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

IN THE MATTER OF APPLICATIONS 53987 THROUGH 53992, INCLUSIVE, FILED TO APPROPRIATE THE UNDERGROUND WATER OF THE CAVE VALLEY, DRY LAKE VALLEY AND DELAMAR VALLEY HYDROGRAPHIC BASINS (180, 181, 182), LINCOLN COUNTY, NEVADA.	)	**RULING** **#5875**

GENERAL

I.

Application 53987 was filed on October 17, 1989, by the Las Vegas Valley Water District[1] to appropriate 6 cubic feet per second (cfs) of underground water from the Cave Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined in Nevada Revised Statutes (NRS) § 243.210-243.225 (Lincoln), 243.275-243.315 (Nye), 243.365-243.385 (White Pine), and 243.035-243.040 (Clark). The proposed point of diversion is described as being located within the SW¼ NW¼ of Section 22, T.6N., R.63E., M.D.B.&M.[2] In Item 12, the remarks section of the application, it indicates that the water sought under the application shall be placed to beneficial use within the Las Vegas Valley Water District service area as set forth in Chapter 752, Statutes of Nevada 1989, or as may be amended. Further, that the water may also be served and beneficially used by lawful users within Lincoln, Nye and White Pine Counties, and that water would be commingled with other water rights owned or served by the Applicant or its designee. By letter dated March 22, 1990, the Applicant further indicated, in reference to Item 12, that the approximate number of persons to be served is 800,000 in addition to the current service of approximately 618,000 persons, that the applications seek all the unappropriated water within the particular ground-water basins in which the water rights are sought and that the projected population of the Clark County service area at the time of the 1990 letter was estimated to be 1,400,000 persons by the year 2020.

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[1] These applications are now held in the name of the Southern Nevada Water Authority.

[2] Exhibit No. 203, public administrative hearing before the State Engineer, February 4-15, 2008. Hereinafter, the transcript and exhibits from this hearing will be referred to solely by the transcript page number or the exhibit number.

II.

Application 53988 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 10 cfs of underground water from the Cave Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined above. The proposed point of diversion is described as being located within the SE¼ SE¼ of Section 21, T.7N., R.63E., M.D.B.&M.[3] This application, along with the others referenced below, contains the same remarks as found in Application 53987.

III.

Application 53989 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 6 cfs of underground water from the Dry Lake Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined above. The proposed point of diversion is described as being located within the SE¼ SW¼ of Section 30, T.2N., R.64E., M.D.B.&M.[4]

IV.

Application 53990 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 10 cfs of underground water from the Dry Lake Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined above. The proposed point of diversion is described as being located within the NE¼ SE¼ of Section 8, T.2N., R.65E., M.D.B.&M.[5]

V.

Application 53991 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 6 cfs of underground water from the Delamar Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined above. The proposed point of diversion is described as being located within the SE¼ NE¼ of Section 4, T.5N., R.63E., M.D.B.&M.[6]

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[3] Exhibit No. 204.
[4] Exhibit No. 205.
[5] Exhibit No. 206.
[6] Exhibit No. 207.

VI.

Application 53992 was filed on October 17, 1989, by the Las Vegas Valley Water District to appropriate 10 cfs of underground water from the Delamar Valley Hydrographic Basin for municipal and domestic purposes within Clark, Lincoln, Nye and White Pine Counties as more specifically described and defined above. The proposed point of diversion is described as being located within the NE¼ NE¼ of Section 15, T.6N., R.64E., M.D.B.&M.[7]

VII.

Applications 53987 – 53992, inclusive, (Applications) were protested by many persons and entities on many grounds; however, not every person protested every application.[8] When the Las Vegas Valley Water District originally filed these applications, it also filed more than 100 other similar applications throughout Nevada. Thousands of protests were filed on the applications and many of the protests repeated the identical or nearly identical list of protest grounds.

At the pre-hearing conference held on August 28, 2007, the Applicant raised the issue that the State Engineer has previously ruled on certain statutory criteria and many of the same protest grounds as are raised in relation to these applications. The Applicant requested that the State Engineer issue an interim order to indicate that those issues have been addressed and would not have to be addressed again under these applications. The State Engineer granted the Applicant's request and issued Intermediate Order No. 1, which reaffirmed previous findings and dismissed certain protest grounds.[9] The remaining protest issues not addressed in Intermediate Order No. 1 are summarized below and will be addressed along with other required statutory criteria.

PROTEST GROUNDS:

1. The water is not available for appropriation and the quantity requested for appropriation will exceed the safe yield of the area thereby mining ground water, which will lower the water table and degrade the quality of water from existing wells, cause negative hydraulic gradient influences and other negative impacts and adversely affect existing rights and threatens to prove detrimental to the public interest. The perennial yield is no greater than the total rate of flow through the aquifer, and is probably less, and to intercept and prevent the underground flow of more than 11,000 acre-feet from Cave Valley to the White River Valley will impact the water sources of the White River Valley.

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[7] Exhibit No. 208.
[8] Exhibit Nos. 209-214.
[9] Exhibit No. 216.

2. 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 ground-water movement in adjoining and hydraulically connected basins thereby reducing spring and stream flows, including those in the Delamar Valley, White River Valley and the southern end of Cave Valley where there are spring, marsh and riparian habitats, which are important to threatened and endangered species. Water from Dry Lake Valley contributes to ground water in Delamar Valley, which is one of the hydrographic basins that contributes ground water to Pahranagat Valley, in which there are candidate, threatened or endangered species, and water from Pahranagat in turn contributes water to the Muddy River where there other species of concern.

3. The applications were some of over 100 applications filed by the Las Vegas Valley Water District (LVVWD), which in total seek a significant quantity of underground 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.

4. The granting of the applications would destroy the current economic welfare and the economic and growth potential of the hydrographic basin.

5. Use of water under the applications would conflict with or tend to impair existing rights of Preston Irrigation Company, the United States Fish and Wildlife Service in Ash Meadows National Wildlife Refuge, Desert National Wildlife Refuge, Moapa National Wildlife Refuge and Pahranagat National Wildlife Refuge, and rights of the National Park Service appurtenant to the Death Valley National Monument, Devil's Hole, and Lake Mead National Recreational Area. Additionally, use of water under the applications will impair existing rights from such sources as Panaca Big Springs, Crystal Springs, the Muddy River and ground water under the Moapa Indian Reservation, under three tracts of land of the Ely Shoshone Colony and the rights of the Ely Shoshone Tribe.

6. Carter-Griffin, Inc. has approximately 4,000 acres of native grass meadows in the White River Valley that are sub-irrigated and the pumping of this water will significantly lower the water table causing those meadows to dry up.

7. Further study is needed because the potential effects are impossible to anticipate. The available scientific literature is not adequate to reasonably assure that the proposed diversions will not impact senior rights and water resources.

VIII.

The Applicant and the United States Fish and Wildlife Service, Bureau of Land Management, Bureau of Indian Affairs, and National Park Service (Federal Bureaus) entered into a stipulation for withdrawal of their protests.[10] The Federal Bureaus agreed to withdraw their protests in exchange for the Applicant agreeing to implement a monitoring, management and mitigation plan in cooperation with the Federal Bureaus in order to protect sensitive resources in the general area and in particular Pahranagat Valley and the Southern White River area.[11] The Applicant also entered into a stipulation for withdrawal of protests with the Moapa Band of Paiute Indians.[12]

IX.

On September 21, 2007, Cave Valley Ranch, LLC, requested interested person status in the matter of Applications 53987 and 53988. Pursuant to State Engineer's Intermediate Order No. 1, the State Engineer found that Cave Valley Ranch's request was not timely and denied the request for interested person status on the grounds of timing with no determination being made on the merits of the request.[13] Cave Valley Ranch appealed this decision and the Seventh Judicial District Court reversed the State Engineer's denial and directed the State Engineer to allow Cave Valley Ranch to participate as an interested person at the administrative hearing.[14] However, the State Engineer notes that the District Court did not remand the matter to the State Engineer for a decision on the merits of the request under Nevada Administrative Code § 533.100.

FINDINGS OF FACT

I.

STATUTORY STANDARD TO GRANT

The State Engineer finds that NRS § 533.370(1) provides that the State Engineer shall approve an application submitted in proper form which contemplates the application of water to beneficial use if the applicant provides proof satisfactory of his intention in good faith to construct

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[10] Exhibit No. 19.
[11] Transcript, p. 85.
[12] Exhibit No. 10.
[13] Exhibit No. 216.
[14] Exhibit No. 13.

any work necessary to apply the water to the intended beneficial use with reasonable diligence, and his financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence.

II.

STATUTORY STANDARD TO DENY

The State Engineer finds that NRS § 533.370(5) provides that the State Engineer shall reject an application and refuse to issue the permit where there is no unappropriated water in the proposed source of supply, or where the proposed use conflicts with existing rights or with protectible interests in existing domestic wells as set forth in NRS § 533.024, or where the proposed use threatens to prove detrimental to the public interest.

III.

STATUTORY STANDARD FOR INTERBASIN TRANSFERS

The State Engineer finds that NRS § 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 the water from another basin; (b) if the State Engineer determines a plan for conservation of water is advisable for the basin into which the water is imported, whether the applicant has demonstrated that such a plan has been adopted and is being effectively 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 to be relevant.

IV.

PLACE OF USE

The Applications under consideration in this ruling were filed for municipal and domestic uses in Clark, Lincoln, Nye and White Pine Counties. As previously discussed at the August 28, 2007, prehearing conference, the Applicant requested that the State Engineer issue an interim order to indicate that the State Engineer had previously ruled on certain statutory criteria including the need for the water. The State Engineer granted the Applicant's request and found in Intermediate Order No. 1 that he had previously ruled that the Applicant had demonstrated a need for the water;

however, the State Engineer also made the finding that the Applicant had only demonstrated a need for the water in Clark County. [15]

During the administrative hearing on these applications, evidence was provided regarding an agreement between the Applicant and Lincoln County for the withdrawal of Lincoln County's protests to the Applications in Cave Valley, Dry Lake Valley and Delamar Valley (the subject basins). Pursuant to said agreement, the Applicant agreed that, upon written request by Lincoln County, the Applicant would assign to Lincoln County such portion of any permit issued to the Applicant within Cave Valley, Dry Lake Valley or Delamar Valley in an amount not to exceed 1,500 acre-feet from either Cave Valley, Dry Lake Valley or Delamar Valley with a combined total not to exceed 3,000 acre-feet. In accordance with the agreement, the use of the water by Lincoln County was limited to Lincoln County in general or the basin of origin.[16] By letter dated December 19, 2007, the Lincoln County Board of Commissioners indicated that it did not anticipate any projects or development in the subject basins and indicated that it wishes to use any water it obtains pursuant to the agreement within the Coyote Springs-Lincoln County General Improvement District, which is not located in either Cave Valley, Dry Lake Valley or Delamar Valley.[17] While the December 19, 2007, letter clearly indicates an intent by Lincoln County to use any water assigned to Lincoln County within the Coyote Springs-Lincoln County General Improvement District, the letter does not provide any information nor was any additional evidence submitted regarding the need for the water, actual beneficial use of the water or a quantity of water needed for the Coyote Springs-Lincoln County General Improvement District.

The State Engineer finds these Applications were originally filed by the Las Vegas Valley Water District and are now held by the Southern Nevada Water Authority (SNWA). The State Engineer finds there is no evidence in the record of a need for or a beneficial use of the water for anywhere other than Clark County and there is no evidence in the record showing the Applicant has justified a need to import water into Coyote Spring Valley as part of the Coyote Springs-Lincoln County General Improvement District, particularly since the Applicant is not the water purveyor in Coyote Spring Valley or a participant in the Coyote Springs-Lincoln County General Improvement District. The State Engineer finds that the Applicant has only provided evidence that demonstrates the need to import water from another ground-water basin into its service area, that being Clark

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[15] Exhibit No. 216.
[16] *See generally*, testimony of John Entsminger, Transcript, pp. 706-735.
[17] Exhibit No. 395, Transcript, pp. 727-728.

County. The State Engineer finds the place of use under these applications is at this time restricted to Clark County.

V.

PERENNIAL YIELD

As detailed in the following section, new information provided by the Applicant and other sources have resulted in new perennial yields being established for the subject basins. The perennial yield of Cave Valley is hereby found to be 5,000 afa, the perennial yield of Dry Lake Valley is 12,700 afa, and the perennial yield of Delamar Valley is 2,550 afa.

In determining the amount of ground water available for appropriation in a given hydrographic basin (basin), the State Engineer relies on available hydrologic studies to provide relevant data to determine the perennial yield of a basin. 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. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be salvaged for beneficial use. The perennial yield cannot be more than the natural recharge to a ground-water basin and in some cases is less. If the perennial yield is exceeded, ground-water levels will decline and steady-state conditions will not be achieved. Additionally, withdrawals of ground water in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased economic pumping lifts, and land subsidence.[18]

In most Nevada basins, ground water is discharged primarily through evapotranspiration (ET). In those basins, the perennial yield is approximately equal to the estimated ground-water ET; the assumption being that water lost to natural ET can be captured by wells and placed to beneficial use. Many of the basins in the carbonate aquifer terrain discharge most of their ground water via subsurface flow to adjacent basins, that is, there is little or no ET. The amount of subsurface discharge that can be captured is highly variable and uncertain. Perennial yields for these basins have historically been set at one-half of the subsurface discharge. However, when conditions are such that there is subsurface flow through several basins, there is a potential for double accounting and over appropriating the resource if the perennial yield of each basin is equal to one half of the subsurface outflow and basin subsurface inflows are not adjusted

[18] State Engineer's Office, Water for Nevada, State of Nevada Water Planning Report No. 3, p. 13, Oct. 1971.

accordingly. Therefore, allowances and adjustments are required to the perennial yields of basins in these "flow systems" so that over appropriation does not occur.

The depth to ground water within the principal ground-water aquifer throughout Cave Valley generally exceeds 50 feet below ground surface; subsequently ground-water ET within Cave Valley is minimal. BARCASS[19] estimated a total of 2,000 afa of ground-water ET discharge from Cave Valley and the Applicant estimated approximately 1,300 afa of ground-water ET discharge from the basin.[20] However, ground-water level data suggests that the ground-water ET discharge that does occur most likely results from perched aquifers, and as such, the ability to capture the ground-water ET discharge with wells drilled into the principal ground-water aquifer may be limited.

Dry Lake Valley and Delamar Valley do not have any natural ground-water ET discharge, rather all ground-water discharge occurs as subsurface outflow to adjacent basins.

In basins with minimal ground-water ET discharge or the complete absence of ground-water ET discharge, the perennial yield of the basins must be determined using estimates of recharge and subsurface outflow.

Reconnaissance estimates of ground-water recharge for Cave Valley, Dry Lake Valley and Delamar Valley were initially made by Eakin in 1962 and 1963.[21, 22] Since that time, there have been other estimates of recharge that have been computed by various methods. In support of these Applications, the Applicant computed new estimates of recharge in a manner similar to the Maxey-Eakin method. They estimated ground-water ET by delineating discharge areas, established ET classifications and rates, and spatially distributed ET classes in each of the basins, scaled basin ET by an estimate of potential ET, and computed ground-water ET for each of the basins within the White River Flow System.[23] Using estimates of interbasin flow as an additional constraint, the Applicant then solved for the recharge efficiency for every one-inch increment of precipitation using the automatic solver function in Excel. Their estimated recharge

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[19] United States Geological Survey, Scientific Investigations Report SIR 2007-5261.
[20] Exhibit No. 236, Table 4-5, p. 4-12.
[21] Eakin, T.E., Ground-Water Appraisal of Cave Valley in Lincoln and White Pine Counties, Nevada, Department of Conservation and Natural Resources, Ground-Water Resources Reconnaissance Series Report 13, 1962.
[22] Eakin, T.E., Ground-Water Appraisal of Dry Lake and Delamar Valleys, Lincoln County, Nevada, Department of Conservation and Natural Resources, Ground-Water Resources Reconnaissance Series Report 16, 1963.
[23] Exhibit No. 236, Part A, Section 4.2.

for basins in the White River Flow System, as well as other published estimates, were presented in Applicant's Exhibit No. 236, Table 5-2, and is shown below.

Table 5-2
Comparison of Estimates of Precipitation Recharge Volumes, in Acre-Feet per Year, for Basins in the WRFS

HA Name	This Study[a]	Flint and Flint (2007)	Flint et al. (2004)		LVVWD (2001)[b]	Nichols (2000)	Eakin (1966) and Rush (1968)
			Mean Year	Time Series			
Long Valley	19,928	25,000	16,289	13,536	23,000	48,000	10,000
Jakes Valley	12,288	16,000	10,974	8,310	24,000	38,500	17,000
White River Valley	41,065	35,000	34,925	30,759	62,000	--	38,000
Cave Valley	14,659	11,000	10,264	9,380	20,000	--	14,000
Garden Valley	24,818	--	17,974	15,559	19,000	--	10,000
Coal Valley	3,857	--	3,839	3,110	7,000	--	2,000
Pahroc Valley	4,507	--	4,432	4,832	8,000	--	2,200
Dry Lake Valley	15,667	--	10,627	11,298	13,000	--	5,000
Pahranagat Valley	5,507	--	7,043	7,186	7,000	--	1,800
Delamar Valley	6,401	--	7,764	6,404	5,000	--	1,000
Kane Springs Valley	4,189	--	5,421	6,328	7,000	--	2,600
Coyote Spring Valley	2,128	--	5,184	5,951	4,000	--	
Muddy River Springs Area	38	--	12	207	200	--	Minor
Hidden Valley	42	--	188	571	300	--	400
Garnet Valley	96	--	294	1,000	300	--	400
California Wash	0	--	23	652	300	--	<100
Lower Moapa Valley	33	--	--	147	1,000	--	<50
Black Mountains Area	0	--	54	1,470	400	--	<100
Total	**155,224**	--	**135,307**	**126,700**	**201,500**	--	**104,650**

[a]Values were only rounded to the nearest "ones" to allow calculations to be tracked during analysis and reporting.
[b]Table 6-1, p. 6-3

As shown in the second column labeled (This Study[a]), the Applicant's proffered estimates of recharge in Cave Valley, Dry Lake Valley, and Delamar Valley are 14,659, 15,667, and 6,401 afa, respectively. As part of an uncertainty analysis, the Applicant also considered other estimates of some of the water budget components, then recomputed recharge coefficients and basin recharge using the same Excel solver technique. The uncertainty parameters considered included ET in the White River Valley, ET in the Muddy River Springs Area, inflow to the White River Flow System from adjacent basins, the permissible maximum recharge efficiency, and reduced outflow to the Colorado River. The uncertain parameters were changed individually, with all other parameters held constant. The resultant ranges of recharge estimates

for Cave Valley were 11,900 to 17,300 afa, for Dry Lake Valley 11,900 to 20,000 afa and for Delamar Valley 4,800 to 8,300 afa.[24]

As shown by the Applicant in Exhibit No. 236, Table 5-2 above, and as noted by the Protestants, there are several other recharge estimates with a wide range of recharge values for the subject basins.

It is the responsibility of the State Engineer to determine what estimate(s) of recharge and/or discharge to use in determining the perennial yield of a basin. Of the methods and estimates shown in Exhibit No. 236, Table 5-2, the estimates of Flint and Flint, 2007 and SNWA are the most recent and perhaps the most credible of the recharge estimates. Flint and Flint, 2007 are the recharge estimates used in the BARCAS Study.[25] The SNWA recharge estimates have the advantage of being balanced to ground-water discharge; however, each of the discharge components has inherent error and uncertainty. Therefore, the accuracy of the method is in large part controlled by the accuracy of the discharge estimates of ground-water ET as well as subsurface boundary inflows from up-gradient basins and outflow from the White River Flow System to the Colorado River. The State Engineer finds that the recharge estimation methodologies employed by the Applicant and submitted in Exhibit No. 236 are generally fundamentally sound and the range of those estimates shall be considered in determining the recharge value upon which to base the perennial yield of Cave Valley, Dry Lake Valley and Delamar Valley.

Of particular interest and concern with the recharge estimates provided by the Applicant is the value used for the White River Flow System boundary outflow to the Colorado River and the water budget calculations made in the uncertainty analysis.[26] The Applicant estimates there are 25,000 acre-feet annually of ground-water outflow from the White River Flow System to the Colorado River. Of that 25,000 acre-feet, 7,000 acre-feet is a ground-water component of the Muddy River, which discharges as surface flow to the Colorado River,[27] 16,000 acre-feet is subsurface ground-water flow from the Lower Moapa Valley, and 2,000 acre-feet is subsurface flow from the Black Mountains Area. Of these calculations, the 16,000 afa of subsurface flow

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[24] Exhibit No. 236, Part A, Table 6-2.
[25] Welch, A.H., Bright, D.J., and Knochenmus, L.A., editors, 2007, Water Resources of the Basin and Range Carbonate-Rock Aquifer System, White Pine County Nevada and Adjacent Areas in Nevada and Utah, USGS SIR 2007-5261.
[26] Exhibit No. 236, Section 6.
[27] Transcript, p. 310.

from the Lower Moapa Valley is a matter of concern. In estimating the 16,000 afa of subsurface flow from the Lower Moapa Valley, the Applicant used hydraulic properties estimated from specific capacity measurements for two wells located approximately 8 miles northwest of the cross section where the volume of subsurface flow from Lower Moapa Valley was calculated.[28] A transmissivity value of 17,000 ft^2/d was estimated from the average of the published specific capacities of 105 and 24 gpm/ft for the two wells.[29] The computed transmissivity value was stated to be within the published range for basin-fill aquifers in the region;[30] however, the well logs for the specified wells indicate that the wells were completed in limestone bedrock, not valley fill material. The hydraulic gradient was estimated to be 0.00432 feet per foot as determined from water levels in the valley fill (alluvial) aquifer.[31] Additionally, the use of a 26,500-foot cross section for the darcy flow calculation is also questioned. Recently published geological maps in the area of the cross section show young valley fill of approximately 5,000 feet in width and not the 26,500 feet as indicated by the Applicant.[32] The remainder of the cross section area is underlain by Tertiary sedimentary rocks of the Muddy Creek formation, which are less permeable than younger valley-fill sediments. There are 18 well logs on file with the State Engineer for wells with specific capacity measurements located closer to the cross section than the two wells used by the Applicant. The specific capacity values of these wells ranged from 0.2 to 10 gpm/ft, which equates to a corresponding transmissivity of about 500 ft^2/d. Using the same cross section width of 26,500 feet as the Applicant and their equation D.2-1, results in a computed subsurface flow of approximately 500 afa as opposed to the Applicant's estimate of 16,000 afa. If a cross sectional flow width of 5,000 feet corresponding with the mapped young sediments, as indicated on the recently published geological maps is used, the subsurface outflow from Lower Moapa Valley would only be 100 afa. The State Engineer finds that the available evidence does not support the Applicant's estimate of subsurface outflow from the Lower Moapa Valley Hydrographic Basin.

The Applicant's calculation of the discharge of the White River Flow System seems overly complex by attempting to sum present-day and historical ET due to natural and

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[28] Exhibit No. 236, Figure D.3-2.
[29] Exhibit No. 236, pp. D21 and D22.
[30] Exhibit No. 236, p. D22.
[31] Exhibit No. 236, pp. D22 and D23.
[32] Page, et al., Nevada Bureau of Mines and Geology, Map 150, Geologic map of parts of the Colorado, White River, and Death Valley groundwater flow systems.

agricultural losses in California Wash, Lower Moapa Valley, and Muddy River Springs Area, a short period of historical surface outflow from a site near St. Thomas, inflow from the Lower Meadow Valley Wash, and subsurface outflow through a cross section of uncertain hydraulic properties. A simpler and more certain estimate of the total outflow could be made by replacing both surface and subsurface loss estimates in the Lower Moapa Valley with measured flow at the Glendale Gage above Jackman Narrows. Jackman Narrows is a natural funnel through which the waters of the Muddy River are forced to the surface and underflow at that location is minimal. The Glendale Gage also captures both surface and subsurface inflow from the Lower Meadow Valley Wash. Historical base flow at the Glendale Gage is nearly identical to the Moapa Gage. Therefore, ET losses between the Moapa and Glendale gages are approximately equal to the inflow from the Lower Meadow Valley Wash. It can be concluded then that pre-development flow at the Moapa Gage plus total ET above the Moapa gage should closely approximate the total discharge of the White River Flow System, which was previously estimated by Eakin to be 50 cfs, or about 36,000 afa.

The Applicant discussed their recharge efficiency uncertainty results for the low outflow case and stated that the model computes 28,022 afa of subsurface flow from Coyote Spring Valley to the Muddy River Springs Area, lower than the observed discharge of the springs of about 34,000 afa and, therefore, indicated the case is highly unlikely, if not impossible.[33] However, the flow to the Muddy River Springs Area could easily be achieved in the model if 15,000 afa was not forced by the model to flow from Coyote Spring Valley to Hidden Valley. The Applicant's basis for the 15,000 afa of flow to Hidden Valley is based on interpreted head gradients through an east-west cross section at the boundary between Coyote Spring Valley and Hidden Valley. When queried about potential flow directions, the witness acknowledged that the available head data could also support other interpretations of flow direction.[34] Therefore, the Excel solver for estimating recharge efficiencies using the low outflow case should not be impossible, or even unlikely, because of too little flow from Coyote Spring Valley to the Muddy River Springs Area. Limiting flow from Coyote Spring Valley to Hidden Valley to a lesser amount results in an equal increase of simulated flow to the Muddy River Springs Area.[35]

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[33] Exhibit No. 236, Part A, p. 6-5.
[34] Transcript, pp. 345-347.
[35] Exhibit No. 269, SNWA-WRFS-Groundwater-Budget-Unc-Outflow-Low.xls.

As mentioned above, the Applicant's recharge estimation procedure is a water balance technique similar to the well-known Maxey-Eakin method. Recent rulings of the State Engineer have clearly stated that the Maxey-Eakin recharge coefficients could not be used with precipitation maps other than the Hardman map and the use of more recent precipitation maps would require recalibration of the recharge coefficients.[36] The Applicant has used the PRISM precipitation map and recomputed the recharge coefficients as required. The State Engineer acknowledges that the technique is appropriate, but there are numerous factors that add a degree of uncertainty to the results. In their uncertainty analysis "low outflow" case, the Applicant suggests that the failure of the Excel solver to find a solution, without also changing other constraints, is an additional reason to discount the low outflow scenario.[37] However, it is apparent that their methodology has errors in its conceptual approach, due in part to its simplicity. Recharge efficiencies vary for reasons other than total precipitation, such as for different rock and soil types, the timing and duration of precipitation, hill slope and aspect, potential ET and other factors that will increase the error of the technique. The use of a power function results in inconsistencies at the higher precipitation amounts where rapidly escalating recharge efficiencies result in recharge amounts that increase faster than the increase in precipitation. For example, the Applicant's proffered solution of recharge efficiency where there is 20.5 inches of precipitation is 0.281, which results in 5.75 inches of recharge. For 25.5 inches of precipitation, the efficiency is 0.63, which results in 16.06 inches of recharge. As can be seen, an additional five inches of precipitation resulted in an additional 10.31 inches of recharge or a 24.5% increase in precipitation results in a 280% increase in recharge. It is unclear how the amount of recharge could increase at a rate greater than the amount of precipitation. It is acknowledged by the State Engineer that the Applicant is not proposing that this technique simulates actual in-place naturally occurring recharge, but the above issue has uncertain ramifications for the validity of the technique and the proffered solution. Therefore, the State Engineer finds the Applicant's recharge estimates have some unquantified error, but their Excel solver solution(s) for recharge efficiency are to be considered in estimating the recharge for subject basins and for the White River Flow System, and that the low outflow case also

[36] State Engineer's Ruling No. 5712, pp. 12-13; State Engineer's Ruling No. 5747, p. 10, official records in the Office of the State Engineer.
[37] Exhibit No. 236, Part A, p. 6-5.

represents a valid solution that will be considered. The State Engineer also finds that other recent estimates of recharge made by other methodologies are to be given consideration.

An analysis of isotopes of oxygen (oxygen-18) and hydrogen (deuterium) was presented by the Applicant's witness to support their interpretation of water budgets and flow paths in the White River Flow System.[38] The study concluded that the oxygen-18 and deuterium concentrations in ground waters of the White River Flow System are consistent with the water budgets and flow paths submitted by the Applicant. It was recognized that the analysis represents a non-unique solution, and that recharge and ET could be higher or lower and that other water budgets are possible.[39] The summary report and testimony stressed the excellent fit of the Applicant's water budget to the isotope model, and in particular emphasized the quality of agreement in Cave Valley, Dry Lake Valley and Delamar Valley. It appears that ground water in the deep wells in Dry Lake and Delamar Valleys are isotopically lighter than would be expected based on the logical source of water, and while the isotopic content of recently drilled wells in Dry Lake Valley do not match local recharge, they are identical to the estimated isotopic content of inflow from the upgradient basins. This result could be because the wells have not been thoroughly developed as suggested by the expert,[40] or that the isotope model and/or recharge model are incorrect. The isotope report refers to the measured and calculated deuterium values in the deep wells in Cave Valley, Dry Lake Valley and Delamar Valley as demonstrable evidence in support of the Applicant's recharge estimates and flow paths; however, the State Engineer finds that the isotopic data do not fully support the Applicant's recharge estimates and theoretical flow paths and considerable uncertainty remains as to actual amount of recharge and flow paths within the subject basins in particular, and the White River Flow System as a whole.

Due to the uncertainty in the amount of recharge and flow paths the recharge estimates will be based on a combination of factors. The State Engineer finds that a reasonable and conservative estimate for recharge in Cave Valley is 12,300 afa, based on the USGS estimate in BARCASS[41] and the Applicant's low outflow case solution.[42] The State Engineer finds that a reasonable and conservative estimate for recharge in Dry Lake Valley is 12,700 afa, based on the

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[38] Exhibit No. 238.
[39] Transcript, pp. 516 and 591.
[40] Transcript, p. 590.
[41] United States Geological Survey, Scientific Investigations Report 2007-5261, p. 44.
[42] Exhibit No. 236, Part A, Table 6-1.

Applicant's low outflow case scenario. The State Engineer finds that a reasonable and conservative estimate for ground-water recharge in Delamar Valley is 5,100 afa, again based on the Applicant's low outflow case solution.

In addition to the 12,300 afa of natural recharge within Cave Valley, the Applicant estimated approximately 1,300 afa of phreatophytic ET from ground water in southern Cave Valley; however, the depth to ground water in that area is greater than 150 feet, so the phreatophytic community there is most likely using perched ground water and it is unlikely that pumping ground water from the principal ground-water aquifer will capture the phreatophytic ET.[43] The Applicant also estimated 4,000 afa of outflow from Cave Valley to White River Valley through the Shingle Pass fault zone. The hydrologic connection between Cave Valley and White River Valley was based on the isotopic similarity of discharge from Butterfield and Flag Springs to the discharge of mountain springs in Cave Valley as well as the lower water temperature at Butterfield and Flag Springs when compared to other regional carbonate springs. The combined discharge of Butterfield and Flag Springs is 7,330 afa. The Applicant estimates that approximately 3,240 afa originates from the up-gradient watersheds on the White River Valley side of the Egan Range and the remaining flow of approximately 4,000 afa is derived from Cave Valley as subsurface flow through the Shingle Pass fault zone.[44] Evidence presented by the Protestants delineated several of their reasons for concern, in particular that some of the abundant ground-water ET discharge in the southern part of the White River Valley may have as its source subsurface outflow from Cave Valley.[45] The north half of Cave Valley is much wetter than the south half of Cave Valley, and could contribute a substantial portion of the estimated 12,300 afa of recharge within Cave Valley as subsurface outflow to White River Valley. The Applicant's use of their computed recharge efficiency solution to estimate in-place recharge in the watersheds up gradient of Butterfield and Flag Springs has not been demonstrated to be a valid application of the technique and, to be fair, the Applicant did not directly represent it as such. They used the methodology as a first approximation in the absence of better information. The uncertainty of the estimate cannot be overlooked and the State Engineer is concerned that subsurface outflow from Cave Valley to White River Valley through the Shingle Pass fault zone and further south along the western hydrographic boundary of Cave Valley may significantly

[43] Transcript, pp. 1013-1015.
[44] Exhibit No. 236, Part A, pp. D9-D11.
[45] Exhibit No. 1200, pp. 9-11.

exceed the 4,000 afa estimated by the Applicant. In the absence of more substantial evidence to the contrary, the State Engineer finds that subsurface outflow from Cave Valley to White River Valley most likely exceeds the outflow attributed to Cave Valley by the Applicant. The State Engineer is concerned that there is underflow in the area of Butterfield and Flag Springs that supplies sub-irrigated pasture that was not included in the discharge of Butterfield and Flag Springs, that there was an over expansion of the up-gradient watershed area on the White River Side of the Egan Range, which the Applicant attributed as contributing to the discharge of Butterfield and Flag Springs, and that the northern end of Cave Valley is substantially wetter than the southern end, thereby having sufficient recharge to substantiate a higher outflow from Cave Valley to White River Valley. To protect the existing rights of Butterfield and Flag Springs, the State Engineer will allocate 6,000 afa of Cave Valley recharge as subsurface discharge from Cave Valley to White River Valley with a majority of said water resulting as discharge from Butterfield and Flag Springs, and will exclude the 6,000 afa from the available perennial yield of Cave Valley. Furthermore, because the approximate 1,300 afa of phreatophytic ET discharge from the southern end of Cave Valley is most likely from a perched aquifer, it is unlikely that ground-water pumpage from the principal ground-water aquifer will capture the phreatophytic ET; therefore, the 1,300 afa of phreatophytic ET will be excluded from the perennial yield. The State Engineer finds that based on an annual recharge of 12,300 acre-feet, less 1,300 afa of phreatophytic ET from a perched ground-water aquifer, less 6,000 afa of subsurface outflow from Cave Valley to White River Valley the perennial yield of the Cave Valley is 5,000 afa.

In addition to the 12,700 afa of natural recharge within Dry Lake Valley, the Applicant estimated that 2,000 afa of subsurface outflow from Cave Valley passes through Pahroc Valley and into the northwestern portion of Dry Lake Valley.[46] The evidence supporting this interpretation of flow was based on geology and fault controls to ground-water flow. Because this subsurface flow is uncertain, and also because the ultimate source is from Cave Valley and is a component of Cave Valley's perennial yield, subsurface inflow to Dry Lake Valley will not be considered as a potential contribution to the basin's perennial yield. The Applicant proposes that the entirety of subsurface outflow from Dry Lake Valley flows into Delamar Valley. However, the Protestants suggested the possibility of subsurface flow westward into northern Pahranagat

[46] Exhibit No. 236, pp. D11-D13.

Valley along the Timpahute Transverse Zone.[47] The isotopic evidence does not support flow into northern Pahranagat Valley; however, the data does not match the Applicant's model that well either due to the observed isotopes being lighter than modeled.[48] The State Engineer finds that due to the remoteness of the basins and lack of natural discharge from springs or ground-water ET, the perennial yield of Dry Lake Valley will be equal to the locally-derived subsurface outflow, which is also equal to the estimated ground-water recharge of 12,700 afa.

In addition to the 5,100 afa of natural recharge within Delamar Valley, there is substantial subsurface inflow from Dry Lake Valley. That subsurface inflow has been included in the perennial yield of Dry Lake Valley, so it is not available to be a component of the Delamar Valley perennial yield. Subsurface outflow from Delamar Valley flows into Coyote Spring Valley and/or the southern portion of Pahranagat Valley,[49] with a small likelihood of subsurface outflow into northern Pahranagat Valley along the Timpahute Transverse Zone as discussed above. In Delamar Valley, there is a reasonable chance of subsurface discharge from Delamar Valley to Pahranagat Valley and to capture the entire discharge from Delamar Valley could result in adverse impacts to existing rights in Pahranagat Valley. Therefore, in Delamar Valley the State Engineer finds that the perennial yield will be equal to one-half of the unallocated subsurface outflow being 2,550 afa.

VI.

IMPACTS TO EXISTING RIGHTS

Nevada Revised Statute § 533.370(5) provides that the State Engineer shall reject an application where the proposed use conflicts with existing rights. Water rights that could potentially be adversely affected by the proposed applications include both ground-water rights and surface-water rights originating as springs on the valley floors, valley margins or surface-water rights originating as springs in down-gradient hydrologically connected basins.

Jim Watrus, a witness for the Applicant, testified that in Cave Valley there is currently 46.58 acre-feet of existing ground-water rights, in Dry Lake Valley 56.56 acre-feet of existing ground-water rights, and in Delamar Valley 7.24 acre-feet of existing ground-water rights and there are no domestic wells located within 2,500 feet of any of the proposed points of diversion. The majority of water rights in Cave Valley, Dry Lake Valley and Delamar Valley are for

[47] Transcript, pp. 1204-1205.
[48] Exhibit No. 238, Table 3, p. 27.
[49] Exhibit No. 236, pp. D13-D17.

springs located in the mountain blocks. In Cave Valley, there are eight permits for the use of ground water (6638, 7397, 7485, 66123, 66125, 73168, 73169, and 73170), all of which are for stock-watering purposes. In Dry Lake Valley, there are six permits for the use of ground water (5936, 6718, 18756, 35770, 35773 and 35774), five of which are for stock-watering purposes and one for mining and milling. In Delamar Valley, there is one permit for the use of ground water (51261), which is for stock-watering purposes. Mr. Watrus' report indicates that many of the permitted water rights were excluded from the impacts analysis as a result of their location in relation to the proposed points of diversion or their priority dates in relation to the pending applications.[50] As to spring rights, Mr. Watrus indicates that it is highly unlikely that ground-water pumping from the principal aquifer would impact any spring rights, because the springs are not in hydraulic continuity with the principal ground-water aquifer system.

Using a Theis drawdown analysis that simulated continuous pumping the applied for amounts for 75 years, the simulated drawdown for pumping in Cave Valley ranged from 41 feet at the point of diversion of Permit 6638, which is a stock-water well 5.97 miles away from the closest proposed point of diversion under these applications, and 50 feet at the point of diversion of Permit 7397, which is a stock-water well 3.53 miles away from the closest proposed point of diversion under these applications. Well construction information is not available for these wells, but Mr. Watrus' report indicates that simulated drawdown at these wells are believed to be the upper bounds for what is expected due to the conservative assumptions in the analysis.[51]

In Dry Lake Valley, the simulated drawdown ranged from 8 feet at the point of diversion of Permit 5936, which is a stock-water well in the very northern portion of Dry Lake Valley, 35.1 miles away from the closest proposed point of diversion under these Applications, and 37 feet at the point of diversion of Permit 18756, which is a stock-water well in the central portion of Dry Lake Valley, 10.48 miles away from the closest proposed point of diversion under these applications. To further evaluate the potential effects of pumping, the Applicant reviewed well construction and water-level information and opined that the 37 feet of drawdown would unlikely cause the well under Permit 18756 to go dry and impair its usefulness as a stock-water well.[52]

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[50] Exhibit No. 236, Part C, p. 3-1.
[51] Exhibit No. 236, Part C, p. 3-13.
[52] Exhibit No. 236, Part C, p. 3-15.

With regards to surface water in Dry Lake Valley, the simulated drawdown was 48 feet at the point of diversion of Permit 8698, which is Ely Spring (reservoir) located in the middle portion of Dry Lake Valley, 6.44 miles from the closest proposed point of diversion under these applications. But since Ely Spring is believed to be recharged from the watershed area up-gradient from the spring, it is not believed the Applicant's pumping will have any effect in that the water source is not directly connected to the principal ground-water aquifer.

In Delamar Valley, simulated drawdown ranged from 53 to 65 feet, with 61 feet at Grassy Spring, but the evidence indicates that this spring is located 450 feet higher in surface elevation than the nearest proposed pumping well and its source of water is not directly connected to the principal ground-water aquifer.[53] The other water rights in Delamar Valley are also associated with springs and the depth to the water table in the vicinity of the springs also suggests that the sources of water are not directly connected to the principal ground-water aquifer.

Mr. Watrus testified that he had no concern as to any impacts on existing rights; however, when asked about Permit 66123, a stock-water well in Cave Valley, he indicated that there is no doubt that it will be impacted by the pumping, but that he did not analyze for impacts to that water right because it is junior in priority to the Applicant's Applications.[54]

The Protestants' witness, Dr. Bredehoeft testified that the Applicant's use of the Theis analysis to estimate drawdown was inappropriate due in part to the way image wells were utilized in the analyses.[55] Because there are impermeable boundaries simulated both east and west of the proposed wells, the Applicant used image wells, one each to the east and west of the barriers, to account for the additional drawdown that would occur. Dr. Bredehoeft testified that there needed to be additional image wells to properly simulate the effects of pumping between impermeable barriers, and by not using the image wells appropriately resulted in an erroneous estimate of drawdown, an estimate that is less than had image wells been used correctly.[56]

Mr. Durbin, a witness for Protestants, testified that he believes that the Applicant's effects analysis is not extensive enough in that it is too localized and does not consider the broader regional impacts from long-term pumping and these must be considered. However, he

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[53] *Ibid.*
[54] Transcript, pp. 459 – 484; Exhibit No. 236, Part C.
[55] Transcript, pp. 1393-1398.
[56] *Ibid.*

also testified that these impacts might not be consequential because they may be outside the timeframe of decision-making. During testimony, Mr. Durbin agreed that as long as pumping is less than the natural discharge of a basin, the system will come into equilibrium by capturing discharge and any effects would most likely be limited to the basin of origin. However, in dry valleys it takes an exceedingly long time to reach equilibrium and effects will eventually spread out from the basin of origin and will affect the down-gradient basins of White River Valley and Pahranagat Valley.

The gist of Mr. Durbin's testimony is that he believes there should be full disclosure and discussion regarding the suite of impacts and that he believes there is an over-reliance on what can be accomplished by monitoring and mitigation as he does not believe it will work and thinks it shifts the focus away from impacts. However, Mr. Durbin also agreed that the subject basins are good places to develop these water resources with respect to environmental impacts.

The Protestants presented testimony and evidence through Dr. Myers to support their claim that there is no water available for appropriation in these valleys as the White River Flow System is fully appropriated due to existing senior appropriations in White River Valley, Pahranagat Valley, Coyote Spring Valley, and the Muddy River Springs Area and that Cave Valley, Dry Lake Valley and Delamar Valley should not be developed. Protestants assert that the water rights in the down-gradient and hydrologically connected basins of White River Valley, Pahranagat Valley, Coyote Spring Valley and the Muddy River Springs Area will eventually be impacted. They assert that steady state will never be reached and the Applicant is not going to capture ground-water ET; therefore, the use of water under these Applications will capture the discharge to the down gradient basins of White River Valley, Pahranagat Valley, Coyote Spring Valley and the Muddy River Springs Area, which they allege are fully appropriated. Dr. Myers's ground-water model runs show significant drawdown, removal of ground water from storage, and that ground-water pumping will eventually reduce the flow at regional springs.[57] Model simulations with pumping equal to the perennial yield show that reduction in the White River Valley regional springs discharge occurs within tens of years, but flow decreases at Pahranagat Valley springs are minimal over hundreds of years. Simulations using the Durbin model have similar results with Butterfield and Flag Springs in the White River

[57] Exhibit No. 1101.

Valley showing the effects of pumping within tens of years, but spring discharge in Pahranagat Valley remaining stable for 200 to 500 years.[58]

The State Engineer finds that the Applicant's Theis analyses provide only a general estimate of future drawdown in the subject basins at the location of existing water rights. The State Engineer finds NRS § 534.110 provides that it is a condition of each appropriation of ground water that the right allows for a reasonable lowering of the static water level at the appropriator's point of diversion, but that the State Engineer is not prohibited from granting new appropriations because the later appropriator may cause the water level to be lowered at the point of diversion of a senior appropriator so long as any protectible interest in existing domestic wells as set forth in NRS § 533.024 and the rights of holders of existing appropriations can be satisfied.

The State Engineer finds that a comprehensive monitoring and mitigation plan will be required as a condition of approval and water-level monitoring will be a part of said monitoring and mitigation plan. The State Engineer finds that if an unreasonable lowering of the static water level should occur that would impact existing rights curtailment of pumping will be ordered unless the impacts can be reasonably and timely mitigated.

The State Engineer finds there is no dispute that there are both existing surface-water and ground-water rights in the down-gradient, hydrologically connected basins in the White River Flow System. The State Engineer finds that NRS § 533.370(5) provides that the State Engineer shall refuse to issue a requested permit if the use of water under those applications will conflict with existing rights. Model simulations indicate that ground-water pumpage from the principal ground-water aquifer in Cave Valley will impact Butterfield and Flag Springs in the White River Valley within tens of years, but spring discharge in Pahranagat Valley will remain stable for 200 to 500 years. To protect the existing rights of Butterfield and Flag Springs, the State Engineer allocated 6,000 afa of the Cave Valley recharge as discussed above, which flows as subsurface discharge from Cave Valley to White River Valley. The State Engineer finds the discussion of impacts that are not manifested until several hundreds of years after the initiation of pumping is far too uncertain to be the basis of reasonable and responsible decision making. The State Engineer finds there is no dispute that the basins of the White River Flow System are hydrologically connected, but that does not mean isolated ground-water resources should never

[58] Exhibit No. 1211, data file: Prediction Hearing Wells\Transient State\all_wells.riv.gph.

be developed. The State Engineer finds he has considered the hydrologic connection and is fully aware that there will eventually be some impact to down-gradient springs where water discharges from the carbonate-rock aquifer system, but the time frame for significant effects to occur is in the hundreds of years.

The State Engineer finds that a monitoring-well network and surface-water flow measurements will be part of a comprehensive monitoring and mitigation plan that will be required as a condition of approval and will provide an early warning for potential impacts to existing rights within the subject basins and the down-gradient basins of White River Flow System. The State Engineer finds that if unreasonable impacts to existing rights occur, curtailment in pumping will be ordered unless the impacts can be reasonably and timely mitigated.

VII.

PROTECTIBLE INTEREST IN EXISTING DOMESTIC WELLS

Nevada Revised Statute § 533.370(5) provides that the State Engineer shall reject an application and refuse to issue the permit where the proposed use of the water will conflict with protectible interests in existing domestic wells as set forth in NRS § 533.024. Nevada Revised Statute § 533.024 provides that it is the policy of this State to recognize the importance of domestic wells as appurtenances to private homes, to create a protectible interest in such wells and to protect their supply of water from unreasonable adverse effects which are caused by municipal, quasi-municipal or industrial uses and which cannot be reasonably mitigated. The State Engineer finds that no evidence was presented which demonstrated there would be unreasonable adverse effects to any specifically identified domestic well. The State Engineer finds that if once the project is developed and unreasonable adverse effects are seen in any domestic well the Applicant will be required to mitigate the impacts in a timely manner.

VIII.

PUBLIC INTEREST NRS § 533.370(5)

Nevada Revised Statute § 533.370(5) provides that the State Engineer must reject an application if the proposed use of the water threatens to prove detrimental to the public interest. The State Engineer finds the analysis of whether the use of water for a proposed project threatens to prove detrimental to the public interest must be addressed on a case-by-case basis. The State Engineer finds the statutory criterion, like beneficial use, is a dynamic concept changing over time,

particularly as the Nevada Legislature provides more guidance as to the issues of importance. In 1999, the Nevada Legislature provided the State Engineer with the additional statutory criteria found in NRS § 533.370(6) to consider whether the use of water in an interbasin transfer project, such as the one requested here, would threaten to prove detrimental to the public interest. The State Engineer specifically adopts and incorporates the public interest analysis found in State Engineer's Ruling No. 5726.[59]

The Protestants presented testimony and evidence regarding whether use of the water would threaten to prove detrimental to the public interest through Dr. Deacon. Dr. Deacon's testimony was based in part on Dr. Myers's testimony and evidence and the belief that the flows of regional springs in Pahranagat Valley and White River Valley will be reduced at some point in time. The time line for impacts is unknown and may be hundreds or thousands of years in the future. Based on the assumption of declines in spring flow, Dr. Deacon believes that the pumpage of ground water will threaten to prove detrimental to the public interest because of the assumed decline in spring flow. Dr. Deacon testified that reductions in spring flow would result in the more rapid cooling of the thermal water of the regional springs, which will reduce the habitat for fish and spring snails and subsequently reduce reproductive potential. Dr. Deacon also testified that declines in spring flows or a lowering of the shallow water tables would reduce wetland areas, impacting migratory birds, fish, and mammals. Since the subject basins are hydrologically connected to the down-gradient basins of the White River Flow System, Dr. Deacon believes there is a likely chance that there will be impacts to the plants and animals dependent on those springs due to a reduction in discharge and those impacts threaten to prove detrimental to the public interest.[60] While Dr. Deacon agrees that there is relatively little potential for adverse impact in the basins of origin, he is very concerned about the regional springs in the down-gradient basins of the White River Flow System and does not believe that the Stipulated Monitoring, Management and Mitigation Agreement between the Applicant and Federal Bureaus will really protect those areas. Dr. Deacon also takes the position that 100 years is an incredibly unreasonable length of time to worry about sustainability of species when species lives are measured on the order of millions of years not hundreds.[61]

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[59] State Engineer's Ruling No. 5726, In the Matter of Applications 54003 – 54021 (Spring Valley), dated April 16, 2007, official records in the Office of the State Engineer.
[60] Transcript, pp. 1541–1610.
[61] Transcript, pp. 1603-1604.

The State Engineer finds in this case that the Applicant has applied for water that belongs to the public at large. The Applicant has demonstrated both a need for the water and a beneficial use for the water and it does not threaten to prove detrimental to the public interest to allow the use of the water for municipal purposes in the service area of the Applicant. The State Engineer recognizes that existing rights must be protected as well as a concern for the wildlife and maintenance of wetlands and fisheries; therefore, the State Engineer finds, as addressed in later sections of this ruling, it would threaten to prove detrimental to the public interest to allow the resource to be developed without a comprehensive monitoring and mitigation plan. The State Engineer finds the springs and streams upon which water rights exist and wildlife depend on must be protected. The State Engineer finds that the subject basins and the down-gradient basins of the White River Valley and Pahranagat Valley are hydrologically connected with important resources warranting protection, but attempting to project impacts that may not occur for several hundred or thousands of years is outside the scope of reasonable and responsible decision making. The State Engineer finds it would threaten to prove detrimental to the public interest to jeopardize the water resources of the hydrologically connected down-gradient basins of the White River Valley and Pahranagat Valley as there are existing resources and water rights on those resources and many water dependent species, including some endangered species. However, the evidence does not support or indicate a measurable impact to those resources within a 200 to 500 year horizon. Therefore, the State Engineer cannot find that the development of the resources in conjunction with a comprehensive monitoring and mitigation plan would threaten to prove detrimental to the public interest. The State Engineer finds under these circumstances the proposed use of the water does not threaten to prove detrimental to the public interest.

IX.

INTERBASIN TRANSFERS NRS § 533.370(6)

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 the water from another basin; (b) if the State Engineer determines a plan for conservation of water is advisable for the basin into which the water is imported, whether the applicant has demonstrated that such a plan has been adopted and is being effectively 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 to be relevant. The State Engineer finds that NRS § 533.370(6) provides the State Engineer with the guidelines to be used in determining whether the use of water under an interbasin transfer threatens to prove detrimental to the public interest.

The State Engineer specifically adopts and incorporates the finding in State Engineer's Ruling No. 5726, which held that the Applicant has justified the need to import water from another basin and which held that the Applicant has demonstrated that a conservation plan has been adopted and is being effectively carried out. The remaining requirements of NRS § 533.370(6) along with other statutory criteria are addressed in the following sections.

X.

ENVIRONMENTALLY SOUND

Nevada Revised Statute § 533.370(6)(c) provides that in determining whether an application for an interbasin transfer of ground water must be rejected the State Engineer shall consider whether the proposed action is environmentally sound as it relates to the basin from which the water is exported. The words environmentally sound have intuitive appeal, but the public record and discussion leading up to the enactment of NRS § 533.370(6)(c) do not specify any operational or measurable criteria for use as the basis for a quantitative definition. The State Engineer specifically adopts and incorporates the findings in State Engineer's Ruling No. 5726 as to this criterion.

The Applicant presented testimony and evidence specific to the subject basins, which indicates that the only real phreatophytic community in any of these valleys is located in the southern end of Cave Valley. It is believed that there will be no impact to those phreatophytes in the southern end of Cave Valley as the depth to ground water is approximately 150 feet. Phreatophytes are not known to utilize ground water deeper than 50 feet; therefore, the phreatophytic community in the southern end of Cave Valley is most likely getting water from a perched aquifer that is not directly connected to the principal ground-water aquifer.[62]

In Cave Valley, there are two main areas of concern, those being an unnamed spring at Parker Station and Cave Spring. There is no expectation of any impact to these springs as they

[62] Transcript, pp. 1013-1015.

are mountain-block springs that are not directly connected to the principal ground-water aquifer.[63]

The areas of environmental concern in Dry Lake Valley are Meloy Spring, Fence Spring, Bailey Spring and Coyote Spring. There is no expectation of any impact to these springs as they are also mountain-block springs that are not directly connected to the principal ground-water aquifer.[64] Additionally, Coyote Spring is also highly developed in that it is boxed and piped to a concrete structure.

Delamar Valley is an extremely dry valley and Grassy Spring is the only spring of concern. Grassy Spring is also a mountain-block spring that is recharged locally from a watershed up gradient of the spring with no direct connection to the principal aquifer.[65]

The Applicant's witness was presented for the purpose of indicating that since effects on any of these resources is highly unlikely that transfer of the water for use outside these basins of origin is not environmentally unsound.[66] Additionally, the witness testified that the goal of the previously discussed Stipulation between the Applicant and the Federal Bureaus is to assure there will be no unreasonable adverse effects to special status species within the subject basins or the adjacent valleys of Pahranagat Valley and the southern end of White River Valley.

Evidence provided by the Protestants through Dr. Charlet was that the ecosystems in the subject basins are unique, that Cave Valley is one of only a few valleys in Nevada which has designated wilderness areas, and that the pipeline project seriously compromises these values with the introduction of tremendous amounts of human activity due to the pipeline construction. The focus of Dr. Charlet's testimony did not relate to actual use of the water, but was more concerned with the building of the pipeline, and that this construction would jeopardize ecosystems that are unique in the world, as the subject basins contain one of the last nearly intact semi-arid biological regions in the world.[67] Dr. Charlet expressed great concern that building the pipeline would introduce species like cheatgrass into the subject basins thereby increasing the potential for wildfires and thereby jeopardizing these unique habitats. He also testified that White River Valley and Pahranagat River Valley are filled with water dependent species and

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[63] Transcript, pp. 1022-1024.
[64] Transcript, pp. 1026–1028.
[65] Transcript, pp. 1028-1029.
[66] Transcript, p. 1030.
[67] Transcript, pp. 1612-1645.

systems and are important areas for some endangered species. Like Dr. Deacon, Dr. Charlet also believes that a 100-year horizon event is not adequate when species live thousands of years.

The State Engineer finds the pipeline construction is not an issue of hydrology and its construction is not within the consideration of public interest criteria under his jurisdiction.

The State Engineer finds the Protestants did not provide any substantial evidence to support a claim that use of water proposed under the Applications is not environmentally sound as it relates to the basins of origin. The State Engineer finds that in consideration of whether the proposed project is environmentally sound there can be a reasonable impact on the hydrologic related natural resources in the basin of origin. The State Engineer finds by requiring the collection of biological and hydrological baseline data and by requiring a comprehensive monitoring and mitigation plan that there are sufficient safeguards in place to ensure that the interbasin transfer of water from Cave Valley, Dry Lake Valley and Delamar Valley will be environmentally sound.

XI.

LONG-TERM USE OF THE WATER AND FUTURE GROWTH AND DEVELOPMENT IN THE BASIN OF ORIGIN

Nevada Revised Statute § 533.370(6)(d) provides that in determining whether an application for an interbasin transfer of ground water must be rejected, the State Engineer shall consider 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 Applicant argues this statutory provision only requires the State Engineer to consider the issue of long-term growth and development, but it does not require the State Engineer to actually leave any water in the basin of origin.[68] The Applicant argues that if too much water is left in a basin of origin it undermines the basis of the water law, which allows water to be appropriated, and that the use of water should be optimized. The Applicant also argues that future use for irrigation should not be one of the State Engineer's considerations when analyzing this section of the law.

The Applicant presented testimony through Mr. Turnipseed that the whole purpose of the water law is to appropriate water and protect existing rights. Mr. Turnipseed, who was the State

[68] Transcript, pp. 627-631.

Engineer when SB108 (basin of origin statute) was passed during the 1999 Legislative session, provided testimony to the Senate Committee on Natural Resources regarding SB108. He also testified on behalf of the Applicant at the hearing on these Applications that the purpose of the basin of origin statute was to protect the economic growth potential for existing municipalities and was not intended to preserve water in the basin of origin simply for the purpose of preserving it and to not unduly affect economic growth of the basin of origin; economic growth meaning some economic beneficial use. Mr. Turnipseed testified that since irrigation has never been declared a preferred use of water in Nevada that he did not believe that the potential for future agriculture use should be part of the analysis as to whether water should be left in a basin of origin.[69] As previously discussed, the Applicant agreed that upon written request by Lincoln County, the Applicant would assign to Lincoln County such portion of any permit issued to the Applicant within the subject basins in an amount not to exceed 1,500 afa from any one of the subject basins with a combined total from all three of the subject basins not to exceed 3,000 afa.

By letter dated December 19, 2007,[70] the Lincoln County Board of County Commissioners indicated that it does not anticipate any projects or development in the subject basins and indicated that it wishes to use any water it obtains pursuant to the agreement with the Applicant within the Coyote Springs-Lincoln County General Improvement District, which is not located in Cave Valley, Dry Lake Valley or Delamar Valley.[71] In accordance with the agreement, Lincoln County specifically agreed to make available all ground water required by the State Engineer or as otherwise necessary to meet the development needs of the basins of origin.

The State Engineer commends the Applicant and Lincoln County for addressing their differences and reaching a constructive agreement and has no doubt that Lincoln County would abide by the terms of the agreement between itself and the Applicant to provide water to meet the future growth and development of the basins of origin. However, the State Engineer finds that any water assigned to Lincoln County by the Applicant, which Lincoln County makes available to meet the future growth and development in the basins of origin does not meet the State Engineer's statutory obligation to consider whether the proposed action is an appropriate long-term use of the water which will not unduly limit the future growth and development in the basins of origin. Therefore, the State Engineer finds that the agreement between the Applicant and Lincoln County

[69] Transcript, pp. 627-632.
[70] Exhibit No. 395.
[71] Exhibit No. 395, Transcript, pp. 727-728.

does not meet the statutory criteria of NRS § 533.370(6)(d) and the State Engineer will address the issue of whether or not to reserve any water for future use in the basins of origin as required by statute.

The Applicant presented testimony and evidence as to White Pine County's land use plans to show that White Pine County does not have any plans for development in Cave Valley.[72] The Protestant presented testimony through White Pine County Commissioner, Laurie Carson whereby she indicated that the northern portion of Cave Valley in White Pine County is primarily public land with only one active ranch, that being Cave Valley Ranch. However, other ranches rely on the area for summer grazing land and the area supports abundant wildlife and recreational activity such as hunting. Her concern is that the natural beauty of Cave Valley be preserved for recreational potential, but she did not provide any testimony or evidence in support of actual development in the White Pine County portion of Cave Valley. She did indicate that White Pine County might work with the U.S. Department of Interior, Bureau of Land Management on land disposal, but at this time there is nothing taking place.[73]

Testimony and evidence provided through Karen Rajala indicates that White Pine County is experiencing population growth and that residential patterns are shifting to outlying areas away from primary population centers.[74] White Pine County is experiencing growth in the urban interface in a southern direction from Ely almost to Cave Valley with mostly five-acre parcels that are being occupied by new families, and second-homes/vacation-homes.[75] While the State Demographer is now showing a slowing growth rate and a projected population decline over the next 20 years, she indicated there is still a strong need for affordable housing. She indicated that if planned power plants are developed more housing will be needed and that parceling activity has been increasing with a real interest in residential development in recreational areas.[76] As to Cave Valley, she indicated that there are 1,823 acres of private land, 177 acres of unimproved land owned by the University of Nevada, (Exhibit No. 241 p. 3 indicates 192 acres) and that the economic activity is agriculture and recreation.[77] She indicated that in the White Pine County portion of Cave Valley, development would be limited to domestic wells and five-acre parcels and if the 1,823 acres

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[72] *See generally*, testimony of Richard Holmes, pp. 756–792, Exhibit No. 402.
[73] Transcript, pp. 1478-1484.
[74] Transcript, p. 1490.
[75] Transcript, p. 1492.
[76] Transcript, pp. 1494-1495.
[77] Transcript, pp. 1495–1496.

of agricultural land were converted to residential it would result in 370 five-acre parcels.[78] She indicated there is some potential for growth in the White Pine County portion of Cave Valley based on the five-acre zoning and future potential changes in zoning, along with possible land disposal, but that the work force based population would not be expected to target Cave Valley (it is 35 miles from Ely) and there are no targeted land exchanges in Cave Valley. Development in White Pine County is more targeted towards Steptoe Valley and White River Valley.[79]

Cave Valley Ranch, LLC (Cave Valley Ranch) argues that the reason and spirit behind the basin of origin statute was to protect the rural lifestyle and that the law was enacted to protect the economic and social well-being of the basin of origin. Therefore, it argues that the State Engineer must consider potential agricultural development in the basin of origin. Cave Valley Ranch alleges that the State Engineer must consider anything that can be envisioned and that does not include only those things that are currently planned, but includes things that are not even thought of yet. Cave Valley Ranch presented evidence in support of its argument that the water should not be exported from Cave Valley, as it can show possibilities for use of much of the water.

Cave Valley Ranch presented testimony from Mr. Sullivan who provided a report as to the market feasibility of developing all the private land in Cave Valley (much of which is not owned by Cave Valley Ranch) into a second-home/vacation-home destination, resort community.[80] Mr. Sullivan's testimony was very much from the sales type of perspective as he took features around Cave Valley and attempted to "sell them" as huge drawing points.[81] Mr. Sullivan took the entire private land area of approximately 6,014 acres in Cave Valley, parceled it down to 2.5 acre parcels and put a house on each of the lots for 2,405.6 second-homes/vacation-homes.[82] He indicated these houses might be occupied for up to 30 to 60 days per year, but also indicated that each house should be allotted 2.0 acre-feet per year per house as if it was lived in year round; therefore, 4,811 acre-feet of water should be kept in the basin just for the houses alone. Mr. Sullivan indicated that development of the Cave Valley Ranch property could include a golf course and water features, but also some of this same property should be preserved and developed as agricultural. Mr. Sullivan

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[78] Transcript, p. 1497.
[79] Transcript, p. 1510.
[80] Exhibit No. 2072.
[81] Transcript, pp. 802-803.
[82] Exhibit No. 2072, p. 5.

testified, "the land in and around Cave Valley is beautiful,[83] it's a world-class site and it's exactly what people are looking for, the rural environment."[84]

Mr. Sullivan also testified that no analysis was performed as to the financial feasibility of such a project or infrastructure hurdles, such as the lack of electricity.[85] Mr. Sullivan testified that no account was taken for the fact that 760 acres[86] are located within a wilderness area and some of the land parcels are in the mountainous areas where there is a good deal of topography,[87] and that his client does not own much of the property he put houses on. As previously stated, Mr. Sullivan testified that, while the homes in Cave Valley may only be occupied for up to 30 to 60 days per year, each home should be allotted 2.0 acre-feet per year per house as if it were being lived in year round. However, Mr. Sullivan later testified that he had never worked on the water demand side of any project and that he would not have any idea how much water is required for a house as he relied on their hydrologist for that figure.[88] While Mr. Sullivan was qualified as an expert witness in real estate market development, submitted an expert report[89] and presented expert testimony regarding the potential development within Cave Valley, he also testified that he had never actually been to Cave Valley.

Cave Valley Ranch also provided testimony and evidence through Mr. McBeath and Mr. Johnson as to expanded agricultural potential in Cave Valley.[90] These witnesses discussed the potential for an additional 743 acres of ground-water irrigated crops in Cave Valley. Testimony of Mr. Johnson indicated a production cost of $327,000.00 for the irrigation of the proposed 743 acres and Table 12[91] of the agricultural plan prepared by Mr. Johnson indicates a corrected production value of approximately $322,500.00 for an annual loss of approximately $4,500.00. The production cost outlined in the Cave Valley Ranches agricultural plan does not account for the amortization of any establishment cost for things such as well design, well drilling, well development, well infrastructure, electrical infrastructure or diesel motors, land preparation and grading, irrigation pivots or fencing. Mr. Johnson testified that the electrical production cost to pump ground water for

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[83] Transcript, p. 798.
[84] Transcript, p. 825.
[85] Transcript, pp. 830-831.
[86] Exhibit No. 2072, p. 5.
[87] Transcript, pp. 832-834.
[88] *See,* testimony of Lonnie Roy, Transcript, pp. 1718-1737.
[89] Exhibit No. 2070.
[90] *See generally*, Transcript, pp. 1769–1915, Exhibit No. 2072 (16).
[91] Exhibit No. 2072.

irrigation purposes was approximately $65.00 per acre based on an estimated pumping lift of 100 feet.[92] However, Cave Valley well log data indicate pumping lifts most likely will exceed 300 feet and may exceed 600 feet. A domestic well drilled by Bill McBeath of Cave Valley Ranch, which is in the general vicinity of the proposed irrigation, reported pumping lifts of 400 and 600 feet at pumping rates of 60 to 100 gpm, respectively.[93] As pumping lifts increase, the cost of pumping will increase at a rate slightly greater than the relative increase in lift. That is, a doubling of the lift will more than double the cost of pumping. As a result, the estimated pumping cost of $65.00 per acre is not substantiated, and pumping costs are more likely to be $200 to $400 per acre. Additionally, if pumping lifts are higher than originally planned, the irrigation pump horsepower must be increased to maintain the designed irrigation production rates, resulting in increased establishment cost. Mr. Johnson testified that even though his agricultural plan was based on a production value of $140.00 per ton for alfalfa, his stated production value during the administrative hearing was $200.00 per ton, but he offered no basis for this value or why it differed from that submitted in the agricultural plan. As previously stated, the Cave Valley Ranch agricultural plan indicates an annual loss of $4,500.00. This loss was based on a pumping lift of 100 feet and excluded the amortization of establishment cost. Accounting for a three to six-fold increase in pumping lift results in an annual loss of $100,000.00 to $245,000.00, and after accounting for an increase in amortization of establishment costs the annual losses would be even greater.

The Applicant provided testimony and evidence to rebut Cave Valley Ranch's long-term growth and development evidence that indicated that Cave Valley Ranch's evidence was based on fundamental errors, was highly speculative and was not economically or financially feasible.[94]

The State Engineer finds the testimony presented by Cave Valley Ranch as to possible long-term growth and development in Cave Valley to be outside the bounds of reasonableness and does not accept Mr. Sullivan's testimony as credible or worthy of much weight. The State Engineer finds Cave Valley Ranch does not own much of the land on which it proposed planned development. The State Engineer finds Cave Valley Ranch counted approximately 760 acres of land in a wilderness area in the count of lots that could be developed on the grounds that it might be able at some time to exchange said land for publicly owned land, a highly speculative proposition. The State Engineer finds that there was contradictory testimony, which includes things such as the owners of Cave

[92] Transcript, p. 1918.
[93] Well log No. 105365.
[94] Transcript, pp. 1920–1969.

Valley Ranch were going to retain the ranch and the historical agricultural, may develop the property and sell off parcels, but were not going to sell the ranch. The State Engineer finds that Cave Valley Ranch over-stated the potential for future growth and development and that its evidence of said use was highly speculative and grossly overstated quantities of water necessary for such development. The State Engineer finds there is no evidence that either White Pine County or Lincoln County would support development of 2.5-acre lots when the area is zoned for 5-acre lots. The State Engineer finds that the testimony and evidence as to the expanded agricultural potential in Cave Valley was contradictory, incomplete and inaccurate and the testimony and evidence demonstrated that it was very unlikely that any agricultural development in Cave Valley would be an economically sound or economically feasible venture. The State Engineer does not find Cave Valley Ranch's evidence credible as to long-term growth and development and gives it very little weight.

The State Engineer finds that he does not accept either the Applicant's or Cave Valley Ranch's arguments as to what he is to consider as to this statutory provision. The State Engineer discounts Cave Valley Ranch's argument that he is to consider things that have not even been thought of yet. There is no reference or mention in the Legislative Record of SB108 indicating that the State Engineer must accept anything anyone can think up as a possibility and leave water in a basin for that purpose. In fact, during the Legislative hearings, Senator Mark James provided testimony regarding SB108 that Nevada has been built on interbasin transfers and the basis for the prior appropriation doctrine is to move water. The State Engineer agrees that the Nevada Legislature did not mandate that water be left in the basin of origin, but the State Engineer is certainly required to insure that the proposed action will not unduly limit the future growth and development in the basin of origin. The State Engineer finds it was most likely that the intent of the law was to ensure water is available for future growth and development and that means leaving some water in the basin of origin. The State Engineer finds that the history of Nevada and western water law is certainly that of placing water to beneficial use, but in today's world that must be measured against other public interest criteria that are reflected in Nevada water law, specifically the statutory provision that requires the State Engineer to fully consider whether the use of the water will unduly limit the long-term future growth and development of a basin of

origin.[95] The State Engineer finds that to set water aside to remain in Cave Valley for a use such as irrigation of alfalfa when there is no evidence that it is an economically sound or feasible venture is beyond the intent of NRS § 533.370(6)(d) and is not a feasible consideration as to the growth and development in the basin of origin.

The evidence indicates that in Cave Valley there are 2,537 acres of privately owned land in White Pine County and 3,477 acres of privately owned land in Lincoln County for a total of 6,014 acres of privately held land with most of the land being classified by the county assessors as "agricultural deferred" vacant, with improvements or a residence. Of the 6,014 acres of privately held land 192 acres are owned by the University of Nevada, approximately 760 acres are located within the Mount Grafton wilderness area with limited access and there is 370 acres of historic agricultural area within the main ranch property of Cave Valley Ranch that the owner testified would remain historic agricultural and not be developed, leaving a total of 4,692 acres of land, which could potentially be developed into the current zoning of five-acre lots.

Within the last 130 years, the population of Cave Valley has fluctuated, but recent population trends have been stagnate with a population base in the single digits over the last 20 years. While there is land available for development, there is certainly no indication of a mass influx of people into Cave Valley on either a permanent or second-home/vacation-home type basis. Therefore, the State Engineer does not believe that hundreds or thousands of homes will be built within the next 50 to 60 years as argued by Cave Valley Ranch. The State Engineer finds if the entire 4,692 acres of potentially developable land was parceled into 5-acre lots this would equate to 938 lots; however, he does not believe it is reasonable to think that all 938 lots will be developed. Therefore, the State Engineer finds that it is reasonable to consider that up to one-half of these 938 lots or 469 lots has the possibility of a second-home/vacation-home being built on them in the future.

Under NRS § 534.180(1) the allocation of a domestic well is 2.0 acre-feet per year and while it is true that any domestic well drilled in Cave Valley will have the statutory authority to withdraw the stated 2.0 acre-feet per year, from a management perspective it is highly unlikely

[95] For example, environmental consideration for wildlife is found in NRS § 533.367, which provides that before a person may obtain a right to the use of water from a spring or water that has seeped to the surface of the ground, he must ensure that the wildlife, which customarily uses the water will continue to have access to it. While this provision of the water law does not specifically apply to an appropriation of ground water, it is a clear demonstration of the public interest in that the sources of water for wildlife remain accessible and viable.

this would be the case. If a property is occupied 60 days per year this equates to the prorated equivalent of 0.33 acre-feet per year. To account for some permanent residences and to ensure sufficient unappropriated water is left in Cave Valley, an allocation of 0.5 of an acre-foot per year will be used for each potential lot. The State Engineer finds it is reasonable to leave 0.5 afa for each of the 469 lots for future growth and development for a total of 235 afa. The State Engineer finds water should also be left in the basin for other uses, such as stock-watering and minor commercial uses; therefore, an additional 40 afa will be left in the basin for other uses such as stock-watering and minor commercial for a total of 275 afa total being left in the basin of origin for future growth and development.

The evidence indicates that in Dry Lake Valley there are 1,117 acres classified as private land with most of the land being classified by the Lincoln County Assessor as "agricultural deferred" vacant, with improvements or a residence and 1,655 acres identified as federal land in mining areas. By letter dated December 19, 2007,[96] the Lincoln County Board of County Commissioners indicated that it does not anticipate any projects or development in Dry Lake Valley and no evidence was provided by any of the Protestants or interested parties indicating any potential development contrary to the Lincoln County Board of County Commissioners.

Of the 1,117 acres classified as private land and the 1,655 acres identified as federal land in mining areas, there are a total of 35 individual parcels. At the present time, there is no indication that anyone lives in Dry Lake Valley on a year-round or temporary basis and there is no evidence of a need for much water in the future. Therefore, the State Engineer finds that not more than the minimal quantity of water of 50 acre-feet needs to be left in the basin of origin for future growth and development.

The evidence indicates that in Delamar Valley there is no private land and 1,440 acres is identified as federal land in mining areas.[97] Of the 1,440 acres identified as federal land in mining areas, there are a total of 14 individual parcels. At the present time, there is no indication that anyone lives in Delamar Valley on a year-round or temporary basis and there is no evidence of a need for much water in the future. Therefore, the State Engineer finds that not more than the minimal quantity of water of 50 acre-feet needs to be left in the basin of origin for future growth and development.

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[96] Exhibit No. 395.
[97] Exhibit No. 241.

The State Engineer finds that the use of water under these Applications is an appropriate long-term use of the ground water and the reservation of unappropriated water in the amounts identified above will not unduly limit the future growth and development of the basins of origin.

XII.

UNAPPROPRIATED WATER

The State Engineer finds the perennial yield of Cave Valley is 5,000 afa, the committed consumptive use of ground-water rights is 47 afa and the water to be left for future growth and development is 275 afa. The State Engineer finds that there is 4,678 afa of water available for appropriation and export from Cave Valley.

The State Engineer finds the perennial yield of Dry Lake Valley is 12,700 afa, committed consumptive use of ground-water rights is 57 afa and 50 afa is reserved for future growth and development of the basin. The State Engineer finds that there is 12,593 afa of water available for appropriation and export from Dry Lake Valley.

The State Engineer finds the perennial yield of Delamar Valley is 2,550 afa, committed consumptive use of ground-water rights is 7 afa and 50 afa is reserved for future growth and development of the basin. The State Engineer finds that there is 2,493 afa of water available for appropriation and export from Delamar Valley.

The State Engineer finds that prior to the Applicant exporting any ground-water resources from Cave Valley, Dry Lake Valley or Delamar Valley, biological and hydrologic baseline studies shall be completed and approved by the State Engineer.

Evidence submitted by the Applicant indicates that the earliest development of the water resources from Cave Valley, Dry Lake Valley and Delamar Valley is 2012.[98] Additionally, the Southern Nevada Water Authority 2006 Water Resource Plan indicates that the in-state water resources option is anticipated for use to meet long-term water demands beginning in 2017.[99]

The State Engineer finds that the development of water resources and monitoring of biological and water resources in Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins will be as follow:

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[98] Transcript, pp. 119-120.
[99] Exhibit No. 324.

- A monitoring and mitigation plan consisting of both biological and hydrological parameters shall be submitted by the Applicant and approved by the State Engineer prior to exporting any ground-water resources.
- A minimum of two years of biological and hydrological baseline data shall be collected by the Applicant in accordance with the approval of the monitoring and mitigation plan and submitted to the State Engineer and approved by the State Engineer prior to the Applicant exporting any ground-water resources. Data collected prior to the approval of the monitoring and mitigation plan by the State Engineer qualifies as baseline data, provided the data was collected in accordance with the subsequently approved, monitoring and mitigation plan.
- After approval of the monitoring and mitigation plan, the Applicant shall file an annual report with the State Engineer by March 15th of each year detailing the findings of the monitoring and mitigation plan.
- The Applicant shall update a ground-water-flow model approved by the State Engineer every five years and provide predictive results for 10-year, 25-year and 100-year periods.

CONCLUSIONS OF LAW

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.[100]

II.

The State Engineer is prohibited by law from granting an application to appropriate the public waters where:[101]

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.

[100] NRS chapters 533 and 534.
[101] NRS 533.370(5).

The State Engineer concludes there is unappropriated water for export from Cave Valley, Dry Lake Valley and Delamar Valley, there is no substantial evidence the proposed use will conflict with existing rights, there is no substantial evidence that the proposed use will conflict with protectible interests in existing domestic wells, or the use will threaten to prove detrimental to the public interest; thus, under NRS § 533.370(5) the law mandates the granting of the water rights.

III.

The State Engineer concludes that the Applicant provided proof satisfactory of its intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence, and its financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence.

IV.

The State Engineer concludes that based on the findings that the Applicant has justified the need to import the water from Cave Valley, Dry Lake Valley and Delamar Valley, that an acceptable conservation plan is being effectively carried out, that the use of the water is environmentally sound as it relates to the basins of origin, and that by leaving an unappropriated portion of water in the basins of origin that the export of the water will not unduly limit the future growth and development of the basins of origin. Therefore, there is no reason to reject the Applications.

RULING

The protests to Applications 53987, 53988, 53989, 53990, 53991 and 53992 are hereby overruled in part and upheld in part.

The perennial yield of Cave Valley is 5,000 afa, the committed consumptive use of ground-water rights is 47 afa and 275 afa is reserved for future growth and development in the basin. The State Engineer grants 4,678 afa under Applications 53987 and 53988.

The perennial yield of Dry Lake Valley is 12,700 afa, committed consumptive use of ground-water rights is 57 afa and 50 afa is reserved for future growth and development in the basin. The State Engineer grants the full amount applied for at 11,584 afa under Applications 53989 and 53990.

The perennial yield of Delamar Valley is 2,550 afa, committed consumptive use of ground-water rights is 7 afa and 50 afa is reserved for future growth and development in the basin. The State Engineer grants 2,493 afa under Applications 53991 and 53992.

The Applications are granted subject to:

1. Existing rights;
2. Payment of the statutory fees;
3. A monitoring and mitigation program approved by the State Engineer prior to the export of any water permitted under these applications;
4. A minimum of two years of biological and hydrological baseline data shall be collected and approved by the State Engineer prior to the Applicant exporting any ground-water resources from Cave Valley, Dry Lake Valley or Delamar Valley under these permits;
5. After approval of the monitoring and mitigation plan, file an annual report with the State Engineer by March 15th of each year detailing the findings of the monitoring and mitigation plan;
6. The total combined duty under Permits 53987 and 53988 located in Cave Valley shall be limited to 4,678 acre-feet annually.
7. The total combined duty under Permits 53989 and 53990 located in Dry Lake Valley shall be limited to 11,584 acre-feet annually.
8. The total combined duty under Permits 53991 and 53992 located in Delamar Valley shall be limited to 2,493 acre-feet annually.
9. If pumpage impacts existing rights, conflicts with the protectible interests in existing domestic wells as set forth in NRS § 533.024, threatens to prove detrimental to the public interest or is found to not be environmentally sound the Applicant will be required to curtail pumpage and/or mitigate the impacts to the satisfaction of the State Engineer.

Respectfully submitted,

TRACY TAYLOR, P.E.
State Engineer

Dated this 9th day of

July, 2008.