEN	UG	NE	NE	09	09S	65E	250	IRR	Y	3/24/1914	0	LI	GREAT WESTERN LAND, WATER & POWER CO
206	4710		3396	11/19/1917	CER	SPR	NE	NW	20	08S	65E	0.002	STK		11/19/1917	0.951359	LI	LDS
206	4750			11/30/1917	CAN	SPR				09S	64E	0.1	STK	Y	11/30/1917		LI	WEDGE, JOHN W.
206	52743			11/30/1988	DEN	SPR	SW	NE	26	07S	65E	0.007	STK		7/29/1919	0	LI	BALLOW, RACHAEL
206	5643		1528	7/29/1919	CER	SPR	SW	SE	16	07S	65E	0.05	STK		7/29/1919	7.28	LI	SCHLARMAN, RACHAEL 25%
		CHANGED BY: 52743			DEN	SPR												
206	5879		1018	11/28/1919	CER	SPR	SE	SE	15	07S	65E	0.003	STK	Y	11/28/1919	2.178919	LI	LDS
206	6007		676	3/5/1920	CER	SPR	NW	NE	07	08S	65E	0.003	STK	Y	3/5/1920	2.178919	LI	LDS
206	6089			5/4/1920	CAN	STR				09S	65E	16	IRR	Y	5/4/1920		LI	JOHN B. BRADSHAW CO.
206	6203			7/14/1920	DEN	SPR	NW	SW	29	08S	65E	0.1	STK	Y	7/14/1920		LI	GARDNER RANCH COMPANY
206	63416			9/10/1997	WDR	SPR		LT06	06	07S	66E	0.01	STK		9/10/1997		CL	TENNILLE, GEORGE R.
206	64688			12/11/1998	WDR	UG	SW	SE	25	08S	65E	10	IRR		12/11/1998	0	LI	LINCOLN COUNTY WATER DISTRICT
		CHANGED BY: 71722			WDR	UG												

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206	64689			12/11/1998	WDR	UG	SE	SW	31	09S	65E	10	IRR		12/11/1998	0	LI	LINCOLN COUNTY WATER DISTRICT
		CHANGED BY: 71723			WDR	UG												
206	6889		1250	4/28/1923	CER	RES	NE	SE	35	09S	64E	0	STK	Y	4/28/1923	10	LI	CORPORATION OF THE PRESIDING BISHOP OF THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS 50%
206	6890		1251	4/28/1923	CER	SPR	NE	NE	28	09S	64E	0.006	STK	Y	4/28/1923	1.09	LI	HIKO LAND AND CATTLE COMPANY
206	71010			4/6/2004	CAN	RES	NE	NE	24	10S	64E	0.00023	WLD		4/6/2004	0	LI	BLM
206	71722			9/22/2004	WDR	UG	SW	SE	25	08S	65E	10	MUN		12/11/1998	0	LI	LINCOLN COUNTY WATER DISTRICT
206	71723			9/22/2004	WDR	UG	SE	SW	31	09S	65E	10	MUN		12/11/1998	0	LI	LINCOLN COUNTY WATER DISTRICT
206	72218			2/14/2005	ABR	UG	SW	SE	25	08S	65E	6	MUN		2/14/2005	0	LI	COYOTE SPRINGS INVESTMENT, LLC
		CHANGED BY: 82647			WDR	UG												
		CHANGED BY: 82727			PER	UG												
206	72219			2/14/2005	ABR	UG	SE	SW	31	09S	65E	6	MUN		2/14/2005	0	LI	COYOTE SPRINGS INVESTMENT, LLC
		CHANGED BY: 82648			WDR	UG												
		CHANGED BY: 82728			PER	UG												
206	72220			2/14/2005	PER	UG	SE	SW	06	11S	64E	6	MUN	Y	2/14/2005	500	LI	COYOTE SPRINGS INVESTMENT, LLC
206	72221			2/14/2005	PER	UG	SE	SW	11	09S	65E	6	MUN	Y	2/14/2005	500	LI	COYOTE SPRINGS INVESTMENT, LLC
		CHANGED BY: 82649			WDR	UG												
		CHANGED BY: 82729			WDR	UG												
206	74147			4/10/2006	RFP	UG	SW	SE	25	08S	65E	6	MUN		1/1/1900	0	LI	LINCOLN COUNTY WATER DISTRICT
206	74148			4/10/2006	RFP	UG	SE	SW	31	09S	65E	6	MUN		1/1/1900	0	LI	LINCOLN COUNTY WATER DISTRICT
206	74149			4/10/2006	RFP	UG	SE	SW	06	11S	64E	6	MUN		1/1/1900	0	LI	LINCOLN COUNTY WATER DISTRICT
206	74150			4/10/2006	RFP	UG	SE	SW	11	09S	65E	6	MUN		1/1/1900	0	LI	LINCOLN COUNTY WATER DISTRICT
206	82647			3/19/2013	WDR	UG	SW	NW	14	10S	64E	6	MUN		2/14/2005	500	LI	LINCOLN COUNTY WATER DISTRICT AND VIDLER WATER COMPANY INC

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206	82648			3/19/2013	WDR	UG	NE	NW	28	10S	64E	6	MUN		2/14/2005	500	LI	LINCOLN COUNTY WATER DISTRICT AND VIDLER WATER COMPANY INC
206	82649			3/19/2013	WDR	UG	SE	SW	32	10S	64E	6	MUN		2/14/2005	500	LI	LINCOLN COUNTY WATER DISTRICT AND VIDLER WATER COMPANY INC
206	82727			4/17/2013	PER	UG	SW	NW	14	10S	64E	6	MUN	Y	2/14/2005	500	LI	COYOTE SPRINGS INVESTMENT LLC
206	82728			4/17/2013	PER	UG	NE	NW	28	10S	64E	6	MUN	Y	2/14/2005	500	LI	COYOTE SPRINGS INVESTMENT LLC
206	82729			4/17/2013	WDR	UG	SW	NW	32	10S	64E	6	MUN		2/14/2005	500	LI	COYOTE SPRINGS INVESTMENT LLC
206	9924		2508	1/2/1936	CER	SPR	SE	NE	24	08S	64E	0.005	STK	Y	1/2/1936	3.62	LI	CORP PRESIDING BISHOP CHURCH JC LDS 50%
206	R09412			4/6/2004	RES	SPR	SW	NW	09	10S	64E	0.0015	STK		4/6/2004	0	LI	BLM
206	V01359			3/22/1915	VST	SPR	SW	SE	28	09S	65E	0.025	STK		1/1/1893	0	LI	CHURCH OF JESUS CHRIST OF LDS 50%
206	V01360			3/22/1915	VST	SPR	SW	SE	16	08S	65E	0.025	STK		1/1/1888	0	LI	CHURCH OF JESUS CHRIST OF LDS 50%
206	V01361			3/22/1915	VST	SPR	SE	SE	30	08S	65E	0.025	STK		1/1/1891	0	LI	BALLOW, RACHAEL
206	V01602			2/6/1919	VST	SPR	NW	NW	25	08S	64E	0.025	STK		1/1/1900		LI	GARDNER RANCH COMPANY
206	V01603			2/6/1919	VST	SPR	SW	SE	23	08S	64E	0.013	STK		1/1/1900		LI	LOVE, H.E.
206	V01718			7/14/1920	VST	SPR	NW	NW	29	08S	65E	0	STK		1/1/1900		LI	GARDNER RANCH CO.

Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('210')

Run Date: 8/22/2019 8:48:14 AM

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION					Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN	RNG							
210	10449		2721	12/4/1939	CER	RES	NE	NW	05	09S	64E	0.013	STK		12/4/1939	8.961188	LI	LDS
210	10477			3/18/1940	CAN	STR	SE	NE	02	10S	62E	0.007	STK		3/18/1940	5	LI	RICHARD J.W.
210	10478		3946	3/18/1940	CER	STR	SW	SE	11	10S	62E	0.007	STK		3/18/1940	5	LI	BUCK HORN CATTLE CO
210	10804			4/6/1942	DEN	UG	NW	NE	11	13S	63E	0.025	STK		4/6/1942	0	CL	BLACKBURN, LESLIE
210	11134			6/26/1944	CAN	SPR						0.05	STK		6/26/1944		LI	PERKINS, GEORGE M.
210	11525		3356	3/26/1946	CER	SPR	SW	NW	17	08S	64E	0.003	STK		3/26/1946	2.240297	LI	CHURCH OF J. CHRIST LATTER DAY SAINT
210	11641		3370	7/26/1946	CER	SPR	NE	SE	35	11S	61E	0.001	WLD		7/26/1946	0.736536	LI	USFWS
210	11645		3366	7/26/1946	CER	SPR	NE	SE	29	14S	61E	0.001	WLD		7/26/1946	0.429646	CL	USFWS
210	12632		3791	9/13/1948	CER	SPR	SE	NE	01	13S	61E	0.003	WLD		9/13/1948	2.178919	LI	USFWS
210	13519		3785	10/16/1950	CER	SPR	NW	NE	30	14S	61E	0	STK		10/16/1950	0.061378	CL	USFWS
210	14984			4/16/1953	WDR	UG	SE	NE	10	09S	62E	3	IRR		4/16/1953	800	LI	GRAINGER, BEN C.
210	15543			3/8/1954	WDR	UG	NW	SE	09	09S	62E	3	IRR		3/8/1954	1600	LI	WILLIAM W. ALLES
210	15591			4/7/1954	WDR	UG	NW	NE	09	10S	62E	6	IRR		4/7/1954		LI	ALLES, WILLIAM W.
210	15592			4/7/1954	WDR	UG	SE	NE	10	10S	62E	6	IRR		4/7/1954		LI	GRAINGER, BEN C.
210	1565			12/29/1909	DEN	SPR			28	14S	61E	0	IRR		12/29/1909	0	CL	KAISER LIVESTOCK
210	1566			12/29/1909	DEN	STR			13	15S	61E	0	IRR		12/29/1909	0	CL	KAISER LIVESTOCK CO
210	16378			4/13/1955	CAN	UG	NW	SE	15	10S	62E	8	IRD		4/13/1955	1280	LI	ROBERTS, HAROLD F.
210	16550			6/6/1955	WDR	UG	SE	SW	24	10S	62E	0	IRR		6/6/1955		LI	BOLINDER, ANNA H.
210	16551			6/6/1955	WDR	UG	NE	NW	36	10S	62E	0	IRR		6/6/1955		LI	AAMODT, MARGARET C.

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
210	16552			6/6/1955	WDR	UG		SW	25	10S	62E	0	IRR	6/6/1955	LI	BOLINDER, JULIUS VERN		
210	16568			6/17/1955	WDR	UG	NW	NW	23	10S	62E	0	IRR	6/17/1955	LI	GOTTFREDSON, DAVID B.		
210	16769			10/21/1955	WDR	UG	NE	NE	23	10S	62E	3	IRR	10/21/1955	LI	GOTTFREDSON, IRMA G.		
210	17892			3/19/1959	CAN	SPR			15	15S	62E	0	STK	3/19/1959	CL	HENDRICKS, JOHN S.		
210	17893			3/19/1959	CAN	SPR				15S	62E	0	STK	3/19/1959	CL	HENDRICKS, JOHN A.		
210	17894			3/19/1959	CAN	SPR						0	STK	3/19/1959	CL	HENDRICKS, JOHN A.		
210	18079			6/23/1959	CAN	SPR				15S	62E	0	STK	6/23/1959	CL	HENDRICKS, JOHN A.		
210	18080			6/23/1959	CAN	SPR				15S	62E	0	STK	6/23/1959	CL	HENDRICKS, HELEN W.		
210	18081			6/23/1959	CAN	UG				15S	62E	0	STK	6/23/1959	CL	HENDRICKS, HELEN W.		
210	18402			10/30/1959	DEN	SPR	NE	SW	12	15S	61E	0.001	STK	10/30/1959	CL	HENDRICKS, HELEN W.		
210	18403			10/30/1959	DEN	SPR	NE	SE	07	15S	62E	0.001	STK	10/30/1959	CL	HENDRICKS, JOHN A.		
210	18890			5/31/1960	CAN	SPR	SE	SE	30	14S	61E	0	STK	5/31/1960	0	CL	USFWS	
210	19306		6011	11/1/1960	CER	SPR	SE	SE	30	14S	61E	0.001	STK	11/1/1960	0.04	CL	USFWS	
210	19708		6069	3/31/1961	CER	SPR	NE	SE	07	15S	62E	0.001	STK	3/31/1961	0.061378	CL	USFWS	
210	19709		6070	3/31/1961	CER	SPR	NE	SW	12	15S	61E	0.001	STK	3/31/1961	0.276201	CL	USFWS	
210	25706			7/10/1970	CAN	UG	SE	NW	13	11S	62E	0.5	COM	7/10/1970	4.726106	LI	C. S., INC.	
210	27925			11/29/1973	CAN	RES		NE	07	09S	64E	0	STK	11/29/1973		LI	SUMMA CORPORATION	
210	3294		1391	3/8/1915	CER	SPR	NW	SE	24	11S	63E	0.013	STK	Y	3/8/1915	8.961188	LI	SCHLARMAN, RACHAEL
210	32947			7/28/1977	DEN	UG	NW	SE	25	10S	62E	0.22	QM	7/28/1977	0	LI	DESERT PARADISE INC.	
210	33067			8/8/1977	DEN	UG	NW	NE	23	13S	63E	2.5	IRC	8/8/1977	800	CL	CONGER, DORIS	
210	33068			8/8/1977	DEN	UG	NE	NE	23	13S	63E	2.5	IRC	8/8/1977	800	CL	CONGER, ERNEST R.	
210	33069			8/8/1977	DEN	UG	SW	SE	11	13S	63E	2.5	IRC	8/8/1977	8000	CL	LEWIS, MALCOM LEE	
210	33070			8/8/1977	DEN	UG	NE	SW	14	13S	63E	2.5	IRR	8/8/1977	0	CL	LEWIS, LOIS	

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210	33071			8/8/1977	DEN	UG	NW	SW	14	13S	63E	2.5	IRC	8/8/1977	8000	CL	LEWIS, CLARVID A.
210	33072			8/8/1977	DEN	UG	NE	NW	14	13S	63E	2.5	IRC	8/8/1977	8000	CL	LEWIS, BARBARA
210	33073			8/8/1977	CAN	UG	NW	NE	11	13S	63E	2.5	IRC	8/8/1977	800	CL	BARNEBY, JEANNINE S.
210	33074			8/8/1977	CAN	UG	NE	NE	11	13S	63E	2.5	IRC	8/8/1977	800	CL	BARNEBY, DAVID G.
210	34096			10/13/1977	CAN	UG	SW	SW	32	12S	63E	2.7	IRR	10/13/1977		LI	BRADLEY, SUSAN L.
210	34176			10/17/1977	CAN	UG		NW	26	13S	63E	2.7	IRR	10/17/1977		CL	GLORE, FRED
210	34177			10/17/1977	CAN	UG		NE	26	13S	63E	2.7	IRR	10/17/1977		CL	GLORE, WAYNE JAMES
210	34178			10/17/1977	CAN	UG		SW	24	13S	63E	2.7	IRR	10/17/1977	100	CL	SENA, ARSENIO G.
210	34286			10/18/1977	CAN	UG		SE	14	13S	63E	2.7	IRC	10/18/1977		CL	SMART, FRED M.
210	34287			10/18/1977	DEN	UG	SW	NE	23	13S	63E	2.7	IRC	10/18/1977	0	CL	BRITZ, HERMAN
210	34300			10/19/1977	CAN	UG		SW	14	13S	63E	2.7	IRC	10/19/1977		CL	BRITZ, EARL F.
210	34396			10/25/1977	DEN	UG	NE	NE	26	13S	63E	2.7	IRC	10/25/1977	0	CL	FULLER, DAVID PAUL
210	34397			10/25/1977	DEN	UG	NW	SE	26	13S	63E	2.7	IRC	10/25/1977	0	CL	FULLER, LEONIE M.
210	34398			10/25/1977	DEN	UG	SE	SE	23	13S	63E	2.7	IRC	10/25/1977	0	CL	HOLTON, VERA L.
210	34581			11/7/1977	DEN	UG	NE	SW	08	13S	63E	2.7	IRC	11/7/1977	0	CL	CHABAFY, RITA T.
210	34582			11/7/1977	DEN	UG	NE	NW	17	13S	63E	2.7	IRC	11/7/1977	0	CL	SZANTO, HUBERT S.
210	34583			11/7/1977	DEN	UG	SW	SE	08	13S	63E	2.7	IRC	11/7/1977	0	CL	CHABAFY, ATTILA M.
210	34584			11/7/1977	DEN	UG	NW	NE	17	13S	63E	2.7	IRC	11/7/1977	0	CL	PARKER, FRANCIS K.
210	35198			3/20/1978	DEN	UG	NW	NE	08	13S	63E	2.7	IRC	3/20/1978	0	CL	LALLEMENT, MELVIN R.
210	35199			3/20/1978	DEN	UG	SE	SW	05	13S	63E	2.7	IRC	3/20/1978	0	CL	HOPPER, MARGARET B.
210	35200			3/20/1978	DEN	UG	SW	SE	05	13S	63E	2.7	IRC	3/20/1978	0	CL	LALLEMENT, GRACE M.
210	35201			3/20/1978	DEN	UG	NE	NW	08	13S	63E	2.7	IRC	3/20/1978	0	CL	LALLEMENT, GRACIABEL H.
210	37202			3/26/1979	DEN	UG	NE	SE	11	13S	63E	5.4	IRD	3/26/1979	0	CL	EARL, MILTON S.

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
210	37207			3/26/1979	DEN	UG	NE	SE	24	11S	62E	5.4	IRR	3/26/1979	0	CL	EARL, DAN	
210	37208			3/26/1979	DEN	UG	NW	NE	13	11S	62E	5.4	IRD	3/26/1979	0	CL	EARL, LORNA	
210	37215			3/26/1979	DEN	UG	NE	SE	23	13S	63E	5.4	IRD	3/26/1979	1600	CL	JOSEPH, KENNETH	
210	37253			3/27/1979	DEN	UG	NE	SE	25	11S	62E	5.4	IRD	3/27/1979	0	CL	LEAVITT, MARIA	
210	37276			3/28/1979	DEN	UG	NW	SW	07	11S	63E	5.4	IRR	3/28/1979		LI	MAX V. LEAVITT	
210	38364			6/19/1979	CAN	UG	NW	SW	17	15S	63E	5.4	IRR	6/19/1979		CL	JOHNSON, MARILYN E.	
210	38556			7/16/1979	DEN	UG	NE	SW	02	13S	63E	5.4	IRD	7/16/1979	0	CL	LEAVITT, KATHY S.	
210	38557			7/16/1979	DEN	UG	NW	NE	23	13S	63E	2.9	IRD	7/16/1979	0	CL	LEAVITT, EARL	
210	40268			1/8/1980	DEN	UG	NE	NW	14	13S	63E	2.9	IRD	1/8/1980	0	CL	LEAVITT, EARL	
210	4213		468	11/11/1916	CER	SPR	SW	NE	12	11S	61E	0.025	STK	Y	11/11/1916	18.07582 1	LI	LAMB, WM. G.
210	42864			11/20/1980	CAN	UG	SE	NE	29	12S	63E	15	QM	11/20/1980		LI	MX	
210	43804			5/28/1981	WDR	UG	NE	SE	29	12S	63E	15	QM	5/28/1981	0	LI	MX	
210	4393			4/11/1917	CAN	SPR	NW	NE	25	11S	63E	0.001	STK	Y	4/11/1917	0.552402	LI	LAMB, WILLIAM S.
210	44220			8/3/1981	WDR	UG	SE	SE	23	13S	63E	15	QM	8/3/1981	0	CL	MX	
210	44720			10/29/1981	CAN	UG	SE	NW	25	13S	63E	0.005	STK	10/29/1981		LI	BLM	
210	45891			7/2/1982	CAN	UG	SE	NE	29	12S	63E	16.2	IRD	7/2/1982	0	CL	MOAPA BAND OF PAIUTES	
210	46627			2/10/1983	CAN	UG	SE	SE	36	08S	63E	0.015	STK	2/10/1983	5.52402	LI	LDS WELFARE	
210	46777			3/31/1983	ABR	UG	SE	SE	23	13S	63E	10	IND	3/31/1983	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 70430			PER	UG												
		CHANGED BY: 70429			CER	UG												
		CHANGED BY: 77292			PER	UG												
210	46915			5/17/1983	DEN	UG	SE	SE	23	13S	63E	4.5	MM	5/17/1983	0	CL	NATASHA MINING COMPANY	
210	46916			5/17/1983	DEN	UG	NE	NW	25	13S	63E	4.5	MM	5/17/1983	0	CL	NATASHA MINING COMPANY	

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210	46917			5/17/1983	DEN	UG	SE	SE	23	13S	63E	4.5	MM		5/17/1983	0	CL	NATASHA MINING COMPANY
210	4717			11/19/1917	CAN	SPR	SE	SE	28	09S	63E	0.025	STK	Y	11/19/1917	0.552402	LI	D. L. STEWART
210	4769			12/10/1917	CAN	RES			11	13S	63E	0.025	STK	Y	12/10/1917	0	CL	RICHARD, J.W.
210	49414			9/27/1985	ABR	UG	SE	SE	23	13S	63E	6	IND		9/27/1985	0	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77293			PER	UG												
210	49606			12/30/1985	DEN	UG	SE	SE	23	13S	63E	10	IND		12/30/1985	7238.000 65	CL	NEVADA POWER
210	49607			12/30/1985	DEN	UG	SE	SE	23	13S	63E	10	IND		12/30/1985	7238.000 65	CL	NEVADA POWER
210	49608			12/30/1985	ABR	UG	NW	NE	26	13S	63E	10	IND		12/30/1985	0	CL	NEVADA POWER
		CHANGED BY: 69448			ABR	UG												
210	49609			12/30/1985	DEN	UG	NW	NE	26	13S	63E	10	IND		12/30/1985	7238.000 65	CL	NEVADA POWER
210	49610			12/30/1985	DEN	UG	NW	NW	25	13S	63E	10	IND		12/30/1985	7238.000 65	CL	NEVADA POWER COMPANY
210	49660			1/27/1986	ABR	UG	SW	NW	13	11S	63E	0.138	IND		1/27/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77294			PER	UG												
210	49661			1/27/1986	ABR	UG	SE	NE	10	12S	63E	0.138	IND		1/27/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77295			PER	UG												
210	49662			1/27/1986	ABR	UG	SE	NE	10	13S	63E	0.138	IND		1/27/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77296			PER	UG												
210	49978			7/15/1986	ABR	UG	SW	NW	13	11S	63E	2	IND		7/15/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77297			PER	UG												
210	49979			7/15/1986	ABR	UG	SE	SE	28	11S	63E	2	IND		7/15/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77298			PER	UG												
210	49980			7/15/1986	ABR	UG	NE	NE	03	12S	63E	2	IND		7/15/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77299			PER	UG												

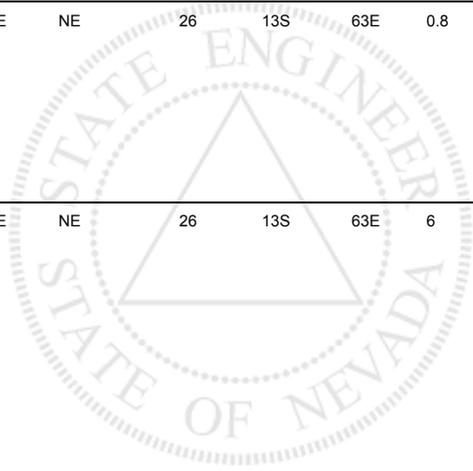
Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION					Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN	RNG							
210	49981			7/15/1986	ABR	UG	SE	NE	10	12S	63E	2	IND	7/15/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77300			PER	UG												
210	49982			7/15/1986	ABR	UG	NW	SE	29	12S	63E	2	IND	7/15/1986	0	LI	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77301			PER	UG												
210	49983			7/15/1986	ABR	UG	NW	NW	03	13S	63E	2	IND	7/15/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77302			PER	UG												
210	49984			7/15/1986	ABR	UG	SE	NE	10	13S	63E	2	IND	7/15/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77303			PER	UG												
210	49985			7/15/1986	ABR	UG	NE	NE	20	13S	63E	2	IND	7/15/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77304			PER	UG												
210	49986			7/15/1986	ABR	UG	NE	NE	21	13S	63E	2	IND	7/15/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77305			PER	UG												
210	49987			7/15/1986	ABR	UG	NE	NE	01	13S	63E	2	IND	7/15/1986	0	CL	SOUTHERN NEVADA WATER AUTHORITY	
		CHANGED BY: 77306			PER	UG												
210	50409			12/10/1986	CAN	UG	SW	NW	14	13S	63E	0.5	MM	12/10/1986	0	CL	BARNELL MINING COMPANY	
210	51912			3/10/1988	DEN	UG	SW	NE	25	13S	63E	15.46	MM	3/10/1988	0	CL	BLACK CANYON MINING CO.	
210	54055			10/17/1989	DEN	UG	SE	SW	05	13S	63E	6	MUN	10/17/1989	4343.905 194	CL	LAS VEGAS VALLEY WATER DISTRICT	
210	54056			10/17/1989	DEN	UG	SE	SE	32	13S	63E	6	MUN	10/17/1989	4344.212 084	CL	LAS VEGAS VALLEY WATER DISTRICT	
210	54057			10/17/1989	DEN	UG	SE	NW	16	14S	63E	6	MUN	10/17/1989	4343.905 194	CL	LAS VEGAS VALLEY WATER DISTRICT	
210	54058			10/17/1989	DEN	UG	NE	NE	01	13S	63E	10	MUN	10/17/1989	7239.841 99	CL	LAS VEGAS VALLEY WATER DISTRICT	
210	54059			10/17/1989	DEN	UG	NW	NW	19	13S	64E	10	MUN	10/17/1989	7239.841 99	CL	LAS VEGAS VALLEY WATER DISTRICT	
210	61458			8/11/1995	EXP	UG	SE	NW	24	11S	62E	1	MM	8/11/1995	0	LI	BEDROC, INC.	
		CHANGED BY: 70861			EXP	UG												

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
CHANGED BY: 70862					EXP	UG												
210	61459			8/11/1995	DEN	UG	SE	NE	24	11S	62E	2.5	IRR		8/11/1995	0	LI	BEDROC, INC.
210	62462			9/13/1996	ABR	SPR	E2	W2	24	11S	62E	0.35	MM		9/13/1996	0	LI	BEDROC LIMITED
CHANGED BY: 70860					EXP	OGW												
210	62865			2/20/1997	DEN	UG	SE	NW	13	11S	62E	0.5	MM		2/20/1997	0	LI	C.S., INC.
210	63272			7/24/1997	DEN	UG	SW	SW	12	12S	63E	10	QM		7/24/1997	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63273			7/24/1997	DEN	UG	NW	NW	12	12S	63E	10	QM		7/24/1997	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63274			7/24/1997	DEN	UG	NE	NW	15	13S	63E	10	QM		7/24/1997	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63275			7/24/1997	DEN	UG	NE	NE	11	13S	63E	10	QM		7/24/1997	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63276			7/24/1997	DEN	UG	SW	SE	13	11S	63E	10	QM		7/24/1997	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	6362			12/23/1920	DEN	SPR	SW	NE	24	11S	62E	2	IRR	Y	12/23/1920		LI	FOREMASTER, JOHN P.
210	6363			12/23/1920	WDR	SPR	NE	SW	24	11S	62E	2	IRR	Y	12/23/1920		LI	FOREMASTER, CARL E.
210	6364			12/23/1920	WDR	SPR	NE	SW	13	11S	62E	1.6	IRR	Y	12/23/1920		LI	RICHARD, JOHN W.
210	63867			2/24/1998	DEN	UG	NW	SW	12	13S	63E	10	QM		2/24/1998	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63868			2/24/1998	DEN	UG	NW	SW	13	13S	63E	10	QM		2/24/1998	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63869			2/24/1998	DEN	UG	SW	SW	11	13S	63E	10	QM		2/24/1998	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63870			2/24/1998	DEN	UG	SE	SE	12	13S	63E	10	QM		2/24/1998	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63871			2/24/1998	DEN	UG	SE	SE	13	13S	63E	10	QM		2/24/1998	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	63872			2/24/1998	DEN	UG	SE	SW	11	12S	63E	10	QM		2/24/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	63873			2/24/1998	DEN	UG	SW	SW	25	12S	63E	10	QM		2/24/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	63874			2/24/1998	DEN	UG	SW	SW	13	12S	63E	10	QM		2/24/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	63875			2/24/1998	DEN	UG	SW	SW	36	11S	63E	10	QM		2/24/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	63876			2/24/1998	DEN	UG	NE	NE	22	11S	63E	10	QM		2/24/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
210	64039			4/17/1998	DEN	UG	NE	SE	28	14S	63E	10	QM		4/17/1998	0	CL	DRY LAKE WATER, L.L.C.
210	64186			6/3/1998	DEN	UG	NW	SE	36	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64187			6/3/1998	DEN	UG	SW	SE	35	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64188			6/3/1998	DEN	UG	NE	SW	34	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64189			6/3/1998	DEN	UG	NE	SW	27	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64190			6/3/1998	DEN	UG	NW	NE	25	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64191			6/3/1998	DEN	UG	NW	SW	24	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	64192			6/3/1998	DEN	UG	NE	SW	26	12S	63E	10	QM		6/3/1998	0	LI	COYOTE SPRINGS INVESTMENT, LLC
210	67892			8/8/2001	DEN	UG	NE	SE	28	14S	63E	10	QM		8/8/2001	0	CL	DRY LAKE WATER, L.L.C.
210	69448			1/6/2003	ABR	UG	NE	NE	26	13S	63E	10	IND		12/30/1985	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 76501			CAN	UG												
		CHANGED BY: 77164			PER	UG												
210	70429		17035	9/24/2003	CER	UG	SE	SW	14	13S	63E	5	MUN	Y	3/31/1983	1500	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
		CHANGED BY: 77338T			EXP	UG												
		CHANGED BY: 77339T			EXP	UG												
		CHANGED BY: 80592			RFA	UG												
		CHANGED BY: 85527T			EXP	UG												
		CHANGED BY: 82051T			EXP	UG												
		CHANGED BY: 74094			PER	UG												
210	70430			9/24/2003	PER	UG	SW	SE	22	13S	63E	4.2	MUN	Y	3/31/1983	1140	CL	COYOTE SPRINGS INVESTMENT, LLC
		CHANGED BY: 72170T			WDR	UG												
		CHANGED BY: 72144			WDR	UG												
		CHANGED BY: 72143T			WDR	UG												

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							Qtr-Qtr	Qtr	SEC								TWN
		CHANGED BY: 77337T			EXP	UG											
		CHANGED BY: 70430R01			RLP	UG											
		CHANGED BY: 74095			PER	UG											
210	70430R01			2/5/2016	RLP	UG	SW	SE	22	13S	63E	0.92	WLD	3/31/1983	460	CL	COYOTE SPRINGS INVESTMENT LLC
210	70859			1/30/2004	EXP	UG	NW	SE	24	11S	62E	0.35	IRR	1/22/1919	100	LI	BEDROC LIMITED, A NEVADA LLC
210	70860			1/30/2004	EXP	OGW	NW	SE	24	11S	62E	0.35	MM	9/13/1996	0	LI	BEDROC LIMITED, A NEVADA LLC
210	70861			1/30/2004	EXP	UG	SE	NW	24	11S	62E	0.25	MM	8/11/1995	0	LI	BEDROC LIMITED, A NEVADA LLC
210	70862			1/30/2004	EXP	UG	NW	SE	24	11S	62E	0.25	MM	8/11/1995	0	LI	BEDROC LIMITED, A NEVADA LLC
210	71031			4/13/2004	RFA	UG	NW	SE	24	11S	62E	0.35	COM	4/13/2004	200	LI	BEDROC LIMITED, A NEVADA LLC
		CHANGED BY: 85251			RFA	UG											
		CHANGED BY: 85252			RFA	UG											
		CHANGED BY: 85253			RFA	UG											
		CHANGED BY: 85254			RFA	UG											
210	72143T			1/21/2005	WDR	UG	NW	SW	22	13S	63E	4.2	MUN	3/31/1983	2100	CL	COYOTE SPRINGS INVESTMENT, LLC
210	72144			1/21/2005	WDR	UG	NW	SW	22	13S	63E	4.2	MUN	3/31/1983	2100	CL	COYOTE SPRINGS INVESTMENT, LLC
210	72170T			1/28/2005	WDR	UG	SE	SE	23	13S	63E	2.9007	MUN	3/31/1983	2100	CL	COYOTE SPRINGS INVESTMENT LLC
210	72838			5/26/2005	DEN	UG	NW	SE	24	11S	62E	0.2763	MM	5/26/2005	200	LI	BEDROC LIMITED, A NEVADA LLC
210	72839			5/26/2005	DEN	UG	SE	NW	24	11S	62E	0.2763	MM	5/26/2005	200	LI	BEDROC LIMITED, A NEVADA LLC
210	72840			5/26/2005	DEN	UG	NW	SE	24	11S	62E	0.2763	MM	5/26/2005	200	LI	BEDROC LIMITED, A NEVADA LLC
210	72841			5/26/2005	DEN	UG	SE	NW	24	11S	62E	0.2763	MM	5/26/2005	200	LI	BEDROC LIMITED, A NEVADA LLC
210	74094			4/3/2006	PER	UG	SW	SE	10	13S	63E	2	MUN	Y 3/31/1983	1000	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
		CHANGED BY: 80593			RFA	UG											
210	74095			4/3/2006	PER	UG	NW	NE	05	13S	63E	1	MUN	Y 3/31/1983	500	CL	COYOTE SPRINGS INVESTMENT, LLC

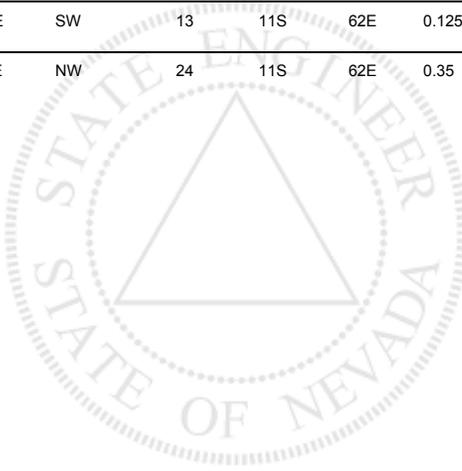
Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record	
							Qtr-Qtr	Qtr	SEC	TWN								RNG
210	76501			11/26/2007	CAN	UG	NE	NE	26	13S	63E	10	IND		12/30/1985	5000	CL	NEVADA POWER COMPANY
210	77164			6/18/2008	PER	UG	NE	NE	26	13S	63E	10	IND		12/30/1985	2500	CL	NEVADA POWER COMPANY
		CHANGED BY: 87737			WDR	UG												
		CHANGED BY: 87738			RFP	UG												
		CHANGED BY: 87736			RFP	UG												
		CHANGED BY: 87735			RFP	UG												
210	77291			8/13/2008	PER	UG	SE	SW	14	13S	63E	15	MUN	Y	8/13/2008	9000	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77292			8/13/2008	PER	UG	NE	NE	26	13S	63E	0.8	MUN	Y	3/31/1983	400	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 77707T			EXP	UG												
		CHANGED BY: 77708T			EXP	UG												
		CHANGED BY: 77709T			EXP	UG												
210	77293			8/13/2008	PER	UG	NE	NE	26	13S	63E	6	MUN	Y	9/27/1985	4000	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 85853T			EXP	UG												
		CHANGED BY: 85854T			EXP	UG												
		CHANGED BY: 85855T			EXP	UG												
		CHANGED BY: 85852T			EXP	UG												
		CHANGED BY: 86959T			EXP	UG												
		CHANGED BY: 86960T			EXP	UG												
		CHANGED BY: 86962T			EXP	UG												
		CHANGED BY: 87102T			EXP	UG												
		CHANGED BY: 86195T			EXP	UG												
		CHANGED BY: 86961T			EXP	UG												
210	77294			8/13/2008	PER	UG	NE	NE	26	13S	63E	0.138	MUN	Y	1/27/1986	100	CL	SOUTHERN NEVADA WATER AUTHORITY



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							Qtr-Qtr	Qtr	SEC								TWN	RNG
210	77295			8/13/2008	PER	UG	NE	NE	26	13S	63E	0.138	MUN	Y	1/27/1986	100	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77296			8/13/2008	PER	UG	NE	NE	26	13S	63E	0.138	MUN	Y	1/27/1986	100	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77297			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77298			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77299			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77300			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77301			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77302			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77303			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77304			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77305			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77306			8/13/2008	PER	UG	NE	NE	26	13S	63E	2	MUN	Y	7/15/1986	1447.93	CL	SOUTHERN NEVADA WATER AUTHORITY
210	77337T			8/22/2008	EXP	UG	SW	SE	10	13S	63E	3.2	MUN		3/31/1983	0	CL	COYOTE SPRINGS INVESTMENT LLC, A NEVADA LIMITED LIABILITY COMPANY
210	77338T			8/22/2008	EXP	UG	NW	NE	05	13S	63E	2.5	MUN		3/31/1983	0	CL	CLARK COUNTY-COYOTE SPRINGS WATER RESOURCES GENERAL IMPROVEMENT DISTRICT
210	77339T			8/22/2008	EXP	UG	NW	NE	05	13S	63E	0.5	MUN		3/31/1983	0	CL	COYOTE SPRINGS INVESTMENT LLC, A NEVADA LIMITED LIABILITY COMPANY
210	77340			8/22/2008	PER	EFF	SE	SE	23	13S	63E	4.64	STO		8/22/2008	3359	CL	COYOTE SPRINGS REUSE WATER COMPANY LLC, A NEVADA LIMITED LIABILITY COMPANY
		CHANGED BY: 77340S01			PER	EFF												
		CHANGED BY: 77340S02			PER	EFF												
210	77340S01			8/22/2008	PER	EFF	SE	SE	23	13S	63E	4.64	IRR		8/22/2008	3359	CL	COYOTE SPRINGS REUSE WATER COMPANY LLC, A NEVADA LIMITED LIABILITY COMPANY
210	77340S02			8/22/2008	PER	EFF	SE	SE	23	13S	63E	4.64	IND		8/22/2008	3359	CL	COYOTE SPRINGS REUSE WATER COMPANY LLC, A NEVADA LIMITED LIABILITY COMPANY
210	77707T			12/22/2008	EXP	UG	NW	NE	28	11S	63E	0.1	OTH		3/31/1983	0	LI	SOUTHERN NEVADA WATER AUTHORITY

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
210	77708T			12/22/2008	EXP	UG	NW	NE	21	11S	63E	0.1	OTH		3/31/1983	0	LI	SOUTHERN NEVADA WATER AUTHORITY
210	77709T			12/22/2008	EXP	UG	SE	SW	20	11S	63E	0.1	OTH		3/31/1983	0	LI	SOUTHERN NEVADA WATER AUTHORITY
210	79296			1/28/2010	DEN	UG	SE	SW	05	13S	63E	6	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
210	79297			1/28/2010	DEN	UG	SE	SE	32	13S	63E	6	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
210	79298			1/28/2010	DEN	UG	SE	NW	16	14S	63E	6	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
210	79299			1/28/2010	DEN	UG	NE	NE	01	13S	63E	10	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
210	79300			1/28/2010	DEN	UG	NW	NW	19	13S	64E	10	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
210	79497			2/11/2010	DEN	UG	SW	SE	10	13S	63E	1.5	MUN		2/11/2010	750	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
210	79498			2/11/2010	DEN	UG	SE	SW	14	13S	63E	2.5	MUN		2/11/2010	1250	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
210	79518			2/11/2010	DEN	UG	NE	NE	26	13S	63E	15	MUN		2/11/2010	9000	CL	SNWA
210	80592			2/18/2011	RFA	UG	NW	NE	05	13S	63E	2.5	MUN		3/31/1983	1250	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
210	80593			2/18/2011	RFA	UG	SW	SE	22	13S	63E	1.5	MUN		3/31/1983	750	CL	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID
210	82051T			8/13/2012	EXP	UG	NW	NE	05	13S	63E	0.5	MUN		3/31/1983	0	CL	COYOTE SPRINGS INVESTMENT, LLC
210	83044			8/26/2013	ABR	UG	NW	SE	24	11S	62E	0.5	IRR		10/22/1919	0	LI	BEDROC LIMITED LLC
		CHANGED BY: 85249			PER	UG												
		CHANGED BY: 85250			PER	UG												
210	83590			3/3/2014	WDR	UG	NW	SE	24	11S	62E	0.35	COM		3/3/2014	200	LI	BEDROC LIMITED
210	85249			6/23/2015	PER	UG	NW	SE	24	11S	62E	0.16	COM	Y	10/22/1919	109.8	LI	BEDROC LIMITED LLC
210	85250			6/23/2015	PER	UG	SE	NW	24	11S	62E	0.34	COM	Y	10/22/1919	233.2	LI	BEDROC LIMITED LLC
210	85251			6/23/2015	RFA	UG	SE	NW	24	11S	62E	0.2	COM		4/13/2004	0	LI	BEDROC LIMITED LLC
210	85252			6/23/2015	RFA	UG	NE	SW	24	11S	62E	0.1	COM		4/13/2004	0	LI	BEDROC LIMITED LLC
210	85253			6/23/2015	RFA	UG	SE	SW	24	11S	62E	0.15	COM		4/13/2004	0	LI	BEDROC LIMITED LLC
210	85254			6/23/2015	RFA	UG	SE	SW	24	11S	62E	0.15	COM		4/13/2004	0	LI	BEDROC LIMITED LLC

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							Qtr-Qtr	Qtr	SEC	TWN	RNG							
210	85527T			10/13/2015	EXP	UG	NW	NE	05	13S	63E	0.5	MUN		3/31/1983	250	CL	COYOTE SPRINGS INVESTMENT LLC
210	87496			11/22/2017	RFA	UG	SE	NW	24	11S	62E	0.2	COM		11/22/2017	0	LI	BEDROC LIMITED, LLC
210	87497			11/22/2017	RFA	UG	NE	SW	24	11S	62E	0.1	COM		11/22/2017	0	LI	BEDROC LIMITED, LLC
210	87498			11/22/2017	RFA	UG	SE	SW	24	11S	62E	0.15	COM		11/22/2017	0	LI	BEDROC LIMITED, LLC
210	87499			11/22/2017	RFA	UG	SE	SW	24	11S	62E	0.15	COM		11/22/2017	0	LI	BEDROC LIMITED, LLC
210	87500			11/22/2017	RFA	UG	SE	SW	24	11S	62E	0.1	COM		11/22/2017	0	LI	BEDROC LIMITED, LLC
210	9818			11/23/1934	DEN	SPR	NW	SW	28	14S	61E	0.025	STK		11/23/1934		CL	WEST, RAYMOND A.
210	V01353			3/8/1915	VST	SPR	NE	SW	13	11S	62E	0.125	STK			3.37579	LI	LDS
210	V04545			10/24/1985	ABR	UG	SE	NW	24	11S	62E	0.35	IRR		10/22/1919	0	LI	BEDROC LIMITED
		CHANGED BY: 70859			EXP	UG												
		CHANGED BY: 83044			ABR	UG												



Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('215')

Run Date: 8/22/2019 8:51:32 AM

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							Qtr-Qtr	Qtr	SEC								TWN
215	10092		4476	2/16/1937	CER	SPR	SE	SE	12	18S	67E	0.44	WLD	2/16/1937	0	CL	U.S.-NATIONAL PARK SERVICE
215	10098			3/12/1937	WDR	SPR	NW	NE	07	18S	68E	2	REC	3/12/1937	0	CL	BLM
215	10202			2/2/1938	WDR	OSW	SW	SW	14	21S	63E	5	WLD	2/2/1938	0	CL	U.S.-AGRICULTURE DEPARTMENT
215	10779		3118	1/28/1942	CAN	STR	SE	NW	11	22S	64E	45	MM	1/28/1942	32578.76 7242	CL	SAGUARO POWER COMPANY
215	10799		3119	3/28/1942	CAN	STR	SE	NW	11	22S	64E	12	MUN	3/28/1942	8687.196 608	CL	DEFENSE PLANT CORPORATION
215	10800			3/30/1942	ABR	STR	SE	NE	19	21S	64E	5	MM	3/30/1942	0	CL	METALS RESERVE COMPANY
		CHANGED BY: 10861			CAN	STR											
215	10861		4101	9/5/1942	CAN	STR	SE	NW	11	22S	64E	5	MM	3/30/1942	3619.859 617	CL	HYDROMANAGEMENT CORPORATION
215	13424		5984	6/19/1950	CAN	RES	SE	NW	11	22S	64E	24	MUN	6/19/1950	8756.952 705	CL	LAS VEGAS VALLEY WATER DISTRICT
215	14512			9/1/1952	CAN	SPR	SE	SE	12	18S	67E	0.25	MM	9/1/1952	0	CL	CRABTREE, RALPH E.
215	1553			12/10/1909	CAN	STR				21S	65E	0	MM	12/10/1909	0	CL	MACE, CLEMENT H.
215	15571			3/26/1954	CAN	STR	SE	NW	11	22S	64E	2	MM	3/26/1954	0	CL	MANGANESE INC.
215	15725			6/6/1954	DEN	SPR	NW	NE	07	18S	68E	1	MM	6/6/1954		CL	MCDONALD, W.H.
215	15733			7/12/1954	CAN	UG	SE	SW	24	22S	64E	0.7	QM	7/12/1954	506.7674 57	CL	RICHARDSON, JACK A.
215	16129			2/23/1955	DEN	SPR	SW	SE	06	18S	68E	1.5	OTH	2/23/1955		CL	MCDONALD, W.H.
215	16485			5/18/1955	CAN	STR	NW	NW	16	19S	67E	0.25	MM	5/18/1955		CL	NATIONAL EXPLORATION LABORATORIES
215	16577			6/27/1955	CAN	OSW	SE	NW	11	22S	64E	34.5	MUN	6/27/1955	0	CL	HENDERSON-CITY
215	17067			10/9/1956	CAN	RES	NE	SE	24	22S	64E	0.1	COM	10/9/1956	72.39535 1	CL	LAKEVIEW COMPANY
215	17494			2/21/1958	DEN	STR	SE	NW	11	22S	64E	13.27	IND	2/21/1958	0	CL	STAUFFER CHEMICAL COMPANY

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
215	17495			2/21/1958	DEN	STR	SE	NW	11	22S	64E	65.76	IND		2/21/1958	0	CL	NATIONAL LEAD
215	17496			2/21/1958	DEN	STR	SE	NW	11	22S	64E	13.464	IND		2/21/1958	0	CL	AMERICAN POTASH & CHEMICAL CORP.
215	17500			3/5/1958	WDR	STR	SE	NW	11	22S	64E	0	MUN		3/5/1958	225000.9 14783	CL	COLORADO RIVER COMMISSION OF NEVADA
215	17501			3/5/1958	WDR	STR	SE	NW	11	22S	64E	0	IND		3/5/1958	75000.29 4698	CL	COLORADO RIVER COMMISSION OF NEVADA
215	17502			3/5/1958	WDR	STR			09	18S	68E	0	MUN		3/5/1958	100000.4 1339	CL	COLORADO RIVER COMMISSION OF NEVADA
215	17503			3/5/1958	WDR	STR			09	18S	68E	0	MUN		3/5/1958	25000.08 8003	CL	COLORADO RIVER COMMISSION OF NEVADA
215	17504			3/5/1958	WDR	STR			09	18S	68E	0	IND		3/5/1958	25000.08 8003	CL	COLORADO RIVER COMMISSION OF NEVADA
215	18345			9/22/1959	WDR	STR	SW	NE	16	21S	64E	1	IND		9/22/1959	0	CL	FIBREBOARD PAPER PRODUCTS CORP.
215	1939			2/2/1911	WDR	STR	SE	SE	10	18S	68E	9	IRR		2/2/1911	0	CL	SYPHUS, LEVI W.
215	1973			3/6/1911	CAN	SPR	SW	SW	07	18S	68E	2.4	IRR	Y	3/6/1911	0	CL	NEVADA FIRE INSURANCE COMPANY
215	19936		5621	6/23/1961	FOR	UG	SW	SW	05	19S	68E	0.248	QM		6/23/1961	0	CL	LAKE MEAD
215	20117			10/4/1961	CAN	LAK	SE	SE	10	22S	64E	0	COM		10/4/1961	0	CL	NELLIS, G.B.
215	20715			9/17/1962	CAN	STR	NE	SE	24	22S	64E	1	COM		9/17/1962	723.9841 99	CL	LAKEVIEW COMPANY
215	21924			4/3/1964	ABR	STR	SW	NW	13	21S	63E	60	MUN		4/3/1964	0	CL	PORT HOLIDAY AUTHORITY
						CHANGED BY: 23620	CAN	EFF										
215	2432			5/27/1912	CAN	SPR	SW	SW	07	18S	68E	1.1	IRR	Y	5/27/1912	0	CL	NEVADA FIRE INSURANCE COMPANY
215	2433			5/27/1912	CAN	SPR	NE	NW	07	18S	68E	2.4	PWR	Y	5/27/1912	0	CL	SYPHUS, LEVI W.
215	24529			6/14/1968	CAN	UG	SW	NW	07	20S	65E	1	IND		6/14/1968	0	CL	DELKIN, A.C.
215	26200			7/13/1971	WDR	STR	SW	SW	22	21S	63E	350	MUN		7/13/1971	774003.1 56674	CL	CLARK COUNTY
215	26783			6/20/1972	WDR	STR	SE	NW	11	22S	64E	15	OTH		6/20/1972	25	CL	NEVADA-DEPARTMENT OF WILDLIFE
215	2869			1/2/1914	CAN	SPR				18S	68E	2.75	PWR	Y	1/2/1914	0	CL	MONTGOMERY, M.M.
215	2935			4/6/1914	CAN	STR	NW	NW	13	17S	68E	4.4	IRR	Y	4/6/1914	0	CL	NEVADA IRRIGATION CO.
215	29368		9933	5/5/1975	ABR	UG	NW	NE	30	17S	67E	0.06	QM		5/5/1975	0	CL	NEVADA-PARKS DIVISION

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
		CHANGED BY: 76939			WDR	UG												
		CHANGED BY: 48816			CER	UG												
		CHANGED BY: 86954			PER	UG												
215	29814			11/28/1975	PER	OSW	NE	NW	11	22S	64E	638	MUN	11/28/1975	0	CL	COLORADO RIVER COMMISSION OF NEVADA	
		CHANGED BY: 53766T			WDR	STR												
215	34545			11/1/1977	WDR	UG	NW	NW	31	17S	66EH	0.56	OTH	11/1/1977		CL	NEVADA-PARKS DIVISION	
215	37199			3/26/1979	CAN	UG	SE	SE	05	20S	64E	5.4	COM	3/26/1979	928.2808 72	CL	TCA INC.	
215	3852			3/30/1916	CAN	STR	SW	NE	08	20S	66E	4.8	IRR	Y	3/30/1916	0	CL	GANN, WILLIAM REGNALD
215	41206		11261	4/30/1980	FOR	UG	SW	SW	25	22S	64E	0.17	COM	4/30/1980	37.74747	CL	LAKEVIEW COMPANY	
215	41394			5/19/1980	CAN	UG	NE	SW	08	20S	64E	0.5	MM	5/19/1980	76.7225	CL	FARGO PACIFIC ROCK AND SAND INC.	
215	41786		11262	7/16/1980	FOR	UG	SW	SW	25	22S	64E	0.15	COM	7/16/1980	69.29576 2	CL	LAKEVIEW COMPANY	
215	42678		14933	10/16/1980	FOR	UG	SE	SE	28	21S	63E	0.891	MM	10/16/1980	0	CL	MEEK, LEROY	
		CHANGED BY: 47477			DEN	UG												
		CHANGED BY: 64578			DEN	UG												
215	45746S01			7/17/1989	WDR	EFF	NW	NW	23	21S	63E	0.8	OTH	7/17/1989	33.6	CL	WASHINGTON CONSTRUCTION CO.	
215	46027			8/18/1982	DEN	OSW	SE	SW	22	21S	63E	25	IRR	8/18/1982	5000	CL	WIESNER, ALFRED A.	
215	46028			8/18/1982	DEN	OSW	SE	SW	22	21S	63E	25	IRR	8/18/1982	0	CL	WIESNER, ALFRED A.	
215	46029			8/18/1982	PER	UG	NE	NW	23	21S	63E	5	QM	Y	11/27/2000	2200.002 343	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	46030			8/18/1982	PER	UG	NE	NE	22	21S	63E	5	QM	Y	11/27/2000	2200.002 343	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	47477			12/1/1983	DEN	UG	SE	NE	28	21S	63E	0.891	MM	10/16/1980	230.1675	CL	MEEK, LEROY	
215	48816		13552	2/1/1985	CER	UG	NW	SW	30	17S	67E	0.045	QM	Y	5/5/1975	4.471	CL	NEVADA-PARKS DIVISION
215	494			5/27/1907	CAN	STR			01	21S	66E	5000	PWR	Y	5/27/1907	0	CL	SMITH, O.J.
215	50988			6/1/1987	CAN	STR	NE	NW	11	22S	64E	638	MUN	6/1/1987	0	CL	LAS VEGAS VALLEY WATER DISTRICT	

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215	51859			2/23/1988	WDR	STR	NE	NW	11	22S	64E	638	MUN		2/23/1988	0	CL	LAS VEGAS VALLEY WATER DISTRICT
215	52254			6/21/1988	ABR	UG	SE	SE	29	20S	64E	1.5	MM		6/21/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 62841T			WDR	UG												
		CHANGED BY: 62691			ABR	UG												
215	52374			8/4/1988	ABR	UG	NE	SE	29	20S	64E	0.33	MM		8/4/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 62842T			WDR	UG												
		CHANGED BY: 62693			ABR	UG												
215	52375			8/4/1988	WDR	UG	SE	NE	29	20S	64E	3	MM		8/4/1988		CL	HEISEN, CHARLES
215	52614			10/18/1988	ABR	UG	NE	SE	29	20S	64E	1.5	MM		10/18/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 62843T			WDR	UG												
		CHANGED BY: 62692			ABR	UG												
215	52738			11/29/1988	CAN	UG	SW	SE	14	21S	63E	2	OTH		11/29/1988	723.9535 1	CL	LAKE AT LAS VEGAS JOINT VENTURE
		CHANGED BY: 53704			WDR	UG												
215	53029			3/16/1989	WDR	OSW	NW	SE	14	21S	63E	0.8	OTH		3/16/1989	0	CL	WASHINGTON CONSTRUCTION COMPANY
215	53386			6/15/1989	CAN	UG	NW	SW	25	20S	63E	3	MM		6/15/1989	0	CL	HEISEN, CHARLES
215	5365			1/20/1919	CAN	STR	SW	NE	13	17S	68E	5.6	IRR	Y	1/20/1919		CL	BAUER, ALBERT L.
215	53704			7/21/1989	WDR	UG	NW	SW	22	21S	63E	2	OTH		6/25/1990	723.9535 1	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
		CHANGED BY: 54439			WDR	UG												
215	53766T			8/18/1989	WDR	STR	SE	SW	30	21S	63E	0.1	MM		11/28/1975	0	CL	NEVADA READY MIX
215	5380			2/1/1919	WDR	SPR	SW	SW	07	18S	68E	5.9	IRR		2/1/1919		CL	NEVADA FIRE INSURANCE CO.
215	53829			9/8/1989	PER	UG	NW	SW	22	21S	63E	1	QM	Y	1/4/2001	723.97	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
		CHANGED BY: 70441T			EXP	UG												
215	53830			9/8/1989	ABR	UG	NW	SE	14	21S	63E	1	QM		9/8/1989	0	CL	LAKE LAS VEGAS JOINT VENTURE, INC.

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
		CHANGED BY: 56232T			EXP	UG												
		CHANGED BY: 56150			PER	UG												
215	53831			9/8/1989	PER	UG	NW	NE	15	21S	63E	1	QM	Y	1/4/2001	723.9535 1	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
		CHANGED BY: 56233			WDR	UG												
215	54037			10/17/1989	WDR	UG	SW	NE	09	18S	68E	10	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
215	5404			3/6/1919	CAN	STR	NW	SE	11	21S	65E	0	PWR	Y	3/6/1919	0	CL	MACE, CLEMENT H.
215	54129			10/30/1989	ABR	UG	NW	SW	07	20S	64E	2.3	IND		10/30/1989	0	CL	NEVADA COGENERATION ASSOCIATES #1
		CHANGED BY: 55270			ABR	UG												
		CHANGED BY: 55269			CER	UG												
215	5427			3/17/1919	CAN	STR	SW	NE	13	17S	68E	10	IRR	Y	3/17/1919		CL	LEWIS, JOHN F.
215	54370			1/23/1990	CAN	UG	SW	SE	29	20S	64E	7	COM		1/23/1990	0	CL	CONCRETE PRODUCTS COMPANY
215	54380			1/26/1990	CAN	UG	SW	SW	15	20S	63E	35	COM		1/26/1990	0	CL	CONCRETE PRODUCTS COMPANY
215	54421			2/9/1990	WDR	UG	NW	NE	22	21S	63E	0.45	OTH		2/9/1990		CL	WASHINGTON CONSTRUCTION COMPANY
215	54438			2/14/1990	CAN	UG			07	20S	64E	2.3	IND		2/14/1990	0	CL	BONNEVILLE NEVADA CORPORATION
215	54439			2/14/1990	WDR	UG	NW	NW	23	21S	63E	0.8	CON		11/29/1988		CL	THE LAS VEGAS JOINT VENTURE, INC.
215	54475			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990	0	CL	HEISEN, CHARLES
215	54476			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990	0	CL	HEISEN, CHARLES
215	54477			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990		CL	HEISEN, CHARLES
215	54478			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990	0	CL	HEISEN, CHARLES
215	54479			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990	0	CL	HEISEN, CHARLES
215	54480			2/26/1990	DEN	UG	SE	NE	28	21S	63E	3	QM		2/26/1990	0	CL	HEISEN, CHARLES
215	54481			2/26/1990	DEN	UG	NW	NW	27	21S	63E	3	IND		2/26/1990	0	CL	HEISEN, CHARLES
215	54482			2/26/1990	DEN	UG	NW	NW	27	21S	63E	3	MM		2/26/1990	0	CL	HEISEN, CHARLES

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215	5494			5/9/1919	CAN	STR	SW	NE	08	20S	68E	6	IRR	Y	5/9/1919	0	CL	STEWART, LESLIE E.
215	55268			9/13/1990	DEN	UG		LT03	26	21S	63E	5	QM		9/13/1990	2016.25	CL	THREE KIDS ENTERPRISES, INC.
215	55269		17123	9/13/1990	CER	UG	SE	SE	13	19S	63E	1.15	IND	Y	10/30/1989	96	CL	NEVADA COGENERATION ASSOCIATES #1
215	55270			9/13/1990	ABR	UG			01	20S	63E	1.15	IND		10/30/1989	0	CL	NEVADA COGENERATION ASSOCIATES #1
		CHANGED BY: 58130T			EXP	UG												
		CHANGED BY: 58031			CER	UG												
215	55271			9/13/1990	ABR	UG	SW	SE	13	19S	63E	2.3	IND		9/13/1990	0	CL	NEVADA COGENERATION ASSOC. #1 & #2
		CHANGED BY: 58129T			EXP	UG												
		CHANGED BY: 58032			CER	UG												
215	55517			12/10/1990	ABR	UG	NE	SE	29	20S	64E	2	MM		12/10/1990	0	CL	GLASIER, DARRYL W.
		CHANGED BY: 64547			ABR	UG												
215	5593			7/3/1919	DEN	STR	SE	NW	12	21S	65E	5000	PWR	Y	7/3/1919	0	CL	WILLIAMS, HARRY N.
215	56150			4/5/1991	PER	UG	NE	NE	15	21S	63E	1	QM	Y	1/4/2001	723.97	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	56232T			4/26/1991	EXP	UG	NE	NE	15	21S	63E	1	QM		9/8/1989	723.95351	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	56233			4/26/1991	WDR	UG	SE	NE	22	21S	63E	1	QM		9/8/1989	0	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	58031		17124	8/31/1992	CER	UG	NE	SE	13	19S	63E	1.15	IND	Y	10/30/1989	824	CL	NEVADA COGENERATION ASSOCIATES #1
215	58032		17125	8/31/1992	CER	UG	NE	SE	13	19S	63E	2.3	IND	Y	9/13/1990	826	CL	NEVADA COGENERATION ASSOCIATES
215	58047			9/4/1992	CAN	UG	SE	SW	08	20S	65E	1.5	MM	Y	9/4/1992	718	CL	DAWSON, LAREEN ET AL
215	58048			9/4/1992	CAN	UG	SW	SE	08	20S	65E	1.5	MM	Y	9/4/1992	718	CL	DAWSON, LAREEN ET AL
215	58049			9/4/1992	CAN	UG	NE	SE	08	20S	65E	1.5	MM	Y	9/4/1992	718	CL	DAWSON, LAREEN ET AL
215	58050			9/4/1992	CAN	UG	SE	NW	08	20S	65E	1.5	MM	Y	9/4/1992	718	CL	DAWSON, LAREEN ET AL
215	58051			9/4/1992	CAN	UG	SW	SE	05	20S	64E	1.5	MM	Y	9/4/1992	250	CL	DAWSON, LAREEN ET AL
		CHANGED BY: 79908			DEN	UG												

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215	58129T			9/25/1992	EXP	UG	NE	SE	13	19S	63E	2.3	PWR		9/13/1990	1665	CL	NEVADA COGENERATION ASSOCIATES 1 & 2
215	58130T			9/25/1992	EXP	UG	NE	SE	13	19S	63E	1.15	PWR		9/13/1990	832.5	CL	NEVADA COGENERATION ASSOCIATES 1 & 2
215	58390		14303	12/11/1992	CER	OSW	SE	SW	22	21S	63E	0	QM		12/11/1992	2029	CL	LAKE LAS VEGAS MASTER ASSOCIATION
215	58589			3/9/1993	RFP	STR	NE	NW	11	22S	64E	100	MUN		3/9/1993	30000	CL	SOUTHERN NEVADA WATER AUTHORITY
215	58590			3/9/1993	RFP	STR	NE	NW	11	22S	64E	700	MUN		3/9/1993	150000	CL	SOUTHERN NEVADA WATER AUTHORITY
215	58592			3/9/1993	DEN	UG	NE	SE	13	19S	63E	0.274	PWR		3/9/1993	0	CL	NEVADA COGENERATION ASSOCIATES 1 & 2
215	58593			3/9/1993	DEN	UG	NE	SE	13	19S	63E	0.274	PWR		3/9/1993	0	CL	NEVADA COGENERATION ASSOCIATES 1 & 2
215	58594			3/9/1993	DEN	UG	SE	SE	13	19S	63E	0.274	PWR		3/9/1993	0	CL	NEVADA COGENERATION ASSOCIATES 1 & 2
215	6021			3/20/1920	CAN	STR	NE	SE	18	21S	65E	1.6	IRR	Y	3/20/1920	0	CL	HESSE, JOHN F.
215	61597			10/10/1995	CAN	UG	SE	SE	02	20S	63E	2.01	MM	Y	10/10/1995	250	CL	DAWSON, LAREEN ET AL
		CHANGED BY: 68021				WDR	UG											
		CHANGED BY: 79909				DEN	UG											
215	61598			10/10/1995	CAN	UG	NE	NE	15	20S	64E	2.01	MM	Y	10/10/1995	250	CL	DAWSON, LAREEN ET AL
		CHANGED BY: 68020				WDR	UG											
		CHANGED BY: 79910				DEN	UG											
215	61599			10/10/1995	CAN	UG	SW	NW	07	20S	65E	2.01	MM	Y	10/10/1995	1088.8	CL	DAWSON, LAREEN ET AL
		CHANGED BY: 68022				WDR	UG											
215	61600			10/10/1995	CAN	UG	NE	NE	07	20S	65E	2.01	MM	Y	10/10/1995	1088.8	CL	DAWSON, LAREEN ET AL
		CHANGED BY: 68019				WDR	UG											
215	62691			12/24/1996	ABR	UG	SE	SE	29	20S	64E	1.5	MM	Y	6/21/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 64542				ABR	UG											
		CHANGED BY: 72761				PER	UG											
215	62692			12/24/1996	ABR	UG	NE	SE	29	20S	64E	1.5	MM	Y	10/18/1988	0	CL	INTERNATIONAL SILICA CORPORATION

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							Qtr-Qtr	Qtr	SEC	TWN							
		CHANGED BY: 63312			ABR	UG											
		CHANGED BY: 64541			ABR	UG											
		CHANGED BY: 72762			PER	UG											
215	62693			12/24/1996	ABR	UG	NE	SE	29	20S	64E	0.33	MM	8/4/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 63313			ABR	UG											
215	62841T			2/6/1997	WDR	UG	SE	SE	29	20S	64E	1.5	MM	6/21/1988	1085.930 265	CL	INTERNATIONAL SILICA CORPORATION
215	62842T			2/6/1997	WDR	UG	NE	SE	29	20S	64E	0.33	MM	8/4/1988	241.3076 07	CL	INTERNATIONAL SILICA CORPORATION
215	62843T			2/6/1997	WDR	UG	NE	SE	29	20S	64E	1.5	MM	10/18/1988	1085.930 265	CL	INTERNATIONAL SILICA CORPORATION
215	63312			8/8/1997	ABR	UG	NE	SE	29	20S	64E	0.56	MM	Y 10/18/1988	0	CL	INTERNATIONAL SILICA CORPORATION
		CHANGED BY: 64540			ABR	UG											
		CHANGED BY: 72759			PER	UG											
215	63313			8/8/1997	ABR	UG	NE	SE	29	20S	64E	0.33	MM	Y 10/18/1988	0	CL	PACIFIC COAST BUILDING PRODUCTS
		CHANGED BY: 67527			WDR	UG											
		CHANGED BY: 72760			PER	UG											
215	64041			4/17/1998	DEN	UG	NE	NW	36	19S	63E	10	QM	4/17/1998	0	CL	DRY LAKE WATER, L.L.C.
215	6406			2/24/1921	WDR	SPR	NW	NE	07	18S	68E	2.4	IRR	Y 2/24/1921	0	CL	NEVADA FIRE INSURANCE CO.
215	64540			10/19/1998	ABR	UG	SW	NW	18	19S	64E	0.165	IND	Y 10/18/1988	0	CL	DRY LAKE WATER COMPANY, LLC
		CHANGED BY: 66166			ABR	UG											
215	64541			10/19/1998	ABR	UG	SW	NW	18	19S	64E	0.19	IND	Y 10/18/1988	0	CL	DRY LAKE WATER COMPANY, LLC
		CHANGED BY: 66164			ABR	UG											
215	64542			10/19/1998	ABR	UG	SW	NW	18	19S	64E	0.75	MM	Y 6/21/1988	0	CL	DRY LAKE WATER COMPANY, LLC
		CHANGED BY: 66165			ABR	UG											
215	64547			10/21/1998	ABR	UG	SW	NW	18	19S	64E	2	IND	Y 12/10/1990	0	CL	DRY LAKE WATER COMPANY, LLC

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
CHANGED BY: 66163						ABR	UG											
215	64578			11/2/1998	DEN	UG	SE	SE	28	21S	63E	0.1515	QM		10/16/1980	47.68	CL	THOMPSON, PHYLLIS E.
215	64960E			3/9/1999	EXP	UG	NW	SW	05	19S	68E	0.005	ENV		3/9/1999	0.030689	CL	ECHO BAY RESORT (DBA)
215	6521			7/22/1921	DEN	STR	NW	SE	36	20S	66E	15000	PWR	Y	7/22/1921	0	CL	PUBLIC SERVICE COMMISSION-NEVADA
215	6532			8/8/1921	DEN	STR	NW	SE	36	20S	66E	15000	STO	Y	8/8/1921	0	CL	LOS ANGELES-CITY
215	6580			10/27/1921	DEN	STR	SW	NE	12	21S	65E	0	PWR	Y	10/27/1921	2731011.440057	CL	SOUTHERN CALIFORNIA EDISON COMPANY
215	6581			10/27/1921	DEN	STR	SW	NE	12	21S	65E	18000	PWR	Y	10/27/1921	0	CL	SOUTHERN CALIFORNIA EDISON CO.
215	6608			1/7/1922	CAN	STR	NE	SW	14	21S	63E	1	IRR	Y	1/7/1922	0	CL	WOODARD, J.W.
215	66085E			2/17/2000	EXP	UG	NW	SW	05	19S	68E	0.005	ENV		2/17/2000	0.55	CL	SEVEN CROWN RESORTS, INC
215	66108			2/28/2000	PER	UG	NE	NW	35	21S	63E	0.06	COM		2/28/2000	1.350316	CL	LAKER PLAZA, INC.
215	66163			3/17/2000	ABR	UG	SW	NW	18	19S	64E	2	QM	Y	12/10/1990	0	CL	DRY LAKE WATER, L.L.C.
CHANGED BY: 69791T						WDR	UG											
CHANGED BY: 67139T						EXP	UG											
CHANGED BY: 68652T						EXP	UG											
CHANGED BY: 68353						ABR	UG											
215	66164			3/17/2000	ABR	UG	SW	NW	18	19S	64E	0.19	QM	Y	10/18/1988	0	CL	DRY LAKE WATER, L.L.C.
CHANGED BY: 68653T						EXP	UG											
CHANGED BY: 69792T						WDR	UG											
CHANGED BY: 67140T						EXP	UG											
CHANGED BY: 68352						ABR	UG											
215	66165			3/17/2000	ABR	UG	SW	NW	18	19S	64E	0.75	QM	Y	6/21/1988	0	CL	DRY LAKE WATER COMPANY, L.L.C.
CHANGED BY: 67141T						EXP	UG											
CHANGED BY: 68654T						EXP	UG											

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
		CHANGED BY: 69793T			WDR	UG												
		CHANGED BY: 68351			ABR	UG												
215	66166			3/17/2000	ABR	UG	SW	NW	18	19S	64E	0.165	QM	Y	10/18/1988	0	CL	DRY LAKE WATER COMPANY, L.L.C.
		CHANGED BY: 69794T			WDR	UG												
		CHANGED BY: 68655T			EXP	UG												
		CHANGED BY: 68350			PER	UG												
215	66872			10/16/2000	WDR	UG	SW	SW	26	21S	63E	0	QM		2/19/1952	1	CL	BERTUCCINI, PAUL DINO
215	66973E			12/4/2000	EXP	UG	NW	SW	05	19S	68E	0.005	ENV		12/4/2000	0.55	CL	SEVEN CROWN RESORTS DBA ECHO BAY RES
215	67139T			1/16/2001	EXP	UG	NE	NE	13	19S	63E	1.175	QM	Y	4/17/1998	348	CL	DRY LAKE WATER COMPANY, LLC.
215	67140T			1/16/2001	EXP	UG	NW	NW	12	19S	63E	0.19	QM	Y	4/17/1998	137.55	CL	DRY LAKE WATER COMPANY, LLC.
215	67141T			1/16/2001	EXP	UG	NW	NE	13	19S	63E	0.414	QM	Y	6/21/1988	300	CL	DRY LAKE WATER COMPANY, LLC.
215	67527			5/15/2001	WDR	UG	SE	SE	29	20S	64E	0.33	MM		10/18/1988	0	CL	SANDIA CONSTRUCTION INC.,A NEV. CORP
215	67893			8/8/2001	DEN	UG	NE	NW	36	19S	63E	10	QM		8/8/2001	0	CL	DRY LAKE WATER, L.L.C.
215	68019			9/18/2001	WDR	UG	NE	NE	13	19S	63E	2.01	QM		10/10/1995	1455.180 313	CL	DAWSON, LAREEN ET AL
215	68020			9/18/2001	WDR	UG	NW	NW	12	19S	63E	2.01	QM		10/10/1995	1455.180 313	CL	DAWSON, LAREEN ET AL
215	68021			9/18/2001	WDR	UG	NE	NE	13	19S	63E	2.01	QM		10/10/1995	1455.180 313	CL	DAWSON, LAREEN ET AL
215	68022			9/18/2001	WDR	UG	NW	NE	13	19S	63E	2.01	QM		10/10/1995	1455.180 313	CL	DAWSON, LAREE ET AL
215	68072			10/9/2001	WDR	UG	NW	NW	04	20S	64E	15	PWR		10/9/2001	0	CL	SILVER STATE WATER CO., LLC
215	6815			11/6/1922	DEN	STR			28	22S	65E	180000	PWR	Y	11/6/1922	0	CL	STETSON, G. HENRY
215	6816			11/6/1922	DEN	STR				21S	65E	180000	PWR	Y	11/6/1922	0	CL	STETSON, G. HENRY
215	6817			11/6/1922	DEN	STR				21S	65E	0	PWR	Y	11/6/1922	0	CL	STETSON, G. HENRY
215	6818			11/6/1922	DEN	STR				21S	65E	0	PWR	Y	11/6/1922	0	CL	STETSON, G. HENRY
215	6833			12/8/1922	CAN	OSW	NE	SW	11	20S	65E	20	MM	Y	12/8/1922	2000.002 13	CL	WEST END CHEMICAL COMPANY

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
215	68350			1/11/2002	PER	UG	NE	NE	13	19S	63E	0.165	QM	Y	10/18/1988	33.44	CL	DRY LAKE WATER, LLC
		CHANGED BY: 87597T			DEN	UG												
		CHANGED BY: 87065T			EXP	UG												
		CHANGED BY: 88873T			PER	UG												
		CHANGED BY: 88874T			PER	UG												
215	68351			1/11/2002	ABR	UG	NE	NE	13	19S	63E	0.75	QM	Y	6/21/1988	0	CL	DRY LAKE WATER, LLC
		CHANGED BY: 88875T			PER	UG												
215	68352			1/11/2002	ABR	UG	NE	NE	13	19S	63E	0.19	QM	Y	10/18/1988	0	CL	DRY LAKE WATER, LLC
		CHANGED BY: 87596T			DEN	UG												
		CHANGED BY: 87066T			EXP	UG												
		CHANGED BY: 88876T			PER	UG												
215	68353			1/11/2002	ABR	UG	NW	NE	13	19S	63E	2	QM	Y	12/10/1990	0	CL	DRY LAKE WATER, LLC
		CHANGED BY: 88877T			PER	UG												
215	68652T			3/26/2002	EXP	UG	NW	NE	13	19S	63E	2	QM	Y	4/17/1998	592.06	CL	DRY LAKE WATER COMPANY, LLC
215	68653T			3/26/2002	EXP	UG	NE	NE	13	19S	63E	0.19	QM	Y	4/17/1998	137.55	CL	DRY LAKE WATER COMPANY, LLC
215	68654T			3/26/2002	EXP	UG	NE	NE	13	19S	63E	0.75	QM	Y	6/21/1988	542.98	CL	DRY LAKE WATER COMPANY, LLC
215	68655T			3/26/2002	EXP	UG	NE	NE	13	19S	63E	0.165	QM	Y	6/21/1988	119.44	CL	DRY LAKE WATER COMPANY, LLC
215	6866			2/26/1923	CAN	SPR				20S	65E	0	QM	Y	2/26/1923		CL	TRACY, E.H.
215	69319E			11/13/2002	CAN	OSW	SE	SW	22	21S	63E	638	QM		11/13/2002	2029	CL	TRILYN PARTNERS, LLC
215	69791T			3/31/2003	WDR	UG	NW	NE	13	19S	63E	2	QM		4/17/1998	592.06	CL	DRY LAKE WATER, LLC
215	69792T			3/31/2003	WDR	UG	NE	NE	13	19S	63E	0.19	QM		4/17/1998	137.58	CL	DRY LAKE WATER, LLC
215	69793T			3/31/2003	WDR	UG	NE	NE	13	19S	63E	0.75	QM		6/21/1988	542.98	CL	DRY LAKE WATER, LLC
215	69794T			3/31/2003	WDR	UG	NE	NE	13	19S	63E	0.165	QM		6/21/1988	119.44	CL	DRY LAKE WATER, LLC

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
215	70441T			9/26/2003	EXP	UG	SW	SW	22	21S	63E	1	QM	Y	1/4/2001	723.97	CL	LAKE LAS VEGAS JOINT VENTURE, INC.
215	70515			10/16/2003	CAN	OSW	SE	SW	22	21S	63E	0	QM		10/16/2003	0	CL	LAKE AT LAS VEGAS JOINT VENTURE
215	70863			2/2/2004	WDR	OSW		SE	22	21S	63E	0	QM		2/2/2004	0	CL	LAKE LAS VEGAS JOINT VENTURE
215	72759			5/11/2005	PER	UG	NE	SE	29	20S	64E	0.3951	MM	Y	10/18/1988	285.96	CL	PACIFIC COAST BUILDING PRODUCTS, INC
215	72760			5/11/2005	PER	UG	NE	SE	29	20S	64E	0.33	MM	Y	10/18/1988	241.32	CL	PACIFIC COAST BUILDING PRODUCTS, INC
		CHANGED BY: 85758T			EXP	UG												
		CHANGED BY: 85757T			EXP	UG												
215	72761			5/11/2005	PER	UG	SE	SE	29	20S	64E	0.75	MM	Y	6/21/1988	527.275	CL	PACIFIC COAST BUILDING PRODUCTS, INC
		CHANGED BY: 89063T			RFA	UG												
215	72762			5/11/2005	PER	UG	NE	SE	29	20S	64E	0.17	MM	Y	10/18/1988	121.88	CL	PACIFIC COAST BUILDING PRODUCTS, INC
215	751			12/10/1907	CAN	SPR		NW	07	18S	68E	0	IRR	Y	12/10/1907	0	CL	SYPHUS, E.H. ET.AL.
215	76354			10/5/2007	DEN	UG	NW	SW	26	20S	64E	20	PWR		10/5/2007	0	CL	MICHAEL RUETH BLUEWATER DIAMOND MINE
215	76617			1/11/2008	DEN	UG	SE	NW	27	20S	64E	20	PWR		1/11/2008	0	CL	MICHAEL A RUETH BLUEWATER DIAMOND MINE
215	76806			3/11/2008	ABR	UG	SW	SW	30	17S	67E	0.1	QM		3/11/2008	4	CL	NEVADA-PARKS DIVISION
		CHANGED BY: 86265			PER	UG												
215	76861			3/27/2008	PER	EFF	NE	SW	07	20S	64E	0.385	STO		3/27/2008	108	CL	NEVADA COGENERATION ASSOCIATES #2
		CHANGED BY: 76861S03			DEN	EFF												
		CHANGED BY: 76861S02			PER	EFF												
		CHANGED BY: 76861S01			PER	EFF												
		CHANGED BY: 76861S04			PER	EFF												
215	76861S01			6/30/2009	PER	EFF	NE	SW	07	20S	64E	0.075	MM		3/27/2008	54	CL	PIONEER GYPSUM MINING INC
215	76861S02			7/30/2009	PER	EFF	NE	SW	07	20S	64E	0.075	OTH		3/27/2008	54	CL	PABCO BUILDING PRODUCTS LLC
215	76861S03			2/10/2016	DEN	EFF	NE	SW	07	20S	64E	0.155	COM		2/10/2016	112	CL	V.T. CONSTRUCTION, INC.

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215	76861S04			7/12/2018	PER	EFF	NE	SW	07	20S	64E	0.235	CON		3/27/2008	170.73	CL	STURGEON ELECTRIC COMPANY
215	76939			4/15/2008	WDR	UG	NE	SW	06	18S	66EH	0.0156	QM		5/5/1975	2.3935	CL	NEVADA-PARKS DIVISION
215	770			12/31/1907	CAN	STR			07	18S	68E	0	PWR	Y	12/31/1907	0	CL	SYPHUS, E.H. ET.AL.
215	7749			5/12/1926	WDR	STR	NW	NW	13	17S	68E	29.4	IRR	Y	5/12/1926	0	CL	NEVADA FIRE INSURANCE COMPANY
215	7834			7/31/1926	DEN	STR	NW	NW	13	17S	68E	12.5	IRR	Y	7/31/1926	0	CL	SYPHUS, LEVI W. TRUSTEE
215	79463			2/2/2010	RFP	STR	NE	NW	11	22S	64E	700	MUN		2/2/2010	150000	CL	SOUTHERN NEVADA WATER AUTHORITY
215	79464			2/2/2010	RFP	STR	NE	NW	11	22S	64E	100	MUN		2/2/2010	30000	CL	SOUTHERN NEVADA WATER AUTHORITY
215	79908			6/15/2010	DEN	UG	SW	SE	05	20S	64E	1.5	MM		9/4/1992	250	CL	JAMES DAWSON 10%
215	79909			6/15/2010	DEN	UG	SE	SE	02	20S	63E	2.01	MM		10/10/1995	250	CL	JAMES DAWSON 10%
215	79910			6/15/2010	DEN	UG	NE	NE	15	20S	64E	2.01	MM		10/10/1995	250	CL	JAMES DAWSON 10%
215	85757T			12/23/2015	EXP	UG	SE	NW	12	20S	63E	0.0825	MM		10/18/1988	60.33	CL	PACIFIC COAST BUILDING PRODUCTS, LLC
215	85758T			12/23/2015	EXP	UG	SW	NW	12	20S	63E	0.0825	MM		10/18/1988	60.33	CL	PACIFIC COAST BUILDING PRODUCTS, LLC
215	8618			7/13/1928	CAN	SPR	NE	SE	12	18S	67E	1.75	IRR	Y			CL	SYPHUS, LEVI W.
215	86265			6/10/2016	PER	UG	SE	SW	30	17S	67E	0.1	QM	Y	3/11/2008	4	CL	NEVADA-STATE PARKS DIVISION
215	86954			2/24/2017	PER	UG	NW	SW	30	17S	67E	0.0156	QM	Y	5/5/1975	2.39	CL	NEVADA-STATE PARKS DIVISION
215	87065T			4/19/2017	EXP	UG	NE	NE	13	19S	63E	0.159	QM	Y	10/18/1988	0	CL	DRY LAKE WATER, LLC
215	87066T			4/19/2017	EXP	UG	NE	NE	13	19S	63E	0.186	QM	Y	10/18/1988	0	CL	DRY LAKE WATER, LLC
215	87105			5/8/2017	RFA	OSW	SE	SW	22	21S	63E	0	QM		5/8/2017	2000	CL	LAKE LAS VEGAS MASTER ASSOCIATION
215	87596T			1/22/2018	DEN	UG	NE	SE	13	19S	63E	0	QM		10/18/1988	0	CL	DRY LAKE WATER, LLC
215	87597T			1/22/2018	DEN	UG	NE	SE	13	19S	63E	0	QM		10/18/1988	0	CL	DRY LAKE WATER, LLC
215	89063T			7/23/2019	RFA	UG	NE	SE	13	19S	63E	0.75	MM		6/21/1988	527.275	CL	PACIFIC COAST BUILDING PRODUCTS, INC.

Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('216')

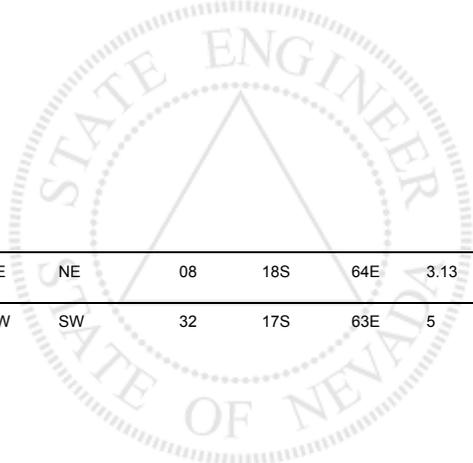
Run Date: 8/22/2019 8:57:08 AM

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
216	13825			9/7/1951	CAN	UG			31	17S	64E	1.5	IRR		9/7/1951	0	CL	MOHLER, MRS. DAISY P.
216	14320			6/3/1952	CAN	UG		S2	06	18S	64E	4.5	IRR		6/3/1952		CL	MCLENNAN, G.W.
216	18140		5115	7/24/1959	ABR	UG	SW	SW	21	17S	64E	0.1	DOM		7/24/1959	0	CL	TECHNICHROME
		CHANGED BY: 83553			PER	UG												
216	24015			7/24/1967	ABR	UG	NW	NW	07	18S	64E	0.5	MM		7/24/1967	0	CL	CHEMSTAR, INC.
		CHANGED BY: 26277			ABR	UG												
216	26277		8462	8/30/1971	ABR	UG	NW	NE	14	18S	63E	0.22	MM		7/24/1967	0	CL	CHEMICAL LIME COMPANY OF ARIZONA
		CHANGED BY: 65125T			EXP	UG												
		CHANGED BY: 64880			CER	UG												
216	32519			6/30/1977	DEN	UG	NW	SW	36	16S	63E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32520			6/30/1977	DEN	UG	NW	NW	36	16S	63E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32521			6/30/1977	DEN	UG	NW	SW	31	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32522			6/30/1977	DEN	UG	NW	NW	31	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32523			6/30/1977	DEN	UG	NW	NW	32	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32524			6/30/1977	DEN	UG	NW	SW	32	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32525			6/30/1977	DEN	UG	NW	NW	33	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32526			6/30/1977	DEN	UG	NW	SW	33	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32527			6/30/1977	DEN	UG	NW	NW	34	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32528			6/30/1977	DEN	UG	NW	SW	34	16S	64E	5.4	IRR		6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK

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216	32529			6/30/1977	DEN	UG	NE	NE	09	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32530			6/30/1977	DEN	UG	SE	SE	09	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32531			6/30/1977	DEN	UG	NW	NW	08	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32532			6/30/1977	DEN	UG	NW	SW	08	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32533			6/30/1977	DEN	UG	NE	NE	07	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32534			6/30/1977	DEN	UG	NE	NW	07	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32535			6/30/1977	DEN	UG	NE	NE	18	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32536			6/30/1977	DEN	UG	NE	NE	17	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32537			6/30/1977	DEN	UG	NE	NW	20	17S	64E	5.4	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32538			6/30/1977	DEN	UG	NE	SW	17	17S	64E	2.7	IRR	6/30/1977	0	CL	COYOTE VALLEY WATER LAND & LIVESTK
216	32765			7/11/1977	CAN	UG	E2	E2	09	17S	63E	2.7	IRR	7/11/1977	0	CL	BOWMAN, DOLPH SR.
216	32766			7/11/1977	CAN	UG	NE	SE	32	17S	63E	2.7	IRR	7/11/1977	0	CL	SHAKES, GARY STEVEN
216	34097			10/13/1977	CAN	UG		SE	31	17S	64E	2.7	IRR	10/13/1977	0	CL	STENGER, JOSEPH WILLIAM
216	34399			10/25/1977	CAN	UG		NW	17	18S	63E	2.7	IRC	10/25/1977	0	CL	CANFIELD, DONNA LEE
216	37128			3/22/1979	CAN	UG	NE	NE	17	17S	64E	5.4	IRR	3/22/1979	0	CL	LEAVITT, JOHN
216	37129			3/22/1979	DEN	UG	NW	NW	31	16S	64E	5.4	IRD	3/22/1979	0	CL	LEAVITT, MISHIE
216	37200			3/26/1979	DEN	UG	NE	NE	31	16S	64E	5.4	IRD	3/26/1979	0	CL	HARDY, RICHARD
216	37206			3/26/1979	DEN	UG	NE	NE	17	17S	64E	5.4	IRR	3/26/1979	0	CL	LUZI, CHERI LYNN
216	37209			3/26/1979	DEN	UG	NW	NE	07	17S	64E	5.4	IRD	3/26/1979	0	CL	LEAVITT, LINDA K.
216	37211			3/26/1979	DEN	UG	NW	NW	07	17S	64E	5.4	IRD	3/26/1979	0	CL	LEAVITT, RICHARD G.
216	37216			3/26/1979	DEN	UG	NW	NW	17	17S	64E	5.4	IRD	3/26/1979	0	CL	JOSEPH, JEFF
216	37217			3/26/1979	DEN	UG	NW	NE	08	17S	64E	5.4	IRD	3/26/1979	0	CL	BUTLER, MARILYN
216	37218			3/26/1979	DEN	UG	NW	NW	18	17S	64E	5.4	IRD	3/26/1979	0	CL	BUTLER, TOM

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216	37255			3/27/1979	DEN	UG	NW	NW	33	16S	64E	5.4	IRD		3/27/1979	0	CL	LEAVITT, LOIS
216	37379			3/30/1979	DEN	UG	NE	NW	09	17S	64E	5.4	IRD		3/30/1979	0	CL	SLOAN, H.MILLARD
216	37383			3/30/1979	DEN	UG	NE	NE	32	16S	64E	5.4	IRD		3/30/1979	0	CL	LINFORD, ESTHER B.
216	37384			3/30/1979	DEN	UG	NW	NW	32	16S	64E	5.4	IRD		3/30/1979	0	CL	LINFORD, DON C.
216	43533			4/14/1981	CAN	UG	SE	SE	07	18S	64E	1	IND		1/28/1988	0	CL	U.S. STEEL CORPORATION
216	44173			7/20/1981	ABR	UG		TR38	21	17S	64E	0.15	QM		7/20/1981	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 60890T			WDR	UG												
		CHANGED BY: 60023T			EXP	UG												
		CHANGED BY: 60022			ABR	UG												
216	44664			10/20/1981	ABR	UG		TR38	21	17S	64E	0.46	COM		10/20/1981	0	CL	KERR-MCGEE CHEMICAL CORPORATION
		CHANGED BY: 55674			ABR	UG												
		CHANGED BY: 55673T			EXP	UG												
216	49164			6/28/1985	CAN	UG	SE	NW	22	18S	63E	1	IRD		6/28/1985	460.06	CL	TRYTHALL, DEBRA L.
216	49165			6/28/1985	CAN	UG	NE	SW	22	18S	63E	1	IRD		6/28/1985	0	CL	HICKOK, PATRICIA A.
216	49166			6/28/1985	CAN	UG	SE	NW	27	18S	63E	1	IRD		6/28/1985	460.06	CL	NESSEN, BARBARA T.
216	49167			6/28/1985	CAN	UG	NE	SW	27	18S	63E	1	IRD		6/28/1985	972	CL	NESSEN, KENNETH
216	50316			10/28/1986	ABR	UG	NW	SE	34	18S	63E	0.35	IND		10/28/1986	0	CL	GEORGIA-PACIFIC CORPORATION
		CHANGED BY: 55275T			EXP	UG												
		CHANGED BY: 56855			CER	UG												
216	50663			3/6/1987	ABR	UG	SW	SW	04	18S	64E	1.34	MM		3/6/1987	0	CL	GREAT STAR CEMENT CORPORATION
		CHANGED BY: 66784			PER	UG												
216	52585			10/3/1988	ABR	UG	NE	NW	19	18S	64E	1	IND		10/3/1988	0	CL	CLARK SANITATION, INC.
		CHANGED BY: 53322			ABR	UG												

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216	53322			5/26/1989	ABR	UG	SW	NE	18	18S	64E	1	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 59237			ABR	UG												
		CHANGED BY: 59216T			EXP	UG												
		CHANGED BY: 62494T			EXP	UG												
		CHANGED BY: 61750			WDR	UG												
		CHANGED BY: 63587			ABR	UG												
		CHANGED BY: 60623			ABR	UG												
		CHANGED BY: 62934T			EXP	UG												
		CHANGED BY: 63585			ABR	UG												
		CHANGED BY: 62935T			EXP	UG												
		CHANGED BY: 63586			ABR	UG												
		CHANGED BY: 67711			ABR	UG												
216	53366			6/8/1989	DEN	UG	SE	NE	08	18S	64E	3.13	MM		6/8/1989	0	CL	GREAT STAR CEMENT CORPORATION
216	54073			10/17/1989	PER	UG	SW	SW	32	17S	63E	5	MUN	Y	10/17/1989	150.21	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 71521T			EXP	UG												
		CHANGED BY: 72799T			EXP	UG												
		CHANGED BY: 68056T			WDR	UG												
		CHANGED BY: 68161T			EXP	UG												
		CHANGED BY: 67595T			WDR	UG												
		CHANGED BY: 67650			WDR	UG												
		CHANGED BY: 68784T			EXP	UG												
		CHANGED BY: 68837T			EXP	UG												
		CHANGED BY: 77642T			EXP	UG												



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		CHANGED BY: 77643T			EXP	UG											
		CHANGED BY: 72798			ABR	UG											
		CHANGED BY: 78954T			EXP	UG											
		CHANGED BY: 73149			ABR	UG											
		CHANGED BY: 73150			ABR	UG											
		CHANGED BY: 73151			ABR	UG											
		CHANGED BY: 86467T			EXP	UG											
		CHANGED BY: 83490			PER	UG											
		CHANGED BY: 68822			PER	UG											
216	54130			10/30/1989	DEN	UG	SE	NE	34	18S	63E	2.3	IND	10/30/1989	1665.13	CL	BONNEVILLE NEVADA CORPORATION
216	54232			12/14/1989	DEN	UG	NW	NW	16	18S	63E	0.3	COM	12/14/1989		CL	KERR-MCGEE CHEMICAL CORPORATION
216	54348			1/19/1990	DEN	UG	SW	SW	12	18S	63E	0.3	IND	1/19/1990	0	CL	ADAMS, JAMES W.
216	54349			1/19/1990	DEN	UG	SE	SE	11	18S	63E	0.15	IND	1/19/1990		CL	ADAMS, JAMES W.
216	54350			1/19/1990	DEN	UG	NW	SE	11	18S	63E	0.3	IND	1/19/1990		CL	ADAMS, JAMES W.
216	54351			1/19/1990	DEN	UG	SW	NE	11	18S	63E	0.23	IND	1/19/1990		CL	ADAMS, JAMES W.
216	54352			1/19/1990	DEN	UG	SE	NW	11	18S	63E	0.23	IND	1/19/1990		CL	ADAMS, JAMES W.
216	54483			2/26/1990	DEN	UG	NW	NW	16	18S	63E	1	COM	2/26/1990		CL	KERR-MCGEE CHEMICAL CORPORATION
216	54484			2/26/1990	DEN	UG	SW	NE	02	18S	63E	2	IND	2/26/1990	1000	CL	NEVADA POWER COMPANY
		CHANGED BY: 79865			WDR	UG											
216	54697			4/26/1990	DEN	UG	SE	NW	03	19S	63E	1	MM	4/26/1990	723.9841 99	CL	AZTEC GLASS SAND CORPORATION
216	55099			7/19/1990	DEN	UG	SE	SE	07	18S	64E	1	IND	7/19/1990	724	CL	CONSTRUCTION PRODUCTS INC.
216	55275T			9/17/1990	EXP	UG	NE	SE	34	18S	63E	0.35	IND	10/28/1986	168.0222 75	CL	GEORGIA-PACIFIC CORPORATION
216	55673T			1/24/1991	EXP	UG	NW	NW	16	18S	63E	0.46	COM	10/20/1981	308.02	CL	KERR-MCGEE CHEMICAL CORPORATION

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216	55674		16705	1/24/1991	ABR	UG	NW	NW	16	18S	63E	0.46	COM		10/20/1981	0	CL	KAPEX, LLC
		CHANGED BY: 61041			ABR	UG												
		CHANGED BY: 61367			CAN	UG												
		CHANGED BY: 63356T			EXP	UG												
		CHANGED BY: 63261			CER	UG												
		CHANGED BY: 63348			CER	UG												
		CHANGED BY: 77745			CER	UG												
216	56855		14449	10/22/1991	CER	UG	SE	NE	34	18S	63E	0.35	IND		10/28/1986	144.1462 33	CL	GEORGIA PACIFIC CORPORATION
216	57011			12/16/1991	DEN	UG	NW	NE	11	18S	63E	8.8	IND		12/16/1991	6370.936	CL	ADAMS, JAMES W.
216	59216T			9/7/1993	EXP	UG	NW	NE	19	18S	64E	0.5	IND		10/3/1988	137	CL	CLARK SANITATION INC.
216	59237		15391	9/16/1993	ABR	UG	NW	NE	19	18S	64E	0.25	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 60624			ABR	UG												
		CHANGED BY: 67712			ABR	UG												
216	60022			4/27/1994	ABR	UG	NW	SW	21	17S	64E	0.15	IND		7/20/1981	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 67880T			EXP	UG												
		CHANGED BY: 64452T			EXP	UG												
		CHANGED BY: 63610T			WDR	UG												
		CHANGED BY: 67476T			EXP	UG												
		CHANGED BY: 74399			CER	UG												
216	60023T			4/27/1994	EXP	UG	NW	SW	21	17S	64E	0.15	IND		7/20/1981	74.56999 99	CL	NEVADA POWER COMPANY
216	60623			10/28/1994	ABR	UG	SE	SE	07	18S	64E	0.25	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 63589			ABR	UG												
216	60624			10/28/1994	ABR	UG	SE	SE	07	18S	64E	0.25	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES

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		CHANGED BY: 63590			ABR	UG												
		CHANGED BY: 67713			ABR	UG												
216	60890T			2/1/1995	WDR	UG	SW	NW	36	17S	63E	0.15	IND	7/20/1981	CL	NEVADA POWER COMPANY		
216	61041			3/15/1995	ABR	UG	SE	SE	07	18S	64E	0.29	IND	10/20/1981	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES	
		CHANGED BY: 63588			ABR	UG												
216	61367			7/3/1995	CAN	UG	NW	NE	03	19S	63E	0.46	COM	10/20/1981	4	CL	WESTERN GYPSUM, INC.	
216	61750			12/18/1995	WDR	UG	NE	SW	19	18S	64E	0	IND	10/3/1988		CL	CLARK SANITATION, INC.	
216	62494T			10/2/1996	EXP	UG	SE	SE	07	18S	64E	0.048	IND	10/3/1988	34.53	CL	SILVER STATE DISPOSAL SERVICE, INC.	
216	62934T			3/24/1997	EXP	UG	SE	SW	19	18S	64E	0.001	IND	10/3/1988	0.122756	CL	ENVIRONMENTAL TECHNOLOGIES OF NV, INC	
216	62935T			3/24/1997	EXP	UG	NE	NW	20	18S	64E	0.001	IND	10/3/1988	0.122756	CL	ENVIRONMENTAL TECHNOLOGIES OF NV, INC	
216	62996			4/3/1997	DEN	UG	NE	NE	14	16S	63E	8.35	IND	4/3/1997	6045.15	CL	NEVADA POWER COMPANY	
216	62998			4/3/1997	DEN	UG	SW	NE	11	16S	63E	8.35	IND	4/3/1997	6045.15	CL	NEVADA POWER COMPANY	
216	63261		16751	7/21/1997	CER	UG	NE	NE	14	18S	63E	0.149	COM	Y	10/20/1981	100	CL	CHEMICAL LIME COMPANY OF ARIZONA
216	63348		15682	8/19/1997	CER	UG	NE	SW	13	18S	63E	0.006	COM	10/20/1981	4	CL	WESTERN MINING & MINERALS, INC.	
216	63356T			8/26/1997	EXP	UG		N2	13	18S	63E	0.006	COM	10/20/1981	4.357838	CL	WESTERN GYPSUM, INC.	
216	63585			11/25/1997	ABR	UG	NE	NW	20	18S	64E	0.001	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.
		CHANGED BY: 67714			ABR	UG												
216	63586			11/25/1997	ABR	UG	SE	SE	07	18S	64E	0.149	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.
		CHANGED BY: 67715			ABR	UG												
216	63587			11/25/1997	ABR	UG	NW	NE	19	18S	64E	0.1004	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.
		CHANGED BY: 67716			ABR	UG												
		CHANGED BY: 67717			ABR	UG												
216	63588			11/25/1997	ABR	UG	SE	SW	19	18S	64E	0.29	IND	Y	10/20/1981	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.

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		CHANGED BY: 67718			ABR	UG												
216	63589			11/25/1997	ABR	UG	NW	NE	19	18S	64E	0.25	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.
		CHANGED BY: 67719			ABR	UG												
216	63590			11/25/1997	ABR	UG	SE	SE	07	18S	64E	0.25	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECH., INC.
		CHANGED BY: 67720			ABR	UG												
216	63610T			12/9/1997	WDR	UG	NW	SW	21	17S	64E	0.15	CON		7/20/1981	74	CL	NEVADA POWER COMPANY
216	64040			4/17/1998	DEN	UG	NW	NW	29	17S	64E	10	QM		4/17/1998	7239.7	CL	DRY LAKE WATER, L.L.C.
216	64045			4/17/1998	DEN	UG	NE	NE	32	17S	63E	10	QM		4/17/1998	7239.7	CL	DRY LAKE WATER, L.L.C.
216	64222			6/12/1998	DEN	UG	SE	SE	09	17S	64E	1.11	IND		6/12/1998	807	CL	NEVADA POWER COMPANY
216	64223			6/12/1998	DEN	UG	SW	SW	10	17S	64E	1.11	IND		6/12/1998	807	CL	NEVADA POWER COMPANY
216	64452T			9/17/1998	EXP	UG	NW	SW	10	17S	64E	0.15	IND		7/20/1981	74	CL	NEVADA POWER COMPANY
216	64880		16864	3/1/1999	CER	UG	SW	SE	23	18S	63E	0.22	MM	Y	7/24/1967	133.81	CL	CHEMICAL LIME COMPANY
216	65125T			5/19/1999	EXP	UG	SW	SE	23	18S	63E	0.22	MM		7/24/1967	150.3761	CL	CHEMICAL LIME COMPANY
216	65950			1/28/2000	WDR	UG	SE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
216	65951			1/28/2000	WDR	UG	NE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
216	65952			1/28/2000	WDR	UG	SW	SE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
216	65953			1/28/2000	WDR	UG	SW	NW	23	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
216	66784			8/25/2000	PER	UG	NE	NE	27	18S	63E	1.34	QM	Y	3/6/1987	156.84	CL	DRY LAKE WATER, LLC
216	66785			8/25/2000	PER	UG	NE	NE	32	17S	63E	1.34	QM	Y	8/25/2000	46.84	CL	DRY LAKE WATER, LLC
		CHANGED BY: 72098			CER	UG												
		CHANGED BY: 74064			ABR	UG												
		CHANGED BY: 79948			PER	UG												
		CHANGED BY: 77389			PER	UG												

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216	67476T			5/3/2001	EXP	UG	NW	SW	21	17S	64E	0.05	IND		7/20/1981	24.85809	CL	NEVADA POWER COMPANY
216	67595T			5/21/2001	WDR	UG	NW	NW	16	18S	63E	1.136	PWR		10/17/1989	500	CL	LAS VEGAS VALLEY WATER DISTRICT
216	67650			6/7/2001	WDR	UG	NE	NE	15	18S	63E	1.59	MUN		10/17/1989	700	CL	LAS VEGAS VALLEY WATER DISTRICT
		CHANGED BY: 71807T			EXP	UG												
		CHANGED BY: 68541T			EXP	UG												
		CHANGED BY: 77605T			WDR	UG												
		CHANGED BY: 77604T			WDR	UG												
216	67711			6/28/2001	ABR	UG	SW	NE	18	18S	64E	0.0004	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83707			CER	UG												
216	67712			6/28/2001	ABR	UG	SW	NE	18	18S	64E	0.25	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 82841T			WDR	UG												
		CHANGED BY: 83708			PER	UG												
216	67713			6/28/2001	ABR	UG	SE	SE	07	18S	64E	0	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83709			PER	UG												
216	67714			6/28/2001	ABR	UG	NE	NW	20	18S	64E	0.0004	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83710			CER	UG												
216	67715			6/28/2001	ABR	UG	SE	SE	07	18S	64E	0.149	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83711			PER	UG												
216	67716			6/28/2001	ABR	UG	NW	NE	19	18S	64E	0.014	IND	Y	10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 81009T			EXP	UG												
		CHANGED BY: 83712			PER	UG												
216	67717			6/28/2001	ABR	UG	SW	NE	18	18S	64E	0.0869	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83713			PER	UG												

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216	67718			6/28/2001	ABR	UG	SE	SW	19	18S	64E	0.29	IND		10/20/1981	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83715			PER	UG												
		CHANGED BY: 83714			CER	UG												
216	67719			6/28/2001	ABR	UG	SW	NE	18	18S	64E	0.25	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83716			PER	UG												
216	67720			6/28/2001	ABR	UG	SE	SE	07	18S	64E	0.25	IND		10/3/1988	0	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES
		CHANGED BY: 83717			CER	UG												
216	67880T			8/3/2001	EXP	UG	NW	SW	21	17S	64E	0.1	IND		7/20/1981	49.71618	CL	NEVADA POWER COMPANY
216	67894			8/8/2001	DEN	UG	NE	NE	32	17S	63E	10	QM		8/8/2001	7239.7	CL	DRY LAKE WATER, L.L.C.
216	68056T			10/3/2001	WDR	UG	NW	NW	16	18S	63E	1.136	MUN		10/17/1989	500	CL	LAS VEGAS VALLEY WATER DISTRICT
216	68161T			11/1/2001	EXP	UG	NE	NE	05	18S	63E	0.454	PWR		10/17/1989	200	CL	LAS VEGAS VALLEY WATER DISTRICT
216	68541T			3/6/2002	EXP	UG	NE	NE	15	18S	63E	1.367	MUN		10/17/1989	600	CL	LAS VEGAS VALLEY WATER DISTRICT
216	68784T			5/6/2002	EXP	UG	NE	SE	05	18S	63E	0.5	MUN		10/17/1989	220	CL	LAS VEGAS VALLEY WATER DISTRICT
216	68822			5/16/2002	PER	UG	NE	NE	05	18S	63E	1.591	MUN	Y	10/17/1989	350	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 79001			PER	UG												
		CHANGED BY: 86466T			EXP	UG												
		CHANGED BY: 88011T			EXP	UG												
216	68837T			5/24/2002	EXP	UG	NE	NE	05	18S	63E	1.136	MUN		10/17/1989	500	CL	LAS VEGAS VALLEY WATER DISTRICT
216	71521T			8/2/2004	EXP	UG	NE	SE	05	18S	63E	0.5	MUN		10/17/1989	220	CL	LAS VEGAS VALLEY WATER DISTRICT
216	71807T			10/22/2004	EXP	UG	NE	NE	15	18S	63E	1.367	MUN		10/17/1989	600	CL	LAS VEGAS VALLEY WATER DISTRICT
216	72098		19102	1/4/2005	CER	UG	SE	SW	13	18S	63E	0.1	QM	Y	8/25/2000	13.16	CL	DRY LAKE WATER, LLC
216	72798			5/18/2005	ABR	UG	NE	SE	05	18S	63E	0.795	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
		CHANGED BY: 79002			PER	UG												

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
216	72799T			5/18/2005	EXP	UG	NE	SE	05	18S	63E	0.795	MUN		10/17/1989	349.8	CL	LAS VEGAS VALLEY WATER DISTRICT
216	73149			8/12/2005	ABR	UG	NE	NE	15	18S	63E	0.53	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
		CHANGED BY: 79003			PER	UG												
216	73150			8/12/2005	ABR	UG	NE	NE	15	18S	63E	0.53	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
		CHANGED BY: 79004			PER	UG												
216	73151			8/12/2005	ABR	UG	NE	NE	15	18S	63E	0.53	MUN		10/17/1989	0	CL	LAS VEGAS VALLEY WATER DISTRICT
		CHANGED BY: 79005			PER	UG												
216	73732			1/20/2006	WDR	UG	SW	NE	04	18S	63E	1	MM		1/20/2006	0	CL	RINKER MATERIALS WEST, LLC.
216	74064			3/24/2006	ABR	UG	SW	NW	35	18S	63E	0.06	QM		8/25/2000	0	CL	DRY LAKE WATER, LLC
		CHANGED BY: 81344			PER	UG												
216	74399		17531	6/19/2006	CER	UG	NW	SW	21	17S	64E	0.15	IND	Y	7/20/1981	74.57	CL	NEVADA POWER COMPANY
216	74758			9/15/2006	DEN	UG	SW	NW	35	18S	63E	0.0028	COM		6/15/2006	2.02	CL	HARDY MANAGEMENT COMPANY, LLC
216	76632			1/16/2008	DEN	UG	NW	SW	13	18S	63E	0.00277	COM		1/16/2008	2	CL	INES ESQUIVEL
216	76862			3/27/2008	PER	EFF	SE	NE	34	18S	63E	0.385	STO		3/27/2008	278.73	CL	NEVADA COGENERATION ASSOCIATES #1
		CHANGED BY: 76862S01			CAN	EFF												
		CHANGED BY: 76862S02			WDR	STO												
		CHANGED BY: 76862S03			CAN	STO												
		CHANGED BY: 76862S04			DEN	EFF												
216	76862S01			8/19/2008	CAN	EFF	SE	NE	34	18S	63E	0.075	MM		3/27/2008	53.8	CL	RINKER MATERIALS WEST LLC
216	76862S02			4/13/2012	WDR	STO	SE	NE	34	18S	63E	0.0315	CON		3/27/2008	9.5	CL	STURGEON ELECTRIC COMPANY INC
216	76862S03			8/22/2012	CAN	STO	SE	NE	34	18S	63E	0.0315	OTH		3/27/2008	9.5	CL	LAS VEGAS PAVING CORP
216	76862S04			2/10/2016	DEN	EFF	SE	NE	34	18S	63E	0.155	COM		2/10/2016	112	CL	V.T. CONSTRUCTION, INC.
216	77389			9/15/2008	PER	UG	NW	SE	33	18S	63E	0.602	QM	Y	8/25/2000	80	CL	DRY LAKE WATER, LLC

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
216	77604T			11/18/2008	WDR	UG	NE	NE	14	18S	63E	0.0568	MM		10/17/1989	25	CL	LAS VEGAS VALLEY WATER DISTRICT
216	77605T			11/18/2008	WDR	UG	SW	SE	23	18S	63E	0.0568	MM		10/17/1989	25	CL	LAS VEGAS VALLEY WATER DISTRICT
216	77642T			11/26/2008	EXP	UG	SW	SE	23	18S	63E	0.057	MM	Y	10/17/1989	25	CL	LAS VEGAS VALLEY WATER DISTRICT
216	77643T			11/26/2008	EXP	UG	NE	NE	14	18S	63E	0.57	MM	Y	10/17/1989	25	CL	LAS VEGAS VALLEY WATER DISTRICT
216	77745		19642	1/7/2009	CER	UG	NW	NW	16	18S	63E	0.015	COM		10/20/1981	10.02	CL	NORTH LAS VEGAS-CITY
216	78954T			10/13/2009	EXP	UG	NW	SW	21	17S	64E	0.342	MUN		10/17/1989	150	CL	LAS VEGAS VALLEY WATER DISTRICT
216	79001			11/2/2009	PER	UG	NE	NE	05	18S	63E	0.7955	MUN	Y	10/17/1989	350	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 86468T	EXP	UG											
216	79002			11/2/2009	PER	UG	NE	SE	05	18S	63E	0.795	MUN	Y	10/17/1989	349.8	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 85856T	EXP	UG											
					CHANGED BY: 86970T	EXP	UG											
216	79003			11/2/2009	PER	UG	NW	SW	21	17S	64E	0.53	MUN	Y	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 85857T	EXP	UG											
					CHANGED BY: 86969T	EXP	UG											
216	79004			11/2/2009	PER	UG	NE	NE	15	18S	63E	0.53	MUN	Y	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 85858T	EXP	UG											
					CHANGED BY: 86968T	EXP	UG											
216	79005			11/2/2009	PER	UG	NE	NE	15	18S	63E	0.53	MUN	Y	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 85859T	EXP	UG											
					CHANGED BY: 86967T	EXP	UG											
216	79006			11/2/2009	PER	UG	NE	NE	05	18S	63E	1.2	MUN	Y	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	79007			11/2/2009	PER	UG	NE	SE	05	18S	63E	0.5	MUN	Y	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 85860T	EXP	UG											

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
		CHANGED BY: 86966T			EXP	UG												
216	79008			11/2/2009	PER	UG	NW	SW	21	17S	64E	1.5	MUN	Y	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 85861T			EXP	UG												
		CHANGED BY: 86965T			EXP	UG												
216	79009			11/2/2009	PER	UG	NE	NE	15	18S	63E	0.15	MUN	Y	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 85862T			EXP	UG												
		CHANGED BY: 86964T			EXP	UG												
216	79010			11/2/2009	PER	UG	NE	NE	15	18S	63E	1.6	MUN	Y	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 85863T			EXP	UG												
		CHANGED BY: 86963T			EXP	UG												
216	79354			1/28/2010	DEN	UG	SW	SW	32	17S	63E	10	MUN		1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	79687			3/15/2010	DEN	UG	SE	SE	09	17S	64E	1.11	IND		3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79688			3/15/2010	DEN	UG	NE	NE	14	16S	63E	8.35	IND		3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79689			3/15/2010	DEN	UG	NW	SW	10	17S	64E	1.11	IND		3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79691			3/15/2010	DEN	UG	SW	NE	11	16S	63E	8.35	IND		3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79865			5/21/2010	WDR	UG	NW	SW	21	17S	64E	2	PWR		2/26/1990	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79903			6/14/2010	DEN	UG	SW	NE	02	18S	63E	2	IND		6/14/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
216	79948			6/21/2010	PER	UG	SE	SW	13	18S	63E	0.226	QM	Y	8/25/2000	30	CL	DRY LAKE WATER LLC
216	81009T			7/28/2011	EXP	UG	NW	NE	19	18S	64E	0.0055	CON	Y	10/3/1988	1.5	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	81344			11/28/2011	PER	UG	SE	SW	13	18S	63E	0.06	QM	Y	8/25/2000	8	CL	DRY LAKE WATER LLC
216	82841T			5/31/2013	WDR	UG	SW	NE	18	18S	64E	0.12	CON		10/3/1988	32	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	83490			1/31/2014	PER	UG	NW	NW	16	18S	63E	0.68	MUN	Y	10/17/1989	300	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 87169T			EXP	UG												

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
216	83553			2/18/2014	PER	UG	SE	NE	03	19S	63E	0.07	IND		7/24/1959	3	CL	TECHNICHROME
216	83707		21125	4/11/2014	CER	UG	SW	NE	18	18S	64E	0.0004	IND	Y	10/3/1988	0.11	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	83708			4/11/2014	PER	UG	SW	NE	18	18S	64E	0.25	IND	Y	10/3/1988	68.5	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83709			4/11/2014	PER	UG	SE	SE	07	18S	64E	0.0004	IND	Y	10/3/1988	0.11	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	83710		21126	4/11/2014	CER	UG	NE	NW	20	18S	64E	0.0004	IND	Y	10/3/1988	0.11	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	83711			4/11/2014	PER	UG	NW	NE	19	18S	64E	0.1488	IND	Y	10/3/1988	40.78	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83712			4/11/2014	PER	UG	NW	NE	19	18S	64E	0.0135	IND	Y	10/3/1988	3.7	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83713			4/11/2014	PER	UG	NW	NE	19	18S	64E	0.0869	IND	Y	10/3/1988	23.8	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83714		21127	4/11/2014	CER	UG	SE	SW	19	18S	64E	0.235	IND	Y	10/20/1981	157	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	83715			4/11/2014	PER	UG	NW	NE	19	18S	64E	0.055	IND	Y	10/20/1981	37	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83716			4/11/2014	PER	UG	SW	NE	18	18S	64E	0.25	IND	Y	10/3/1988	68.5	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
						RFA	UG											
216	83717		21128	4/11/2014	CER	UG	SE	SE	07	18S	64E	0.2496	IND	Y	10/3/1988	68.39	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC
216	84041			7/1/2014	PER	UG	SE	SW	13	18S	63E	0.5	QM	Y	7/1/2014	40	CL	DRY LAKE WATER LLC
216	84042			7/1/2014	WDR	UG	SE	SW	13	18S	63E	0.5	QM		7/1/2014	40	CL	DRY LAKE WATER LLC
216	85852T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	0.41	MUN		9/27/1985	290	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85853T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	1.91	MUN		9/27/1985	1380	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85854T			1/14/2016	EXP	UG	NE	SE	05	18S	63E	1.47	MUN		9/27/1985	1060	CL	SOUTHERN NEVADA WATER AUTHORITY

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							Qtr-Qtr	Qtr	SEC	TWN							
216	85855T			1/14/2016	EXP	UG	NW	SW	21	17S	64E	0.38	MUN	9/27/1985	270	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85856T			1/14/2016	EXP	UG	NE	SE	05	18S	63E	0.795	MUN	10/17/1989	349.8	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85857T			1/14/2016	EXP	UG	NW	SW	21	17S	64E	0.53	MUN	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85858T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	0.53	MUN	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85859T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	0.53	MUN	10/17/1989	233.33	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85860T			1/14/2016	EXP	UG	NE	SE	05	18S	63E	0.5	MUN	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85861T			1/14/2016	EXP	UG	NW	SW	21	17S	64E	1.5	MUN	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85862T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	0.15	MUN	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	85863T			1/14/2016	EXP	UG	NE	NE	15	18S	63E	1.6	MUN	11/2/2009	0	CL	SOUTHERN NEVADA WATER AUTHORITY
216	86195T			5/6/2016	EXP	UG	NW	SW	33	17S	63E	1.53	CON	Y 9/27/1985	1000	CL	SOUTHERN NEVADA WATER AUTHORITY
216	86466T			9/23/2016	EXP	UG	NE	SE	08	18S	63E	0.795	MUN	Y 10/17/1989	0	CL	SNWA
216	86467T			9/23/2016	EXP	UG	NE	SE	08	18S	63E	0.344	MUN	Y 10/17/1989	150.21	CL	SNWA
216	86468T			9/23/2016	EXP	UG	NE	SE	08	18S	63E	0.12	MUN	Y 10/17/1989	80	CL	SNWA
216	86959T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	1.91	MUN	Y 9/27/1985	1380	CL	SNWA
216	86960T			2/27/2017	EXP	UG	NE	SE	05	18S	63E	1.47	MUN	Y 9/27/1985	1060	CL	SNWA
216	86961T			2/27/2017	EXP	UG	NW	SW	21	17S	64E	0.38	MUN	Y 9/27/1985	0	CL	SNWA
216	86962T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	0.41	MUN	Y 9/27/1985	290	CL	SNWA
216	86963T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	1.6	MUN	Y 11/2/2009	0	CL	SNWA
216	86964T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	0.15	MUN	Y 11/2/2009	0	CL	SNWA
216	86965T			2/27/2017	EXP	UG	NW	SW	21	17S	64E	1.5	MUN	Y 11/2/2009	0	CL	SNWA
216	86966T			2/27/2017	EXP	UG	NE	SE	05	18S	63E	0.5	MUN	Y 11/2/2009	0	CL	SNWA
216	86967T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	0.53	MUN	Y 10/17/1989	233.33	CL	SNWA
216	86968T			2/27/2017	EXP	UG	NE	NE	15	18S	63E	0.53	MUN	Y 10/17/1989	233.33	CL	SNWA

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216	86969T			2/27/2017	EXP	UG	NW	SW	21	17S	64E	0.53	MUN	Y	10/17/1989	233.33	CL	SNWA
216	86970T			2/27/2017	EXP	UG	NE	SE	05	18S	63E	0.795	MUN	Y	10/17/1989	349.8	CL	SNWA
216	87102T			5/5/2017	EXP	UG	NW	SW	33	17S	63E	1.25	CON	Y	1/1/1900	900	CL	SNWA
216	87169T			6/16/2017	EXP	UG	NW	NE	02	18S	63E	0.007	COM		10/17/1989	5	CL	SNWA
216	87735			3/6/2018	RFP	UG	NE	NE	05	18S	63E	2.5	PWR		3/6/2018	1800	CL	NEVADA POWER COMPANY
216	87736			3/6/2018	RFP	UG	NE	NE	05	18S	63E	2.5	PWR		3/6/2018	1800	CL	NEVADA POWER COMPANY
216	87737			3/6/2018	WDR	UG	NE	NE	05	18S	63E	2.5	PWR		3/6/2018	1800	CL	NEVADA POWER COMPANY
216	87738			3/6/2018	RFP	UG	NE	NE	05	18S	63E	2.5	PWR		3/6/2018	1800	CL	NEVADA POWER COMPANY
216	88011T			5/25/2018	EXP	UG	NW	SW	33	17S	63E	0.795	CON		10/17/1989	0	CL	SNWA
216	88181			7/31/2018	RFP	UG	NE	NE	15	18S	63E	2.5	PWR		7/31/2018	0	CL	NEVADA POWER COMPANY
216	88292			9/11/2018	RFA	UG	SE	SE	07	18S	64E	0.25	IND		10/3/1988	68.5	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88293			9/11/2018	RFA	UG	SE	SE	07	18S	64E	0.1488	IND		10/3/1988	40.78	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88294			9/11/2018	RFA	UG	SE	SE	07	18S	64E	0.0135	IND		10/3/1988	3.7	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88295			9/11/2018	RFA	UG	SE	SE	07	18S	64E	0.0869	IND		10/3/1988	23.8	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88296			9/11/2018	RFA	UG	SE	SE	07	18S	64E	0.055	IND		10/20/1981	37	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88297			9/11/2018	RFA	UG	NE	NW	20	18S	64E	0.25	IND		10/3/1988	68.5	CL	REPUBLIC ENVIRONMENTAL TECHNOLOGIES, INC.
216	88873T			5/15/2019	PER	UG	NE	NE	27	18S	63E	0.119	QM		10/18/1988	86	CL	DRY LAKE WATER, LLC
216	88874T			5/15/2019	PER	UG	SE	SE	14	18S	63E	0.046	QM		10/18/1988	33.44	CL	DRY LAKE WATER, LLC
216	88875T			5/15/2019	PER	UG	NE	NW	10	18S	63E	0.75	QM		6/21/1988	542.98	CL	DRY LAKE WATER, LLC
216	88876T			5/15/2019	PER	UG	SE	SE	14	18S	63E	0.19	QM		10/18/1988	137.55	CL	DRY LAKE WATER, LLC
216	88877T			5/15/2019	PER	UG	SE	SE	14	18S	63E	2	QM		12/10/1990	592.06	CL	DRY LAKE WATER, LLC

Hydrographic Abstracts

Hydrographic Abstract Report

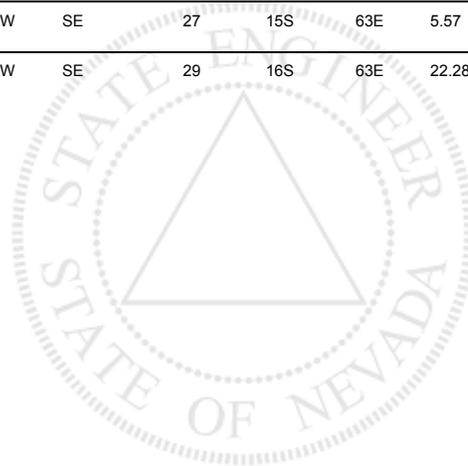
Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('217')

Run Date: 8/22/2019 9:00:40 AM

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							Qtr-Qtr	Qtr	SEC	TWN								RNG
217	16862			2/10/1956	CAN	UG	NE	SE	09	16S	63E	8	IRR		2/10/1956	0	CL	COLLET, RUDOLPH J.
217	32631			7/1/1977	DEN	UG	SE	SE	09	16S	63E	4	IRR		7/1/1977	0	CL	KNAPP, HERSCHEL J.
217	32632			7/1/1977	DEN	UG	SW	SW	03	16S	63E	4	IRR		7/1/1977	0	CL	KNAPP, BEECHER E.
217	32633			7/1/1977	DEN	UG	SE	SW	10	16S	63E	4	IRR		7/1/1977	0	CL	KNAPP, BARBARA A.
217	32634			7/1/1977	DEN	UG	NE	SE	04	16S	63E	4	IRR		7/1/1977	0	CL	CUDDY, WILLIAM T.
217	32635			7/1/1977	DEN	UG	SE	NE	16	16S	63E	4	IRR		7/1/1977	0	CL	SMITH, SABRINA R.
217	32636			7/1/1977	DEN	UG	SE	NE	21	16S	63E	4	IRR		7/1/1977	0	CL	VINCENT, CASSANDRA J. SMITH
217	32637			7/1/1977	DEN	UG	SE	SE	16	16S	63E	4	IRR		7/1/1977	0	CL	SMITH, LESLIE H.
217	32638			7/1/1977	DEN	UG	NE	NW	15	16S	63E	4	IRR		7/1/1977	0	CL	STEWART, SUZANNE SMITH
217	32639			7/1/1977	DEN	UG	SE	NW	21	16S	63E	4	IRR		7/1/1977	0	CL	STEWART, GRANT T.
217	32640			7/1/1977	DEN	UG	NE	NW	10	16S	63E	4	IRR		7/1/1977	0	CL	LOZZI, JOHN
217	33081			8/8/1977	DEN	UG	NE	NE	17	16S	63E	2.7	IRC		8/8/1977	0	CL	DIXON, RAOUL M.
217	33082			8/8/1977	DEN	UG	SE	SE	17	16S	63E	2.7	IRC		8/8/1977	0	CL	BLAKE, DONN I.
217	33093			8/8/1977	DEN	UG		NW	16	16S	63E	2.7	IRR		8/8/1977	0	CL	COBURN, KENNETH RAY
217	33094			8/8/1977	DEN	UG		NW	21	16S	63E	2.7	IRR		8/8/1977		CL	WILSON, JANINE M.
217	33095			8/8/1977	DEN	UG		SW	16	16S	63E	2.7	IRR		8/8/1977	0	CL	COBURN, CALIN KAY
217	33096			8/8/1977	DEN	UG		SW	09	16S	63E	2.7	IRR		8/8/1977	0	CL	DUNCAN, CLAYTON B.
217	33291			8/23/1977	DEN	UG		SW	21	16S	63E	2.7	IRR		8/23/1977	0	CL	BISEK, ALBERT ROBERT
217	33292			8/23/1977	CAN	UG		SW	20	16S	63E	2.7	IRR		8/23/1977	0	CL	SPECTER, FRANK

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
217	33313			8/23/1977	DEN	UG		SW	10	16S	63E	2.7	IRR		8/23/1977	0	CL	DIXON, HISAKO A.
		CHANGED BY: 38783			CAN	UG												
217	33352			8/25/1977	CAN	UG			08	16S	63E	2.7	IRR		8/25/1977	0	CL	PAGLIUSO, ERNEST P.
217	33353			8/25/1977	WDR	UG		SE	08	16S	63E	2.7	IRR		8/25/1977	0	CL	ABE, DAVID
217	33856			9/23/1977	CAN	UG		NW	09	16S	63E	2.7	IRR		9/23/1977	0	CL	SAKAMOTO, JIM
217	33928			10/3/1977	DEN	UG	SW	SW	04	16S	63E	2.7	IRR		10/3/1977	0	CL	BAKER, HAROLD J.
217	34027			10/6/1977	CAN	UG		SE	04	16S	63E	2.7	IRR		10/6/1977	0	CL	NEWELL, NINA R.
217	34028			10/6/1977	CAN	UG		NE	04	16S	63E	2.7	IRR		10/6/1977	0	CL	NEWELL, WM. A.
217	34029			10/6/1977	DEN	UG	SW	NW	04	16S	63E	2.7	IRR		10/6/1977	0	CL	BAKER, MAE L.
217	34170			10/14/1977	WDR	UG		NW	16	17S	63E	2.7	IRR		10/14/1977	100	CL	GRANTHAM, KELLEY D.
217	38653			7/24/1979	CAN	UG		SE	20	16S	63E	2.7	IRR		7/24/1979	0	CL	WILSON, JANINE
217	38758			8/8/1979	DEN	UG	SE	SE	08	16S	63E	2.7	IRC		8/8/1979	800	CL	NORTH VALLEY HOLDINGS, LLC
		CHANGED BY: 66316			DEN	UG												
217	38781			8/14/1979	DEN	UG	SE	SE	20	16S	63E	2.7	IRR		8/14/1979	0	CL	WILSON, JANINE M.
217	38783			8/14/1979	CAN	UG	SW	NE	20	16S	63E	2.7	IRR		8/23/1977		CL	DIXON, HISAKO A.
217	52837			12/28/1988	DEN	UG	NE	SE	29	16S	63E	6.4	IRR		12/28/1988	0	CL	LEAVITT, J. ROBERT C.
217	52846			1/5/1989	DEN	UG	SE	NE	29	16S	63E	6.4	IRR		1/5/1989	0	CL	LEAVITT, EARL M.
217	54074			10/17/1989	PER	UG	SW	SW	25	16S	62E	5	MUN	Y	10/17/1989	2200	CL	SOUTHERN NEVADA WATER AUTHORITY
217	62997			4/3/1997	DEN	UG	NW	SE	27	15S	63E	5.57	IND		4/3/1997	0	CL	NEVADA POWER COMPANY
217	62999			4/3/1997	DEN	UG	NW	SE	29	16S	63E	22.28	IND		4/3/1997	0	CL	NEVADA POWER COMPANY
217	64038			4/17/1998	DEN	UG	NW	NE	16	16S	63E	10	QM		4/17/1998	7239.7	CL	DRY LAKE WATER, L.L.C.
		CHANGED BY: 66162			DEN	UG												
217	66162			3/17/2000	DEN	UG	SW	SE	21	17S	63E	10	QM		4/17/1998	7239.7	CL	DRY LAKE WATER, L.L.C.

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							Qtr-Qtr	Qtr	SEC	TWN							
CHANGED BY: 67160					WDR	UG											
217	66316			4/28/2000	DEN	UG	SE	NE	21	16S	63E	2.7	IND	8/8/1979	0	CL	NICHOLS, CHRIS D. (C/O)
217	66871			10/13/2000	WDR	UG	SE	NE	21	16S	63E	3	QM	10/13/2000	0	CL	NORTH VALLEY HOLDINGS, LLC
217	67160			1/24/2001	WDR	UG	SW	SE	21	17S	63E	10	QM	4/17/1998		CL	DRY LAKE WATER, L.L.C.
217	67895			8/8/2001	DEN	UG	SW	SE	21	17S	63E	10	QM	8/8/2001	0	CL	DRY LAKE WATER, L.L.C.
217	68501			2/15/2002	DEN	UG	SW	SE	21	17S	63E	10	QM	2/15/2002	0	CL	DRY LAKE WATER, L.L.C.
217	79355			1/28/2010	DEN	UG	SW	SW	25	16S	62E	10	MUN	1/28/2010	0	CL	SOUTHERN NEVADA WATER AUTHORITY
217	79692			3/15/2010	DEN	UG	NW	SE	27	15S	63E	5.57	IND	3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
217	79693			3/15/2010	DEN	UG	NW	SE	29	16S	63E	22.28	IND	3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY



Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('218')

Run Date: 8/22/2019 9:02:08 AM

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
218	10034			10/8/1936	DEN	STR	SW	SW	04	15S	66E	50	PWR		10/8/1936	0	CL	LIVINGSTON, D.H.
218	10045			10/26/1936	WDR	UG	NW	NE	33	16S	65E	0.25	STK		10/26/1936	0	CL	BLM
218	11492			1/30/1946	WDR	UG	W2	NE	31	15S	66E	0.3	QM		1/30/1946	0	CL	GIBBONS, J.P.
218	11717			11/12/1946	WDR	SPR	SE	NE	02	15S	66E	0.1	DOM		11/12/1946		CL	CAPLES, VERNON S.
218	12803			1/25/1949	DEN	UG	SE	SE	06	15S	66E	5	IRR		1/25/1949		CL	HIDDEN VALLEY RANCH
		CHANGED BY: 66930			WDR	UG												
218	1504			11/4/1909	CAN	STR	SW	SE	04	15S	66E	60	COM		11/4/1909	0	CL	JUDD, THOMAS
218	1530			11/22/1909	CAN	UG				13S	66E	0	IRC		11/22/1909	0	CL	DUNAWAY, T.F.
218	19979			7/7/1961	CAN	STR	NW	NW	09	15S	66E	0.414	DEC		7/7/1961	0	CL	TANNER, EVAN O.
218	20160			11/17/1961	ABR	SPR	NE	SE	06	15S	66E	0.414	IRR		11/17/1961	0	CL	NEVADA POWER CO.
		CHANGED BY: 21901			WDR	SPR												
218	21901			3/26/1964	WDR	SPR	SE	SE	06	15S	66E	0.414	PWR		3/26/1964		CL	NEVADA POWER CO.
218	22603		7337	5/19/1965	ABR	STR	SE	SE	06	15S	66E	0.414	IND		5/19/1965	0	CL	NEVADA POWER CO.
		CHANGED BY: 29764			CER	STR												
218	25355			11/18/1969	ABR	UG	NE	SW	25	14S	65E	1	IRR		11/18/1969	0	CL	LYTLE, JOHN
		CHANGED BY: 26371			CER	UG												
218	26240			8/2/1971	WDR	UG	NE	SW	25	14S	65E	0.675	IRR		8/2/1971	0	CL	LYTLE, JOHN
218	26371		9404	10/20/1971	CER	UG	NE	SW	25	14S	65E	0.37	IRR		11/18/1969	90	CL	MOAPA VALLEY WATER COMPANY
218	28161			2/28/1974	CAN	UG	SE	NW	02	15S	66E	0.5	MM		2/28/1974	0	CL	CX PRODUCTS CORP.

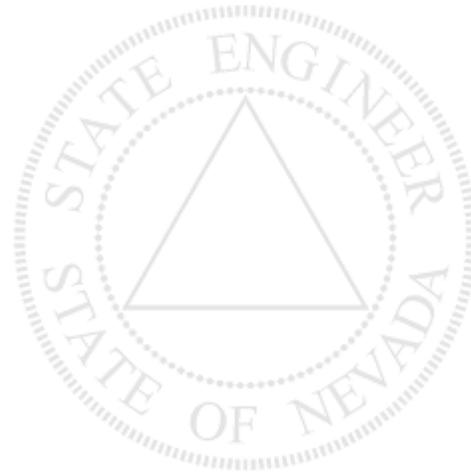
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							Qtr-Qtr	Qtr	SEC	TWN							
218	28413			6/12/1974	CAN	SPR	NE	SW	11	15S	65E	0.1	COM	6/12/1974	0	CL	BELL, SYLVIA
218	28635			8/26/1974	DEN	UG	SW	SW	25	14S	65E	4	IRR	8/26/1974	0	CL	PERKINS, ROBERT
218	31086			2/10/1977	CAN	UG	NE	NW	36	14S	65E	2.5	IRR	2/10/1977	1000	CL	MOAPA BAND OF PAIUTE INDIANS
218	31087			2/10/1977	CAN	UG	NE	NW	36	14S	65E	2.5	IRR	2/10/1977	0	CL	MOAPA BAND OF PAIUTE INDIANS
218	33026			8/4/1977	CAN	UG		SE	24	14S	65E	2.7	IRR	8/4/1977	0	CL	ROTH, MARILYN
218	33159			8/15/1977	DEN	UG	SW	SE	01	15S	65E	2	IRR	8/15/1977	0	CL	PERKINS, CAROLYN L.
218	33161			8/15/1977	DEN	UG	SW	SE	02	15S	65E	2	IRR	8/15/1977	0	CL	PERKINS, JOHN G.
218	33891			9/30/1977	CAN	UG		NE	13	15S	65E	2.7	IRC	9/30/1977	0	CL	ZUNIGA, GREGORIO
218	33925			10/3/1977	CAN	UG	NW	SW	13	15S	65E	2.7	IRC	10/3/1977	100	CL	CORTEZ, SANDRA LEE
218	33926			10/3/1977	CAN	UG		NE	14	15S	65E	2.7	IRC	10/3/1977	0	CL	HUGHES, ERWIN LEE
218	33927			10/3/1977	CAN	UG		NW	13	15S	65E	2.7	IRC	10/3/1977	0	CL	ZUNIGA, GREGORIO P.
218	34045			10/7/1977	CAN	UG	NW	SE	33	15S	65E	2.7	IRC	10/7/1977	0	CL	CHAMBERLAND, JAMES W.
218	34046			10/7/1977	CAN	UG	SW	NE	33	15S	65E	2.7	IRC	10/7/1977	0	CL	LOUVIERE, MYRNA
218	34288			10/18/1977	CAN	UG		NW	14	15S	65E	2.7	IRR	10/18/1977	0	CL	LOPEZ, MARGARET
218	34289			10/18/1977	CAN	UG		SW	14	15S	65E	2.7	IRR	10/18/1977	0	CL	LOPEZ, DANIEL JOE
218	34290			10/18/1977	CAN	UG		SE	15	15S	65E	2.7	IRR	10/18/1977	0	CL	WELLER, JOANN
218	34543			11/1/1977	CAN	UG		NW	30	14S	66E	2.7	IRC	11/1/1977	0	CL	LEE, GARY D.
218	34544			11/1/1977	CAN	UG		SW	30	14S	66E	2.7	IRC	11/1/1977	0	CL	LEE, SANDRA L.
218	35380			5/4/1978	CAN	UG		SW	07	15S	66E	2.7	IRR	5/4/1978		CL	MADRID, DANIEL MATTHEW
218	35646			7/20/1978	CAN	UG	SW	NW	02	15S	66E	0.17	IRR	7/20/1978	0	CL	ZACHARIAS, EDWARD M.
218	3694			11/11/1915	CAN	STR	SE	SW	04	15S	66E	60	PWR	11/11/1915	0	CL	LIVINGSTON, D.H.
218	37430			3/30/1979	CAN	UG			01	14S	65E	1	IRR	3/30/1979	0	CL	JOHNSON, MR. FREEMAN
218	38011			4/24/1979	DEN	UG	NW	SE	33	15S	65E	2.7	IRC	4/24/1979	100	CL	CHAMBERLAND, JAMES W.

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218	38012			4/24/1979	DEN	UG	SW	NE	33	15S	65E	2.7	IRC		4/24/1979	100	CL	LOUVIERE, MYRNA
218	39368			10/17/1979	CAN	UG			01	15S	65E	1	IRR		10/17/1979	0	CL	JOHNSON, FREEMAN W.
218	44716			10/29/1981	CAN	UG	NW	SE	31	17S	65E	0.005	STK		10/29/1981	0	CL	BLM
218	44736			10/29/1981	CAN	UG	NE	NE	25	18S	64E	0.005	STK		10/29/1981	0.675158	CL	BLM
218	45256			1/21/1982	WDR	UG			01	15S	65E	1	IRR		1/21/1982		CL	JOHNSON, FREEMAN
218	50558			2/2/1987	PER	UG	NE	SW	05	15S	66E	0.04	ENV		2/2/1987	28.970416	CL	NEVADA POWER COMPANY
218	50559		13823	2/2/1987	CER	UG	SE	SW	05	15S	66E	0.5	IND	Y	2/2/1987	361.976755	CL	NEVADA POWER COMPANY
218	50560			2/2/1987	PER	UG	NE	SW	05	15S	66E	0.04	ENV		2/2/1987	28.970416	CL	NEVADA POWER COMPANY
218	53091			4/4/1989	ABR	UG	NW	SW	25	14S	65E	0.2	IRR		4/4/1989	0	CL	WHEELER, ELMER
		CHANGED BY: 66319T			EXP	UG												
		CHANGED BY: 66320			ABR	UG												
218	54075			10/17/1989	ABR	UG	NE	SW	04	16S	66E	5	MUN		10/17/1989	0	CL	MOAPA BAND OF PAIUTE INDIANS
		CHANGED BY: 70257			PER	UG												
		CHANGED BY: 70258			PER	UG												
		CHANGED BY: 70259			PER	UG												
218	54076			10/17/1989	DEN	UG	NW	NW	16	15S	64E	10	MUN		10/17/1989	7239.7	CL	MOAPA BAND OF PAIUTE INDIANS
218	54202			11/30/1989	DEN	UG	NE	SE	29	14S	66E	3	IND		11/30/1989	0	CL	OXFORD ENERGY COMPANY
218	54634			4/6/1990	DEN	UG	SE	NW	07	15S	66E	3.5	PWR		4/6/1990	0	CL	NEVADA POWER COMPANY
218	54698			4/26/1990	DEN	UG	SW	NW	12	18S	65E	1	MM		4/26/1990	0	CL	AZTEC GLASS SAND CORPORATION
218	57441E			4/16/1992	PER	UG	SW	NE	02	15S	66E	0.045	ENV		4/16/1992	32.591718	CL	NEVADA-DEPARTMENT OF TRANSPORTATION
218	6012			3/9/1920	CAN	OSW	SW	SW	09	16S	66E	0.016	STK	Y	3/9/1920	0	CL	BUFFINGTON, C.F.
218	6013			3/9/1920	CAN	OSW	NE	NW	11	16S	65E	0.016	STK	Y	3/9/1920	0	CL	BUFFINGTON, C.F.
218	64037			4/17/1998	DEN	UG	NE	NE	33	17S	65E	10	QM		4/17/1998	0	CL	DRY LAKE WATER, LLC

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218	65197			6/14/1999	DEN	UG	SE	NW	31	16S	65E	0.5	COM		6/14/1999	0	CL	MOAPA BAND OF PAIUTES
218	65722			12/15/1999	DEN	UG	NE	NW	27	16S	65E	1	MM		12/15/1999	0	CL	STALLION SAND AND GRAVEL, LLC.
218	65944			1/28/2000	DEN	UG	SE	SE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65945			1/28/2000	DEN	UG	NE	NE	22	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65946			1/28/2000	DEN	UG	SE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65947			1/28/2000	DEN	UG	SE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65948			1/28/2000	DEN	UG	NE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65949			1/28/2000	DEN	UG	SE	NE	15	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65954			1/28/2000	DEN	UG	SE	SW	34	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	65955			1/28/2000	DEN	UG	SE	SW	34	16S	64E	6	PWR		1/28/2000	3500	CL	MOAPA BAND OF PAIUTES
218	66319T			5/2/2000	EXP	UG	NE	SE	10	17S	55E	0.2	MM		4/4/1989	25	CL	WHEELER, ELMER
218	66320			5/2/2000	ABR	UG	NE	SE	10	17S	65E	0.2	MM		4/4/1989	0	CL	E. WHEELER & P. WHEELER FAMILY TRUST
		CHANGED BY: 75198			PER	UG												
218	66473			6/19/2000	DEN	UG	NE	NE	15	16S	64E	6	PWR		6/19/2000	0	CL	MOAPA BAND OF PAIUTES
218	66474			6/19/2000	DEN	UG	SW	SE	15	16S	64E	6	PWR		6/19/2000	0	CL	MOAPA BAND OF PAIUTES
218	66475			6/19/2000	DEN	UG	SE	NE	15	16S	64E	6	PWR		6/19/2000	0	CL	MOAPA BAND OF PAIUTES
218	66476			6/19/2000	DEN	UG	SW	NW	23	16S	64E	1	COM		6/19/2000	0	CL	MOAPA BAND OF PAIUTES
218	66930			11/8/2000	WDR	UG	NE	NW	04	19S	64E	5	QM		1/25/1949		CL	HIDDEN VALLEY RANCH
218	67896			8/8/2001	DEN	UG	NE	NE	04	19S	64E	10	QM		8/8/2001	7239.7	CL	DRY LAKE WATER, L.L.C.
218	69700T			3/3/2003	EXP	STR	NE	SE	06	15S	66E	0.2	STO		12/17/1981	6.1378	CL	NEVADA POWER COMPANY
218	70257			7/23/2003	PER	UG	SE	NE	15	16S	64E	5	MUN	Y	10/17/1989	2500	CL	MOAPA BAND OF PAIUTE INDIANS
218	70258			7/23/2003	PER	UG	NE	NE	15	16S	64E	5	MUN	Y	10/17/1989	2500	CL	MOAPA BAND OF PAIUTE INDIANS
218	70259			7/23/2003	PER	UG	NE	NE	15	16S	64E	5	MUN	Y	10/17/1989	2500	CL	MOAPA BAND OF PAIUTE INDIANS

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218	7199			8/21/1924	CAN	STR	SE	NW	02	15S	66E	0	MM	Y	8/21/1924		CL	WHITE STAR PLASTER COMPANY
218	75198			12/18/2006	PER	UG	NE	SW	25	14S	65E	0.2	MUN		4/4/1989	25	CL	COYOTE SPRINGS INVESTMENT LLC
218	75247			1/10/2007	WDR	STR	NE	NW	08	15S	66E	0	DEC		1/1/1900	0	CL	SOUTHERN NEVADA WATER AUTHORITY
218	76643			1/18/2008	PER	UG	SW	NW	23	16S	64E	5	MUN	Y	1/18/2008	2500	CL	MOAPA BAND OF PAIUTE INDIANS
218	78756T			7/23/2009	WDR	STR	NW	NW	06	15S	66E	6	IRR		7/23/2009	400	CL	MUDDY VALLEY IRRIGATION COMPANY
218	79690			3/15/2010	DEN	UG	SE	NW	07	15S	66E	3.5	IND		3/15/2010	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
218	79949			6/22/2010	WDR	STR	SW	SE	36	14S	65E	6	IRR		6/22/2010	1400	CL	MUDDY VALLEY IRRIGATION COMPANY
218	8430			1/8/1928	CAN	STR	SW	SE	26	14S	65E	0	IRR	Y	1/8/1928	0	CL	MUDDY VALLEY IRRIGATION CO
218	85009			3/27/2015	CAN	STR		LT19	06	15S	66E	0.4	COM		3/27/2015	0	CL	MOAPA BAND OF PAIUTE INDIANS
218	85037			4/3/2015	DEN	SPR	SE	SE	09	15S	66E	0.003	WLD		4/3/2015	2.2	CL	MOAPA VALLEY WATER DISTRICT
218	85038			4/3/2015	DEN	SPR	NE	SE	09	15S	66E	0.022	WLD		4/3/2015	16.1	CL	MOAPA VALLEY WATER DISTRICT
218	85043			4/3/2015	DEN	SPR	NW	NW	11	15S	66E	0.01	WLD		4/3/2015	7.3	CL	MOAPA VALLEY WATER DISTRICT
218	85529T			10/15/2015	EXP	STR	SE	SE	06	15S	66E	0.5	IRR		10/15/2015	300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	85530T			10/15/2015	EXP	STR	SE	SE	06	15S	66E	0.35	IRR		10/15/2015	300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	86738			12/27/2016	RFP	UG	SE	NE	15	16S	64E	2.312	IND		1/1/1900	340	CL	MOAPA BAND OF PAIUTE INDIANS
218	86739			12/27/2016	RFP	UG	SE	NE	15	16S	64E	1.2	IND		1/1/1900	160	CL	MOAPA BAND OF PAIUTE INDIANS
218	87143T			5/26/2017	EXP	STR	SE	SE	06	15S	66E	0.5	IRR			300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	87144T			5/26/2017	EXP	STR	SE	SE	06	15S	66E	0.35	IRR		1/1/1900	300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	87932T			5/14/2018	EXP	STR	SE	SE	06	15S	66E	0.35	IRR		1/1/1900	300	CL	MUDDY VALLEY IRRIGATION DISTRICT
218	87933T			5/14/2018	EXP	STR	SE	SE	06	15S	66E	0.5	IRR		1/1/1900	300	CL	MUDDY VALLEY IRRIGATION DISTRICT
218	87998			5/21/2018	RFP	SPR	NE	SE	09	15S	66E	0.022	WLD		5/21/2018	16	CL	U.S.-BUREAU OF LAND MANAGEMENT
218	87999			5/21/2018	RFP	SPR	SE	SE	09	15S	66E	0.003	WLD		5/21/2018	2	CL	U.S.-BUREAU OF LAND MANAGEMENT
218	88000			5/21/2018	RFP	SPR	NW	NW	11	15S	66E	0.01	WLD		5/21/2018	7	CL	U.S.-BUREAU OF LAND MANAGEMENT

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
218	8818			1/23/1929	DEN	STR	SW	SE	26	14S	65E	0	IRR	Y	1/23/1929	10000	CL	MUDDY VALLEY IRRIGATION COMPANY
218	88719T			3/4/2019	PER	STR	SE	SE	06	15S	66E	0.35	IRR		3/1/1905	300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	88720T			3/4/2019	PER	STR	SE	SE	06	15S	66E	0.5	IRR		3/1/1905	300	CL	MUDDY VALLEY IRRIGATION COMPANY
218	949			5/1/1908	DEN	STR	SW	SE	26	14S	65E	25	IRR	Y	5/1/1908	0	CL	WILLIAM C. SHARP, I.T., IN CHARGE
218	9571			1/30/1932	CAN	STR		SE	34	14S	65E	0	MM		1/30/1932	0	CL	SALTER, THOS. J.



Hydrographic Abstracts

Hydrographic Abstract Report

Selection Criteria: WHERE owner_type IN ('C','B') AND ms.Basin IN ('219')

Run Date: 8/22/2019 9:04:44 AM

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							Qtr-Qtr	Qtr	SEC	TWN	RNG							
219	11960		4481	8/13/1947	ABR	UG	NW	NW	15	14S	65E	3.5	IRR	8/13/1947	0	CL	LDS	
		CHANGED BY: 25862			ABR	UG												
		CHANGED BY: 25863			ABR	UG												
		CHANGED BY: 50723			CER	UG												
219	11961		4555	8/13/1947	ABR	UG	SW	NE	15	14S	65E	2.85	IRR	8/13/1947	0	CL	LDS	
		CHANGED BY: 25058			CAN	UG												
		CHANGED BY: 25864			ABR	UG												
		CHANGED BY: 25887			ABR	UG												
219	12244		4016	2/4/1948	ABR	UG	NW	NW	23	14S	65E	0.72	IRR	2/4/1948	0	CL	BEHMER, B.R.	
		CHANGED BY: 45418			WDR	UG												
		CHANGED BY: 38871			CER	UG												
		CHANGED BY: 29296			CER	UG												
219	12458			5/20/1948	CAN	UG	NW	NW	23	14S	65E	1	IRR	5/20/1948	200	CL	PERKINS, DALE B.	
219	12459		4017	4/20/1948	ABR	UG	SW	NE	23	14S	65E	0.79	IRR	4/20/1948	0	CL	PERKINS, LAWRENCE W.	
		CHANGED BY: 27661			WDR	UG												
		CHANGED BY: 43160			ABR	UG												
219	12576		3911	8/14/1948	ABR	UG	NW	NE	08	14S	65E	1.34	IRR	8/14/1948	0	CL	LEWIS, CLARENCE A.	
		CHANGED BY: 21263			WDR	UG												
		CHANGED BY: 22634			ABR	UG												

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							Qtr-Qtr	Qtr	SEC	TWN	RNG							
219	12679		3738	10/7/1948	ABR	UG	NE	NE	22	14S	65E	1	IRR	10/7/1948	0	CL	PERKINS, G.M.	
		CHANGED BY: 50851			CER	UG												
		CHANGED BY: 50275			CER	UG												
219	12774		3942	12/20/1948	ABR	UG	SW	NE	08	14S	65E	1.5	IRR	12/20/1948	0	CL	LEWIS, CLARVID A.	
		CHANGED BY: 21264			WDR	UG												
		CHANGED BY: 22633			CER	UG												
219	13074		4121	10/4/1949	ABR	UG	SW	SW	09	14S	65E	0.92	IRR	10/4/1949	0	CL	LDS	
		CHANGED BY: 50724			CER	UG												
219	13881			10/24/1951	CAN	UG	NW	SE	08	14S	65E	1.5	IRR	10/24/1951		CL	LEWIS, CLARVID A.	
219	13882			10/24/1951	CAN	UG	NW	SE	08	14S	65E	1.5	IRR	10/24/1951		CL	LEWIS, LILLIAN C.	
219	14344		4123	6/19/1952	ABR	UG	NW	SE	08	14S	65E	1.5	IRR	6/19/1952	0	CL	LEWIS, CLARENCE A.	
		CHANGED BY: 21261			WDR	UG												
		CHANGED BY: 22636			CER	UG												
219	14345		4306	6/19/1952	ABR	UG	NW	SE	08	14S	65E	1.5	IRR	6/19/1952	0	CL	LEWIS, CLARVID A.	
		CHANGED BY: 21265			WDR	UG												
		CHANGED BY: 22632			CER	UG												
219	14982			4/15/1953	CAN	UG	NE	SW	11	14S	65E	3	IRR	4/15/1953		CL	MILLS, LESTER	
219	15151			6/22/1953	DEN	UG	SW	SW	11	14S	65E	1.6	IRR	6/22/1953		CL	ADAMS, LOUIS	
219	1655			4/2/1910	DEN	STR			15	14S	65E	8	IRR	4/2/1910	0	CL	FITZGERALD, THOMAS H	
219	16583			6/30/1955	CAN	UG	SE	NW	11	14S	65E	0	IRD	6/30/1955		CL	MILLS, LESTER	
219	16603			7/11/1955	WDR	SPR	NW	NW	22	14S	65E	0.01	COM	7/11/1955		CL	COBURN, L.R.	
219	17678			10/1/1958	WDR	SPR				14S	65E	0	MUN	10/1/1958		CL	MUDDY VALLEY IRRIGATION CO	
219	17754		5563	12/18/1958	ABR	UG	SE	NE	08	14S	65E	1.2	IRR	12/18/1958	0	CL	LEWIS, CLARVID A.	

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							Qtr-Qtr	Qtr	SEC	TWN	RNG							
		CHANGED BY: 21262			WDR	UG												
		CHANGED BY: 22635			CER	UG												
219	18437		5683	11/20/1959	CER	UG	SE	SE	09	14S	65E	1	IRR	11/20/1959	20.15	CL	COYOTE SPRINGS INVESTMENT LLC	
		CHANGED BY: 50934			CER	UG												
219	20124			10/11/1961	WDR	UG	SW	NE	23	14S	65E	2	IND	10/11/1961	30	CL	LANGFORD, F.H.	
219	21261			5/13/1963	WDR	UG	NW	SE	08	14S	65E	1.5	PWR	6/19/1952	0	CL	LEWIS, LOIS ALLEN	
219	21262			5/13/1963	WDR	UG	SE	NE	08	14S	65E	1.2	PWR	12/18/1958		CL	LEWIS, CLARVID ARTHUR	
219	21263			5/13/1963	WDR	UG	NW	NE	08	14S	65E	1.34	PWR	8/14/1948	0	CL	LEWIS, CLARVID ARTHUR	
219	21264			5/13/1963	WDR	UG	SW	NE	08	14S	65E	1.5	PWR	12/20/1948	0	CL	LEWIS, LOIS ALLEN	
219	21265			5/13/1963	WDR	UG	NW	SE	08	14S	65E	1.5	PWR	6/19/1952	0	CL	LEWIS, CLARVID ARTHUR	
219	21466		6293	8/15/1963	CER	UG	SE	SE	08	14S	65E	1	IRR	8/15/1963	183.2	CL	CASA DE WARM SPRINGS LLC	
219	2162			7/31/1911	DEN	SPR				14S	65E	0.5	IRR	7/31/1911	0	CL	BURTNER, JAMES H.	
219	22559		9606	4/28/1965	ABR	UG	NW	NW	23	14S	65E	0.117	IRR	4/28/1965	0	CL	LDS	
		CHANGED BY: 26313			ABR	UG												
		CHANGED BY: 50730			CER	UG												
		CHANGED BY: 25733			ABR	UG												
219	22632		7164	6/14/1965	CER	UG	NW	SE	08	14S	65E	1.5	IND	Y 6/19/1952	315	CL	NEVADA POWER COMPANY	
219	22633		7165	6/14/1965	CER	UG	SW	NE	08	14S	65E	1.5	IND	Y 12/20/1948	297.5	CL	NEVADA POWER COMPANY	
219	22634			6/14/1965	ABR	UG	NW	NE	08	14S	65E	1.34	IND	8/14/1948	0	CL	LEWIS, CLARENCE A.	
		CHANGED BY: 24186			CER	UG												
219	22635		7166	6/14/1965	CER	UG	SE	NE	08	14S	65E	1.2	IND	Y 12/18/1958	25	CL	NEVADA POWER COMPANY	
		CHANGED BY: 49842			WDR	UG												
219	22636		7167	6/14/1965	CER	UG	NW	SE	08	14S	65E	1.5	IND	Y 6/19/1952	260	CL	NEVADA POWER COMPANY	

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							Qtr-Qtr	Qtr	SEC	TWN	RNG							
219	22738		8331	8/25/1965	CER	UG	NE	NE	22	14S	65E	0.25	COM		8/25/1965	18.81	CL	DAVIS, DON J. & MARSHA L.
		CHANGED BY: 27216			CER	UG												
219	22739		10060	8/25/1965	CER	SPR	NW	SE	16	14S	65E	1	MUN			723.8000 65	CL	MOAPA VALLEY WATER DISTRICT
		CHANGED BY: 28659			CAN	STR												
219	22861			11/24/1965	CAN	UG	NE	SW	14	14S	65E	2	IRR		11/24/1965		CL	ABBOTT, S.E.
219	22948			2/2/1966	ABR	UG	NW	NE	08	14S	65E	2.945	IND		2/2/1966	0	CL	LEWIS, CLARENCE A.
		CHANGED BY: 24185			CER	UG												
219	22949		7168	2/2/1966	CER	UG	SE	NE	08	14S	65E	2.945	IND	Y	2/2/1966	433	CL	LEWIS, CLARENCE A. AND/OR CLARVID ARTHUR
		CHANGED BY: 49844			WDR	UG												
		CHANGED BY: 86738			RFP	UG												
219	22950		7169	2/2/1966	CER	UG	SW	NE	08	14S	65E	2.945	IND	Y	2/2/1966	433	CL	NEVADA POWER COMPANY
219	22951		7170	2/2/1966	CER	UG	NW	SE	08	14S	65E	2.945	IND	Y	2/2/1966	433	CL	NEVADA POWER COMPANY
219	22952		7171	2/2/1966	CER	UG	NW	SE	08	14S	65E	2.945	IND	Y	2/2/1966	433	CL	NEVADA POWER COMPANY
219	23600		7316	1/11/1967	CER	STR	SE	SE	15	14S	65E	7	IND		1/1/1905	2000	CL	MUDDY VALLEY IRRIGATION COMPANY
219	24185		7172	10/20/1967	CER	UG	NW	NE	08	14S	65E	2.945	IND	Y	2/2/1966	433	CL	NEVADA POWER COMPANY
219	24186		7173	10/20/1967	CER	UG	NW	NE	08	14S	65E	1.34	IND	Y	8/14/1948	310	CL	NEVADA POWER COMPANY
219	25058			5/7/1969	CAN	UG	SW	SW	09	14S	65E	2.85	IRR		8/13/1947	1000	CL	WEBB, R.W.
219	25173			7/28/1969	DEN	SPR	SW	SE	16	14S	65E	0.33	IRR		7/28/1969	100	CL	APCAR, FREDERIC
219	25174			7/28/1969	DEN	SPR	SW	SE	16	14S	65E	0.25	IRR		7/28/1969	75	CL	APCAR, FREDERIC
219	25310		7844	10/9/1969	CER	UG	SE	NE	08	14S	65E	1.2	IND	Y	10/9/1969	160	CL	MOAPA BAND OF PAIUTE INDIANS
		CHANGED BY: 49843			WDR	UG												
		CHANGED BY: 86739			RFP	UG												
219	25375			12/3/1969	DEN	SPR	NW	SE	16	14S	65E	4	MUN		12/3/1969		CL	OVERTON WATER DISTRICT

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							Qtr-Qtr	Qtr	SEC								TWN
219	25495			3/12/1970	CAN	UG	SW	NE	23	14S	65E	2.4	IRR	3/12/1970	600	CL	PERKINS, LAWRENCE W.
		CHANGED BY: 30991			DEN	UG											
219	25697		10660	7/7/1970	ABR	UG	NE	NE	22	14S	65E	1.23	IRR	7/7/1970	0	CL	PERKINS, G.M.
		CHANGED BY: 50272			CER	UG											
219	25698		10661	7/7/1970	ABR	UG	NE	NE	22	14S	65E	0.67	IRR	7/7/1970	0	CL	PERKINS, G.M.
		CHANGED BY: 29328			ABR	UG											
		CHANGED BY: 50273			CER	UG											
219	25699			7/7/1970	ABR	UG	SE	SW	14	14S	65E	2.5	IRR	7/7/1970	0	CL	ABBOTT, STOWELL E.
		CHANGED BY: 29297			ABR	UG											
		CHANGED BY: 29298			CER	UG											
219	25700			7/7/1970	ABR	UG	SE	SE	14	14S	65E	0	IRR	7/7/1970	0	CL	ABBOTT, STOWELL E.
		CHANGED BY: 28522			CAN	UG											
219	25701			7/7/1970	ABR	UG	SE	SE	14	14S	65E	2.5	IRR	7/7/1970	0	CL	ABBOTT, STOWELL E.
		CHANGED BY: 28523			CAN	UG											
219	25731			7/29/1970	WDR	UG	SE	SE	09	14S	65E	1.6	IRR	7/29/1970	375	CL	WEBB, R.W.
219	25732			7/29/1970	WDR	UG	NE	NE	16	14S	65E	3	IRR	7/29/1970		CL	WEBB, R.W.
219	25733			7/29/1970	ABR	UG	NW	NW	23	14S	65E	0.581	IRR	7/29/1970	0	CL	LDS
		CHANGED BY: 26315			ABR	UG											
		CHANGED BY: 26314			ABR	UG											
219	25734			7/29/1970	WDR	UG	NW	NW	23	14S	65E	1.7	IRR	7/29/1970		CL	WEBB, R.W.
219	25860			11/12/1970	ABR	SPR	SW	SW	09	14S	65E	0.829	IRR		0	CL	LDS
		CHANGED BY: 26316			CER	STR											
219	25861		10944	11/12/1970	CER	SPR			16	14S	65E	1.62	IRR	11/12/1970	0	CL	MOAPA VALLEY WATER DISTRICT- LEASEE

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							Qtr-Qtr	Qtr	SEC								TWN
		CHANGED BY: 26317			CER	SPR											
		CHANGED BY: 26318			CER	STR											
219	25862		10945	11/12/1970	ABR	UG	NW	NW	15	14S	65E	2.16	IRR	8/13/1947	0	CL	LDS
		CHANGED BY: 26319			ABR	UG											
		CHANGED BY: 50731			CER	UG											
219	25863			11/12/1970	ABR	UG	NW	NW	23	14S	65E	0.44	IRR	8/13/1947	0	CL	LDS
		CHANGED BY: 26320			ABR	UG											
219	25864		10946	11/12/1970	ABR	UG	NE	NE	16	14S	65E	2.51	IRR	8/13/1947	0	CL	LDS
		CHANGED BY: 50732			CER	UG											
219	25887		10947	12/10/1970	ABR	UG	NE	NE	16	14S	65E	0.2	IRR	8/13/1947	0	CL	LDS
		CHANGED BY: 50733			CER	UG											
219	26313		10948	9/15/1971	ABR	UG	SW	SW	09	14S	65E	0.302	IRR	4/28/1965	0	CL	LDS
		CHANGED BY: 50725			CER	UG											
219	26314		10949	9/15/1971	ABR	UG	SW	SW	09	14S	65E	0.302	IRR	7/29/1970	0	CL	LDS
		CHANGED BY: 50726			CER	UG											
219	26315		10950	9/15/1971	ABR	UG	NW	NW	23	14S	65E	0.271	IRR	7/29/1970	0	CL	LDS
		CHANGED BY: 50727			CER	UG											
219	26316		10951	9/15/1971	CER	STR	SE	SE	15	14S	65E	0.829	IRR		0	CL	MOAPA VALLEY WATER DISTRICT
219	26317		10952	9/15/1971	CER	SPR	NW	SE	16	14S	65E	0.057	IRR		18.02	CL	MOAPA VALLEY WATER DISTRICT
219	26318		10953	9/15/1971	CER	STR	SW	NW	16	14S	65E	0.536	IRR	11/12/1970	0	CL	MOAPA VALLEY WATER DISTRICT
219	26319		10954	9/15/1971	ABR	UG	SW	SW	09	14S	65E	0.58	IRR	8/13/1947	0	CL	LDS
		CHANGED BY: 50728			CER	UG											
219	26320		10955	9/15/1971	ABR	UG	SW	SW	09	14S	65E	0.44	IRR	8/13/1947	0	CL	LDS

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							Qtr-Qtr	Qtr	SEC	TWN							
		CHANGED BY: 50729			CER	UG											
219	27216		12758	1/2/1973	CER	UG	NW	SE	16	14S	65E	0.25	COM	8/25/1965	1.381005	CL	UNITED STATES OF AMERICA
219	27648			7/23/1973	CAN	UG	NW	SW	09	14S	65E	0.1	COM	7/23/1973	72.39535 1	CL	J. FLECK REALTY
219	27661			7/27/1973	WDR	UG	SW	NE	23	14S	65E	0.79	IRR	4/20/1948	175.5	CL	PERKINS, LAWRENCE W.
219	27662			7/27/1973	ABR	UG	SW	NE	23	14S	65E	0.1	IRR	7/27/1973		CL	LEAVITT, J.D.
		CHANGED BY: 28789			WDR	UG											
		CHANGED BY: 29473			CAN	UG											
219	28522			7/15/1974	CAN	UG	SW	SE	14	14S	65E	0	IRR	7/7/1970	0	CL	ABBOTT, STOWELL E.
219	28523			7/15/1974	CAN	UG	NE	SW	14	14S	65E	2.5	IRR	7/7/1970	650	CL	ABBOTT, STOWELL E.
219	28659			9/10/1974	CAN	STR	NW	SE	16	14S	65E	1	MUN		723.8	CL	MOAPA VALLEY WATER CO.
219	28789			10/9/1974	WDR	UG	SW	NE	23	14S	65E	0.1	IRR	7/27/1973		CL	LEAVITT, J.D.
219	28791		13445	10/11/1974	CER	SPR	SE	NW	16	14S	65E	3	MUN	1/1/1905	2132.056 897	CL	MUDDY VALLEY IRRIGATION CO.
		CHANGED BY: 52351			CAN	STR											
219	29150			1/16/1975	CAN	UG	SW	NE	23	14S	65E	2.4	IRR	6/27/1975	600	CL	PERKINS, LAWRENCE W.
219	29295		9609	3/25/1975	CER	OSW	SE	SE	15	14S	65E	1.357	IND		811.3	CL	SOUTHERN NEVADA WATER AUTHORITY
219	29296		9691	3/25/1975	CER	UG	NW	NW	23	14S	65E	0.576	IND	Y 2/4/1948	300	CL	NEVADA POWER COMPANY
219	29297		9745	3/25/1975	ABR	UG	SE	SW	14	14S	65E	0.4455	IND	7/7/1970	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 52587			ABR	UG											
219	29298		9750	3/25/1975	CER	UG	NW	NW	23	14S	65E	0.452	IND	Y 7/7/1970	327.5	CL	NEVADA POWER COMPANY
219	29328		10667	4/3/1975	ABR	UG	NE	NE	22	14S	65E	1	IRR	7/7/1970	0	CL	PERKINS, G.M.
		CHANGED BY: 50274			ABR	UG											
219	29473			6/27/1975	CAN	UG	SW	NE	23	14S	65E	0.1	IRR	7/27/1973		CL	LEAVITT, J.D.
219	29764		9661	11/13/1975	CER	STR	SE	SE	15	14S	65E	0.4143	IND	5/19/1965	247.6	CL	NEVADA POWER CO.

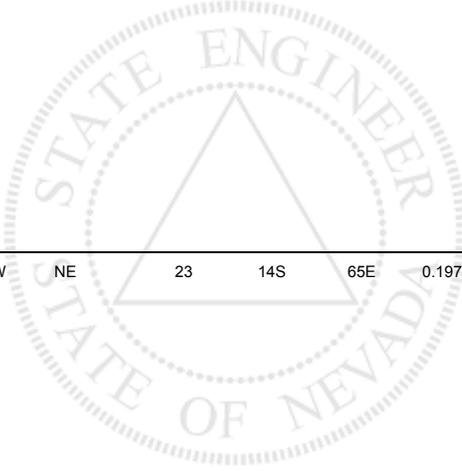
Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record	
							Qtr-Qtr	Qtr	SEC	TWN								RNG
CHANGED BY: 69700T					EXP	STR												
219	30991			1/12/1977	DEN	UG	SE	SE	08	14S	65E	2.4	IRR		3/12/1970		CL	LEWIS, CLARVID ARTHUR
219	3340			4/9/1915	DEN	STR	SW	SW	07	14S	65E	0	IRR	Y	4/9/1915	0	CL	WOODRUFF, SIDNEY H.
219	33660			9/19/1977	DEN	UG	NW	NW	27	14S	65E	1.5	IRC		9/19/1977	1000	CL	PERKINS, G.M.
219	33661			9/19/1977	DEN	UG	NE	NE	27	14S	65E	1.5	IRC		9/19/1977	1000	CL	PERKINS, G.M.
219	33778			9/23/1977	CAN	UG		SW	03	14S	65E	2.7	IRR		9/23/1977	100	CL	WILLIAMS, RICHARD E.
219	33779			9/23/1977	CAN	UG		NW	14	14S	65E	2.7	IRR		9/23/1977	100	CL	KONYS, MARY
219	33780			9/23/1977	DEN	UG	SW	SE	22	14S	65E	2.7	IRR		9/23/1977	100	CL	GALUS, PAUL JOHN
219	33781			9/23/1977	DEN	UG	NW	NE	14	14S	65E	2.7	IRR		9/23/1977	100	CL	KONYS, JOANNA
219	33782			9/23/1977	DEN	UG	SE	SE	10	14S	65E	2.7	IRR		9/23/1977	100	CL	KONYS, STEPHEN J.
219	33783			9/23/1977	CAN	UG	NW	SW	10	14S	65E	2.7	IRR		9/23/1977	100	CL	BRADLEY, PHILIP A.
219	33795			9/26/1977	CAN	UG		NW	16	14S	65E	0	IRR		9/26/1977	0	CL	COPPER COUNTRY EXPLORATIONS INC.
219	33859			9/28/1977	CAN	UG		NW	12	14S	65E	2.7	IRR		9/28/1977	100	CL	UNGARO, BRENDA KAYE
219	33860			9/28/1977	CAN	UG		SW	12	14S	65E	2.7	IRR		9/28/1977	100	CL	GALE, WILLIAM
219	33862			9/28/1977	DEN	UG	SE	SE	17	14S	65E	2.7	IRR		9/28/1977	100	CL	CLEMENTS, JOAN M.
219	33863			9/28/1977	DEN	UG	SW	SE	11	14S	65E	2.7	IRR		9/28/1977	100	CL	CORTEZ, JOHNNY M. III
219	33864			9/28/1977	DEN	UG	SE	SW	11	14S	65E	2.7	IRR		9/28/1977	800	CL	GALUS, FRANCES C.
219	33890			9/30/1977	DEN	UG	SW	SE	03	14S	65E	0	IRR		9/30/1977	0	CL	BEELEER, LYNDESEY D.
219	34013			10/5/1977	CAN	UG		NE	03	14S	65E	2.7	IRR		10/5/1977	750	CL	WHITNEY, RAYMOND C., SR.
219	34291			10/18/1977	CAN	UG		SE	07	14S	65E	2.7	IRC		10/18/1977		CL	LAMB, ROZELLA
219	36091			10/24/1978	DEN	UG	SE	NW	04	14S	65E	2.7	IRR		10/24/1978		CL	KATHY ANNE KOSTAL
219	36092			10/24/1978	DEN	UG	SW	NE	04	14S	65E	2.7	IRR		10/24/1978		CL	ARTHUR KOSTAL
219	37381			3/30/1979	DEN	UG	SE	SW	03	14S	65E	5.4	IRD		3/30/1979	0	CL	EARL, DIANE

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219	37382			3/30/1979	DEN	UG	SE	SW	02	14S	65E	5	IRD		3/30/1979	0	CL	EARL, GARY
219	37518			4/2/1979	CAN	UG	NW	SE	04	14S	65E	0	IRR		4/2/1979	0	CL	PEEK, KATHERINE J.
219	37519			4/2/1979	CAN	UG	NE	NW	09	14S	65E	0	IRR		4/2/1979	0	CL	PEEK, KATHERINE J.
219	37520			4/2/1979	CAN	UG	NE	NW	04	14S	65E	0	IRR		4/2/1979	0	CL	PEEK, FLOYD J.
219	37521			4/2/1979	CAN	UG	NW	NW	04	14S	65E	0	IRR		4/2/1979	0	CL	PEEK, FLOYD J.
219	38871		10166	8/28/1979	CER	UG	NW	NW	23	14S	65E	0.144	IRR		2/4/1948	75	CL	EGTEDAR, ASCAR
219	42100		10920	8/18/1980	CER	SPR	NE	NE	21	14S	65E	0.003	DOM		8/18/1980	2.025474	CL	UNITED STATES OF AMERICA
219	43160		10168	1/29/1981	ABR	UG	SW	NE	23	14S	65E	0.79	IRR		4/20/1948	0	CL	WHITMORE, DAN OR LATRICE
		CHANGED BY: 59254			ABR	UG												
		CHANGED BY: 59255			ABR	UG												
		CHANGED BY: 59257			CER	UG												
		CHANGED BY: 59256			CER	UG												
		CHANGED BY: 59253			CER	UG												
219	4471			6/16/1917	DEN	STR	NE	SW	15	14S	65E	7	IRR		6/16/1917	0	CL	BALDWIN, GEORGE C.
219	45418			3/4/1982	WDR	UG	NW	NW	23	14S	65E	0	IRR		2/4/1948	0	CL	EGTEDAR, ASCAR
219	46168			9/24/1982	WDR	UG	NW	SE	16	14S	65E	0.37	MUN		11/18/1969	0	CL	MOAPA VALLEY WATER COMPANY
219	46932			5/19/1983	PER	UG	NE	NE	35	13S	64E	2	MUN	Y	5/19/1983	1000.154 51	CL	MOAPA VALLEY WATER DISTRICT
		CHANGED BY: 59062T			WDR	UG												
		CHANGED BY: 63496T			EXP	UG												
		CHANGED BY: 64724T			EXP	UG												
219	4754			12/3/1917	DEN	STR	NW	NE	16	14S	65E	1	IRR	Y		0	CL	MOAPA & SALT LAKE PRODUCE COMPANY
219	49825			4/14/1986	ABR	UG	NE	SE	06	14S	65E	2	MUN		4/14/1986	0	CL	MOAPA VALLEY WATER DISTRICT
		CHANGED BY: 52520			CER	UG												

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							Qtr-Qtr	Qtr	SEC	TWN								RNG	
219	49842			4/21/1986	WDR	UG	SW	NE	08	14S	65E	1.2	IND		12/18/1958	24.91946 7969311	CL	NEVADA POWER COMPANY	
219	49843			4/21/1986	WDR	UG	SW	NE	08	14S	65E	1.2	IND		10/9/1969	159.5828	CL	NEVADA POWER COMPANY	
219	49844			4/21/1986	WDR	UG	SW	NE	08	14S	65E	2.945	IND		2/2/1966	431.8556 08	CL	NEVADA POWER COMPANY	
219	50272		13507	10/13/1986	CER	UG	NE	NE	22	14S	65E	0.23	IND	Y	7/7/1970	99.51	CL	NEVADA POWER COMPANY	
219	50273		13508	10/13/1986	CER	UG	NE	NE	22	14S	65E	0.67	IND	Y	7/7/1970	289.91	CL	NEVADA POWER COMPANY	
219	50274		13509	10/13/1986	ABR	UG	NE	NE	22	14S	65E	1	IND		7/7/1970	0	CL	NEVADA POWER COMPANY	
						CHANGED BY: 79069T											EXP	UG	
						CHANGED BY: 79068												CER	UG
219	50275		13510	10/13/1986	CER	UG	NE	NE	22	14S	65E	0.52	IND	Y	10/7/1948	32.88	CL	NEVADA POWER COMPANY	
219	50723		13381	3/24/1987	CER	UG	NW	NW	15	14S	65E	0.32	IND	Y	8/13/1947	88	CL	LDS	
219	50724		13382	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.92	IND	Y	10/4/1949	162.55	CL	LDS	
219	50725		13383	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.302	IND	Y	4/28/1965	65	CL	LDS	
219	50726		13384	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.302	IND	Y	4/28/1965	65	CL	LDS	
219	50727		13385	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.271	IND	Y	4/28/1965	60	CL	LDS	
219	50728		13386	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.58	IND	Y	8/13/1947	158	CL	LDS	
219	50729		13387	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.44	IND	Y	8/13/1947	120	CL	LDS	
219	50730		13388	3/24/1987	CER	UG	SW	SW	09	14S	65E	0.117	IND	Y	4/28/1965	25	CL	LDS	
219	50731		13389	3/24/1987	CER	UG	NW	NW	15	14S	65E	2.16	IND	Y	8/13/1947	586	CL	LDS	
219	50732		13390	3/24/1987	CER	UG	NE	NE	16	14S	65E	2.33	IND	Y	8/13/1947	930	CL	LDS	
219	50733		13391	3/24/1987	CER	UG	NE	NE	16	14S	65E	0.18	IND	Y	8/13/1947	70	CL	LDS	
219	50734		13851	3/24/1987	CER	STR	SE	SE	15	14S	65E	3.5	IND		1/1/1905	1000	CL	NEVADA POWER COMPANY (LESSEE)	
219	50851		14294	4/23/1987	CER	UG	NW	NW	23	14S	65E	0.48	IRR	Y	10/7/1948	30	CL	CLARK COUNTY	
						CHANGED BY: 56428												WDR	UG

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CHANGED BY: 64840					CER	UG												
219	50934		13581	5/14/1987	CER	UG	NE	NE	22	14S	65E	0.733	IND	Y	11/20/1959	55.4	CL	NEVADA POWER COMPANY
219	52351			7/29/1988	CAN	STR	SW	NW	16	14S	65E	3	MUN			2171.400 195	CL	MUDDY VALLEY IRRIGATION COMPANY
219	52520		21072	9/19/1988	CER	UG	SE	NE	07	14S	65E	2	MUN	Y	4/14/1986	1447.937 709	CL	MOAPA VALLEY WATER DISTRICT
219	52587			10/4/1988	ABR	UG	NW	NW	23	14S	65E	0.0005	IND		7/7/1970	0	CL	NEVADA POWER COMPANY
CHANGED BY: 72186					CAN	UG												
CHANGED BY: 75404					ABR	UG												
219	55450			11/9/1990	PER	UG	SE	NE	07	14S	65E	3	MUN	Y	11/9/1990	2171.906 5635	CL	MOAPA VALLEY WATER DISTRICT
219	56059			3/25/1991	DEN	UG	NE	NE	35	13S	64E	3	IND		3/25/1991	0	CL	OXFORD ENERGY OF NEVADA INC.
219	56428			6/11/1991	WDR	UG	NW	NW	23	14S	65E	0.19	IRR		10/7/1948	19.98	CL	PERKINS, G.M.
219	56668		15097	8/15/1991	CER	SPR	SE	SE	16	14S	65E	3.5	WLD		8/15/1991	2533.960 041	CL	USFWS
219	58269			10/27/1992	PER	UG	SE	NE	07	14S	65E	5	MUN	Y	10/27/1992	1085.94	CL	MOAPA VALLEY WATER DISTRICT
CHANGED BY: 66043					PER	UG												
219	58787			4/23/1993	WDR	UG	NE	SE	07	14S	65E	6	PWR		4/23/1993	0	CL	MOAPA VALLEY WATER DISTRICT
219	59062T			7/27/1993	WDR	UG	SE	NE	07	14S	65E	1	MUN		5/19/1983	0	CL	MOAPA VALLEY WATER DISTRICT
219	59253		15460	9/20/1993	CER	UG	SW	NE	23	14S	65E	0.1975	IRR		5/20/1948	43.875	CL	LEAVITT, UTE
219	59254			9/20/1993	ABR	UG	SW	NE	23	14S	65E	0.198	IRR		4/20/1948	0	CL	HENRY, SUZIE
CHANGED BY: 63505					ABR	UG												
CHANGED BY: 63504					CER	UG												
219	59255			9/20/1993	ABR	UG	SW	NE	23	14S	65E	0.198	IRR		4/20/1948	0	CL	ROBINSON, MARLEY
CHANGED BY: 63535					ABR	UG												
219	59256		15104	9/20/1993	CER	UG	SW	NE	23	14S	65E	0.12998	IRR		5/20/1948	28.875	CL	WHITMORE, DAN
219	59257		15105	9/20/1993	CER	UG	SW	NE	23	14S	65E	0.06752	IRR		5/20/1948	15	CL	BRUNDY, LARRY

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219	59369			11/5/1993	DEN	UG	NE	NE	33	13SH	64E	10	MUN		11/5/1993	0	CL	MOAPA VALLEY WATER DISTRICT
219	61052			3/20/1995	WDR	UG	SE	SW	09	14S	65E	1626	COM		3/20/1995		CL	S AND R, INC.
219	61427			7/26/1995	PER	UG	SE	SW	09	14S	65E	0.007	COM		7/26/1995	1.350316	CL	S & R, INC.
219	6169			6/14/1920	DEN	STR	NW	NE	16	14S	65E	1	IRR	Y	6/14/1920	0	CL	MOAPA & SALT LAKE PRODUCE CO.
219	63496T			10/10/1997	EXP	UG	SE	NE	07	14S	65E	2	MUN		5/19/1983	1000.154 51	CL	MOAPA VALLEY WATER DISTRICT
219	63504		15771	10/14/1997	CER	UG	SW	NE	23	14S	65E	0.0675	IRR		5/20/1948	15	CL	KOLHOSS, KELLY
219	63505		15772	10/14/1997	ABR	UG	SW	NE	23	14S	65E	0.13	IRR		4/20/1948	0	CL	DAVIS, VENNA LEAVITT
						CHANGED BY: 71769		CAN	UG									
						CHANGED BY: 70520		ABR	UG									
						CHANGED BY: 82096		PER	UG									
						CHANGED BY: 71026		CER	UG									
						CHANGED BY: 77381		PER	UG									
219	63535		15773	10/28/1997	ABR	UG	SW	NE	23	14S	65E	0.1975	IRR		4/20/1948	0	CL	DAVIS, VENNA LEAVITT
						CHANGED BY: 71768		CAN	UG									
						CHANGED BY: 82097		PER	UG									
						CHANGED BY: 71344		CER	UG									
						CHANGED BY: 70519		ABR	UG									
						CHANGED BY: 77382		PER	UG									
219	6419		6795	3/9/1921	CER	STR	NW	NW	15	14S	65E	0.2	IRR			0	CL	MOAPA VALLEY WATER DISTRICT
219	64724T			12/29/1998	EXP	UG	SE	NE	07	14S	65E	2	MUN		5/19/1983	1000.154 51	CL	MOAPA VALLEY WATER DISTRICT
219	64840		16450	2/8/1999	CER	UG	NW	NW	23	14S	65E	0.192	IRR	Y	10/7/1948	19.8	CL	CLARK COUNTY
219	66043			2/3/2000	PER	UG	SE	NE	07	14S	65E	3.5	MUN	Y	10/27/1992	2533.9	CL	MOAPA VALLEY WATER DISTRICT
219	68079			10/9/2001	WDR	UG	NW	NW	06	14S	65E	15	PWR		10/9/2001	0	CL	SILVER STATE WATER CO., LLC

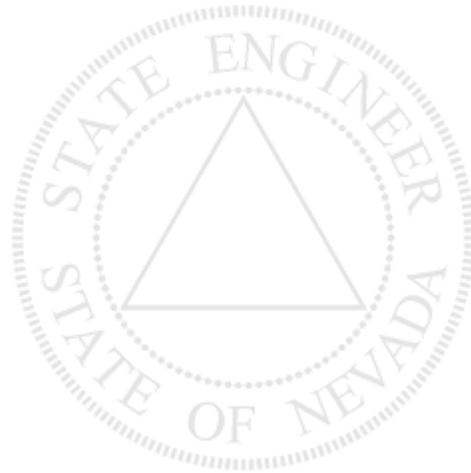


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							Qtr-Qtr	Qtr	SEC	TWN								RNG
219	70519			10/20/2003	ABR	UG	NE	NE	22	14S	65E	0.0958	IRR		4/20/1948	0	CL	DAVIS, VENNA LEAVITT
		CHANGED BY: 71223T			EXP	UG												
		CHANGED BY: 71766			CER	UG												
219	70520			10/20/2003	ABR	UG	NE	NE	22	14S	65E	0.0631	IRR		4/20/1948	0	CL	3335HILLSIDE, LLC
		CHANGED BY: 86209			PER	UG												
219	71026		16914	4/9/2004	CER	UG	SE	SE	09	14S	65E	0.018	IRR	Y	5/20/1948	3.993	CL	PARSON, BILLY & LINDA
219	71223T			5/14/2004	EXP	UG	NE	NE	22	14S	65E	0.0958	IRR		4/20/1948	21.29	CL	DAVIS, VENNA LEAVITT
219	71344		16915	6/18/2004	CER	UG	SE	SE	09	14S	65E	0.0273	IRR	Y	5/20/1948	6.067	CL	PARSON, BILLY & LINDA
219	71766		21130	10/14/2004	CER	UG	NE	NE	22	14S	65E	0.0958	IRR	Y	7/21/2011	21.289	CL	3335HILLSIDE, LLC
219	71768			10/14/2004	CAN	UG	NE	NE	22	14S	65E	0.019	IRR		4/20/1948	4.22	CL	DAVIS, VENNA LEAVITT
219	71769			10/14/2004	CAN	UG	NE	NE	22	14S	65E	0.013	IRR		4/20/1948	2.78	CL	DAVIS, VENNA LEAVITT
219	72186			2/2/2005	CAN	UG	SE	SW	14	14S	65E	0.4454	IND		7/7/1970	322.5	CL	NEVADA POWER COMPANY
219	73482			11/14/2005	ABR	STR	SW	SE	26	14S	65E	3.98	IRR		1/1/1905	0	CL	MUDDY VALLEY IRRIGATION COMPANY
		CHANGED BY: 85530T			EXP	STR												
		CHANGED BY: 87144T			EXP	STR												
		CHANGED BY: 88719T			PER	STR												
		CHANGED BY: 87932T			EXP	STR												
219	73483			11/14/2005	ABR	STR	SW	SE	26	14S	65E	7.948	IRR		1/1/1905	0	CL	MUDDY VALLEY IRRIGATION COMPANY
		CHANGED BY: 78756T			WDR	STR												
		CHANGED BY: 79949			WDR	STR												
		CHANGED BY: 85009			CAN	STR												
		CHANGED BY: 85529T			EXP	STR												
		CHANGED BY: 87143T			EXP	STR												

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							Qtr-Qtr	Qtr	SEC								TWN	RNG
		CHANGED BY: 87933T			EXP	STR												
		CHANGED BY: 88720T			PER	STR												
219	73695			1/12/2006	PER	STR	SW	SE	26	14S	65E	3.552	IRR		1/1/1905	0	CL	MUDDY VALLEY IRRIGATION COMPANY
219	75161E			12/6/2006	PER	UG	NW	NW	23	14S	65E	1.268	ENV	Y	12/6/2006	905.81	CL	NEVADA POWER COMPANY
219	75404			3/2/2007	ABR	UG	SE	SW	14	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 79067			ABR	UG												
219	77381			9/12/2008	PER	UG	NE	SW	09	14S	65E	0.027	COM	Y	4/20/1948	6.069	CL	WILLIAM O'DONNELL
219	77382			9/12/2008	PER	UG	NE	SW	09	14S	65E	0.042	COM	Y	4/20/1948	9.221	CL	WILLIAM O'DONNELL
219	77575			11/6/2008	RFP	SPR	NE	NE	21	14S	65E	3	WLD		11/6/2008	0	CL	U.S.-FISH AND WILDLIFE SERVICE
219	77599			11/17/2008	RFP	SPR	NW	SE	16	14S	65E	3	WLD		11/17/2008	0	CL	U.S.-FISH AND WILDLIFE SERVICE
219	79067			12/2/2009	ABR	UG	SE	SW	14	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY
		CHANGED BY: 80167			WDR	UG												
		CHANGED BY: 85156			PER	UG												
219	79068		20183	12/2/2009	CER	UG	NE	NE	22	14S	65E	1	IND	Y	7/7/1970	432.7	CL	NEVADA POWER COMPANY
219	79069T			12/2/2009	EXP	UG	NE	NE	22	14S	65E	1	IND		7/7/1970	432.7	CL	NEVADA POWER COMPANY DBA
219	79629			2/22/2010	WDR	UG	NE	NE	33	13SH	64E	10	MUN		2/22/2010	7240	CL	MOAPA VALLEY WATER DISTRICT
219	80167			9/22/2010	WDR	UG	SE	NE	08	14S	65E	0.445	IND		7/7/1970	322.17	CL	NEVADA POWER COMPANY DBA NV ENERGY
219	80212			10/18/2010	WDR	UG	NW	SE	08	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
219	80213			10/18/2010	WDR	UG	NW	SE	08	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
219	80214			10/18/2010	WDR	UG	SW	NE	08	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
219	80215			10/18/2010	WDR	UG	NW	NE	08	14S	65E	0.445	IND		7/7/1970	0	CL	NEVADA POWER COMPANY DBA NV ENERGY
219	80843			5/9/2011	PER	UG	SE	NE	08	14S	65E	0.445	IND	Y	5/9/2011	322.17	CL	NEVADA POWER COMPANY
219	80844			5/9/2011	PER	UG	SW	NE	08	14S	65E	0.445	IND	Y	5/9/2011	322.17	CL	NEVADA POWER COMPANY

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record	
							Qtr-Qtr	Qtr	SEC	TWN								RNG
219	80845			5/9/2011	PER	UG	NW	NE	08	14S	65E	0.445	IND	Y	5/9/2011	322.17	CL	NEVADA POWER COMPANY
219	80846			5/9/2011	PER	UG	NW	SE	08	14S	65E	0.445	IND	Y	5/9/2011	322.17	CL	NEVADA POWER COMPANY
219	80847			5/9/2011	WDR	UG	NW	SE	08	14S	65E	0.445	IND		5/9/2011	0	CL	NEVADA POWER COMPANY
219	82096			9/7/2012	PER	UG	NW	NE	26	14S	65E	0.009	QM	Y	4/20/1948	1.903	CL	CLOUD, MARY K
219	82097			9/7/2012	PER	UG	NW	NE	26	14S	65E	0.0135	QM	Y	4/20/1948	2.891	CL	CLOUD, MARY K
219	85040			4/3/2015	DEN	SPR	NW	SW	27	14S	65E	0.011	WLD		4/3/2015	8	CL	MOAPA VALLEY WATER DISTRICT
219	85156			5/8/2015	PER	UG	NW	SE	08	14S	65E	0.445	IND	Y	7/7/1970	322.17	CL	NEVADA POWER COMPANY
219	86209			5/13/2016	PER	UG	NE	NE	22	14S	65E	0.0631	COM	Y	4/20/1948	14.01	CL	3335HILLSIDE LLC
219	86955T			2/24/2017	EXP	STR	SW	SW	09	14S	65E	0.06435	IRR		2/24/2017	0	CL	SNWA
219	86956T			2/24/2017	EXP	STR	NW	SE	15	14S	65E	0.0786	IRR		2/24/2017	0	CL	SNWA
219	86957T			2/24/2017	EXP	STR	SW	SW	09	14S	65E	0.043	IRR		2/24/2017	0	CL	SNWA
219	87996			5/21/2018	RFP	SPR	NW	SW	27	14S	65E	0.011	WLD		5/21/2018	8	CL	U.S.-BUREAU OF LAND MANAGEMENT
219	88008T			5/25/2018	EXP	STR	SW	SW	09	14S	65E	0.045	IRR		4/23/1919	0	CL	SNWA
219	88009T			5/25/2018	EXP	STR	NW	SE	15	14S	65E	0.055	IRR		4/23/1919	0	CL	SNWA
219	88010T			5/25/2018	EXP	STR	SW	SW	09	14S	65E	0.03	IRR		4/23/1919	0	CL	SNWA
219	89			4/26/1906	CAN	STR	NE	NE	16	14S	65E	0	IRR	Y	4/26/1906	0	CL	STOER, FRED J.
219	9461			5/22/1931	DEN	STR	NE	NE	21	14S	65E	0.029	IRR	Y	5/22/1931		CL	BEACH, CALVIN B.
219	9985			4/30/1936	CAN	OSW	NE	SE	03	14S	64E	30	STO	Y	4/30/1936	700	CL	MUDDY VALLEY IRRIGATION CO., INC.
219	V01619			4/23/1919	DEC	STR	NW	NE	16	14S	65E	0.143	IRR		4/23/1919	123.907	CL	SOUTHERN NEVADA WATER AUTHORITY
					CHANGED BY: 86956T		EXP	STR										
					CHANGED BY: 86955T		EXP	STR										
					CHANGED BY: 88008T		EXP	STR										
					CHANGED BY: 88009T		EXP	STR										

Basin	App	Prev App Change of App	Cert	Filing Date	Status	Source	POINT OF DIVERSION				Div Rate (CFS)	Manner of Use	Sup?	Priority Date	Duty Bal	County	Owner of Record
							Qtr-Qtr	Qtr	SEC	TWN							
219	V01625			6/23/1919	VST	SPR					0	DEC	6/23/1919	0	CL	ROBERT E. AND LYNN C. PLUMMER FAMILY TRUST U/A/D JUNE 9 AND 10, 1987	
219	V01631			4/23/1919	PER	STR	NE	NE	16	14S	65E	0.043	IRR	4/23/1919	25.66	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY: 86957T			EXP	STR											
		CHANGED BY: 88010T			EXP	STR											



Hydrographic Area Summary

Hydrographic Area No.	205	Hydrographic Area Name	LOWER MEADOW VALLEY WASH
Subarea Name			
Hydrographic Region No.	13	Hydrographic Region Name	COLORADO RIVER BASIN
Area (sq. mi.)	979		
Counties within the hydrographic area	Lincoln, Clark		
Nearest Communities to Hydrographic Area	Caliente, Moapa		
Designated (Y/N, Order No.)	Y, O-803	For All or Portion of Basin	All
Preferred Use	None	For All or Portion of Basin	All
State Engineer's Orders:		For All or Portion of Basin	All
State Engineer's Rulings:			
Pumpage Inventory Status	None	Crop Inventory Status	None
Water Level Measurement?	Y		
Yield Values			
Perennial Yield (AFY)	25000		
System Yield (AFY)			
Yield Reference(s)	USGS Recon. 27		
Yield Remarks	Yield for basins 198 - 205 totals 25,000		
Source of Committed Data:	NDWR Database	Supplementally Adjusted?	Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	1,014.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	40.33	0.00	0.00
Industrial	6,904.87	0.00	0.00
Irrigation	6,631.70	0.00	0.00
Mining and Milling	6.40	0.00	0.00
Municipal	10,516.87	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	4.48	0.00	0.00
Recreation	3.00	0.00	0.00
Stockwater	10.93	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	74.51	0.00	0.00
Totals	25,207.09	0.00	0.00

Related Reports

USGS Reconnaissance 27 USGS Bulletin 7

Other References

Comments

Hydrographic Area Summary

Hydrographic Area No.	206	Hydrographic Area Name	KANE SPRINGS VALLEY
Subarea Name			
Hydrographic Region No.	13	Hydrographic Region Name	COLORADO RIVER BASIN
Area (sq. mi.)	234		
Counties within the hydrographic area	Lincoln		
Nearest Communities to Hydrographic Area	Caliente, Moapa		
Designated (Y/N, Order No.)	N	For All or Portion of Basin	All
Preferred Use	None	For All or Portion of Basin	All
State Engineer's Orders:		For All or Portion of Basin	All
State Engineer's Rulings:			
Pumpage Inventory Status	None	Crop Inventory Status	None
Water Level Measurement?	Y		
Yield Values			
Perennial Yield (AFY)	1000		
System Yield (AFY)			
Yield Reference(s)	State Engineer Ruling 5712		
Yield Remarks			
Source of Committed Data:	NDWR Database	Supplementally Adjusted?	Y

Manner of Use	Underground	Geothermal	Other Ground Water
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
Mining and Milling	0.00	0.00	0.00
Municipal	1,000.00	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	1,000.00	0.00	0.00

Related Reports

USGS Reconnaissance 25 **USGS Bulletin** 33

Other References

Comments

Hydrographic Area Summary

Hydrographic Area No. 210 **Hydrographic Area Name** COYOTE SPRING VALLEY
Subarea Name
Hydrographic Region No. 13 **Hydrographic Region Name** COLORADO RIVER BASIN
Area (sq. mi.) 657
Counties within the hydrographic area Lincoln, Clark
Nearest Communities to Hydrographic Area Moapa, Alamo
Designated (Y/N, Order No.) Y, O-905 **For All or Portion of Basin** All
Preferred Use O-905 Preferred Uses Only MUN, IND, DOM, PWR **For All or Portion of Basin** All
State Engineer's Orders:  **For All or Portion of Basin** All
State Engineer's Rulings: 
Pumpage Inventory Status Ongoing **Crop Inventory Status** None
Water Level Measurement? Y
Yield Values
Perennial Yield (AFY) 1900 - 18000
System Yield (AFY)
Yield Reference(s) State Engineer Ruling 4542
Yield Remarks See State Engineer Ruling 6254 and 6255
Source of Committed Data: NDWR Database **Supplementally Adjusted?** Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	343.00	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	2,500.00	0.00	0.00
Irrigation	0.00	0.00	0.00
Mining and Milling	0.00	0.00	0.00
Municipal	13,600.00	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	460.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	16,903.00	0.00	0.00

Related Reports

USGS Reconnaissance 25 **USGS Bulletin** 18, 33

Other References

Comments A Part of this Basin is In Desert National Wildlife Range.

Hydrographic Area Summary

Hydrographic Area No.	215	Hydrographic Area Name	BLACK MOUNTAINS AREA
Subarea Name			
Hydrographic Region No.	13	Hydrographic Region Name	COLORADO RIVER BASIN
Area (sq. mi.)	630		
Counties within the hydrographic area	Clark		
Nearest Communities to Hydrographic Area	Boulder City, Overton		
Designated (Y/N, Order No.)	Y, O-1018	For All or Portion of Basin	All
Preferred Use	O-1018 Preferred Uses Only MUN, IND, COM, PWR	For All or Portion of Basin	All
State Engineer's Orders:		For All or Portion of Basin	All
State Engineer's Rulings:			
Pumpage Inventory Status	ongoing	Crop Inventory Status	None
Water Level Measurement?	Y		
Yield Values			
Perennial Yield (AFY)	1300		
System Yield (AFY)	7000		
Yield Reference(s)	USGS Open File Report 78-768		
Yield Remarks	See State Engineer Ruling 6260		
Source of Committed Data:	NDWR Database	Supplementally Adjusted?	Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	1.35	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	1,665.00	0.00	0.00
Irrigation	0.00	0.00	0.00
Mining and Milling	527.28	0.00	0.00
Municipal	0.00	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	3,602.93	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	5,796.56	0.00	0.00

Related Reports

USGS Reconnaissance 50 **USGS Bulletin** None

Other References

Comments Basin is Shared in Common with Arizona.

Hydrographic Area Summary

Hydrographic Area No. 216 **Hydrographic Area Name** GARNET VALLEY
Subarea Name
Hydrographic Region No. 13 **Hydrographic Region Name** COLORADO RIVER BASIN
Area (sq. mi.) 156
Counties within the hydrographic area Clark
Nearest Communities to Hydrographic Area North Las Vegas, Moapa
Designated (Y/N, Order No.) Y, O-1025 **For All or Portion of Basin** All
Preferred Use O-1025 Preferred Uses Only MUN, QM, IND, COM, MM, **For All or Portion of Basin** All
State Engineer's Orders:  **For All or Portion of Basin** All
State Engineer's Rulings: 
Pumpage Inventory Status Ongoing **Crop Inventory Status** None
Water Level Measurement? Y
Yield Values
Perennial Yield (AFY) 400
System Yield (AFY)
Yield Reference(s) USGS Recon. 50
Yield Remarks See State Engineer Ruling 6256
Source of Committed Data: NDWR Database **Supplementally Adjusted?** Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	14.02	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	615.15	0.00	0.00
Irrigation	0.00	0.00	0.00
Mining and Milling	283.81	0.00	0.00
Municipal	2,274.57	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	1,570.03	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	4,757.58	0.00	0.00

Related Reports

USGS Reconnaissance 50 **USGS Bulletin** 189

Other References

Comments Part of this Basin is in Desert National Wildlife Range

Hydrographic Area Summary

Hydrographic Area No. 217 **Hydrographic Area Name** HIDDEN VALLEY (NORTH)
Subarea Name
Hydrographic Region No. 13 **Hydrographic Region Name** COLORADO RIVER BASIN
Area (sq. mi.) 80
Counties within the hydrographic area Clark
Nearest Communities to Hydrographic Area North Las Vegas, Moapa
Designated (Y/N, Order No.) Y, O-1024 **For All or Portion of Basin** All
Preferred Use O-1024 Preferred Uses Only MUN, QM, IND, COM, MM, **For All or Portion of Basin** All
State Engineer's Orders:  **For All or Portion of Basin** All
State Engineer's Rulings: 
Pumpage Inventory Status None **Crop Inventory Status** None
Water Level Measurement? Y
Yield Values
Perennial Yield (AFY) 200
System Yield (AFY)
Yield Reference(s) USGS Recon. 50
Yield Remarks See State Engineer Ruling 6257
Source of Committed Data: NDWR Database **Supplementally Adjusted?** Y

Manner of Use	Underground	Geothermal	Other Ground Water
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
Mining and Milling	0.00	0.00	0.00
Municipal	2,274.57	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	2,274.57	0.00	0.00

Related Reports

USGS Reconnaissance 50 **USGS Bulletin** 18

Other References

Comments Part of the Basin is in Desert National Wildlife Range

Hydrographic Area Summary

Hydrographic Area No. 218 **Hydrographic Area Name** CALIFORNIA WASH
Subarea Name
Hydrographic Region No. 13 **Hydrographic Region Name** COLORADO RIVER BASIN
Area (sq. mi.) 318
Counties within the hydrographic area Clark
Nearest Communities to Hydrographic Area Moapa
Designated (Y/N, Order No.) Y, O-1026 **For All or Portion of Basin** All
Preferred Use O-1026 Preferred Uses Only MUN, QM, IND, COM, MM, **For All or Portion of Basin** All
State Engineer's Orders:  **For All or Portion of Basin** All
State Engineer's Rulings: 
Pumpage Inventory Status None **Crop Inventory Status** None
Water Level Measurement? Y
Yield Values
Perennial Yield (AFY) 2200
System Yield (AFY) 40000
Yield Reference(s) USGS Open File Report 78-768
Yield Remarks See State Engineer Ruling 6258
Source of Committed Data: NDWR Database **Supplementally Adjusted?** Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	0.00	0.00	0.00
Construction	0.00	0.00	0.00
Domestic	0.00	0.00	0.00
Environmental	90.53	0.00	0.00
Industrial	6,904.87	0.00	0.00
Irrigation	90.00	0.00	0.00
Mining and Milling	0.00	0.00	0.00
Municipal	2,525.00	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	0.00	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	9,610.40	0.00	0.00

Related Reports

USGS Reconnaissance 50 **USGS Bulletin** None

Other References

Comments

Hydrographic Area Summary

Hydrographic Area No.	219	Hydrographic Area Name	MUDDY RIVER SPRINGS AREA (UPPER MOAPA)
Subarea Name			
Hydrographic Region No.	13	Hydrographic Region Name	COLORADO RIVER BASIN
Area (sq. mi.)	91		
Counties within the hydrographic area	Clark, Lincoln		
Nearest Communities to Hydrographic Area	Moapa, Overton		
Designated (Y/N, Order No.)	Y, O-1023	For All or Portion of Basin	All
Preferred Use	O-1023 Preferred Uses Only MUN, QM, IND, COM, MM,	For All or Portion of Basin	All
State Engineer's Orders:		For All or Portion of Basin	All
State Engineer's Rulings:			
Pumpage Inventory Status	None	Crop Inventory Status	None
Water Level Measurement?	Y		
Yield Values			
Perennial Yield (AFY)	100 - 36000		
System Yield (AFY)			
Yield Reference(s)	USGS Recon. 25		
Yield Remarks	See State Engineer Ruling 6259		
Source of Committed Data:	NDWR Database	Supplementally Adjusted?	Y

Manner of Use	Underground	Geothermal	Other Ground Water
Commercial	36.83	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	9,234.42	0.00	0.00
Irrigation	476.26	0.00	0.00
Mining and Milling	0.00	0.00	0.00
Municipal	6,791.91	0.00	0.00
Power	0.00	0.00	0.00
Quasi-Municipal	4.79	0.00	0.00
Recreation	0.00	0.00	0.00
Stockwater	0.00	0.00	0.00
Storage	0.00	0.00	0.00
Wildlife	0.00	0.00	0.00
Other	0.00	0.00	0.00
Totals	16,544.21	0.00	0.00

Related Reports

USGS Reconnaissance 25 USGS Bulletin 33

Other References

Comments

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2005**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
46777	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	0.00	
49414	Permit		SW	NW	13	11	63				
49660	Permit		SE	NE	10	12	63				
49661	Permit		SE	NE	10	13	63				
49662	Permit		SW	NW	13	11	63				
49978	Permit		SE	SE	28						
49979	Permit		NE	NE	3	12	63				
49980	Permit		SE	NE	10						
49981	Permit		NW	SE	29						
49982	Permit		NW	NW	3	13	63				
49983	Permit		SE	NE	10	13	63				
49984	Permit		NE	NE	20						
49985	Permit		NE	NE	21						
49986	Permit		NE	NE	1						
49987	Permit										
61458	Permit	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	406.49	3 wells.
70860	Permit		NW	SE							
70861	Permit		SE	NW							
70862	Permit		NW	SE							
69448	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	
70429	Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	258.50	
70430			SW	SE	22						
TOTAL										664.99	Permitted rights

SE ROA 1070

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO 210
2006**

IRRIGATION 0 Ac-Ft

MINING AND INDUSTRIAL 385.61 Ac-Ft

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL 416.09 Ac-Ft

DOMESTIC 2 Ac-Ft

Domestic wells drilled in 2006 = 0

TOTAL 804 Ac-Ft

SE ROA 1071

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2006**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
46777	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	0.00	
49414	Permit		SW	NW	13	11	63				
49660	Permit		SE	NE	10	12	63				
49661	Permit		SE	NE	10	13	63				
49662	Permit		SW	NW	13	11	63				
49978	Permit		SE	SE	28						
49979	Permit		NE	NE	3	12	63				
49980	Permit		SE	NE	10						
49981	Permit		NW	SE	29						
49982	Permit		NW	NW	3	13	63				
49983	Permit		SE	NE	10	13	63				
49984	Permit		NE	NE	20						
49985	Permit		NE	NE	21						
49986	Permit		NE	NE	1						
49987	Permit										
61458	Permit	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	385.61	3 wells.
70860	Permit		NW	SE							
70861	Permit		SE	NW							
70862	Permit		NW	SE							
69448	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	
70429	Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	416.09	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
TOTAL										801.70	Permitted rights

SE ROA 1072

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO 210
2007**

IRRIGATION **0 Ac-Ft**

MINING AND INDUSTRIAL **363.97 Ac-Ft**

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL **2780.57 Ac-Ft**

DOMESTIC **2 Ac-Ft**

Domestic wells drilled in 2007 = 0

TOTAL 3,145 Ac-Ft

SE ROA 1073

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2007**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
46777	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	0.00	
49414	Permit		SW	NW	13	11	63				
49660	Permit		SE	NE	10	12	63				
49661	Permit		SE	NE	10	13	63				
49662	Permit		SW	NW	13	11	63				
49978	Permit		SE	SE	28						
49979	Permit		NE	NE	3	12	63				
49980	Permit		SE	NE	10						
49981	Permit		NW	SE	29						
49982	Permit		NW	NW	3	13	63				
49983	Permit		SE	NE	10	13	63				
49984	Permit		NE	NE	20						
49985	Permit		NE	NE	21						
49986	Permit		NE	NE	1						
49987	Permit										
61458	Exp	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	363.97	3 wells.
70860	Exp		NW	SE							
70861	Exp		SE	NW							
70862	Exp		NW	SE							
69448	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	
70429	Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	2780.57	Pumpage submitted.
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
TOTAL										3144.54	Permitted rights

SE ROA 1074

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO 210
2008**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	337.78 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	1659.87 Ac-Ft
DOMESTIC	2 Ac-Ft
Domestic wells drilled in 2008 = 0	
TOTAL	2,000 Ac-Ft

SE ROA 1075

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2008**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
V-04545	VST	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	337.78	3 wells.
61458	Exp		NW	SE							
70860	Exp		SE	NW							
70861	Exp		NW	SE							
70862	Exp										
70429	Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	1659.87	
70430	Abr		SW	SE	22						
74094	Permit										
74095	Permit										
77337-T	Permit										
77338-T	Permit										
77339-T	Permit										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	0.00	
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
77707-T	Permit										
77708-T	Permit										
77709-T	Permit										

TOTAL 1997.65 Permitted rights

SE ROA 1076

**GROUND WATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO. 210
2009**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	392 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	1,398 ac-ft
DOMESTIC	2 ac-ft
Domestic wells drilled in 2009 = 0	
Total	1,792 ac-ft

SE ROA 1077

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2009**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
V-04545	Abr	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	376.66	3 wells.
61458	Exp		NW	SE							
70859	Permit		SE	NW							
70860	Exp		NW	SE							
70861	Exp										
70862	Exp										
70429	Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	1397.96	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
77337-T	Exp										
77338-T	Exp										
77339-T	Exp										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	15.40	
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
77707-T	Permit										
77708-T	Permit										
77709-T	Permit										

TOTAL **1790.02** **Permitted rights**

SE ROA 1078

**GROUND WATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO. 210
2010**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,807 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	1,114 ac-ft
DOMESTIC	2 ac-ft
Domestic wells drilled in 2010 = 0 (Total Wells = 2)	
Total	2,923 ac-ft

SE ROA 1079

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
V-04545	Abr	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	422.89	3 wells.
61458	Exp		NW	SE							
70859	Permit		SE	NW							
70860	Exp		NW	SE							
70861	Exp										
70862	Exp										
70429	Cert	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	1114.16	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
77337-T	Exp										
77338-T	Exp										
77339-T	Exp										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	

SE ROA 1080

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	1383.78
77292	Permit		SW	NW	13	11	63			
77293	Permit		SE	NE	10	12	63			
77294	Permit		SE	NE	10	13	63			
77295	Permit		SW	NW	13	11	63			
77296	Permit		SE	SE	28					
77297	Permit		NE	NE	3	12	63			
77298	Permit		SE	NE	10					
77299	Permit		NW	SE	29					
77300	Permit		NW	NW	3	13	63			
77301	Permit		SE	NE	10	13	63			
77302	Permit		NE	NE	20					
77303	Permit		NE	NE	21					
77304	Permit		NE	NE	1					
77305	Permit									
77306	Permit									
77707-T	Exp									
77708-T	Exp									
77709-T	Exp									
TOTAL								2920.83	Permitted rights	

SE ROA 1081

**GROUND WATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO. 210
2011**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	4,558 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	1,046 ac-ft
DOMESTIC	2 ac-ft
Domestic wells drilled in 2011 = 0 (Total Wells = 2)	
Total	5,606 ac-ft

SE ROA 1082

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
V-04545	Abr	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	427.09	3 wells.
61458	Exp		NW	SE							
70859	Permit		SE	NW							
70860	Exp		NW	SE							
70861	Exp										
70862	Exp										
70429	Cert	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	1045.91	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
77337-T	Exp										
77338-T	Exp										
77339-T	Exp										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	

SE ROA 1083

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	4131.00
77292	Permit		SW	NW	13	11	63			
77293	Permit		SE	NE	10	12	63			
77294	Permit		SE	NE	10	13	63			
77295	Permit		SW	NW	13	11	63			
77296	Permit		SE	SE	28					
77297	Permit		NE	NE	3	12	63			
77298	Permit		SE	NE	10					
77299	Permit		NW	SE	29					
77300	Permit		NW	NW	3	13	63			
77301	Permit		SE	NE	10	13	63			
77302	Permit		NE	NE	20					
77303	Permit		NE	NE	21					
77304	Permit		NE	NE	1					
77305	Permit									
77306	Permit									
77707-T	Exp									
77708-T	Exp									
77709-T	Exp									

TOTAL 5604.00 Permitted rights

SE ROA 1084

**GROUND WATER PUMPAGE INVENTORY
COYOTE SPRINGS VALLEY, NO. 210
2012**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	4,374 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	1,141 ac-ft
DOMESTIC	2 ac-ft
Domestic wells drilled in 2012 = 0 (Total Wells = 2)	
Total	5,517 ac-ft

SE ROA 1085

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
V-04545 61458 70859 70860 70861 70862	Abr Exp Permit Exp Exp Exp	Bedrock Inc.	SE	NW	24	11	62	200.00	MM	413.18	3 wells. See Pahrnagat Measurement Book for meter readings.
70429 70430 74094 74095 82051-T	Cert Permit Permit Permit Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MN	1140.13	Pumpage submitted.
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	ID	0.00	Shauncy Malloy 402-5477 Robert Ott 334-5764

SE ROA 1086

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	ID	3961.00	Jeff Johnson 862-3748
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
77707-T	Exp										
77708-T	Exp										
77709-T	Exp										

TOTAL 5514.31 Permitted rights

SE ROA 1087

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



COYOTE SPRING VALLEY (HYDROGRAPHIC BASIN 13-210)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2013

Field Investigated by: John Guillory, P.E. & Christi Emery

Report Prepared by: John Guillory, P.E.

SE ROA 1088

JA_1253

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ABSTRACT

This inventory represents the status and pumpage of all permitted, certificated and claims of vested right groundwater rights located within Coyote Spring Valley, Hydrographic Basin 13-210, for calendar year 2013 (January 1, 2013 through December 31, 2013). Also included is data associated with depth to groundwater.

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

For calendar year 2013 the permitted, certificated and claims of vested right groundwater rights totaled **16,450 acre-feet**. Estimated pumpage for the calendar year was **3,407 acre-feet**. Municipal is the largest manner of use within the basin. For calendar year 2013, appropriations for municipal use totaled 13,850 acre-feet and the pumpage was 2,992 acre-feet. The next largest manner of use was industrial with appropriations totaling 2,500 acre-feet and the pumpage was 0 acre-feet. The next largest manner of use was irrigation with appropriations totaling 100 acre-feet and the pumpage was 413 acre-feet. The next largest manner of use was pumping by exempt domestic wells, at 2 acre-feet. Exempt domestic wells are defined by Nevada Revised Statutes 534.013 and do not require a permit issued by the State Engineer.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER..... 210, REGION 13

HYDROGRAPHIC BASIN NAME COYOTE SPRING VALLEY

COUNTIES..... CLARK, LINCOLN

NEARBY COMMUNITIES ALAMO, MOAPA

DESIGNATED YES

DENIALS BASED UPON WATER AVAILABILITY IRRIGATION

GROUNDWATER LEVEL MEASUREMENTS NDWR, SNWA, USGS

ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2013 3,407*

STATE ENGINEER'S ORDERS

905	- DESIGNATION	AUGUST 21, 1985
1169	- FURTHER STUDY	MARCH 8, 2002
1169a	- FURTHER STUDY	DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 16,450 ACRE-FEET..DATE: JUNE 2013

MUNICIPAL 13,850 INDUSTRIAL 2,500 IRRIGATION..... 100

NOTE: Committed groundwater resource data are accurate for June 2013. Manner of use category totals vary over time, as water rights (rights) are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin was estimated by a query of the [Nevada Division of Water Resources' Well Log Database](#) and is estimated to be 2.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources, and to estimate the amount of groundwater pumped within the Coyote Spring Valley Hydrographic Basin 13-210, for the calendar year beginning January 1, 2013 and ending December 31, 2013 (hereafter referred to as calendar year 2013). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

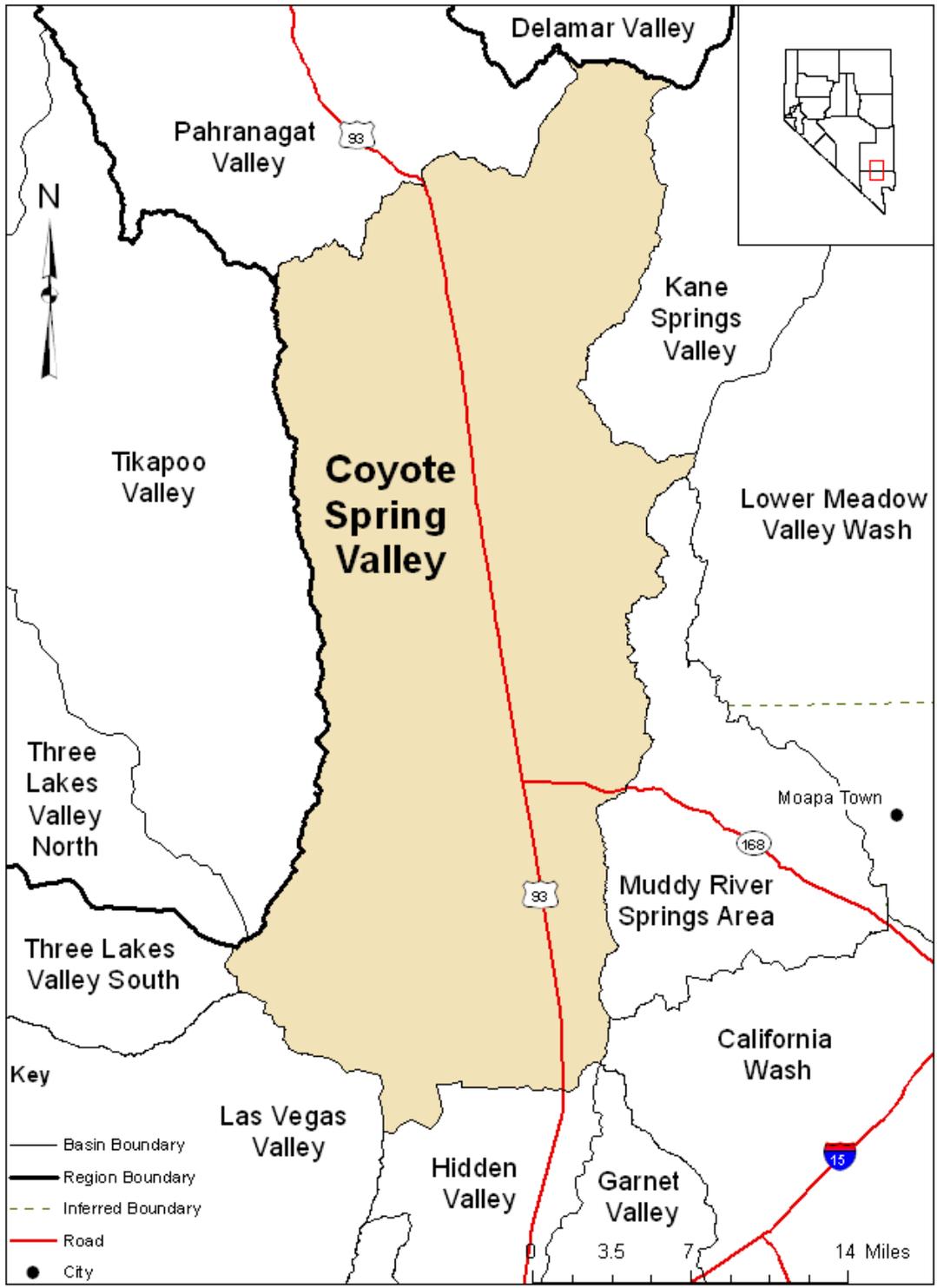
DESCRIPTION OF THE STUDY AREA

Coyote Spring Valley is a basin located in southeastern Nevada. The valley is approximately 60 miles north of Las Vegas, Nevada, and is within the Colorado River Hydrographic Region. The basin is located within Clark and Lincoln Counties (see Figure 1).

Coyote Spring Valley is bounded on the west by the Sheep Range. This range rises to 9,920 feet (all elevations in this text are above mean sea level) at Hayford Peak at the south end of the range. The south end of Coyote Spring Valley is topographically closed by a bedrock and alluvial divide extending eastward from Hayford Peak to the Arrow Canyon Range. The Delamar Range borders the basin to the east and the Arrow Canyon Range bounds the southeast part of the basin. The north boundary is defined by a series of hills at the south end of the Pahranaagat Range that connects with the north end of the Sheep and Delamar Ranges.

The adjacent Nevada hydrographic basins are as follows: Pahranaagat Valley, 13-209, to the north; Delamar Valley, 10-182, to the north; Kane Springs Valley, 13-206, to the northeast; Lower Meadow Valley Wash, 13-205, to the east; Muddy River Springs Area, 13-219, to the east; California Wash, 13-218, to the southeast; Hidden Valley (North), 13-217, to the south; Las Vegas Valley, 13-212, to the southwest; Three Lakes Valley (Southern Part), 13-211, to the southwest; Three Lakes Valley (Northern Part), 10-168, to the southwest; and Tikapoo Valley (Southern Part), 10-169B, to the west. The exterior boundary of the Coyote Spring Valley Hydrographic Basin is as described by Designation Order 905, issued by the Nevada State Engineer August 21, 1985.

FIGURE 1 LOCATION MAP OF COYOTE SPRING VALLEY HYDROGRAPHIC BASIN 13-210



GROUNDWATER LEVELS

Depths to groundwater in Coyote Spring Valley have been measured by the Nevada Division of Water Resources consistently since the late 1990's. There are three (3) active sites and zero (0) inactive sites in the monitoring well network. The following are the site names and links to the data (refer to Figure 2 for monitoring well locations):

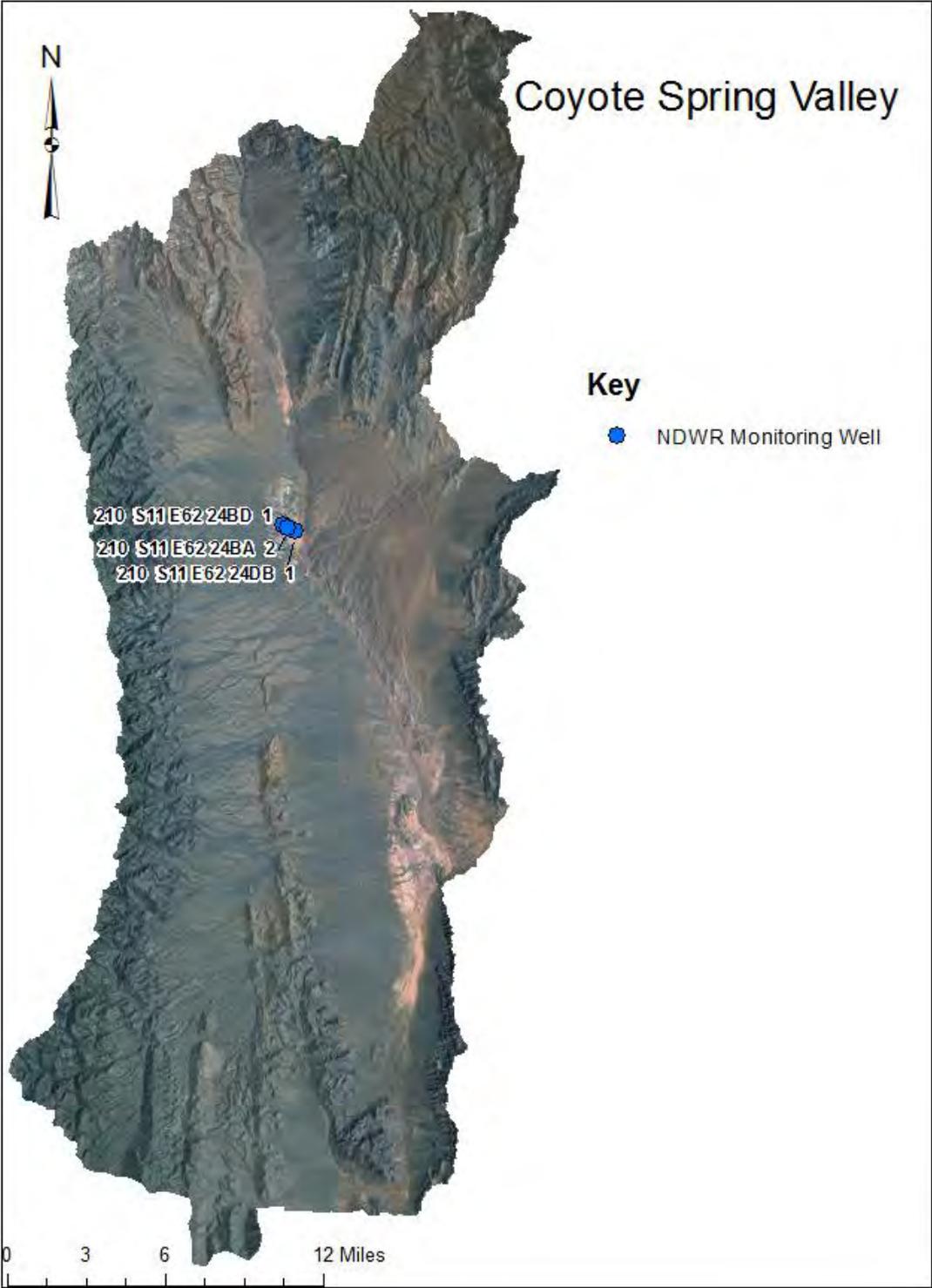
[210 S11 E62 24BA 2](#)

[210 S11 E62 24BD 1](#)

[210 S11 E62 24DB 1](#)

In addition, numerous wells are monitored by water rights holders. These water level data are provided to NDWR and are also available on line (<http://water.nv.gov>). Groundwater level data are also collected by the USGS (data may be accessed through the USGS website <http://nevada.usgs.gov/>).

**FIGURE 2 MONITORING WELL LOCATION MAP OF COYOTE SPRING VALLEY
13-210**



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 and exempt domestic wells in the Coyote Spring Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 meters were not in place, use was irrigation, and the number of hours the well was operated was unknown an inspection of the place of use was done to estimate the amount of acreage under cultivation. The number of acres under cultivation was then multiplied by a duty of 5 acre-feet per acre to estimate the use.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- If no water was used under the certificate, permit or claim, zero pumpage was recorded.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer and are limited to a maximum of 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: *“Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.”* The number of exempt domestic wells in the basin is determined by a query of the Nevada Division of Water Resources' Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1.0 acre-foot per well in Coyote Spring Valley. Actual domestic well pumpage is not precisely known.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and are subject to revision. The total estimated groundwater pumpage for calendar year 2013 was **3,407 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Coyote Spring Valley Hydrographic Basin totaled **16,450 acre-feet**. The appropriated and actual pumped totals, categorized by manner of use, are as follows:

A. Municipal (MUN)

During calendar year 2013, appropriations for municipal purposes totaled 13,850 acre-feet in the basin. An estimated 2,992 acre-feet of groundwater was pumped during calendar year 2013.

B. Industrial (IND)

During calendar year 2013, appropriations for industrial purposes totaled 2,500 acre-feet in the basin. An estimated 0 acre-feet of groundwater was pumped during calendar year 2013.

C. Irrigation (IRR)

During calendar year 2013, appropriations for irrigation purposes totaled 100 acre-feet in the basin. An estimated 413 acre-feet of groundwater was pumped during calendar year 2013.

D. Domestic (DOM)

During water year 2013, appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 2 exempt domestic wells existed in the basin during water year 2013. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 2 acre-feet.

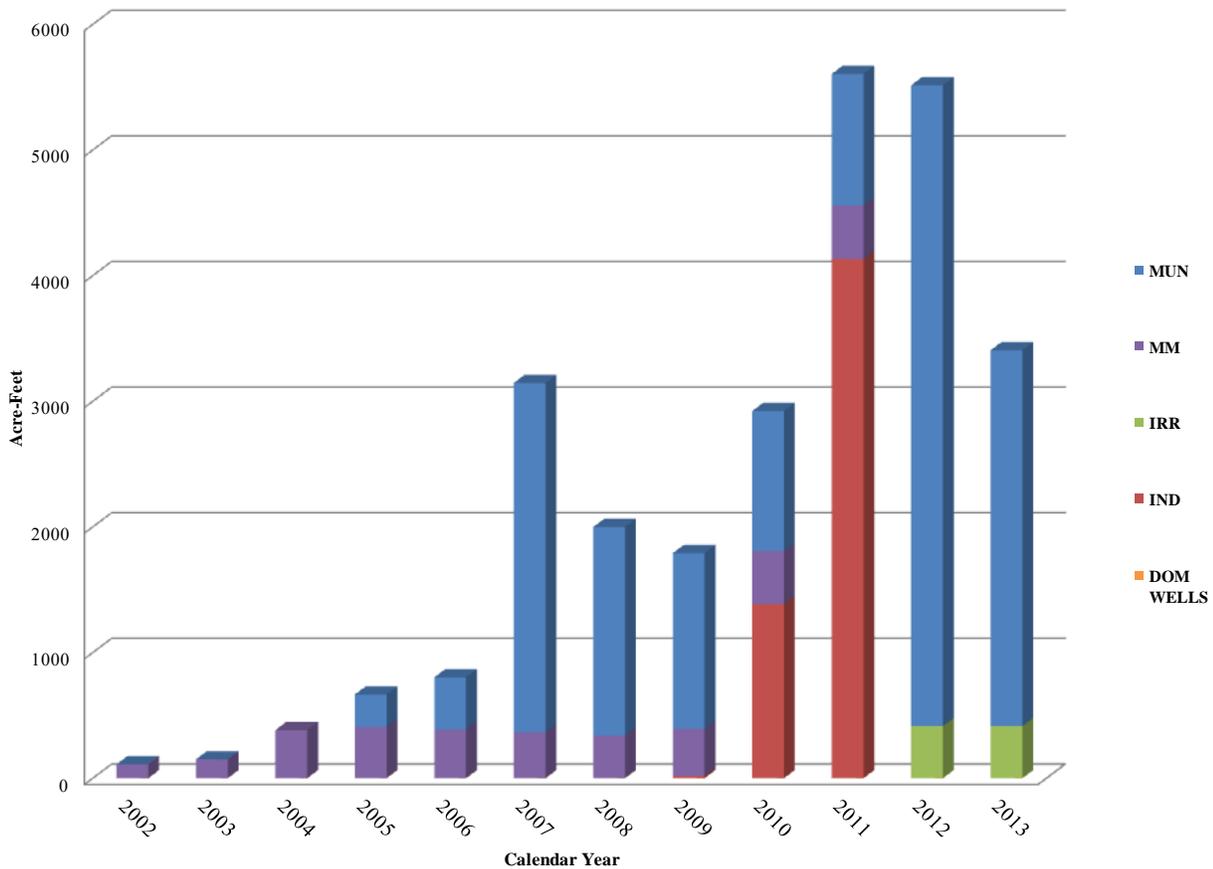
APPENDIX A

COYOTE SPRING VALLEY HISTORICAL PUMPAGE

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

YEAR	DOM	IND	IRR	MM	MUN	TOTAL
2002	1	0	0	110	0	111
2003	2	0	0	149	0	151
2004	2	0	0	382	0	384
2005	2	0	0	406	259	667
2006	2	0	0	386	416	804
2007	2	0	0	364	2781	3147
2008	2	0	0	338	1660	2000
2009	2	15	0	377	1398	1792
2010	2	1384	0	423	1114	2923
2011	2	4131	0	427	1046	5606
2012	2	0	413	0	5101	5516
2013	2	0	413	0	2992	3407

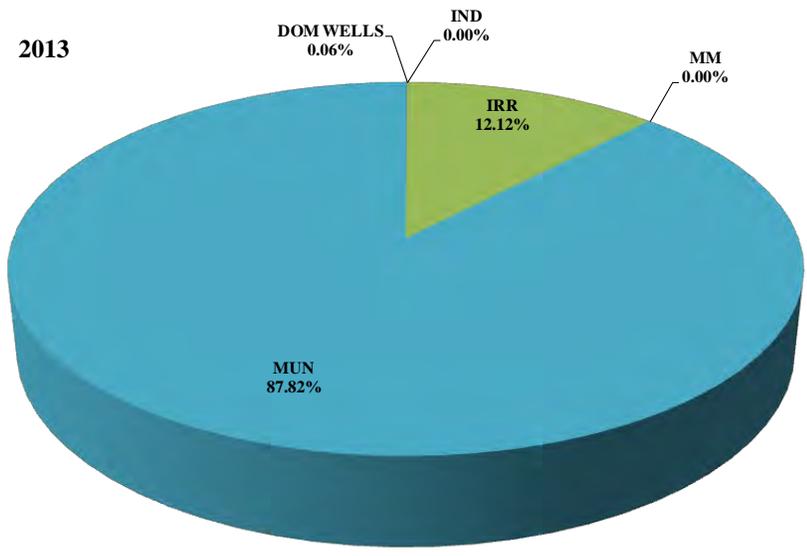
All values are in acre-feet



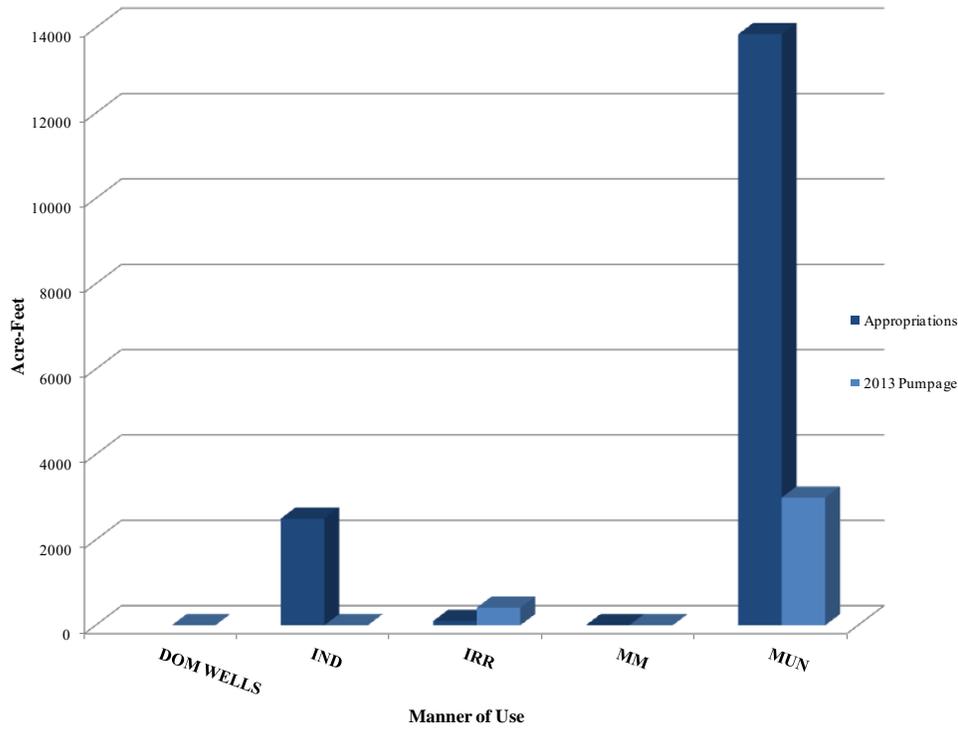
APPENDIX B

**COYOTE SPRING VALLEY GROUNDWATER PUMPAGE FOR CALENDAR YEAR
2013 BY MANNER OF USE**

PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 BY MANNER OF USE



GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 APPROPRIATIONS vs. ACTUAL PUMPAGE



APPENDIX C

**COYOTE SPRING VALLEY GROUNDWATER PUMPAGE FOR CALENDAR YEAR
2013**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
QQ	The quarter quarter of the Section in which the point of diversion is located.																
QTR	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
ACRES IRR OR USE	<p>The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include:</p> <table border="0" style="width: 100%;"> <tr> <td>COM - Commercial</td> <td>CON - Construction</td> </tr> <tr> <td>DOM - Domestic</td> <td>ENV - Environmental</td> </tr> <tr> <td>IND - Industrial</td> <td>IRR - Irrigation</td> </tr> <tr> <td>MM - Mining & Milling</td> <td>MUN - Municipal</td> </tr> <tr> <td>OTH - Other</td> <td>PWR - Power</td> </tr> <tr> <td>QM - Quasi-Municipal</td> <td>REC - Recreation</td> </tr> <tr> <td>STK - Stockwater</td> <td>STO - Storage</td> </tr> <tr> <td>WLD - Wildlife</td> <td></td> </tr> </table>	COM - Commercial	CON - Construction	DOM - Domestic	ENV - Environmental	IND - Industrial	IRR - Irrigation	MM - Mining & Milling	MUN - Municipal	OTH - Other	PWR - Power	QM - Quasi-Municipal	REC - Recreation	STK - Stockwater	STO - Storage	WLD - Wildlife	
COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
IND - Industrial	IRR - Irrigation																
MM - Mining & Milling	MUN - Municipal																
OTH - Other	PWR - Power																
QM - Quasi-Municipal	REC - Recreation																
STK - Stockwater	STO - Storage																
WLD - Wildlife																	
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.																
REMARKS	Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
V-04545 61458 70859 70860 70861 70862	Abr Exp Permit Exp Exp Exp	Bedrock Inc.	SE	NW	24	11	62	25.00	60.00	413.18	3 wells pump water ponds
70429 70430 74094 74095 82051-T	Cert Permit Permit Permit Permit	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MUN	1222.30	
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	IND	0.00	

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	MUN	1769.70	
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
77707-T	Exp										
77708-T	Exp										
77709-T	Exp										

 , P.E.

Verified with field notes: _____

TOTAL 3405.18 Permitted rights

APPENDIX D

**COYOTE SPRING VALLEY GROUNDWATER PUMPAGE INVENTORY FIELD
NOTES FOR CALENDAR YEAR 2013**

2013

Coyote Spring Valley
No. 210

Inventory Field Notes

compiled by
John Guillory, P.E. and Christi Emery

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 210

PERMIT NO: 70859

WELL: YES NO **X**

METER SER NO: 1278659

PUMP: YES **X** NO

PUMP TYPE: Sump pump

MOTOR: YES NO **X**

MOTOR TYPE:

METER: YES **X** NO

METER READ: 55761700

PHOTO: YES NO **X**

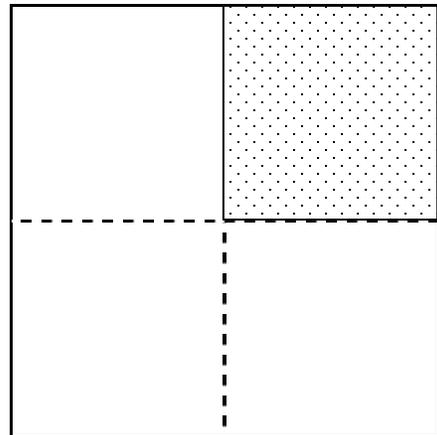
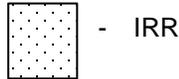
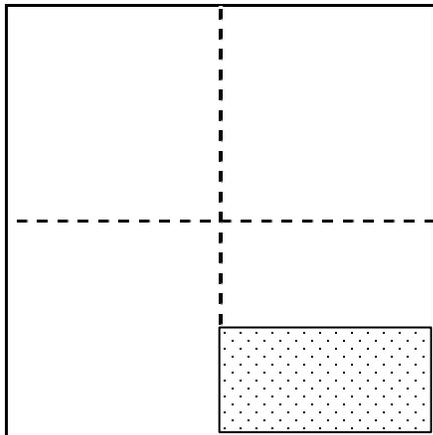
ACRES IRR: 60.0

BENEFICIAL USE: YES **X** NO PORTION ALL **X** TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 **NE** 1/4 SEC **24**

 1/4 **SE** 1/4 SEC **24**



REMARKS: Permit is valid for 25 acres within POU (E1/2 and E1/2 W1/2 of Section 24).

Approx. 35 acres irrigated additionally within POU. Mining and milling operation

within POU also. 3 unpermitted wells within POU pump water to ponds.

Meter has been broken for years.

SIGNATURE:  , P.E.

DATE: 10/8/2013

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



COYOTE SPRING VALLEY
(HYDROGRAPHIC BASIN 13-210)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2014

Field Investigations by: John Guillory, P.E. & Christi Cooper

Report Prepared by: John Guillory, P.E.

SE ROA 1109

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PURPOSE AND SCOPE.....	3
DESCRIPTION OF THE STUDY AREA	3
GROUNDWATER LEVELS	3
FIGURE 1. PHYSIOGRAPHIC MAP OF COYOTE SPRING VALLEY, HYDROGRAPHIC BASIN 13-210.....	5
METHODS TO ESTIMATE PUMPAGE.....	6
PUMPAGE BY MANNER OF USE	7
APPENDIX A. COYOTE SPRING VALLEY HISTORICAL PUMPAGE.	8
APPENDIX B. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 BY MANNER OF USE.....	10
APPENDIX C. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE INVENTORY FOR CALENDAR YEAR 2014.....	12
APPENDIX D. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE INVENTORY FIELD NOTES FOR CALENDAR YEAR 2014.....	16

ABSTRACT

This inventory represents the status and pumpage of all permitted, certificated and claims of vested right groundwater rights located within Coyote Spring Valley, Hydrographic Basin 13-210, for calendar year 2014 (January 1, 2014 through December 31, 2014). Also included is data associated with depth to groundwater.

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

For calendar year 2014 the permitted, certificated and claims of vested right groundwater rights totaled **16,443 acre-feet**. Estimated pumpage for the calendar year was **2,258 acre-feet**. For calendar year 2014, appropriations for municipal use (the largest manner of use in the basin) totaled 13,600 acre-feet and the pumpage was 1,643 acre-feet. The second largest manner of use was industrial, with appropriations totaling 2,500 acre-feet and pumpage of 0 acre-feet. The third largest manner of use was irrigation, with appropriations totaling 343 acre-feet and pumpage of 613 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 2 acre-feet. Exempt domestic wells are defined by Nevada Revised Statutes 534.013 and do not require a permit issued by the State Engineer.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER..... 210, REGION 13

HYDROGRAPHIC BASIN NAME COYOTE SPRING VALLEY

COUNTIES..... CLARK, LINCOLN

NEARBY COMMUNITIES ALAMO, MOAPA

DESIGNATED YES

DENIALS BASED UPON WATER AVAILABILITY IRRIGATION

GROUNDWATER LEVEL MEASUREMENTS NDWR, SNWA, USGS

ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2014..... 2,258*

STATE ENGINEER'S ORDERS

[905](#) - DESIGNATION..... AUGUST 21, 1985
[1169](#) - FURTHER STUDY..... MARCH 8, 2002
[1169a](#) - FURTHER STUDY..... DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 16,443 ACRE-FEET..DATE: JUNE 2015

MUNICIPAL 13,600 INDUSTRIAL 2,500 IRRIGATION..... 343

NOTE: Committed groundwater resource data are accurate for June 2015. Manner of use category totals vary over time, as water rights (rights) are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin, obtained by a query of the [Nevada Division of Water Resources Well Log Database](#), is estimated to be 2.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Coyote Spring Valley (Hydrographic Basin 13-210), for the time period beginning January 1, 2014 and ending December 31, 2014 (hereafter referred to as calendar year 2014). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

DESCRIPTION OF THE STUDY AREA

Coyote Spring Valley is a basin located in southeastern Nevada. The basin lies within Clark and Lincoln Counties (Figure 1) approximately 60 miles north of Las Vegas, Nevada, and is within the Colorado River Hydrographic Region.

Coyote Spring Valley is bounded on the west by the Sheep Range. This range rises to 9,920 feet (all elevations in this text are above mean sea level) at Hayford Peak at the south end of the range. The south end of Coyote Spring Valley is topographically closed by a bedrock and alluvial divide extending eastward from Hayford Peak to the Arrow Canyon Range. The Delamar Range borders the basin to the east and the Arrow Canyon Range bounds the southeast part of the basin. The north boundary is defined by a series of hills at the south end of the Pahranaagat Range that connects with the north end of the Sheep and Delamar Ranges.

The adjacent Nevada hydrographic basins are as follows: Pahranaagat Valley (13-209) and Delamar Valley (10-182) to the north; Kane Springs Valley (13-206) to the northeast; Lower Meadow Valley Wash (13-205) and Muddy River Springs Area (13-219) to the east; California Wash (13-218) to the southeast; Hidden Valley - North (13-217) to the south; Las Vegas Valley (13-212), Three Lakes Valley - Southern Part (13-211) and Three Lakes Valley - Northern Part (10-168) to the southwest; and Tikapoo Valley - Southern Part (10-169B) to the west. The exterior boundary of the Coyote Spring Valley Hydrographic Basin is described in Designation Order 905, issued by the Nevada State Engineer August 21, 1985.

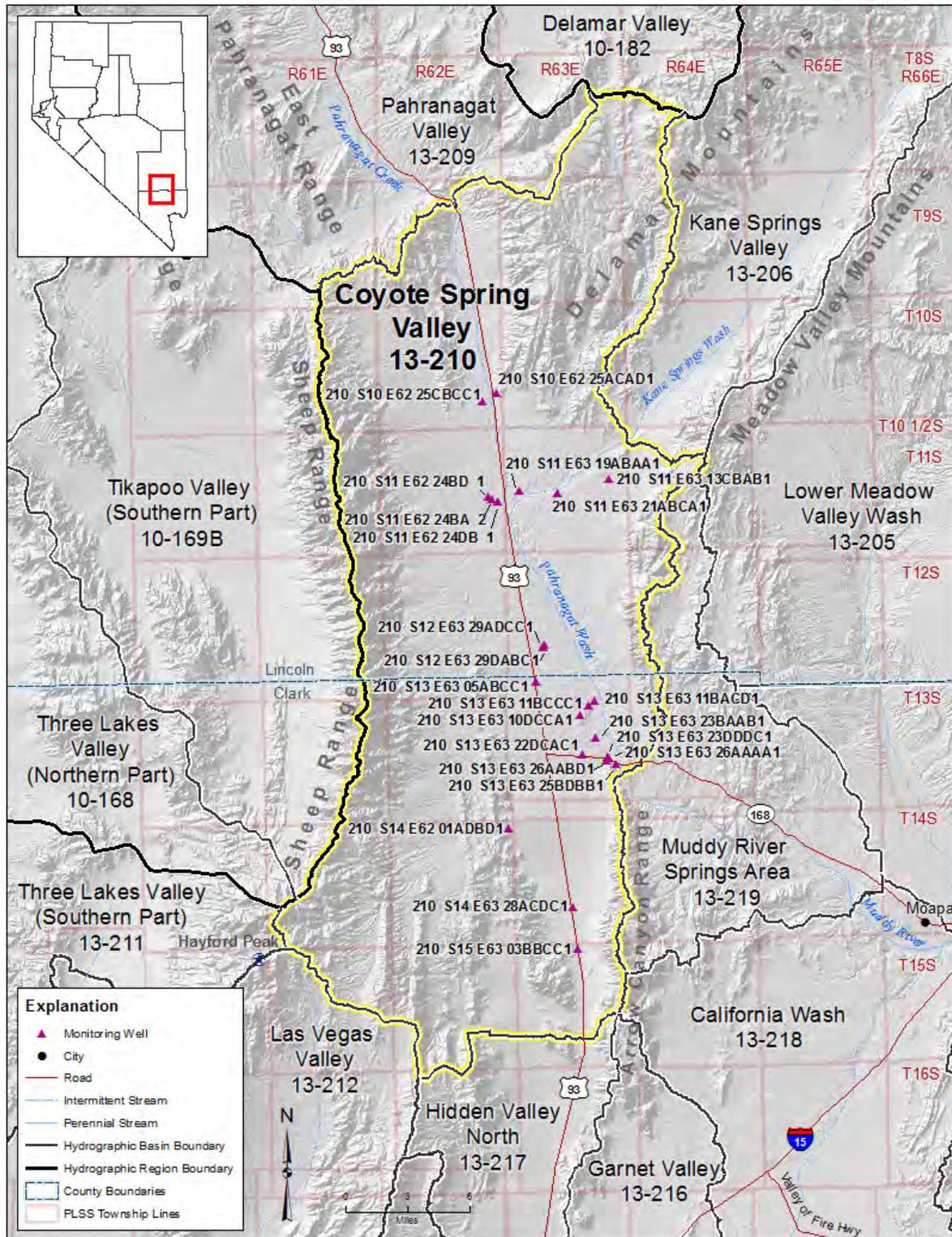
GROUNDWATER LEVELS

Depths to groundwater are measured by multiple entities in the basin. Sites at which water level measurements are made by or reported to NDWR (see Figure 1) on a semi-annual basis include:

210 S10 E62 25ACAD1	210 S10 E62 25CBCC1	210 S11 E62 24BA 2
210 S11 E62 24BD 1	210 S11 E62 24DB 1	210 S11 E63 13CBAB1
210 S11 E63 19ABAA1	210 S11 E63 21ABCA1	210 S12 E63 29ADCC1
210 S12 E63 29DABC1	210 S13 E63 05ABCC1	210 S13 E63 10DCCA1
210 S13 E63 11BACD1	210 S13 E63 11BCCC1	210 S13 E63 22DCAC1
210 S13 E63 23BAAB1	210 S13 E63 23DDDC1	210 S13 E63 25BDBB1
210 S13 E63 26AAAA1	210 S13 E63 26AABD1	210 S14 E62 01ADBD1
210 S14 E63 28ACDC1	210 S15 E63 03BBCC1	

Additional water level and site data can be obtained on the NDWR website (<http://water.nv.gov>). Groundwater level data are also collected by the US Geological Survey (USGS) and can be accessed on their website (<http://nevada.usgs.gov/>).

FIGURE 1. PHYSIOGRAPHIC MAP OF COYOTE SPRING VALLEY, HYDROGRAPHIC BASIN 13-210.



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 and exempt domestic wells in the Coyote Springs Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 are 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 multiplied 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%. For places where the groundwater rights are supplemental to surface water, groundwater use is estimated using the NIWR method above, but is 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 may differ significantly from previous year's estimates.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: "*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*" The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1.0 acre-foot per well in Coyote Spring Valley.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and are subject to revision. The total estimated groundwater pumpage for calendar year 2014 was **2,258 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Coyote Spring Valley Hydrographic Basin totaled **16,443 acre-feet**. For calendar year 2014, the appropriated and actual pumped totals are categorized by manner of use, as follows:

A. Municipal (MUN)

Appropriations for municipal purposes totaled 13,600 acre-feet, with pumpage estimated at 1,643 acre-feet.

B. Industrial (IND)

Appropriations for industrial purposes totaled 2,500 acre-feet, with estimated groundwater pumpage of 0 acre-feet.

C. Irrigation (IRR)

Appropriations for irrigation purposes totaled 343 acre-feet, with estimated groundwater pumpage of 613 acre-feet.

D. Domestic (DOM)

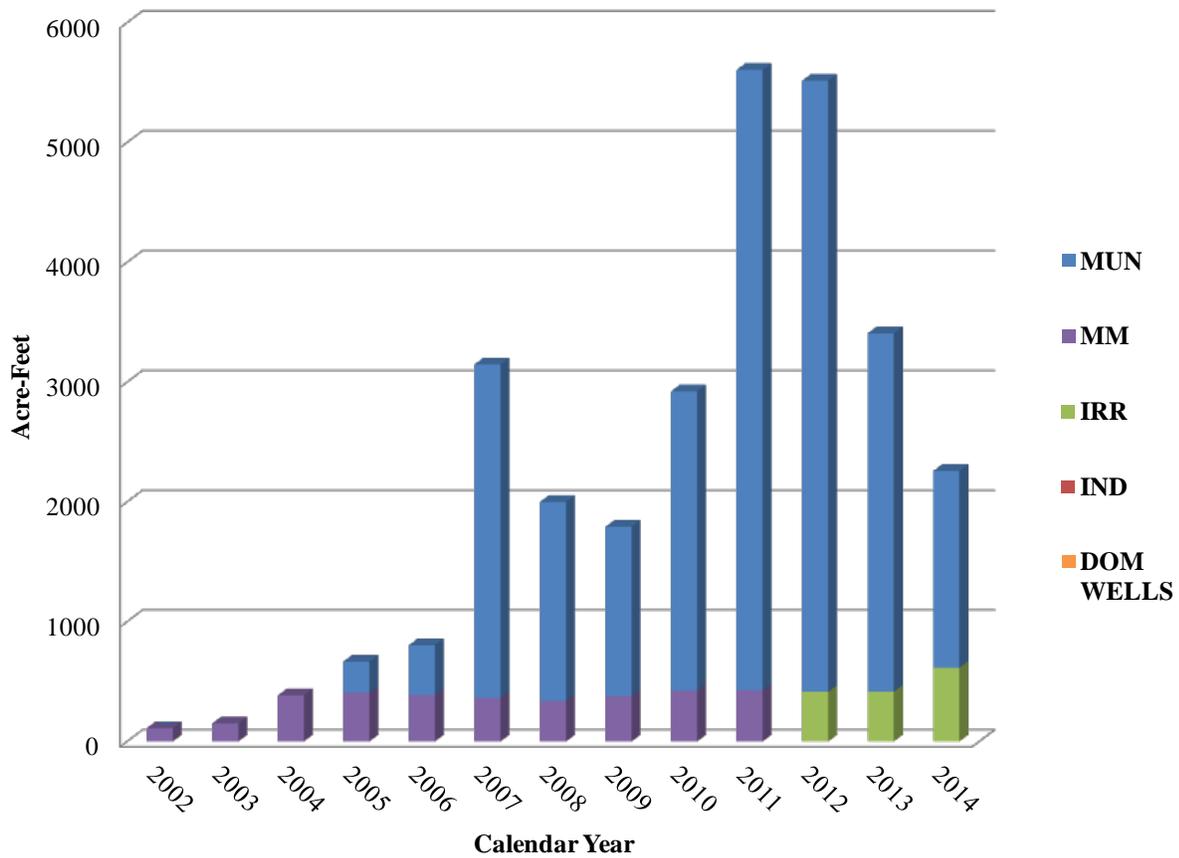
Appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 2 exempt domestic wells existed in the basin during water year 2014. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 2 acre-feet.

APPENDIX A. COYOTE SPRING VALLEY HISTORICAL PUMPAGE.

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

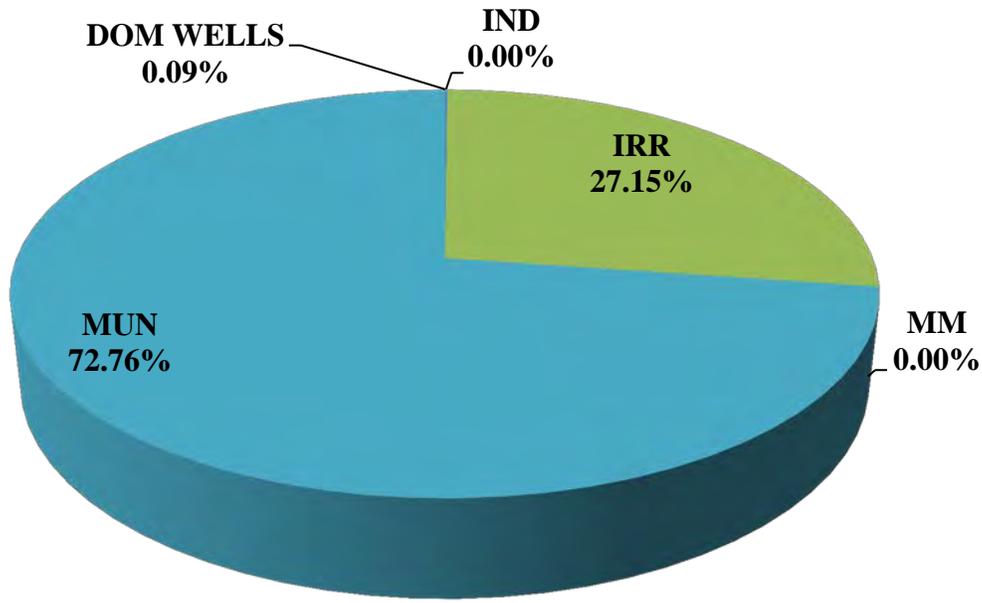
YEAR	DOM WELLS	IND	IRR	MM	MUN	TOTAL
2002	1	0	0	110	0	111
2003	2	0	0	149	0	151
2004	2	0	0	382	0	384
2005	2	0	0	406	259	667
2006	2	0	0	386	416	804
2007	2	0	0	364	2781	3147
2008	2	0	0	338	1660	2000
2009*	2	0	0	377	1413	1792
2010*	2	0	0	423	2498	2923
2011*	2	0	0	427	5177	5606
2012	2	0	413	0	5101	5516
2013	2	0	413	0	2992	3407
2014	2	0	613	0	1643	2258

* IND and MUN uses figures edited from previous reports. All values are in acre-feet.

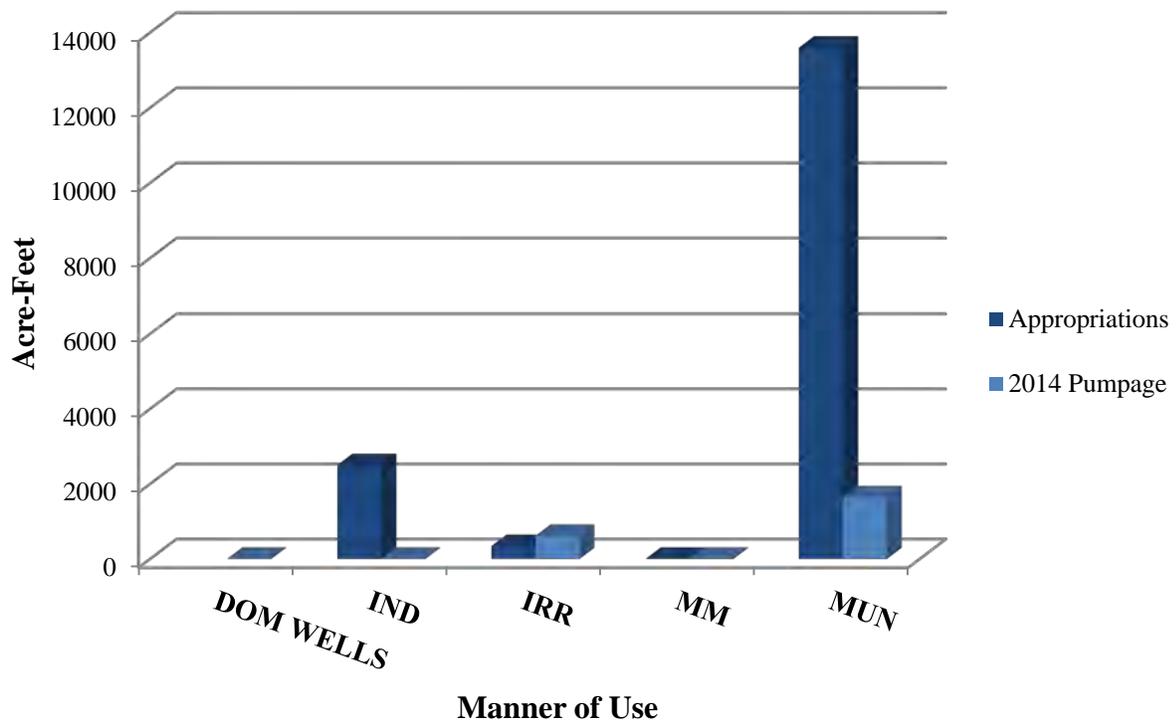


**APPENDIX B. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE FOR
CALENDAR YEAR 2014 BY MANNER OF USE.**

**PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014
BY MANNER OF USE**



**GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 APPROPRIATIONS
VS. ACTUAL PUMPAGE**



**APPENDIX C. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE
INVENTORY FOR CALENDAR YEAR 2014.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
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QTR	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
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COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
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STK - Stockwater	STO - Storage																
WLD - Wildlife																	
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.																
REMARKS	Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
70429	Cert	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MUN	1216.30	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
82051-T	Exp										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	IND	0.00	
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	MUN	426.28	
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
77707-T	Exp										
77708-T	Exp										
77709-T	Exp										

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS	
			QQ	Qtr	Sec	T	R					
83044	Permit	Bedrock Inc.			NE	24	11	62	68.60	100.00	613.33	Alfalfa, wheel line, NIWR = 4.6 Well 1: S/N 61792164 RD - 02866300 - 10-08-13 RD - 40722400 - 10-24-14 Well 3: S/N 1546592 RD - 79293500 - 10-08-13 RD - (1)20993300 - 10-14-14 Meters installed in 2015: Well 2: S/N 97707924 RD - 34428700 - 03-17-15 Well 4: S/N 14-018685 RD - 01559100 - 03-17-15 Well 5: S/N 14-016496 RD - 05196000 - 03-17-15 Well 6: S/N 62683157 RD - 04592500 - 03-17-15

Verified with field notes:  , P.E.

TOTAL 2255.91 Permitted rights

**APPENDIX D. COYOTE SPRING VALLEY GROUNDWATER PUMPAGE
INVENTORY FIELD NOTES FOR CALENDAR YEAR 2014.**

2014

Coyote Spring Valley
No. 210

Inventory Field Notes

compiled by
John Guillory, P.E. and Christi Cooper

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



COYOTE SPRING VALLEY
HYDROGRAPHIC BASIN 13-210

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2015

Field Investigated by: John Guillory, P.E. & Christi Cooper
Report Prepared by: John Guillory, P.E.

SE ROA 1129

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HYDROGRAPHIC BASIN SUMMARY	2
PURPOSE AND SCOPE	3
DESCRIPTION OF THE STUDY AREA	3
GROUNDWATER LEVELS	3
METHODS TO ESTIMATE PUMPAGE	4
PUMPAGE BY MANNER OF USE	5
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ABSTRACT

This inventory represents the status and usage of all permitted, certificated and claims of vested right groundwater rights located within Coyote Spring Valley, Hydrographic Basin 13-210, for calendar year 2015 (January 1, 2015 through December 31, 2015). Also included for summary purposes are graphs and data associated with this use, and yearly totals of historical groundwater use from 2002 through 2015 by manner of use.

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 continual basis.

For calendar year 2015, the permitted, certificated and claims of vested right groundwater rights totaled 16,693 acre-feet, with estimated pumpage of approximately **2,064 acre-feet**. This figure includes an estimated 2 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2015, appropriations for municipal purposes totaled 13,850 acre-feet and the pumpage was 1,494 acre-feet. The second largest manner of use was industrial with appropriations totaling 2,500 acre-feet and pumpage of 0 acre-feet. The third largest manner of use was irrigation with appropriations totaling 343 acre-feet and pumpage of 568 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 2 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the Coyote Spring Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	210, REGION 13
HYDROGRAPHIC BASIN NAME	COYOTE SPRING VALLEY
COUNTIES	CLARK, LINCOLN
MAJOR COMMUNITIES	ALAMO, MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR, SNWA, USGS
PUMPAGE INVENTORY, ACRE-FEET IN 2015	2,064 ¹

STATE ENGINEER'S ORDERS

NO. 905 – DESIGNATION	DATE: AUGUST 21, 1985
NO. 1169 – FURTHER STUDY	DATE: MARCH 8, 2002
NO. 1169a – FURTHER STUDY	DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 16,693 ACRE-FEET	DATE: APRIL 2016	
INDUSTRIAL.....2,500	IRRIGATION.....343	MUNICIPAL.....13,850

NOTE: Committed groundwater resource data are accurate for April 2016. Manner of use category totals vary over time, as rights are not necessarily static. 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. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells.

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1.0 acre-foot per annum. The number of domestic wells in the basin, estimated by a query of the Nevada Division of Water Resources Well Log Database, is approximately 2.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Coyote Spring Valley Hydrographic Basin (13-210), for the time period beginning January 1, 2015 and ending December 31, 2015 (hereafter referred to as calendar year 2015). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Coyote Spring Valley is a basin located in south eastern Nevada, approximately 60 miles north of Las Vegas. The basin is located in Clark and Lincoln Counties (see Figure 1), and is within the Colorado River Hydrographic Region.

Coyote Spring Valley is bounded on the west by the Sheep Range. This range rises to 9,920 feet (all elevations in this text are above mean sea level) at Hayford Peak at the south end of the range. The south end of Coyote Spring Valley is topographically closed by a bedrock and alluvial divide extending eastward from Hayford Peak to the Arrow Canyon Range. The Arrow Canyon Range and Meadow Valley Mountains border the basin to the east. The north boundary is defined by a series of hills at the south end of the Pahrangat and Hiko Ranges and the Delamar Mountains.

The adjacent Nevada hydrographic basins are as follows: Pahrangat Valley (13-209), to the north; Delamar Valley (10-182), to the north; Kane Springs Valley, 13-206, to the northeast; Lower Meadow Valley Wash, 13-205, to the east; Muddy River Springs Area, 13-219, to the east; California Wash, 13-218, to the southeast; Hidden Valley (13-217), to the south; Las Vegas Valley, 13-212, to the southwest; Three Lakes Valley (Southern Part), 13-211, to the southwest; Three Lakes Valley (Northern Part), 10-168, to the southwest; and Tikapoo Valley (Southern Part), 10-169B, to the west. The exterior boundary of the Coyote Spring Valley Hydrographic Basin is as described by Designation Order 905, issued by the Nevada State Engineer August 21, 1985.

GROUNDWATER LEVELS

Depths to groundwater in Coyote Spring Valley are measured by multiple agencies. Active measurement site names and links to their data (refer to Figure 2 for well locations) are:

[210 S10 E62 25ACAD1](#)
[210 S11 E62 24BD 1](#)
[210 S11 E63 19ABAA1](#)
[210 S12 E63 29DABC1](#)
[210 S13 E63 11BACD1](#)
[210 S13 E63 23BAAB1](#)
[210 S13 E63 26AAAA1](#)
[210 S14 E63 28ACDC1](#)

[210 S10 E62 25CBCC1](#)
[210 S11 E62 24DB 1](#)
[210 S11 E63 21ABCA1](#)
[210 S13 E63 05ABCC1](#)
[210 S13 E63 11BCCC1](#)
[210 S13 E63 23DDDC1](#)
[210 S13 E63 26AABD1](#)
[210 S15 E63 03BBCC1](#)

[210 S11 E62 24BA 2](#)
[210 S11 E63 13CBAB1](#)
[210 S12 E63 29ADCC1](#)
[210 S13 E63 10DCCA1](#)
[210 S13 E63 22DCAC1](#)
[210 S13 E63 25BDBB1](#)
[210 S14 E62 01ADBD1](#)

Groundwater level data have also been collected by the U.S. Geological Survey and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. 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 were 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.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1 acre-foot per well in Coyote Spring Valley.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and subject to revision.

The total estimated groundwater pumpage for the calendar year 2015 was 2,064 acre-feet. The annual duties of permitted, certificated and claims of vested groundwater rights within the Coyote Spring Valley Hydrographic Basin total approximately 16,693 acre-feet. The permitted and pumped totals for calendar year 2015, categorized by manner of use, are as follows:

A. Domestic (DOM)

Appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 2 exempt domestic wells existed in the basin during water year 2015. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 2 acre-feet.

B. Industrial (IND)

Appropriations for industrial purposes totaled 2,500 acre-feet, with estimated groundwater pumpage of 0 acre-feet.

C. Irrigation (IRR)

Appropriations for irrigation purposes totaled 343 acre-feet, with estimated groundwater pumpage of 568 acre-feet.

D. Municipal (MUN)

Appropriations for municipal totaled 13,850 acre-feet, with estimated groundwater pumpage of 1,494 acre-feet.

TABLES

Table 1. Coyote Spring Valley historical pumpage (acre-feet) by calendar year.

YEAR	DOM	IND	IRR	MM	MUN	TOTAL
2002	1	0	0	110	0	111
2003	2	0	0	149	0	151
2004	2	0	0	382	0	384
2005	2	0	0	406	259	667
2006	2	0	0	386	416	804
2007	2	0	0	364	2,781	3,147
2008	2	0	0	338	1,660	2,000
2009	2	0	0	377	1,413	1,792
2010	2	0	0	423	2,498	2,923
2011	2	0	0	427	5,177	5,606
2012	2	0	413	0	5,101	5,516
2013	2	0	413	0	2,992	3,407
2014	2	0	613	0	1,643	2,258
2015	2	0	568	0	1,494	2,064

All values are in acre-feet.

FIGURES

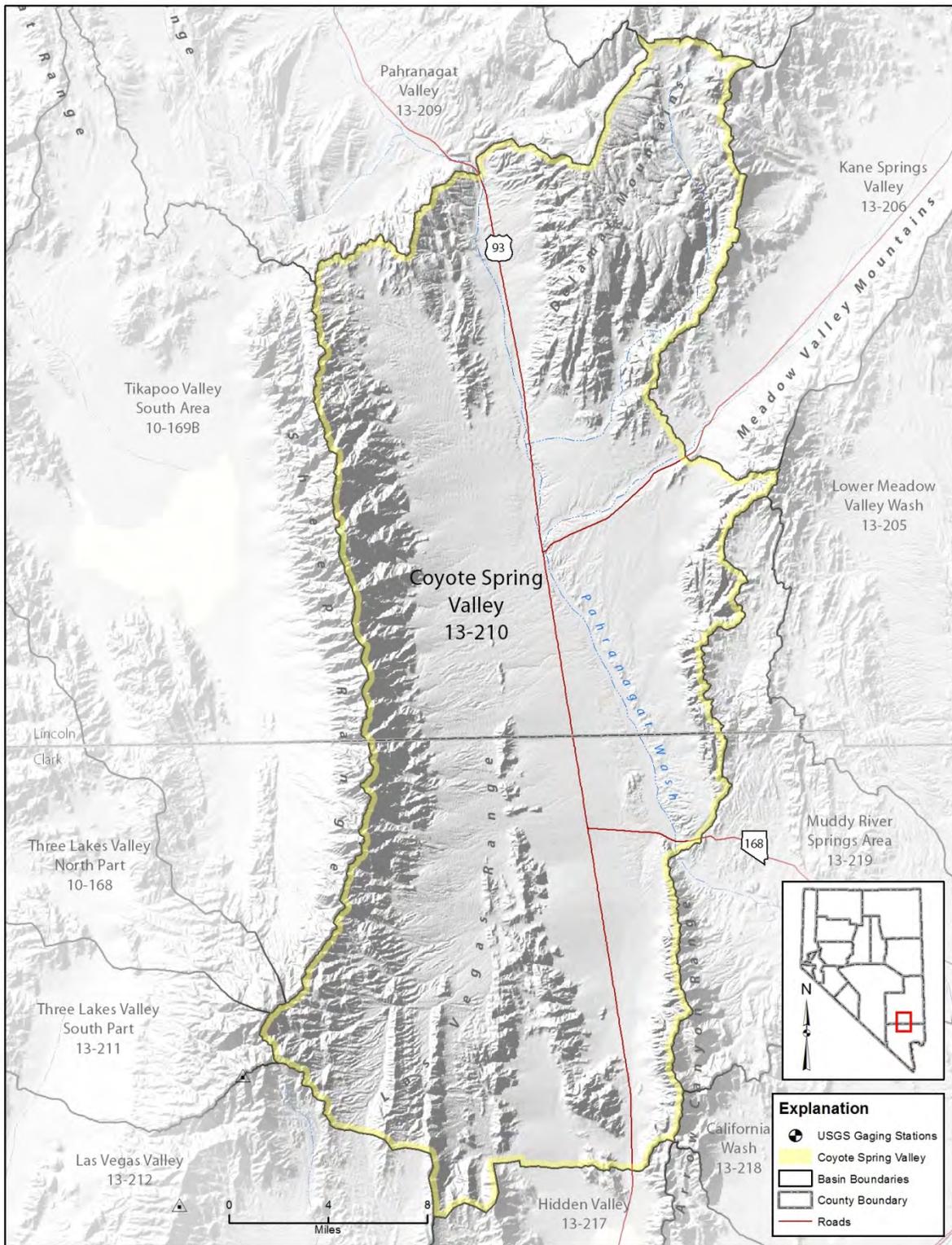


Figure 1. Location map for Coyote Spring Valley (Hydrographic Basin 13-210).

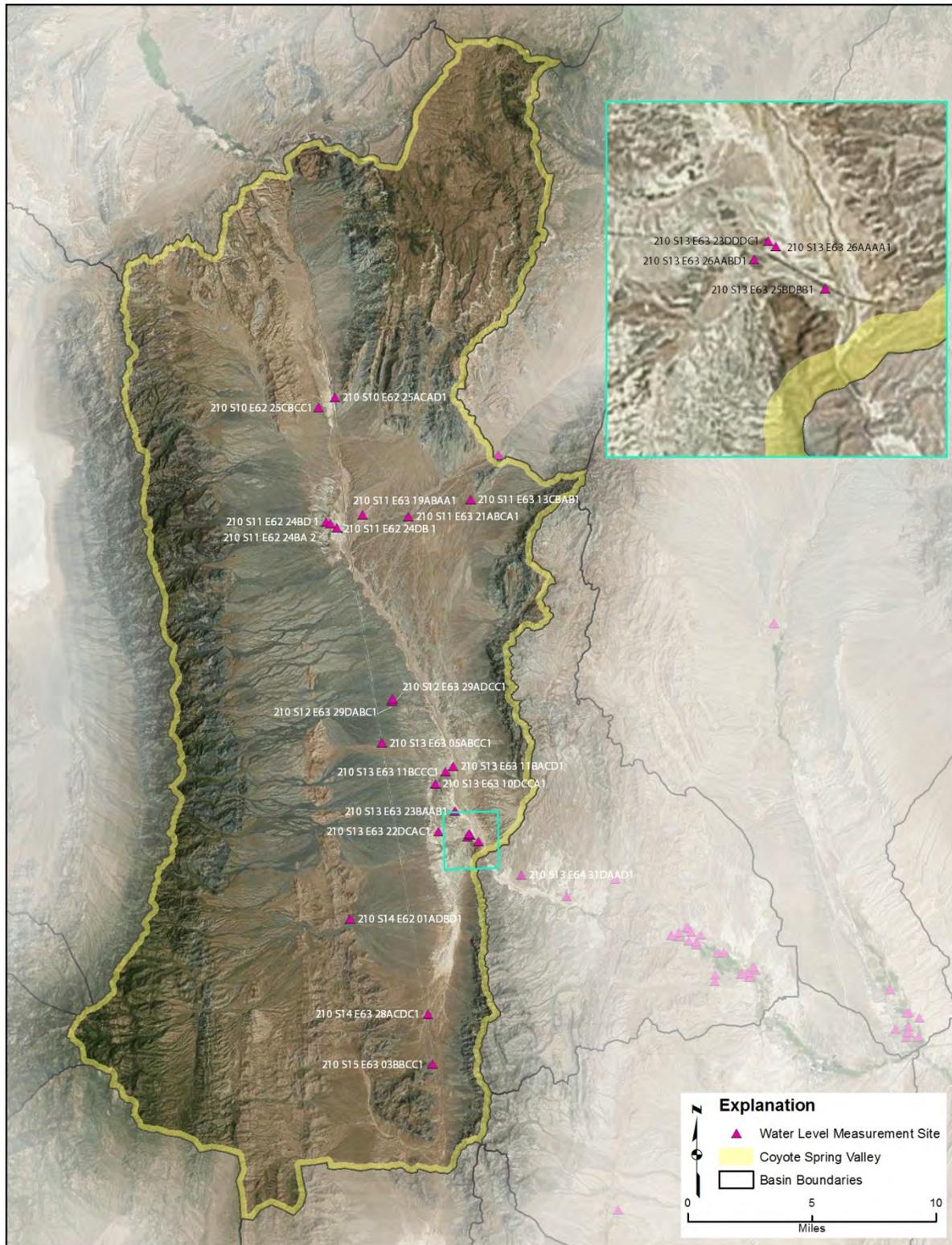


Figure 2. Coyote Spring Valley farm areas and water level measurement sites. Base map is standard satellite imagery; National Agricultural Imagery Program imagery is incomplete in this area.

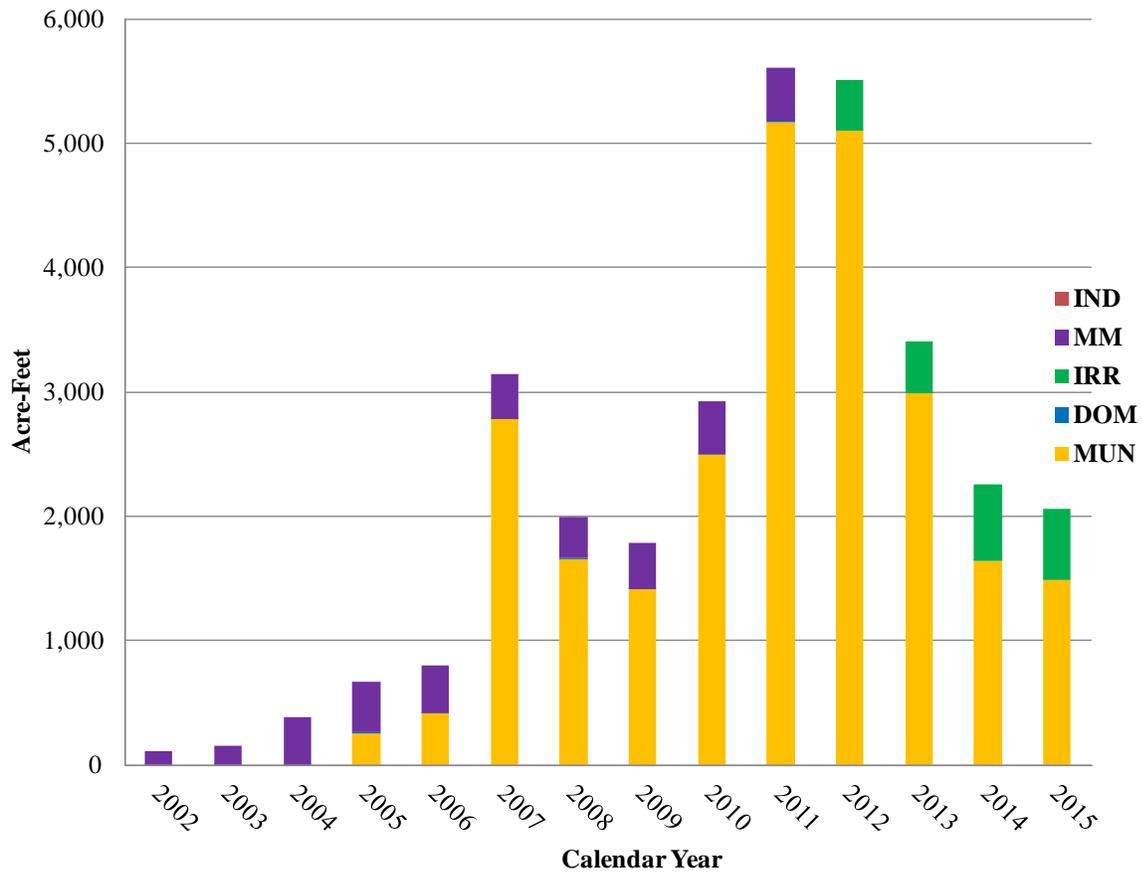


Figure 3. Coyote Spring Valley historical pumpage by manner of use.

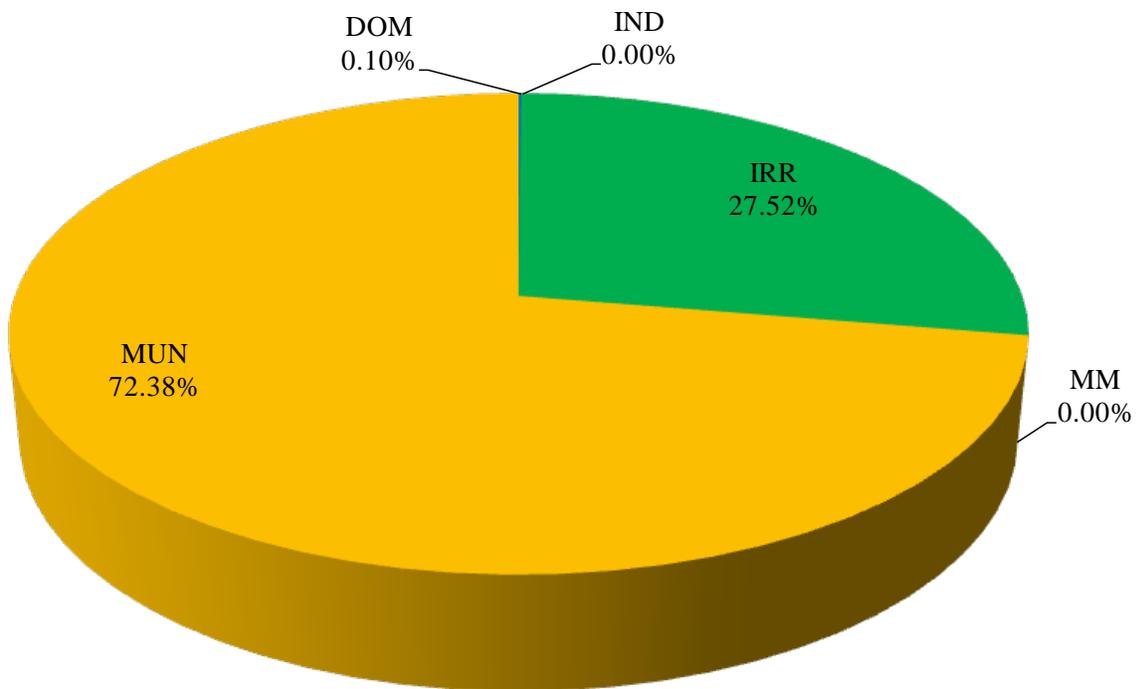


Figure 4. Percentage of 2015 groundwater pumpage by manner of use.

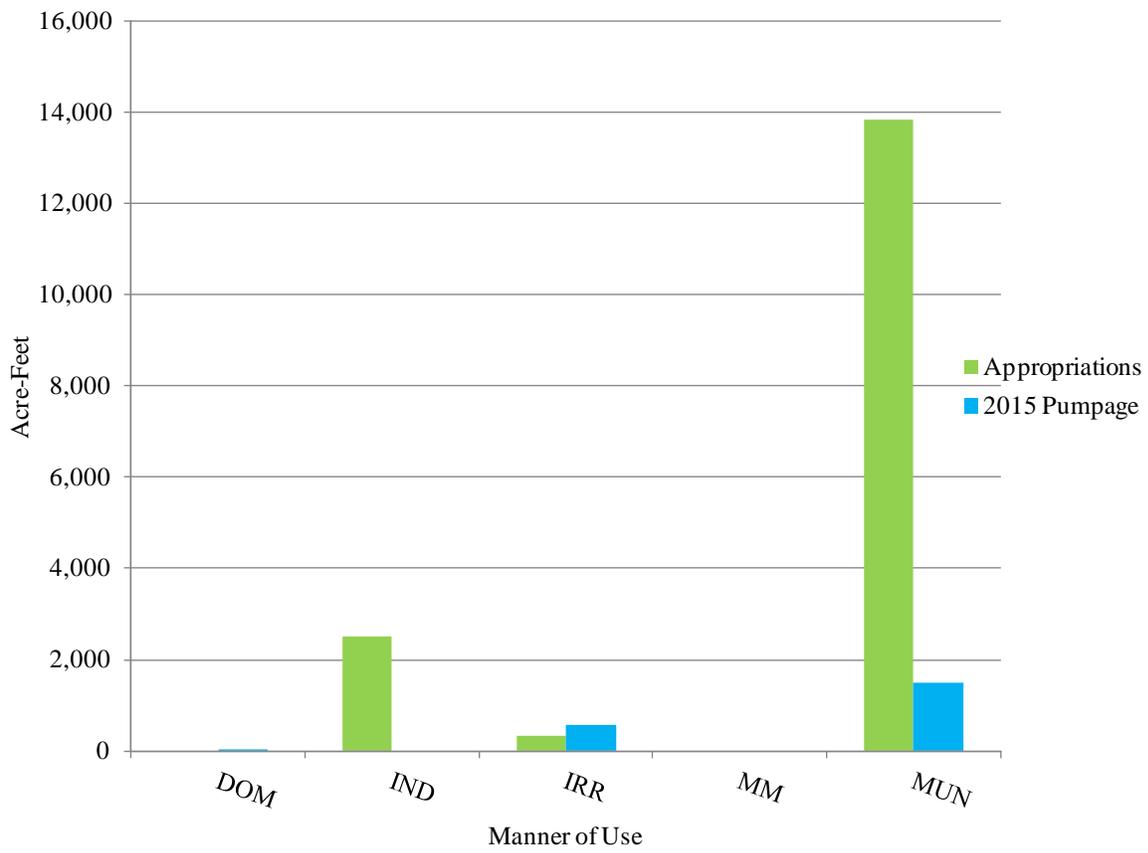


Figure 5. 2015 groundwater pumpage appropriations versus actual pumpage.

**APPENDIX A. COYOTE SPRING VALLEY 2015 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

SE ROA 1141

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
70429	Cert	Coyote Springs Invest.	SE	SW	14	13	63	4600.00	MUN	1,108.39	
70430	Permit		SW	SE	22						
74094	Permit										
74095	Permit										
85527-T	Permit										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	IND	0.00	
77291	Permit	SNWA	SE	SE	23	13	63	9000.00	MUN	385.40	
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										
85852-T	Permit										
85853-T	Permit										
85854-T	Permit										
85855-T	Permit										

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
83044	Permit	Bedrock Inc.		NE	24	11	62	68.60	100.00	567.79	Alfalfa, wheel line Well 1: S/N 61792164 RD - 75411500 - 10-13-15 RD - 40722400 - 10-24-14 Well 3: S/N 1546592 RD - (1)56710600 - 10-13-15 RD - (1)20993300 - 10-14-14 Meters installed in 2015: Well 2: S/N 97707924 RD - 63890700 - 10-13-15 RD - 34428700 - 03-17-15 Well 4: S/N 14-018685 RD - 06893700 - 10-13-15 RD - 01559100 - 03-17-15 Well 5: S/N 14-016496 RD - 23590400 - 10-13-15 RD - 05196000 - 03-17-15 Well 6: S/N 62683157 RD - 18256700 - 10-13-15 RD - 04592500 - 03-17-15

Verified with field notes:

 , P.E.

TOTAL 2,061.58 Permitted rights

**APPENDIX B. COYOTE SPRING VALLEY 2015 GROUNDWATER PUMPAGE FIELD
NOTES.**

2015

Coyote Spring Valley
No. 210

Inventory Field Notes

Compiled by:
John Guillory, P.E. and Christi Cooper

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



COYOTE SPRING VALLEY
HYDROGRAPHIC BASIN 13-210

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2016

Field Investigated by: John Guillory, P.E. & Aurelio “Manny” Fernandez
Report Prepared by: Christi Cooper

SE ROA 1148

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GROUNDWATER LEVELS	3
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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Coyote Spring Valley, Hydrographic Basin 13-210, for calendar year 2016 (January 1, 2016 through December 31, 2016). Also included are tables, graphs and data associated with this use.

The data presented are valid for the 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 continual basis.

For calendar year 2016, the committed groundwater resource totaled 16,447 acre-feet, with estimated pumpage of approximately **1,722 acre-feet**. This figure includes an estimated 2 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2016, appropriations for municipal purposes totaled 12,600 acre-feet, with pumpage of 1,117 acre-feet. The second largest manner of use was industrial with appropriations totaling 2,500 acre-feet and pumpage of 0 acre-feet. The third largest manner of use was commercial with appropriations totaling 343 acre-feet and pumpage of 603 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the Coyote Spring Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	210, REGION 13
HYDROGRAPHIC BASIN NAME	COYOTE SPRING VALLEY
COUNTIES	CLARK, LINCOLN
MAJOR COMMUNITIES	ALAMO, MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR, SNWA, USGS
PUMPAGE INVENTORY, ACRE-FEET IN 2016	1,722 ¹

STATE ENGINEER'S ORDERS

[NO. 905 – DESIGNATION](#)

[NO. 1169 – FURTHER STUDY](#)

[NO. 1169A – FURTHER STUDY](#)

DATE: AUGUST 21, 1985

DATE: MARCH 8, 2002

DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE²: 16,447 ACRE-FEET

DATE: APRIL 2017

COMMERICAL.....343

INDUSTRIAL.....2,500

MUNICIPAL.....12,600

DOMESTIC.....4

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013

² Committed groundwater resource data are accurate for April 2017. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 2 domestic wells existed in the basin during calendar year 2016. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 4 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Coyote Spring Valley for calendar year 2016. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Coyote Spring Valley is a basin located in southeastern Nevada, approximately 60 miles north of Las Vegas. The basin is located in Clark and Lincoln Counties (Figure 1), and is within the Colorado River Hydrographic Region.

Coyote Spring Valley is bounded on the west by the Sheep Range. The south end of Coyote Spring Valley is topographically closed by a bedrock and alluvial divide extending eastward from Hayford Peak to the Arrow Canyon Range. The Arrow Canyon Range and Meadow Valley Mountains border the basin to the east. The north boundary is defined by a series of hills at the south end of the Pahranaagat and Hiko Ranges and the Delamar Mountains.

The adjacent Nevada hydrographic basins are Pahranaagat Valley (13-209) and Delamar Valley (10-182) to the north, Kane Springs Valley (13-206) to the northeast, Lower Meadow Valley Wash (13-205) and Muddy River Springs Area (13-219) to the east, California Wash (13-218) to the southeast, Hidden Valley (13-217) to the south, Las Vegas Valley (13-212), Three Lakes Valley (Southern Part, 13-211), and Three Lakes Valley (Northern Part, 10-168) to the southwest, and Tikapoo Valley (South Subarea, 10-169B) to the west. The exterior boundary of the Coyote Spring Valley Hydrographic Basin is as described by Designation Order 905, issued by the Nevada State Engineer August 21, 1985.

GROUNDWATER LEVELS

Depths to groundwater in Coyote Spring Valley are measured by multiple agencies. There are 23 active sites in the monitoring well network. The following are the site names and links to the data for active sites (Figure 2):

210 S10 E62 25ACAD1	210 S10 E62 25CBCC1	210 S11 E62 24BA 2
210 S11 E62 24BD 1	210 S11 E62 24DB 1	210 S11 E63 13CBAB1
210 S11 E63 19ABAA1	210 S11 E63 21ABCA1	210 S12 E63 29ADCC1
210 S12 E63 29DABC1	210 S13 E63 05ABCC1	210 S13 E63 10DCCA1
210 S13 E63 11BACD1	210 S13 E63 11BCCC1	210 S13 E63 22DCAC1
210 S13 E63 23BAAB1	210 S13 E63 23DDDC1	210 S13 E63 25BDBB1
210 S13 E63 26AAAA1	210 S13 E63 26AABD1	210 S14 E62 01ADBD1
210 S14 E63 28ACDC1	210 S15 E63 03BBCC1	

Groundwater level data are also collected by the U.S. Geological Survey and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 were 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Coyote Spring Valley, or 2 acre-feet.

TABLES

Table 1. Coyote Spring Valley historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	IND	IRR	MUN	TOTAL
2012		2	0	413	5,101	5,516
2013		2	0	413	2,992	3,407
2014		2	0	613	1,643	2,258
2015		2	0	568	1,494	2,064
2016	603	2	0	0	1,117	1,722

FIGURES

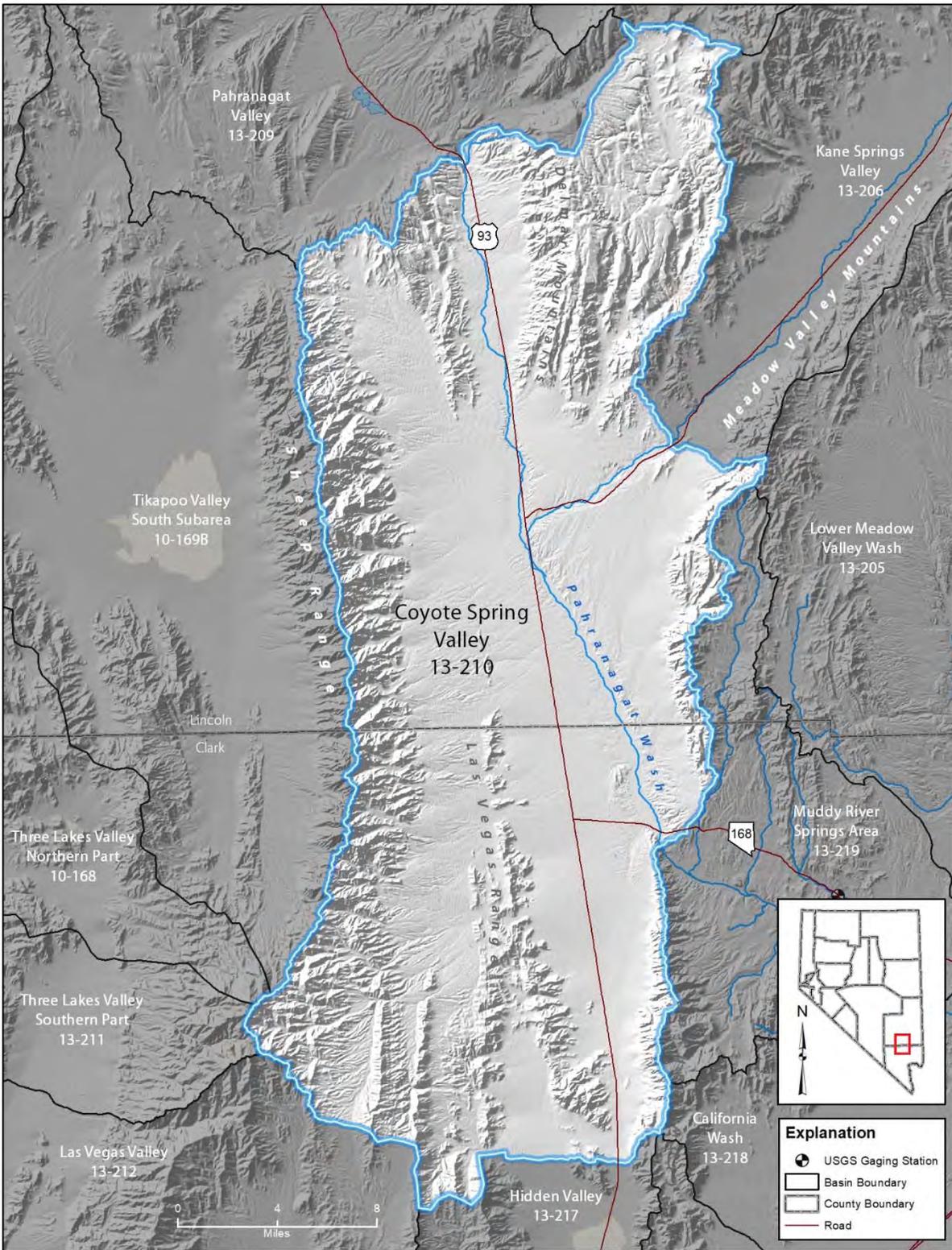


Figure 1. Physiographic map of Coyote Spring Valley (Hydrographic Basin 13-210).

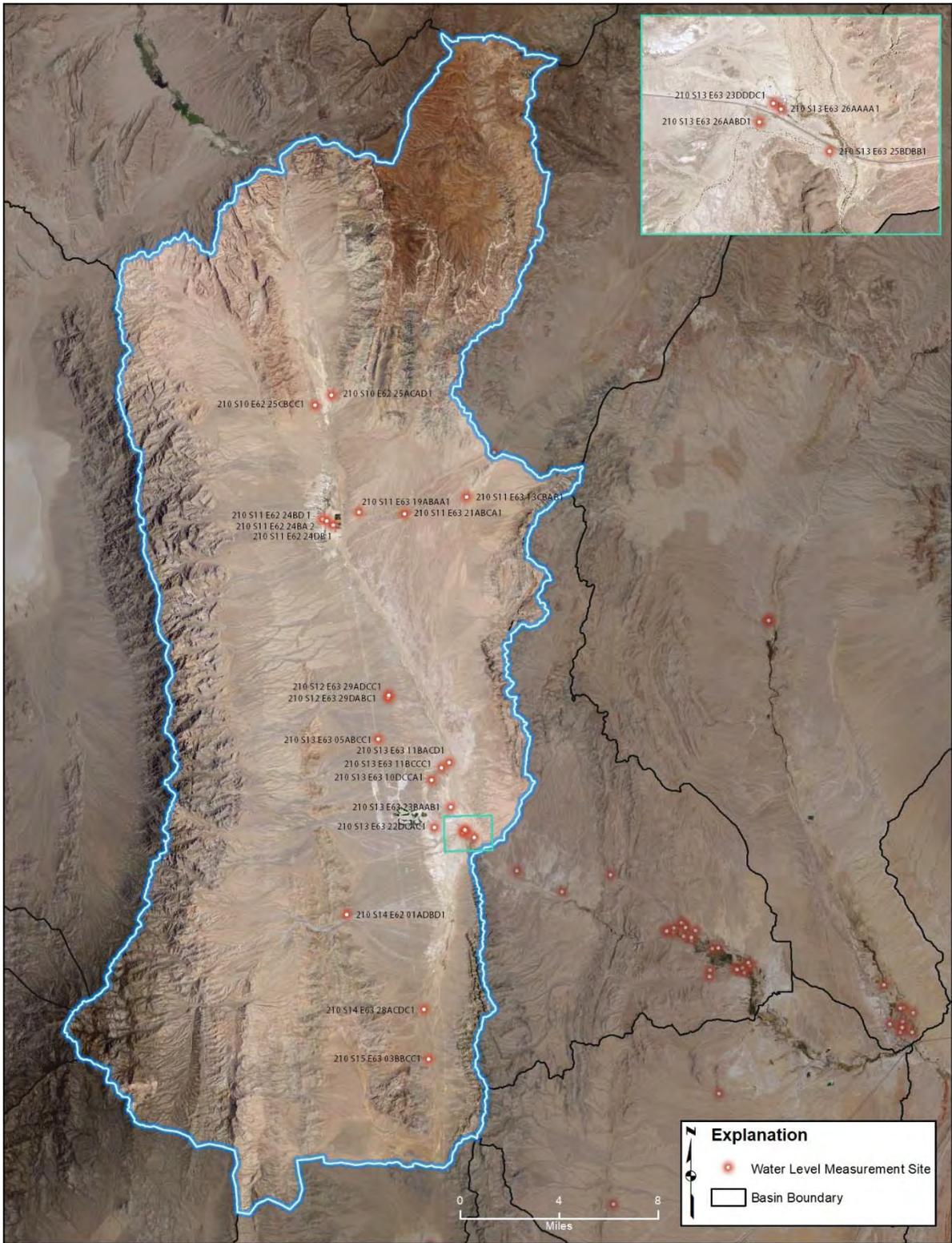


Figure 2. Coyote Spring Valley water level measurement sites.

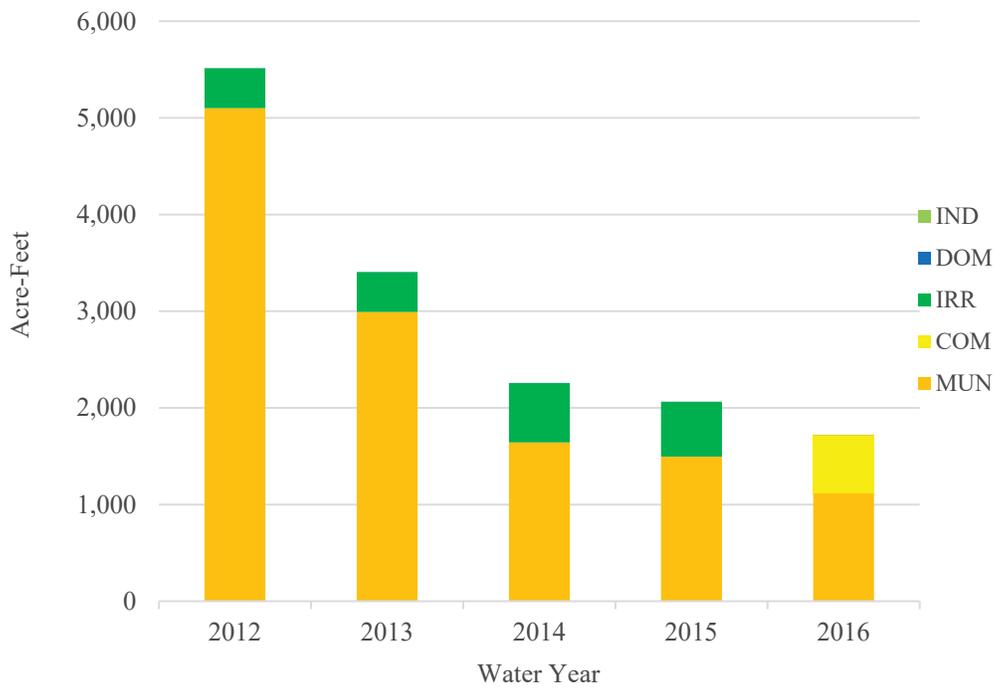


Figure 3. Coyote Spring Valley historical pumpage by manner of use.

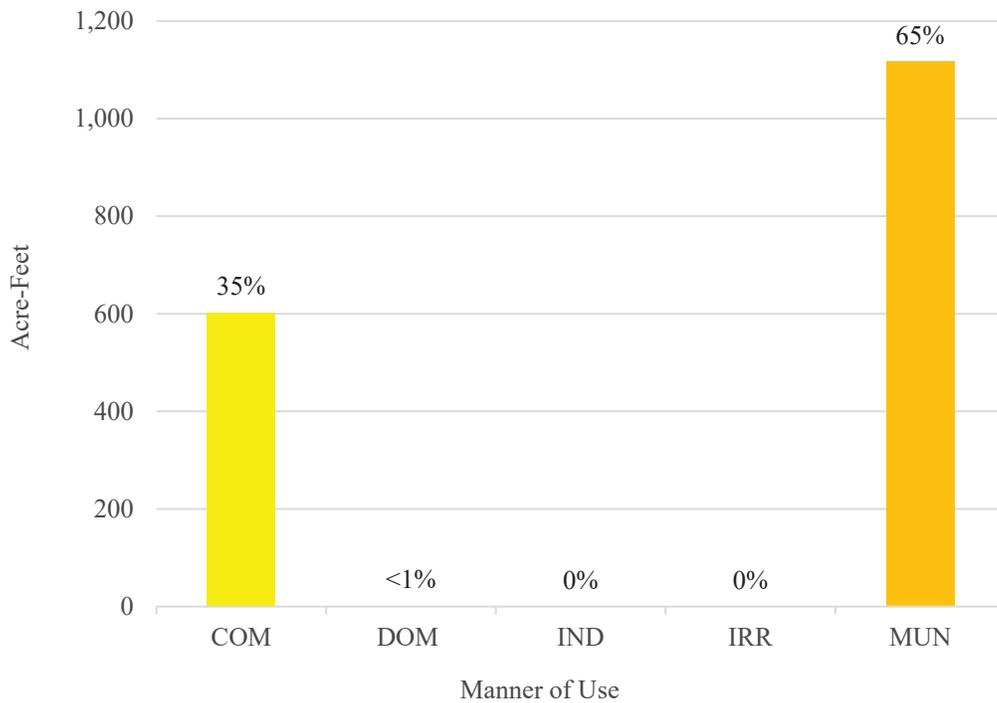


Figure 4. Percentage of 2016 groundwater pumpage by manner of use.

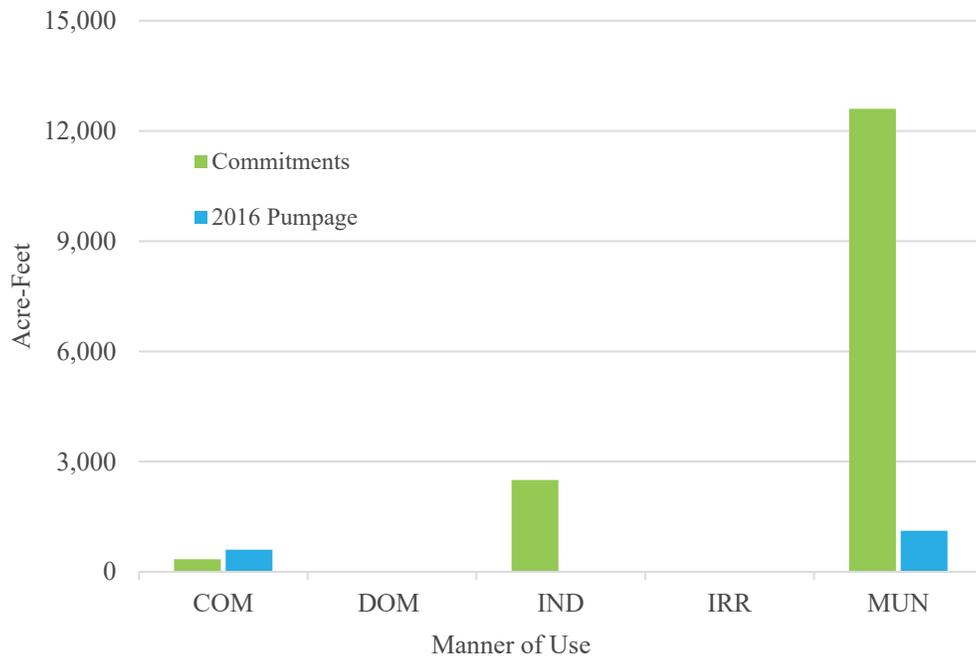


Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.

**APPENDIX A. COYOTE SPRING VALLEY 2016 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER The file number of the Application or the Vested Claim of Right.
- STATUS Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE
- QQ The quarter quarter of the Section in which the point of diversion is located.
- Qtr The quarter of the Section in which the point of diversion is located.
- Sec The Section in which the point of diversion is located.
- T The Township in which the point of diversion is located.
- R The Range in which the point of diversion is located.
- ACRES OR DUTY The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE The number of acres irrigated or the manner of use of the appropriated water.
 The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF) The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
70429	Cert	Clark County Coyote	SE	SW	14	13	63	4600.00	MUN	1,117.31	
70430	Permit	Spring Water	SW	SE	22						
74094	Permit	Resources GID									
74095	Permit										
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	IND	0.00	
77291	Permit	SNWA	SE	SE	23	13	63	8000.00	MUN	0.00	86195T from Permit 77293, portio of rights moved to Basin 216
77292	Permit		SW	NW	13	11	63				
77293	Permit		SE	NE	10	12	63				
77294	Permit		SE	NE	10	13	63				
77295	Permit		SW	NW	13	11	63				
77296	Permit		SE	SE	28						
77297	Permit		NE	NE	3	12	63				
77298	Permit		SE	NE	10						
77299	Permit		NW	SE	29						
77300	Permit		NW	NW	3	13	63				
77301	Permit		SE	NE	10	13	63				
77302	Permit		NE	NE	20						
77303	Permit		NE	NE	21						
77304	Permit		NE	NE	1						
77305	Permit										
77306	Permit										

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
85249	Permit	Bedroc Limited LLC		E2	24	11	62	315.56	COM	603.07	Alfalfa, wheel line, 70 acres
85250	Permit			E2	W2	24	11	62			Well 1: S/N 61792164
83044	Abr			E2	NE	25	11	62			RD - 75411500 - 10-13-15 RD - 89925900 - 05-31-16 broken meter removed, new mete installed 5/31/16. S/N 14018674 RD - 11146500 - 10-18-16 Well 2: S/N 97707924 RD - 63890700 - 10-13-15 RD - (1)35814500 - 10-18-16 Well 3: S/N 1546592 RD - 56710600 - 10-13-15 RD - 95662700 - 10-18-16 Well 4: S/N 14-018685 RD - 06893700 - 10-13-15 RD - 13722200 - 10-18-16 Well 5: S/N 14-016496 RD - 23590400 - 10-13-15 RD - 56041300 - 10-18-16 Well 6: S/N 62683157 RD - 18256700 - 10-13-15 RD - 41643400 - 10-18-16 TCD NTE 315.56

Verified with field notes:  , P.E.

TOTAL 1,720.38 Permitted rights

**APPENDIX B. COYOTE SPRING VALLEY 2016 GROUNDWATER PUMPAGE FIELD
NOTES.**

2016

Coyote Spring Valley
No. 210

Inventory Field Notes

Compiled by:
John Guillory, P.E. & Aurelio "Manny" Fernandez

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



COYOTE SPRING VALLEY
HYDROGRAPHIC BASIN 13-210

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2017

Field Investigated by: Christi Cooper & John Guillory, P.E.
Report Prepared by: Christi Cooper

SE ROA 1166

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Coyote Spring Valley, Hydrographic Basin 13-210, for calendar year 2017 (January 1, 2017 through December 31, 2017). Also included are tables, graphs and data associated with this use.

The data presented are valid for the 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 continual basis.

For calendar year 2017, the committed groundwater resource totaled 13,007 acre-feet, with estimated pumpage of approximately **1,961 acre-feet**. This figure includes an estimated 2 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2017, appropriations for municipal purposes totaled 9,700 acre-feet, with pumpage of 1,399 acre-feet. The second largest manner of use was industrial with appropriations totaling 2,500 acre-feet and pumpage of 0 acre-feet. The third largest manner of use was commercial with appropriations totaling 343 acre-feet and pumpage of 560 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the Coyote Spring Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	210, REGION 13
HYDROGRAPHIC BASIN NAME	COYOTE SPRING VALLEY
COUNTIES	CLARK, LINCOLN
MAJOR COMMUNITIES	ALAMO, MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR, SNWA, USGS
PUMPAGE INVENTORY, ACRE-FEET IN 2017	1,961 ¹

STATE ENGINEER'S ORDERS

[NO. 905 – DESIGNATION](#)

[NO. 1169 – FURTHER STUDY](#)

[NO. 1169A – FURTHER STUDY](#)

DATE: AUGUST 21, 1985

DATE: MARCH 8, 2002

DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE²: 13,007 ACRE-FEET

DATE: APRIL 2018

COMMERICAL.....343

DOMESTIC.....4

INDUSTRIAL.....2,500

MUNICIPAL.....9,700

WILDLIFE.....460

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013

² Committed groundwater resource data are accurate for April 2018. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 2 domestic wells existed in the basin during calendar year 2017. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 4 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Coyote Spring Valley for calendar year 2017. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Coyote Spring Valley is a basin located in southeastern Nevada, approximately 60 miles north of Las Vegas. The basin is located in Clark and Lincoln Counties (Figure 1), and is within the Colorado River Hydrographic Region.

Coyote Spring Valley is bounded on the west by the Sheep Range. The south end of Coyote Spring Valley is topographically closed by a bedrock and alluvial divide extending eastward from Hayford Peak to the Arrow Canyon Range. The Arrow Canyon Range and Meadow Valley Mountains border the basin to the east. The north boundary is defined by a series of hills at the south end of the Pahranaagat and Hiko Ranges and the Delamar Mountains.

The adjacent Nevada hydrographic basins are Pahranaagat Valley (13-209) and Delamar Valley (10-182) to the north, Kane Springs Valley (13-206) to the northeast, Lower Meadow Valley Wash (13-205) and Muddy River Springs Area (13-219) to the east, California Wash (13-218) to the southeast, Hidden Valley (13-217) to the south, Las Vegas Valley (13-212), Three Lakes Valley (Southern Part, 13-211), and Three Lakes Valley (Northern Part, 10-168) to the southwest, and Tikapoo Valley (South Subarea, 10-169B) to the west. The exterior boundary of the Coyote Spring Valley Hydrographic Basin is as described by Designation Order 905, issued by the Nevada State Engineer August 21, 1985.

GROUNDWATER LEVELS

Depths to groundwater in Coyote Spring Valley are measured by multiple agencies. There are 23 active sites in the monitoring well network. The following are the site names and links to the data for active sites (Figure 2):

210 S10 E62 25ACAD1	210 S10 E62 25CBCC1	210 S11 E62 24BA 2
210 S11 E62 24BD 1	210 S11 E62 24DB 1	210 S11 E63 13CBAB1
210 S11 E63 19ABAA1	210 S11 E63 21ABCA1	210 S12 E63 29ADCC1
210 S12 E63 29DABC1	210 S13 E63 05ABCC1	210 S13 E63 10DCCA1
210 S13 E63 11BACD1	210 S13 E63 11BCCC1	210 S13 E63 22DCAC1
210 S13 E63 23BAAB1	210 S13 E63 23DDDC1	210 S13 E63 25BDBB1
210 S13 E63 26AAAA1	210 S13 E63 26AABD1	210 S14 E62 01ADBD1
210 S14 E63 28ACDC1	210 S15 E63 03BBCC1	

Groundwater level data are also collected by the U.S. Geological Survey and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 were 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Coyote Spring Valley, or 2 acre-feet.

TABLES

Table 1. Coyote Spring Valley historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	IND	IRR	MUN	TOTAL
2013		2	0	413	2,992	3,407
2014		2	0	613	1,643	2,258
2015		2	0	568	1,494	2,064
2016	603	2	0	0	1,117	1,722
2017	560	2	0	0	1,399	1,961

FIGURES

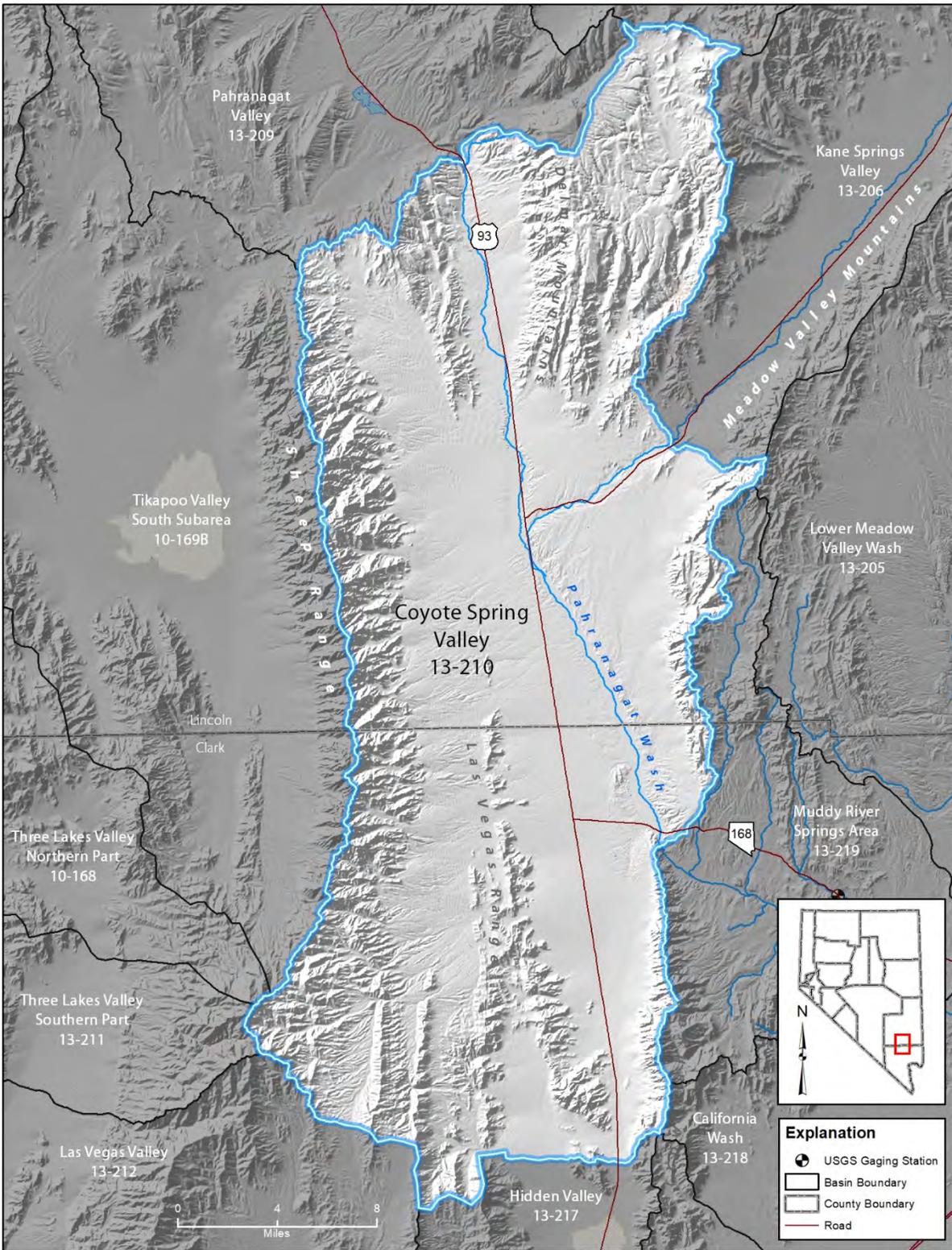


Figure 1. Physiographic map of Coyote Spring Valley (Hydrographic Basin 13-210).



Figure 2. Coyote Spring Valley water level measurement sites.

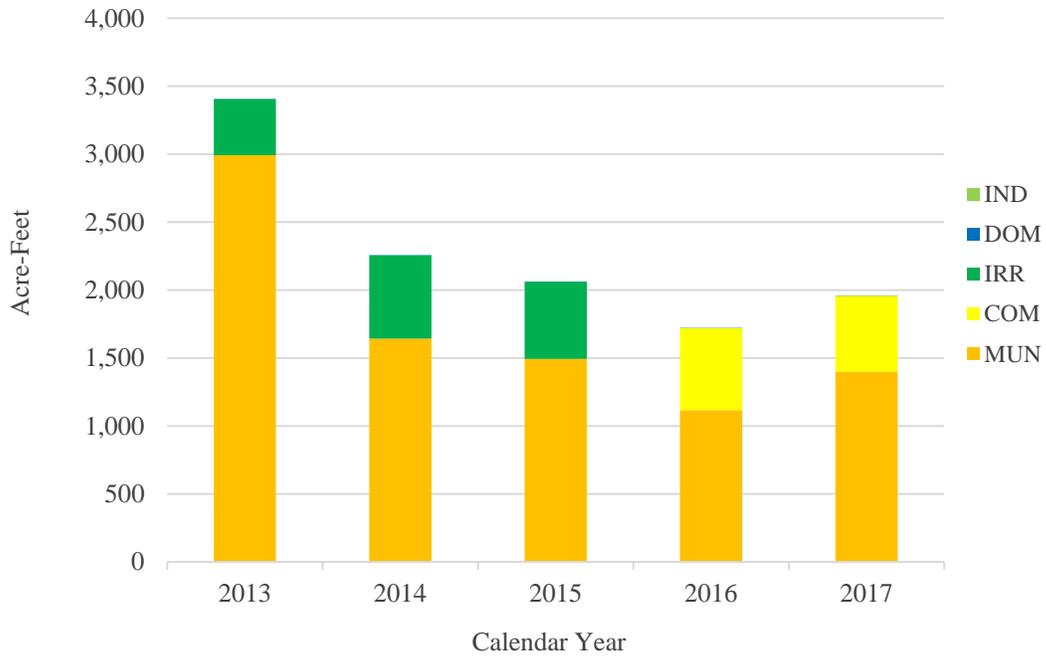


Figure 3. Coyote Spring Valley historical pumpage by manner of use.

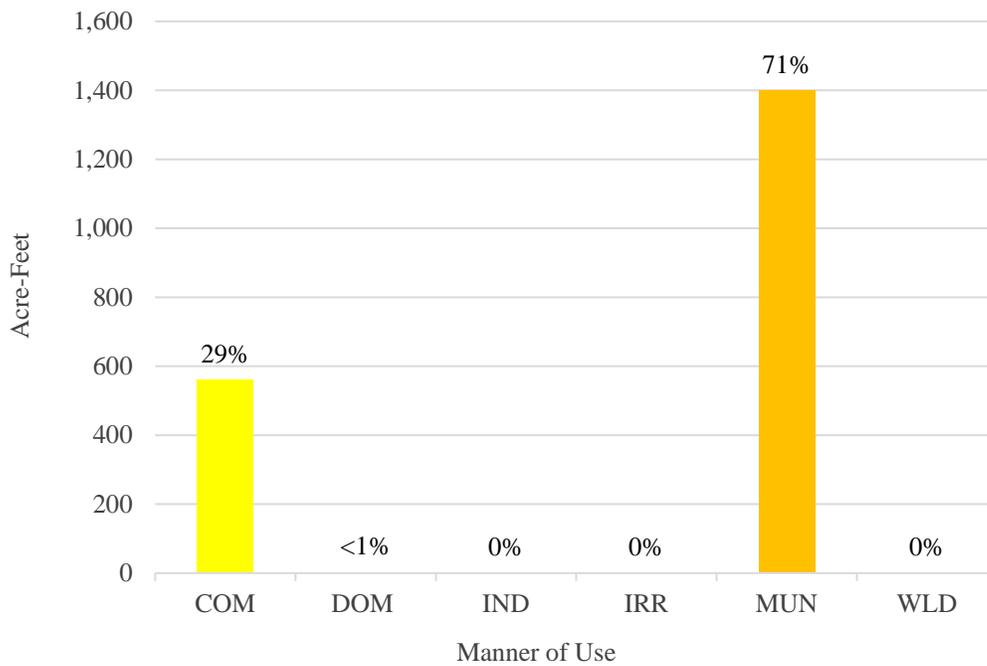


Figure 4. Percentage of 2017 groundwater pumpage by manner of use.

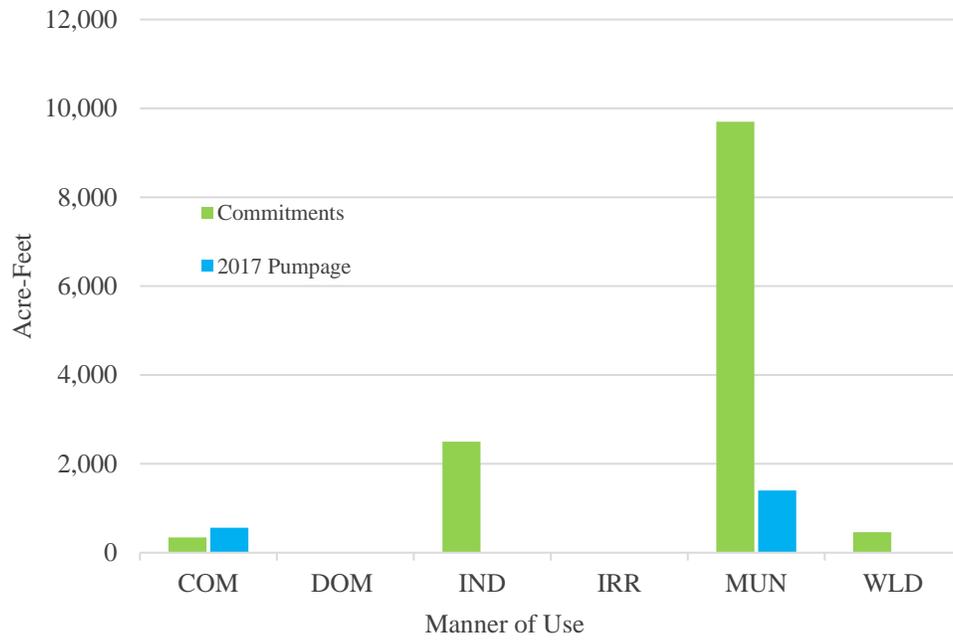


Figure 5. Comparison between 2017 groundwater commitments and estimated pumpage.

**APPENDIX A. COYOTE SPRING VALLEY 2017 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
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- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (AF)	REMARKS	
			QQ	Qtr	Sec	T	R					
70429	Cert	Clark County Coyote Springs Water Resources GID	SE	SW	14	13	63	4600.00	MUN	1,399.42		
70430	Permit		SW	SE	22							
74094	Permit											
74095	Permit											
77164	Permit	Nevada Power Co.	NE	NE	26	13	63	2500.00	IND	0.00	RW-2 well	
77291	Permit	SNWA	SE	SE	23	13	63	5100.00	MUN	0.00	POD 77291 (CSI-2 well)	
77292	Permit		SW	NW	13	11	63					
77293	Permit		SE	NE	10	12	63					POD's 77292-77306 (MX-5 well)
77294	Permit		SE	NE	10	13	63					
77295	Permit		SW	NW	13	11	63					86959T - 86962T, 87102T
77296	Permit		SE	SE	28							from Permit 77293, portion of rights
77297	Permit		NE	NE	3	12	63					moved to Garnet Valley (Basin 216)
77298	Permit		SE	NE	10							
77299	Permit		NW	SE	29							
77300	Permit		NW	NW	3	13	63					
77301	Permit		SE	NE	10	13	63					
77302	Permit		NE	NE	20							
77303	Permit		NE	NE	21							
77304	Permit	NE	NE	1								
77305	Permit											
77306	Permit											
85249	Permit	Bedroc Limited LLC		E2	24	11	62	315.56	COM	559.57	<u>Alfalfa, wheel line, 70 acres</u>	
85250	Permit		E2	W2	24	11	62				Well 1: S/N 14018674	
83044	Abr		E2	NE	25	11	62				Well 2: S/N 17-08374-03	
											Well 3: S/N 1546592	
											Well 4: S/N 14-018685	
											Well 5: S/N 14-016496	
											New meter installed 7-28-17	

**GROUNDWATER PUMPAGE INVENTORY
COYOTE SPRING VALLEY, NO. 210
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				

Initial reading zero; S/N 17038765
Well 6: S/N 62683157
Well 7: S/N 60548254
TCD NTE 315.56
Usage total from submitted data

Verified with field notes: Christi Cooper

TOTAL 1,958.99 Permitted rights

**APPENDIX B. COYOTE SPRING VALLEY 2017 GROUNDWATER PUMPAGE FIELD
NOTES.**

2017

Coyote Spring Valley
No. 210

Inventory Field Notes

Compiled by:
Christi Cooper & John Guillory, P.E

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2001

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	12.86	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, well not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. ww, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1588.40	
58031	Permit		NE	SE							
58032	Permit		NE	SE							
58047	Permit	Oglebay Norton Co.	SE	SW	8	20	65	1088.80	MM	0.00	No wells drilled. Not in use
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1184

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2001**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
62691	Permit	International Silica Corp.	E/2	SE	29	20	64	1327.28	MI	0.00	Not in use
62692	Permit										
63312	Permit										
63313	Permit										
64960-E	Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.12	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Paul Addi	NE	NW	35	21	63	1.34	CM	0.96	Mini mart. S/N 994889 RD - 314170 - 01-15-02
66163	Permit	Dry Lake Water Co., LLC	SW	NW	18	19	64	1392.06	QM	0.00	Not in use
66164	Permit										
66165	Permit										
66166	Permit										
67139-T	Permit										
67140-T	Permit										
67141-T	Permit										
TOTAL								1602.35	Permitted rights		

SE ROA 1185

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2002**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	1,905.4 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.17 Ac-Ft
DOMESTIC	1 Ac-Ft
Domestic wells drilled in 2002 = 0	
TOTAL	1,916 Ac-Ft

SE ROA 1186

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2002**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	8.85	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. wv, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1744.23	
58031	Permit		NE	SE							
58032	Permit		NE	SE							
58047	Permit	Oglebay Norton Co.	SE	SW	8	20	65	1088.80	MM	0.00	2 wells drilled. Not in use
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1187

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2002**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
62691	Permit	International Silica Corp.	E/2	SE	29	20	64	1327.28	MI	161.12	Government wash. 3 wells
62692	Permit										
63312	Permit										
63313	Permit										
64960-E	Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Paul Addi	NE	NW	35	21	63	1.34	CM	0.32	Mini mart. S/N 994889 RD - 419200 - 01-09-03
66163	Permit	Dry Lake Water Co., LLC	SW	NW	18	19	64	1392.06	QM	0.00	Not in use
66164	Permit										
66165	Permit										
66166	Permit										
68652-T	Permit				13	19	63				
68653-T	Permit										
68654-T	Permit										
68655-T	Permit										
TOTAL									1914.52	Permitted rights	

SE ROA 1188

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2003**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	1,967.2 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	8.77 Ac-Ft
DOMESTIC	2 Ac-Ft
Domestic wells drilled in 2003 = 1	

TOTAL 1,978 Ac-Ft

SE ROA 1189

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2003**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	7.98	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. wv, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Permit		SW	SW	22						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1709.15	
58031	Permit		NE	SE							
58032	Permit		NE	SE							
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1190

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2003**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
62691	Permit	International Silica Corp.	E/2	SE	29	20	64	1327.28	MI	258.09	Government wash. 3 wells
62692	Permit										
63312	Permit										
63313	Permit										
64960-E	Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Paul Addi	NE	NW	35	21	63	1.34	CM	0.79	Mini mart. S/N 994889 RD - 0675000 - 01-08-04
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	64	1392.06	QM	0.00	Not in use
68351	Permit										
68352	Permit										
68353	Permit		NW	NE	13						
68652-T	Permit				13	19	63				
68653-T	Permit										
68654-T	Permit										
68655-T	Permit										
TOTAL									1976.01	Permitted rights	

SE ROA 1191

GROUNDWATER MAPPING PAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2004

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS				
			1/4	1/4	S	T								
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use			
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire			
48816	Cert.		NW	SW								4.47	QM	6.20
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use			
41786	Cert.													
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. ww, not in use			
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.			
46030	Permit		NE	NE								22		
53829	Permit		NW	SW								22		
53831	Permit		NW	NE								15		
56150	Permit		NE	NE								15		
70441-T	Permit		SW	SW								22		
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1710.39				
58031	Permit		NE	SE										
58032	Permit		NE	SE										
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.			
58048	Permit		SW	SE										
58049	Permit		NE	SE										
58050	Permit		SE	NW										
58051	Permit		SW	SE								5	20	64
61597	Permit		NW	SE								5		
61598	Permit		NE	NE								15		
61599	Permit		SW	NW								7	20	65
61600	Permit		NE	NE								7		

SE ROA 1192

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2004**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
62691	Permit	Pacific Coast	E/2	SE	29	20	64	1327.28	MI	220.65	Government wash. 3 wells
62692	Permit										
63312	Permit										
63313	Permit										
64960-E	Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.74	S/N 99488918 RD - 0915000 - 01-01-05 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	64	1392.06	QM	0.00	Not in use
68351	Permit										
68352	Permit										
68353	Permit		NW	NE	13	13	19	63			
TOTAL										1937.98	Permitted rights

SE ROA 1193

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2005**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	9.10	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. wv, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1513.34	
58031	Permit		NE	SE							
58032	Permit		NE	SE							
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1194

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2005**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
62691	Permit	Pacific Coast	E/2	SE	29	20	64	1327.28	MI	370.72	Government wash. 3 wells
62692	Permit										
63312	Permit										
63313	Permit										
64960-E	Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.57	S/N 99488918 RD - 1100000 - 01-01-06 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	Not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
TOTAL									1893.73	Permitted rights	

SE ROA 1195

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2006**

IRRIGATION 0 Ac-Ft

MINING AND INDUSTRIAL 1,848.2 Ac-Ft

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL 9.41 Ac-Ft

DOMESTIC 2 Ac-Ft

Domestic wells drilled in 2006 = 0

TOTAL 1,860 Ac-Ft

SE ROA 1196

GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2006

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	8.33	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. wv, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1568.93	
58031	Permit		NE	SE							
58032	Permit		NE	SE							
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1197

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2006**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
64960-E	Permit	Seven Crown Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit	dba Echo Bay Resorts									
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	1.08	S/N 99488918 RD - 1471840 - 01-20-07 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast	E/2	SE	29	20	64	527.28	MI	279.27	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
								TOTAL		1857.61	Permitted rights

SE ROA 1198

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2007**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	1,718.56 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	11.48 Ac-Ft
DOMESTIC	2 Ac-Ft
Domestic wells drilled in 2007 = 0	
TOTAL	1,730 Ac-Ft

SE ROA 1199

GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2007

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	10.14	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. ww, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1585.06	S/N 20021800 North well
58031	Permit		NE	SE							RD - 358772000 - 05-22-08
58032	Permit		NE	SE							S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08

SE ROA 1200

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2007**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						
64960-E	Permit	Seven Crown Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit	dba Echo Bay Resorts									
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	1.34	S/N 99488918 Meter broken RD - 1471840 - 01-20-07 RD - 1516650 - 01-14-08 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Silica)	E/2	SE	29	20	64	527.28	MI	133.50	Government wash. 3 wells Pumpage submitted
72760	Permit										
72761	Permit										
72762	Permit										

TOTAL 1730.04 Permitted rights
SE ROA 1201

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2008**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	1,747.03 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.61 Ac-Ft
DOMESTIC	2 Ac-Ft
Domestic wells drilled in 2008 = 0	
TOTAL	1,759 Ac-Ft

SE ROA 1202

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2008**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
19936	Cert.	US National Park Service	SW	SW	5	19	68	179.55	QM	0.00	Echo Bay well, not in use
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	8.94	
41206	Cert.	Lakeview Company	SW	SW	25	22	64	107.04	CM	0.00	Hacienda Hotel & Casino on city water, wells not in use
41786	Cert.										
42678	Cert.	Meek & Thompson	SE	SE	28	21	63	47.69	MI	0.00	Basic Ready Mix. wv, not in use
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Permit	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1591.44	S/N 20021800 North well
58031	Permit		NE	SE							RD - 358772000 - 05-22-08
58032	Permit		NE	SE							S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08

SE ROA 1203

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2008**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.67	S/N 38441345 New meter Installed 07-02-08 RD - 0057270 - 05-20-09 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Silica)	E/2	SE	29	20	64	527.28	MI	155.59	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										

TOTAL 1756.64 Permitted rights

SE ROA 1204

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2009**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,147 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.25 ac-ft
DOMESTIC	1 ac-ft
Domestic wells drilled in 2009 = 0	
Total	1,157 ac-ft

SE ROA 1205

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2009**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM		
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1137.13	S/N 20021800 North well RD - 358772000 - 05-22-08 S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08
58031	Cert.		NE	SE							
58032	Cert.		NE	SE							
58047	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	1088.80	MM	0.00	2 monitoring wells drilled. Not in use.
58048	Permit		SW	SE							
58049	Permit		NE	SE							
58050	Permit		SE	NW							
58051	Permit		SW	SE	5	20	64				
61597	Permit		NW	SE	5						
61598	Permit		NE	NE	15						
61599	Permit		SW	NW	7	20	65				
61600	Permit		NE	NE	7						

SE ROA 1206

GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2009

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.23	S/N 38441345 RD - 0057490 - 06-29-09 RD - 0104760 - 03-17-10 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MI	10.13	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
TOTAL									1156.51	Permitted rights	

SE ROA 1207

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2010**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,561 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.64 ac-ft
DOMESTIC	1 ac-ft
Domestic wells drilled in 2010 = 0 (Total Wells = 1)	
Total	1,572 ac-ft

SE ROA 1208

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM		
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1561.03	S/N 20021800 North well RD - 358772000 - 05-22-08 S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08
58031	Cert.		NE	SE							
58032	Cert.		NE	SE							
58051	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	250.00	MM	0.00	2 monitoring wells drilled. Not in use.
61597	Permit		SW	SE							
61598	Permit		NE	SE							
			SE	NW							
			SW	SE	5	20	64				
			NW	SE	5						
			NE	NE	15						
		SW	NW	7	20	65					
		NE	NE	7							

SE ROA 1209

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.34	S/N 38441345 RD - 0104760 - 03-17-10 RD - 0202750 - 02-01-11 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MI	0.00	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
TOTAL									1570.67	Permitted rights	

SE ROA 1210

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2011**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,398 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.62 ac-ft
DOMESTIC	1 ac-ft
Domestic wells drilled in 2011 = 0 (Total Wells = 1)	
Total	1,409 ac-ft

SE ROA 1211

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS		
			1/4	1/4	S	T						
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire	
48816	Cert.		NW	SW				4.47	QM			9.38
76086	Permit							4.00	QM			0.00
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.	
46030	Permit		NE	NE	22							
53829	Permit		NW	SW	22							
53831	Permit		NW	NE	15							
56150	Permit		NE	NE	15							
70441-T	Exp		SW	SW	22							
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1398.26	S/N 20021800 North well RD - 358772000 - 05-22-08 S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08	
58031	Cert.		NE	SE								
58032	Cert.		NE	SE								
58051	Permit	Lareen Dawson et. al.	SE	SW	8	20	65	250.00	MM	0.00	2 monitoring wells drilled. Not in use.	
61597	Permit		SW	SE								
61598	Permit		NE	SE								
			SE	NW								
			SW	SE	5	20	64					
			NW	SE	5							
			NE	NE	15							
		SW	NW	7	20	65						
		NE	NE	7								

SE ROA 1212

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.24	S/N 38441345 RD - 0202750 - 02-01-11 RD - 0288400 - 03-13-12 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MI	0.00	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
TOTAL										1407.88	Permitted rights

SE ROA 1213

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO 215
2012**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,556 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	7.42 ac-ft
DOMESTIC	1 ac-ft
Domestic wells drilled in 2012 = 0 (Total Wells = 1)	
Total	1,564 ac-ft

SE ROA 1214

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	7.28	
76086	Permit							4.00	QM	0.00	
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	ID	1555.53	S/N 20021800 North well RD - 358772000 - 05-22-08 S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08
58031	Cert.		NE	SE							
58032	Cert.		NE	SE							
58051	Canc.	Lareen Dawson et. al.	SE	SW	8	20	65	250.00	MM	0.00	2 monitoring wells drilled. Not in use.
61597	Canc.		SW	SE							
61598	Canc.		NE	SE							
			SE	NW							
			SW	SE	5	20	64				
			NW	SE	5						
			NE	NE	15						
		SW	NW	7	20	65					
		NE	NE	7							

SE ROA 1215

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
64960-E	Exp	Seven Crown Resorts	NW	SW	5	19	68	9.92	EC	0.00	
66085-E	Permit	dba Echo Bay Resorts									
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	CM	0.14	S/N 38441345 RD - 0288400 - 03-13-12 RD - 0333720 - 03-08-13 Mini mart.
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MI	0.00	Govemment wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
TOTAL										1562.95	Permitted rights

SE ROA 1216

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



BLACK MOUNTAINS AREA (HYDROGRAPHIC BASIN 13-215)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2013

Field Investigated by: John Guillory, P.E.

Report Prepared by: John Guillory, P.E.

SE ROA 1217

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated and claims of vested right groundwater rights located within Black Mountains Area, Hydrographic Basin 13-215, for calendar year 2013 (January 1, 2013 through December 31, 2013). Also included is data associated with depth to groundwater.

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

For calendar year 2013 the permitted, certificated and claims of vested right groundwater rights totaled **5,797 acre-feet**. Estimated pumpage for the calendar year was **1,776 acre-feet**. Quasi-municipal is the largest manner of use within the basin. For calendar year 2013, appropriations for quasi-municipal totaled 3,603 acre-feet and the pumpage was 10 acre-feet. The next largest manner of use was industrial with appropriations for industrial totaling 1,665 acre-feet and the pumpage was 1,585 acre-feet. The next largest manner of use was mining & milling with appropriations totaling 527 acre-feet and the pumpage was 179 acre-feet. The next largest manner of use was pumping by exempt domestic wells, at 1 acre-foot. Exempt domestic wells are defined by Nevada Revised Statutes 534.013 and do not require a permit issued by the State Engineer.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER.....215, REGION 13

HYDROGRAPHIC BASIN NAMEBLACK MOUNTAINS AREA

COUNTIES.....CLARK

COMMUNITIESBOULDER CITY

DESIGNATED.....YES

DENIALS BASED UPON WATER AVAILABILITYIRRIGATION

GROUNDWATER LEVEL MEASUREMENTSSNWA, USGS

ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2013 1,776*

STATE ENGINEER'S ORDERS

[1018](#) - DESIGNATION.....NOVEMBER 22, 1989

[1169](#) - FURTHER STUDY.....MARCH 8, 2002

[1169a](#) - FURTHER STUDY.....DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 5,797 ACRE-FEET....DATE: JUNE 2013

QUASI-MUNICIPAL...3,603 INDUSTRIAL1,665 MINING&MILLING ... 527

COMMERCIAL1 ENVIRONMENTAL.... 1

NOTE: Committed groundwater resource data are accurate for June 2013. Manner of use category totals vary over time, as rights are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin was estimated by a query of the [Nevada Division of Water Resources' Well Log Database](#) and is estimated to be 1.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources, and to estimate the amount of groundwater pumped within the Black Mountains Area Hydrographic Basin 13-215, for the calendar year beginning January 1, 2013 and ending December 31, 2013 (hereafter referred to as calendar year 2013). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

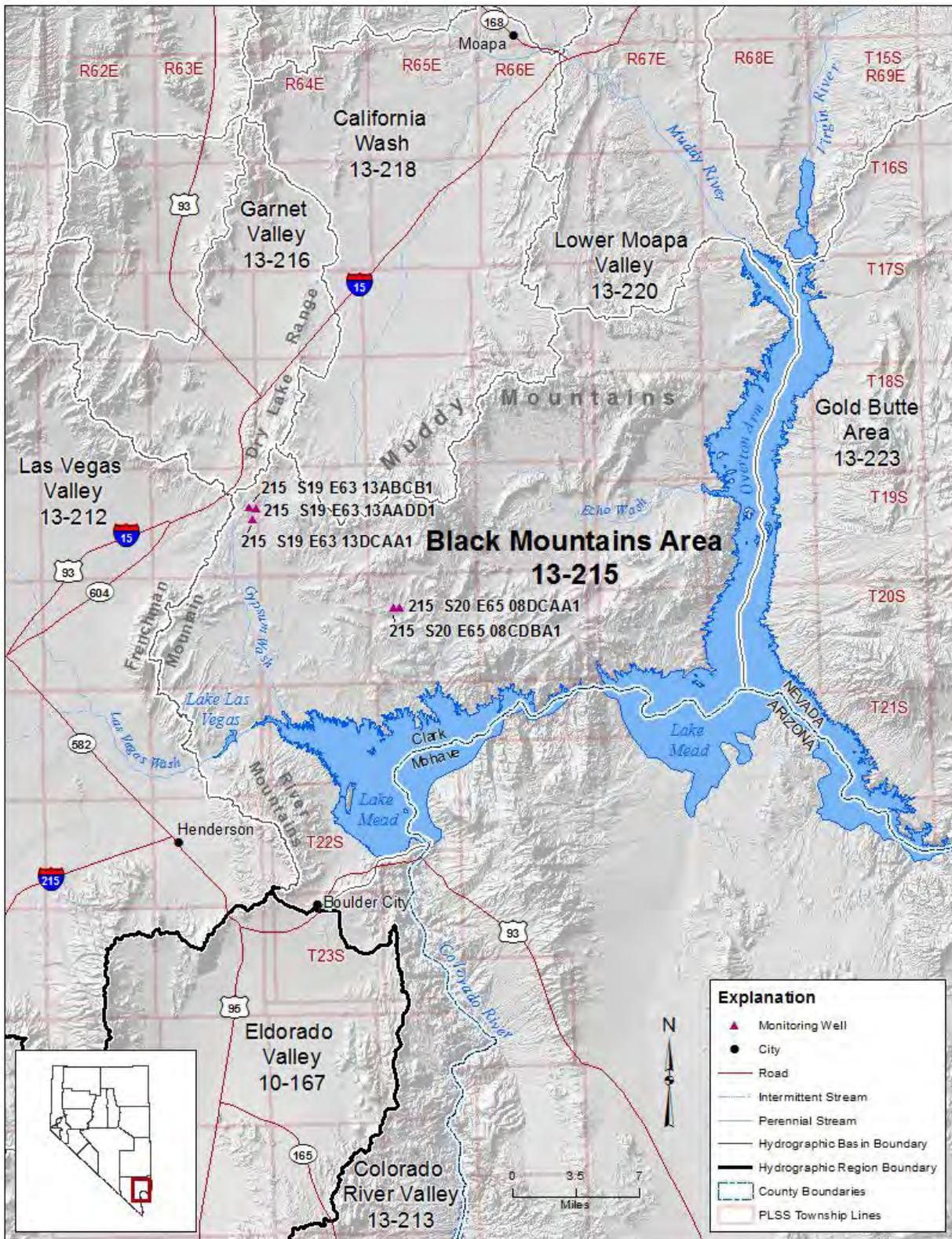
DESCRIPTION OF THE STUDY AREA

Black Mountains Area is a basin located in southern Nevada. The valley is approximately 30 miles east of Las Vegas, Nevada, and is within the Colorado River Hydrographic Region. The basin is located within Clark County (see Figure 1).

Black Mountains Area is bounded on the north by the Muddy Mountains. The centerline of Lake Mead forms the east and south boundaries. The River Mountains border the basin to the south; the Frenchman Mountains border the basin to the west. The northwest boundary is formed by the Dry Valley Range.

The adjacent Nevada hydrographic basins are as follows: Colorado River Valley, 13-213, to the south; Eldorado Valley, 10-167, to the south; Las Vegas Valley, 13-212, to the west; Garnet Valley, 13-216, to the northwest; California Wash, 13-218, to the north; and Lower Moapa Valley, 13-220, to the northeast. The exterior boundary of the Black Mountains Area Hydrographic Basin is as described by Designation Order 1018, issued by the Nevada State Engineer November 22, 1989. The basin covers approximately 627 square miles.

FIGURE 1: LOCATION MAP OF BLACK MOUNTAINS AREA, BASIN 13-215



GROUNDWATER LEVELS

Depths to groundwater in Black Mountains Area are not measured by the Nevada Division of Water Resources (NDWR), but data are provided to NDWR by water rights holders. Groundwater level data are collected by the USGS (data may be accessed through the USGS website <http://nevada.usgs.gov/>).

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 and exempt domestic wells in the Black Mountains Area Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 meters were not in place, use was irrigation, and the number of hours the well was operated was unknown an inspection of the place of use was done to estimate the amount of acreage under cultivation. The number of acres under cultivation was then multiplied by a duty of 5 acre-feet per acre to estimate the use.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- If no water was used under the certificate, permit or claim, zero pumpage was recorded.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer and are limited to a maximum of 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: *“Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.”* The number of exempt domestic wells in the basin is determined by a query of the Nevada Division of Water Resources' Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1.0 acre-foot per well in Black Mountains Area. Actual domestic well pumpage is not precisely known.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and are subject to revision. The total estimated groundwater pumpage for calendar year 2013 was **1,776 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Black Mountains Area Hydrographic Basin totaled **5,797 acre-feet**. The appropriated and actual pumped totals, categorized by manner of use, are as follows:

A. Quasi-Municipal (QM)

During calendar year 2013, appropriations for quasi-municipal purposes totaled 3,603 acre-feet in the basin. An estimated 10 acre-feet of groundwater was pumped during calendar year 2013.

B. Industrial (IND)

During calendar year 2013, appropriations for industrial purposes totaled 1,665 acre-feet in the basin. An estimated 1,585 acre-feet of groundwater was pumped during calendar year 2013.

C. Mining & Milling (MM)

During calendar year 2013, appropriations for mining & milling purposes totaled 527 acre-feet in the basin. An estimated 179 acre-feet of groundwater was pumped during calendar year 2013.

D. Commercial (COM)

During calendar year 2013, appropriations for commercial purposes totaled 1 acre-foot in the basin. An estimated 1 acre-foot of groundwater was pumped during calendar year 2013.

E. Environmental (ENV)

During calendar year 2013, appropriations for environmental purposes totaled 1 acre-foot in the basin. An estimated 0 acre-feet of groundwater was pumped during calendar year 2013.

F. Domestic (DOM)

During water year 2013, appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 1 exempt domestic well existed in the basin during water year 2013. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 1 acre-foot.

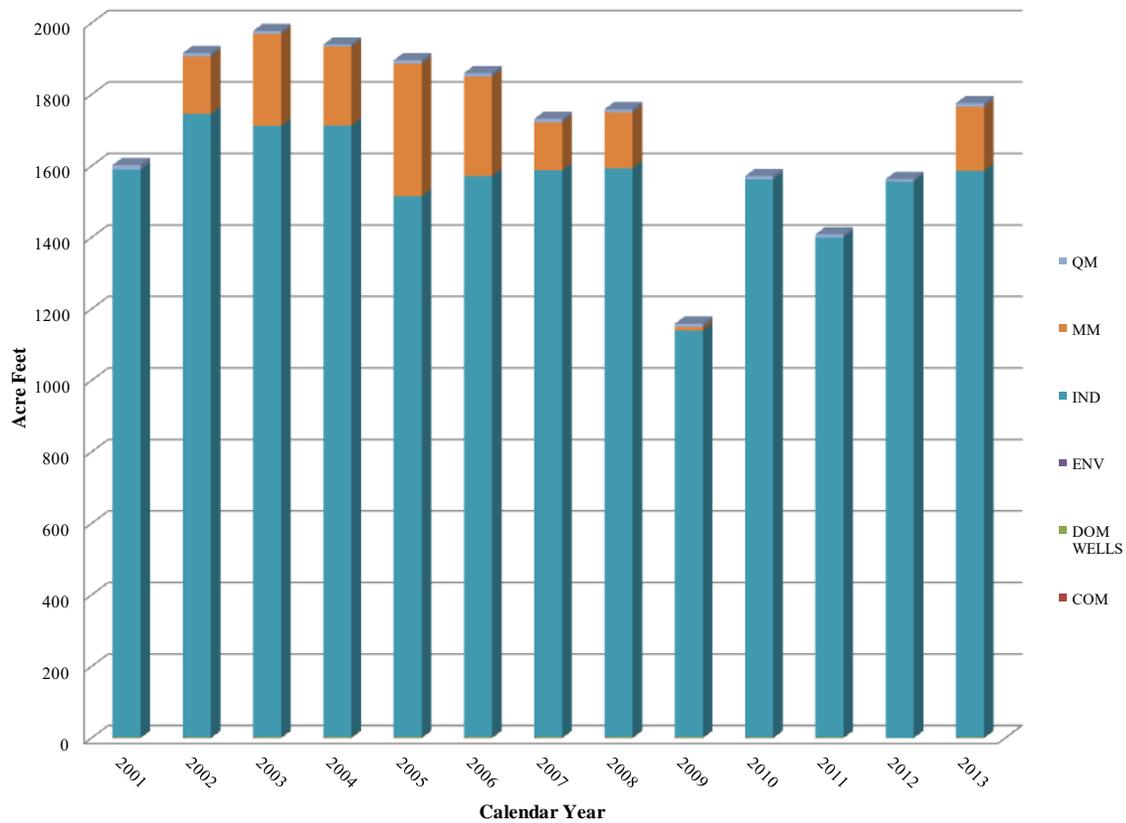
APPENDIX A

BLACK MOUNTAINS AREA HISTORICAL PUMPAGE

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

YEAR	COM	DOM	ENV	IND	MM	QM	TOTAL
2001	1	1	0	1588	0	13	1603
2002	1	1	0	1744	161	9	1916
2003	1	2	0	1709	258	8	1978
2004	1	2	0	1710	221	6	1940
2005	1	2	0	1513	371	9	1896
2006	1	2	0	1569	279	9	1860
2007	1	2	0	1585	134	10	1732
2008	1	2	0	1591	156	9	1759
2009	1	2	0	1137	10	9	1159
2010	1	1	0	1561	0	9	1572
2011	1	1	0	1398	0	9	1409
2012	0	1	0	1556	0	7	1564
2013	1	1	0	1585	179	10	1776

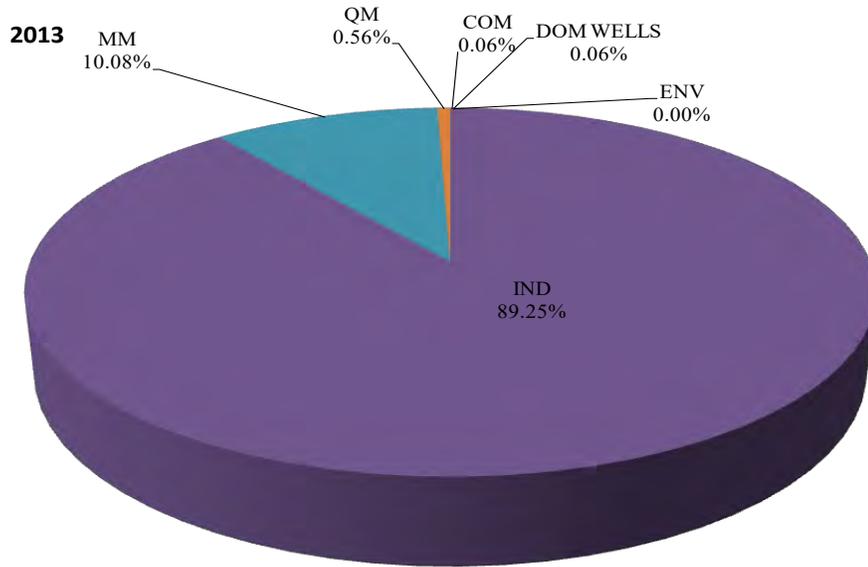
All values are in acre-feet



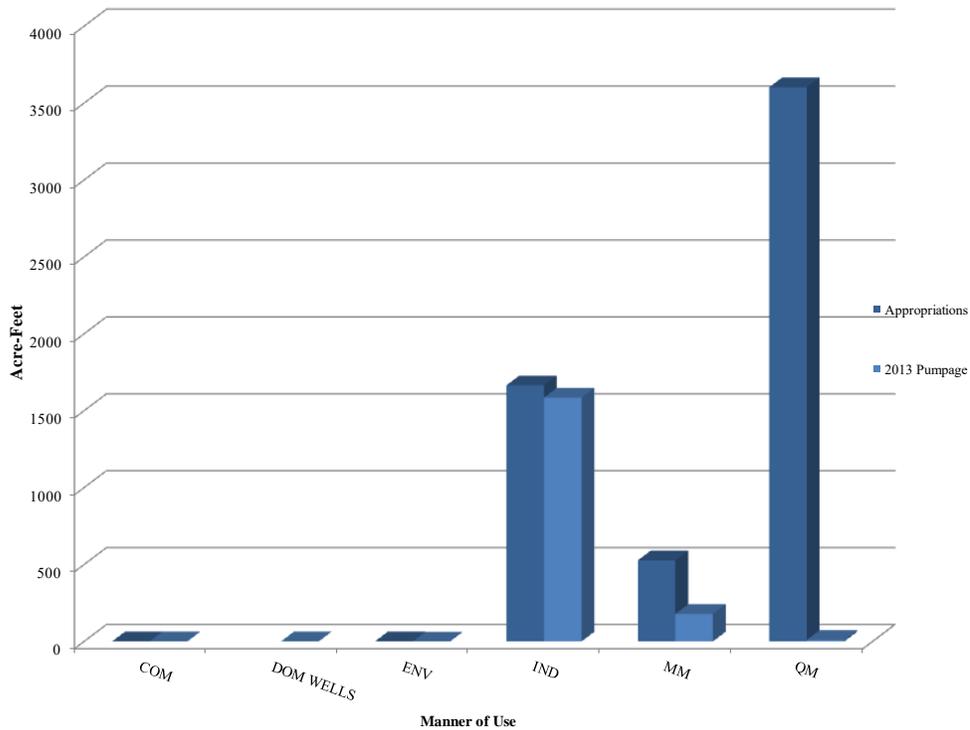
APPENDIX B

**BLACK MOUNTAINS AREA GROUNDWATER PUMPAGE FOR CALENDAR
YEAR 2013 BY MANNER OF USE**

PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 BY MANNER OF USE



GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 APPROPRIATIONS vs. ACTUAL PUMPAGE



APPENDIX C

**BLACK MOUNTAINS AREA GROUNDWATER PUMPAGE INVENTORY FOR
CALENDAR YEAR 2013**

EXPLANATION OF COLUMN HEADINGS

APP NUMBER	The file number of the Application or the Vested Claim of Right.
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
QQ	The quarter-quarter of the Section in which the point of diversion is located.
QTR	The quarter of the Section in which the point of diversion is located.
Sec	The Section in which the point of diversion is located.
T	The Township in which the point of diversion is located.
R	The Range in which the point of diversion is located.
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
ACRES IRR OR USE	The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include: COM - Commercial CON - Construction DOM - Domestic ENV - Environmental IND - Industrial IRR - Irrigation MM - Mining & Milling MUN - Municipal OTH - Other PWR - Power QM - Quasi-Municipal REC - Recreation STK - Stockwater STO - Storage WLD - Wildlife
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
REMARKS	Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)
			Qq	Qtr	Sec	T	R			
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00
48816	Cert.		NW	SW				4.47	QM	10.41
76086	Permit							4.00	QM	0.00
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00
46030	Permit		NE	NE	22					
53829	Permit		NW	SW	22					
53831	Permit		NW	NE	15					
56150	Permit		NE	NE	15					
70441-T	Exp		SW	SW	22					
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	IND	1584.67
58031	Cert.		NE	SE						
58032	Cert.		NE	SE						
58051	Canc.	Lareen Dawson et. al.	SE	SW	8	20	65	250.00	MM	0.00
61597	Canc.		SW	SE						
61598	Canc.		NE	SE						
			SE	NW						
			SW	SE	5	20	64			
			NW	SE	5					
			NE	NE	15					
			SW	NW	7	20	65			
		NE	NE	7						

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)
			QQ	Qtr	Sec	T	R			
64960-E 66085-E 66973-E	Exp Permit Permit	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	ENV	0.00
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	COM	0.26
68350 68351 68352 68353	Permit Permit Permit Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00
72759 72760 72761 72762	Permit Permit Permit Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MM	178.86
TOTAL										1774.20

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



BLACK MOUNTAINS AREA
(HYDROGRAPHIC BASIN 13-215)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2014

Field Investigated by: John Guillory, P.E.

Report Prepared by: John Guillory, P.E.

SE ROA 1233

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated and claims of vested right groundwater rights located within Black Mountains Area, Hydrographic Basin 13-215, for calendar year 2014 (January 1, 2014 through December 31, 2014). Also included is data associated with depth to groundwater.

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

For calendar year 2014 the permitted, certificated and claims of vested right groundwater rights totaled **5,797 acre-feet**. Estimated pumpage for the calendar year was **1,624 acre-feet**. For calendar year 2014, appropriations for quasi-municipal (the largest manner of use in the basin) totaled 3,603 acre-feet and the pumpage was 7 acre-feet. The second largest manner of use was industrial, with appropriations totaling 1,665 acre-feet and pumpage of 1,429 acre-feet. The third largest manner of use was mining & milling, with appropriations totaling 527 acre-feet and pumpage of 187 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 1 acre-foot. Exempt domestic wells are defined by Nevada Revised Statutes 534.013 and do not require a permit issued by the State Engineer.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER..... 215, REGION 13

HYDROGRAPHIC BASIN NAME BLACK MOUNTAINS AREA

COUNTIES..... CLARK

COMMUNITIES BOULDER CITY

DESIGNATED YES

DENIALS BASED UPON WATER AVAILABILITY IRRIGATION

GROUNDWATER LEVEL MEASUREMENTS SNWA, USGS

ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2014..... 1,624*

STATE ENGINEER'S ORDERS

[1018](#) - DESIGNATION..... NOVEMBER 22, 1989
[1169](#) - FURTHER STUDY..... MARCH 8, 2002
[1169a](#) - FURTHER STUDY..... DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 5,797 ACRE-FEET.... DATE: JUNE 2015

QUASI-MUNICIPAL...3,603 INDUSTRIAL 1,665 MINING&MILLING ... 527

COMMERCIAL1 ENVIRONMENTAL.... 1

NOTE: Committed groundwater resource data are accurate for June 2015. Manner of use category totals vary over time, as rights are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin, obtained by a query of the [Nevada Division of Water Resources Well Log Database](#), is estimated to be 1.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Black Mountains Area (Hydrographic Basin 13-215), for the time period beginning January 1, 2014 and ending December 31, 2014 (hereafter referred to as calendar year 2014). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

DESCRIPTION OF THE STUDY AREA

Black Mountains Area is a basin located in southern Nevada. The valley lies within Clark County (Figure 1) approximately 30 miles east of Las Vegas, Nevada, and is within the Colorado River Hydrographic Region.

Black Mountains Area is bounded on the north by the Muddy Mountains. The centerline of Lake Mead forms the east and south boundaries. The River Mountains border the basin to the south; the Frenchman Mountains border the basin to the west. The northwest boundary is formed by the Dry Valley Range.

The adjacent Nevada hydrographic basins are as follows: Colorado River Valley (13-213) and Eldorado Valley (10-167), to the south; Las Vegas Valley (13-212), to the west; Garnet Valley (13-216), to the northwest; California Wash (13-218), to the north; and Lower Moapa Valley (13-220), to the northeast. The exterior boundary of the Black Mountains Area Hydrographic Basin is as described by Designation Order 1018, issued by the Nevada State Engineer November 22, 1989. The basin covers approximately 627 square miles.

GROUNDWATER LEVELS

Depths to groundwater in Black Mountains Area are measured by multiple entities in the basin on a semi-annual basis. These include:

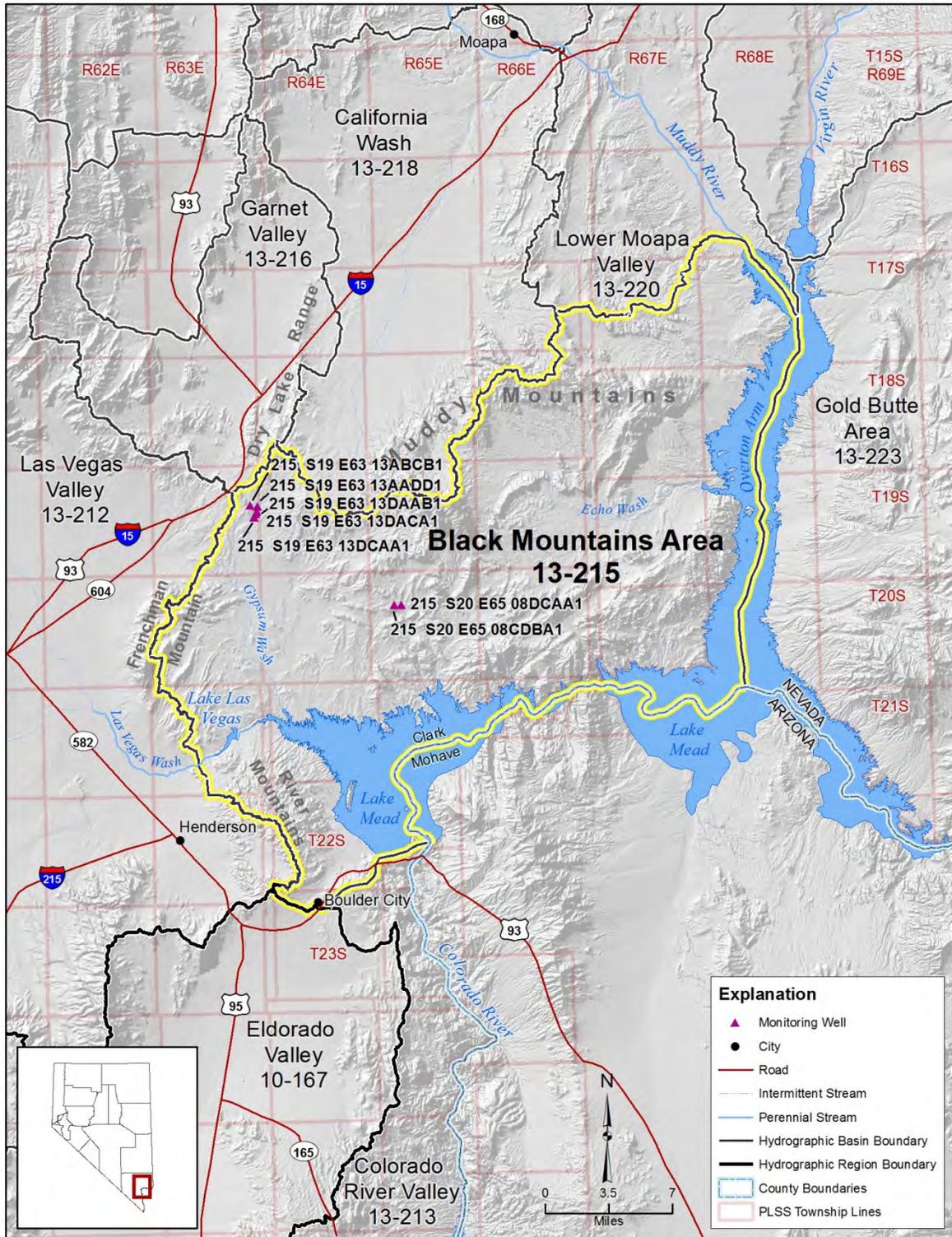
[215 S19 E63 13AADD1](#)
[215 S19 E63 13DACA1](#)
[215 S20 E65 08DCAA1](#)

[215 S19 E63 13ABCB1](#)
[215 S19 E63 13DCAA1](#)

[215 S19 E63 13DAAB1](#)
[215 S20 E65 08CDBA1](#)

Groundwater level data are also collected by the US Geological Survey (USGS), and may be accessed through their website (<http://nevada.usgs.gov/>).

FIGURE 1. PHYSIOGRAPHIC MAP OF BLACK MOUNTAINS AREA, HYDROGRAPHIC BASIN 13-215.



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 and exempt domestic wells in the Dry Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 are 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 multiplied by the amount 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 is estimated using the NIWR method above, but is 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 may differ significantly from estimates for previous years.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1.0 acre-foot per well in Black Mountains Area.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and are subject to revision.

The total estimated groundwater pumpage for calendar year 2014 was **1,624 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Black Mountains Area Hydrographic Basin totaled **5,797 acre-feet**. For calendar year 2014, the appropriated and actual pumped totals are categorized by manner of use, as follows:

A. Quasi-Municipal (QM)

Appropriations for quasi-municipal purposes totaled 3,603 acre-feet, with estimated groundwater pumpage of 7 acre-feet.

B. Industrial (IND)

Appropriations for industrial purposes totaled 1,665 acre-feet, with estimated groundwater pumpage of 1,429 acre-feet.

C. Mining & Milling (MM)

Appropriations for mining & milling purposes totaled 527 acre-feet, with estimated pumpage of 187 acre-feet.

D. Commercial (COM)

Appropriations for commercial purposes totaled 1 acre-foot in the basin, with estimated pumpage of 0 acre-feet.

E. Environmental (ENV)

Appropriations for environmental purposes totaled 1 acre-foot, with estimated pumpage of 0 acre-feet.

F. Domestic (DOM)

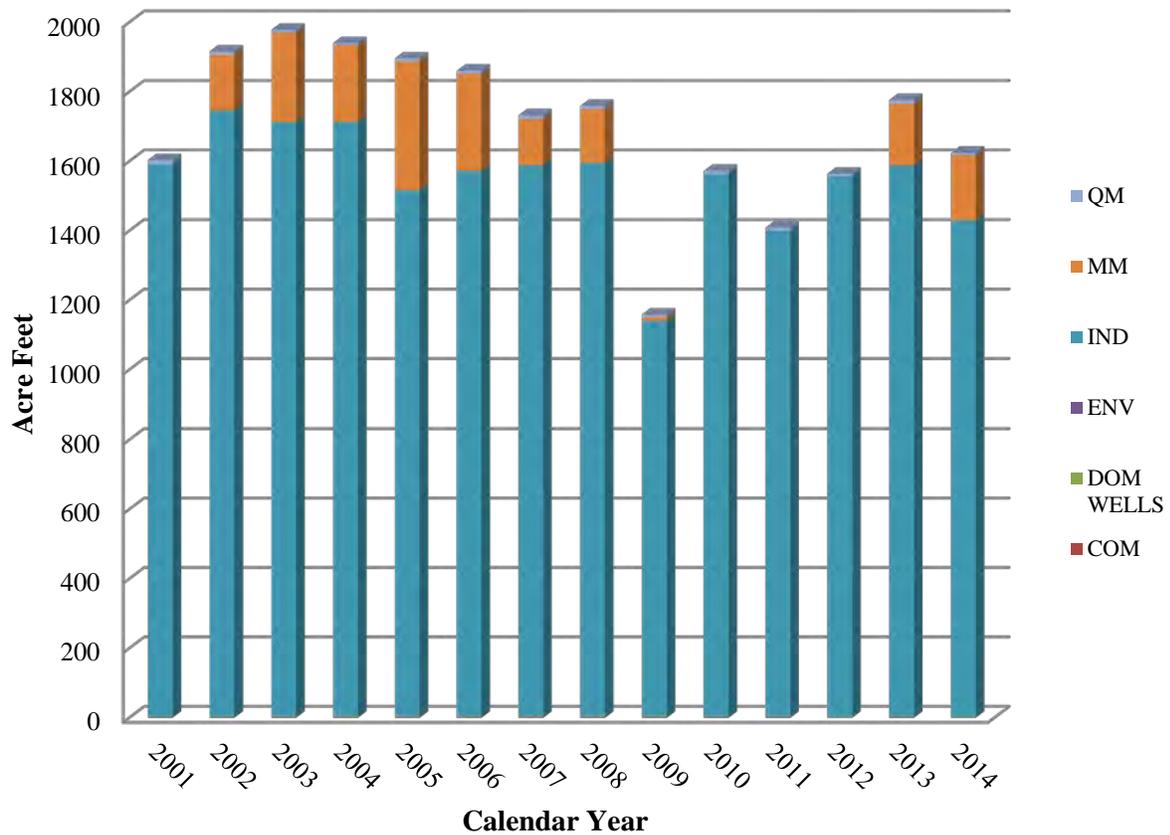
Appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 1 exempt domestic well existed in the basin during water year 2014. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 1 acre-foot.

APPENDIX A. BLACK MOUNTAINS AREA HISTORICAL PUMPAGE.

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

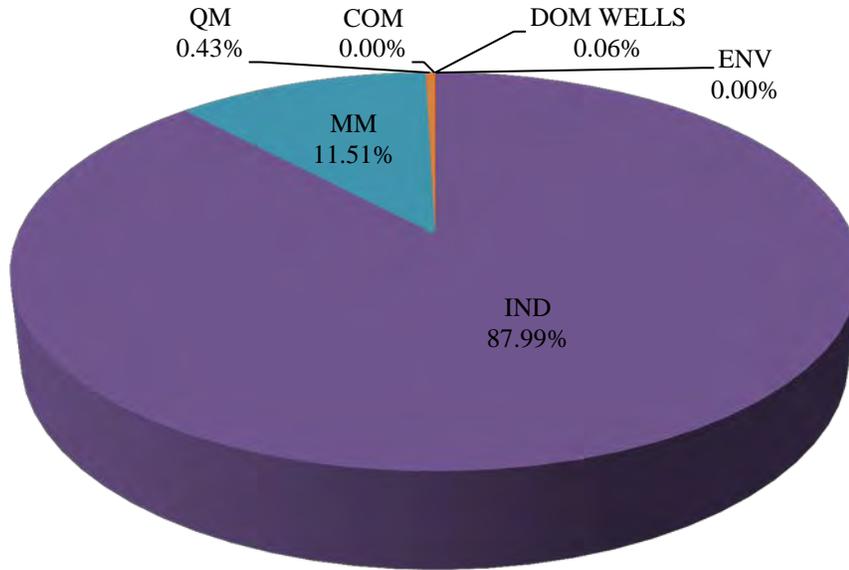
YEAR	COM	DOM	ENV	IND	MM	QM	TOTAL
2001	1	1	0	1588	0	13	1603
2002	1	1	0	1744	161	9	1916
2003	1	2	0	1709	258	8	1978
2004	1	2	0	1710	221	6	1940
2005	1	2	0	1513	371	9	1896
2006	1	2	0	1569	279	9	1860
2007	1	2	0	1585	134	10	1732
2008	1	2	0	1591	156	9	1759
2009	1	2	0	1137	10	9	1159
2010	1	1	0	1561	0	9	1572
2011	1	1	0	1398	0	9	1409
2012	0	1	0	1556	0	7	1564
2013	1	1	0	1585	179	10	1776
2014	0	1	0	1429	187	7	1624

All values are in acre-feet

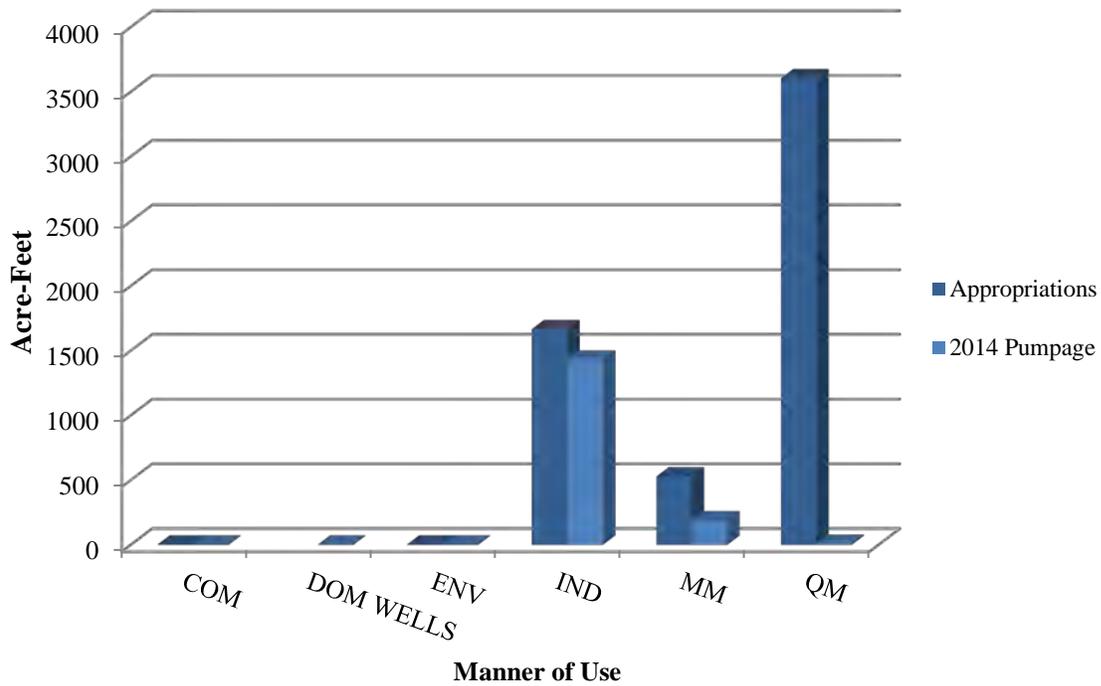


**APPENDIX B. BLACK MOUNTAINS AREA GROUNDWATER PUMPAGE FOR
CALENDAR YEAR 2014 BY MANNER OF USE.**

PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 BY MANNER OF USE



GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 APPROPRIATIONS vs. ACTUAL PUMPAGE



**APPENDIX C. BLACK MOUNTAINS AREA GROUNDWATER PUMPAGE
INVENTORY FOR CALENDAR YEAR 2014.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
QQ	The quarter quarter of the Section in which the point of diversion is located.																
QTR	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
ACRES IRR OR USE	<p>The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include:</p> <table border="0" style="width: 100%;"> <tr> <td>COM - Commercial</td> <td>CON - Construction</td> </tr> <tr> <td>DOM - Domestic</td> <td>ENV - Environmental</td> </tr> <tr> <td>IND - Industrial</td> <td>IRR - Irrigation</td> </tr> <tr> <td>MM - Mining & Milling</td> <td>MUN - Municipal</td> </tr> <tr> <td>OTH - Other</td> <td>PWR - Power</td> </tr> <tr> <td>QM - Quasi-Municipal</td> <td>REC - Recreation</td> </tr> <tr> <td>STK - Stockwater</td> <td>STO - Storage</td> </tr> <tr> <td>WLD - Wildlife</td> <td></td> </tr> </table>	COM - Commercial	CON - Construction	DOM - Domestic	ENV - Environmental	IND - Industrial	IRR - Irrigation	MM - Mining & Milling	MUN - Municipal	OTH - Other	PWR - Power	QM - Quasi-Municipal	REC - Recreation	STK - Stockwater	STO - Storage	WLD - Wildlife	
COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
IND - Industrial	IRR - Irrigation																
MM - Mining & Milling	MUN - Municipal																
OTH - Other	PWR - Power																
QM - Quasi-Municipal	REC - Recreation																
STK - Stockwater	STO - Storage																
WLD - Wildlife																	
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.																
REMARKS	Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	7.28	
76086	Permit							4.00	QM	0.00	
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	IND	1428.85	S/N 20021800 North well RD - 358772000 - 05-22-08 S/N 9324526 Middle well RD - 475047000 - 05-22-08 S/N 2002180006 South well RD - 037774000 - 05-22-08
58031	Cert.		NE	SE							
58032	Cert.		NE	SE							
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	ENV	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	COM	0.09	S/N 38441345 RD - 0418340 - 03-14-14 RD - 0445570 - 02-26-15 Mini mart.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MM	187.05	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
TOTAL									1623.27	Permitted rights	

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



BLACK MOUNTAINS AREA
HYDROGRAPHIC BASIN 13-215

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2015

Field Investigated by: John Guillory, P.E.
Report Prepared by: John Guillory, P.E.

SE ROA 1249

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated and claims of vested right groundwater rights located within Black Mountains Area, Hydrographic Basin 13-215, for calendar year 2015 (January 1, 2015 through December 31, 2015). Also included for summary purposes are graphs and data associated with this use, and yearly totals of historical groundwater use from 2001 through 2015 by manner of use.

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 continual basis.

For calendar year 2015, the permitted, certificated and claims of vested right groundwater rights totaled 5,797 acre-feet, with estimated pumpage of approximately **1,708 acre-feet**. This figure includes an estimated 1 acre-foot pumped from exempt domestic wells.

Quasi-municipal is the largest manner of use within the basin. For calendar year 2015, appropriations for quasi-municipal totaled 3,603 acre-feet, with pumpage of 6 acre-feet. The second largest manner of use was industrial with appropriations totaling 1,665 acre-feet and pumpage of 1,448 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 527 acre-feet and pumpage of 253 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 1 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This Pumpage Inventory only includes details on groundwater pumping from the Black Mountains Area Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	215, REGION 13	
HYDROGRAPHIC BASIN NAME	BLACK MOUNTAINS AREA	
COUNTIES	CLARK	
MAJOR COMMUNITIES	BOULDER CITY	
DESIGNATED	YES	
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION	
GROUNDWATER LEVEL MEASUREMENTS	SNWA, USGS	
PUMPAGE INVENTORY, ACRE-FEET IN 2015	1,708 ¹	
STATE ENGINEER'S ORDERS		
NO. 1018 – DESIGNATION	DATE: NOVEMBER 22, 1989	
NO. 1169 – FURTHER STUDY	DATE: MARCH 8, 2002	
NO. 1169a – FURTHER STUDY	DATE: DECEMBER 21, 2012	
COMMITTED GROUNDWATER RESOURCE: 5,797 ACRE-FEET	DATE: APRIL 2016	
COMMERCIAL.....1	ENVIRONMENTAL.....1	INDUSTRIAL.....1,665
MINING & MILLING.....527	QUASI-MUNICIPAL.....3,603	

NOTE: Committed groundwater resource data are accurate for April 2016. Manner of use category totals vary over time, as rights are not necessarily static. 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. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells.

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin, estimated by a query of the Nevada Division of Water Resources Well Log Database, is approximately 1.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Black Mountains Area Hydrographic Basin (13-215), for the time period beginning January 1, 2015 and ending December 31, 2015 (hereafter referred to as calendar year 2015). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Black Mountains Area is a basin located in southern Nevada, approximately 30 miles east of Las Vegas. The basin is located within the Colorado River Hydrographic Region, in Clark County (see Figure 1).

Black Mountains Area is bounded on the north by the Muddy Mountains. The centerline of Lake Mead forms the east and south boundaries. The River Mountains border the basin to the south; Frenchman and Sunrise Mountains border the basin to the west. The northwest boundary is formed by the Dry Lake Range.

The adjacent Nevada hydrographic basins are as follows: Colorado River Valley (13-213) and Eldorado Valley (10-167) to the south; Las Vegas Valley (13-212) to the west; Garnet Valley (13-216) to the northwest; California Wash (13-218) to the north; and Lower Moapa Valley (13-220) to the northeast. The exterior boundary of the Black Mountains Area Hydrographic Basin is as described by Designation Order 1018, issued by the Nevada State Engineer November 22, 1989. The basin covers approximately 627 square miles.

The U.S. Geological Survey (USGS) operates a network of stream gauging stations in the basin, primarily at the southwest and northeast ends of the basin (Figure 1). Data from these gauges are maintained on the USGS website at <http://nevada.usgs.gov/>

GROUNDWATER LEVELS

Depths to groundwater in Black Mountains Area are not measured by the Nevada Division of Water Resources (NDWR); however measurements are taken by other entities that and submitted to NDWR. These data can be found on the NDWR website at <http://water.nv.gov/data/waterlevel/>. Water level measurement locations are shown on Figure 2. Actively monitored sites and links to their data are:

[215 S19 E63 13AADD1](#)
[215 S19 E63 13DACA1](#)
[215 S20 E65 08DCAA1](#)

[215 S19 E63 13ABCB1](#)
[215 S19 E63 13DCAA1](#)

[215 S19 E63 13DAAB1](#)
[215 S20 E65 08CDBA1](#)

Groundwater level data is also collected by the USGS and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by exempt domestic wells in the valley. 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.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Black Mountains Area.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and subject to revision.

The total estimated groundwater pumpage for the calendar year 2015 was 1,708 acre-feet. The annual duties of permitted, certificated and claims of vested groundwater rights within the Black Mountains Area Hydrographic Basin total approximately 5,797 acre-feet. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 percentage of water pumped by manner of use; and Figure 5 compares groundwater appropriations to actual pumpage. The permitted and pumped totals for calendar year 2015, categorized by manner of use, are as follows:

A. Commercial (COM)

Appropriations for commercial purposes totaled 1 acre-foot, with estimated pumpage of 0 acre-feet.

B. Domestic (DOM)

Appropriations for domestic purposes totaled 0 acre-feet in the basin. However, records of the State Engineer indicate an estimated 1 exempt domestic well existed in the basin during calendar year 2015. The amount of water pumped for domestic use as described under NRS 534.013 is estimated at 1 acre-foot.

C. Environmental (ENV)

Appropriations for environmental purposes totaled 1 acre-foot, with estimated groundwater pumpage of 0 acre-feet.

D. Industrial (IND)

Appropriations for industrial purposes totaled 1,665 acre-feet, with estimated groundwater pumpage of 1,448 acre-feet.

E. Mining & Milling (MM)

Appropriations for mining and milling purposes totaled 527 acre-feet in the basin; groundwater pumpage was estimated to be 253 acre-feet.

F. Quasi-Municipal (QM)

Appropriations for quasi-municipal totaled 3,603 acre-feet, with estimated groundwater pumpage of 6 acre-feet.

TABLES

Table 1. Black Mountains Area historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	ENV	IND	MM	QM	TOTAL
2001	1	1	0	1,588	0	13	1,603
2002	1	1	0	1,744	161	9	1,916
2003	1	2	0	1,709	258	8	1,978
2004	1	2	0	1,710	221	6	1,940
2005	1	2	0	1,513	371	9	1,896
2006	1	2	0	1,569	279	9	1,860
2007	1	2	0	1,585	134	10	1,732
2008	1	2	0	1,591	156	9	1,759
2009	1	2	0	1,137	10	9	1,159
2010	1	1	0	1,561	0	9	1,572
2011	1	1	0	1,398	0	9	1,409
2012	0	1	0	1,556	0	7	1,564
2013	1	1	0	1,585	179	10	1,776
2014	0	1	0	1,429	187	7	1,624
2015	0	1	0	1,448	253	6	1,708

All values are in acre-feet

FIGURES

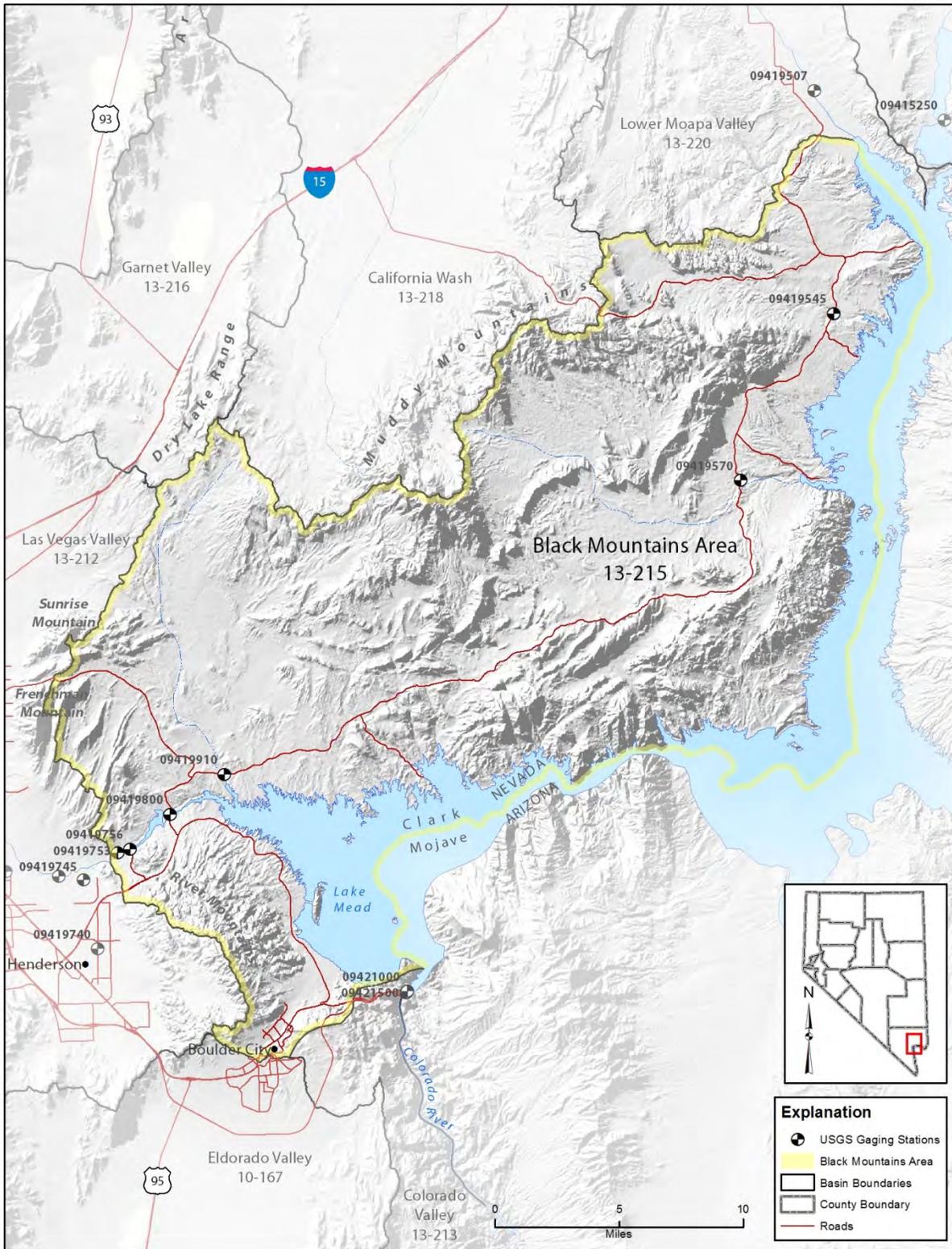


Figure 1. Location map for Black Mountains Area (Hydrographic Basin 13-215).



Figure 2. Black Mountains Area irrigated acreage and water level measurement sites.

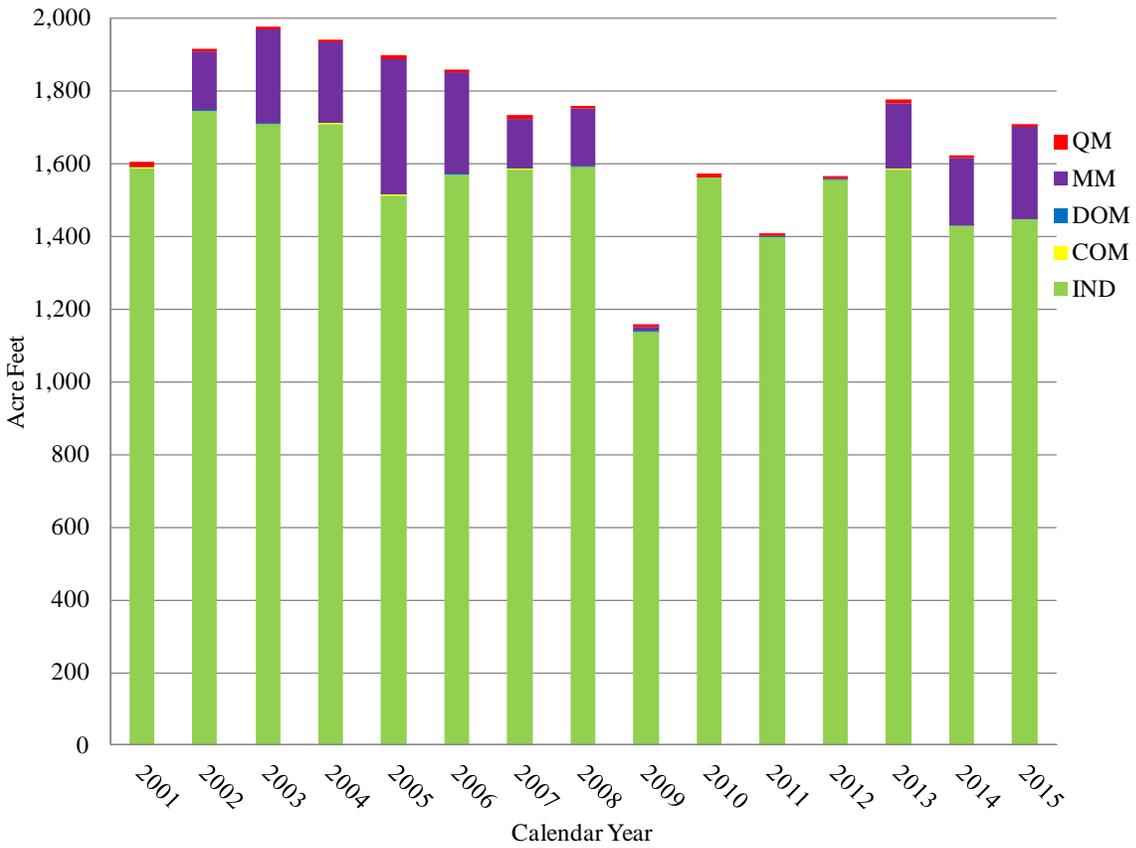


Figure 3. Black Mountains Area historical pumpage by manner of use.

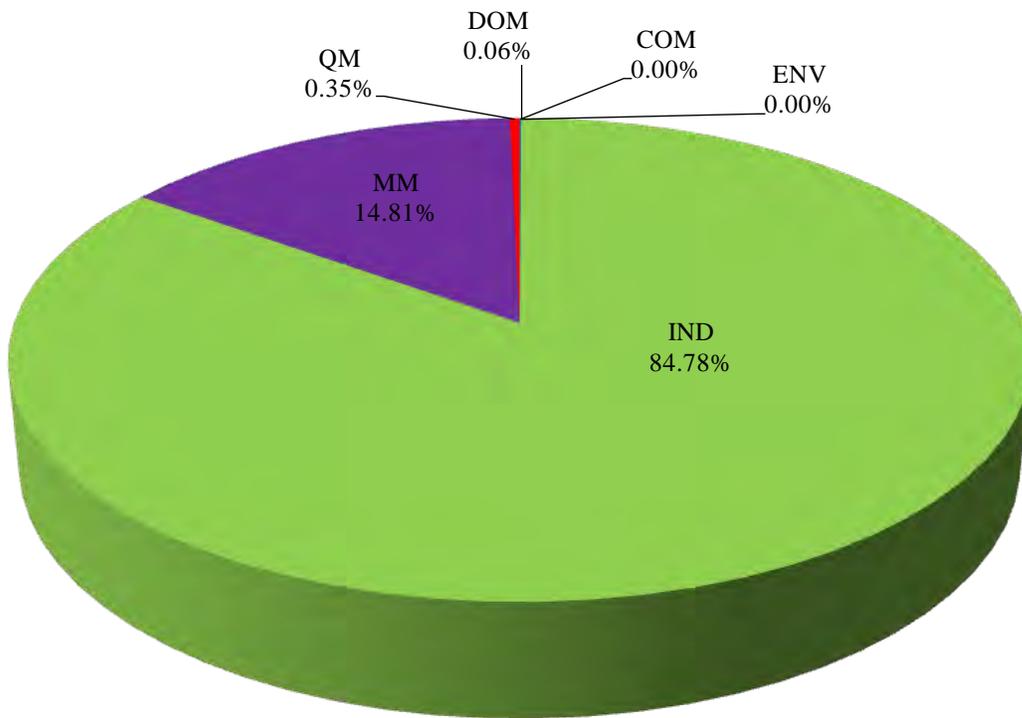


Figure 4. Percentage of 2015 groundwater pumpage by manner of use.

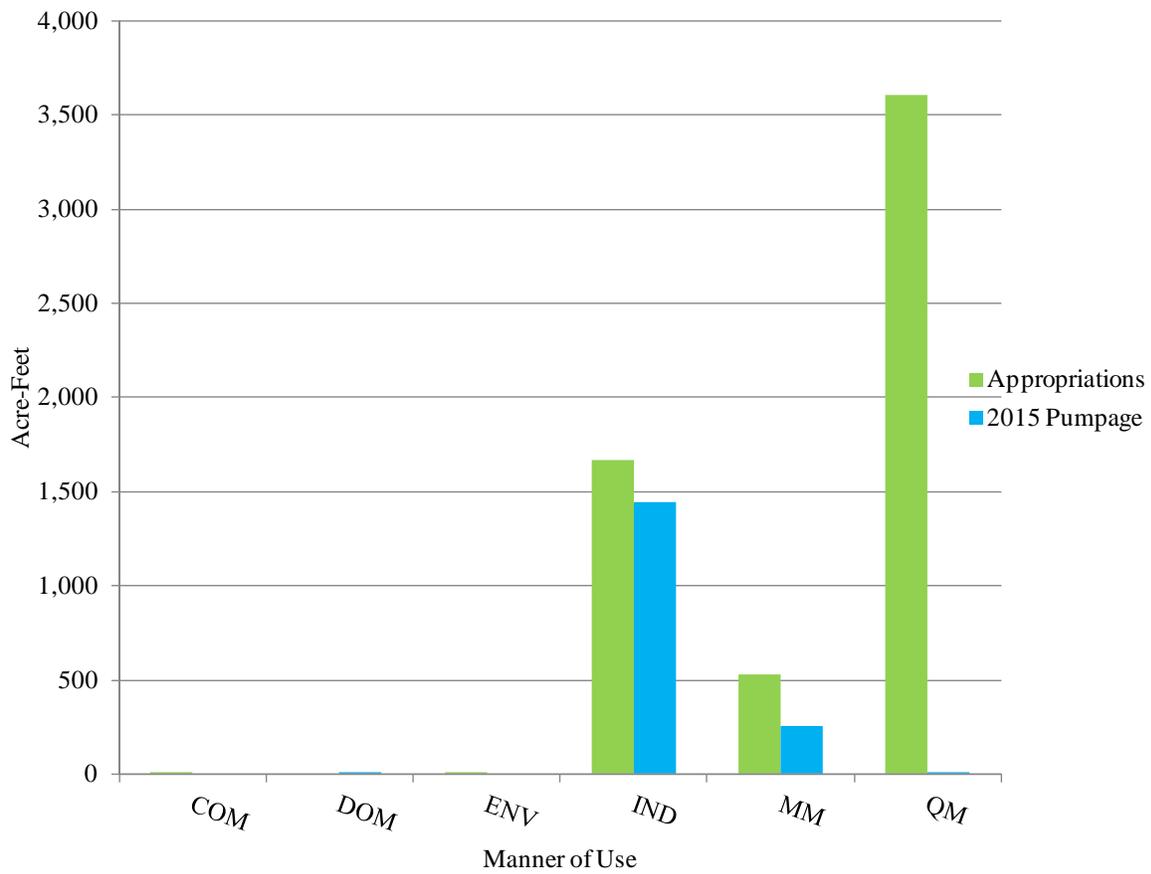


Figure 5. 2015 groundwater appropriations versus actual pumpage.

**APPENDIX A. BLACK MOUNTAINS AREA 2015 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER The file number of the Application or the Vested Claim of Right.
- STATUS Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE
- QQ The quarter quarter of the Section in which the point of diversion is located.
- Qtr The quarter of the Section in which the point of diversion is located.
- Sec The Section in which the point of diversion is located.
- T The Township in which the point of diversion is located.
- R The Range in which the point of diversion is located.
- ACRES OR DUTY The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE The number of acres irrigated or the manner of use of the appropriated water.
 The types of manner of use may include:
 COM - Commercial CON - Construction
 DOM - Domestic ENV - Environmental
 IND - Industrial IRR - Irrigation
 MM - Mining & Milling MUN - Municipal
 OTH - Other PWR - Power
 QM - Quasi-Municipal REC - Recreation
 STK - Stockwater STO - Storage
 WLD - Wildlife
- USED (AF) The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	5.95	S/N None
76086	Permit							4.00	QM	0.00	RD - 31812800 - 03-11-16
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	IND	1447.91	S/N 20021800 North well
58031	Cert.		NE	SE							
58032	Cert.		NE	SE							S/N 9324526 Middle well S/N 2002180006 South well
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	ENV	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	COM	0.13	S/N 38441345 RD - 0485860 - 02-16-16 RD - 0445570 - 02-26-15 Mini mart.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						
68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MM	253.03	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
85757-T	Permit										
85758-T	Permit										
TOTAL									1707.02	Permitted rights	

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



BLACK MOUNTAINS AREA
HYDROGRAPHIC BASIN 13-215

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2016

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1265

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Black Mountains Area, Hydrographic Basin 13-215, for calendar year 2016 (January 1, 2016 through December 31, 2016). Also included are tables, graphs and data associated with this use.

The data presented are valid for the 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 continual basis.

For calendar year 2016, the committed resource totaled 5,799 acre-feet, with estimated pumpage of approximately **1,641 acre-feet**. This figure includes an estimated 1 acre-foot pumped from exempt domestic wells.

Quasi-municipal is the largest manner of use within the basin. For calendar year 2016, appropriations for quasi-municipal totaled 3,603 acre-feet, with pumpage of 11 acre-feet. The second largest manner of use was industrial with appropriations totaling 1,665 acre-feet and pumpage of 1,434 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 527 acre-feet and pumpage of 195 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 1 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This Pumpage Inventory only includes details on groundwater pumping from the Black Mountains Area Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	215, REGION 13	
HYDROGRAPHIC BASIN NAME	BLACK MOUNTAINS AREA	
COUNTIES	CLARK	
MAJOR COMMUNITIES	BOULDER CITY, OVERTON	
DESIGNATED	YES	
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION	
GROUNDWATER LEVEL MEASUREMENTS	SNWA, USGS	
PUMPAGE INVENTORY, ACRE-FEET IN 2016	1,641 ¹	
STATE ENGINEER'S ORDERS		
<u>NO. 1018 – DESIGNATION</u>	DATE: NOVEMBER 22, 1989	
<u>NO. 1169 – FURTHER STUDY</u>	DATE: MARCH 8, 2002	
<u>NO. 1169A – FURTHER STUDY</u>	DATE: DECEMBER 21, 2012	
COMMITTED GROUNDWATER RESOURCE ² : 5,799 ACRE-FEET	DATE: APRIL 2017	
COMMERCIAL 1	ENVIRONMENTAL.. 1	INDUSTRIAL..... 1,665
MINING & MILLING ... 527	DOMESTIC..... 2	QUASI-MUNICIPAL ... 3,603

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2017. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 1 domestic well existed in the basin during calendar year 2016. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 2 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Black Mountains Area for calendar year 2016. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Black Mountains Area is a basin located in southern Nevada, approximately 30 miles east of Las Vegas. The basin is located within the Colorado River Hydrographic Region, in Clark County and covers approximately 627 square miles (Figure 1).

Black Mountains Area is bounded on the north by the Muddy Mountains. The centerline of Lake Mead forms the east and south boundaries. The River Mountains border the basin to the south; Frenchman and Sunrise Mountains border the basin to the west. The northwest boundary is formed by the Dry Lake Range.

The adjacent Nevada hydrographic basins are Colorado River Valley (13-213) and Eldorado Valley (10-167) to the south, Las Vegas Valley (13-212) to the west, Garnet Valley (13-216) to the northwest, California Wash (13-218) to the north, and Lower Moapa Valley (13-220) to the northeast. The exterior boundary of the Black Mountains Area Hydrographic Basin is as described by Designation Order 1018, issued by the Nevada State Engineer November 22, 1989.

The U.S. Geological Survey (USGS) operates a network of stream gauging stations in the basin, primarily at the southwest and northeast ends of the basin (Figure 1). Data from these gauges are maintained on the USGS website at <http://nevada.usgs.gov/>

GROUNDWATER LEVELS

Depths to groundwater in Black Mountains Area are not measured by NDWR. However, measurements are taken by other entities and submitted to NDWR. There are seven active sites in the monitoring well network. The following are the site names and links to the data for active sites (Figure 2):

[215 S19 E63 13AADD1](#) [215 S19 E63 13ABCB1](#) [215 S19 E63 13DAAB1](#)
[215 S19 E63 13DACA1](#) [215 S19 E63 13DCAA1](#) [215 S20 E65 08CDBA1](#)
[215 S20 E65 08DCAA1](#)

Groundwater level data is also collected by the USGS and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Black Mountains Area, or 1 acre-foot.

TABLES

Table 1. Black Mountains Area historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	ENV	IND	MM	QM	TOTAL
2012	0	1	0	1,556	0	7	1,564
2013	1	1	0	1,585	179	10	1,776
2014	0	1	0	1,429	187	7	1,624
2015	0	1	0	1,448	253	6	1,708
2016	0	1	0	1,434	195	11	1,641

FIGURES

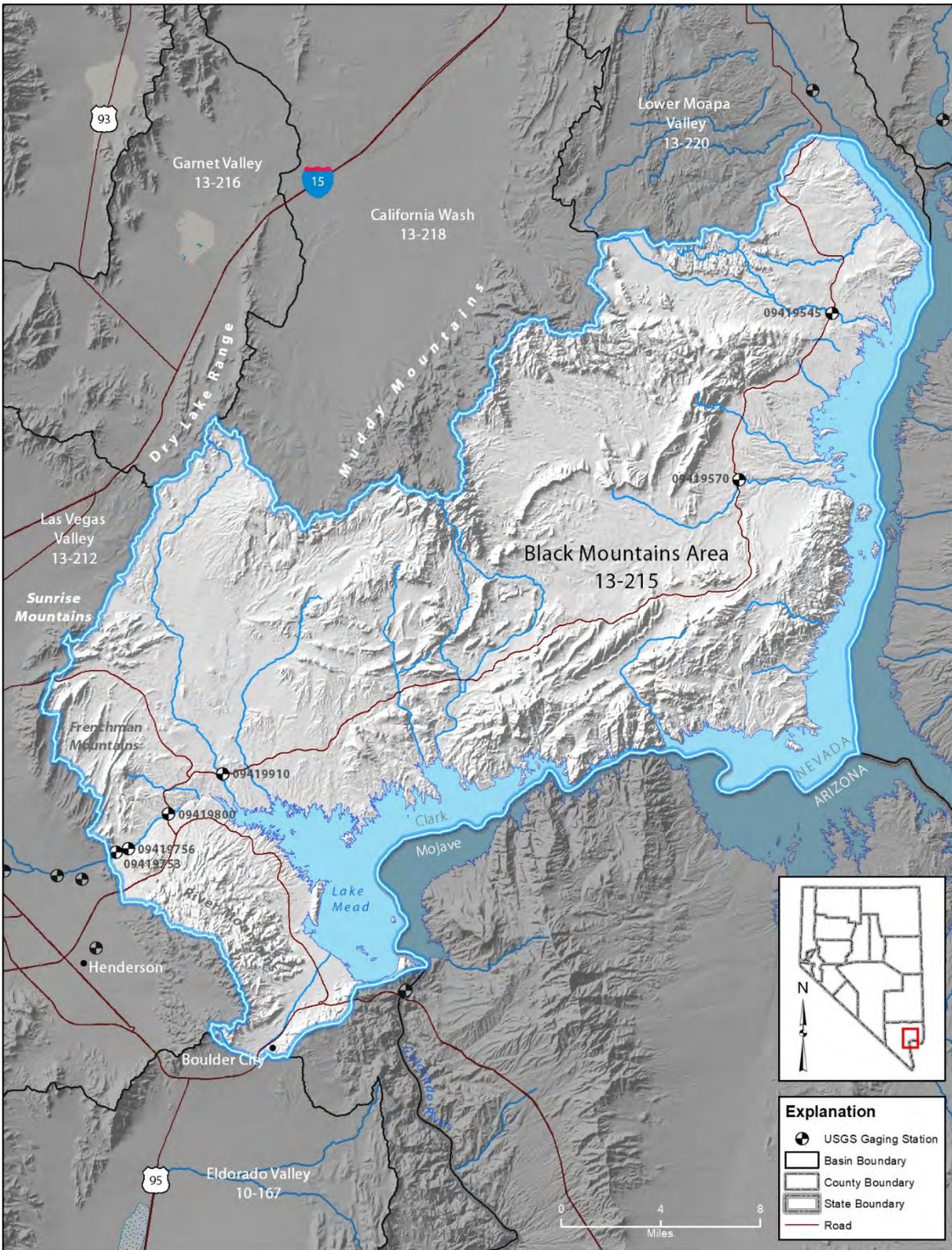


Figure 1. Physiographic map of Black Mountains Area (Hydrographic Basin 13-215).



Figure 2. Black Mountains Area water level measurement sites.

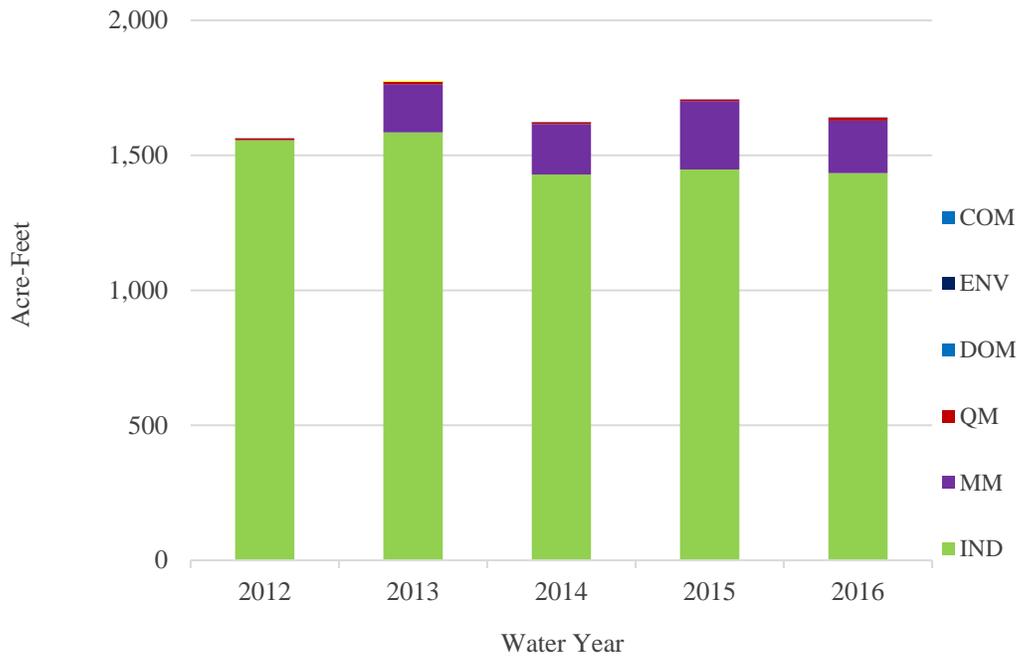


Figure 3. Black Mountains Area historical pumpage by manner of use.

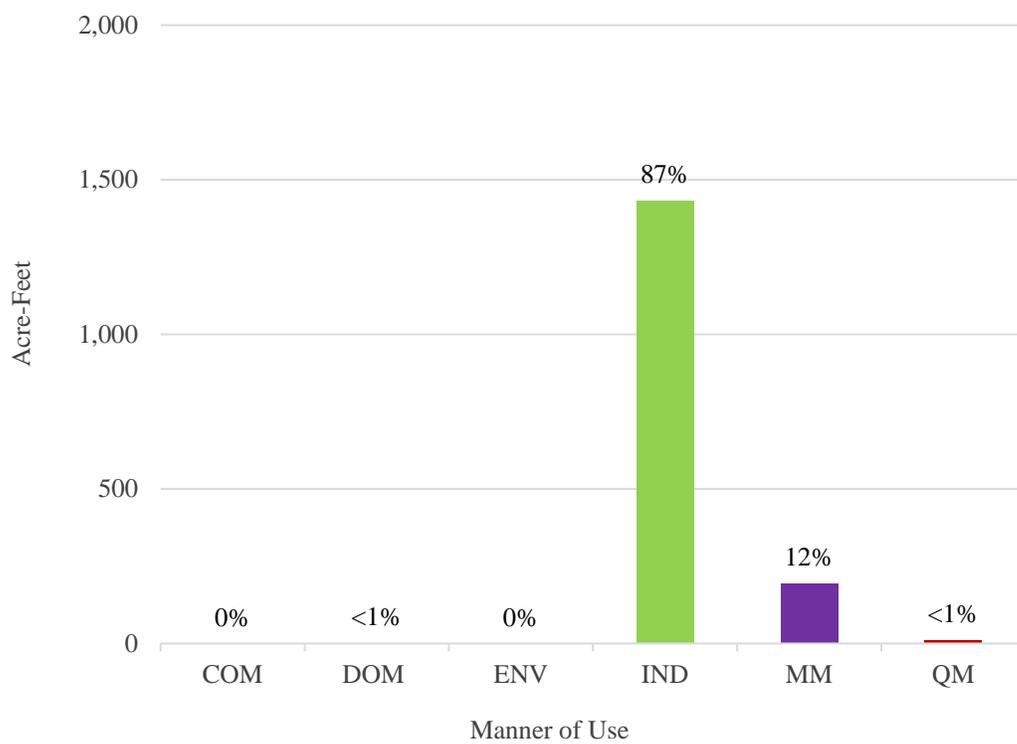


Figure 4. Percentage of 2016 groundwater pumpage by manner of use.

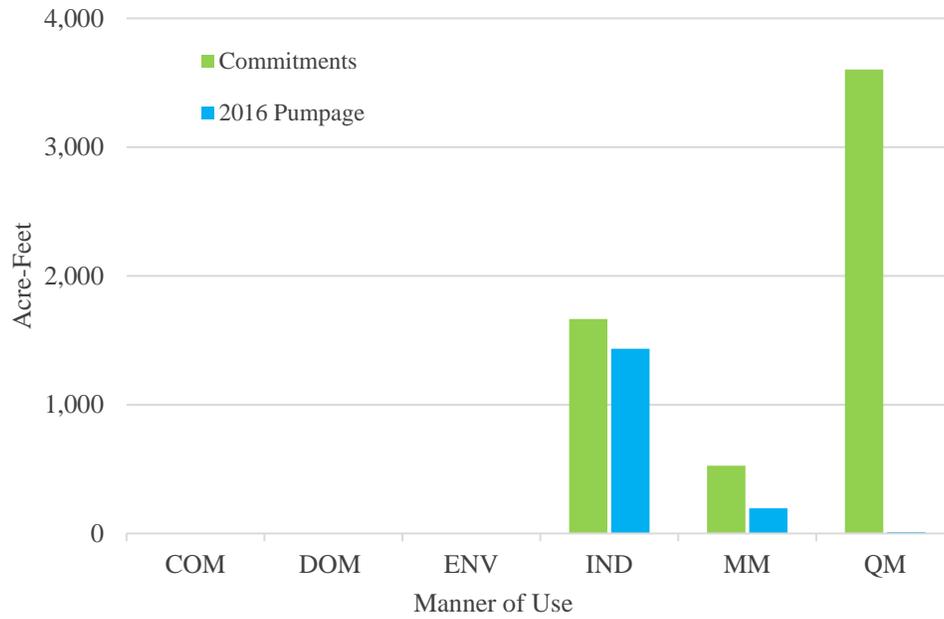


Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.

**APPENDIX A. BLACK MOUNTAINS AREA 2016 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
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- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
29368	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	0.00	Valley of Fire
48816	Cert.		NW	SW				4.47	QM	10.60	S/N None
76086	Permit							4.00	QM	0.00	RD - 31812800 - 03-11-16
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
70441-T	Exp		SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	IND	1,433.86	EBP-2: S/N 0293981
58031	Cert.		NE	SE							EBM-5: S/N 0288019
58032	Cert.		NE	SE							EBM-6: S/N 0358747
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	ENV	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	COM	0.10	S/N 38441345 RD - 0485860 - 02-16-16 RD - 0517850 - 02-13-17 Mini mart.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
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68353	Permit		NW	NE	13						
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MM	195.21	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
85757-T	Permit										
85758-T	Permit										
TOTAL									1,639.77	Permitted rights	

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



BLACK MOUNTAINS AREA
HYDROGRAPHIC BASIN 13-215

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2017

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1280

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The data presented are valid for the 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 continual basis.

For calendar year 2017, the committed resource totaled 5,799 acre-feet, with estimated pumpage of approximately **1,634 acre-feet**. This figure includes an estimated 1 acre-foot pumped from exempt domestic wells.

Quasi-municipal is the largest manner of use within the basin. For calendar year 2017, appropriations for quasi-municipal totaled 3,603 acre-feet, with pumpage of 11 acre-feet. The second largest manner of use was industrial with appropriations totaling 1,665 acre-feet and pumpage of 1,507 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 527 acre-feet and pumpage of 115 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells, at 1 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This Pumpage Inventory only includes details on groundwater pumping from the Black Mountains Area Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	215, REGION 13	
HYDROGRAPHIC BASIN NAME	BLACK MOUNTAINS AREA	
COUNTIES	CLARK	
MAJOR COMMUNITIES	BOULDER CITY, OVERTON	
DESIGNATED	YES	
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION	
GROUNDWATER LEVEL MEASUREMENTS	SNWA, USGS	
PUMPAGE INVENTORY, ACRE-FEET IN 2017	1,634 ¹	
STATE ENGINEER'S ORDERS		
<u>NO. 1018 – DESIGNATION</u>	DATE: NOVEMBER 22, 1989	
<u>NO. 1169 – FURTHER STUDY</u>	DATE: MARCH 8, 2002	
<u>NO. 1169A – FURTHER STUDY</u>	DATE: DECEMBER 21, 2012	
COMMITTED GROUNDWATER RESOURCE ² : 5,799 ACRE-FEET	DATE: APRIL 2018	
COMMERCIAL 1	ENVIRONMENTAL.. 1	INDUSTRIAL..... 1,665
MINING & MILLING ... 527	DOMESTIC..... 2	QUASI-MUNICIPAL ... 3,603

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2018. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 1 domestic well existed in the basin during calendar year 2017. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 2 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Black Mountains Area for calendar year 2017. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Black Mountains Area is a basin located in southern Nevada, approximately 30 miles east of Las Vegas. The basin is located within the Colorado River Hydrographic Region, in Clark County and covers approximately 627 square miles (Figure 1).

Black Mountains Area is bounded on the north by the Muddy Mountains. The centerline of Lake Mead forms the east and south boundaries. The River Mountains border the basin to the south; Frenchman and Sunrise Mountains border the basin to the west. The northwest boundary is formed by the Dry Lake Range.

The adjacent Nevada hydrographic basins are Colorado River Valley (13-213) and Eldorado Valley (10-167) to the south, Las Vegas Valley (13-212) to the west, Garnet Valley (13-216) to the northwest, California Wash (13-218) to the north, and Lower Moapa Valley (13-220) to the northeast. The exterior boundary of the Black Mountains Area Hydrographic Basin is as described by Designation Order 1018, issued by the Nevada State Engineer November 22, 1989.

The U.S. Geological Survey (USGS) operates a network of stream gauging stations in the basin, primarily at the southwest and northeast ends of the basin (Figure 1). Data from these gauges are maintained on the USGS website at <http://nevada.usgs.gov/>

GROUNDWATER LEVELS

Depths to groundwater in Black Mountains Area are not measured by NDWR. However, measurements are taken by other entities and submitted to NDWR. There are seven active sites in the monitoring well network. The following are the site names and links to the data for active sites (Figure 2):

215 S19 E63 13AADD1	215 S19 E63 13ABCB1	215 S19 E63 13DAAB1
215 S19 E63 13DACA1	215 S19 E63 13DCAA1	215 S20 E65 08CDBA1
215 S20 E65 08DCAA1		

Groundwater level data is also collected by the USGS and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Black Mountains Area, or 1 acre-foot.

TABLES

Table 1. Black Mountains Area historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	ENV	IND	MM	QM	TOTAL
2013	1	1	0	1,585	179	10	1,776
2014	0	1	0	1,429	187	7	1,624
2015	0	1	0	1,448	253	6	1,708
2016	0	1	0	1,434	195	11	1,641
2017	0	1	0	1,507	115	11	1,634

FIGURES

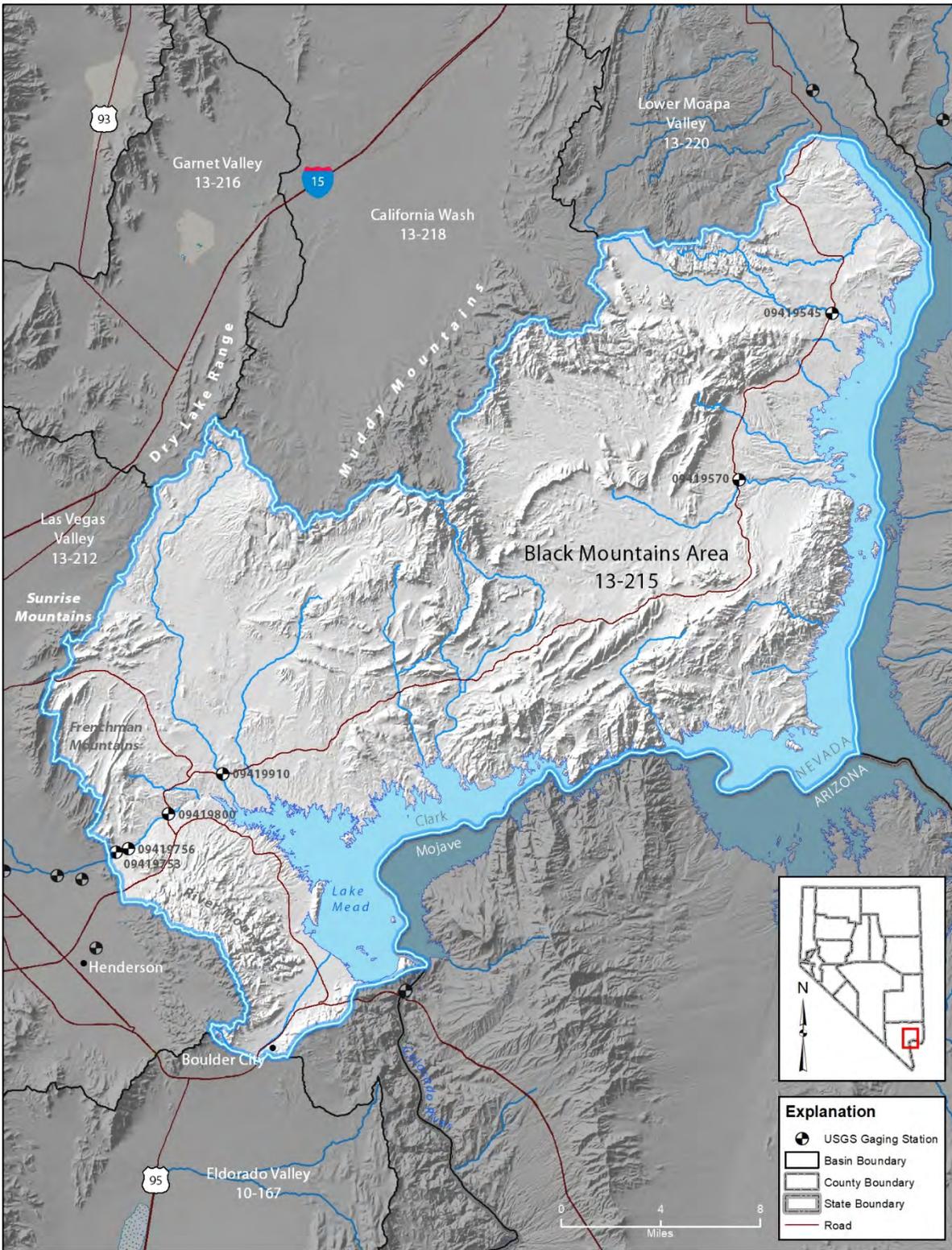


Figure 1. Physiographic map of Black Mountains Area (Hydrographic Basin 13-215).



Figure 2. Black Mountains Area water level measurement sites.



Figure 3. Black Mountains Area historical pumpage by manner of use.

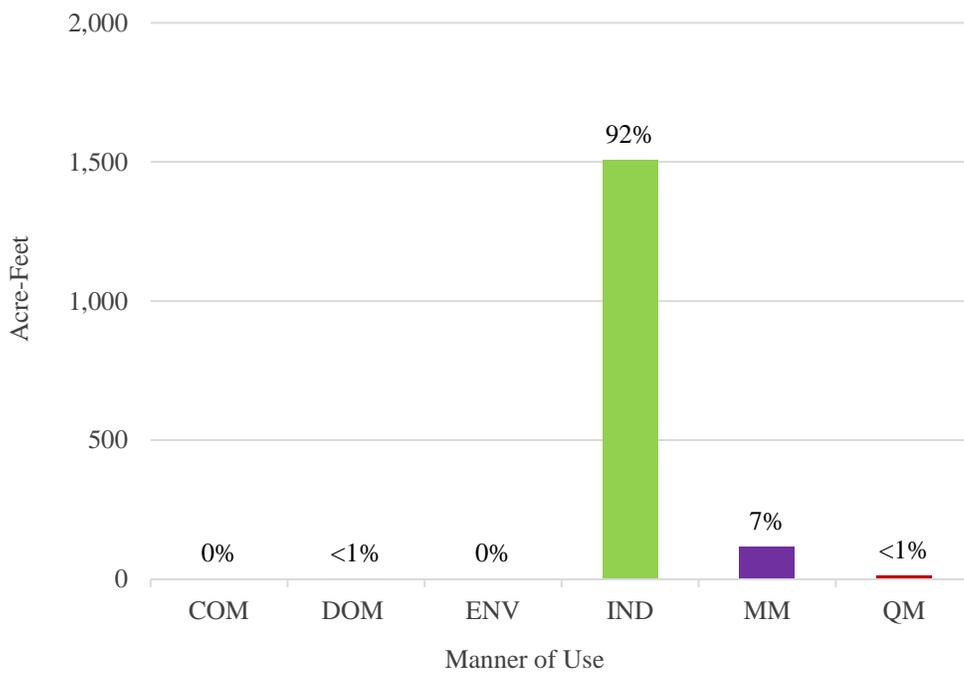


Figure 4. Percentage of 2017 groundwater pumpage by manner of use.

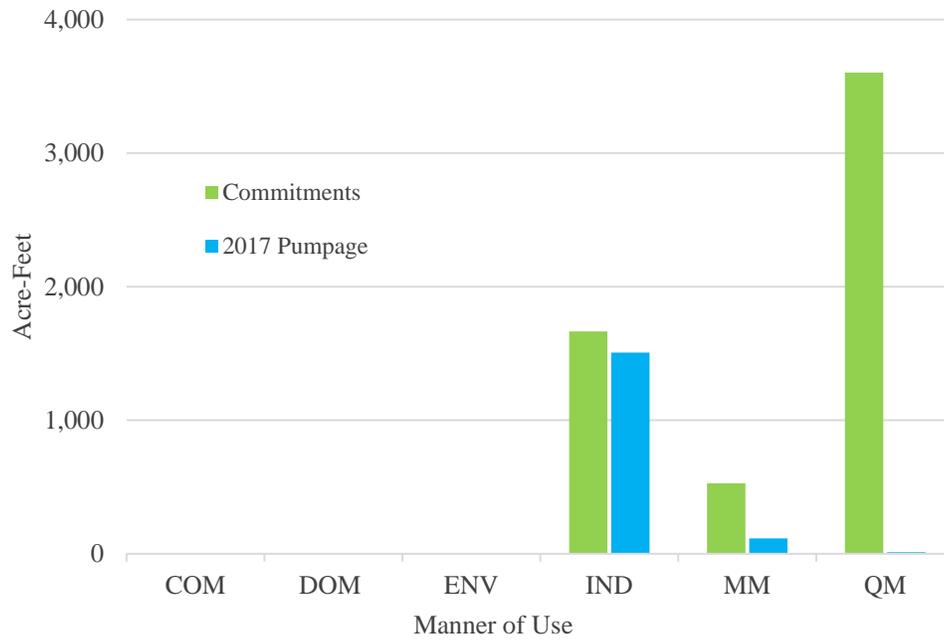


Figure 5. Comparison between 2017 groundwater commitments and estimated pumpage.

**APPENDIX A. BLACK MOUNTAINS AREA 2017 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), Expired (Exp), Abrogated (Abr), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
48816	Cert.	NV State Park System	NW	NE	30	17	67	2.39	QM	10.51	Valley of Fire
86265	Permit		NW	SW				4.47	QM		S/N None
86954	Permit							4.00	QM		RD - 31812800 - 03-11-16
76806	Abr.										POD: 48816 & 86954
29368	Abr.										POD: 86265 well drilled in 2016 well log number 126452
46029	Permit	Lake Las Vegas	NE	NW	23	21	63	2200.00	QM	0.00	Not in use.
46030	Permit		NE	NE	22						
53829	Permit		NW	SW	22						
53831	Permit		NW	NE	15						
56150	Permit		NE	NE	15						
			SW	SW	22						
55269	Cert.	NV Cogeneration Assoc.	SE	SE	13	19	63	1665.00	IND	1,507.31	EBP-2: S/N 0293981
58031	Cert.		NE	SE							EBM-5: S/N 0288019
58032	Cert.		NE	SE							EBM-6: S/N 0358747
64960-E	Exp	Seven Crown Resorts dba Echo Bay Resorts	NW	SW	5	19	68	9.92	ENV	0.00	
66085-E	Permit										
66973-E	Permit										
66108	Permit	Laker Plaza	NE	NW	35	21	63	1.34	COM	0.00	Mini mart; S/N 38441345 RD - 0485860 - 02-16-16 RD - 0517850 - 02-13-17 well disconnected

**GROUNDWATER PUMPAGE INVENTORY
BLACK MOUNTAINS AREA, NO. 215
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
68350	Permit	Dry Lake Water Co., LLC	NE	NE	13	19	63	1392.06	QM	0.00	2 wells visible, not in use
68351	Permit		NE	NE	13						
68352	Permit		NE	NE	13						of portion of water to include Pabco
68353	Permit		NW	NE	13						Gypsum facility
87065T	Permit										<u>POD 68350,68351,68352,87065T</u>
87066T	Permit										<u>and 87066T (BMDL-1 well)</u> POD 68353 (BMDL-2 well)
72759	Permit	Pacific Coast (Sandia)	E/2	SE	29	20	64	527.28	MM	114.65	Government wash. 3 wells
72760	Permit										
72761	Permit										
72762	Permit										
85757-T	Exp										
85758-T	Exp										
								TOTAL		1,632.47	Permitted rights

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2001**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	0.00	No wells drilled
67650	Permit		NE	NE	15	18	63				
68056-T	Permit		NW	NW	16	18	63				
68161-T	Permit		SE	NE	5	18	63				
55674	Permit	Kerr-McGee Chemical	NW	NW	16	18	63	10.02	CM	2.09	
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	149.86	S/N 86611614
60022	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	48.43	Harvey Well
67476-T	Permit							24.86	ID	0.00	Expires 07-12-02
63261	Permit	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	102.47	
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	4.52	S/N 97800120 RD - 4017400 - 01-04-01
64880	Permit	Chemical Lime Co.	SW	SE	23	18	63	150.38	MM	128.65	S/N - H010703009
66784	Permit	Great Star Cement Corp.	NE	NE	27	18	63	178.00	QM	0.00	Industrial Properties Development wells are capped, not in use.
66785	Permit			NE	NE	32	17				

SE ROA 1295

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2001

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	428.97	
67712	Permit		SW	NE	18						
67713	Permit		SE	SE	7						
67714	Permit		NE	NW	20						
67715	Permit		SE	SE	7						
67716	Permit		NW	NE	19						
67717	Permit		SW	NE	18						
67718	Permit		SE	SW	19						
67719	Permit		SW	NE	18						
67720	Permit		SE	SE	7						
67880-T	Permit	Nevada Power Co.	NW	SW	21	17	64	49.72	ID	46.63	Expires 10-22-02
								TOTAL		911.62	Permitted rights

SE ROA 1296

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO 216
2002**

IRRIGATION 0 Ac-Ft

MINING AND INDUSTRIAL 834 Ac-Ft

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL 9.86 Ac-Ft

DOMESTIC 0 Ac-Ft

Domestic wells drilled in 2002 = 0

TOTAL 844 Ac-Ft

SE ROA 1297

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2002**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	0.00	
67650	Permit		NE	NE	15	18	63				
68056-T	Permit		NW	NW	16	18	63				
68541-T	Permit		SE	NE	5	18	63				
68784-T	Permit										
55674	Permit	Kerr-McGee Chemical	NW	NW	16	18	63	10.02	CM	3.16	
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	139.22	S/N 86611614
60022	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	0.00	Harry Allen Plant. Harvey Well
67476-T	Exp		24.86	ID	0.00	Richard Willer 367-5000					
67880-T	Exp		49.72	ID	84.88						
63261	Permit	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	109.10	
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	6.70	S/N 97800120 RD - 4017400 - 01-04-01
64880	Permit	Chemical Lime Co.	SW	SE	23	18	63	150.38	MM	145.16	S/N - H010703009
66784	Permit	Great Star Cement Corp.	NE	NE	27	18	63	178.00	QM	0.00	Industrial Properties Development wells are capped, not in use. Adam Titus 838-1253
66785	Permit		NE	NE	32	17	63				

SE ROA 1298

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2002

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	355.37
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					

TOTAL 843.59 Permitted rights

SE ROA 1299

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO 216
2003**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	872 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	13.33 Ac-Ft
DOMESTIC	0 Ac-Ft
Domestic wells drilled in 2003 = 0	
TOTAL	885 Ac-Ft

SE ROA 1300

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2003**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES		ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T	R	OR DUTY			
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	0.00	
67650	Permit		NE	NE	15	18	63				
68822	Permit		NW	NW	16	18	63				
68837-T	Permit		SE	NE	5	18	63				
55674	Permit	Kerr-McGee Chemical	NW	NW	16	18	63	10.02	CM	5.52	
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	188.56	S/N 86611614
60022	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	0.00	Harry Allen Plant. Harvey Well
67476-T	Exp							24.86	ID	0.00	
67880-T	Exp							49.72	ID	1.17	
63261	Permit	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	101.64	
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	7.81	S/N 97800120
64880	Permit	Chemical Lime Co.	SW	SE	23	18	63	150.38	MM	132.79	S/N - H010703009
66784	Permit	Great Star Cement Corp.	NE	NE	27	18	63	178.00	QM	0.00	Industrial Properties Development
66785	Permit		NE	NE	32	17	63				wells are capped, not in use.

SE ROA 1301

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2003

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	447.69
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					

TOTAL 885.18 Permitted rights

SE ROA 1302

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2004**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	0.00	
67650	Permit		NE	NE	15	18	63				
68822	Permit		NW	NW	16	18	63				
71521-T	Permit		SE	NE	5	18	63				
55674	Permit	Kerr-McGee Chemical	NW	NW	16	18	63	10.02	CM	10.09	
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	186.70	S/N 86611614
60022	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	0.00	Harry Allen Plant. Harvey Well
67476-T	Exp							24.86	ID	0.00	
67880-T	Exp							49.72	ID	0.70	
63261	Permit	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	118.49	
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	0.00	S/N 97800120
64880	Permit	Chemical Lime Co.	SW	SE	23	18	63	150.38	MM	126.87	S/N - H010703009
66784	Permit	Dry Lake Water	NE	NE	27	18	63	178.00	QM	0.00	Industrial Properties Development wells are capped, not in use.
66785	Permit		NE	NE	32	17	63				

SE ROA 1303

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2004**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	374.53
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					

TOTAL 817.38 Permitted rights

SE ROA 1304

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2005**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	0.00	
67650	WDR		NE	NE	15	18	63				
68822	Permit		NW	NW	16	18	63				
72799	Permit		SE	NE	5	18	63				
55674	Permit	US Avestor, LLC	NW	NW	16	18	63	10.02	CM	9.74	S/N 58446021 RD - 27015300 - 02-17-06
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	151.20	S/N 86611614
60022	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	0.00	Harry Allen Plant. Harvey Well
67476-T	Exp							24.86	ID	0.00	
67880-T	Exp							49.72	ID	1.10	
63261	Permit	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	111.00	
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	0.00	S/N 97800120
64880	Permit	Chemical Lime Co.	SW	SE	23	18	63	150.38	MM	108.70	S/N - H010703009
66784	Permit	Dry Lake Water	NE	NE	27	18	63	164.83	QM	0.00	Industrial Properties Development
66785	Permit		NE	NE	32	17	63				wells are capped, not in use.
72098	Permit		SE	SW	13	18	63	13.17			

SE ROA 1305

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2005

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	415.74	
67712	Permit		SW	NE	18						
67713	Permit		SE	SE	7						
67714	Permit		NE	NW	20						
67715	Permit		SE	SE	7						
67716	Permit		NW	NE	19						
67717	Permit		SW	NE	18						
67718	Permit		SE	SW	19						
67719	Permit		SW	NE	18						
67720	Permit		SE	SE	7						

TOTAL 797.48 Permitted rights

SE ROA 1306

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO 216
2006**

IRRIGATION **0 Ac-Ft**

MINING AND INDUSTRIAL **1,551 Ac-Ft**

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL **7.24 Ac-Ft**

DOMESTIC **0 Ac-Ft**

Domestic wells drilled in 2006 = 0

TOTAL 1,558 Ac-Ft

SE ROA 1307

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2006

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	491.66	Mirant, Silverhawk, and Chuck Lenzie power plant facilities. Pumpage reported in 2002-2005 pumpage inventories was in error. 2005 pumpage should have been reported as 333.39 Acre Feet; 2004 pumpage should have been reported as 187.28 Acre Feet; 2003 pumpage should have been reported as 173.03 Acre Feet; 2002 pumpage should have been reported as 275.78 Acre Feet.
68822	Permit		NE	NE	15	18	63				
72798	Permit		NW	NW	16	18	63				
73149	Permit		SE	NE	5	18	63				
73150	Permit										
73151	Permit										
55674	Cert.	US Avestor, LLC	NW	NW	16	18	63	10.02	CM	4.17	S/N 58446021 RD - 27015300 - 02-17-06 RD - 28714200 - 05-22-07
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	139.51	S/N 12086435 RD - 48201200 - 05-23-07
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	251.10	S/N - 1595764-H001
64880	Permit		SW	SE	23	18	63	150.38	MM	108.70	S/N - 108818-H001

SE ROA 1308

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2006**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	3.07	S/N 97800120 RD - 14871700 - 05-23-07 Pumpage reported in 2004 & 2005 pumpage inventories was in error. 2005 pumpage should have been reported as 2.98 Acre Feet. 2004 pumpage should have been reported as 2.32 Acre Feet.
66784	Permit	Dry Lake Water	NE	NE	27	18	63	164.83	QM	0.00	Industrial Properties Development wells are visible, not in use.
66785	Permit		NE	NE	32	17	63				
72098	Permit		SE	SW	13	18	63	13.17			
67711	Canc	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	521.36	
67712	Canc		SW	NE	18						
67713	Canc		SE	SE	7						
67714	Canc		NE	NW	20						
67715	Canc		SE	SE	7						
67716	Canc		NW	NE	19						
67717	Canc		SW	NE	18						
67718	Canc		SE	SW	19						
67719	Canc		SW	NE	18						
67720	Canc		SE	SE	7						
74399	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	38.18	Harry Allen Plant. Harvey Well
TOTAL										1557.75	Permitted rights

SE ROA 1309

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO 216
2007**

IRRIGATION 0 Ac-Ft

MINING AND INDUSTRIAL 1,372 Ac-Ft

QUASI-MUNICIPAL, RECREATION AND COMMERCIAL 39.88 Ac-Ft

DOMESTIC 0 Ac-Ft

Domestic wells drilled in 2007 = 0

TOTAL 1,412 Ac-Ft

SE ROA 1310

GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2007

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	551.69	Mirant, Silverhawk, and Chuck Lenzie power plant facilities.
68822	Permit		NE	NE	15	18	63				
72798	Permit		NW	NW	16	18	63				
73149	Permit		SE	NE	5	18	63				
73150	Permit										
73151	Permit										
55674	Cert.	US Avestor, LLC	NW	NW	16	18	63	10.02	CM	3.02	S/N 58446021 RD - 28714200 - 05-22-07 RD - 29603400 - 04-17-08
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	148.50	S/N 12086435 RD - 48201200 - 05-23-07 Pumpage submitted
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	126.10	S/N - 1595764-H001
64880	Cert		SW	SE	23	18	63	133.81	MM	158.75	S/N - 108818-H001
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	3.46	S/N 97800120 RD - 14871700 - 05-23-07

SE ROA 1311

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2007**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
66784	Permit	Dry Lake Water	NE	NE	27	18	63	164.83	QM	33.40 Industrial Properties Development S/N 63073750 (Permit 66784) RD - 10883900 - 01-01-08 RD - 34520900 - 05-22-08 Other 2 wells visible, not in use
66785	Permit		NE	NE	32	17	63			
72098	Permit		SE	SW	13	18	63	13.17		
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	386.69 S/N 53172198 Well 1 RD - 01746100 - 05-22-08 S/N 70177000 Well 2 RD - 44457200 - 05-22-08 S/N None Well 3 RD - 1459730 - 05-22-08 S/N 70155806 Well 5 RD - 45882400 - 05-22-08 S/N 70155512 Well 6 RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit	SW	NE	18						
67720	Permit	SE	SE	7						
74399	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	0.00 Harry Allen Plant. Harvey Well
TOTAL									1411.61	Permitted rights

SE ROA 1312

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO 216
2008**

IRRIGATION	0 Ac-Ft
MINING AND INDUSTRIAL	1,543 Ac-Ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	9.09 Ac-Ft
DOMESTIC	0 Ac-Ft
Domestic wells drilled in 2008 = 0	
TOTAL	1,552 Ac-Ft

SE ROA 1313

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2008**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	435.13	Mirant, Silverhawk, and Chuck Lenzie power plant facilities.
68822	Permit		NE	NE	15	18	63				
72798	Permit		NW	NW	16	18	63				
73149	Permit		SE	NE	5	18	63				
73150	Permit										
73151	Permit										
55674	Cert.	US Avestor, LLC	NW	NW	16	18	63	10.02	CM	4.02	S/N 58446021 RD - 29213900 - 02-04-08 RD - 30522400 - 02-03-09
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	145.52	S/N 69045705 New Meter RD - 63639600 - 04-01-09
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	99.92	S/N - 1595764-H001
64880	Cert		SW	SE	23	18	63	133.81	MM	133.68	S/N - 108818-H001
63348	Cert	Western Gypsum Inc.	NE	SW	13	18	63	4.00	CM	5.07	S/N 97800120 RD - 17398900 - 04-01-09

SE ROA 1314

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2008**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
66784	Permit	Dry Lake Water	NE	NE	27	18	63	178.00	QM	0.00	Industrial Properties Development wells not in use
66785	Permit		NE	NE	32	17	63				
72098	Permit		SE	SW	13	18	63				
74064	Permit										
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	541.58	S/N 53172198 Well 1
67712	Permit		SW	NE	18						RD - 01746100 - 05-22-08
67713	Permit		SE	SE	7						S/N 70177000 Well 2
67714	Permit		NE	NW	20						RD - 44457200 - 05-22-08
67715	Permit		SE	SE	7						S/N None Well 3
67716	Permit		NW	NE	19						RD - 1459730 - 05-22-08
67717	Permit		SW	NE	18						S/N 70155806 Well 5
67718	Permit		SE	SW	19						RD - 45882400 - 05-22-08
67719	Permit		SW	NE	18						S/N 70155512 Well 6
67720	Permit		SE	SE	7						RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
74399	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	187.20	Harry Allen Plant. Harvey Well S/N 0870128188
								TOTAL		1552.12	Permitted rights

SE ROA 1315

**GROUND WATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2009**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	1,403 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	24 ac-ft
DOMESTIC	0 ac-ft
Domestic wells drilled in 2009 = 0	
Total	1,427 ac-ft

SE ROA 1316

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2009**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	SW	SW	32	17	63	2200.00	MN	656.35	Mirant, Silverhawk, and Chuck
68822	Permit		NE	NE	15	18	63	Lenzie power plant facilities.			
72798	Permit		NW	NW	16	18	63	54073: WV, no works 04-09-10			
73149	Permit		SE	NE	5	18	63	68822: No S/N			
73150	Permit							RD - 171480000 - 04-09-10			
73151	Permit							72798: No S/N			
78954-T	Permit						RD - 16818808 - 04-09-10				
							73149: WNV				
							73150: S/N 0860188635, RD - 0.00				
							73151: S/N 0860188417				
							RD - 114485704 - 04-09-10				
							RD - 19954898 - 04-01-09				
							78954-T: same POD as 74399				
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	112.45	S/N 69045705 New Meter RD - 63639600 - 04-01-09 RD - 01084200 - 04-09-10
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	91.37	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	82.47	RD - 093005890 - 04-01-09 RD - 123431060 - 04-09-10 S/N - 108818-H001 West meter RD - 037867550 - 04-01-09 RD - 065329330 - 04-09-10 meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	CM	4.08	S/N 97800120 RD - 17398900 - 04-01-09 RD - 18757100 - 04-09-10

SE ROA 1317

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2009**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	15.77 Industrial Properties Development 66784: S/N 161418 new meter RD - 00165400 - 04-09-10 66785: WV, no works 72098: Locked 74064: WNV; 77389: WNV
66785	Permit		NE	NE	32	17	63			
72098	Permit		SE	SW	13	18	63			
74064	Permit									
77389	Permit									
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	291.29 S/N 53172198 Well 1 RD - 01746100 - 05-22-08 S/N 70177000 Well 2 RD - 44457200 - 05-22-08 S/N None Well 3 RD - 1459730 - 05-22-08 S/N 70155806 Well 5 RD - 45882400 - 05-22-08 S/N 70155512 Well 6 RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					
74399	Permit	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	169.24 Harry Allen Plant. Harvey Well S/N 0870128188
77745	Permit	Kapex, LLC	NW	NW	16	18	63	10.02	CM	3.80 S/N 58446021 RD - 30522400 - 02-03-09 RD - 31982000 - 04-09-10
TOTAL									1426.82	Permitted rights

SE ROA 1318

**GROUND WATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2010**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	752 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	621 ac-ft
DOMESTIC	0 ac-ft
Domestic wells drilled in 2010 = 0 (Total Wells = 0)	
Total	1,373 ac-ft

SE ROA 1319

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	50.68	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	CLARK COUNTY				450.21	MN	0.00	54073: WV, no works 04-08-11 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.	
68822	Abr		LINCOLN COUNTY								
72798	Abr		NYE COUNTY								
73149	Abr		WHITE PINE COUNTY								
73150	Abr										
73151	Abr										
78954-T	Exp										
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	124.41	S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	68.80	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	91.15	RD - 123431060 - 04-09-10 RD - 153965280 - 04-08-11 S/N - 108818-H001 West meter RD - 065329330 - 04-09-10 RD - 087830310 - 04-08-11 meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	CM	3.65	S/N 97800120 RD - 18757100 - 04-09-10 RD - 19996700 - 04-08-11

SE ROA 1320

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	9.92	Industrial Properties Development
66785	Permit		NE	NE	32	17	63				66784: No S/N new meter
72098	Permit		SE	SW	13	18	63				RD - 00000000 - 04-08-11
74064	Permit										66785: WV, no works
77389	Permit										72098: Locked 74064: WNV; 77389: WNV
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	377.27	S/N 53172198 Well 1
67712	Permit		SW	NE	18						RD - 01746100 - 05-22-08
67713	Permit		SE	SE	7						S/N 70177000 Well 2
67714	Permit		NE	NW	20						RD - 44457200 - 05-22-08
67715	Permit		SE	SE	7						S/N None Well 3
67716	Permit		NW	NE	19						RD - 1459730 - 05-22-08
67717	Permit		SW	NE	18						S/N 70155806 Well 5
67718	Permit		SE	SW	19						RD - 45882400 - 05-22-08
67719	Permit		SW	NE	18						S/N 70155512 Well 6
67720	Permit		SE	SE	7						RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	90.46	Harry Allen Plant. Harvey Well S/N 0870128188
77745	Permit	Kapex, LLC	NW	NW	16	18	63	10.02	CM	6.38	S/N 58446021 RD - 31982000 - 04-09-10 RD - 34055600 - 04-08-11

SE ROA 1321

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2010**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
79001	Permit	LVVWD			12	17	63	1400.00	MN	601.36	Mirant, Silverhawk, and Chuck
79002	Permit				13						Lenzie power plant facilities.
79003	Permit				35					79001 & 79006: No S/N	
79004	Permit				24					RD - 181900000 - 04-08-11	
79005	Permit				25						
79006	Permit				36					79002 & 79007: No S/N	
79007	Permit				7	17	64			RD - 74491286 - 04-08-11	
79008	Permit				18						
79009	Permit				19					79004 & 79009: S/N 106102725	
79010	Permit				30					RD - 18200 - 04-08-11 new meter	
				31							
				1	18	63					79005 & 79010: S/N 0860188417
				2							RD - 194173164 - 04-08-11
			SE	NE	5						
			NE	SE	5						79003 & 79008: same POD
			SE	SW	5						as 74399
			E2	NE	15						
			E2	SE	15						
								TOTAL	1373.40	Permitted rights	

SE ROA 1322

**GROUND WATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2011**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	827 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	600 ac-ft
DOMESTIC	0 ac-ft
Domestic wells drilled in 2011 = 0 (Total Wells = 0)	
Total	1,427 ac-ft

SE ROA 1323

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4	1/4	S	T					
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	3.00	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD						450.21	MN	0.00	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.
68822	Abr										
72798	Abr										
73149	Abr										
73150	Abr										
73151	Abr										
78954-T	Exp										
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	133.27	S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	88.81	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	118.70	RD - 123431060 - 04-09-10 RD - 153965280 - 04-08-11 S/N - 108818-H001 West meter RD - 065329330 - 04-09-10 RD - 087830310 - 04-08-11 meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	CM	3.69	S/N 97800120 RD - 18757100 - 04-09-10 RD - 19996700 - 04-08-11

SE ROA 1324

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	13.00 Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 05446800 - 04-08-11 RD - 09717700 - 04-11-12 74064: WNV; 77389: WNV
66785	Permit		NE	NE	32	17	63			
72098	Permit		SE	SW	13	18	63			
74064	Permit									
77389	Permit									
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	362.12 S/N 53172198 Well 1 RD - 01746100 - 05-22-08 S/N 70177000 Well 2 RD - 44457200 - 05-22-08 S/N None Well 3 RD - 1459730 - 05-22-08 S/N 70155806 Well 5 RD - 45882400 - 05-22-08 S/N 70155512 Well 6 RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	123.97 Harry Allen Plant. Harvey Well S/N 0870128188
77745	Permit	Kapex, LLC	NW	NW	16	18	63	10.02	CM	6.38 S/N F1031916000 new meter RD - 4640614 - 04-26-12

SE ROA 1325

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2011**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
79001	Permit	LVVWD			12	17	63	1400.00	MN	576.95 Mirant, Silverhawk, and Chuck Lenzie power plant facilities. 79001 & 79006: No S/N RD - 192920000 - 04-26-12 well not in use 79002 & 79007: No S/N RD - 19733140 - 04-26-12 79004 & 79009: S/N 106102725 RD - 26264300 - 04-26-12 79005 & 79010: S/N 0860188417 RD - 18919742 - 04-26-12 79003 & 79008: same POD as 74399
79002	Permit				13					
79003	Permit				35					
79004	Permit				24					
79005	Permit				25					
79006	Permit				36					
79007	Permit				7	17	64			
79008	Permit				18					
79009	Permit				19					
79010	Permit				30					
				31						
				1	18	63				
				2						
			SE	NE	5					
			NE	SE	5					
			SE	SW	5					
			E2	NE	15					
			E2	SE	15					
TOTAL								1426.89	Permitted rights	

SE ROA 1326

**GROUND WATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2012**

IRRIGATION	0 ac-ft
MINING AND INDUSTRIAL	733 ac-ft
QUASI-MUNICIPAL, RECREATION AND COMMERCIAL	618 ac-ft
DOMESTIC	0 ac-ft
Domestic wells drilled in 2012 = 0 (Total Wells = 0)	
Total	1,351 ac-ft

SE ROA 1327

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS	
			1/4 1/4	S	T						
18140	Cert.	State of NV - Highways	SW	SW	21	17	64	3.00	DO	0.00	Old rest stop, not in use.
54073	Permit	LVVWD	CLARK COUNTY				450.21	MN	15.84	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.	
68822	Permit		LINCOLN COUNTY								
72798	Abr		NYE COUNTY								
73149	Abr		WHITE PINE COUNTY								
73150	Abr										
73151	Abr										
78954-T	Exp										
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	ID	110.24	S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	58.62	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	113.43	RD - 123431060 - 04-09-10 RD - 153965280 - 04-08-11 S/N - 108818-H001 West meter RD - 065329330 - 04-09-10 RD - 087830310 - 04-08-11 meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	CM	3.91	S/N 97800120 RD - 18757100 - 04-09-10 RD - 19996700 - 04-08-11

SE ROA 1328

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	21.47 Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 05446800 - 04-08-11 RD - 09717700 - 04-11-12 74064: WNV; 77389: WNV
66785	Permit		NE	NE	32	17	63			
72098	Permit		SE	SW	13	18	63			
74064	Permit									
77389	Permit									
79948	Permit									
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	ID	376.36 S/N 53172198 Well 1 RD - 01746100 - 05-22-08 S/N 70177000 Well 2 RD - 44457200 - 05-22-08 S/N None Well 3 RD - 1459730 - 05-22-08 S/N 70155806 Well 5 RD - 45882400 - 05-22-08 S/N 70155512 Well 6 RD - 17769300 - 05-22-08 S/N 49631323 Well 7 RD - 0068760 - 05-22-08
67712	Permit		SW	NE	18					
67713	Permit		SE	SE	7					
67714	Permit		NE	NW	20					
67715	Permit		SE	SE	7					
67716	Permit		NW	NE	19					
67717	Permit		SW	NE	18					
67718	Permit		SE	SW	19					
67719	Permit		SW	NE	18					
67720	Permit		SE	SE	7					
81009-T	Permit									
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	ID	74.60 Harry Allen Plant. Harvey Well S/N 0870128188
77745	Permit	Kapex, LLC	NW	NW	16	18	63	10.02	CM	9.96 S/N F1031916000 new meter RD - 4640614 - 04-26-12

SE ROA 1329

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2012**

NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE				ACRES R OR DUTY	ACRES IRR.	USED (A/F)	REMARKS
			1/4	1/4	S	T				
79001	Permit	LVVWD			12	17	63	1400.00	MN 566.67 Mirant, Silverhawk, and Chuck Lenzie power plant facilities. 79001 & 79006: No S/N RD - 192920000 - 04-26-12 well not in use 79002 & 79007: No S/N RD - 19733140 - 04-26-12 79004 & 79009: S/N 106102725 RD - 26264300 - 04-26-12 79005 & 79010: S/N 0860188417 RD - 18919742 - 04-26-12 79003 & 79008: same POD as 74399 (RW-1 well)	
79002	Permit				13					
79003	Permit				35					
79004	Permit				24					
79005	Permit				25					
79006	Permit				36					
79007	Permit				7	17	64			
79008	Permit				18					
79009	Permit				19					
79010	Permit				30					
				31						
				1	18	63				
				2						
			SE	NE	5					
			NE	SE	5					
			SE	SW	5					
			E2	NE	15					
			E2	SE	15					
TOTAL								1351.10	Permitted rights	

SE ROA 1330

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



GARNET VALLEY (HYDROGRAPHIC BASIN 13-216)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2013

Field Investigated by: John Guillory, P.E.

Report Prepared by: John Guillory, P.E.

SE ROA 1331

JA_1496

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ABSTRACT

This inventory represents the status and pumpage of all permitted, certificated and claims of vested right groundwater rights located within Garnet Valley, Hydrographic Basin 13-216, for calendar year 2013 (January 1, 2013 through December 31, 2013). Also included is data associated with depth to groundwater.

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

For calendar year 2013 the permitted, certificated and claims of vested right groundwater rights totaled **3,366 acre-feet**. Estimated pumpage for the calendar year was **1,484 acre-feet**. Municipal is the largest manner of use within the basin. For calendar year 2013, appropriations for municipal use totaled 2,275 acre-feet and the pumpage was 754 acre-feet. The next largest manner of use was industrial with appropriations totaling 612 acre-feet and the pumpage was 559 acre-feet. The next largest manner of use was mining & milling with appropriations totaling 284 acre-feet and the pumpage was 144 acre-feet.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER.....216, REGION 13

HYDROGRAPHIC BASIN NAME GARNET VALLEY

COUNTIES..... CLARK

COMMUNITIESAPEX

DESIGNATED YES

DENIALS BASED UPON WATER AVAILABILITY IRRIGATION

GROUNDWATER LEVEL MEASUREMENTSNDWR, SNWA

ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2013 1,484*

STATE ENGINEER'S ORDERS

[1025](#) - DESIGNATION & PREFERRED USE..... APRIL 24, 1990
[1169](#) - FURTHER STUDY.....MARCH 8, 2002
[1169a](#) - FURTHER STUDY DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 3,366 ACRE-FEET.... DATE: JUNE 2013

MUNICIPAL2,275 INDUSTRIAL612 MINING&MILLING ... 284

QUASI-MUNICIPAL...178 COMMERCIAL 14 DOMESTIC..... 3

NOTE: Committed groundwater resource data are accurate for June 2013. Manner of use category totals vary over time, as water rights (rights) are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin was estimated by a query of the [Nevada Division of Water Resources' Well Log Database](#) and is estimated to be 0.

PURPOSE AND SCOPE

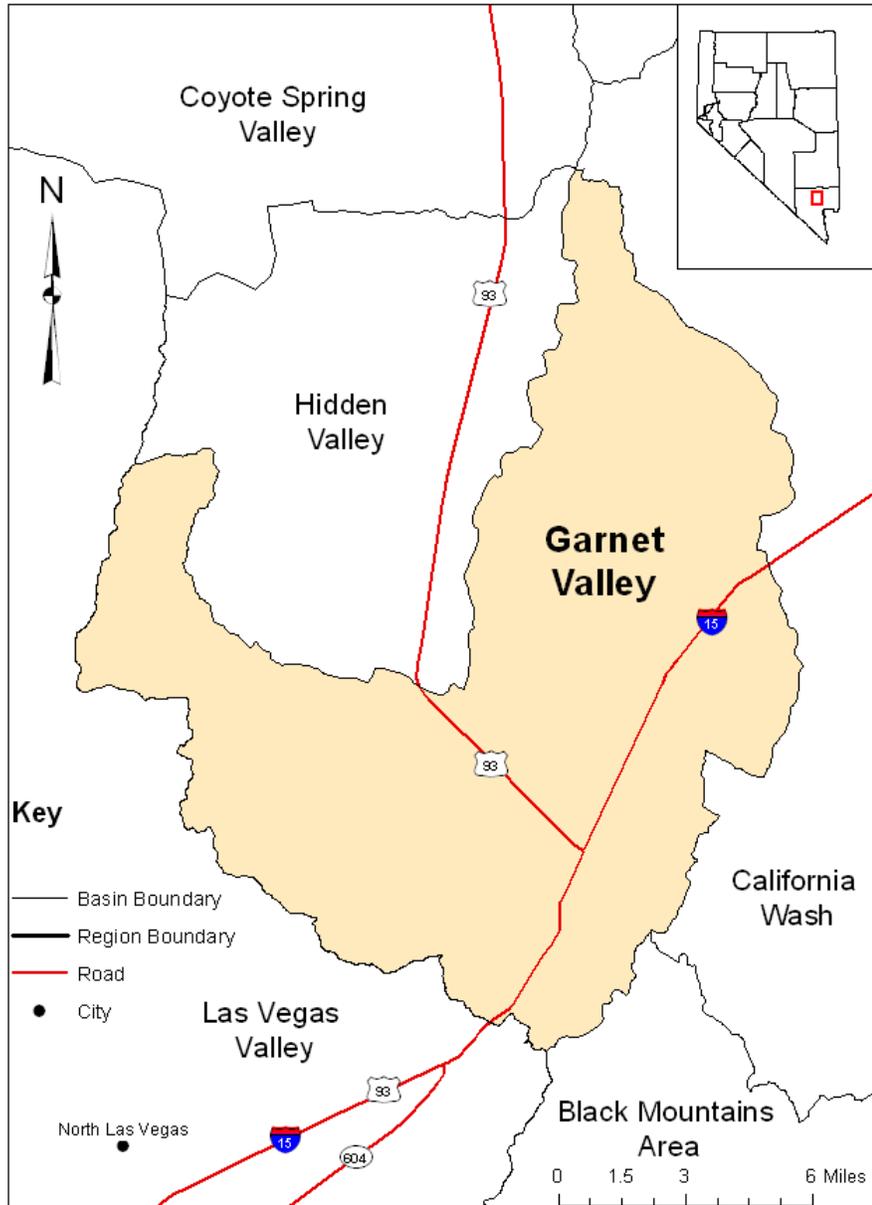
The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources, and to estimate the amount of groundwater pumped within the Garnet Valley Hydrographic Basin 13-216, for the calendar year beginning January 1, 2013 and ending December 31, 2013 (hereafter referred to as calendar year 2013). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

DESCRIPTION OF THE STUDY AREA

Garnet Valley is a small basin located in southeastern Nevada. The valley is approximately 28 miles northeast of Las Vegas, Nevada, and is within the Colorado River Hydrographic Region. The basin is located within Clark County (see Figure 1).

Garnet Valley is bounded on the east by the Dry Valley Range. The Las Vegas Range forms the south and west boundary. The northern part of Garnet Valley is dissected by the Arrow Canyon Range. The adjacent Nevada hydrographic basins are as follows: California Wash, 13-218, to the east; Black Mountains Area, 13-215, to the southeast; Las Vegas Valley, 13-212, to the south and west; and Hidden Valley, 13-217, to the north. The exterior boundary of the Garnet Valley Hydrographic Basin is as described by Designation Order 1025, issued by the Nevada State Engineer April 24, 1990. The basin covers approximately 167 square miles.

FIGURE 1 LOCATION MAP OF GARNET VALLEY HYDROGRAPHIC BASIN 13-216



GROUNDWATER LEVELS

Depths to groundwater in Garnet Valley are not measured by the Nevada Division of Water Resources (NDWR), but data are provided to NDWR by water rights holders.

Groundwater level data have been collected by the USGS in the past (data may be accessed through the USGS website <http://nevada.usgs.gov/>).

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 and exempt domestic wells in the Garnet Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 meters were not in place, use was irrigation, and the number of hours the well was operated was unknown an inspection of the place of use was done to estimate the amount of acreage under cultivation. The number of acres under cultivation was then multiplied by a duty of 5 acre-feet per acre to estimate the use.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- If no water was used under the certificate, permit or claim, zero pumpage was recorded.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer and are limited to a maximum of 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: *“Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.”* The number of exempt domestic wells in the basin is determined by a query of the Nevada Division of Water Resources' Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1.0 acre-foot per well in Garnet Valley. Actual domestic well pumpage is not precisely known.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and are subject to revision. The total estimated groundwater pumpage for calendar year 2013 was **1,484 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Garnet Valley Hydrographic Basin totaled **3,366 acre-feet**. The appropriated and actual pumped totals, categorized by manner of use, are as follows:

A. Municipal (MUN)

During calendar year 2013, appropriations for municipal purposes totaled 2,275 acre-feet in the basin. An estimated 754 acre-feet of groundwater was pumped during calendar year 2013.

B. Industrial (IND)

During calendar year 2013, appropriations for industrial purposes totaled 612 acre-feet in the basin. An estimated 559 acre-feet of groundwater was pumped during calendar year 2013.

C. Mining & Milling (MM)

During calendar year 2013, appropriations for mining & milling purposes totaled 284 acre-feet in the basin. An estimated 144 acre-feet of groundwater was pumped during calendar year 2013.

D. Quasi-Municipal (QM)

During calendar year 2013, appropriations for quasi-municipal purposes totaled 178 acre-feet in the basin. An estimated 13 acre-feet of groundwater was pumped during calendar year 2013.

E. Commercial (COM)

During calendar year 2013, appropriations for commercial purposes totaled 14 acre-feet in the basin. An estimated 14 acre-feet of groundwater was pumped during calendar year 2013.

F. Domestic (DOM)

During calendar year 2013, appropriations for domestic purposes totaled 3 acre-feet in the basin. An estimated 0 acre-feet of groundwater was pumped during calendar year 2013.

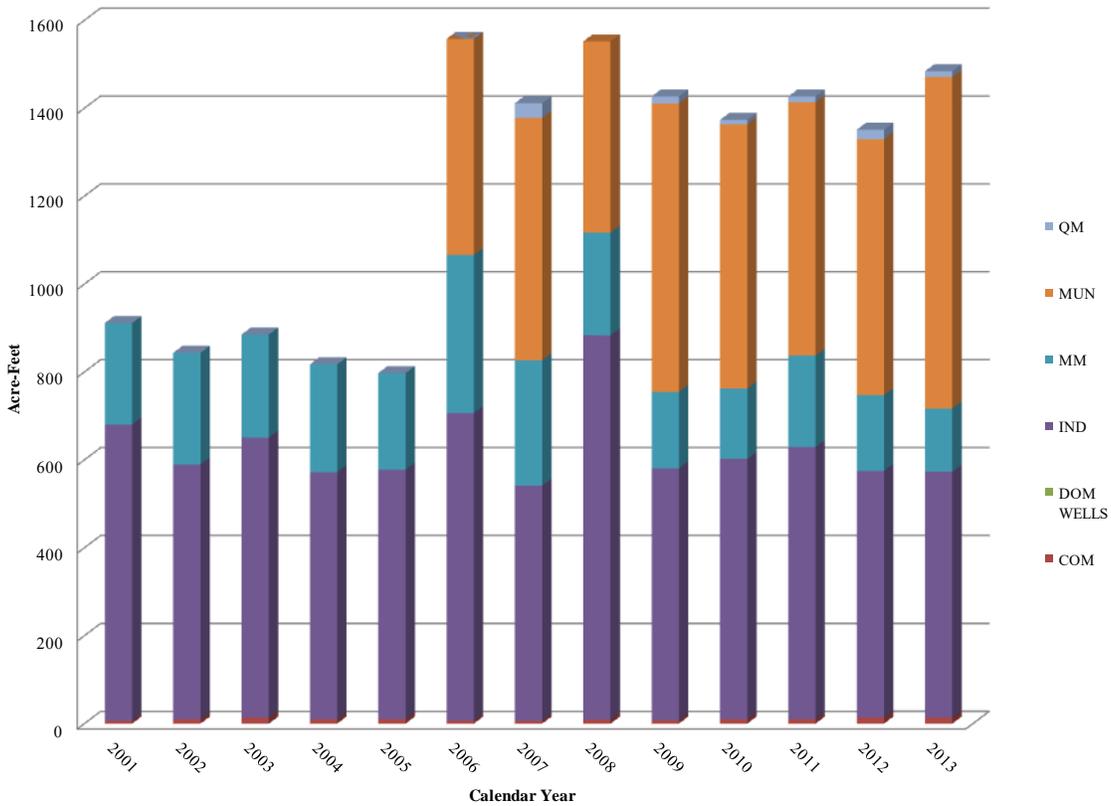
APPENDIX A

GARNET VALLEY HISTORICAL PUMPAGE

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

YEAR	COM	DOM	IND	MM	MUN	QM	TOTAL
2001	7	0	674	231	0	0	912
2002	10	0	579	254	0	0	844
2003	13	0	637	234	0	0	885
2004	10	0	562	245	0	0	817
2005	10	0	568	220	0	0	797
2006	7	0	699	360	492	0	1558
2007	6	0	535	285	552	33	1412
2008	9	0	874	234	435	0	1552
2009	8	0	573	174	656	16	1427
2010	10	0	592	160	601	10	1373
2011	10	0	619	208	577	13	1427
2012	14	0	561	172	583	21	1351
2013	14	0	559	144	754	13	1484

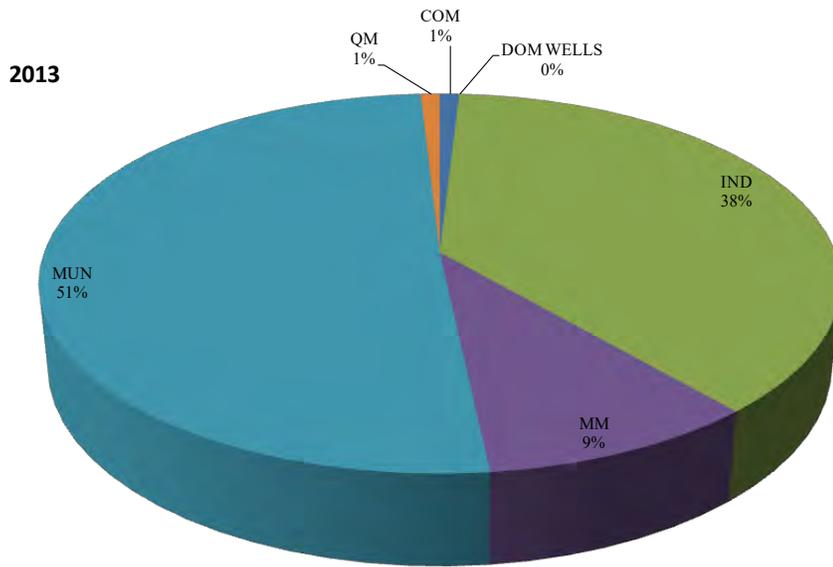
All values are in acre-feet



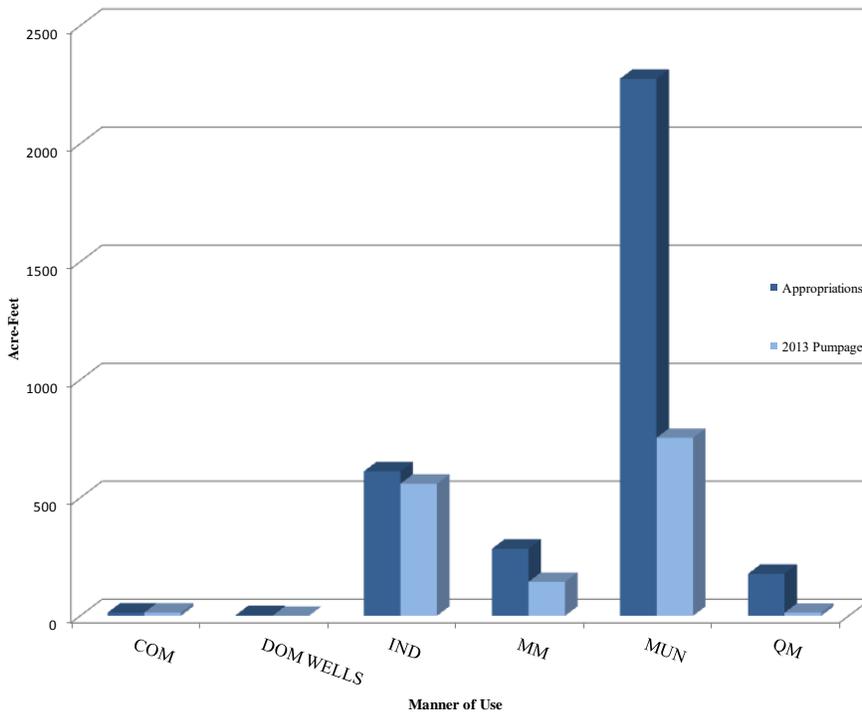
APPENDIX B

**GARNET VALLEY GROUNDWATER PUMPAGE FOR CALENDAR YEAR
2013 BY MANNER OF USE**

PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 BY MANNER OF USE



GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2013 APPROPRIATIONS VS. ACTUAL PUMPAGE



APPENDIX C

**GARNET VALLEY GROUNDWATER PUMPAGE INVENTORY FOR
CALENDAR YEAR 2013**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
QQ	The quarter quarter of the Section in which the point of diversion is located.																
QTR	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
ACRES IRR OR USE	<p>The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include:</p> <table border="0" style="width: 100%;"> <tr> <td>COM - Commercial</td> <td>CON - Construction</td> </tr> <tr> <td>DOM - Domestic</td> <td>ENV - Environmental</td> </tr> <tr> <td>IND - Industrial</td> <td>IRR - Irrigation</td> </tr> <tr> <td>MM - Mining & Milling</td> <td>MUN - Municipal</td> </tr> <tr> <td>OTH - Other</td> <td>PWR - Power</td> </tr> <tr> <td>QM - Quasi-Municipal</td> <td>REC - Recreation</td> </tr> <tr> <td>STK - Stockwater</td> <td>STO - Storage</td> </tr> <tr> <td>WLD - Wildlife</td> <td></td> </tr> </table>	COM - Commercial	CON - Construction	DOM - Domestic	ENV - Environmental	IND - Industrial	IRR - Irrigation	MM - Mining & Milling	MUN - Municipal	OTH - Other	PWR - Power	QM - Quasi-Municipal	REC - Recreation	STK - Stockwater	STO - Storage	WLD - Wildlife	
COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
IND - Industrial	IRR - Irrigation																
MM - Mining & Milling	MUN - Municipal																
OTH - Other	PWR - Power																
QM - Quasi-Municipal	REC - Recreation																
STK - Stockwater	STO - Storage																
WLD - Wildlife																	
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.																
REMARKS	Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS	
			QQ	Qtr	Sec	T	R					
18140	Cert	State of NV - Highways	SW	SW	21	17	64	3.00	DOM	0.00	Old rest stop, not in use.	
54073	Permit	LVVWD	CLARK COUNTY					450.21	MUN	26.09	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.	
68822	Permit		LINCOLN COUNTY									
72798	Abr		NYE COUNTY									
73149	Abr		WHITE PINE COUNTY									
73150	Abr											
73151	Abr											
78954-T	Exp											
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	IND	145.73	S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11	
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	80.16	S/N - 1595764-H001 East meter RD - 123431060 - 04-09-10 RD - 153965280 - 04-08-11 S/N - 108818-H001 West meter RD - 065329330 - 04-09-10 RD - 087830310 - 04-08-11 meters on water tank	
64880	Cert		SW	SE	23	18	63	133.81	MM	63.59		
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	COM	3.80		S/N 97800120 RD - 18757100 - 04-09-10 RD - 19996700 - 04-08-11
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	13.22		Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 05446800 - 04-08-11 RD - 09717700 - 04-11-12
66785	Permit		NE	NE	32	17	63					
72098	Cert		SE	SW	13	18	63					
74064	Permit											
77389	Permit											
79948	Permit											

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
										74064: WNV; 77389: WNV	
67711	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	IND	339.13	S/N 53172198 Well 1
67712	Permit		SW	NE	18						RD - 01746100 - 05-22-08
67713	Permit		SE	SE	7						S/N 70177000 Well 2
67714	Permit		NE	NW	20						RD - 44457200 - 05-22-08
67715	Permit		SE	SE	7						S/N None Well 3
67716	Permit		NW	NE	19						RD - 1459730 - 05-22-08
67717	Permit		SW	NE	18						S/N 70155806 Well 5
67718	Permit		SE	SW	19						RD - 45882400 - 05-22-08
67719	Permit		SW	NE	18						S/N 70155512 Well 6
67720	Permit		SE	SE	7						RD - 17769300 - 05-22-08
81009-T	Exp										S/N 49631323 Well 7 RD - 0068760 - 05-22-08
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	IND	74.60	Harry Allen Plant. Harvey Well S/N 0870128188
77745	Permit	City of North Las Vegas	NW	NW	16	18	63	10.02	COM	9.81	S/N F1031916000 new meter RD - 4957659 - 01-01-13 RD - 78916619 - 12-31-13 + 256,680 gallons flush water
79001	Permit	LVVWD			12	17	63	1400.00	MUN	728.03	Mirant, Silverhawk, and Chuck Lenzie power plant facilities.
79002	Permit				13						79001 & 79006: No S/N
79003	Permit				35						RD - 192920000 - 04-26-12
79004	Permit				24						well not in use
79005	Permit				25						
79006	Permit				36						
79007	Permit				7	17	64				79002 & 79007: No S/N
79008	Permit				18						RD - 19733140 - 04-26-12
79009	Permit				19						

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2013**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
79010	Permit				30					79004 & 79009: S/N 106102725 RD - 26264300 - 04-26-12	
					31						
					1	18	63				
					2					79005 & 79010: S/N 0860188417 RD - 18919742 - 04-26-12	
			SE	NE	5						
			NE	SE	5						
			SE	SW	5					79003 & 79008: same POD as 74399 (RW-1 well)	
			E2	NE	15						
			E2	SE	15						
TOTAL								1484.15	Permitted rights		

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



GARNET VALLEY
(HYDROGRAPHIC BASIN 13-216)

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2014

Field Investigated by: John Guillory, P.E.

Report Prepared by: John Guillory, P.E.

SE ROA 1348

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DESCRIPTION OF THE STUDY AREA	3
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PUMPAGE BY MANNER OF USE	6
APPENDIX A. GARNET VALLEY HISTORICAL PUMPAGE.	7
APPENDIX B. GARNET VALLEY GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 BY MANNER OF USE.	10
APPENDIX C. GARNET VALLEY GROUNDWATER PUMPAGE INVENTORY FOR CALENDAR YEAR 2014	12

ABSTRACT

This inventory represents the status and pumpage of all permitted, certificated and claims of vested right groundwater rights located within Garnet Valley, Hydrographic Basin 13-216, for calendar year 2014 (January 1, 2014 through December 31, 2014). Also included is data associated with depth to groundwater.

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

For calendar year 2014 the permitted, certificated and claims of vested right groundwater rights totaled **3,366 acre-feet**. Estimated pumpage for the calendar year was **1,568 acre-feet**. For calendar year 2014, appropriations for municipal (the largest manner of use in the basin) totaled 2,275 acre-feet and the pumpage was 915 acre-feet. The second largest manner of use was industrial, with appropriations totaling 615 acre-feet and pumpage of 492 acre-feet. The third largest manner of use was mining & milling, with appropriations totaling 284 acre-feet and the pumpage of 132 acre-feet.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER..... 216, REGION 13
HYDROGRAPHIC BASIN NAME GARNET VALLEY
COUNTIES..... CLARK
COMMUNITIES APEX
DESIGNATED YES
DENIALS BASED UPON WATER AVAILABILITY IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS NDWR, SNWA
ESTIMATED PUMPAGE INVENTORY, ACRE-FEET IN 2014..... 1,568*

STATE ENGINEER'S ORDERS

[1025](#) - DESIGNATION & PREFERRED USE..... APRIL 24, 1990
[1169](#) - FURTHER STUDY..... MARCH 8, 2002
[1169a](#) - FURTHER STUDY..... DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 3,366 ACRE-FEET.... DATE: JUNE 2015

MUNICIPAL2,275 INDUSTRIAL 615 MINING&MILLING ... 284

QUASI-MUNICIPAL...178 COMMERCIAL 14

NOTE: Committed groundwater resource data are accurate for June 2015. Manner of use category totals vary over time, as water rights (rights) are not necessarily static. 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.

*Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin, obtained by a query of the [Nevada Division of Water Resources Well Log Database](#), is estimated to be 0.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Garnet Valley Hydrographic Basin (13-216), for the time period beginning January 1, 2014 and ending December 31, 2014 (hereafter referred to as calendar year 2014). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin. Associated information, such as groundwater level measurements, is also presented.

DESCRIPTION OF THE STUDY AREA

Garnet Valley is a small basin located in southeastern Nevada, approximately 28 miles northeast of Las Vegas. The basin is located within Clark County (see Figure 1), within the Colorado River Hydrographic Region.

Garnet Valley is bounded on the east by the Dry Valley Range. The Las Vegas Range forms the south and west boundary. The northern part of Garnet Valley is dissected by the Arrow Canyon Range. The adjacent Nevada hydrographic basins are as follows: California Wash (13-218), to the east; Black Mountains Area (13-215), to the southeast; Las Vegas Valley (13-212), to the south and west; and Hidden Valley (13-217), to the north. The exterior boundary of the Garnet Valley Hydrographic Basin is as described by Designation Order 1025, issued by the Nevada State Engineer April 24, 1990. The basin covers approximately 167 square miles.

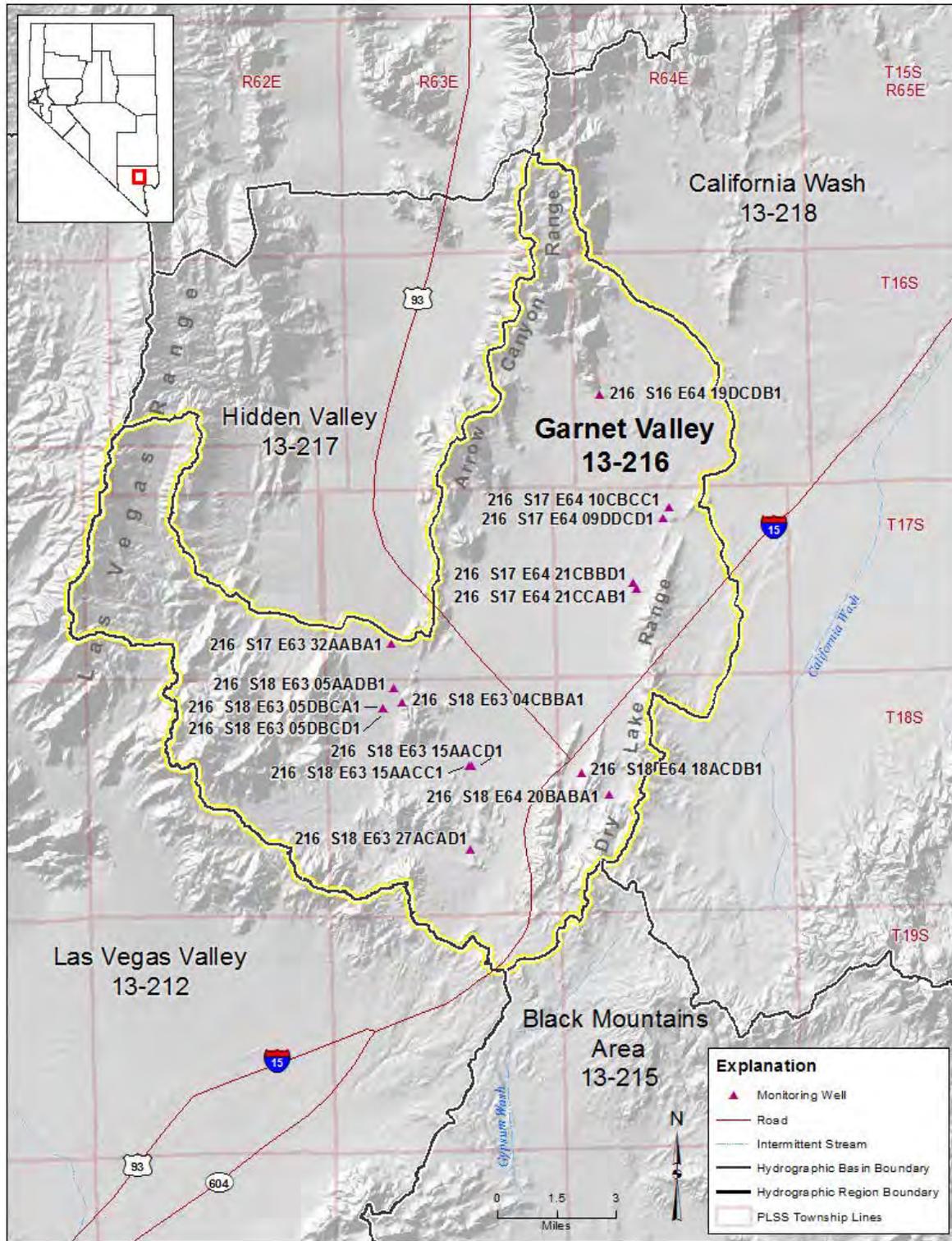
GROUNDWATER LEVELS

Depths to groundwater in are measured by multiple entities in the basin. Sites for which water level data are reported to NDWR (Figure 1) on a semi-annual basis include:

216 S16 E64 19DCDB1	216 S17 E63 32AABA1	216 S17 E64 09DDCD1
216 S17 E64 10CBCC1	216 S17 E64 21CBBD1	216 S18 E63 04CBBA1
216 S18 E63 05AADB1	216 S18 E63 05DBCA1	216 S18 E63 05DBCD1
216 S18 E63 15AACCI	216 S18 E63 15AACDI	216 S18 E63 27ACADI
216 S18 E64 18ACDB1	216 S18 E64 20BABA1	

Additional water level and site data can be obtained on the NDWR website (<http://water.nv.gov>). Groundwater level data have also been collected by the US Geological Survey (USGS) and may be accessed through their website (<http://nevada.usgs.gov/>).

FIGURE 1. PHYSIOGRAPHIC MAP OF GARNET VALLEY, HYDROGRAPHIC BASIN 13-216.



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 and exempt domestic wells in the Dry Valley Hydrographic Basin. The following methods were used to arrive at the estimated use:

- Where totalizing meters are 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 are 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 is estimated using the NIWR method above, but is 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 may differ significantly from estimates of previous years.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by querying the NDWR Well Log Database. The amount of water pumped by exempt domestic wells is estimated to be 1 acre-foot per well in Garnet Valley.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and subject to revision.

The total estimated groundwater pumpage for calendar year 2014 was **1,568 acre-feet**. The annual duties of the certificates, permits and claims of vested right within the Garnet Valley Hydrographic Basin totaled **3,366 acre-feet**. For calendar year 2014, the appropriated and actual pumped totals are categorized by manner of use:

A. Municipal (MUN)

Appropriations for municipal purposes totaled 2,275 acre-feet, with estimated groundwater pumpage of 915 acre-feet.

B. Industrial (IND)

Appropriations for industrial purposes totaled 615 acre-feet, with estimated groundwater pumpage of 492 acre-feet.

C. Mining & Milling (MM)

Appropriations for mining & milling purposes totaled 284 acre-feet, with estimated pumpage of 132 acre-feet.

D. Quasi-Municipal (QM)

Appropriations for quasi-municipal purposes totaled 178 acre-feet, with groundwater pumpage estimated at 16 acre-feet.

E. Commercial (COM)

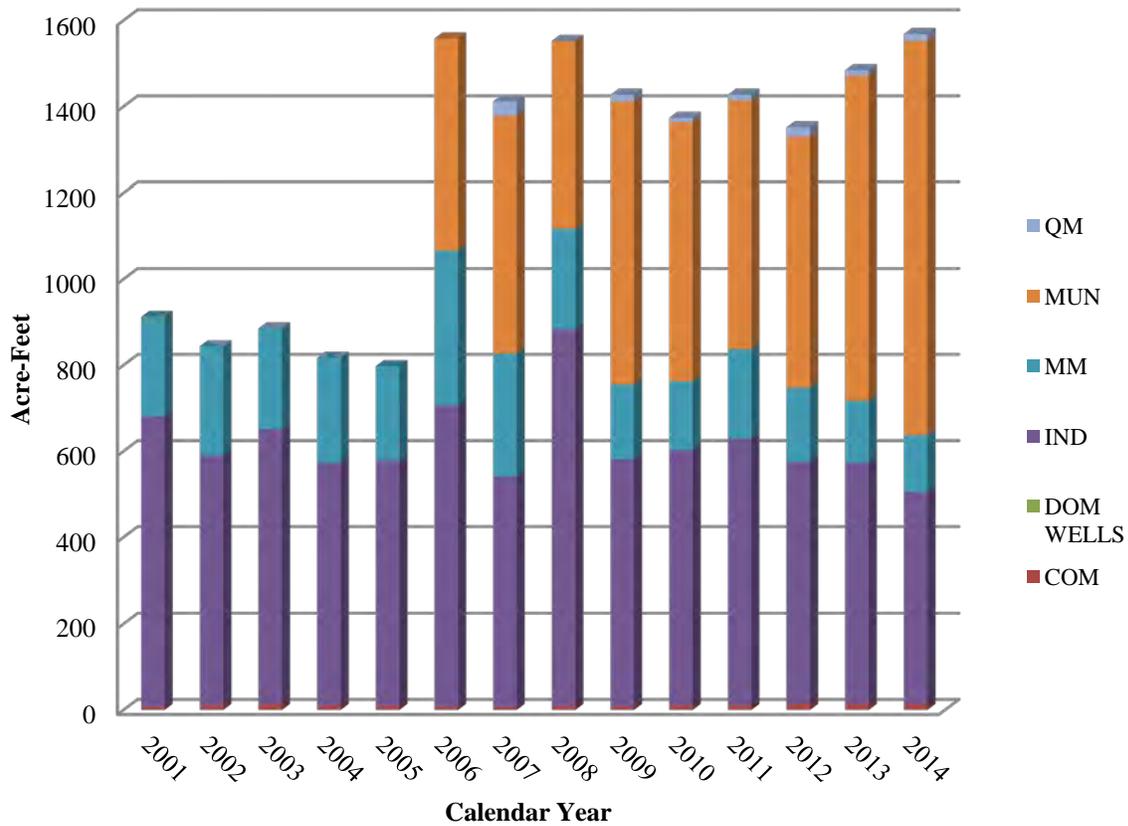
Appropriations for commercial purposes totaled 14 acre-feet, with estimated groundwater pumpage of 13 acre-feet.

APPENDIX A. GARNET VALLEY HISTORICAL PUMPAGE.

HISTORICAL GROUNDWATER PUMPAGE BY MANNER OF USE

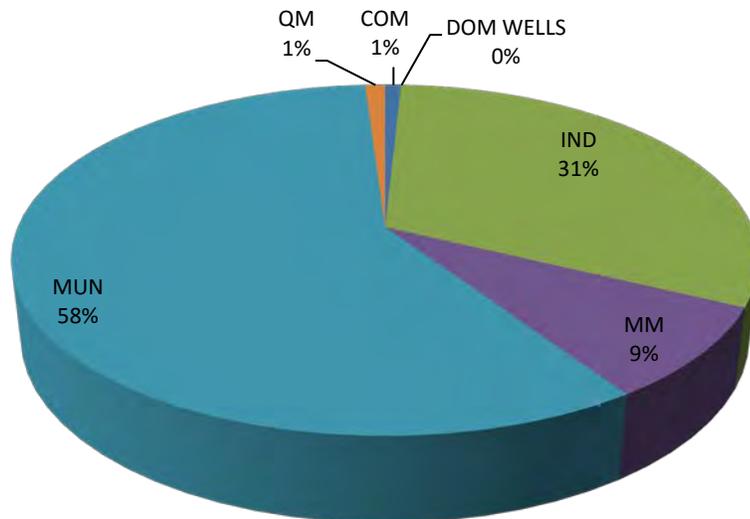
YEAR	COM	DOM	IND	MM	MUN	QM	TOTAL
2001	7	0	674	231	0	0	912
2002	10	0	579	254	0	0	844
2003	13	0	637	234	0	0	885
2004	10	0	562	245	0	0	817
2005	10	0	568	220	0	0	797
2006	7	0	699	360	492	0	1558
2007	6	0	535	285	552	33	1412
2008	9	0	874	234	435	0	1552
2009	8	0	573	174	656	16	1427
2010	10	0	592	160	601	10	1373
2011	10	0	619	208	577	13	1427
2012	14	0	561	172	583	21	1351
2013	14	0	559	144	754	13	1484
2014	13	0	492	132	915	16	1568

All values are in acre-feet

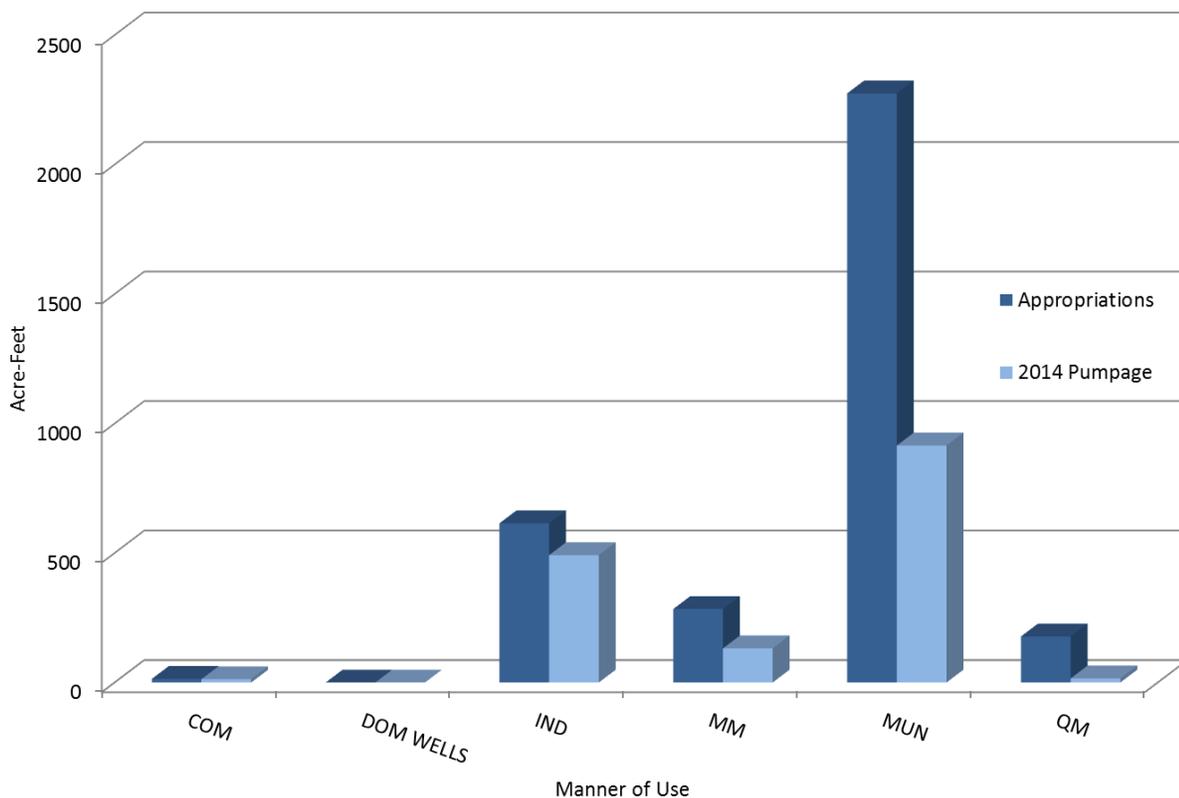


**APPENDIX B. GARNET VALLEY GROUNDWATER PUMPAGE FOR
CALENDAR YEAR 2014 BY MANNER OF USE.**

PERCENTAGE OF GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 BY MANNER OF USE



GROUNDWATER PUMPAGE FOR CALENDAR YEAR 2014 APPROPRIATIONS VS. ACTUAL PUMPAGE



**APPENDIX C. GARNET VALLEY GROUNDWATER PUMPAGE INVENTORY
FOR CALENDAR YEAR 2014.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
QQ	The quarter quarter of the Section in which the point of diversion is located.																
QTR	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
ACRES OR DUTY	The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
ACRES IRR OR USE	<p>The number of acres irrigated or the manner of use of the appropriated water.</p> <p>The types of manner of use may include:</p> <table border="0" style="width: 100%;"> <tr> <td>COM - Commercial</td> <td>CON - Construction</td> </tr> <tr> <td>DOM - Domestic</td> <td>ENV - Environmental</td> </tr> <tr> <td>IND - Industrial</td> <td>IRR - Irrigation</td> </tr> <tr> <td>MM - Mining & Milling</td> <td>MUN - Municipal</td> </tr> <tr> <td>OTH - Other</td> <td>PWR - Power</td> </tr> <tr> <td>QM - Quasi-Municipal</td> <td>REC - Recreation</td> </tr> <tr> <td>STK - Stockwater</td> <td>STO - Storage</td> </tr> <tr> <td>WLD - Wildlife</td> <td></td> </tr> </table>	COM - Commercial	CON - Construction	DOM - Domestic	ENV - Environmental	IND - Industrial	IRR - Irrigation	MM - Mining & Milling	MUN - Municipal	OTH - Other	PWR - Power	QM - Quasi-Municipal	REC - Recreation	STK - Stockwater	STO - Storage	WLD - Wildlife	
COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
IND - Industrial	IRR - Irrigation																
MM - Mining & Milling	MUN - Municipal																
OTH - Other	PWR - Power																
QM - Quasi-Municipal	REC - Recreation																
STK - Stockwater	STO - Storage																
WLD - Wildlife																	
USED (AF)	The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.																
REMARKS	Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS				
			QQ	Qtr	Sec	T	R								
54073 68822	Permit Permit	LVVWD									CLARK COUNTY LINCOLN COUNTY NYE COUNTY WHITE PINE COUNTY	150.21	MUN	43.85	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	IND	69.56					S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11
63261 64880	Cert Cert	Chemical Lime Co.	NE SW	NE SE	14 23	18 18	63 63	100.00 133.81	MM MM	60.52 70.99					S/N - 1595764-H001 East meter RD - 123431060 - 04-09-10 RD - 153965280 - 04-08-11 S/N - 108818-H001 West meter RD - 065329330 - 04-09-10 RD - 087830310 - 04-08-11 meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	COM	2.58					S/N 97800120 RD - 18757100 - 04-09-10 RD - 19996700 - 04-08-11
66784 66785 72098 77389 79948 81344 84041	Permit Permit Cert Permit Permit Permit Permit	Dry Lake Water LLC	NE NE SE	NE NE SW	27 32 13	18 17 18	63 63 63	178.00	QM	15.69					Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 05446800 - 04-08-11 RD - 09717700 - 04-11-12 74064: WNV; 77389: WNV
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	IND	74.60					Harry Allen Plant. Harvey Well S/N 0870128188

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
77745 83490	Cert Permit	City of North Las Vegas LVVWD	NW	NW	16	18	63	310.02	COM	10.77	S/N F1031916000 new meter RD - 4957659 - 01-01-13 RD - 78916619 - 12-31-13 + 256,680 gallons flush water
79001 79002 79003 79004 79005 79006 79007 79008 79009 79010	Permit Permit Permit Permit Permit Permit Permit Permit Permit Permit	LVVWD			12 13 35 24 25 36 7 18 19 30 31 1 2 SE NE NE SE SE SW E2 NE E2 SE	17 17 18	63 64	1400.00	MUN	871.07	Mirant, Silverhawk, and Chuck Lenzie power plant facilities. 79001 & 79006: No S/N RD - 192920000 - 04-26-12 well not in use 79002 & 79007: No S/N RD - 19733140 - 04-26-12 79004 & 79009: S/N 106102725 RD - 26264300 - 04-26-12 79005 & 79010: S/N 0860188417 RD - 18919742 - 04-26-12 79003 & 79008: same POD as 74399 (RW-1 well)
83553	Permit	Technichrome	SE	NE	3	19	63	3.00	IND	0.00	WNV, POU vacant.
83707 83708 83709 83710 83711	Permit Permit Permit Permit Permit	Republic Environ. Tech.	SW SW SE NE SE	NE NE SE NW SE	18 18 7 20 7	18	64	468.00	IND	348.17	S/N 53172198 Well 1 RD - 01746100 - 05-22-08 S/N 70177000 Well 2 RD - 44457200 - 05-22-08 S/N None Well 3

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2014**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
83712	Permit		NW	NE	19					RD - 1459730 - 05-22-08	
83713	Permit		SW	NE	18					S/N 70155806 Well 5	
83714	Permit		SE	SW	19					RD - 45882400 - 05-22-08	
83715	Permit		SW	NE	18					S/N 70155512 Well 6	
83716	Permit		SE	SE	7					RD - 17769300 - 05-22-08	
83717	Permit									S/N 49631323 Well 7 RD - 0068760 - 05-22-08	
TOTAL								1567.80	Permitted rights		

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



GARNET VALLEY
HYDROGRAPHIC BASIN 13-216

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2015

Field Investigated by: John Guillory, P.E.
Report Prepared by: John Guillory, P.E.

SE ROA 1365

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated and claims of vested right groundwater rights located within Garnet Valley, Hydrographic Basin 13-216, for calendar year 2015 (January 1, 2015 through December 31, 2015). Also included for summary purposes are graphs and data associated with this use, and yearly totals of historical groundwater use from 2001 through 2015 by manner of use.

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 continual basis.

For calendar year 2015, the permitted, certificated and claims of vested right groundwater rights totaled 3,366 acre-feet, with estimated pumpage of approximately **1,520 acre-feet**.

Municipal is the largest manner of use within the basin. For calendar year 2015, appropriations for municipal purposes totaled 2,275 acre-feet, with pumpage of 759 acre-feet. The second largest manner of use was industrial with appropriations totaling 615 acre-feet and pumpage of 516 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 284 acre-feet and pumpage of 194 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This inventory report only includes details on groundwater pumping from the Garnet Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER 216, REGION 13
HYDROGRAPHIC BASIN NAME GARNET VALLEY
COUNTIES CLARK
MAJOR COMMUNITIES APEX
DESIGNATED YES
DENIALS BASED UPON WATER AVAILABILITY IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS USGS, SNWA
PUMPAGE INVENTORY, ACRE-FEET IN 2015 1,520¹

STATE ENGINEER'S ORDERS

NO. [1025](#) – DESIGNATION & PREFERRED USE DATE: APRIL 24, 1990
NO. [1169](#) – FURTHER STUDY DATE: MARCH 8, 2002
NO. [1169a](#) – FURTHER STUDY DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE: 3,366 ACRE-FEET DATE: APRIL 2016

COMMERCIAL.....14 INDUSTRIAL.....615 MINING & MILLING.....284
MUNICIPAL.....2,275 QUASI-MUNICIPAL.....178

NOTE: Committed groundwater resource data are accurate for April 2016. Manner of use category totals vary over time, as rights are not necessarily static. 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. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells.

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013. The domestic use estimate is based upon a count of the total domestic wells in the basin multiplied by 1 acre-foot per annum. The number of domestic wells in the basin, estimated by a query of the Nevada Division of Water Resources Well Log Database, is approximately 0.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within the Garnet Valley Hydrographic Basin (13-216), for the time period beginning January 1, 2015 and ending December 31, 2015 (hereafter referred to as calendar year 2015). This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Garnet Valley is a small basin located in southeastern Nevada, approximately 28 miles northeast of Las Vegas (Figure 1). The basin lies within Clark County, and is in the Colorado River Hydrographic Region.

Garnet Valley is bounded on the east by the Dry Lake Range. The Las Vegas Range forms the south and west boundary. The northern part of Garnet Valley is dissected by the Arrow Canyon Range. The adjacent Nevada hydrographic basins are as follows: California Wash, 13-218, to the east; Black Mountains Area, 13-215, to the southeast; Las Vegas Valley, 13-212, to the south and west; and Hidden Valley, 13-217, to the north. The exterior boundary of the Garnet Valley Hydrographic Basin is as described by Designation Order 1025, issued by the Nevada State Engineer April 24, 1990. The basin covers approximately 167 square miles.

GROUNDWATER LEVELS

Depths to groundwater in Garnet Valley are not measured by NDWR, but are reported by other entities. Names of active sites and links to their data are:

216 S16 E64 19DCDB1	216 S17 E63 32AABA1	216 S17 E64 09DDCD1
216 S17 E64 10CBCC1	216 S17 E64 21CBBD1	216 S18 E63 04CBBA1
216 S18 E63 05AADB1	216 S18 E63 05DBCA1	216 S18 E63 05DBCD1
216 S18 E63 15AACCI	216 S18 E63 15AACD1	216 S18 E63 27ACAD1
216 S18 E64 18ACDB1	216 S18 E64 20BABA1	

Groundwater level data is also collected by the U.S. Geological Survey (USGS) and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. 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 were 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.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Garnet Valley.

PUMPAGE BY MANNER OF USE

Note that all data herein are estimates and subject to revision.

The total estimated groundwater pumpage for calendar year 2015 was 1,520 acre-feet. The annual duties of permitted, certificated and claims of vested groundwater rights within the Garnet Valley Hydrographic Basin total approximately 3,366 acre-feet. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of groundwater pumped by manner of use; and Figure 5 compares groundwater appropriations to the amounts pumped. The permitted and pumped totals for calendar year 2015, categorized by manner of use, are:

A. Commercial (COM)

Appropriations for commercial purposes totaled 14 acre-feet, with estimated pumpage of 21 acre-feet.

B. Industrial (IND)

Appropriations for industrial purposes totaled 615 acre-feet, with estimated groundwater pumpage of 516 acre-feet.

C. Mining & Milling (MM)

Appropriations for mining and milling purposes totaled 284 acre-feet in the basin; groundwater pumpage was estimated to be 194 acre-feet.

D. Quasi-Municipal (QM)

Appropriations for quasi-municipal totaled 178 acre-feet, with estimated groundwater pumpage of 30 acre-feet.

E. Municipal (MUN)

Appropriations for municipal totaled 2,275 acre-feet, with estimated groundwater pumpage of 759 acre-feet.

TABLES

Table 1. Garnet Valley historical pumpage (acre-feet) by calendar year.

YEAR	COM	DOM	IND	MM	MUN	QM	TOTAL
2001	7	0	674	231	0	0	912
2002	10	0	579	254	0	0	844
2003	13	0	637	234	0	0	885
2004	10	0	562	245	0	0	817
2005	10	0	568	220	0	0	797
2006	7	0	699	360	492	0	1,558
2007	6	0	535	285	552	33	1,412
2008	9	0	874	234	435	0	1,552
2009	8	0	573	174	656	16	1,427
2010	10	0	592	160	601	10	1,373
2011	10	0	619	208	577	13	1,427
2012	14	0	561	172	583	21	1,351
2013	14	0	559	144	754	13	1,484
2014	13	0	492	132	915	16	1,568
2015	21	0	516	194	759	30	1,520

All values are in acre-feet

FIGURES

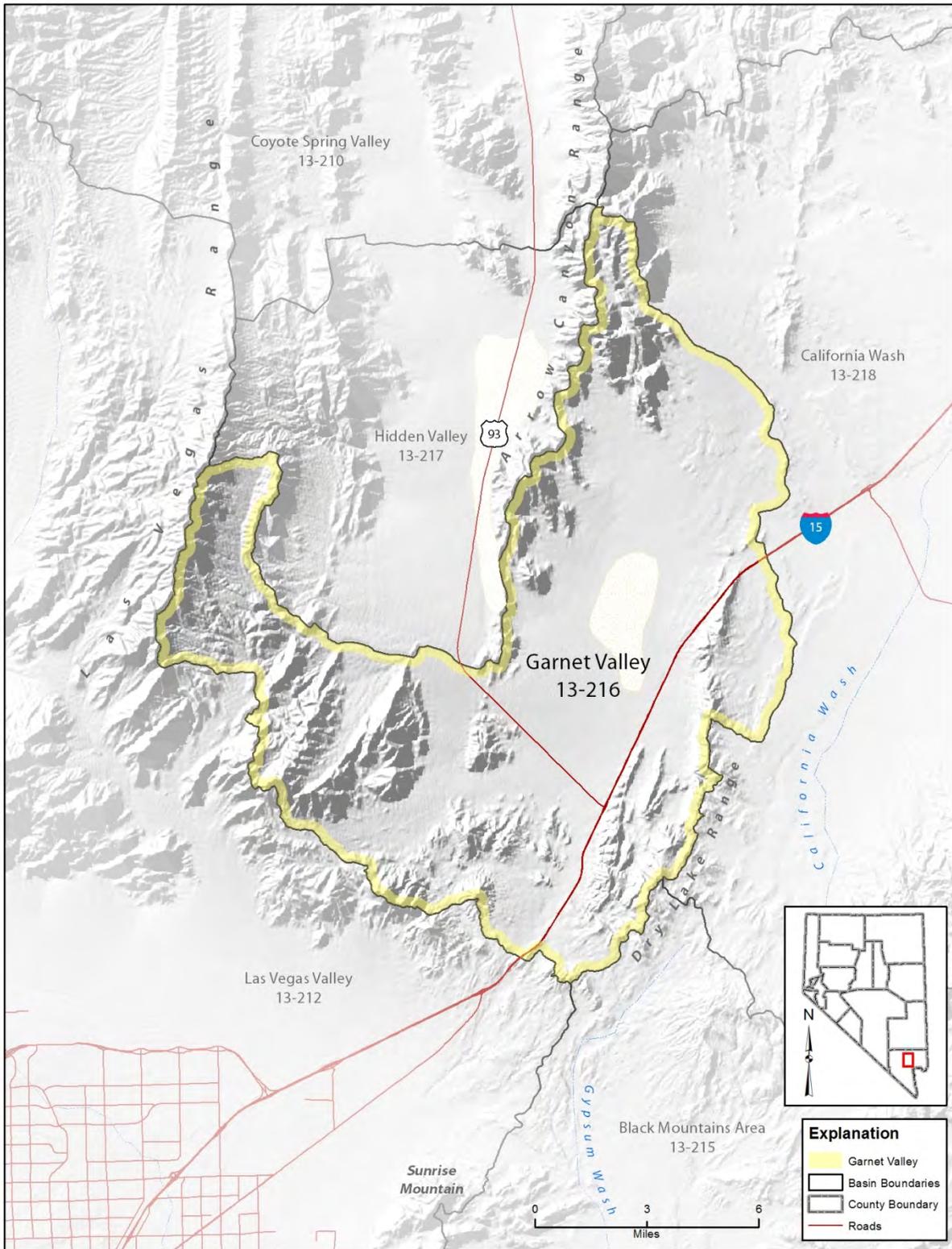


Figure 1. Location map for Garnet Valley (Hydrographic Basin 13-216).

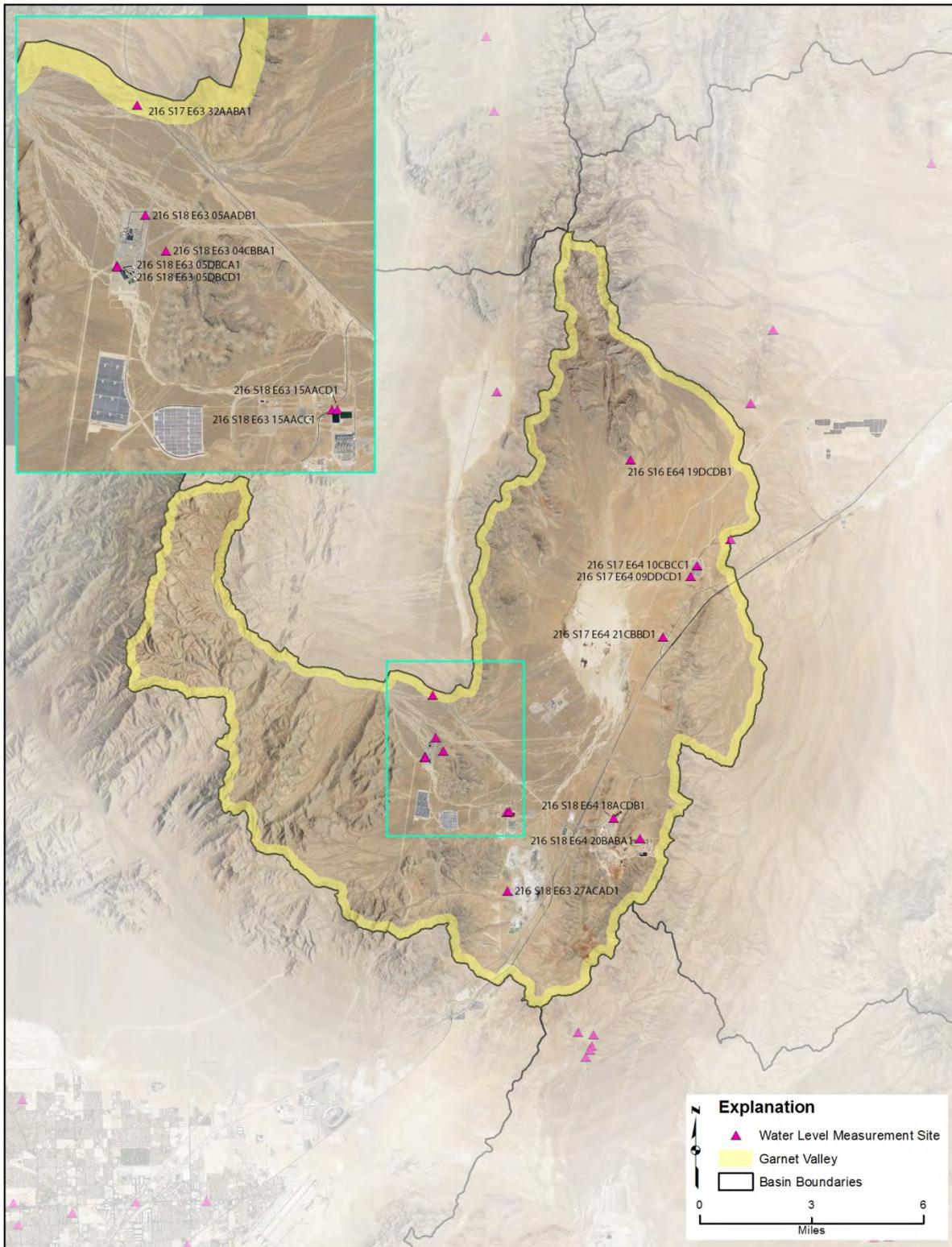


Figure 2. Garnet Valley water level measurement sites.

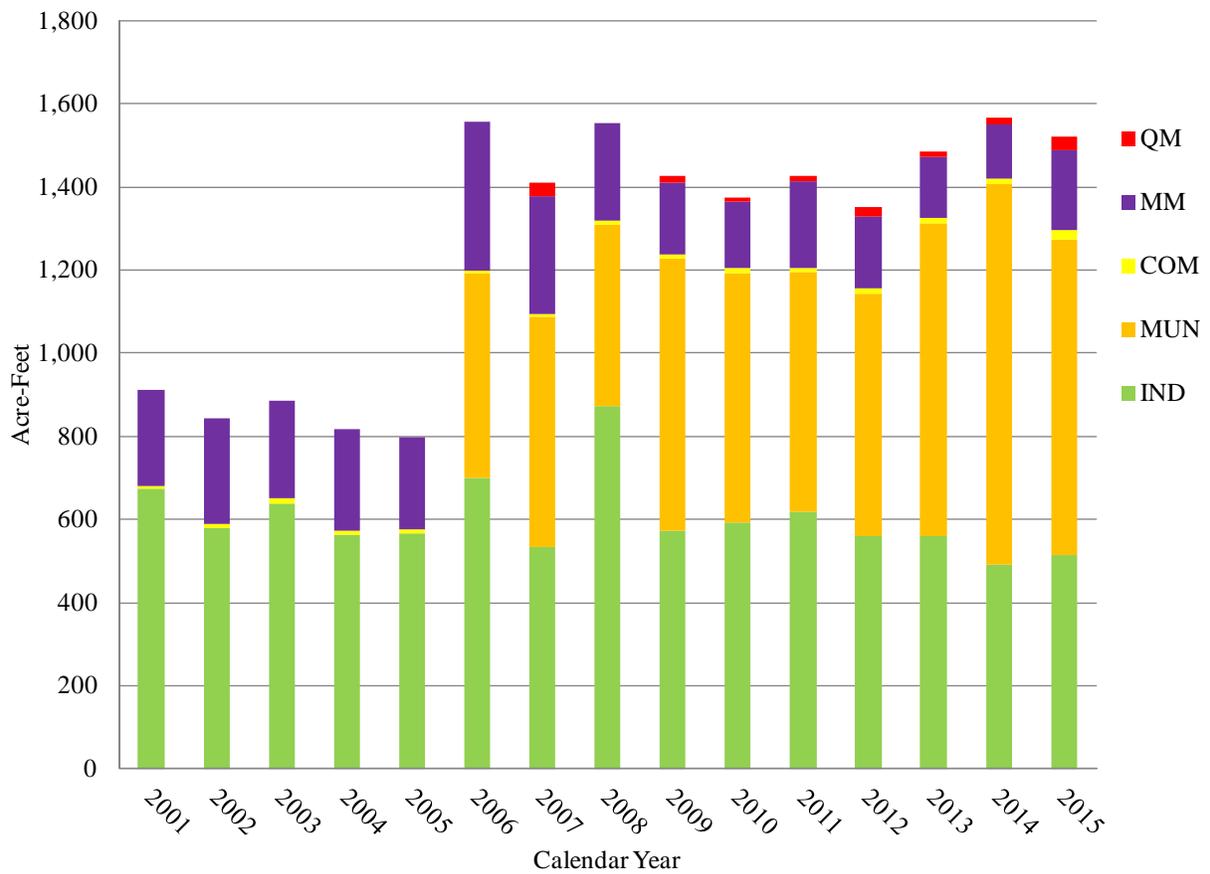


Figure 3. Garnet Valley historical pumpage by manner of use.

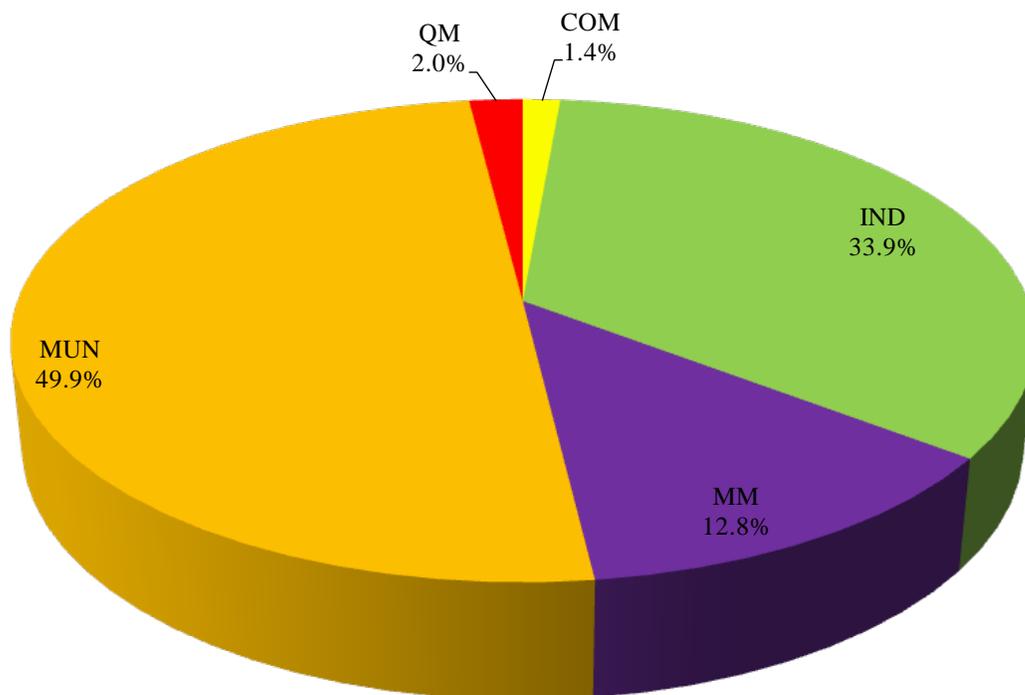


Figure 4. Percentage of 2015 groundwater pumpage by manner of use.

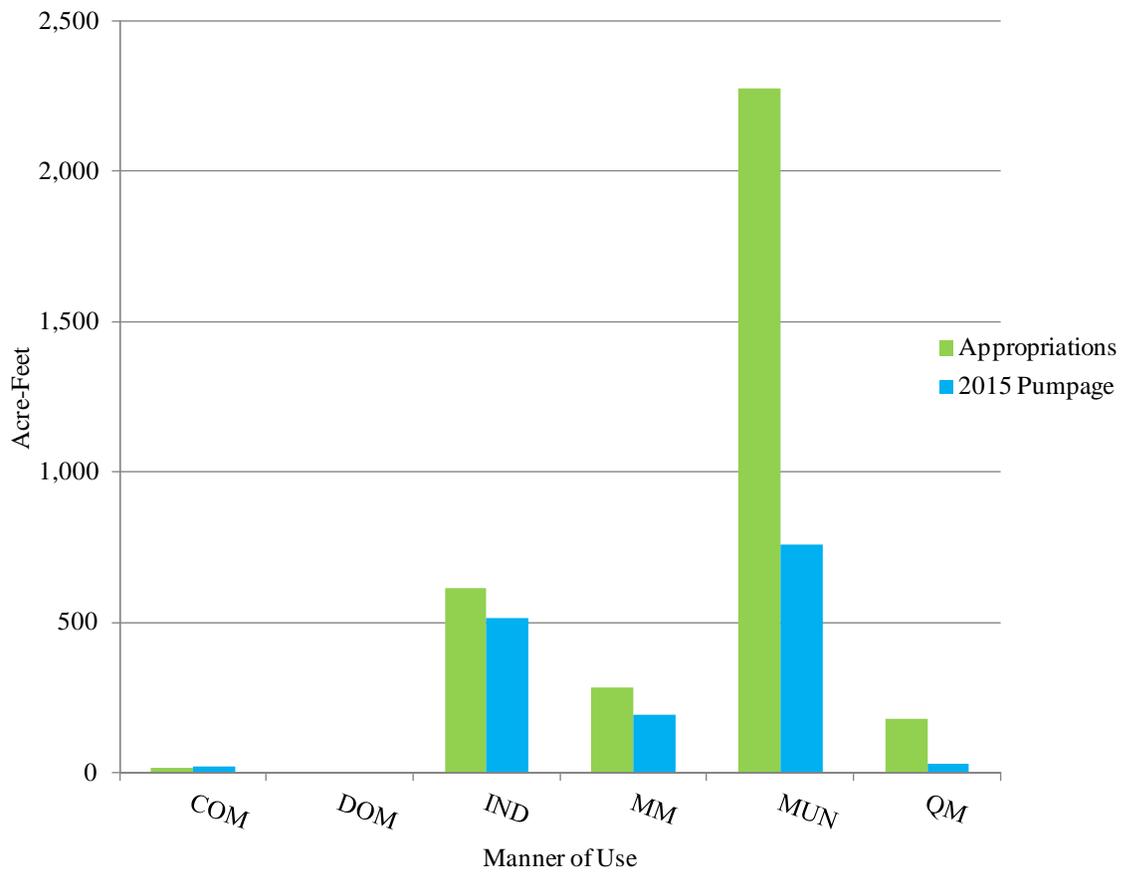


Figure 5. 2015 groundwater pumpage appropriations versus actual pumpage.

**APPENDIX A. GARNET VALLEY 2015 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

APP NUMBER	The file number of the Application or the Vested Claim of Right.																
STATUS	Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).																
OWNER OF RECORD	The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.																
 PLACE OF USE																	
QQ	The quarter quarter of the Section in which the point of diversion is located.																
Qtr	The quarter of the Section in which the point of diversion is located.																
Sec	The Section in which the point of diversion is located.																
T	The Township in which the point of diversion is located.																
R	The Range in which the point of diversion is located.																
 ACRES OR DUTY	 The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.																
 ACRES IRR OR USE	 The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include: <table border="0" style="margin-left: 20px;"> <tr> <td>COM - Commercial</td> <td>CON - Construction</td> </tr> <tr> <td>DOM - Domestic</td> <td>ENV - Environmental</td> </tr> <tr> <td>IND - Industrial</td> <td>IRR - Irrigation</td> </tr> <tr> <td>MM - Mining & Milling</td> <td>MUN - Municipal</td> </tr> <tr> <td>OTH - Other</td> <td>PWR - Power</td> </tr> <tr> <td>QM - Quasi-Municipal</td> <td>REC - Recreation</td> </tr> <tr> <td>STK - Stockwater</td> <td>STO - Storage</td> </tr> <tr> <td>WLD - Wildlife</td> <td></td> </tr> </table>	COM - Commercial	CON - Construction	DOM - Domestic	ENV - Environmental	IND - Industrial	IRR - Irrigation	MM - Mining & Milling	MUN - Municipal	OTH - Other	PWR - Power	QM - Quasi-Municipal	REC - Recreation	STK - Stockwater	STO - Storage	WLD - Wildlife	
COM - Commercial	CON - Construction																
DOM - Domestic	ENV - Environmental																
IND - Industrial	IRR - Irrigation																
MM - Mining & Milling	MUN - Municipal																
OTH - Other	PWR - Power																
QM - Quasi-Municipal	REC - Recreation																
STK - Stockwater	STO - Storage																
WLD - Wildlife																	
 USED (AF)	 The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.																
 REMARKS	 Notes pertaining to field investigation and/or review of records.																

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
54073 68822	Permit Permit	LVVWD			CLARK COUNTY LINCOLN COUNTY NYE COUNTY WHITE PINE COUNTY			150.21	MUN	56.56	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E.
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	IND	117.24	S/N 69045705 New Meter RD - 01084200 - 04-09-10 RD - 45442600 - 04-08-11
63261 64880	Cert Cert	Chemical Lime Co.	NE SW	NE SE	14 23	18 18	63 63	100.00 133.81	MM MM	72.64 121.50	S/N - 1595764-H001 East meter S/N - 108818-H001 West meter meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	COM	3.42	S/N 97800120
66784 66785 72098 77389 79948 81344 84041	Permit Permit Cert Permit Permit Permit Permit	Dry Lake Water LLC	NE NE SE	NE NE SW	27 32 13	18 17 18	63 63 63	178.00	QM	29.67	Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 43266000 - 03-08-16 74064: WNV; 77389: WNV

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	IND	74.60	Harry Allen Plant. Harvey Well S/N 0870128188
77745	Cert	City of North Las Vegas	NW	NW	16	18	63	10.02	COM	17.72	S/N F1031916000 new meter
83490	Permit	LVVWD						300.00	MUN	0.00	
79001	Permit	LVVWD			12	17	63	1400.00	MUN	702.69	Mirant, Silverhawk, and Chuck Lenzie power plant facilities.
79002	Abr				13						
79003	Abr				35						79001 & 79006: No S/N, well not in use
79004	Abr				24						
79005	Abr				25						
79006	Permit				36						
79007	Abr				7	17	64				79002 & 79007: No S/N
79008	Abr				18						
79009	Abr				19						
79010	Abr				30						79004 & 79009: S/N 106102725
85852-T	Permit				31						
85853-T	Permit				1	18	63				
85854-T	Permit				2						79005 & 79010: S/N 0860188417
85855-T	Permit		SE	NE	5						
17.719	Permit		NE	SE	5						
85857-T	Permit		SE	SW	5						79003 & 79008: same POD as 74399 (RW-1 well)
85858-T	Permit		E2	NE	15						
85859-T	Permit		E2	SE	15						
85860-T	Permit										
85861-T	Permit										
85862-T	Permit										
85863-T	Permit										

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2015**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
83553	Permit	Technichrome	SE	NE	3	19	63	3.00	IND	0.00	WNV, POU vacant.
83707	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	IND	324.05	S/N 53172198 Well 1
83708	Permit		SW	NE	18						S/N 70177000 Well 2
83709	Permit		SE	SE	7						S/N None Well 3
83710	Permit		NE	NW	20						S/N 70155806 Well 5
83711	Permit		SE	SE	7						S/N 70155512 Well 6
83712	Permit		NW	NE	19						S/N 49631323 Well 7
83713	Permit		SW	NE	18						
83714	Permit		SE	SW	19						
83715	Permit	SW	NE	18							
83716	Permit	SE	SE	7							
83717	Permit										
TOTAL										1,520.09	Permitted rights

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



GARNET VALLEY
HYDROGRAPHIC BASIN 13-216

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2016

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1382

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Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.	9

ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Garnet Valley, Hydrographic Basin 13-216, for calendar year 2016 (January 1, 2016 through December 31, 2016). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2016, committed resource totaled 4,366 acre-feet, with estimated pumpage of approximately **2,181 acre-feet**.

Municipal is the largest manner of use within the basin. For calendar year 2016, appropriations for municipal purposes totaled 2,275 acre-feet, with pumpage of 1,351 acre-feet. The second largest manner of use was industrial with appropriations totaling 615 acre-feet and pumpage of 546 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 284 acre-feet and pumpage of 144 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This inventory report only includes details on groundwater pumping from the Garnet Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	216, REGION 13
HYDROGRAPHIC BASIN NAME	GARNET VALLEY
COUNTIES	CLARK
MAJOR COMMUNITIES	NORTH LAS VEGAS, MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	USGS, SNWA
PUMPAGE INVENTORY, ACRE-FEET IN 2016	2,181 ¹

STATE ENGINEER'S ORDERS

<u>NO. 1025 – DESIGNATION & PREFERRED USE</u>	DATE: APRIL 24, 1990
<u>NO. 1169 – FURTHER STUDY</u>	DATE: MARCH 8, 2002
<u>NO. 1169A – FURTHER STUDY</u>	DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE ² : 4,366 ACRE-FEET	DATE: APRIL 2017
COMMERCIAL 14 CONSTRUCTION 1,000	INDUSTRIAL.....615
MINING & MILLING ... 284 MUNICIPAL 2,275	QUASI-MUNICIPAL ...178

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2017. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 0 domestic wells existed in the basin during calendar year 2016. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 0 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Garnet Valley for calendar year 2016. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Garnet Valley is a small basin located in southeastern Nevada, approximately 28 miles northeast of Las Vegas (Figure 1). The basin covers approximately 167 square miles within Clark County, and is in the Colorado River Hydrographic Region.

Garnet Valley is bounded on the east by the Dry Lake Range. The Las Vegas Range forms the south and west boundary. The northern part of Garnet Valley is dissected by the Arrow Canyon Range. The adjacent Nevada hydrographic basins are California Wash, 13-218, to the east, Black Mountains Area, 13-215, to the southeast, Las Vegas Valley, 13-212, to the south and west, and Hidden Valley, 13-217, to the north. The exterior boundary of the Garnet Valley Hydrographic Basin is as described by Designation Order 1025, issued by the Nevada State Engineer April 24, 1990.

GROUNDWATER LEVELS

Depths to groundwater in Garnet Valley are not measured by NDWR, but are reported by other entities. The following are the site names and links to the data for active sites (Figure 2):

216 S16 E64 19DCDB1	216 S17 E63 32AABA1	216 S17 E64 09DDCD1
216 S17 E64 10CBCC1	216 S17 E64 21CBBD1	216 S18 E63 04CBBA1
216 S18 E63 05AADB1	216 S18 E63 05DBCA1	216 S18 E63 05DBCD1
216 S18 E63 15AACC1	216 S18 E63 15AACD1	216 S18 E63 27ACAD1
216 S18 E64 18ACDB1	216 S18 E64 20BABA1	216 S17 E63 33CBCB1

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 were 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Garnet Valley.

TABLES

Table 1. Garnet Valley historical pumpage (acre-feet) by calendar year.

YEAR	COM	CON	DOM	IND	MM	MUN	QM	TOTAL
2012	14	0	0	561	172	583	21	1,351
2013	14	0	0	559	144	754	13	1,484
2014	13	0	0	492	132	915	16	1,568
2015	21	0	0	516	194	759	30	1,520
2016	13	92	0	546	144	1,351	35	2,181

FIGURES

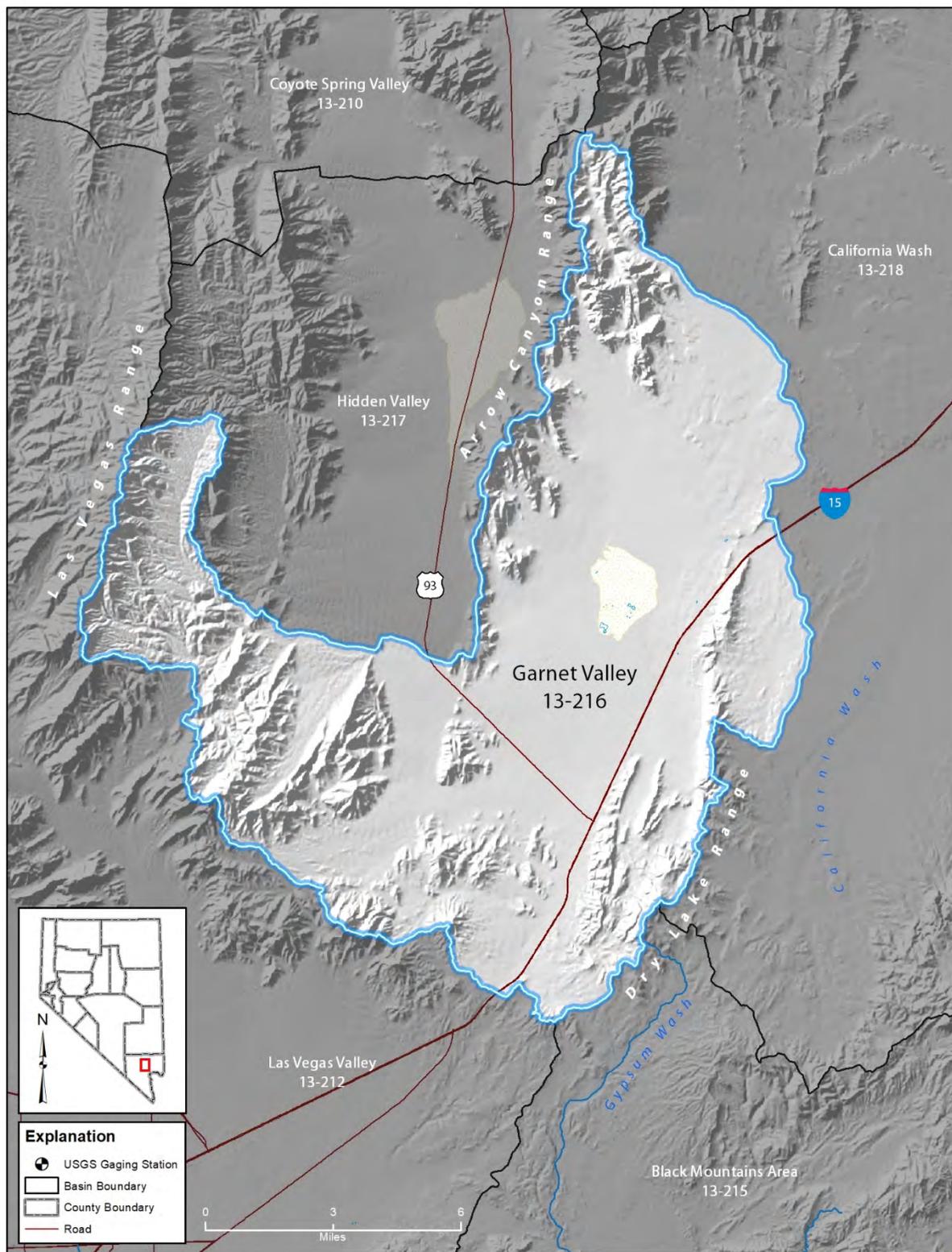


Figure 1. Physiographic map of Garnet Valley (Hydrographic Basin 13-216).

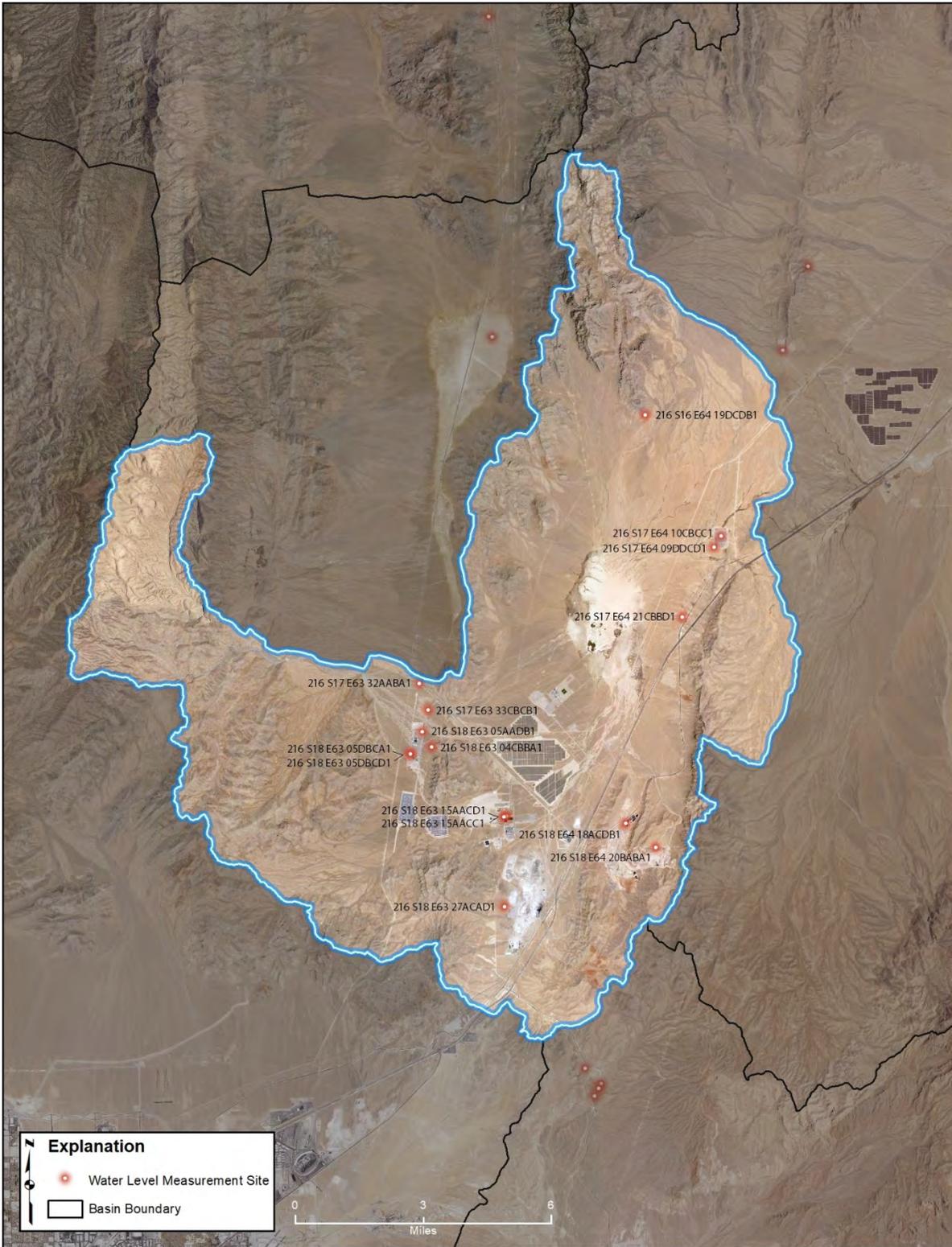


Figure 2. Garnet Valley water level measurement sites.

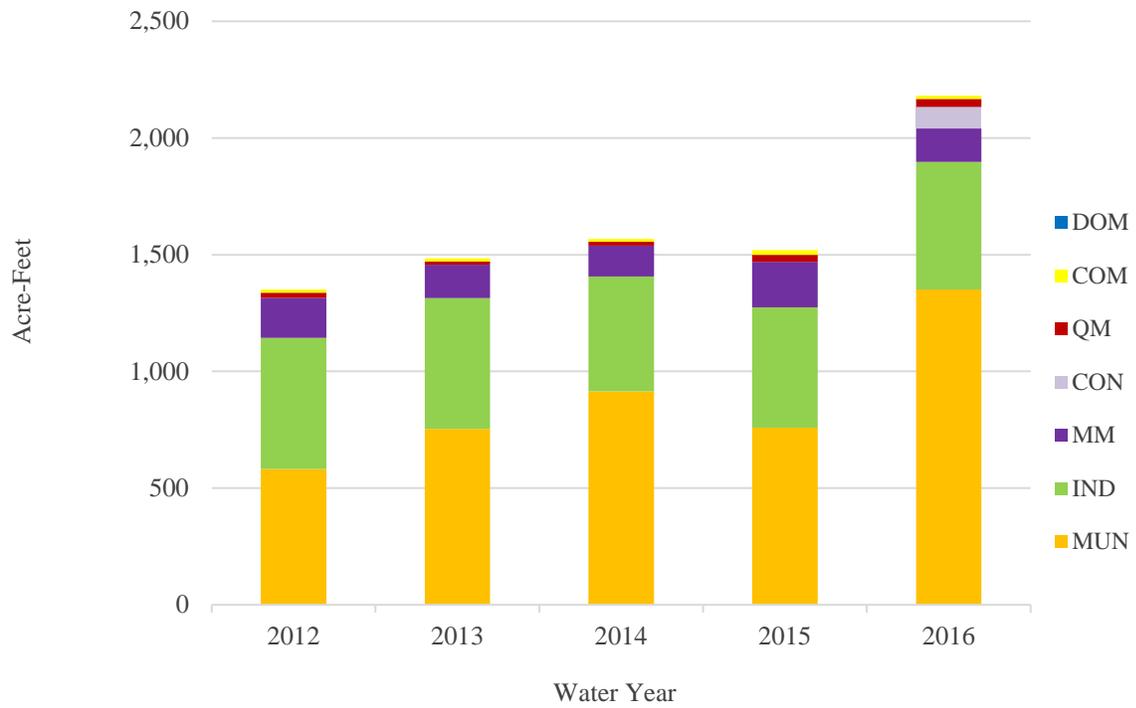


Figure 3. Garnet Valley historical pumpage by manner of use.

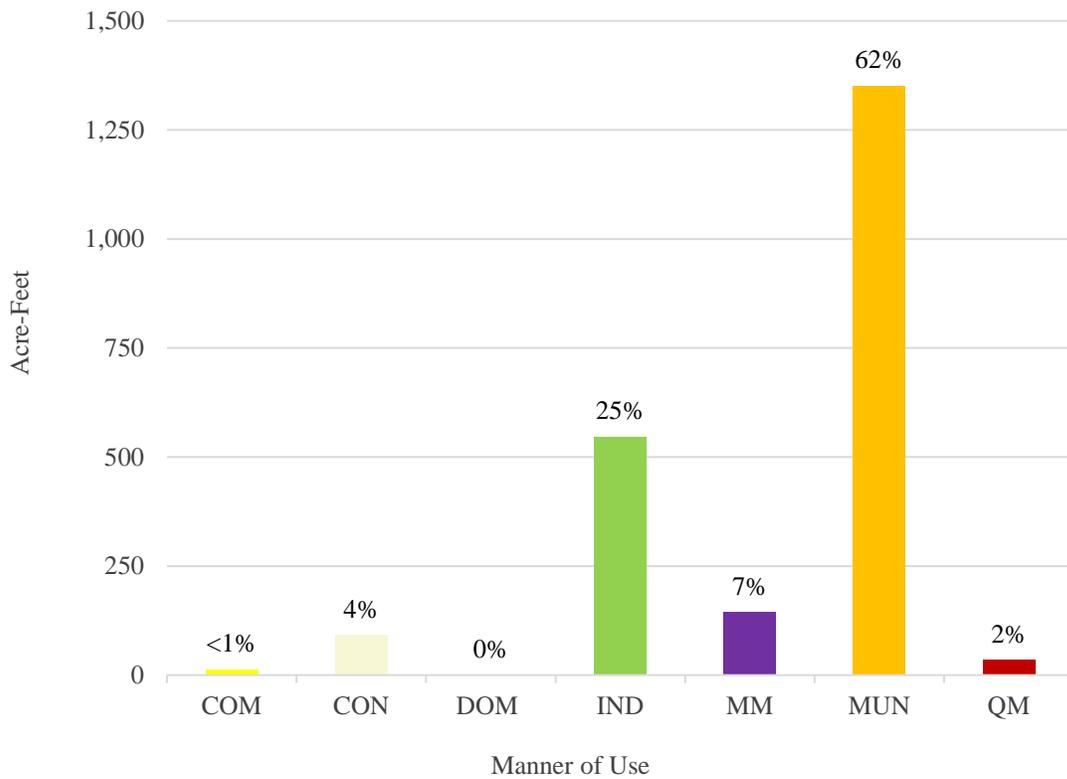


Figure 4. Percentage of 2016 groundwater pumpage by manner of use.

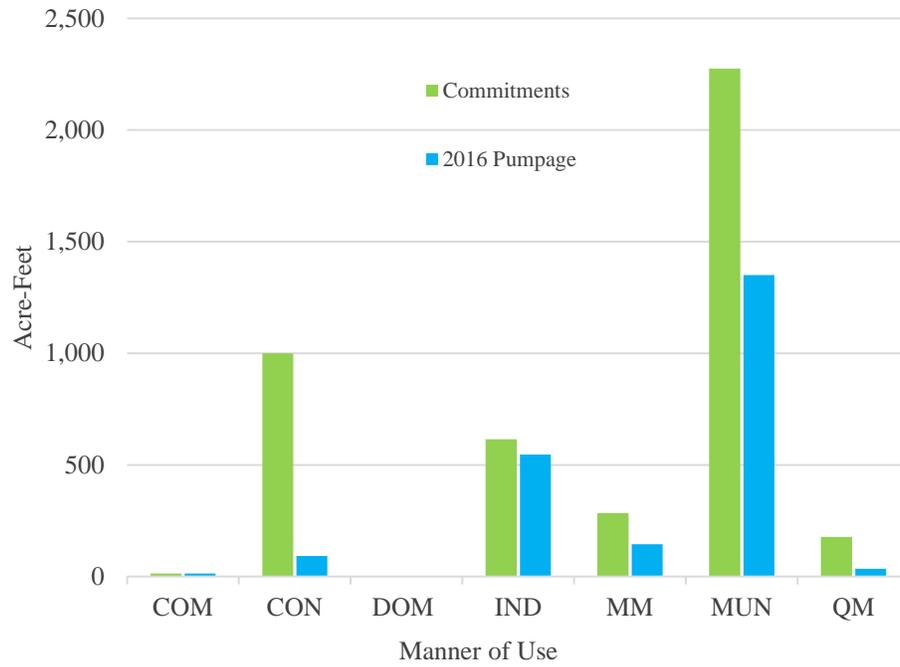


Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.

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APPLICATION NUMBER.**

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Qtr	The quarter of the Section in which the point of diversion is located.
Sec	The Section in which the point of diversion is located.
T	The Township in which the point of diversion is located.
R	The Range in which the point of diversion is located.
 ACRES OR DUTY	 The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
 ACRES IRR OR USE	 The number of acres irrigated or the manner of use of the appropriated water. The types of manner of use may include: COM - Commercial CON - Construction DOM - Domestic ENV - Environmental IND - Industrial IRR - Irrigation MM - Mining & Milling MUN - Municipal OTH - Other PWR - Power QM - Quasi-Municipal REC - Recreation STK - Stockwater STO - Storage WLD - Wildlife
 USED (AF)	 The amount of water used during the water year, in acre-feet, as determined by review of records and/or field investigation.
 REMARKS	 Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
54073	Permit	Southern Nevada Water Authority	WITHIN BASINS:					2274.57	MUN	1305.90	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E. 79001 & 79006: No S/N, well not in use 79002 & 79007: No S/N 79004 & 79009: S/N 106102725 79005 & 79010: S/N 0860188417 79003 & 79008: same POD as 74399 (RW-1 well) Total included pumpage from: Mirant, Silverhawk, Chuck Lenzie, and Harry Allen (SNWA portion) power plant facilities.
68822	Permit		210, 216, 217, 218, 219								
79001	Permit										
79002	Permit										
79003	Permit										
79004	Permit										
79005	Permit										
79006	Permit										
79007	Permit										
79008	Permit										
79009	Permit										
79010	Permit										
83490	Permit										
86466T	Permit										
86467T	Permit										
86468T	Permit										
86195T	Permit	Southern Nevada Water Authority	WITHIN BASINS:					1000.00	CON	92.20	Solar Well; Temporary change of comminted right in Basin 210
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	IND	113.74	S/N 69045705
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	53.28	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	90.07	S/N - 108818-H001 West meter meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	COM	3.30	S/N 97800120
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	34.68	Industrial Properties Development 66784: No meter, well not in use 66785: WV, no works 72098 & 79948: S/N 003216 RD - 43266000 - 03-08-16
66785	Permit		NE	NE	32	17	63				
72098	Cert		SE	SW	13	18	63				
77389	Permit										
79948	Permit										

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS			
			QQ	Qtr	Sec	T	R							
81344	Permit										74064: WNV; 77389: WNV			
84041	Permit													
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	IND	74.60	Harry Allen Plant. Harvey Well S/N 0870128188			
77745	Cert	City of North Las Vegas Southern Nevada Water Authority	NW	NW	16	18	63	10.02	COM	10.02	S/N F1031916000			
83490	Permit							300.00	MUN	45.23	Kerr Well			
83553	Permit	Technichrome	SE	NE	3	19	63	3.00	IND	0.00	WNV, POU vacant.			
83707	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	IND	357.80	S/N 53172198 Well 1			
83708	Permit		SW	NE	18									
83709	Permit		SE	SE	7									S/N 70177000 Well 2
83710	Permit		NE	NW	20									
83711	Permit		SE	SE	7									S/N None Well 3
83712	Permit		NW	NE	19									
83713	Permit		SW	NE	18									S/N 70155806 Well 5
83714	Permit		SE	SW	19									
83715	Permit	SW	NE	18						S/N 70155512 Well 6				
83716	Permit	SE	SE	7										
83717	Permit										S/N 49631323 Well 7			
TOTAL										2,180.82	Permitted rights			

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



GARNET VALLEY
HYDROGRAPHIC BASIN 13-216

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2017

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1397

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This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Garnet Valley, Hydrographic Basin 13-216, for calendar year 2017 (January 1, 2017 through December 31, 2017). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2017, committed resource totaled 7,271 acre-feet, with estimated pumpage of approximately **1,981 acre-feet**.

Municipal is the largest manner of use within the basin. For calendar year 2017, appropriations for municipal purposes totaled 5,275 acre-feet, with pumpage of 831 acre-feet. The second largest manner of use was industrial with appropriations totaling 615 acre-feet and pumpage of 717 acre-feet. The third largest manner of use was mining & milling with appropriations totaling 284 acre-feet and pumpage of 173 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. This inventory report only includes details on groundwater pumping from the Garnet Valley Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	216, REGION 13
HYDROGRAPHIC BASIN NAME	GARNET VALLEY
COUNTIES	CLARK
MAJOR COMMUNITIES	NORTH LAS VEGAS, MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	USGS, SNWA
PUMPAGE INVENTORY, ACRE-FEET IN 2017	1,981 ¹

STATE ENGINEER'S ORDERS

[NO. 1025 – DESIGNATION & PREFERRED USE](#)
[NO. 1169 – FURTHER STUDY](#)
[NO. 1169A – FURTHER STUDY](#)

DATE: APRIL 24, 1990
 DATE: MARCH 8, 2002
 DATE: DECEMBER 21, 2012

COMMITTED GROUNDWATER RESOURCE²: 7,271 ACRE-FEET

DATE: APRIL 2018

COMMERCIAL 19	CONSTRUCTION 900	INDUSTRIAL.....615
MINING & MILLING ... 284	MUNICIPAL 5,275	QUASI-MUNICIPAL ...178

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2018. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 0 domestic wells existed in the basin during calendar year 2017. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 0 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Garnet Valley for calendar year 2017. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Garnet Valley is a small basin located in southeastern Nevada, approximately 28 miles northeast of Las Vegas (Figure 1). The basin covers approximately 167 square miles within Clark County, and is in the Colorado River Hydrographic Region.

Garnet Valley is bounded on the east by the Dry Lake Range. The Las Vegas Range forms the south and west boundary. The northern part of Garnet Valley is dissected by the Arrow Canyon Range. The adjacent Nevada hydrographic basins are California Wash, 13-218, to the east, Black Mountains Area, 13-215, to the southeast, Las Vegas Valley, 13-212, to the south and west, and Hidden Valley, 13-217, to the north. The exterior boundary of the Garnet Valley Hydrographic Basin is as described by Designation Order 1025, issued by the Nevada State Engineer April 24, 1990.

GROUNDWATER LEVELS

Depths to groundwater in Garnet Valley are not measured by NDWR, but are reported by other entities. The following are the site names and links to the data for active sites (Figure 2):

216 S16 E64 19DCDB1	216 S17 E63 32AABA1	216 S17 E64 09DDCD1
216 S17 E64 10CBCC1	216 S17 E64 21CBBD1	216 S18 E63 04CBBA1
216 S18 E63 05AADB1	216 S18 E63 05DBCA1	216 S18 E63 05DBCD1
216 S18 E63 15AACC1	216 S18 E63 15AACD1	216 S18 E63 27ACAD1
216 S18 E64 18ACDB1	216 S18 E64 20BABA1	216 S17 E63 33CBCB1

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website at <http://nevada.usgs.gov/>.

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 were 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Garnet Valley.

TABLES

Table 1. Garnet Valley historical pumpage (acre-feet) by calendar year.

YEAR	COM	CON	DOM	IND	MM	MUN	QM	TOTAL
2013	14	0	0	559	144	754	13	1,484
2014	13	0	0	492	132	915	16	1,568
2015	21	0	0	516	194	759	30	1,520
2016	13	92	0	546	144	1351	35	2,181
2017	13	217	0	717	173	831	30	1,981

FIGURES

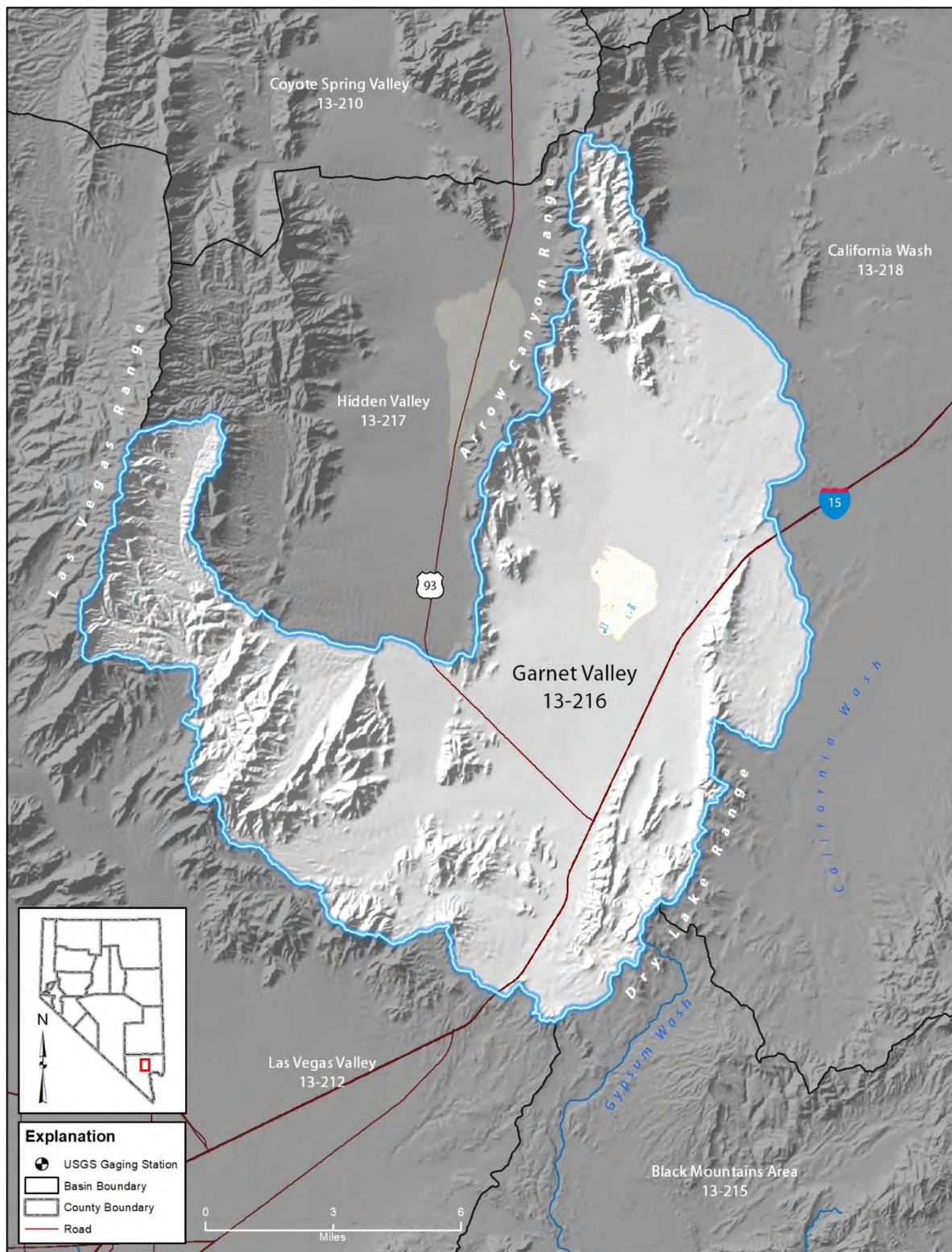


Figure 1. Physiographic map of Garnet Valley (Hydrographic Basin 13-216).

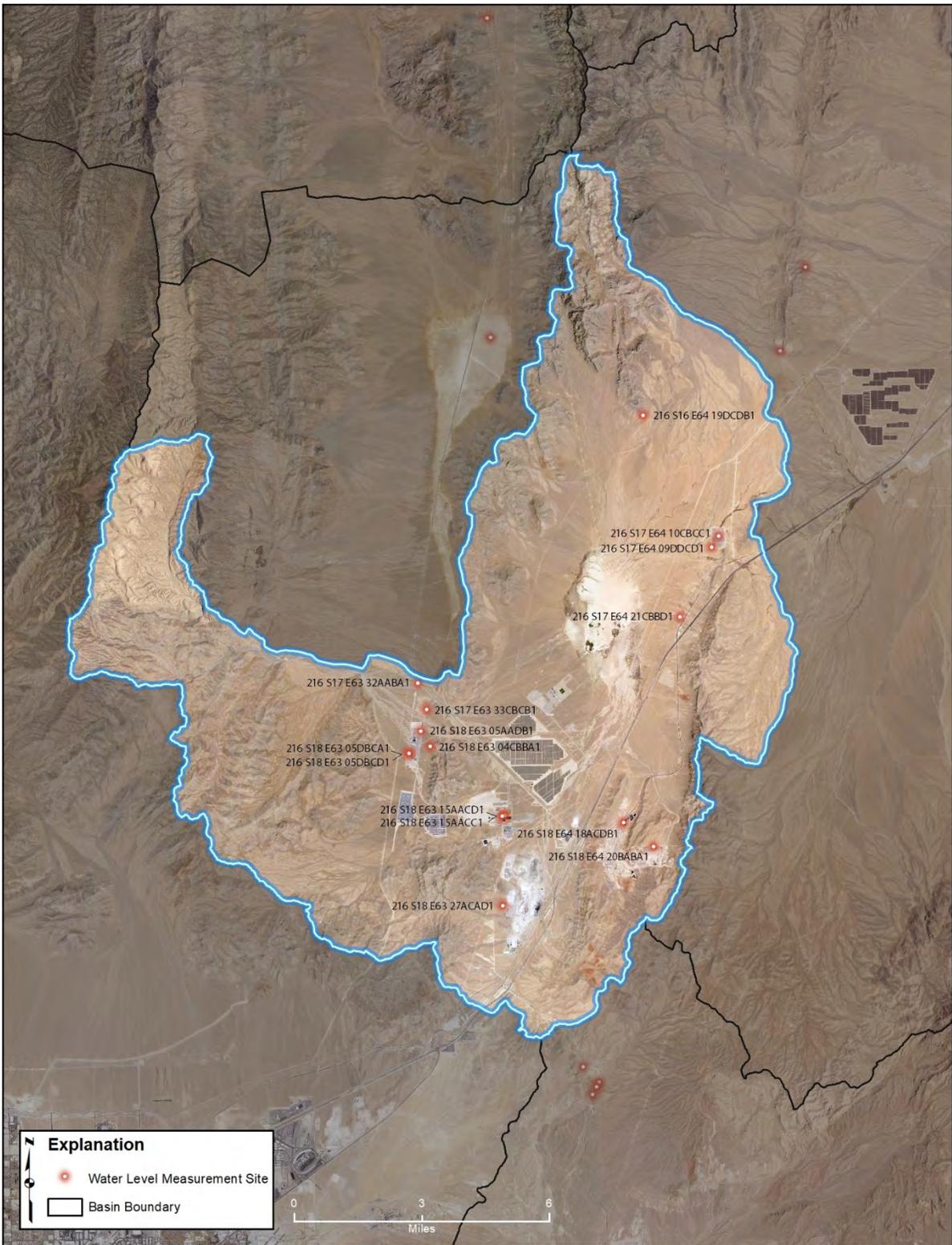


Figure 2. Garnet Valley water level measurement sites.

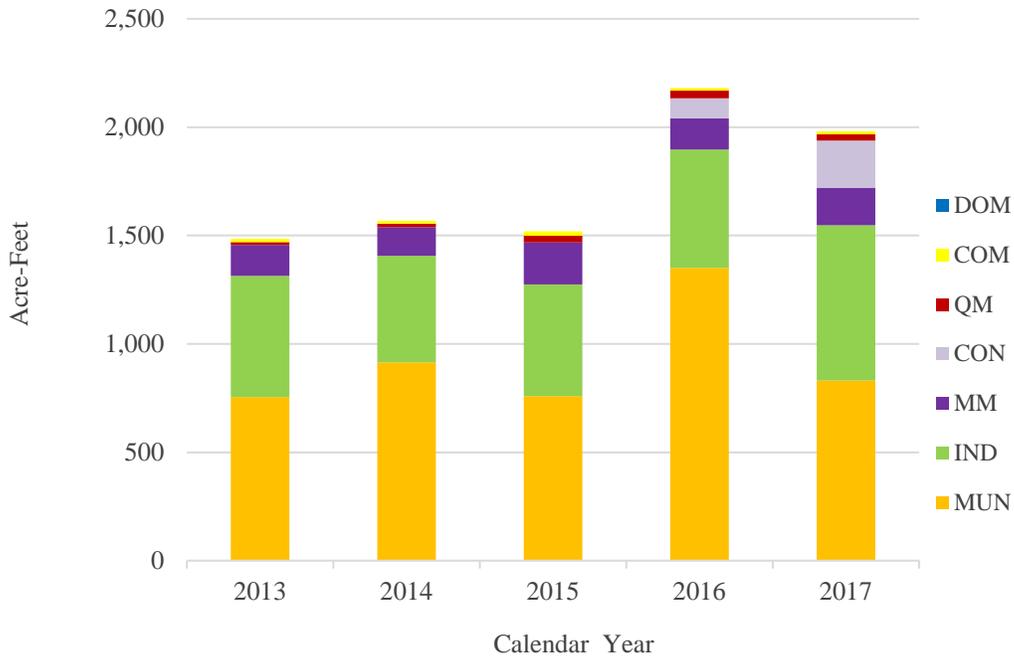


Figure 3. Garnet Valley historical pumpage by manner of use.

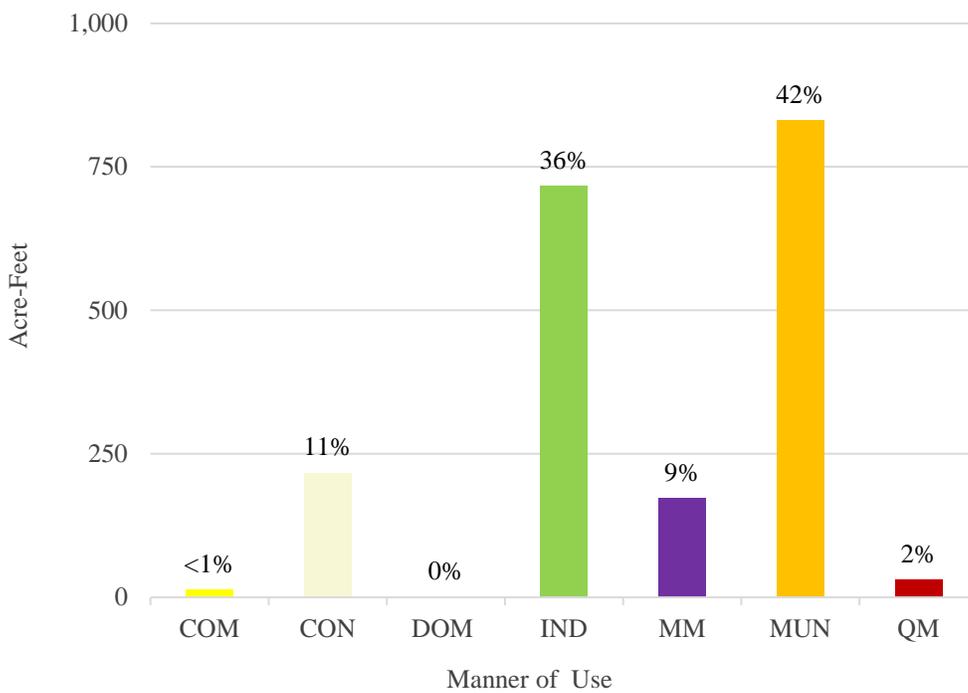


Figure 4. Percentage of 2017 groundwater pumpage by manner of use.

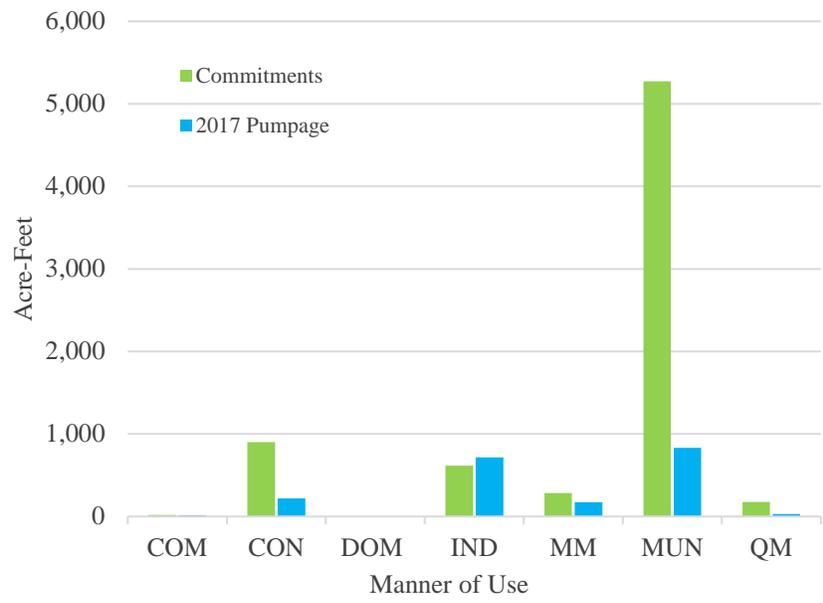


Figure 5. Comparison between 2017 groundwater commitments and estimated pumpage.

**APPENDIX A. GARNET VALLEY 2017 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), Permit (Permit), Certificate (Cert) or Expired (Exp).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
 The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
54073	Permit	Southern Nevada Water Authority	WITHIN BASINS:					2274.57	MUN	813.67	54073: WV, no works 04-26-12 Plotted POD is in the SW SW of Section 32 17S 63E; well drilled in Section 4 18S 63E. 79001 & 79006: No S/N, well not in use 79002 & 79007: No S/N 79004 & 79009: S/N 106102725 79005 & 79010: S/N 0860188417 79003 & 79008: same POD as 74399 (RW-1 well) Total included pumpage from: Mirant, Silverhawk, Chuck Lenzie, and Harry Allen (SNWA portion) power plant facilities.
68822	Permit		210, 216, 217, 218, 219								
79001	Permit										
79002	Permit										
79003	Permit										
79004	Permit										
79005	Permit										
79006	Permit										
79007	Permit										
79008	Permit										
79009	Permit										
79010	Permit										
83490	Permit										
86959T	Permit										
86960T	Permit										
86961T	Permit										
86962T	Permit										
86963T	Permit										
86964T	Permit										
86965T	Permit										
86966T	Permit										
86967T	Permit										
86968T	Permit										
86969T	Permit										
86970T	Permit										
87102T	Permit	Southern Nevada Water Authority	WITHIN BASINS:					900.00	CON	217.38	Solar Well
87169T			210, 216, 217, 218, 219								
86195T	Exp		5.00								
56855	Cert	Georgia Pacific Corp.	SE	NE	34	18	63	144.15	IND	94.27	S/N 69045705

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
63261	Cert	Chemical Lime Co.	NE	NE	14	18	63	100.00	MM	55.61	S/N - 1595764-H001 East meter
64880	Cert		SW	SE	23	18	63	133.81	MM	117.17	S/N - 108818-H001 West meter meters on water tank
63348	Cert	Western Mining & Milling	NE	SW	13	18	63	4.00	COM	2.71	S/N 97800120
66784	Permit	Dry Lake Water LLC	NE	NE	27	18	63	178.00	QM	29.97	Industrial Properties Development <u>66784: No meter, well not in use</u> <u>66785: WV, no works</u> 72098, 79948, 81344 & 84041: S/N 00321 S/N 003216, RD - 43266000 - 03-08-16 <u>RD - 63841600 - 04-16-18</u> 77389: WNV
66785	Permit		NE	NE	32	17	63				
72098	Cert		SE	SW	13	18	63				
77389	Permit										
79948	Permit										
81344	Permit										
84041	Permit										
74399	Cert	Nevada Power Co.	NW	SW	21	17	64	74.57	IND	74.57	Harry Allen Plant. Harvey Well S/N 0870128188
77745	Cert	City of North Las Vegas Southern Nevada Water Authority	NW	NW	16	18	63	10.02	COM	10.02	S/N F1031916000
83490	Permit		295.00	MUN	17.50	Kerr Well					
83553	Permit	Technichrome	SE	NE	3	19	63	3.00	IND	0.00	WNV, POU vacant.
83707	Permit	Republic Environ. Tech.	SW	NE	18	18	64	468.00	IND	548.36	S/N 53172198 Well 1
83708	Permit		SW	NE	18						S/N 70177000 Well 2
83709	Permit		SE	SE	7						S/N None Well 3
83710	Permit		NE	NW	20						POD: 83717 (well 5) S/N 0260330
83711	Permit		SE	SE	7						POD: 83714 (well 6) S/N 0260334
83712	Permit		NW	NE	19						POD: 83708, 83710 & 83716 (well 7)
83713	Permit		SW	NE	18						S/N 0396542

**GROUNDWATER PUMPAGE INVENTORY
GARNET VALLEY, NO. 216
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				

83714 Permit
83715 Permit
83716 Permit
83717 Permit

SE SW 19
SW NE 18
SE SE 7

TOTAL 1,981.23 Permitted rights

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



CALIFORNIA WASH
HYDROGRAPHIC BASIN 13-218

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2016

Field Investigated by: Christi Cooper and John Guillory, P.E.
Report Prepared by: Christi Cooper

SE ROA 1413

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within California Wash, Hydrographic Basin 13-218, for calendar year 2016 (January 1, 2016 through December 31, 2016). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2016, the committed resource totaled 9,643 acre-feet, with estimated pumpage of approximately **252 acre-feet**. This figure includes an estimated 16 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2016, appropriations for municipal totaled 2,525 acre-feet and pumpage was 200 acre-feet. The second largest manner of use was industrial with appropriations totaling 6,905 acre-feet and pumpage of 36 acre-feet. The third largest manner of use was pumping by exempt domestic wells at 16 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the California Wash Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	218, REGION 13
HYDROGRAPHIC BASIN NAME	CALIFORNIA WASH
COUNTIES	CLARK
MAJOR COMMUNITIES	MOAPA
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR
PUMPAGE INVENTORY, ACRE-FEET IN 2016	252 ¹
STATE ENGINEER'S ORDERS	
<u>NO. 1026- DESIGNATION</u>	DATE: APRIL 24, 1990
COMMITTED GROUNDWATER RESOURCE ² : 9,643 ACRE-FEET	DATE: APRIL 2017
ENVIRONMENTAL..... 91	INDUSTRIAL 6,905
MUNICIPAL..... 2,525	DOMESTIC..... 32
	IRRIGATION90

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2017. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 16 domestic wells existed in the basin during calendar year 2016. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 32 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within California Wash for calendar year 2016. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

California Wash is located in southeastern Nevada, approximately 55 miles north of Las Vegas, within Clark County, in the Colorado River Hydrographic Region (Figure 1). The basin is bounded by the Arrow Canyon Range to the northwest, the Dry Lake Range to the southwest, the Muddy Mountains to the southeast, and the North Muddy Mountains to the east. The adjacent Nevada hydrographic basins are Coyote Spring Valley (13-210) and Garnet Valley (13-216) to the west, Lower Moapa Valley (13-220) to the east, Muddy River Springs Area (13-219) and Lower Meadow Valley Wash (13-205) to the north, and Black Mountains Area (13-215) to the south.

GROUNDWATER LEVELS

Depths to groundwater in California Wash are not measured by NDWR, but are reported by other entities. The following are the site names and links to the data for active sites (Figure 2):

[218 S15 E65 09DDDD1](#)
[218 S16 E64 15AADD1](#)

[218 S15 E66 31DACA1](#)
[218 S16 E64 34CDBC1](#)

[218 S16 E64 02ABCD1](#)

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 is 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in California Wash, or 16 acre-feet.

TABLES

Table 1. California Wash historical pumpage (acre-feet) by calendar year.

YEAR	DOM	COM	ENV	IND	IRR	MUN	QM	TOTAL
2016	16	0	0	36	0	200	0	252

FIGURES

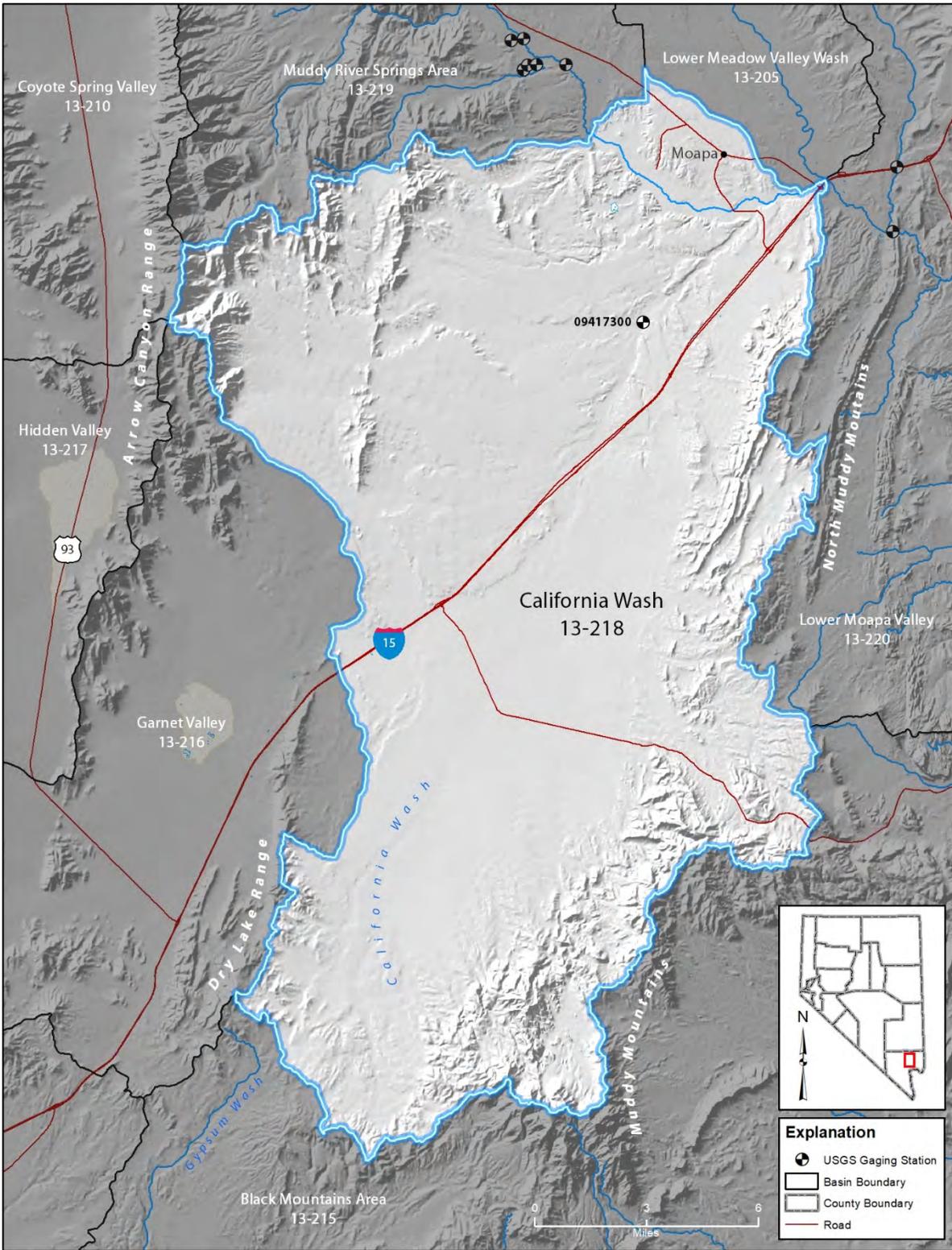


Figure 1. Physiographic map of California Wash (Hydrographic Basin 13-218).

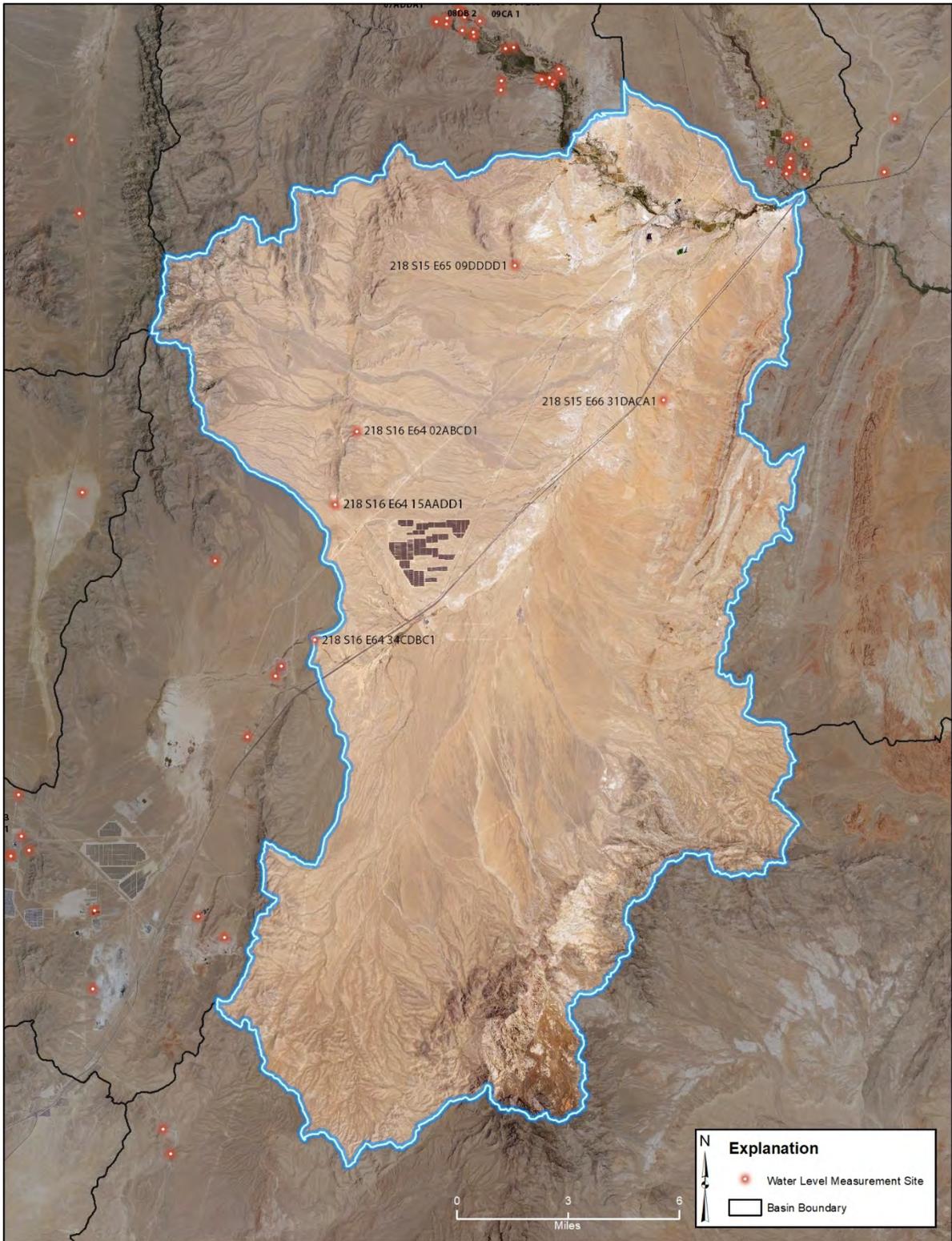


Figure 2. California Wash water level measurement sites.

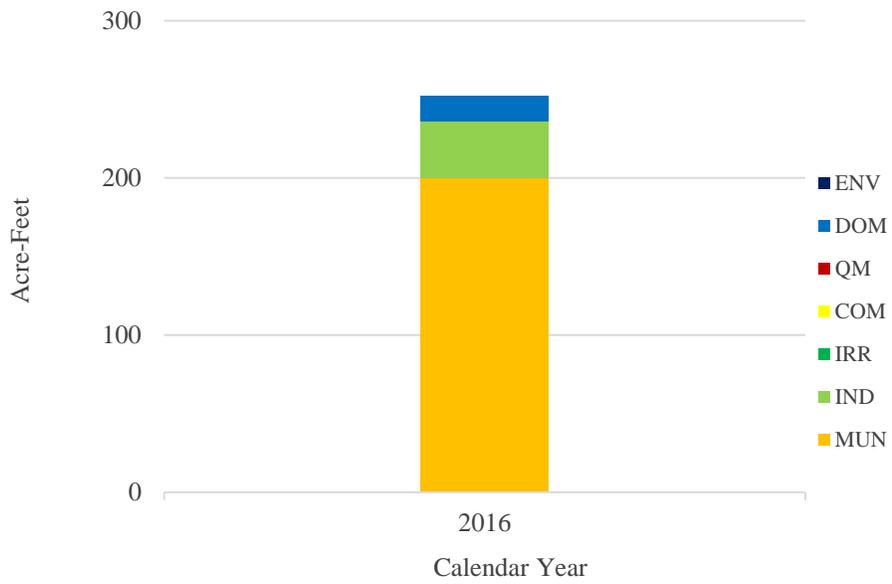


Figure 3. California Wash historical pumpage by manner of use.

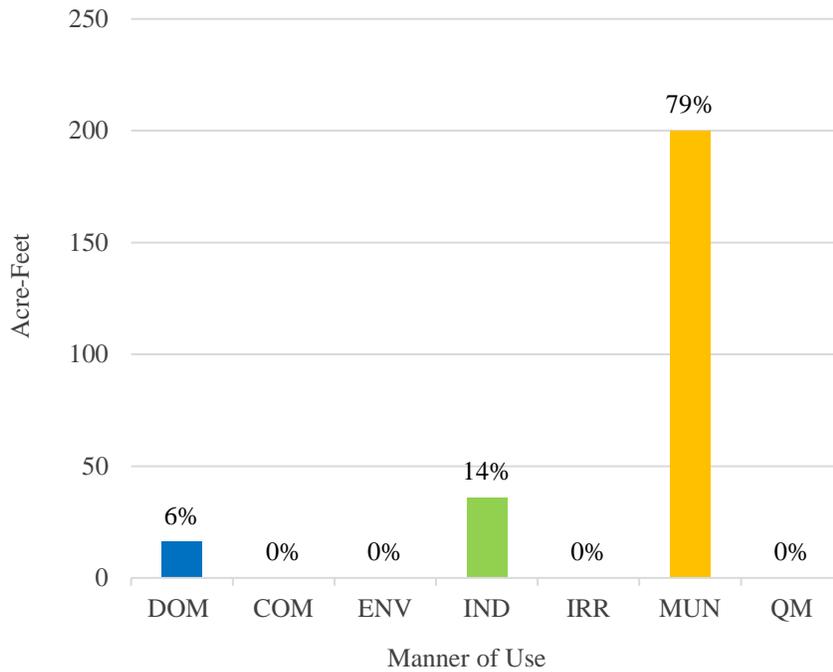


Figure 4. Percentage of 2016 groundwater pumpage by manner of use.

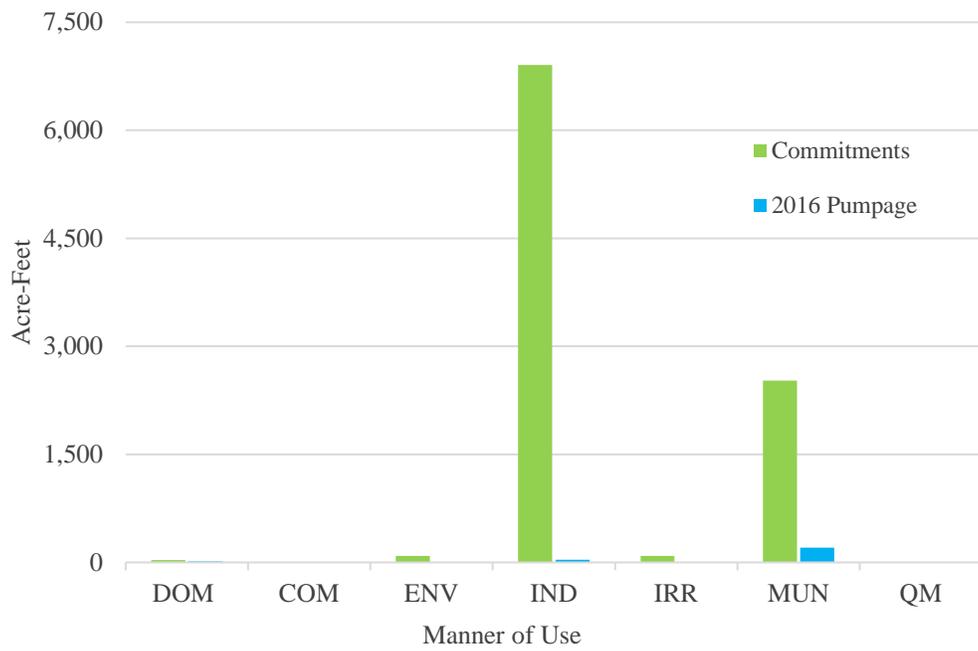


Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.

**APPENDIX A. CALIFORNIA WASH 2016 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
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- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
CALIFORNIA WASH, NO. 218
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
26371	Cert	Moapa Valley Water Company	NE	SW	25 14 65	90.00	0.00	0.00	No well visible, no use, house on city water same POD as 75198
50558	Permit	Nevada Power Company	NE	SW	05 15 66	28.97	ENV	0.00	
50559	Cert	Nevada Power Company	SE	SW	05 15 66	361.98	IND	35.94	
50560	Permit	Nevada Power Company	NE	SW	05 15 66	28.97	ENV	0.00	
57441E	Permit	Nevada Department of Transportation	SW	NE	02 15 66	32.59	ENV	0.00	
70257	Permit	Moapa Band of Paiute Indians	SE	NE	15 16 64	2500.00	MUN	136.62	POD = ECP-1 well
70258	Permit	Moapa Band of Paiute Indians	NE	NE	15 16 64	2500.00	MUN	0.00	POD = ECP-2 well
70259	Permit	Moapa Band of Paiute Indians	NE	NE	15 16 64	2500.00	MUN	29.48	POD = ECP-3 well
75198	Permit	Coyote Springs Investments LLC	NE	SW	25 14 65	25.00	MUN	0.00	No well visible, same POD as 26371
76643	Permit	Moapa Band of Paiute Indians	SW	NW	23 16 64	2500.00	MUN	33.87	POD = TH-1 well
							TOTAL	235.91	Permitted rights

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



CALIFORNIA WASH
HYDROGRAPHIC BASIN 13-218

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2017

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1427

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within California Wash, Hydrographic Basin 13-218, for calendar year 2017 (January 1, 2017 through December 31, 2017). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2017, the committed resource totaled 9,642 acre-feet, with estimated pumpage of approximately **88 acre-feet**. This figure includes an estimated 16 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2017, appropriations for municipal totaled 2,525 acre-feet and pumpage was 43 acre-feet. The second largest manner of use was industrial with appropriations totaling 6,905 acre-feet and pumpage of 29 acre-feet. The third largest manner of use was pumping by exempt domestic wells at 16 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the California Wash Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	218, REGION 13	
HYDROGRAPHIC BASIN NAME	CALIFORNIA WASH	
COUNTIES	CLARK	
MAJOR COMMUNITIES	MOAPA	
DESIGNATED	YES	
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION	
GROUNDWATER LEVEL MEASUREMENTS	NDWR	
PUMPAGE INVENTORY, ACRE-FEET IN 2017	88 ¹	
STATE ENGINEER'S ORDERS		
NO. 1026- DESIGNATION	DATE: APRIL 24, 1990	
COMMITTED GROUNDWATER RESOURCE ² : 9,642 ACRE-FEET	DATE: APRIL 2018	
ENVIRONMENTAL..... 90	INDUSTRIAL 6,905	IRRIGATION90
MUNICIPAL..... 2,525	DOMESTIC..... 32	

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2018. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 16 domestic wells existed in the basin during calendar year 2017. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 32 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within California Wash for calendar year 2017. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, as well as the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

California Wash is located in southeastern Nevada, approximately 55 miles north of Las Vegas, within Clark County, in the Colorado River Hydrographic Region (Figure 1). The basin is bounded by the Arrow Canyon Range to the northwest, the Dry Lake Range to the southwest, the Muddy Mountains to the southeast, and the North Muddy Mountains to the east. The adjacent Nevada hydrographic basins are Coyote Spring Valley (13-210) and Garnet Valley (13-216) to the west, Lower Moapa Valley (13-220) to the east, Muddy River Springs Area (13-219) and Lower Meadow Valley Wash (13-205) to the north, and Black Mountains Area (13-215) to the south.

GROUNDWATER LEVELS

Depths to groundwater in California Wash are not measured by NDWR, but are reported by other entities. The following are the site names and links to the data for active sites (Figure 2):

[218 S15 E65 09DDDD1](#)
[218 S16 E64 15AADD1](#)

[218 S15 E66 31DACA1](#)
[218 S16 E64 34CDBC1](#)

[218 S16 E64 02ABCD1](#)

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 is 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in California Wash, or 16 acre-feet.

TABLES

Table 1. California Wash historical pumpage (acre-feet) by calendar year.

YEAR	DOM	COM	ENV	IND	IRR	MUN	QM	TOTAL
2016	16	0	0	36	0	200	0	252
2017	16	0	0	29	0	43	0	88

FIGURES

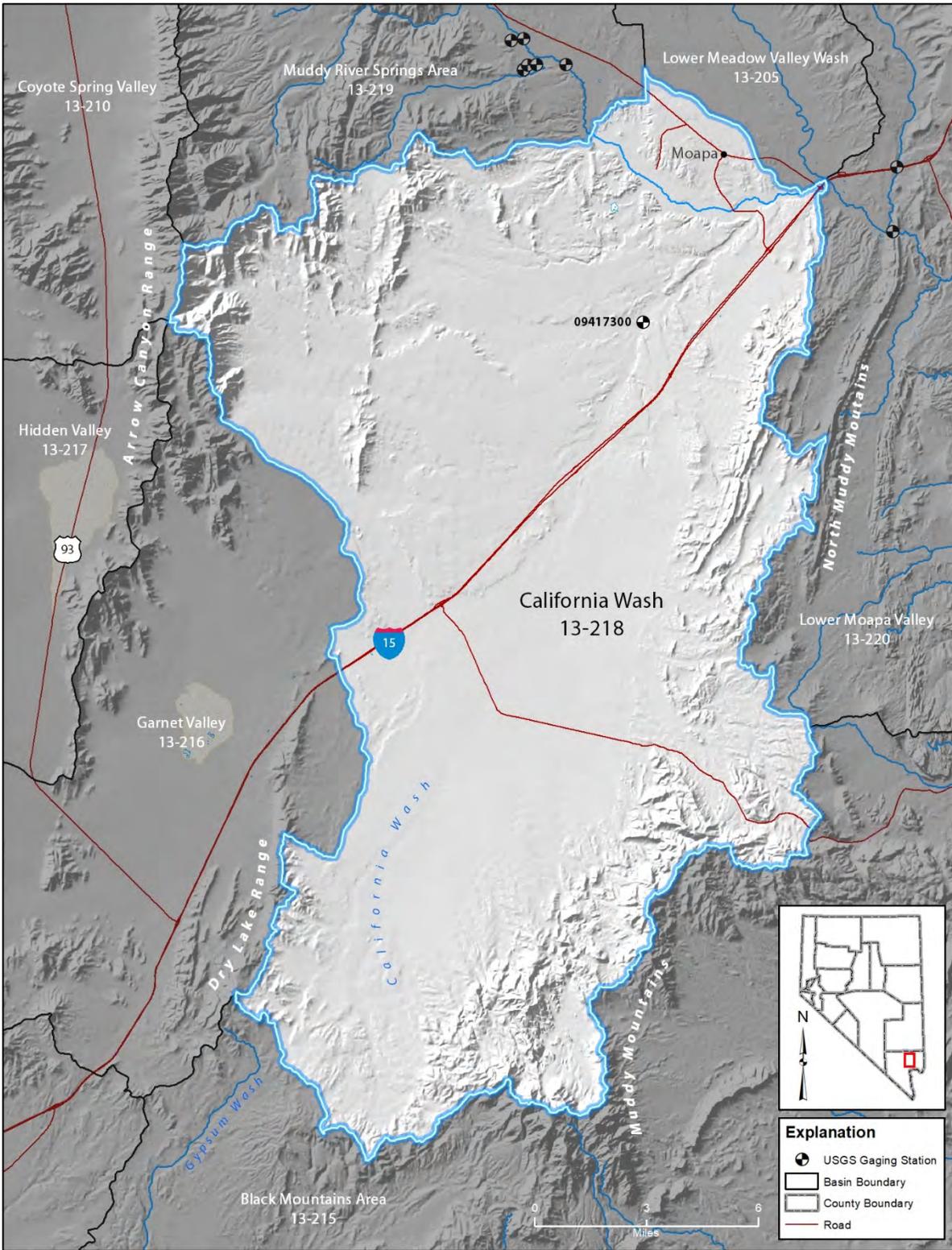


Figure 1. Physiographic map of California Wash (Hydrographic Basin 13-218).

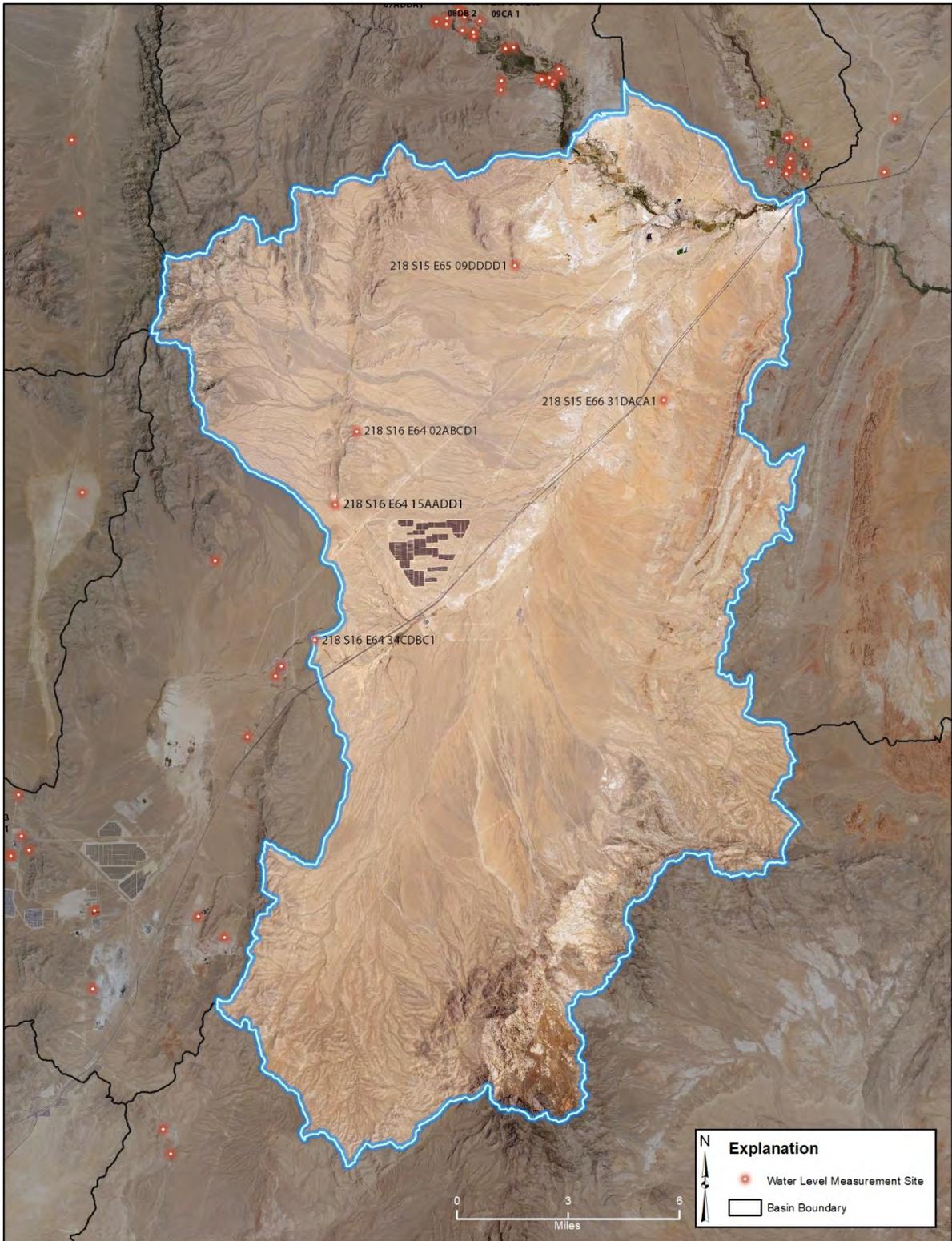


Figure 2. California Wash water level measurement sites.

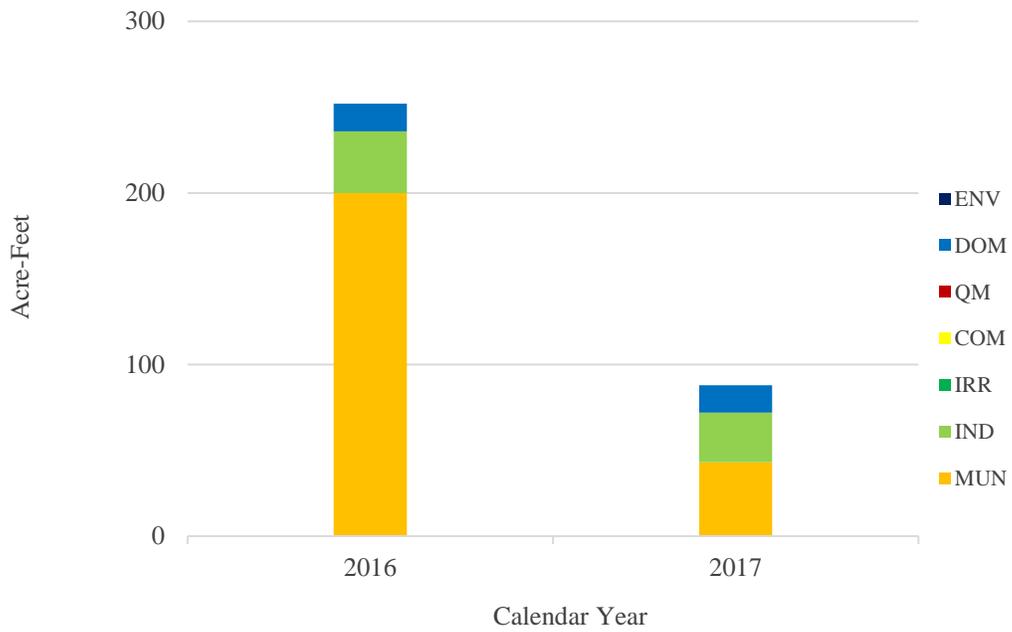


Figure 3. California Wash historical pumpage by manner of use.

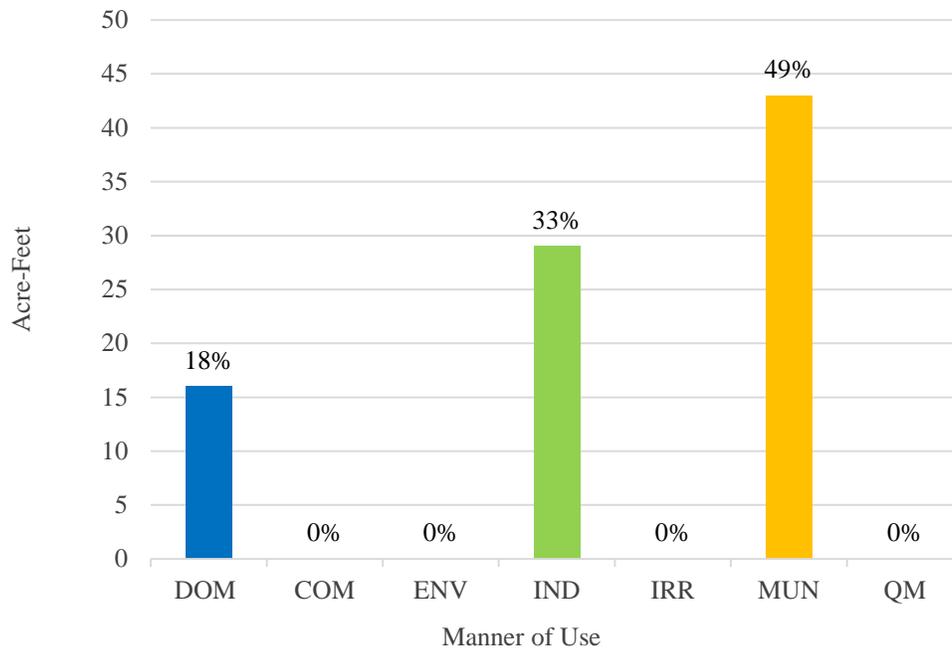


Figure 4. Percentage of 2017 groundwater pumpage by manner of use.

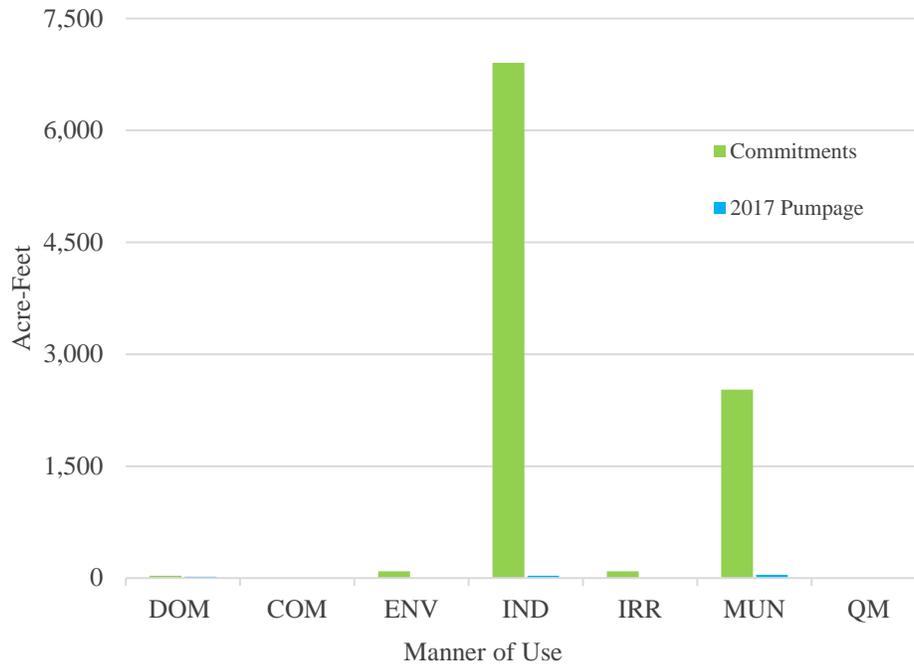


Figure 5. Comparison between 2017 groundwater commitments and estimated pumpage.

**APPENDIX A. CALIFORNIA WASH 2017 GROUNDWATER PUMPAGE BY
APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
CALIFORNIA WASH, NO. 218
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
26371	Cert	Moapa Valley Water Company	NE	SW	25 14 65	90.00	0.00	0.00	No well visible, no use, house on city water same POD as 75198
50558	Permit	Nevada Power Company	NE	SW	05 15 66	28.97	ENV	0.00	
50559	Cert	Nevada Power Company	SE	SW	05 15 66	361.98	IND	28.97	
50560	Permit	Nevada Power Company	NE	SW	05 15 66	28.97	ENV	0.00	
57441E	Permit	Nevada Department of Transportation	SW	NE	02 15 66	32.59	ENV	0.00	
70257	Permit	Moapa Band of Paiute Indians	SE	NE	15 16 64	2500.00	MUN	12.82	POD = ECP-1 well
70258	Permit	Moapa Band of Paiute Indians	NE	NE	15 16 64	2500.00	MUN	0.00	POD = ECP-2 well
70259	Permit	Moapa Band of Paiute Indians	NE	NE	15 16 64	2500.00	MUN	0.00	POD = ECP-3 well
75198	Permit	Coyote Springs Investments LLC	NE	SW	25 14 65	25.00	MUN	0.00	No well visible, same POD as 26371
76643	Permit	Moapa Band of Paiute Indians	SW	NW	23 16 64	2500.00	MUN	30.06	POD = TH-1 well
							TOTAL	71.85	Permitted rights

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



MUDDY RIVER SPRINGS AREA (UPPER MOAPA VALLEY)
HYDROGRAPHIC BASIN 13-219

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2016

Field Investigated by: Christi Cooper and John Guillory, P.E.
Report Prepared by: Christi Cooper

SE ROA 1441

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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Muddy River Springs Area, Hydrographic Basin 13-219, for calendar year 2016 (January 1, 2016 through December 31, 2016). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2016, the committed resource totaled 16,632 acre-feet, with estimated pumpage of approximately **4,048 acre-feet**. This figure includes an estimated 44 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2016, appropriations for municipal totaled 6,792 acre-feet and pumpage was 2,795 acre-feet. The second largest manner of use was industrial with appropriations totaling 9,234 acre-feet and pumpage of 941 acre-feet. The third largest manner of use was irrigation with appropriations totaling 476 acre-feet and pumpage of 248 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells at 44 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the Muddy River Springs Area Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	219, REGION 13
HYDROGRAPHIC BASIN NAME	MUDDY RIVER SPRINGS AREA (UPPER MOAPA V.)
COUNTIES	CLARK, LINCOLN
MAJOR COMMUNITIES	MOAPA, OVERTON
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR
PUMPAGE INVENTORY, ACRE-FEET IN 2016	4,048 ¹

STATE ENGINEER'S ORDERS

[NO. 1023- DESIGNATION](#)

DATE: APRIL 24, 1990

COMMITTED GROUNDWATER RESOURCE²: 16,632 ACRE-FEET

DATE: APRIL 2017

COMMERCIAL 37	INDUSTRIAL 9,234	IRRIGATION 476
QUASI-MUNICIPAL 5	MUNICIPAL 6,792	DOMESTIC 88

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2017. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 44 domestic wells existed in the basin during calendar year 2016. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 88 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Muddy River Springs Area for calendar year 2016. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Muddy River Springs Area (Upper Moapa V.) is located in south eastern Nevada, approximately 58 miles north of Las Vegas. The basin lies within Clark and Lincoln Counties, in the Colorado River Hydrographic Region. (Figure 1). The basin is bounded by the Arrow Canyon Range to the southwest and the Meadow Valley Mountains to the north. The adjacent Nevada hydrographic basins are Coyote Spring Valley (13-210) to the west, Lower Meadow Valley Wash (13-205) to the east, and California Wash (13-218) to the south.

GROUNDWATER LEVELS

Depths to groundwater in Muddy River Springs Area have been measured by the Nevada Division of Water Resources consistently since the mid 1950's. Additional groundwater level data measured by multiple agencies are reported to NDWR. The following are the site names and links to the data for active sites (Figure 2):

219 S14 E65 23BB 1	219 S14 E65 21AB 1	219 S14 E65 23BB 2
219 S14 E65 08DB 2	219 S14 E65 08AB 1	219 S14 E65 09CA 1
219 S14 E65 14CD 1	219 S14 E65 14CDBB1	219 S14 E65 23BBBB1
219 S14 E65 21ACAA1	219 S14 E65 08BDCC1	219 S14 E65 16AACD1
219 S14 E65 15BBCA1	219 S14 E65 09CCBC1	219 S14 E65 08ABBD1
219 S14 E65 08ADBB1	219 S14 E65 08BDBD1	219 S14 E65 09CBCC1
219 S14 E65 22AABB1	219 S14 E65 22AABB2	210 S13 E64 31DAAD1
219 S13HE64 33DBBC1	219 S14 E65 07ADDA1	219 S14 E65 07ADDA2
219 S13 E64 35DCAD1		

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 is 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Muddy River Springs Area, or 44 acre-feet.

TABLES

Table 1. Muddy River Springs Area historical pumpage (acre-feet) by calendar year.

YEAR	DOM	COM	ENV	IND	IRR	MUN	QM	TOTAL
2016	44	20	0	941	248	2795	0	4,048

FIGURES

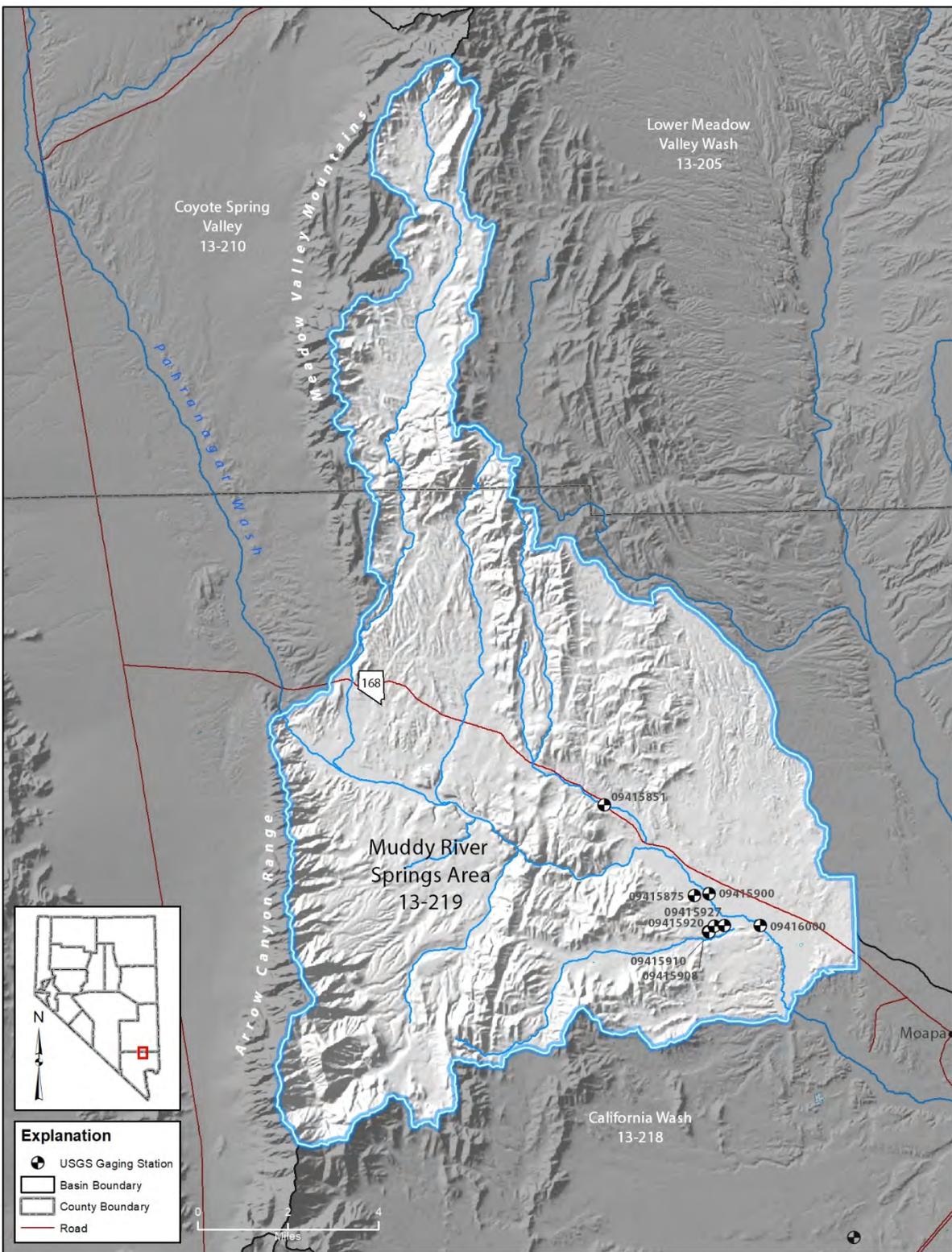


Figure 1. Physiographic map of Muddy River Springs Area (Hydrographic Basin 13-219).

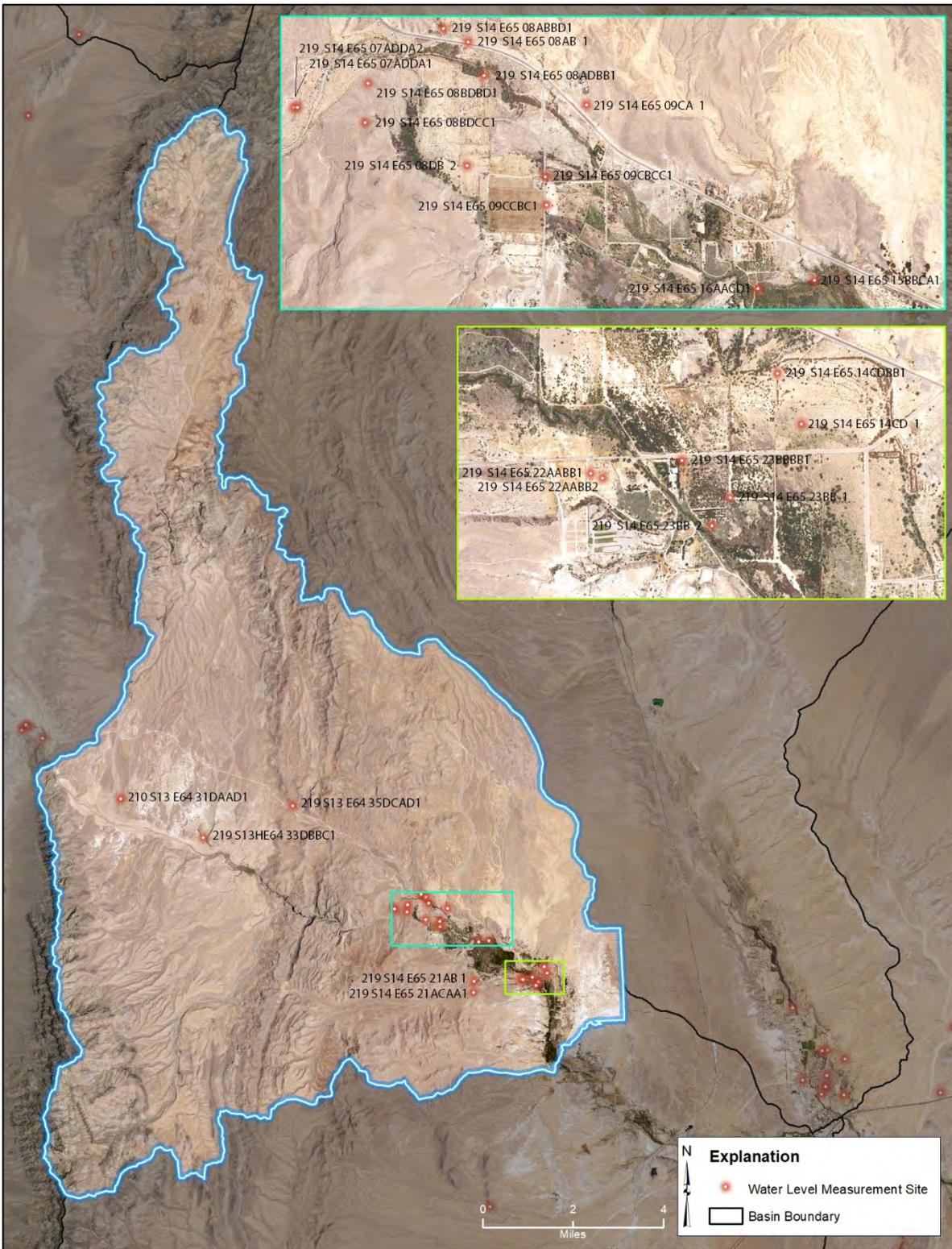


Figure 2. Muddy River Springs Area water level measurement sites.

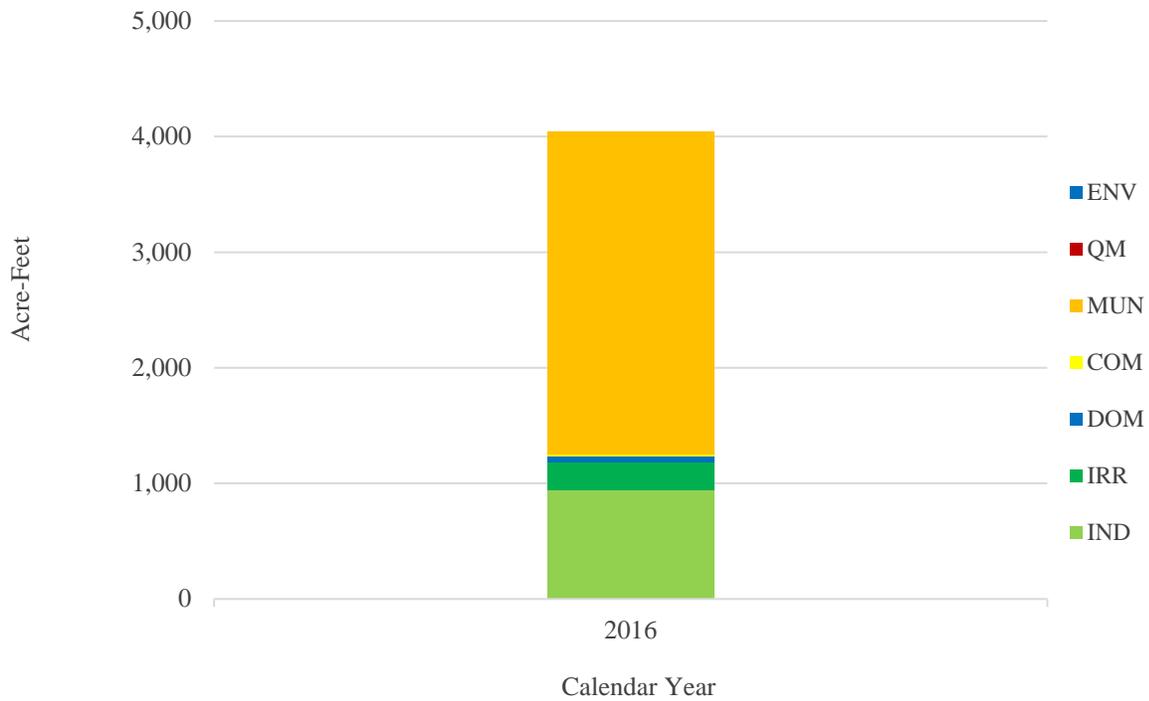


Figure 3. Muddy River Springs Area historical pumpage by manner of use.

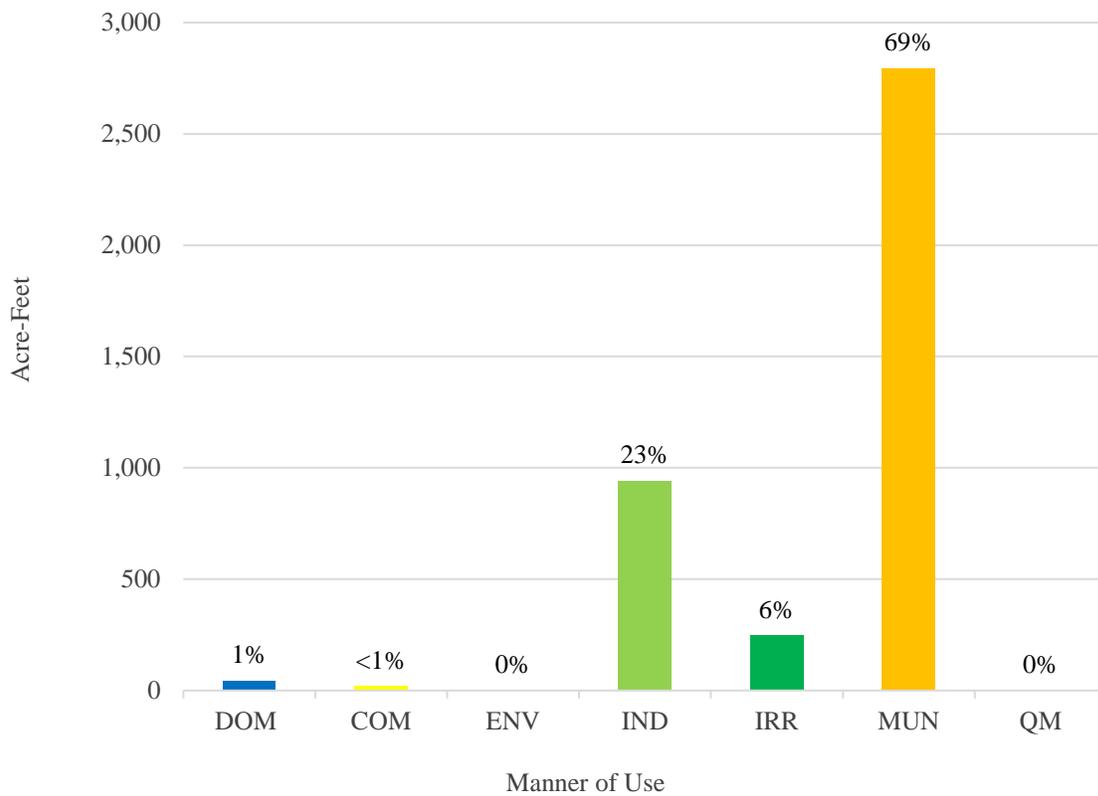


Figure 4. Percentage of 2016 groundwater pumpage by manner of use.

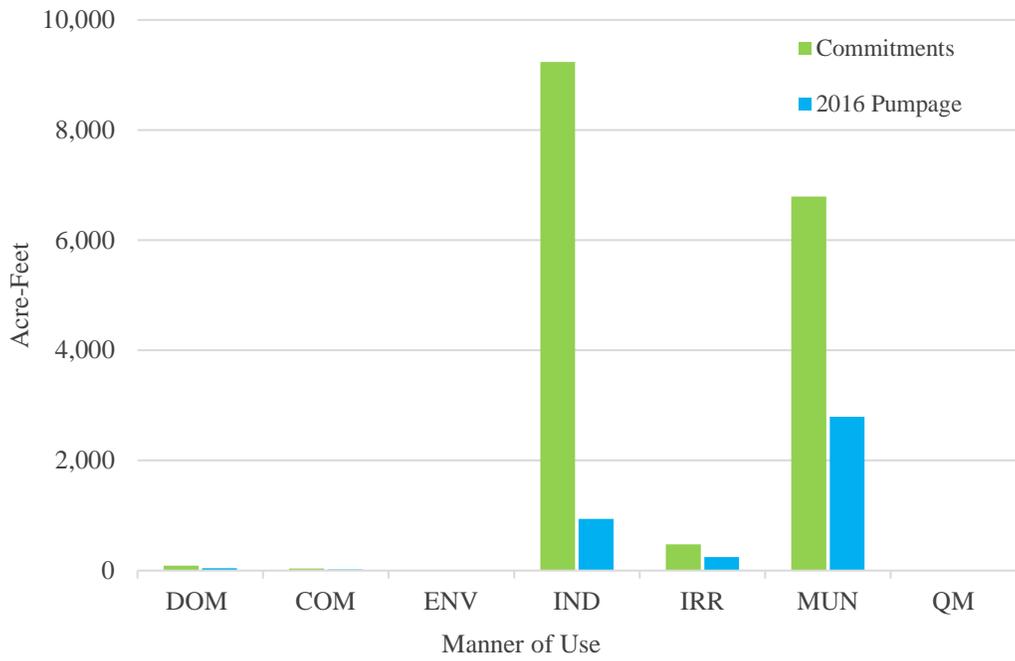


Figure 5. Comparison between 2016 groundwater commitments and estimated pumpage.

**APPENDIX A. MUDDY RIVER SPRINGS AREA 2016 GROUNDWATER PUMPAGE
BY APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
18437	Cert	Coyote Springs Investment LLC	SE	SE	09 14 65	15.11	0.00	1.00	Total is Water Year Duty = 20.15 No mtr, No irr use, Domestic credit
21466	Cert	Casa De Warm Springs LLC	SE	SE	08 14 65	36.64	25.00	156.67	Total is Water Year Duty = 183.20 Wheel line, Alfalfa, NIWR = 4.7
22632 22952 85156	Cert Cert Permit	Nevada Power Company	NW	SE	08 14 65	315.00 433.00 322.17	IND	411.72	POD = Lewis 5 well
22633 22950 80844	Cert Cert Permit	Nevada Power Company	SW	NE	08 14 65	297.50 433.00 322.17	IND	196.07	POD = Lewis 3 well
22635 22949 25310 80843	Cert Cert Cert Permit	Nevada Power Company	SE	NE	08 14 65	25.00 433.00 160.00 322.17	IND	0.00	POD = Lewis 2 well
22636 22951 80846	Cert Cert Permit	Nevada Power Company	NW	SE	08 14 65	260.00 433.00 322.17	IND	53.12	POD = Lewis 4 well
22738	Cert	Davis, Don & Marsha	NE	NE	22 14 65	18.81	COM	18.81	Palm Creek Ranch, no mtr

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
24185	Cert	Nevada Power Company	NW	NE	08 14 65	433.00	IND	0.00	POD = Lewis 1 well
24186	Cert					310.00			
80845	Permit					322.17			
27216	Cert	United States of America	NW	SE	16 14 65	1.38	COM	1.38	USFWS property, Mtr S/N 0004327 RD - 1662730 - 8/17/16
29296	Cert	Nevada Power Company	NW	NW	23 14 65	300.00	IND	0.06	POD = Behmer well
29298	Cert					327.50			
38871	Cert	Egtedar, Ascar	NW	NW	23 14 65	15.00	10.00	7.71	Total is Water Year Duty = 75.00, POD = Behmer well Pistachio Trees 8/17/16 See field sheet for mtr readings
46932	Permit	Moapa Valley Water District	NE	NE	35 13 64	1000.15	MUN	0.00	POD = MX-6 well
50272	Cert	Nevada Power Company	NE	NE	22 14 65	99.51	IND	3.50	POD = Perkins well
50273	Cert					289.91			
50275	Cert					32.88			
50934	Cert					55.40			
79068	Permit					432.70			
50723	Cert	L.D.S. Church	NW	NW	15 14 65	88.00	IND	0.00	POD = LDS East well
50731	Cert								
50724	Cert	L.D.S. Church	SW	SW	9 14 65	162.55	IND	216.08	POD = LDS West well
50725	Cert					65.00			
50726	Cert					65.00			
50727	Cert					60.00			
50728	Cert					158.00			
50729	Cert					120.00			
50730	Cert					<u>25.00</u>			
						655.55	Total		

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
50732	Cert	L.D.S. Church	NE	NE	16 14 65	930.00	IND	60.37	POD = LDS Cental well
50733	Cert					<u>70.00</u>			
						1000.00 Total			
50851	Cert	Clark County	NW	NW	23 14 65	5.00	5.00	7.56	Total is Water Year
64840	Cert					3.33	0.00		POD = GM Perkins well 50851 & 64840 have same POD Different POU TCD = 49.8 AFA See field sheet for mtr readings
52520	Permit	Moapa Valley Water District	SE	NE	7 14 65	1447.94	MUN	2260.00	POD = Arrow Canyon well 1
55450	Permit					2171.91			
58269	Permit					0.00			
59253	Cert	Leavitt, Ute	SW	NE	23 14 65	8.78	4.40	18.77	Total is Water Year 59253, 59256, 59257, 63504 have same POD Duty = 43.875 AFA Low Managed Pasture Grass, NIWR = 3.2
59256	Cert	Witmore, Dan	SW	NE	23 14 65	5.78	2.89	12.33	Total is Water Year 59253, 59256, 59257, 63504 have same POD Duty = 28.875 AFA Low Managed Pasture Grass, NIWR = 3.2
59257	Cert	Brundy, Larry	SW	NE	23 14 65	3.00	1.50	6.40	Total is Water Year 59253, 59256, 59257, 63504 have same POD Duty = 15.0 AFA Low Managed Pasture Grass, NIWR = 3.2
61427	Permit	S & R, Inc	SE	SW	9 14 65	1.35	COM	0.00	No mtr., well visable, no use, 8/17/16
63504	Cert	Kolhoss, Kelly	SW	NE	23 14 65	3.00	1.50	6.40	Total is Water Year 59253, 59256, 59257, 63504 have same POD Duty = 15.0 AFA Low Managed Pasture Grass, NIWR = 3.2

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2016**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
66043	Permit	Moapa Valley Water	SE	NE	7 14 65	2533.90	MUN	535.11	POD = Arrow Canyon well 2
70520 86209	Permit RFA	3335 Hillside LLC	NE	NE	22 14 65	7.06	0.00	0.00	Total is Water Year Duty = 14.01 AFA moving 70520 to same POD as 71766 No well at POD 70520
71026 71344	Cert Cert	Billy and Linda Parson	SE	SE	9 14 65	3.99 6.07	1.50 3.00	10.06	Total is Water Year 71026 & 71344 have same POD TCD = 10.06 AFA Low Managed Pasture Grass, NIWR = 3.2
71766	Permit	3335 Hillside LLC	NE	NE	22 14 65	4.26	4.26	21.28	Total is Water Year Same POD as 86209 Duty = 21.289 AFA Same POU as 70520 & 86209
75161E	Permit	Nevada Power	NW	NW	23 14 65	905.81	ENV	0.00	No use per NVE 4-6-17
77381 77382	Permit Permit	William O'Donnell	NE	NW	9 14 65	6.07 9.22	COM COM	0.00 0.00	77381 & 77382 same POD & POU TCD = 15.29 AFA Property vacant, no building, no use 8/17/16
82096 82097	Permit Permit	Mary K Cloud	NW	NE	26 14 65	1.90 2.89	QM	0.00	82096 & 82097 same POD & POU TCD = 4.794 AFA Well visible, no meter, no works 8/17/16
TOTAL								4004.40	Permitted rights

Verified with field notes: Christie Cooper

**APPENDIX B. MUDDY RIVER SPRINGS AREA 2016 GROUNDWATER PUMPAGE
FIELD NOTES.**

2016

Muddy River Springs Area
(Upper Moapa Valley)
No. 219

Inventory Field Notes

Compiled by:
Christi Cooper & John Guillory, P.E.

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 18437

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

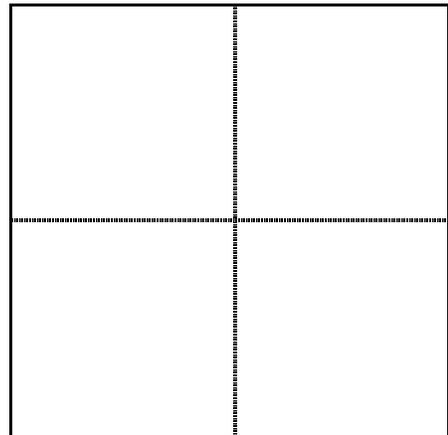
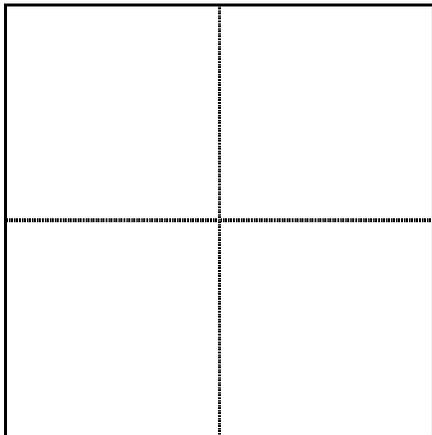
ACRES IRR: 0

BENEFICIAL USE: YES NO PORTION ALL TYPE _____

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: No meter, no irrigation use, house vacant. Domestic Credit.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 21466

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

ACRES IRR: 25

BENEFICIAL USE: YES NO

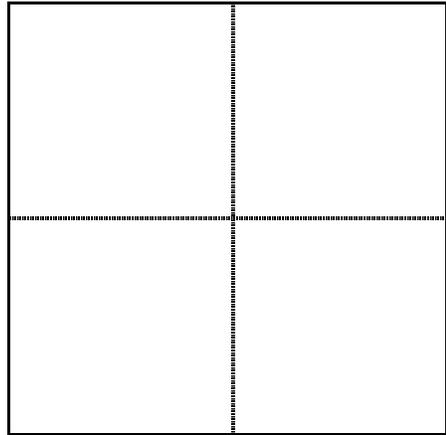
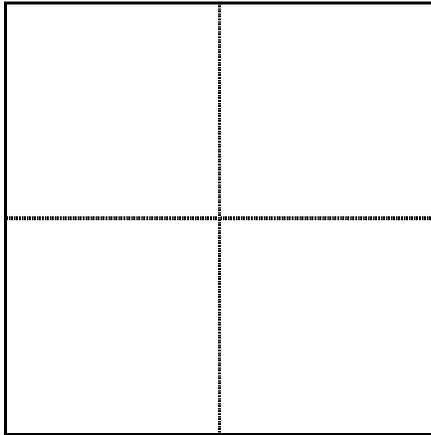
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: No meter on well.

Alfalfa, wheel line.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 38871

WELL: YES NO

METER SER NO: G-02825

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

ACRES IRR: 10

BENEFICIAL USE: YES NO

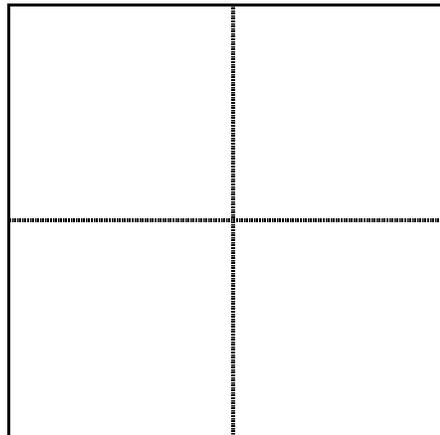
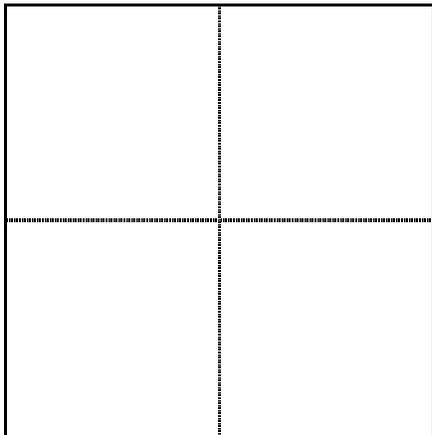
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Pistachio Trees.

RD - 26975400 on 12/27/16, RD - 24462300 on 12/28/15

SIGNATURE: Christie Cooper

DATE: 8/17/2016

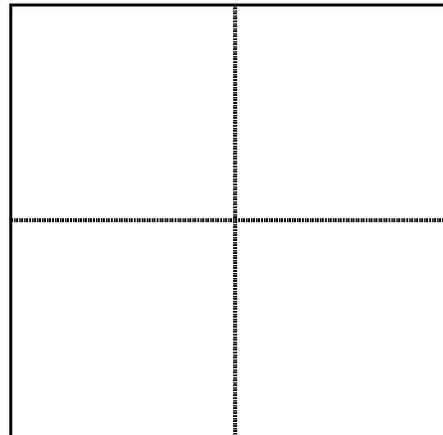
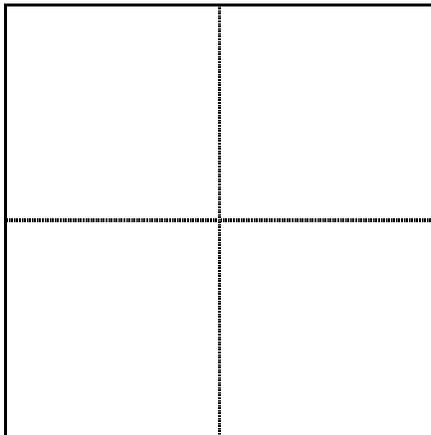
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 50851 & 64840
WELL: YES NO METER SER NO: _____
PUMP: YES NO PUMP TYPE: _____
MOTOR: YES NO MOTOR TYPE: _____
METER: YES NO METER READ: _____
PHOTO: YES NO ACRES IRR: 5.0
BENEFICIAL USE: YES NO PORTION ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: RD - 30173600 on 12/27/16, RD - 27710600 gallons on 12/28/16

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 59253

WELL: YES NO

METER SER NO: 12-00907-04

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: 478982 X 0.001 AF

PHOTO: YES NO

ACRES IRR: 4.4

BENEFICIAL USE: YES NO

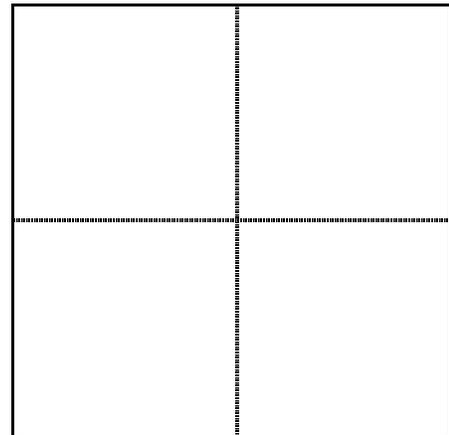
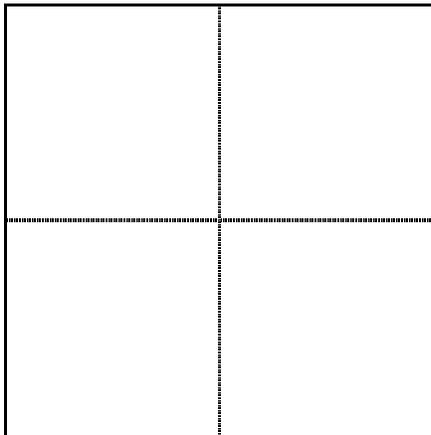
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59256, 59257 & 63504

McCrometer S/N 12-00907-04, RD - 478982 X 0.001 AF.

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 59256

WELL: YES NO

METER SER NO: 12-00907-04

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: 478982 X 0.001 AF

PHOTO: YES NO

ACRES IRR: 2.89

BENEFICIAL USE: YES NO

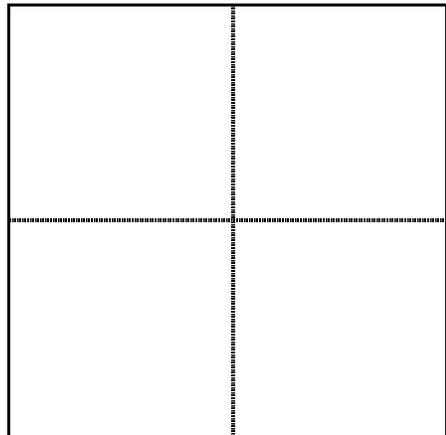
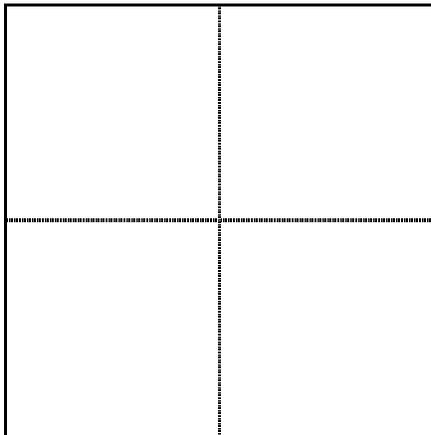
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59253, 59257 & 63504.

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 59257

WELL: YES NO

METER SER NO: 12-00907-04

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: 478982 X 0.001 AF

PHOTO: YES NO

ACRES IRR: 1.5

BENEFICIAL USE: YES NO

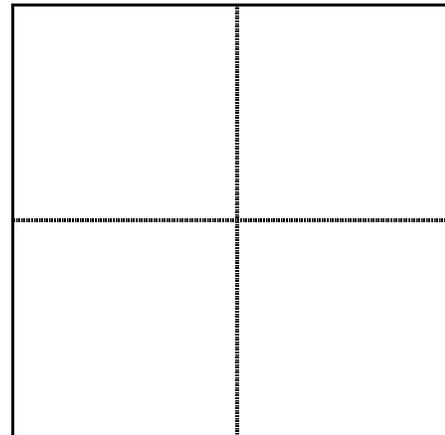
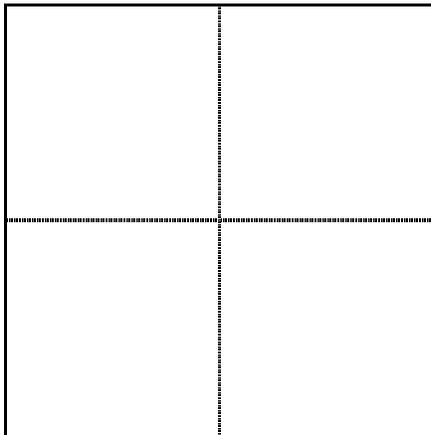
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59253, 59256 & 63504.

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 63504

WELL: YES NO

METER SER NO: 12-00907-04

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: 478982 X 0.001 AF

PHOTO: YES NO

ACRES IRR: 1.5

BENEFICIAL USE: YES NO

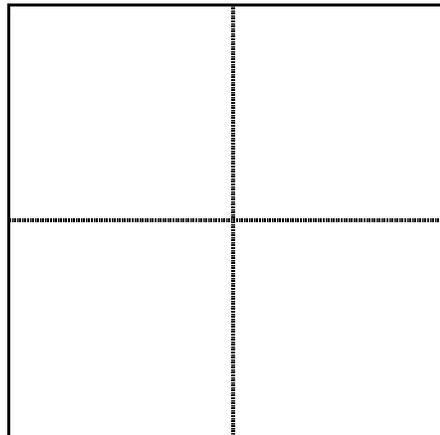
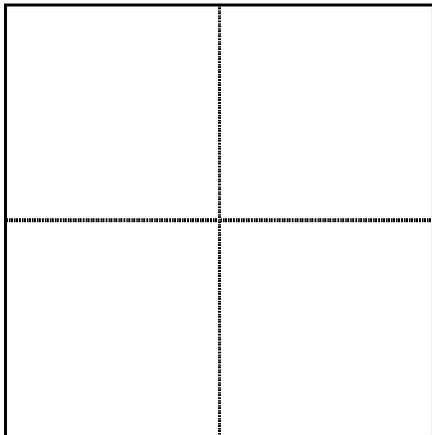
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Sprinkler, low managed pasture grass.

Same POD as 59253, 59256 & 59257.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 70520

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

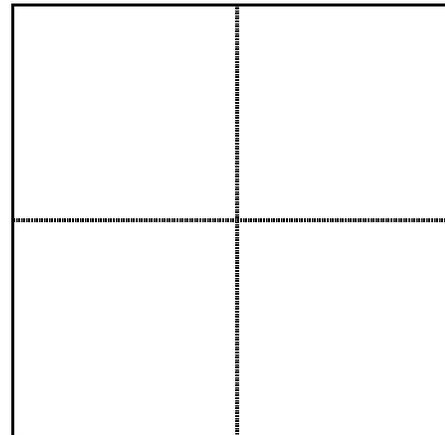
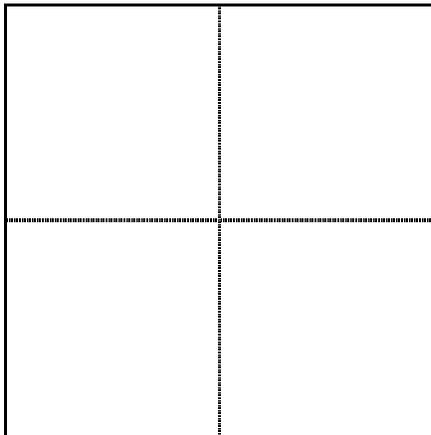
ACRES IRR: _____

BENEFICIAL USE: YES NO PORTION ALL TYPE _____

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

1/4 1/4 SEC

1/4 1/4 SEC



REMARKS: No well at POD

SIGNATURE: Christie Cooper

DATE: 8/17/2016

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 71026 & 71344

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: 41928300

PHOTO: YES NO

ACRES IRR: 4.5

BENEFICIAL USE: YES NO

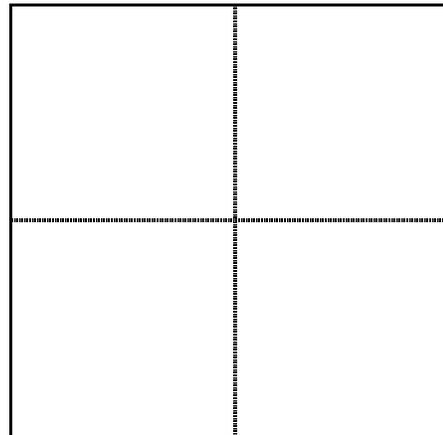
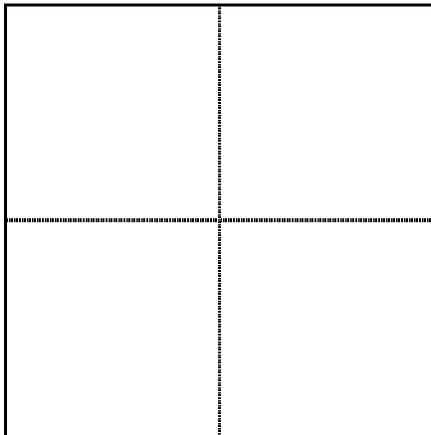
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: DLJ meter, RD- 41928300 gallons on 8/17/16

SIGNATURE: Christie Cooper

DATE: 8/17/2016

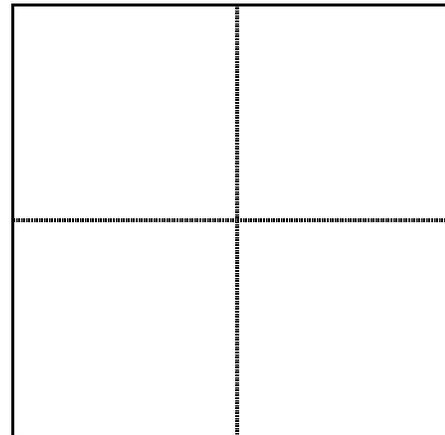
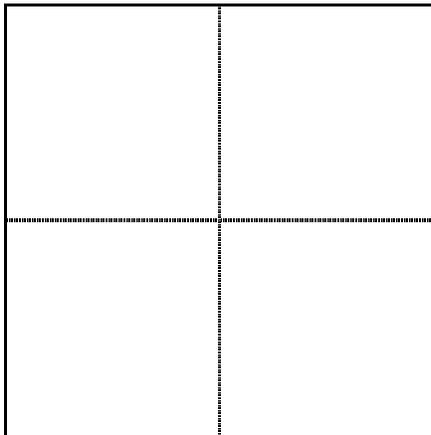
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 71776 & 86209
WELL: YES NO METER SER NO: 14018933
PUMP: YES NO PUMP TYPE: _____
MOTOR: YES NO MOTOR TYPE: _____
METER: YES NO METER READ: 11161000
PHOTO: YES NO ACRES IRR: 4.26
BENEFICIAL USE: YES NO PORTION ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: DLJ meter S/N 14018933, RD - 01161000 gallons on 8/17/16

Commercial tree nursery. Palm, pine, fig, and pomegranate trees. Drip irrigation.

SIGNATURE: Christie Cooper

DATE: 8/17/2016

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES

JASON KING, P.E.
STATE ENGINEER



MUDDY RIVER SPRINGS AREA (UPPER MOAPA VALLEY)
HYDROGRAPHIC BASIN 13-219

GROUNDWATER PUMPAGE INVENTORY

CALENDAR YEAR 2017

Field Investigated by: Christi Cooper
Report Prepared by: Christi Cooper

SE ROA 1471

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PURPOSE AND SCOPE.....	3
DESCRIPTION OF THE STUDY AREA	3
GROUNDWATER LEVELS	3
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ABSTRACT

This inventory represents the status and usage of all permitted, certificated, claims of vested right groundwater rights, and exempt domestic wells located within Muddy River Springs Area, Hydrographic Basin 13-219, for calendar year 2017 (January 1, 2017 through December 31, 2017). Also included are tables, graphs and data associated with this use.

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 continual basis.

For calendar year 2017, the committed resource totaled 16,632 acre-feet, with estimated pumpage of approximately **3,553 acre-feet**. This figure includes an estimated 44 acre-feet pumped from exempt domestic wells.

Municipal is the largest manner of use within the basin. For calendar year 2017, appropriations for municipal totaled 6,792 acre-feet and pumpage was 2,824 acre-feet. The second largest manner of use was industrial with appropriations totaling 9,234 acre-feet and pumpage of 535 acre-feet. The third largest manner of use was irrigation with appropriations totaling 476 acre-feet and pumpage of 115 acre-feet. The fourth largest manner of use was pumping by exempt domestic wells at 44 acre-feet.

In January 2014, State Engineer's Rulings 6254 through 6260 found that Coyote Spring Valley (Hydrographic Basin 13-210), Garnet Valley (13-216), Hidden Valley (13-217), California Wash (13-218), Muddy River Springs Area (13-219), and the northwestern portion of Black Mountains Area (13-215) share a unique and close hydrologic connection and in the future should be jointly managed. Consistent with the joint management of these hydrographic basins, the State Engineer has allowed changes in points of diversion between them, a practice not allowed in separately-managed basins. However, this pumpage inventory only includes details on groundwater pumping from the Muddy River Springs Area Hydrographic Basin.

HYDROGRAPHIC BASIN SUMMARY

HYDROGRAPHIC BASIN NUMBER	219, REGION 13
HYDROGRAPHIC BASIN NAME	MUDDY RIVER SPRINGS AREA (UPPER MOAPA V.)
COUNTIES	CLARK, LINCOLN
MAJOR COMMUNITIES	MOAPA, OVERTON
DESIGNATED	YES
DENIALS BASED UPON WATER AVAILABILITY	IRRIGATION
GROUNDWATER LEVEL MEASUREMENTS	NDWR
PUMPAGE INVENTORY, ACRE-FEET IN 2017	3,553 ¹

STATE ENGINEER'S ORDERS

[NO. 1023- DESIGNATION](#)

DATE: APRIL 24, 1990

COMMITTED GROUNDWATER RESOURCE²: 16,632 ACRE-FEET

DATE: APRIL 2018

COMMERCIAL 37	INDUSTRIAL 9,234	IRRIGATION 476
QUASI-MUNICIPAL 5	MUNICIPAL 6,792	DOMESTIC 88

¹ Includes pumpage by exempt domestic wells, as defined by NRS 534.013.

² Committed groundwater resource data are accurate for April 2018. Manner of use category totals vary over time, as rights are not necessarily static. Rights may be subject to change applications, certification, withdrawals, forfeiture and cancellations; each of these circumstances could affect the duty, diversion rate and acreage associated with a given right. The value associated with each manner of use category does not include those portions that have been relinquished in support of domestic wells. A query of the NDWR Well Log Database indicates that 44 domestic wells existed in the basin during calendar year 2017. This query is assumed to represent both appropriations and exempt domestic wells. The committed domestic water resource is considered to be 2 acre-feet per domestic well, or 88 acre-feet annually.

PURPOSE AND SCOPE

The purpose of this report is to inventory all of the groundwater resources allocated and described by the Office of the State Engineer, Nevada Division of Water Resources (NDWR), and to estimate the amount of groundwater pumped within Muddy River Springs Area for calendar year 2017. This report estimates the amount of groundwater pumped under the permits and certificates issued by the State Engineer, claims of vested right, and the amount pumped by exempt domestic wells within the basin.

DESCRIPTION OF THE STUDY AREA

Muddy River Springs Area (Upper Moapa V.) is located in south eastern Nevada, approximately 58 miles north of Las Vegas. The basin lies within Clark and Lincoln Counties, in the Colorado River Hydrographic Region. (Figure 1). The basin is bounded by the Arrow Canyon Range to the southwest and the Meadow Valley Mountains to the north. The adjacent Nevada hydrographic basins are Coyote Spring Valley (13-210) to the west, Lower Meadow Valley Wash (13-205) to the east, and California Wash (13-218) to the south.

GROUNDWATER LEVELS

Depths to groundwater in Muddy River Springs Area have been measured by the Nevada Division of Water Resources consistently since the mid 1950's. Additional groundwater level data measured by multiple agencies are reported to NDWR. The following are the site names and links to the data for active sites (Figure 2):

219 S14 E65 23BB 1	219 S14 E65 21AB 1	219 S14 E65 23BB 2
219 S14 E65 08DB 2	219 S14 E65 08AB 1	219 S14 E65 09CA 1
219 S14 E65 14CD 1	219 S14 E65 14CDBB1	219 S14 E65 23BBBB1
219 S14 E65 21ACAA1	219 S14 E65 08BDCC1	219 S14 E65 16AACD1
219 S14 E65 15BBCA1	219 S14 E65 09CCBC1	219 S14 E65 08ABBD1
219 S14 E65 08ADBB1	219 S14 E65 08BDBD1	219 S14 E65 09CBCC1
219 S14 E65 22AABB1	219 S14 E65 22AABB2	210 S13 E64 31DAAD1
219 S13HE64 33DBBC1	219 S14 E65 07ADDA1	219 S14 E65 07ADDA2
219 S13 E64 35DCAD1		

Groundwater level data are also collected by the U.S. Geological Survey (USGS) and may be accessed through their website (<http://nevada.usgs.gov/>).

METHODS TO ESTIMATE PUMPAGE

One of the purposes of this report is to estimate the amount of groundwater pumped under vested claims, permits and certificates issued by the State Engineer, as well as the amount pumped by the exempt domestic wells in the valley. Table 1 and Figure 3 show historical pumpage by manner of use; Figure 4 shows the percentage of water pumped by manner of use; and Figure 5 compares groundwater commitments and estimated pumpage by manner of use. 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 is 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/Evapotranspiration.aspx>.
- Where meters were not present, previous data were not available, and the manner of use was not irrigation, pumpage was estimated by applying the annual duty associated with the certificate (if the water right was perfected), permit or claim, if the use was as described in the certificate, permit or claim. If the use was not as described in the certificate, permit or claim, a value was estimated based upon the circumstances of use for the subject year.
- Exempt domestic wells may be drilled and utilized where water service from a purveyor is not available. These types of wells do not require a permit from the State Engineer if they do not pump more than 2 acre-feet per year as provided by Nevada Revised Statutes (NRS) [534.180](#). [NRS 534.013](#) defines this category of domestic use as follows: “*Domestic use or domestic purposes extends to culinary and household purposes directly related to a single family dwelling, including, without limitation, the watering of a family garden and lawn and the watering of livestock and any other domestic animals or household pets.*” The number of exempt domestic wells in the basin was determined by a query of the NDWR Well Log Database. The amount of water pumped annually by exempt domestic wells is estimated to be 1 acre-foot per well in Muddy River Springs Area, or 44 acre-feet.

TABLES

Table 1. Muddy River Springs Area historical pumpage (acre-feet) by calendar year.

YEAR	DOM	COM	ENV	IND	IRR	MUN	QM	TOTAL
2016	44	20	0	941	248	2795	0	4,048
2017	44	33	0	535	115	2824	2	3,553

FIGURES

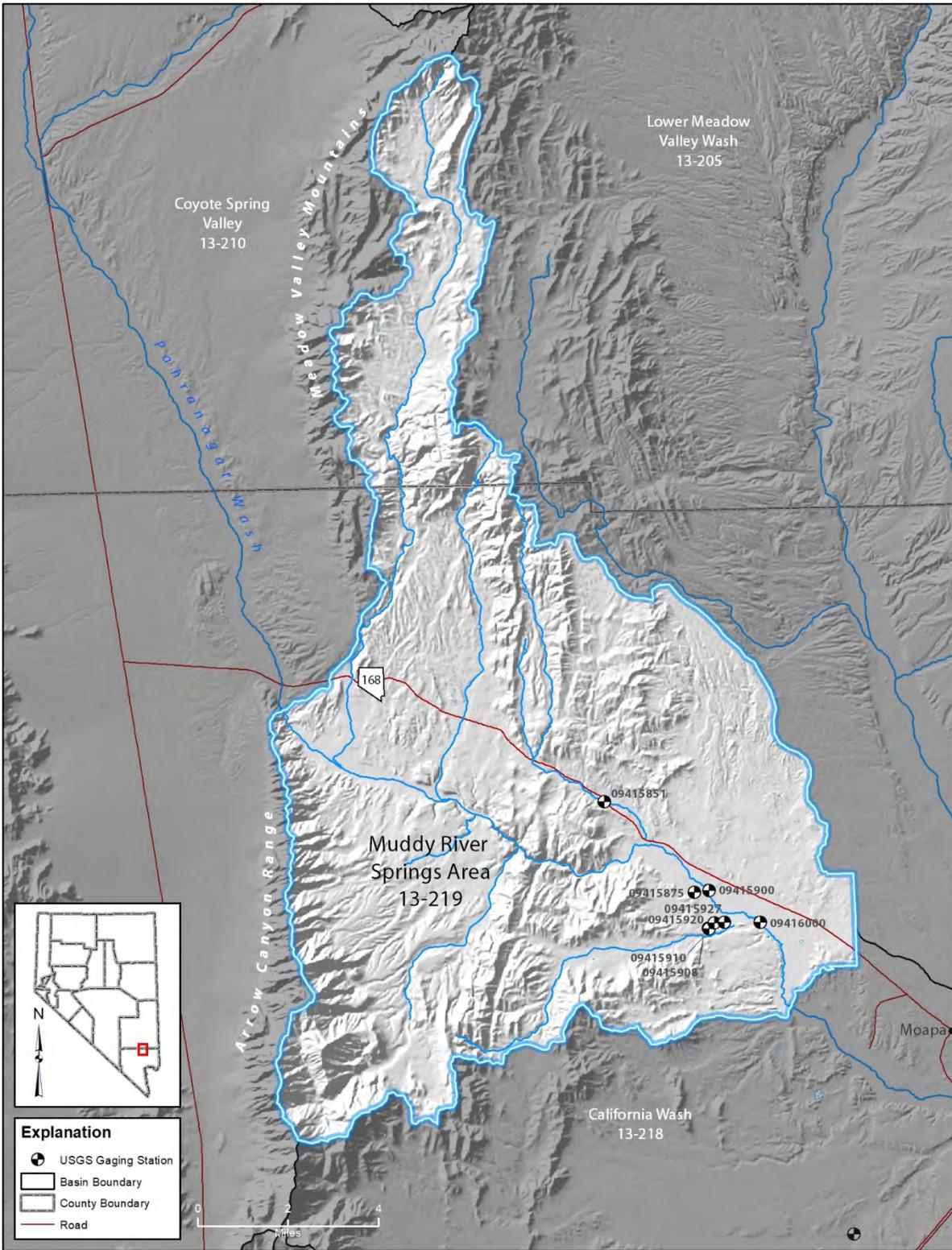


Figure 1. Physiographic map of Muddy River Springs Area (Hydrographic Basin 13-219).

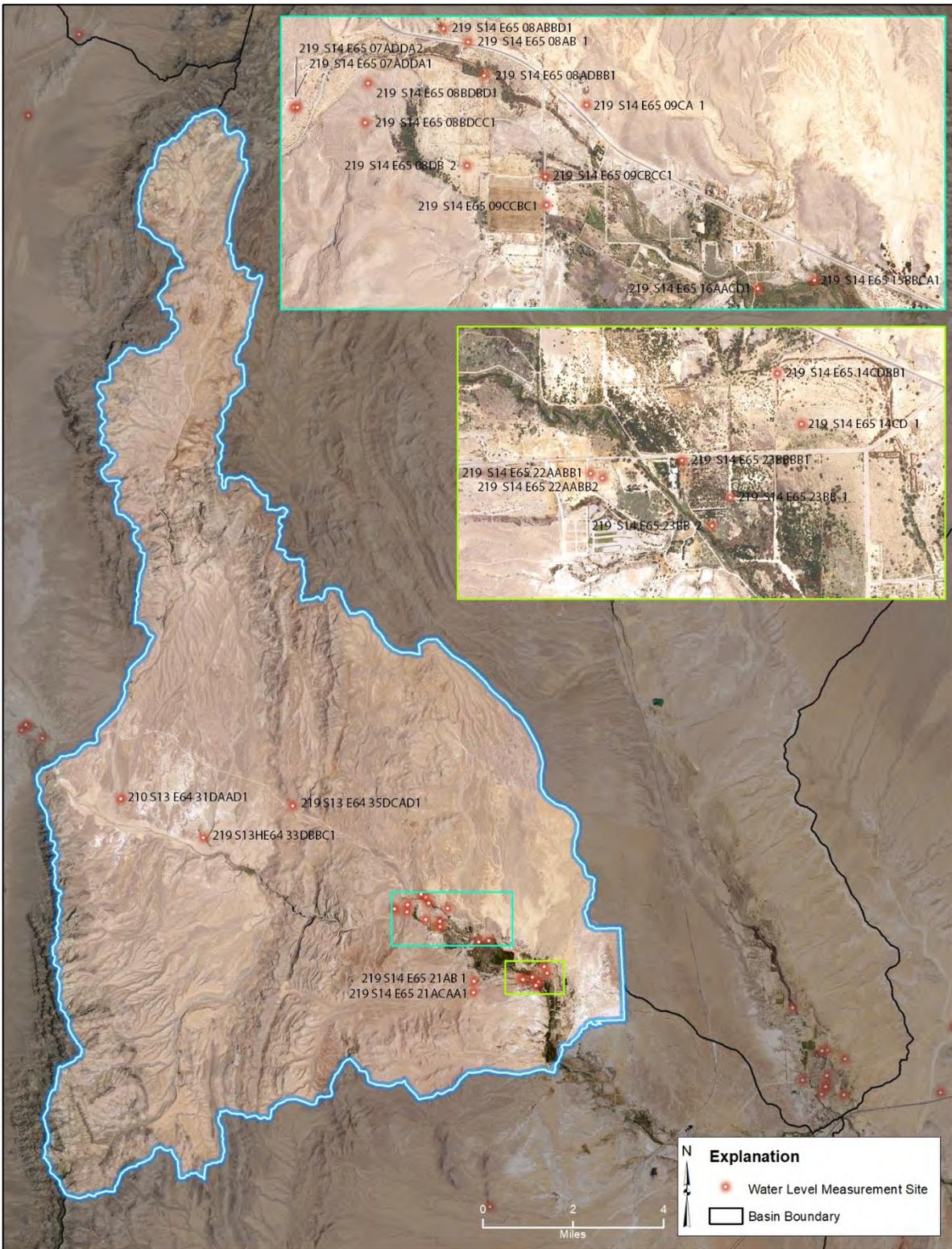


Figure 2. Muddy River Springs Area water level measurement sites.

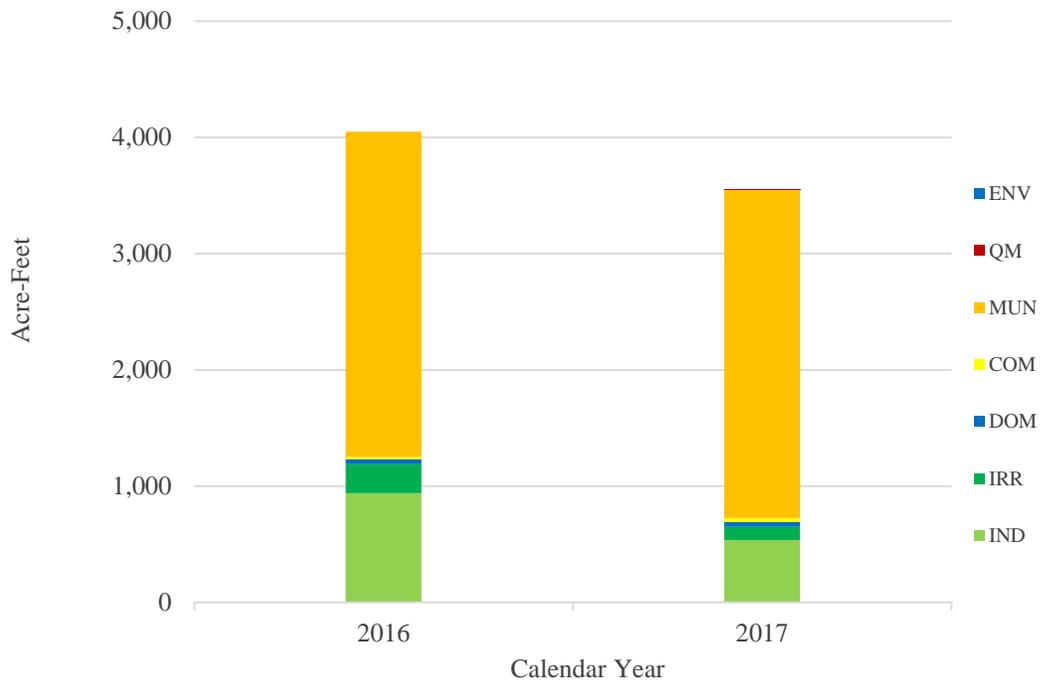


Figure 3. Muddy River Springs Area historical pumpage by manner of use.

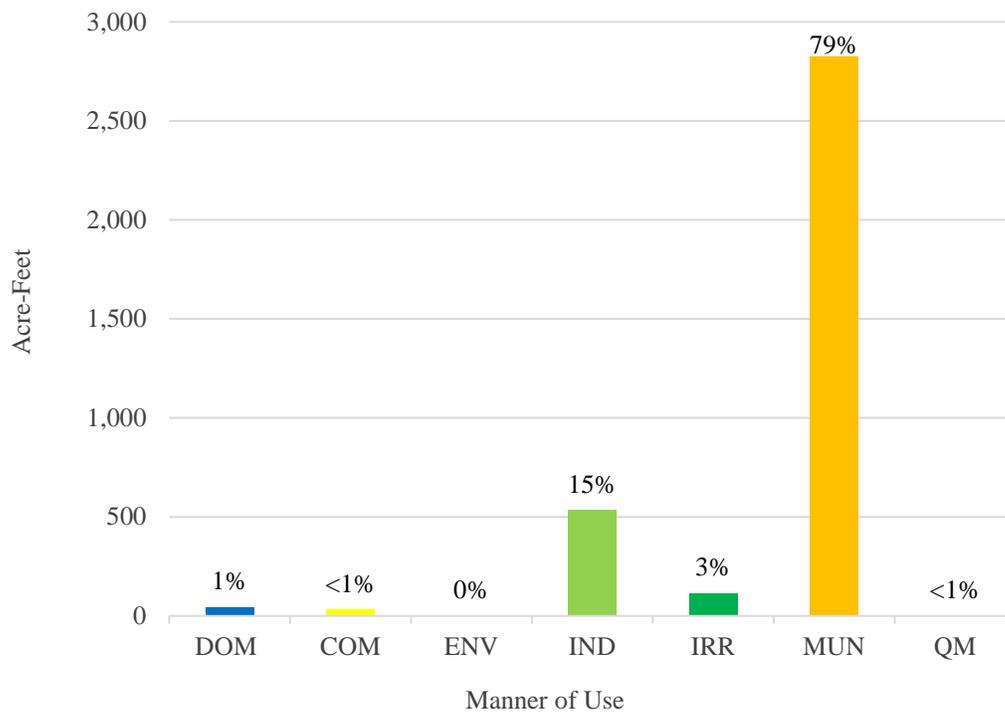


Figure 4. Percentage of 2017 groundwater pumpage by manner of use.

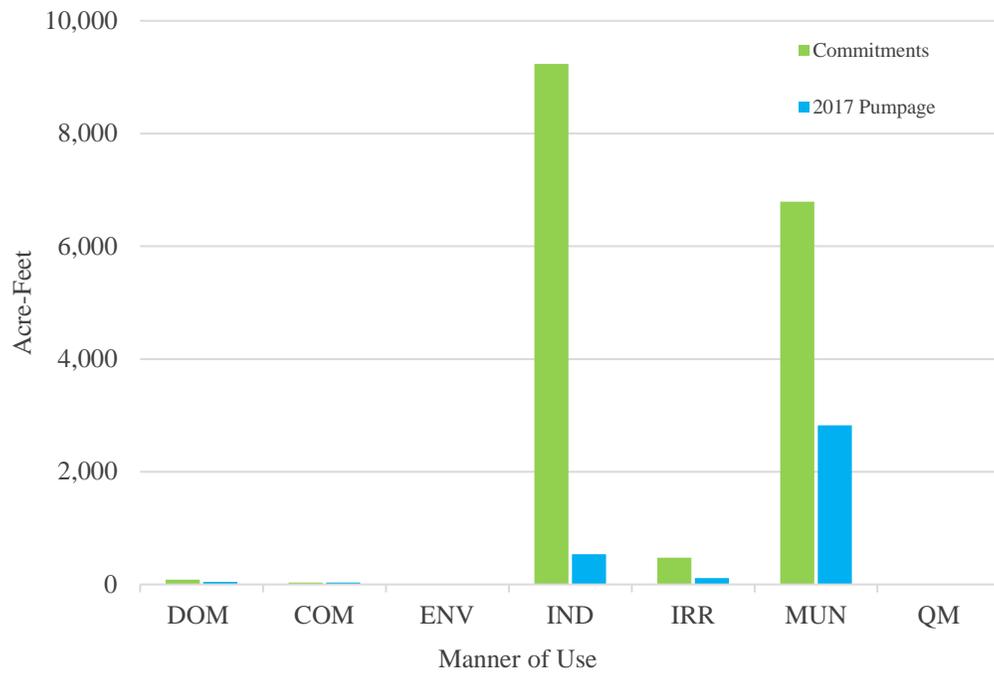


Figure 5. Comparison between 2017 groundwater commitments and estimated pumpage.

**APPENDIX A. MUDDY RIVER SPRINGS AREA 2017 GROUNDWATER PUMPAGE
BY APPLICATION NUMBER.**

EXPLANATION OF COLUMN HEADINGS FOR GROUNDWATER PUMPAGE INVENTORY

- APP NUMBER** The file number of the Application or the Vested Claim of Right.
- STATUS** Indicates if the application is a Vested Claim of Right (VST), a Permit (Permit), Abrogated (Abr), or a Certificate (Cert).
- OWNER OF RECORD** The owner of the water right as recorded in the files of the State Engineer. A water right may have more than one owner of record.
- PLACE OF USE**
- QQ** The quarter quarter of the Section in which the point of diversion is located.
- Qtr** The quarter of the Section in which the point of diversion is located.
- Sec** The Section in which the point of diversion is located.
- T** The Township in which the point of diversion is located.
- R** The Range in which the point of diversion is located.
- ACRES OR DUTY** The number of acres that are permitted to be irrigated or the duty if the manner of use is anything other than irrigation.
- ACRES IRR OR USE** The number of acres irrigated or the manner of use of the appropriated water.
The types of manner of use may include:
- | | |
|-----------------------|---------------------|
| COM - Commercial | CON - Construction |
| DOM - Domestic | ENV - Environmental |
| IND - Industrial | IRR - Irrigation |
| MM - Mining & Milling | MUN - Municipal |
| OTH - Other | PWR - Power |
| QM - Quasi-Municipal | REC - Recreation |
| STK - Stockwater | STO - Storage |
| WLD - Wildlife | |
- USED (AF)** The amount of water used during the calendar year, in acre-feet, as determined by review of records and/or field investigation.
- REMARKS** Notes pertaining to field investigation and/or review of records.

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
18437	Cert	Coyote Springs Investment LLC	SE	SE	09	14	65	15.11	0.00	1.00	Total is Water Year Duty = 20.15 No mtr, No irr use, Domestic credit
21466	Cert	Casa De Warm Springs LLC	SE	SE	08	14	65	36.64	0.00	0.00	Total is Water Year Duty = 183.20 No irrigation in 2017
22632	Cert	Nevada Power Company	NW	SE	08	14	65	315.00	IND	134.08	POD = Lewis 5 well
22952	Cert							433.00			
85156	Permit							322.17			
22633	Cert	Nevada Power Company	SW	NE	08	14	65	297.50	IND	0.00	POD = Lewis 3 well
22950	Cert							433.00			
80844	Permit							322.17			
22635	Cert	Nevada Power Company Clarence A Lewis/Clarvid Arthur Moapa Band of Paiute Indians Nevada Power Company	SE	NE	08	14	65	25.00	IND	0.00	POD = Lewis 2 well
22949	Cert							433.00			
25310	Cert							160.00			
80843	Permit							322.17			
22636	Cert	Nevada Power Company	NW	SE	08	14	65	260.00	IND	2.09	POD = Lewis 4 well
22951	Cert							433.00			
80846	Permit							322.17			
22738	Cert	Davis, Don & Marsha	NE	NE	22	14	65	18.81	COM	18.81	Palm Creek Ranch, no mtr
24185	Cert	Nevada Power Company	NW	NE	08	14	65	433.00	IND	0.00	POD = Lewis 1 well
24186	Cert							310.00			
80845	Permit							322.17			
27216	Cert	United States of America	NW	SE	16	14	65	1.38	COM	0.18	USFWS property, Mtr S/N 0004327 RD - 1662730 gal - 8/17/16 RD - 1727750 gal - 9/22/17

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
29296	Cert	Nevada Power Company	NW	NW	23	14	65	300.00	IND	88.26	POD = Behmer well
29298	Cert							327.50	IND		
38871	Cert	Egtedar, Ascar	NW	NW	23	14	65	15.00	10.00	11.10	Total is Water Year Duty = 75.00, POD = Behmer well Pistachio Trees 9/22/17 See field sheet for mtr readings
46932	Permit	Moapa Valley Water District	NE	NE	35	13	64	1000.15	MUN	0.00	POD = MX-6 well
50272	Cert	Nevada Power Company	NE	NE	22	14	65	99.51	IND	71.11	POD = Perkins well
50273	Cert							289.91			
50275	Cert							32.88			
50934	Cert							55.40			
79068	Permit							432.70			
50723	Cert	L.D.S. Church	NW	NW	15	14	65	88.00	IND	184.44	POD = LDS East well
50731	Cert										
50724	Cert	L.D.S. Church	SW	SW	9	14	65	162.55	IND	55.15	POD = LDS West well
50725	Cert							65.00			
50726	Cert							65.00			
50727	Cert							60.00			
50728	Cert							158.00			
50729	Cert							120.00			
50730	Cert							25.00			
								655.55 Total			
50732	Cert	L.D.S. Church	NE	NE	16	14	65	930.00	IND	0.00	POD = LDS Central well
50733	Cert							70.00			
							1000.00 Total				

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE					ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec	T	R				
50851	Cert	Clark County	NW	NW	23	14	65	5.00	0.00	0.04	Total is Water Year POD = GM Perkins well 50851 & 64840 have same POD Different POU TCD = 49.8 AFA See field sheet for mtr readings
64840	Cert						3.33	0.00			
52520	Permit	Moapa Valley Water	SE	NE	7	14	65	1447.94	MUN	2461.69	POD = Arrow Canyon well 1
55450	Permit	District					2171.91				
58269	Permit						0.00				
59253	Cert	Leavitt, Ute	SW	NE	23	14	65	8.78	4.40	Duty = 43.875 AFA 59253, 59256, 59257, 63504 have same POD Duty = 28.875 AFA Duty = 15.0 AFA Duty = 15.0 AFA S/N 12-00907-04 RD - 478982 X 0.0001 AF - 8/17/16 RD - (1)197596 X 0.0001 AF - 9/22/17 Total is Water Year	
59256	Cert	Witmore, Dan	SW	NE	23	14	65	5.78	2.89		
59257	Cert	Brundy, Larry	SW	NE	23	14	65	3.00	1.50		
63504	Cert	Kolhoss, Kelly	SW	NE	23	14	65	3.00	1.50		
Total											65.41
61427	Permit	S & R, Inc	SE	SW	9	14	65	1.35	COM	0.00	No mtr., well visible, no use, 9/22/17
66043	Permit	Moapa Valley Water Dis.	SE	NE	7	14	65	2533.90	MUN	361.79	POD = Arrow Canyon well 2
71026	Cert	Billy and Linda Parson	SE	SE	9	14	65	3.99	1.50	13.27	Total is Water Year 71026 & 71344 have same POD over pumpage, TCD NTE = 10.06 AFA See field sheet for mtr readings
71344	Cert						6.07	3.00			
71766	Permit	3335 Hillside LLC	NE	NE	22	14	65	7.06	7.06	24.20	Same POD as 86209 No well ever drilled at POD 70520 over pumpage, TCD NTE = 35.3 AFA See field sheet for mtr readings
86209	Permit						14.01	COM	14.01		
70520	Abr										

**GROUNDWATER PUMPAGE INVENTORY
MUDDY RIVER SPRINGS AREA, NO. 219
2017**

APP NUMBER	STATUS	OWNER OF RECORD	PLACE OF USE			ACRES OR DUTY	ACRES IRR OR USE	USED (A/F)	REMARKS
			QQ	Qtr	Sec T R				
75161E	Permit	Nevada Power	NW	NW	23 14 65	905.81	ENV	0.00	No use per NVE 4-6-17
77381	Permit	William O'Donnell	NE	NW	9 14 65	6.07	COM	0.00	77381 & 77382 same POD & POU TCD = 15.29 AFA Property vacant, no building, no use 9/22/17
77382	Permit								
82096	Permit	Mary K Cloud	NW	NE	26 14 65	1.90	QM	2.29	82096 & 82097 same POD & POU TCD = 4.794 AFA Master meter S/N 8215026 RD - 00797600 gallons - 7/14/17 RD - 00940800 gallons - 9/22/17
82097	Permit								
TOTAL								3508.92	Permitted rights

Verified with field notes: Christi Cooper

**APPENDIX B. MUDDY RIVER SPRINGS AREA 2017 GROUNDWATER PUMPAGE
FIELD NOTES.**

2017

Muddy River Springs Area
(Upper Moapa Valley)
No. 219

Inventory Field Notes

compiled by
Christi Cooper

State of Nevada
Division of Water Resources
Southern Nevada Branch Office

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 18437

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

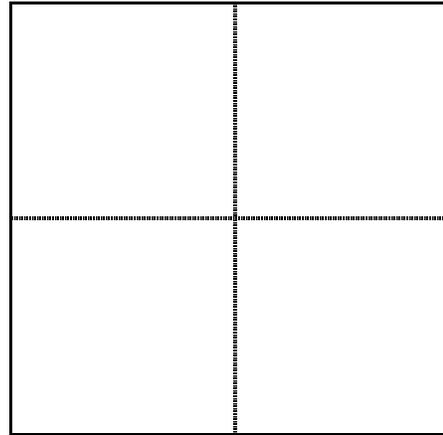
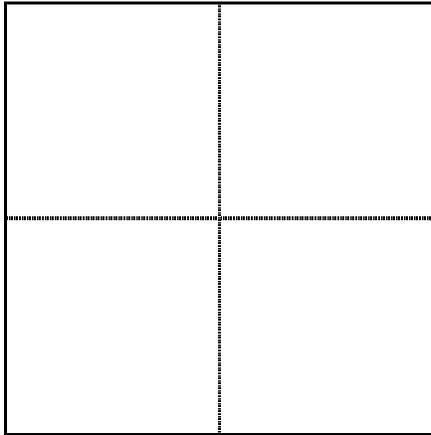
ACRES IRR: 0

BENEFICIAL USE: YES NO PORTION ALL TYPE _____

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: No meter, no irrigation use, house torn down, travel trailer and horses
on property. Domestic use.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 21466

WELL: YES NO

METER SER NO: _____

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

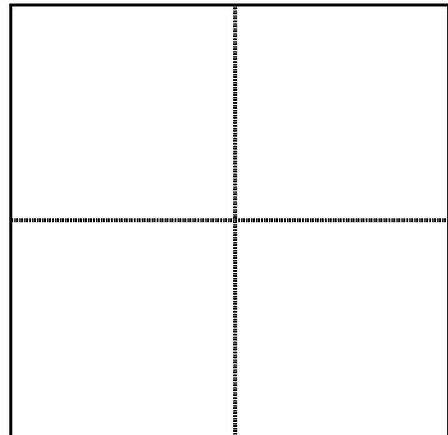
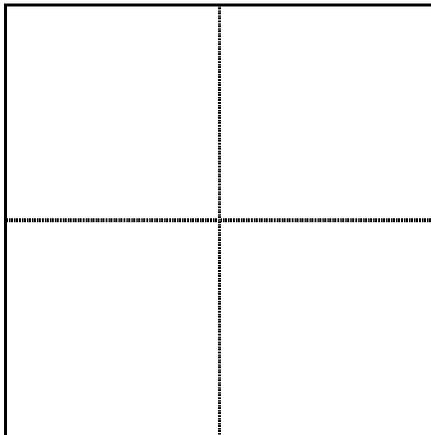
ACRES IRR: 0

BENEFICIAL USE: YES NO PORTION ALL TYPE _____

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: No meter on well.

No irrigation in 2017.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 38871

WELL: YES NO

METER SER NO: G-02828

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: _____

PHOTO: YES NO

ACRES IRR: 10

BENEFICIAL USE: YES NO

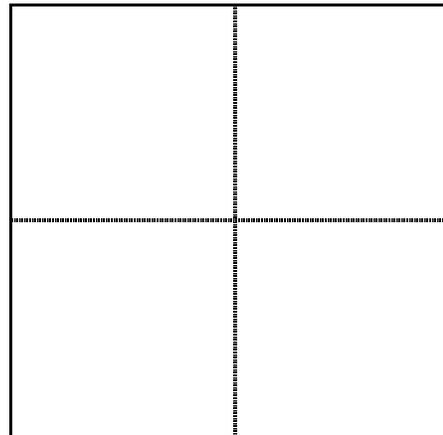
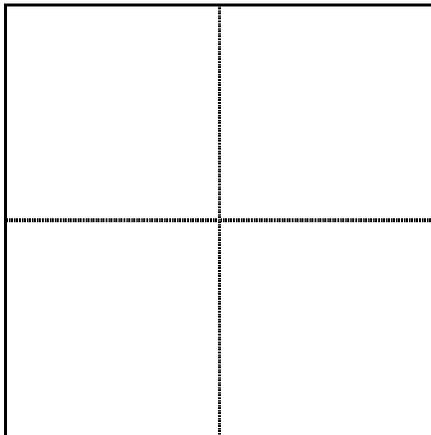
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Pistachio Trees.

RD - 26975400 on 12/27/16, RD - 30947900 on 9/22/17

SIGNATURE: Christie Cooper

DATE: 9/22/2017

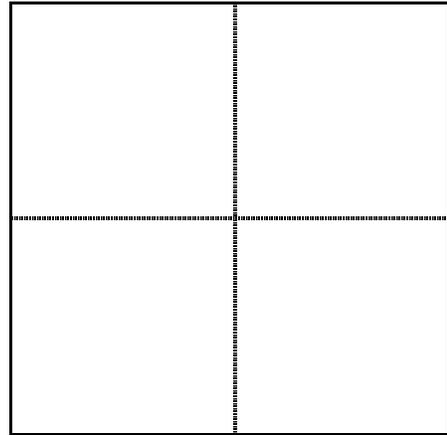
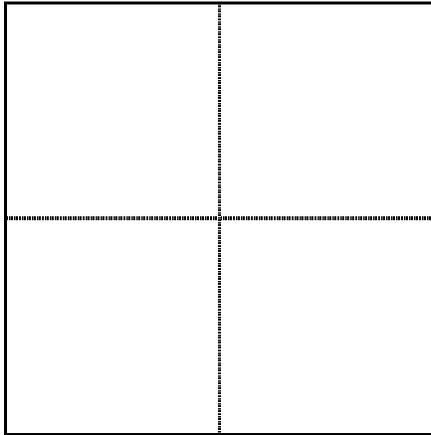
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 50851 & 64840
WELL: YES NO METER SER NO: 99-7330-4
PUMP: YES NO PUMP TYPE: _____
MOTOR: YES NO MOTOR TYPE: _____
METER: YES NO METER READ: _____
PHOTO: YES NO ACRES IRR: 0.0
BENEFICIAL USE: YES NO PORTION ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: RD - 30173600 on 12/27/16, RD - 30183900 on 9/22/17 and 11/30/17

SIGNATURE: Christie Cooper DATE: 9/22/2017

PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219

PERMIT NO: 59253

WELL: YES NO

METER SER NO: 12-00907-04

PUMP: YES NO

PUMP TYPE: _____

MOTOR: YES NO

MOTOR TYPE: _____

METER: YES NO

METER READ: (1)197596 X 0.0001 AF

PHOTO: YES NO

ACRES IRR: 4.4

BENEFICIAL USE: YES NO

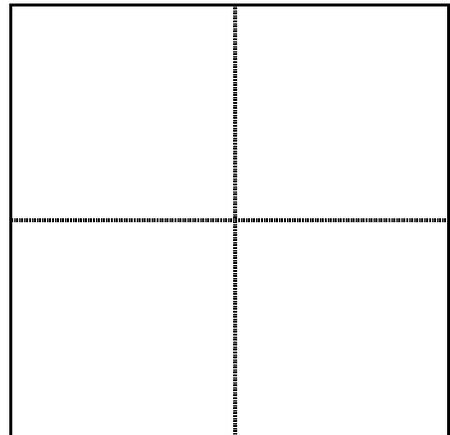
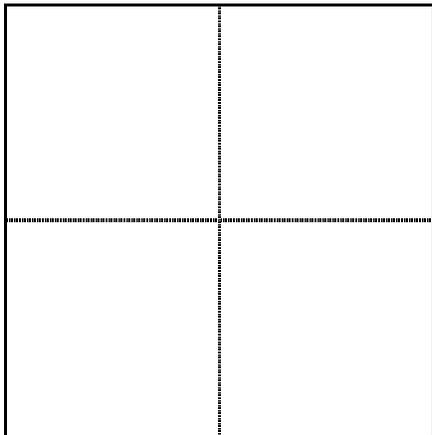
PORTION ALL

TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59256, 59257 & 63504

McCrometer S/N 12-00907-04, RD - 478982 X 0.0001 AF on 8/17/16

RD - (1)197596 X 0.0001 AF on 9/22/17

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

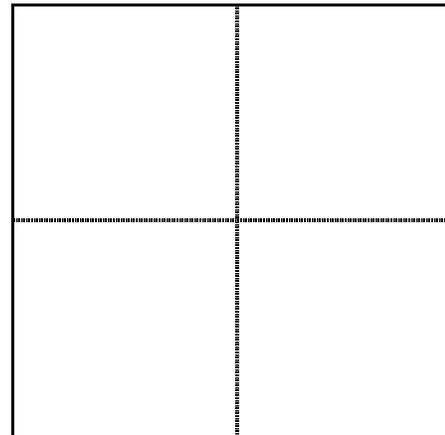
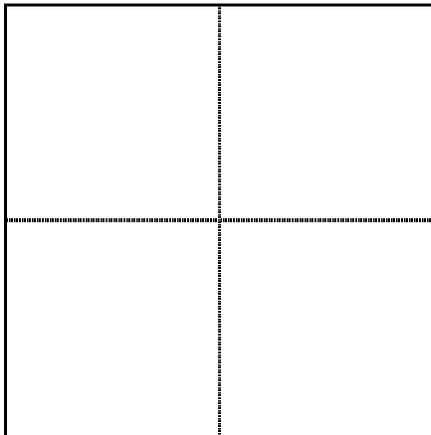
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 59256
WELL: YES X NO METER SER NO: 12-00907-04
PUMP: YES X NO PUMP TYPE:
MOTOR: YES NO MOTOR TYPE:
METER: YES X NO METER READ: see 59253 field sheet
PHOTO: YES NO X ACRES IRR: 2.89
BENEFICIAL USE: YES X NO PORTION X ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59253, 59257 & 63504.

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

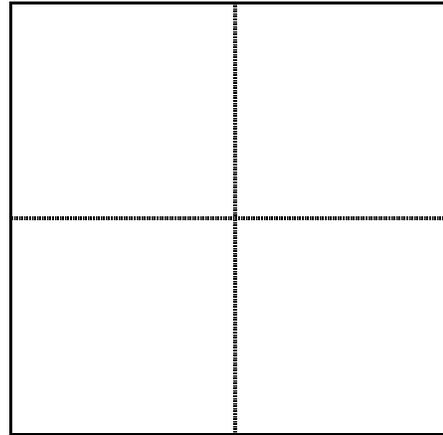
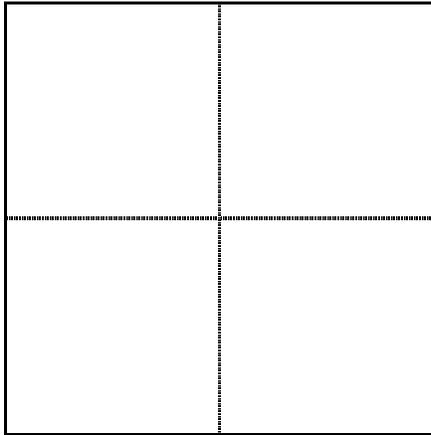
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 59257
WELL: YES X NO METER SER NO: 12-00907-04
PUMP: YES X NO PUMP TYPE:
MOTOR: YES NO MOTOR TYPE:
METER: YES X NO METER READ: see 59253 field sheet
PHOTO: YES NO X ACRES IRR: 1.5
BENEFICIAL USE: YES X NO PORTION X ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Same POD as 59253, 59256 & 63504.

Sprinkler, low managed pasture grass.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

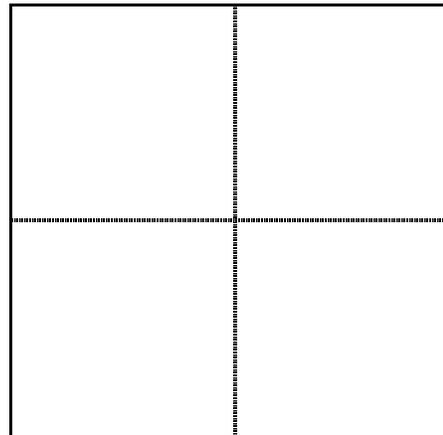
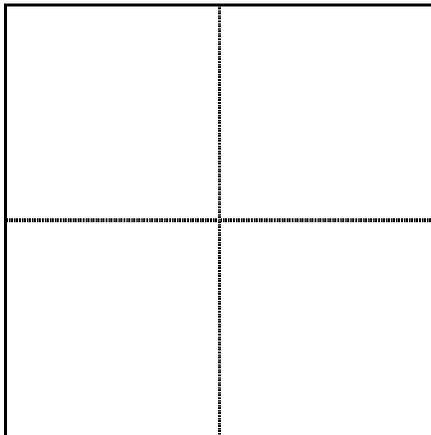
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 63504
WELL: YES X NO METER SER NO: 12-00907-04
PUMP: YES X NO PUMP TYPE:
MOTOR: YES NO MOTOR TYPE:
METER: YES X NO METER READ: see 59253 field sheet
PHOTO: YES NO X ACRES IRR: 1.5
BENEFICIAL USE: YES X NO PORTION X ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: Sprinkler, low managed pasture grass.

Same POD as 59253, 59256 & 59257.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

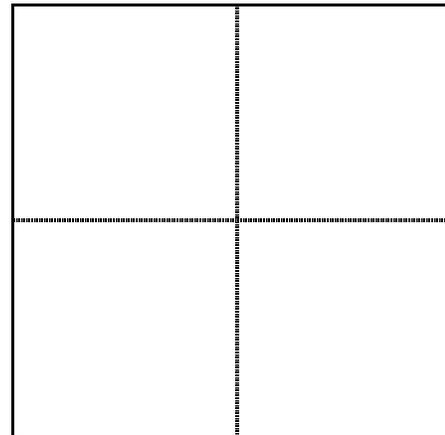
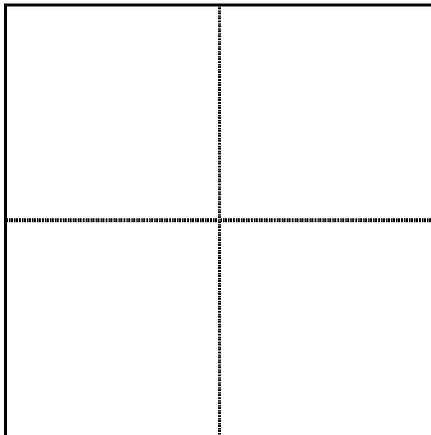
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 71026 & 71344
WELL: YES X NO METER SER NO: 5001266
PUMP: YES X NO PUMP TYPE:
MOTOR: YES NO MOTOR TYPE:
METER: YES X NO METER READ: 46678800
PHOTO: YES NO X ACRES IRR: 4.5
BENEFICIAL USE: YES X NO PORTION X ALL TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: DLJ meter, RD- 41928300 gal on 8/17/16; RD - 46678800 gal on 9/22/17

Pasture grass, horses, and cows.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

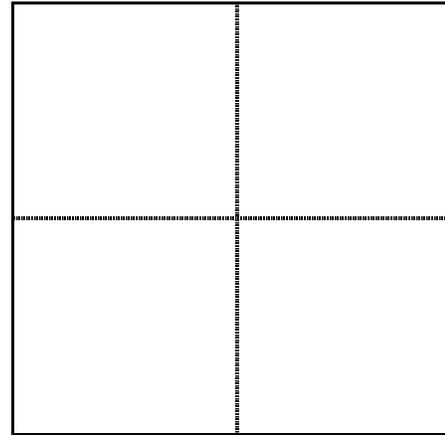
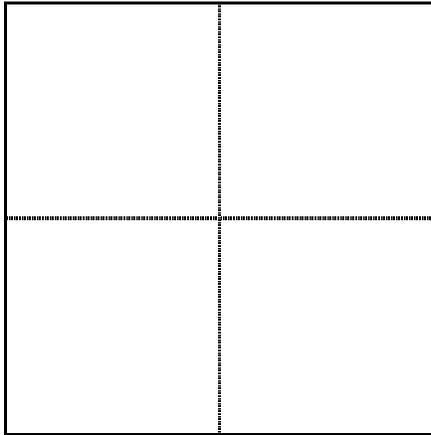
PUMPAGE INVENTORY FIELD REPORT

BASIN NO: 219 PERMIT NO: 71776 & 86209
WELL: YES X NO METER SER NO: 14018933
PUMP: YES X NO PUMP TYPE:
MOTOR: YES NO MOTOR TYPE:
METER: YES X NO METER READ: 024841000
PHOTO: YES NO X ACRES IRR: 7.06
BENEFICIAL USE: YES X NO PORTION ALL X TYPE Irrigation

IF PARTIAL USE, SKETCH OF LAND IRRIGATED.

 1/4 1/4 SEC

 1/4 1/4 SEC



REMARKS: DLJ meter S/N 14018933, RD - 011161000 gallons on 8/17/16.

RD - 024841000 gallons on 9/22/17.

Commercial tree nursery. Palm, pine, fig, and pomegranate trees. Drip irrigation.

TCD NTE 5 AF/AC for the irrigation of 7.06 acres.

SIGNATURE: Christie Cooper

DATE: 9/22/2017

LWRFS GI

Basin	Permit	Priority Date	Cumulative Duty
Coyote Spring Valley	*85249	10/22/1919	109.80
Coyote Spring Valley	*85250	10/22/1919	343.00
Muddy River Springs Area	*50733	8/13/1947	413.00
Muddy River Springs Area	*50723	8/13/1947	501.00
Muddy River Springs Area	*50729	8/13/1947	621.00
Muddy River Springs Area	*50728	8/13/1947	779.00
Muddy River Springs Area	*50731	8/13/1947	1365.00
Muddy River Springs Area	*50732	8/13/1947	2295.00
Muddy River Springs Area	*29296	2/4/1948	2595.00
Muddy River Springs Area	38871	2/4/1948	2670.00
Muddy River Springs Area	*86209	4/20/1948	2684.01
Muddy River Springs Area	*82096	4/20/1948	2685.91
Muddy River Springs Area	*82097	4/20/1948	2688.80
Muddy River Springs Area	*77381	4/20/1948	2694.87
Muddy River Springs Area	*77382	4/20/1948	2704.09
Muddy River Springs Area	*71026	5/20/1948	2708.09
Muddy River Springs Area	*71344	5/20/1948	2714.15
Muddy River Springs Area	59257	5/20/1948	2729.15
Muddy River Springs Area	63504	5/20/1948	2744.15
Muddy River Springs Area	59256	5/20/1948	2773.03
Muddy River Springs Area	59253	5/20/1948	2816.90
Muddy River Springs Area	*24186	8/14/1948	3126.90
Muddy River Springs Area	*64840	10/7/1948	3146.70
Muddy River Springs Area	*50851	10/7/1948	3176.70
Muddy River Springs Area	*50275	10/7/1948	3209.58
Muddy River Springs Area	*22633	12/20/1948	3507.08
Muddy River Springs Area	*50724	10/4/1949	3669.63
Muddy River Springs Area	*22636	6/19/1952	3929.63
Muddy River Springs Area	*22632	6/19/1952	4244.63
Muddy River Springs Area	*22635	12/18/1958	4269.63
Garnet Valley	83553	7/24/1959	4272.63
Muddy River Springs Area	*50934	11/20/1959	4328.03
Muddy River Springs Area	18437	11/20/1959	4348.18
Muddy River Springs Area	21466	8/15/1963	4531.38
Muddy River Springs Area	*50730	4/28/1965	4556.38
Muddy River Springs Area	*50725	4/28/1965	4621.38
Muddy River Springs Area	*50727	4/28/1965	4681.38
Muddy River Springs Area	*50726	4/28/1965	4746.38
Muddy River Springs Area	27216	8/25/1965	4747.77
Muddy River Springs Area	22738	8/25/1965	4766.58
Muddy River Springs Area	*22949	2/2/1966	5199.58
Muddy River Springs Area	**22950	2/2/1966	5199.58
Muddy River Springs Area	**22951	2/2/1966	5199.58
Muddy River Springs Area	**22952	2/2/1966	5199.58

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Muddy River Springs Area	**24185	2/2/1966	5199.58
Garnet Valley	*64880	7/24/1967	5333.39
Muddy River Springs Area	*25310	10/9/1969	5493.39
California Wash	26371	11/18/1969	5583.39
Muddy River Springs Area	*50272	7/7/1970	5682.90
Muddy River Springs Area	*50273	7/7/1970	5972.81
Muddy River Springs Area	*85156	7/7/1970	6294.98
Muddy River Springs Area	*29298	7/7/1970	6622.48
Muddy River Springs Area	*79068	7/7/1970	7055.18
Garnet Valley	*74399	7/20/1981	7129.75
Garnet Valley	*63261	10/20/1981	7229.75
Garnet Valley	*83715	10/20/1981	7266.75
Garnet Valley	*83714	10/20/1981	7423.75
Garnet Valley	63348	10/20/1981	7427.75
Garnet Valley	77745	10/20/1981	7437.77
Coyote Spring Valley	*74095	3/31/1983	7937.77
Coyote Spring Valley	*74094	3/31/1983	8937.77
Coyote Spring Valley	*70430	3/31/1983	10077.77
Coyote Spring Valley	*70429	3/31/1983	11577.77
Coyote Spring Valley	*70430R01	3/31/1983	12037.77
Coyote Spring Valley	*77292	3/31/1983	12437.77
Muddy River Springs Area	*46932	5/19/1983	13437.92
Coyote Spring Valley	**77293	9/27/1985	17437.92
Garnet Valley	**86961T	9/27/1985	17437.92
Garnet Valley	**86962T	9/27/1985	17437.92
Garnet Valley	**86959T	9/27/1985	17437.92
Garnet Valley	**86960T	9/27/1985	17437.92
Coyote Spring Valley	77164	12/30/1985	19937.92
Coyote Spring Valley	*77294	1/27/1986	20037.92
Coyote Spring Valley	**77295	1/27/1986	20037.92
Coyote Spring Valley	**77296	1/27/1986	20037.92
Muddy River Springs Area	**52520	4/14/1986	20037.92
Coyote Spring Valley	*77297	7/15/1986	24537.92
Coyote Spring Valley	**77298	7/15/1986	24537.92
Coyote Spring Valley	**77299	7/15/1986	24537.92
Coyote Spring Valley	**77300	7/15/1986	24537.92
Coyote Spring Valley	**77301	7/15/1986	24537.92
Coyote Spring Valley	**77302	7/15/1986	24537.92
Coyote Spring Valley	**77303	7/15/1986	24537.92
Coyote Spring Valley	**77304	7/15/1986	24537.92
Coyote Spring Valley	**77305	7/15/1986	24537.92
Coyote Spring Valley	**77306	7/15/1986	24537.92
Garnet Valley	56855	10/28/1986	24682.07
California Wash	**50559	2/2/1987	24682.07
California Wash	50558	2/2/1987	24711.04
California Wash	50560	2/2/1987	24740.01
Garnet Valley	*66784	3/6/1987	24896.85

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Black Mountains Area	*68351	6/21/1988	25439.83
Garnet Valley	*83707	10/3/1988	25439.94
Garnet Valley	*83709	10/3/1988	25440.05
Garnet Valley	*83710	10/3/1988	25440.16
Garnet Valley	*83712	10/3/1988	25443.86
Garnet Valley	*83713	10/3/1988	25467.66
Garnet Valley	*83711	10/3/1988	25508.44
Garnet Valley	*83717	10/3/1988	25576.83
Garnet Valley	*83708	10/3/1988	25645.33
Garnet Valley	*83716	10/3/1988	25713.83
Black Mountains Area	*68350	10/18/1988	25833.27
Black Mountains Area	*68352	10/18/1988	25970.82
California Wash	75198	4/4/1989	25995.82
California Wash	*70257	10/17/1989	28495.82
California Wash	**70258	10/17/1989	28495.82
California Wash	**70259	10/17/1989	28495.82
Garnet Valley	**79002	10/17/1989	28495.82
Garnet Valley	**79003	10/17/1989	28495.82
Garnet Valley	**79004	10/17/1989	28495.82
Garnet Valley	**79005	10/17/1989	28495.82
Garnet Valley	**54073	10/17/1989	28495.82
Garnet Valley	**86967T	10/17/1989	28495.82
Garnet Valley	**86968T	10/17/1989	28495.82
Garnet Valley	**86969T	10/17/1989	28495.82
Garnet Valley	**83490	10/17/1989	28495.82
Garnet Valley	**86970T	10/17/1989	28495.82
Garnet Valley	**79001	10/17/1989	28495.82
Garnet Valley	**68822	10/17/1989	28495.82
Hidden Valley	*54074	10/17/1989	30695.82
Garnet Valley	*87169T	10/17/1989	30700.82
Black Mountains Area	*55269	10/30/1989	30796.82
Black Mountains Area	*58031	10/30/1989	31620.82
Black Mountains Area	*58032	9/13/1990	32365.82
Muddy River Springs Area	*55450	11/9/1990	34537.72
Black Mountains Area	*68353	12/10/1990	35129.78
California Wash	57441E	4/16/1992	35162.37
Muddy River Springs Area	*58269	10/27/1992	36248.31
Muddy River Springs Area	*66043	10/27/1992	38782.21
Muddy River Springs Area	61427	7/26/1995	38783.57
Garnet Valley	*81344	8/25/2000	38791.57
Garnet Valley	*72098	8/25/2000	38804.73
Garnet Valley	**79948	8/25/2000	38804.73
Garnet Valley	**66785	8/25/2000	38804.73
Garnet Valley	**77389	8/25/2000	38804.73
Muddy River Springs Area	*75161E	12/6/2006	39710.54
California Wash	**76643	1/18/2008	39710.54
Coyote Spring Valley	**77291	8/13/2008	39710.54

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Garnet Valley	**79009	11/2/2009	39710.54
Garnet Valley	**79008	11/2/2009	39710.54
Garnet Valley	**79010	11/2/2009	39710.54
Garnet Valley	**79007	11/2/2009	39710.54
Garnet Valley	**79006	11/2/2009	39710.54
Garnet Valley	**86965T	11/2/2009	39710.54
Garnet Valley	**86964T	11/2/2009	39710.54
Garnet Valley	**86963T	11/2/2009	39710.54
Garnet Valley	**86966T	11/2/2009	39710.54
Muddy River Springs Area	**80843	5/9/2011	39710.54
Muddy River Springs Area	**80844	5/9/2011	39710.54
Muddy River Springs Area	**80845	5/9/2011	39710.54
Muddy River Springs Area	**80846	5/9/2011	39710.54
Muddy River Springs Area	*71766	7/21/2011	39731.83
Garnet Valley	**84041	7/1/2014	39731.83

SE ROA 8218

ROUNDWATER RIGHTS BY PRIORITY

Owner of Record	Site ID	Point_X
BEDROC LIMITED LLC	210 S11 E62 24DB 1	679415.9657
BEDROC LIMITED LLC	210 S11 E62 24BA 2	678994.4984
LDS	219 S14 E65 16AACD1	704095.5619
LDS	219 S14 E65 15BBCA1	704511.1582
LDS	219 S14 E65 09CCBC1	702750.1662
LDS	219 S14 E65 09CCBC1	702750.1662
LDS	219 S14 E65 15BBCA1	704511.1582
LDS	219 S14 E65 16AACD1	704095.5619
NEVADA POWER COMPANY	219 S14 E65 23BBBB1	706035.1054
EGTEDAR, ASCAR	219 S14 E65 23BBBB1	706035.1054
3335HILLSIDE LLC	219 S14 E65 22AADB1	705825.5606
CLOUD, MARY K	219 S14 E65 26ABDB1	707142.4168
CLOUD, MARY K	219 S14 E65 26ABDB1	707142.4168
WILLIAM O`DONNELL	219 S14 E65 09CACCC1	703186.2268
WILLIAM O`DONNELL	219 S14 E65 09CACCC1	703186.2268
PARSON, BILLY & LINDA	219 S14 E65 09DDCB1	703965.5489
PARSON, BILLY & LINDA	219 S14 E65 09DDCB1	703965.5489
BRUNDY, LARRY	219 S14 E65 23BC 1	706848.9150
KOLHOSS, KELLY	219 S14 E65 23BC 1	706848.9150
WHITMORE, DAN	219 S14 E65 23BC 1	706848.9150
LEAVITT, UTE	219 S14 E65 23BC 1	706848.9150
NEVADA POWER COMPANY	219 S14 E65 08AB 1	702141.1717
CLARK COUNTY	219 S14 E65 23BBCC1	706030.7904
CLARK COUNTY	219 S14 E65 23BBCC1	706030.7904
NEVADA POWER COMPANY	219 S14 E65 22AABB2	705691.1410
NEVADA POWER COMPANY	219 S14 E65 08AC 2	701911.5282
LDS	219 S14 E65 09CCBC1	702750.1662
NEVADA POWER COMPANY	219 S14 E65 08DB 2	701994.2240
NEVADA POWER COMPANY	219 S14 E65 08DBAC1	702155.9035
NEVADA POWER COMPANY	219 S14 E65 08ADBB1	702327.3808
TECHNICHROME	216 S19 E63 03ADDD1	686699.0151
NEVADA POWER COMPANY	219 S14 E65 22AABB2	705691.1410
COYOTE SPRINGS INVESTMENT LLC	219 S14 E65 09DDBC1	703956.0895
CASA DE WARM SPRINGS LLC	219 S14 E65 08DDBB1	702364.2688
LDS	219 S14 E65 09CCBC1	702750.1662
LDS	219 S14 E65 09CCBC1	702750.1662
LDS	219 S14 E65 09CCBC1	702750.1662
LDS	219 S14 E65 09CCBC1	702750.1662
UNITED STATES OF AMERICA	219 S14 E65 16DBCA1	703709.5266
DAVIS, DON J. & MARSHA L.	219 S14 E65 22AAAA1	706011.4762
NEVADA POWER COMPANY	219 S14 E65 08ADBB1	702327.3808
NEVADA POWER COMPANY	219 S14 E65 08AC 2	701911.5282
NEVADA POWER COMPANY	219 S14 E65 08DB 2	701994.2240
NEVADA POWER COMPANY	219 S14 E65 08DBAC1	702155.9035

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DRY LAKE WATER, LLC	215 S19 E63 13AADD1	689940.2391
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1	690780.0253
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 07DDCB1	691041.8320
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 20BABA1	691936.0521
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1	690679.3344
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1	690679.3344
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1	690679.3344
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 07DDCC1	691049.5420
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1	690780.0253
REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1	690780.0253
DRY LAKE WATER, LLC	215 S19 E63 13AADD1	689940.2391
DRY LAKE WATER, LLC	215 S19 E63 13AADD1	689940.2391
COYOTE SPRINGS INVESTMENT LLC	218 S14 E65 25CACC1	708114.0324
MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15ADAA1	696739.7747
MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15AAAA1	696714.7967
MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15AADA1	696725.6937
SNWA	216 S18 E63 05DACC1	683006.1888
SNWA	216 S17 E64 21CBBD1	692929.6284
SNWA	216 S18 E63 15AACD1	686286.8792
SNWA	216 S18 E63 15AACC1	686199.6845
SNWA	216 S17 E63 32CCCB1	681775.6464
SNWA	216 S18 E63 15AACC1	686199.6845
SNWA	216 S18 E63 15AACD1	686286.8792
SNWA	216 S17 E64 21CBBD1	692929.6284
SNWA	216 S18 E63 16BBDA1	683730.5385
SNWA	216 S18 E63 05DACC1	683006.1888
SNWA	216 S18 E63 05AADB1	683113.9361
SNWA	216 S18 E63 05AADB1	683113.9361
SNWA	217 S16 E62 25CCCA1	679695.7593
SNWA	216 S18 E63 02ABDC1	687567.3739
NEVADA COGENERATION ASSOCIATES #1	215 S19 E63 13DDBB1	689638.3166
NEVADA COGENERATION ASSOCIATES #1	215 S19 E63 13DAAB1	689868.6478
NEVADA COGENERATION ASSOCIATES	215 S19 E63 13DACA1	689795.9912
MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA1	701053.8273
DRY LAKE WATER, LLC	215 S19 E63 13ABCB1	689282.7713
NDOT	218 S15 E66 02ACBB1	716776.0126
MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA1	701053.8273
MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA2	701006.5335
S & R, INC.	219 S14 E65 09CDCB1	703172.6426
DRY LAKE WATER, LLC	216 S18 E63 13CDBC1	688657.6070
DRY LAKE WATER, LLC	216 S18 E63 13CDBC1	688657.6070
DRY LAKE WATER, LLC	216 S18 E63 13CDBC1	688657.6070
DRY LAKE WATER, LLC	216 S17 E63 32AABA1	682983.9731
DRY LAKE WATER, LLC	216 S18 E63 33DBBA1	684409.0599
NEVADA POWER COMPANY	219 S14 E65 23BBBB1	706035.1054
MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 23BCAA1	697235.0499
SNWA	210 S13 E63 23BAAB1	687044.5320

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SNWA	216 S18 E63 15AACD1	686286.8792
SNWA	216 S17 E64 21CBBD1	692929.6284
SNWA	216 S18 E63 15AACC1	686199.6845
SNWA	216 S18 E63 05DACC1	683006.1888
SNWA	216 S18 E63 05AADB1	683113.9361
SNWA	216 S17 E64 21CBBD1	692929.6284
SNWA	216 S18 E63 15AACD1	686286.8792
SNWA	216 S18 E63 15AACC1	686199.6845
SNWA	216 S18 E63 05DACC1	683006.1888
NEVADA POWER COMPANY	219 S14 E65 08ADBB1	702327.3808
NEVADA POWER COMPANY	219 S14 E65 08AC 2	701911.5282
NEVADA POWER COMPANY	219 S14 E65 08AB 1	702141.1717
NEVADA POWER COMPANY	219 S14 E65 08DB 2	701994.2240
3335HILLSIDE, LLC	219 S14 E65 22AADB1	705825.5606
DRY LAKE WATER LLC	216 S18 E63 13CDBC1	688657.6070

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Point_Y	Cumulative Pumpage
4094155.3445	109.8
4094392.7286	559.57
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4066640.5300	647.57
4067033.8615	702.72
4067033.8615	702.72
4066640.5300	799.16
4066521.4015	799.16
4065282.4873	887.42
4065282.4873	898.52
4065020.3597	912.53
4063384.2923	912.53
4063384.2923	914.82
4067288.9011	914.82
4067288.9011	914.82
4067009.9677	928.09
4067009.9677	928.09
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4064680.1319	947.17
4064680.1319	965.54
4064680.1319	993.5
4068024.8452	993.5
4064970.0930	993.54
4064970.0930	993.54
4065219.3765	1048.54
4067932.7250	1048.54
4067033.8615	1048.54
4067590.8058	1050.63
4067454.9929	1184.71
4067948.5427	1184.71
4022256.9150	1184.71
4065219.3765	1200.82
4067072.3977	1201.82
4067147.2938	1201.82
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4065250.8849	1220.81
4067948.5427	1220.81
4067932.7250	1220.81
4067590.8058	1220.81
4067454.9929	1220.81

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4068024.8452	1220.81
4026563.1051	1337.98
4067948.5427	1337.98
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4065219.3765	1337.98
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4065282.4873	1337.98
4065219.3765	1337.98
4036640.5845	1412.55
4029331.4899	1468.16
4027891.3828	1468.16
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4024116.3877	4849.19
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SE ROA 8224

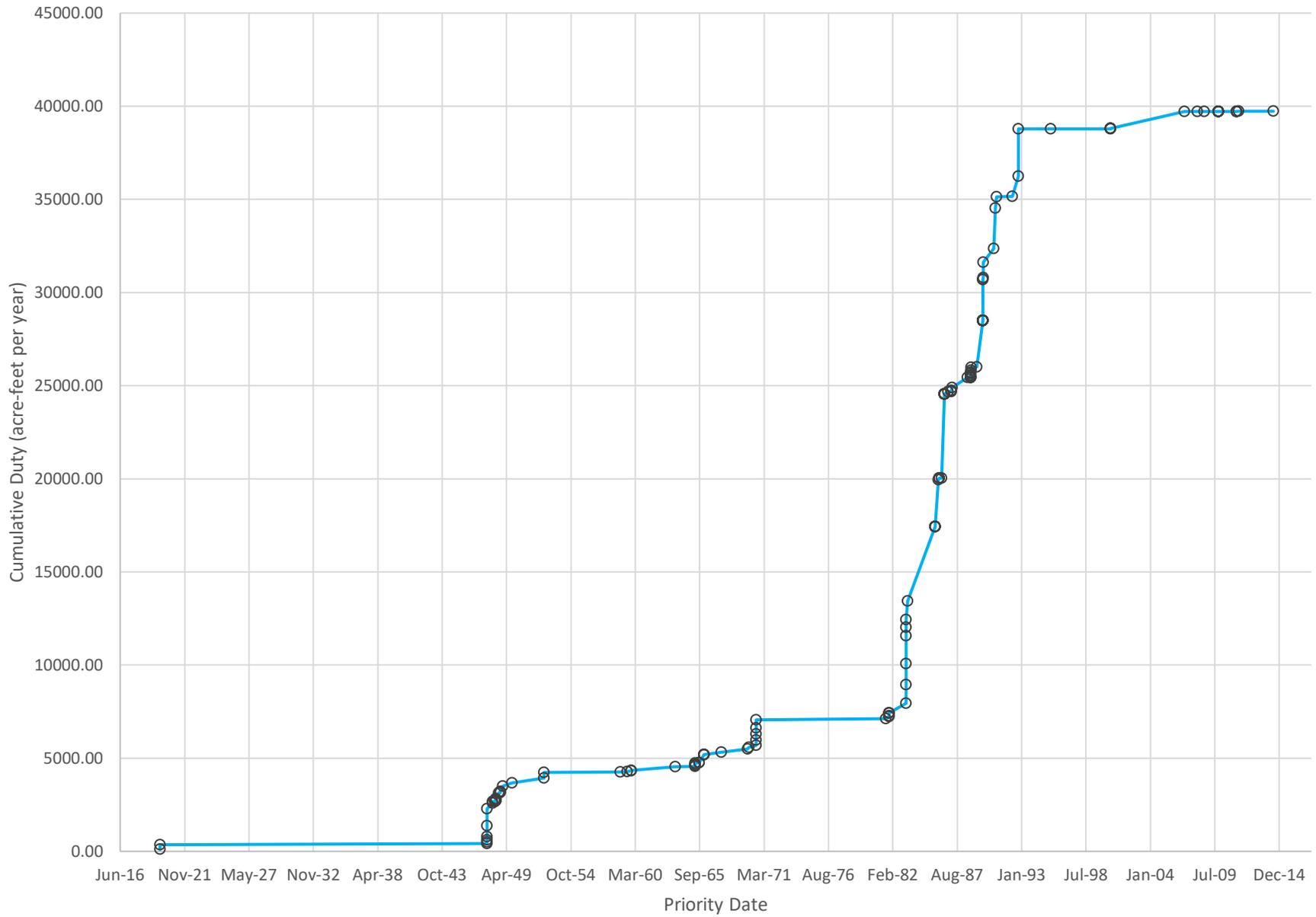
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4027891.3828	4878.16
4027891.3828	4878.16
4029631.0735	5149.23
4028853.4838	5217.22
4028853.4838	5217.22
4019495.5289	5217.22
4019495.5289	5217.22
4062500.2439	5217.22
4046589.7362	5230.04
4046982.5488	5230.04
4046740.6346	5230.04
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4036640.5845	5230.04
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4029096.3670	5693.71
4032732.5766	5693.71
4029096.3670	5693.71
4029102.7666	5693.71
4036640.5845	5693.71
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4032318.8655	5711.21
4032318.8655	6061.21
4042080.5675	6061.21
4032304.2840	6061.21
4018606.637	6094.26
4019007.699	6928.98
4018835.089	7568.52
4067723.5524	8582.28
4019608.6656	8944.07
4060136.8039	8582.28
4067723.5524	8582.28
4067733.9277	8944.07
4066936.1863	8944.07
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4028092.7416	8974.04
4034139.7370	8974.04
4023668.2210	8974.04
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4029096.3670	9004.1
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4032318.8655	9004.1
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4067590.8058	9004.1
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4028092.7416	9028.3

SE ROA 8226

Cumulative Duty



SE ROA 8227

LWRFS GROUNDWATER RIGHTS BY PRIORITY

Basin	Permit	Priority Date	MOU	Annual Duty	Cumulative Duty	Owner of Record	Site ID	2017 Pumpage	Cumulative Pumpage
Coyote Spring Valley	*85249	10/22/1919	COM	109.8	109.80	BEDROC LIMITED LLC	210 S11 E62 24DB 1	109.8	109.8
Coyote Spring Valley	*85250	10/22/1919	COM	233.2	343.00	BEDROC LIMITED LLC	210 S11 E62 24BA 2	449.77	559.57
Muddy River Springs Area	*50733	8/13/1947	IND	70	413.00	LDS	219 S14 E65 16AACD1	0	559.57
Muddy River Springs Area	*50723	8/13/1947	IND	88	501.00	LDS	219 S14 E65 15BBCA1	88	647.57
Muddy River Springs Area	*50729	8/13/1947	IND	120	621.00	LDS	219 S14 E65 09CCBC1	55.15	702.72
Muddy River Springs Area	*50728	8/13/1947	IND	158	779.00	LDS	219 S14 E65 09CCBC1		702.72
Muddy River Springs Area	*50731	8/13/1947	IND	586	1365.00	LDS	219 S14 E65 15BBCA1	96.44	799.16
Muddy River Springs Area	*50732	8/13/1947	IND	930	2295.00	LDS	219 S14 E65 16AACD1	0	799.16
Muddy River Springs Area	*29296	2/4/1948	IND	300	2595.00	NEVADA POWER COMPANY	219 S14 E65 23BBBB1	88.26	887.42
Muddy River Springs Area	38871	2/4/1948	IRR	75	2670.00	EGTEDAR, ASCAR	219 S14 E65 23BBBB1	11.1	898.52
Muddy River Springs Area	*86209	4/20/1948	COM	14.01	2684.01	3335HILLSIDE LLC	219 S14 E65 22AADB1	14.01	912.53
Muddy River Springs Area	*82096	4/20/1948	QM	1.903	2685.91	CLOUD, MARY K	219 S14 E65 26ABDB1		912.53
Muddy River Springs Area	*82097	4/20/1948	QM	2.891	2688.80	CLOUD, MARY K	219 S14 E65 26ABDB1	2.29	914.82
Muddy River Springs Area	*77381	4/20/1948	COM	6.069	2694.87	WILLIAM O`DONNELL	219 S14 E65 09CACCC1		914.82
Muddy River Springs Area	*77382	4/20/1948	COM	9.221	2704.09	WILLIAM O`DONNELL	219 S14 E65 09CACCC1	0	914.82
Muddy River Springs Area	*71026	5/20/1948	IRR	3.993	2708.09	PARSON, BILLY & LINDA	219 S14 E65 09DDCB1	13.27	928.09
Muddy River Springs Area	*71344	5/20/1948	IRR	6.067	2714.15	PARSON, BILLY & LINDA	219 S14 E65 09DDCB1		928.09
Muddy River Springs Area	59257	5/20/1948	IRR	15	2729.15	BRUNDY, LARRY	219 S14 E65 23BC 1	9.54	937.63
Muddy River Springs Area	63504	5/20/1948	IRR	15	2744.15	KOLHOSS, KELLY	219 S14 E65 23BC 1	9.54	947.17
Muddy River Springs Area	59256	5/20/1948	IRR	28.875	2773.03	WHITMORE, DAN	219 S14 E65 23BC 1	18.37	965.54
Muddy River Springs Area	59253	5/20/1948	IRR	43.875	2816.90	LEAVITT, UTE	219 S14 E65 23BC 1	27.96	993.5
Muddy River Springs Area	*24186	8/14/1948	IND	310	3126.90	NEVADA POWER COMPANY	219 S14 E65 08AB 1	0	993.5
Muddy River Springs Area	*64840	10/7/1948	IRR	19.8	3146.70	CLARK COUNTY	219 S14 E65 23BBCC1	0.04	993.54
Muddy River Springs Area	*50851	10/7/1948	IRR	30	3176.70	CLARK COUNTY	219 S14 E65 23BBCC1		993.54
Muddy River Springs Area	*50275	10/7/1948	IND	32.88	3209.58	NEVADA POWER COMPANY	219 S14 E65 22AABB2	55	1048.54
Muddy River Springs Area	*22633	12/20/1948	IND	297.5	3507.08	NEVADA POWER COMPANY	219 S14 E65 08AC 2	0	1048.54
Muddy River Springs Area	*50724	10/4/1949	IND	162.55	3669.63	LDS	219 S14 E65 09CCBC1		1048.54
Muddy River Springs Area	*22636	6/19/1952	IND	260	3929.63	NEVADA POWER COMPANY	219 S14 E65 08DB 2	2.09	1050.63
Muddy River Springs Area	*22632	6/19/1952	IND	315	4244.63	NEVADA POWER COMPANY	219 S14 E65 08DBAC1	134.08	1184.71
Muddy River Springs Area	*22635	12/18/1958	IND	25	4269.63	NEVADA POWER COMPANY	219 S14 E65 08ADBB1		1184.71
Garnet Valley	83553	7/24/1959	IND	3	4272.63	TECHNICHROME	216 S19 E63 03ADDD1		1184.71
Muddy River Springs Area	*50934	11/20/1959	IND	55.4	4328.03	NEVADA POWER COMPANY	219 S14 E65 22AABB2	16.11	1200.82
Muddy River Springs Area	18437	11/20/1959	IRR	20.15	4348.18	COYOTE SPRINGS INVESTMENT LLC	219 S14 E65 09DDBC1	1	1201.82
Muddy River Springs Area	21466	8/15/1963	IRR	183.2	4531.38	CASA DE WARM SPRINGS LLC	219 S14 E65 08DDBB1		1201.82
Muddy River Springs Area	*50730	4/28/1965	IND	25	4556.38	LDS	219 S14 E65 09CCBC1		1201.82
Muddy River Springs Area	*50725	4/28/1965	IND	65	4621.38	LDS	219 S14 E65 09CCBC1		1201.82
Muddy River Springs Area	*50727	4/28/1965	IND	60	4681.38	LDS	219 S14 E65 09CCBC1		1201.82
Muddy River Springs Area	*50726	4/28/1965	IND	65	4746.38	LDS	219 S14 E65 09CCBC1		1201.82
Muddy River Springs Area	27216	8/25/1965	COM	1.381005	4747.77	UNITED STATES OF AMERICA	219 S14 E65 16DBCA1	0.18	1202
Muddy River Springs Area	22738	8/25/1965	COM	18.81	4766.58	DAVIS, DON J. & MARSHA L.	219 S14 E65 22AAAA1	18.81	1220.81
Muddy River Springs Area	*22949	2/2/1966	IND	433	5199.58	NEVADA POWER COMPANY	219 S14 E65 08ADBB1		1220.81
Muddy River Springs Area	**22950	2/2/1966	IND	0	5199.58	NEVADA POWER COMPANY	219 S14 E65 08AC 2		1220.81
Muddy River Springs Area	**22951	2/2/1966	IND	0	5199.58	NEVADA POWER COMPANY	219 S14 E65 08DB 2		1220.81
Muddy River Springs Area	**22952	2/2/1966	IND	0	5199.58	NEVADA POWER COMPANY	219 S14 E65 08DBAC1		1220.81
Muddy River Springs Area	**24185	2/2/1966	IND	0	5199.58	NEVADA POWER COMPANY	219 S14 E65 08AB 1		1220.81
Garnet Valley	*64880	7/24/1967	MM	133.81	5333.39	CHEMICAL LIME COMPANY	216 S18 E63 23DCAA1	117.17	1337.98
Muddy River Springs Area	*25310	10/9/1969	IND	160	5493.39	NEVADA POWER COMPANY	219 S14 E65 08ADBB1		1337.98
California Wash	26371	11/18/1969	IRR	90	5583.39	MOAPA VALLEY WATER COMPANY	218 S14 E65 25CACCC1		1337.98
Muddy River Springs Area	*50272	7/7/1970	IND	99.51	5682.90	NEVADA POWER COMPANY	219 S14 E65 22AABB2		1337.98
Muddy River Springs Area	*50273	7/7/1970	IND	289.91	5972.81	NEVADA POWER COMPANY	219 S14 E65 22AABB2		1337.98
Muddy River Springs Area	*85156	7/7/1970	IND	322.17	6294.98	NEVADA POWER COMPANY	219 S14 E65 08DBAC1		1337.98

*TCD, additive duty

**TCD, supplemental duty

SE ROA 8511

Basin	Permit	Priority Date	MOU	Annual Duty	Cumulative Duty	Owner of Record	Site ID	2017 Pumpage	Cumulative Pumpage
Muddy River Springs Area	*29298	7/7/1970	IND	327.5	6622.48	NEVADA POWER COMPANY	219 S14 E65 23BBBB1		1337.98
Muddy River Springs Area	*79068	7/7/1970	IND	432.7	7055.18	NEVADA POWER COMPANY	219 S14 E65 22AABB2		1337.98
Garnet Valley	*74399	7/20/1981	IND	74.57	7129.75	NEVADA POWER COMPANY	216 S17 E64 21CBBD1	74.57	1412.55
Garnet Valley	*63261	10/20/1981	COM	100	7229.75	CHEMICAL LIME COMPANY OF ARIZONA	216 S18 E63 14AABD1	55.61	1468.16
Garnet Valley	*83715	10/20/1981	IND	37	7266.75	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1		1468.16
Garnet Valley	*83714	10/20/1981	IND	157	7423.75	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19CDDD1	209.3	1677.46
Garnet Valley	63348	10/20/1981	COM	4	7427.75	WESTERN MINING & MINERALS, INC.	216 S18 E63 13CAAA1	2.71	1680.17
Garnet Valley	77745	10/20/1981	COM	10.02	7437.77	NORTH LAS VEGAS-CITY	216 S18 E63 16BBDA1	10.02	1690.19
Coyote Spring Valley	*74095	3/31/1983	MUN	500	7937.77	COYOTE SPRINGS INVESTMENT, LLC	210 S13 E63 05ABCC1	172.78	1862.97
Coyote Spring Valley	*74094	3/31/1983	MUN	1000	8937.77	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID	210 S13 E63 10DCCA1		1862.97
Coyote Spring Valley	*70430	3/31/1983	MUN	1140	10077.77	COYOTE SPRINGS INVESTMENT, LLC	210 S13 E63 22DCAC1		1862.97
Coyote Spring Valley	*70429	3/31/1983	MUN	1500	11577.77	CLARK COUNTY COYOTE SPRINGS WATER RESOURCES GID	210 S13 E63 23BAAB1	1226.64	3089.61
Coyote Spring Valley	*70430R01	3/31/1983	WLD	460	12037.77	COYOTE SPRINGS INVESTMENT LLC			3089.61
Coyote Spring Valley	*77292	3/31/1983	MUN	400	12437.77	SNWA	210 S13 E63 26AAAA1		3089.61
Muddy River Springs Area	*46932	5/19/1983	MUN	1000.15451	13437.92	MOAPA VALLEY WATER DISTRICT	219 S13 E64 35DCAD1	0	3089.61
Coyote Spring Valley	**77293	9/27/1985	MUN	4000	17437.92	SNWA	210 S13 E63 26AAAA1		3089.61
Garnet Valley	**86961T	9/27/1985	MUN	0	17437.92	SNWA	216 S17 E64 21CBBD1	217.38	3306.99
Garnet Valley	**86962T	9/27/1985	MUN	0	17437.92	SNWA	216 S18 E63 15AACD1		3306.99
Garnet Valley	**86959T	9/27/1985	MUN	0	17437.92	SNWA	216 S18 E63 15AACC1		3306.99
Garnet Valley	**86960T	9/27/1985	MUN	0	17437.92	SNWA	216 S18 E63 05DACC1		3306.99
Coyote Spring Valley	77164	12/30/1985	IND	2500	19937.92	NEVADA POWER COMPANY	210 S13 E63 26AABD1		3306.99
Coyote Spring Valley	*77294	1/27/1986	MUN	100	20037.92	SNWA	210 S13 E63 26AAAA1		3306.99
Coyote Spring Valley	**77295	1/27/1986	MUN	0	20037.92	SNWA	210 S13 E63 26AAAA1		3306.99
Coyote Spring Valley	**77296	1/27/1986	MUN	0	20037.92	SNWA	210 S13 E63 26AAAA1		3306.99
Muddy River Springs Area	**52520	4/14/1986	MUN	0	20037.92	MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA1	1447.93	4754.92
Coyote Spring Valley	*77297	7/15/1986	MUN	4500	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77298	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77299	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77300	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77301	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77302	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77303	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77304	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77305	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Coyote Spring Valley	**77306	7/15/1986	MUN	0	24537.92	SNWA	210 S13 E63 26AAAA1		4754.92
Garnet Valley	56855	10/28/1986	IND	144.146233	24682.07	GEORGIA PACIFIC CORPORATION	216 S18 E63 34ADAB1	94.27	4849.19
California Wash	**50559	2/2/1987	IND	0	24682.07	NEVADA POWER COMPANY	218 S15 E66 05CDBD1	28.97	4878.16
California Wash	50558	2/2/1987	ENV	28.970416	24711.04	NEVADA POWER COMPANY	218 S15 E66 05CAAC1		4878.16
California Wash	50560	2/2/1987	ENV	28.970416	24740.01	NEVADA POWER COMPANY	218 S15 E66 05CAAC2		4878.16
Garnet Valley	*66784	3/6/1987	QM	156.84	24896.85	DRY LAKE WATER, LLC	216 S18 E63 27ACAD1		4878.16
Black Mountains Area	*68351	6/21/1988	QM	542.98	25439.83	DRY LAKE WATER, LLC	215 S19 E63 13AADD1		4878.16
Garnet Valley	*83707	10/3/1988	IND	0.11	25439.94	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1		4878.16
Garnet Valley	*83709	10/3/1988	IND	0.11	25440.05	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 07DDCB1		4878.16
Garnet Valley	*83710	10/3/1988	IND	0.11	25440.16	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 20BABA1		4878.16
Garnet Valley	*83712	10/3/1988	IND	3.7	25443.86	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1		4878.16
Garnet Valley	*83713	10/3/1988	IND	23.8	25467.66	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1		4878.16
Garnet Valley	*83711	10/3/1988	IND	40.78	25508.44	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 19ABBB1		4878.16
Garnet Valley	*83717	10/3/1988	IND	68.39	25576.83	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 07DDCC1	271.07	5149.23
Garnet Valley	*83708	10/3/1988	IND	68.5	25645.33	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1	67.99	5217.22
Garnet Valley	*83716	10/3/1988	IND	68.5	25713.83	REPUBLIC ENVIRONMENTAL TECHNOLOGIES INC	216 S18 E64 18ACDB1		5217.22
Black Mountains Area	*68350	10/18/1988	QM	119.44	25833.27	DRY LAKE WATER, LLC	215 S19 E63 13AADD1		5217.22
Black Mountains Area	*68352	10/18/1988	QM	137.55	25970.82	DRY LAKE WATER, LLC	215 S19 E63 13AADD1		5217.22
California Wash	75198	4/4/1989	MUN	25	25995.82	COYOTE SPRINGS INVESTMENT LLC	218 S14 E65 25CAC1		5217.22

*TCD, additive duty

**TCD, supplemental duty

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Basin	Permit	Priority Date	MOU	Annual Duty	Cumulative Duty	Owner of Record	Site ID	2017 Pumpage	Cumulative Pumpage
California Wash	*70257	10/17/1989	MUN	2500	28495.82	MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15ADAA1	12.82	5230.04
California Wash	**70258	10/17/1989	MUN	0	28495.82	MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15AAAA1		5230.04
California Wash	**70259	10/17/1989	MUN	0	28495.82	MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 15AADA1		5230.04
Garnet Valley	**79002	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 05DACC1		5230.04
Garnet Valley	**79003	10/17/1989	MUN	0	28495.82	SNWA	216 S17 E64 21CBBD1		5230.04
Garnet Valley	**79004	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 15AACD1	233.33	5463.37
Garnet Valley	**79005	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 15AACC1	230.34	5693.71
Garnet Valley	**54073	10/17/1989	MUN	0	28495.82	SNWA	216 S17 E63 32CCCB1		5693.71
Garnet Valley	**86967T	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 15AACC1		5693.71
Garnet Valley	**86968T	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 15AACD1		5693.71
Garnet Valley	**86969T	10/17/1989	MUN	0	28495.82	SNWA	216 S17 E64 21CBBD1		5693.71
Garnet Valley	**83490	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 16BBDA1	17.5	5711.21
Garnet Valley	**86970T	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 05DACC1		5711.21
Garnet Valley	**79001	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 05AADB1		5711.21
Garnet Valley	**68822	10/17/1989	MUN	0	28495.82	SNWA	216 S18 E63 05AADB1	350	6061.21
Hidden Valley	*54074	10/17/1989	MUN	2200	30695.82	SNWA	217 S16 E62 25CCCA1		6061.21
Garnet Valley	*87169T	10/17/1989	COM	5	30700.82	SNWA	216 S18 E63 02ABDC1		6061.21
Black Mountains Area	*55269	10/30/1989	IND	96	30796.82	NEVADA COGENERATION ASSOCIATES #1	215 S19 E63 13DDBB1	33.05	6094.26
Black Mountains Area	*58031	10/30/1989	IND	824	31620.82	NEVADA COGENERATION ASSOCIATES #1	215 S19 E63 13DAAB1	834.72	6928.98
Black Mountains Area	*58032	9/13/1990	IND	745	32365.82	NEVADA COGENERATION ASSOCIATES	215 S19 E63 13DACA1	639.54	7568.52
Muddy River Springs Area	*55450	11/9/1990	MUN	2171.906564	34537.72	MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA1	1013.76	8582.28
Black Mountains Area	*68353	12/10/1990	QM	592.06	35129.78	DRY LAKE WATER, LLC	215 S19 E63 13ABCB1		8582.28
California Wash	57441E	4/16/1992	ENV	32.591718	35162.37	NDOT	218 S15 E66 02ACBB1		8582.28
Muddy River Springs Area	*58269	10/27/1992	MUN	1085.94	36248.31	MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA1		8582.28
Muddy River Springs Area	*66043	10/27/1992	MUN	2533.9	38782.21	MOAPA VALLEY WATER DISTRICT	219 S14 E65 07ADDA2	361.79	8944.07
Muddy River Springs Area	61427	7/26/1995	COM	1.350316	38783.57	S & R, INC.	219 S14 E65 09CDCB1		8944.07
Garnet Valley	*81344	8/25/2000	QM	8	38791.57	DRY LAKE WATER. LLC	216 S18 E63 13CDBC1	8	8952.07
Garnet Valley	*72098	8/25/2000	QM	13.16	38804.73	DRY LAKE WATER, LLC	216 S18 E63 13CDBC1	13	8965.07
Garnet Valley	**79948	8/25/2000	QM	0	38804.73	DRY LAKE WATER LLC	216 S18 E63 13CDBC1	8.97	8974.04
Garnet Valley	**66785	8/25/2000	QM	0	38804.73	DRY LAKE WATER, LLC	216 S17 E63 32AABA1		8974.04
Garnet Valley	**77389	8/25/2000	QM	0	38804.73	DRY LAKE WATER, LLC	216 S18 E63 33DBBA1		8974.04
Muddy River Springs Area	*75161E	12/6/2006	ENV	905.81	39710.54	NEVADA POWER COMPANY	219 S14 E65 23BBBB1		8974.04
California Wash	**76643	1/18/2008	MUN	0	39710.54	MOAPA BAND OF PAIUTE INDIANS	218 S16 E64 23BCAA1	30.06	9004.1
Coyote Spring Valley	**77291	8/13/2008	MUN	0	39710.54	SNWA	210 S13 E63 23BAAB1		9004.1
Garnet Valley	**79009	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 15AACD1		9004.1
Garnet Valley	**79008	11/2/2009	MUN	0	39710.54	SNWA	216 S17 E64 21CBBD1		9004.1
Garnet Valley	**79010	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 15AACC1		9004.1
Garnet Valley	**79007	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 05DACC1		9004.1
Garnet Valley	**79006	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 05AADB1		9004.1
Garnet Valley	**86965T	11/2/2009	MUN	0	39710.54	SNWA	216 S17 E64 21CBBD1		9004.1
Garnet Valley	**86964T	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 15AACD1		9004.1
Garnet Valley	**86963T	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 15AACC1		9004.1
Garnet Valley	**86966T	11/2/2009	MUN	0	39710.54	SNWA	216 S18 E63 05DACC1		9004.1
Muddy River Springs Area	**80843	5/9/2011	IND	0	39710.54	NEVADA POWER COMPANY	219 S14 E65 08ADBB1		9004.1
Muddy River Springs Area	**80844	5/9/2011	IND	0	39710.54	NEVADA POWER COMPANY	219 S14 E65 08AC 2		9004.1
Muddy River Springs Area	**80845	5/9/2011	IND	0	39710.54	NEVADA POWER COMPANY	219 S14 E65 08AB 1		9004.1
Muddy River Springs Area	**80846	5/9/2011	IND	0	39710.54	NEVADA POWER COMPANY	219 S14 E65 08DB 2		9004.1
Muddy River Springs Area	*71766	7/21/2011	IRR	21.29	39731.83	3335HILLSIDE, LLC	219 S14 E65 22AADB1	24.2	9028.3
Garnet Valley	**84041	7/1/2014	QM	0	39731.83	DRY LAKE WATER LLC	216 S18 E63 13CDBC1		9028.3

Pumpage amount from same POD and within same TCD applied to most senior right first

*TCD, additive duty

**TCD, supplemental duty

SE ROA 8513