

# Stanka Consulting, LTD

**A Professional Engineering Company**

3032 Silver Sage Dr., Suite 101  
Carson City, Nevada 89701  
(775) 885-9283  
[michael@stankaconsulting.com](mailto:michael@stankaconsulting.com)

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Southern Nevada Water Authority

June 22, 2017

ATTN: James Prieur  
1001 S. Valley View Blvd., MS #485  
Las Vegas, NV 89153

**Subject: Technical Memorandum: Quantification of Selected Water Rights and Vested Claims in Five Nevada Groundwater Hydrographic Areas**

Mr. Prieur,

This technical memorandum responds to your request for Stanka Consulting LTD to assist in quantifying select water rights for your monitoring, management and mitigation plan (3M Plan). It is my understanding that NDWR online hydrographic abstracts and online database summary data were utilized for accounting purposes for the 3M Plan. Some water rights are listed on the NDWR online database with a duty of 0.00 AFA, but are still identified as active water rights. It is common for both vested claims which have not yet been adjudicated, and for older stockwater rights to only have a diversion rate listed on the vested claim or certificate, but no AFA term listed. This does not mean that there is no AFA duty associated with the vested claim or certificate. However, the quantity must be calculated based on information within the permit, certificate, or vested claims. In order to quantify the AFA duty for the selected water rights, NDWR online data, vested claims, permits, certificates, and any relevant or available maps were reviewed by Stanka Consulting. Documentation of our work can be seen in "**Attachment 1**".

A large number of the water rights analyzed are non-adjudicated vested claims. What this means is the applicant filed a vested claim citing historic use of a water source; however, the State Engineer has not determined if these claims are valid or not and no Nevada court has issued a decree confirming the claims in an adjudication. Since the claims have not been approved in an adjudication proceeding, the original vested claim was reviewed to determine probable validity and if any total combined duty (TCD) terms should be associated with the vested claims. Stockwater vested claims list the historic number of stock animals raised within a grazing allotment. In our review, we found that applicants often filed vested claims for multiple springs within their current grazing allotment. Although stock historically would use all of these springs as water

sources, each animal can only drink from one source of water at a time. Our review identified many water rights from different springs, filed for the same diversion rate, at the same time, by the same applicant, for the same number of animals.

In these situations, we quantified these vested claims by applying a TCD limitation for all of these springs as a whole, since these sources appeared to have historically served only one group of animals.

**Attachment 1** includes a spreadsheet listing all the water rights that your office inquired about, the calculated duty, and notes stating the method of calculation used to determine the calculated duty. The below table summarizes the findings of our work.

Basin	Water Right No.	Manner of Use	Source	Calculated Diversion (CFS)	Assumed Total Combined Duty (AFA)
180 - Cave Valley	9001	Domestic	Spring	0.044	31.85
	V01696	Stockwatering	Spring	0.025	11.31
	V01698	Stockwatering	Spring	0.025	
	V01699	Stockwatering	Spring	0.025	
	V02693	Irrigation	Spring	-	0
	V02694	Irrigation	Spring	-	0
	V01678	Stockwatering	Stream	0.0156	7.56
	V01680	Stockwatering	Stream	0.0156	
	V01807	Irrigation	Stream	1.12	336.82
182 - Delamar Valley	V01520	Stockwatering	Spring	0.0017	0.80
184 - Spring Valley	V10073	Stockwatering	Spring	0.0391	28.28
	V10082	Stockwatering	Spring	0.0391	
	V10083	Stockwatering	Spring	0.0391	
	V10084	Stockwatering	Spring	0.0391	
	V10087	Stockwatering	Spring	0.0391	
	V10088	Stockwatering	Spring	0.0391	
	V10086	Stockwatering	Spring	0.0391	
	45675	Power	Stream	8.0	0
	V00789	Irrigation	Stream	N/A	0
195 - Snake Valley	V09610	Irrigation	Stream	7.6	2,621.37
	V04568	Stockwatering	Underground	0	0
	V09745	Stockwatering	Underground	0.89	82.0
196 - Hamlin Valley	R05277	Other	Spring	0.0364	26.32
	V02125	Stockwatering	Spring	0.025	13.33
207 - White River Valley	V09237	Stockwatering	Spring	0.01	4.74
	V10515	Irrigation	Stream	4.16	1,107.60

Please note that Stanka Consulting, LTD has performed this review through use of Nevada Division of Water Resources online data only. All data gathered in this technical memorandum is current as of May 10, 2017. If you would like any additional information or have any questions, please call me at (775) 885-9283.

Michael Stanka, P.E.



Stanka Consulting, LTD

**Attachment 1** – Spreadsheet Summarizing Findings and Quantification of Select Water Rights

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Basin	Water Right No.	Manner of Use	Source	Source Description	Diversion (Per Document)	Calculated Diversion (CFS)	Calculated Diversion (AFA)	Assigned Total Combined Duty (AFA)	Notes
180 - Cave Valley	9001	Domestic	Spring	Cave Spring	0.044 cfs (per Cert)	0.044	31.85	31.85	Permit 9001 is Certificated for 0.044 cfs year round, which calculates to 31.85 AFA
	V01696	Stockwatering	Spring	Wall Spring	0.025 cfs	0.025	11.31	11.31	300 to 500 Cattle have been watered at the spring since 1890. One cow requires 20 gpd. 500 cattle = 0.015625 cfs. Vested Claim lists 0.025 cfs diversion rate. 0.025 cfs diversion rate with annual duty of 11.31 AFA used for accounting. Additionally, Claim lists use as 25 days per month; however, year round use was calculated. Calculated Duty is limited by the number of cattle and not cfs.
	V01698	Stockwatering	Spring	Cabbin Spring	0.025 cfs	0.025	11.31		300 to 500 Cattle have been watered at the spring since 1890. One cow requires 20 gpd. 500 cattle = 0.015625 cfs. Vested Claim lists 0.025 cfs diversion rate. 0.025 cfs diversion rate with annual duty of 11.31 AFA used for accounting. Additionally, Claim lists use as 25 days per month; however, year round use was calculated. Calculated Duty is limited by the number of cattle and not cfs.
	V01699	Stockwatering	Spring	Canyon Spring	0.025 cfs	0.025	11.31		300 to 500 Cattle have been watered at the spring since 1890. One cow requires 20 gpd. 500 cattle = 0.015625 cfs. Vested Claim lists 0.025 cfs diversion rate. 0.025 cfs diversion rate with annual duty of 11.31 AFA used for accounting. Additionally, Claim lists use as 25 days per month; however, year round use was calculated. Calculated Duty is limited by the number of cattle and not cfs.
	V02693	Irrigation	Spring	Haggarty Creek	0.414 cfs (60 acres)	-	0	0	Scan of Document for V02693 not available online. Per review of NDWR Online data, V02693 shares a common place of use with 25322 (Certificated Right). TCD of 240.00 AFA should be applied to 25322 and V02693. 240.00 AFA has already been accounted for under 25322. Therefore, the additional duty associated with V02693 should be 0.00 AFA.
	V02694	Irrigation	Spring	Haggarty Lower Spring	0.12 cfs (19.8 acres)	-	0	0	Scan of Document for V02694 not available online. Per review of NDWR Online data, V02694 shares a common place of use with 25411 (Certificated Right). TCD of 79.2 AFA should be applied to 25411 and V02694. 79.2 AFA has already been accounted for under 25411. Therefore, the additional duty associated with V02694 should be 0.00 AFA.
	V01678	Stockwatering	Stream	North Branch of Sheep Creek	1 cfs, 2,500 sheep, April 1st - Nov. 30th	0.015625	7.56	7.56	April 1st through November 30th use listed on Vested Claim. Calculated to 244 days of use per year. 2,500 sheep have historically been watered at the spring. One Sheep requires 4 gpd. 2,500 sheep = 0.015625 cfs. 1.0 cfs diversion rate with annual duty of 7.56 AFA should be used for accounting. Calculated Duty is limited by the number of sheep and not cfs
	V01680	Stockwatering	Stream	Sheep Creek	1 cfs, 2,500 sheep, April 1st - Nov. 30th	0.015625	7.56		April 1st through November 30th use listed on Vested Claim. Calculated to 244 days of use per year. 2,500 sheep have historically been watered at the spring. One Sheep requires 4 gpd. 2,500 sheep = 0.015625 cfs. 1.0 cfs diversion rate with annual duty of 7.56 AFA should be used for accounting. Calculated Duty is limited by the number of sheep and not cfs
	V01807	Irrigation	Stream	Cave Valley Creek or Sheep Creek	25.57 acres of Garden, Grain, and Alfalfa and 117.27 Acres of Grass Hay Meadow.	1.42	428.82	428.82	Two Proofs Listed. One for 25.67 Acres of Garden, Grain, and Alfalfa (3.0 AF/Acre), and one for 117.27 Acres of Grass Hay Meadow (3.0 AF/Acre). There is a note on the Vested Claim stating "During the dry Season there is not sufficient water in this Creek to properly irrigate the lands mentioned, unless aided by storm runoff". Cfs calculated from 428.82 AFA delivery over a 5 month span (April 15 - Sept 15). 428.82 AFA /723.97 AFA = 0.592 cfs. annually. 0.592 cfs annually / 5 months * 12 months in a year = 1.42 cfs. seasonal diversion rate.
182 - Delamar Valley	V01520	Stockwatering	Spring	Jumbo Spring	50 Cattle, April - November	0.001548	0.8046	0.8046	April through November use listed on Vested Claim. April 1st - November 30th use calculates to 244 days of use per year.



Basin	Water Right No.	Manner of Use	Source	Source Description	Diversion (Per Document)	Calculated Diversion (CFS)	Calculated Diversion (AFA)	Assigned Total Combined Duty (AFA)	Notes
184 - Spring Valley	V10073	Stockwatering	Spring	Layton Spring	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28	28.28	Layton Springs has numerous filings on it including Certificated Stockwater Rights. V10073 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10082	Stockwatering	Spring	Cleveland Ranch Allotment Spring - North	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10082 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10083	Stockwatering	Spring	Cleveland Ranch Allotment Spring - South	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10083 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10084	Stockwatering	Spring	Fenceline Spring - North	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10084 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10087	Stockwatering	Spring	Rogers Ranch Spring	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10087 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10088	Stockwatering	Spring	North Millick Spring	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10088 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	V10086	Stockwatering	Spring	North Cleveland Unit Spring	Up to 0.12 cfs (Historically 1,000+ Cattle and 250+ horses)	0.0390625	28.28		V10086 was only recently filed in 2011. Review of other Vested Claims filed by LDS in 2011 suggest TCD (for accounting purposes only) should be applied to springs (as 1,250 horses and cattle appear to have historically traveled from spring to spring within the allotment). Spring's physical production might be limiting factor. 1,250 Cattle and Horses at 20 gpd per animal = 0.0390625 cfs. 0.0390625 cfs year round = 28.28 AFA
	45675	Power	Stream	Little Negro Creek AKA North Garden Creek	8.0 cfs	8.0	0	0	Hydroelectric Power Usage requires high diversion rates; however, it is considered non-consumptive, so annual duty should be considered 0.00 AFA. 8.0 cfs should still be accounted for, even though it is considered non-consumptive.
	V00789	Irrigation	Stream	North Garden Creek	N/A	N/A	N/A	0	Document not available online. Originally filed by William McGill in 1910. Still in William McGill's name. Per NDWR note online: the cfs was not given and the duty can not be calculated. During the previous 2011 hearing V00789 was identified but not mapped by Stanka Consulting with the note "Water Right Not Mapped. See Basset Decree". Bassett Creek was adjudicated in 1945, and the Determination of the Relative Rights did not include this right, so a duty of 0 AFA is being assigned to it.

Basin	Water Right No.	Manner of Use	Source	Source Description	Diversion (Per Document)	Calculated Diversion (CFS)	Calculated Diversion (AFA)	Assigned Total Combined Duty (AFA)	Notes
195 - Snake Valley	V09610	Irrigation	Stream	Big Springs Creek	600 Acres listed as being irrigated from April 1st - October 31st. 1,475 Cattle and one family of Domestic use was also identified on the Permit. 7.6 cfs diversion listed and 4.31 AF/acre duty listed.	7.6	2,621.37	2,621.37	Water Rights Already filed under Utah Water Rights Numbers 18-41, 18-244, and 18-393 Application/Claim Nos. A8080, D283, and D3360. 600 Acres at 4.31 AF/Acre = 2,586 AFA for irrigation. 1,475 cattle at 20 gpd = 0.04609375 cfs, or 33.37 AFA. Assume 2.0 AFA for Domestic Use. Total is 2,621.37 AFA.
	V04568	Stockwatering	Underground	12" Well	1 cfs	0	0	0	Vested Claim says works begun in 1970. This does not make it old enough to be a Vested Claim. Assign 0 AFA.
	V09745	Stockwatering	Underground	Underground (018142)	20 Acres listed as being planted in 1934, 0.89 cfs flow listed for 20 acres of land, and 80 acre-feet per annum. Domestic and Stockwatering is also listed as a use other than irrigation.	0.89	82.0	82.0	Assume 80 AFA for irrigation of 20 Acres and 2.0 AF for domestic (Which can include watering of personal stock)
196 - Hamlin Valley	R05277	Other	Spring	South Little Springs (67)	0.036357 cfs listed for 468 Cattle, 3,500 Sheep, and 35 Antelope, Year Round	0.036357	26.32	26.32	Calculation of Duty Resulted in Calculation of 0.03671875 cfs; however, in our analysis, Antelope were given same 4 gpd as sheep. This might account for difference in our calculations vs. BLM Calculations. BLM CFS used in calculating annual duty.
	V02125	Stockwatering	Spring	South Water Hole Spring	"one-fortieth" cfs or 0.025 cfs	0.025	13.33	13.33	5,000 sheep have been watered at the spring since 1900. One Sheep requires 4 gpd. 5,000 sheep = 0.03125 cfs. Vested Claim lists 0.025 cfs diversion rate. April 1st through November 1st use listed on Vested Claim. Calculated to 215 days of use per year. 0.03125 cfs diversion rate with annual duty of 11.312 AFA should be used for accounting.
207 - White River Valley	V09237	Stockwatering	Spring	Silver Spring	0.01 cfs, 500 cattle, June - October	0.01	4.74	4.74	Vested Claim lists 0.01 cfs sufficient to water 500 head of cattle June 1st to October 31st of each year. NDWR recommends 0.015625 cfs for 500 head of cattle. 0.015625 cfs * 723.97 AFA/cfs = 11.31 AFA. 11.31 AFA / 365 days a year * 153 days of use = 4.74 AFA.
	V10515	Irrigation	Stream	Hot Creek Channel, White River Channel and Tributaries	12.9 cfs, 859.4 Acres at 4.0 AF/Acre Duty	4.16	1,107.60	1,107.60	No POU Map accompanied Vested Claim. Compared POU listed in Vested Claim to other Certificated Rights. Most Quarter-Quarter POU's seem to correspond to Certificated Stream Rights. Quarter-Quarter locations with no certificated stream rights within the same Quarter-Quarter POU were assumed to be stand alone vested claim rights. Approximate acreage of standalone irrigation rights is 276.9 acres. 276.9 acres * 4.0 AF/Acre = 1,107.6 AFA. 1,107.6 AFA. 12.9 cfs listed in claim / 859.4 total acres * 276.9 sole source acres = 4.16 cfs diversion rate