SNWA_EXH_613

Stanka slideshow

SNWA 484

Committed Groundwater Resources within the White River Flow System

PRESENTATION TO THE OFFICE OF THE NEVADA STATE ENGINEER

Prepared for

SOUTHERN NEVADA WATER AUTHORITY

Prepared by

Stanka Consulting, LTD

A Professional Engineering Company

June 2017

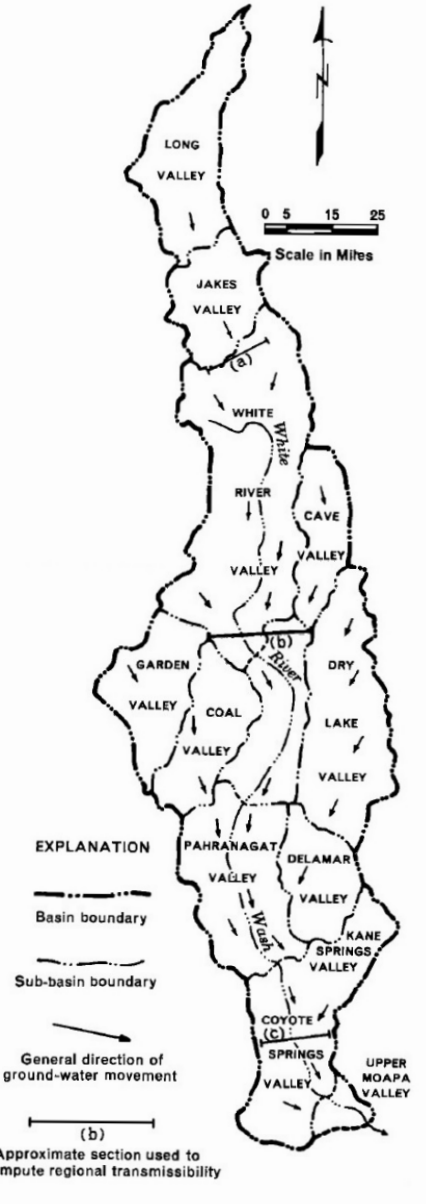

Figure 1-1
Overview of WRFS, *as shown in Figure 6 of the 1966 Eakin Report*

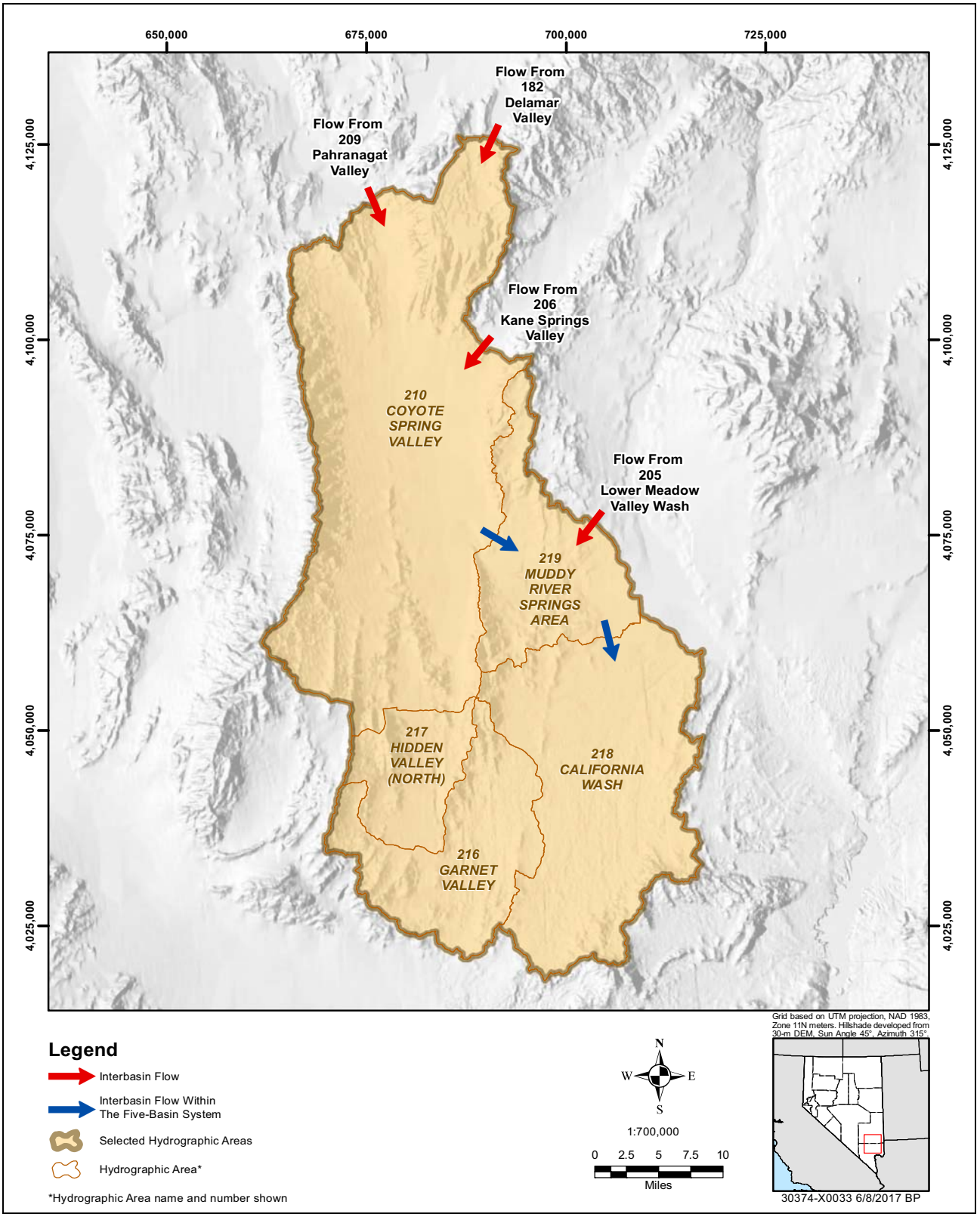

Figure 1-3
Overview of the Jointly-Managed Five-Basin System

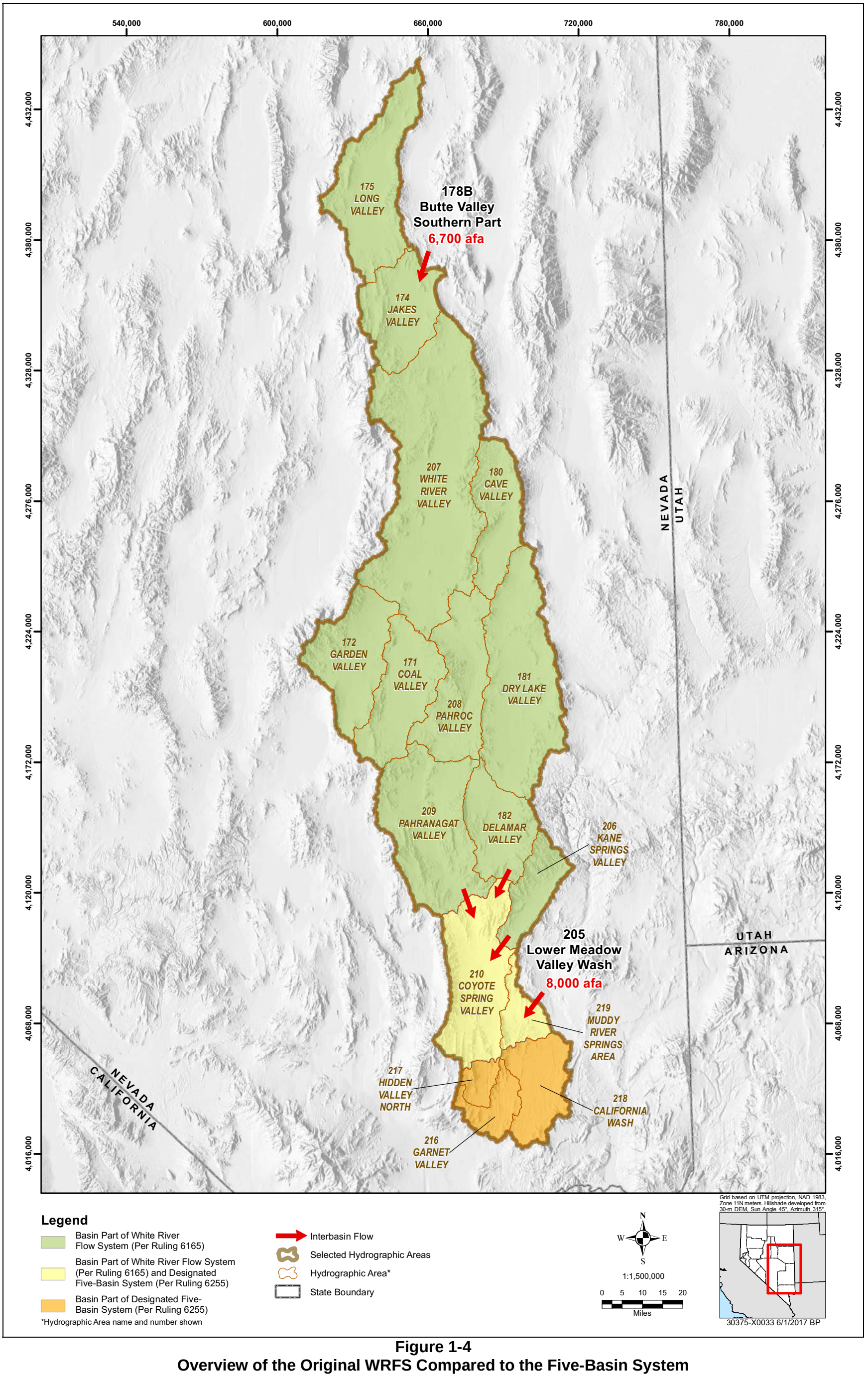

Figure 1-4
Overview of the Original WRFS Compared to the Five-Basin System

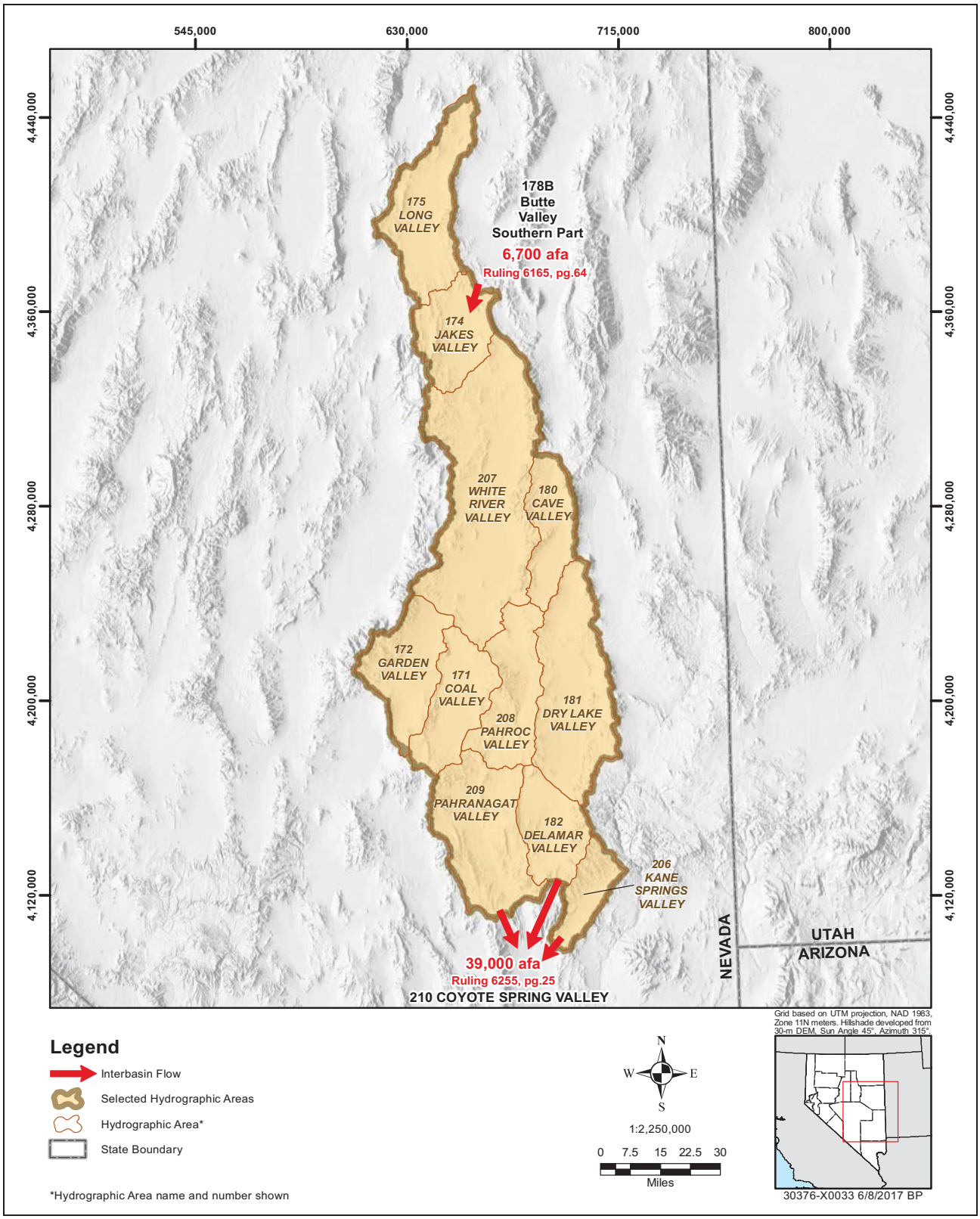

Figure 1-5
Overview of the Northern 11 WRFS Basins used in this Analysis

the down-gradient basin, being Tikapoo Valley - Southern Part, which may be impacted. The State Engineer is not required to let outflow to the down-gradient basin, as long as existing rights will not be impacted and basin inflow values are modified to prevent double accounting of the resource. Therefore, the State Engineer finds the amount of basin outflow from Tikapoo Valley - Northern Part into Tikapoo Valley - Southern Part is adjusted from 2,600 acre-feet annual to zero.

XLVII.

For Tikapoo Valley - Southern Part, Rush[69] established the basin recharge to be 3,400 acre-feet annually, inflow to the basin from Tikapoo Valley - Northern Part to be 2,600 acre-feet, the basin outflow to Three Lakes Valley - Northern Part to be 6,000 acre-feet, and the perennial yield to be 3,000 acre-feet annually, i.e., one-half of the basin outflow.[70] As previously determined, the basin outflow from Tikapoo Valley - Northern Part is reduced to zero to account for the water appropriated from that groundwater basin, which reduces the basin outflow to Three Lakes Valley - Northern Part from 6,000 acre-feet annually to the natural recharge of 3,400 acre-feet annually.

The State Engineer acknowledges the claims that some of the basin discharge from Tikapoo Valley - Southern Part may flow towards Coyote Springs Valley and is cognizant of these claims in this analysis. However, the claim of basin outflow from Tikapoo Valley - Southern Part to Coyote Springs Valley is relatively recent with no quantification; therefore, the State Engineer will accept the adjusted 3,400 acre-feet of basin outflow from Tikapoo

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[69] F.E. Rush, Water Resources Reconnaissance Series Report 54, Regional Ground-water Systems in the Nevada Test Site Area, Nye, Lincoln, and Clark Counties, Nevada, Nevada Department of Conservation and Natural Resources, Division of Water Resources in cooperation with the United States Geological Survey, 1970.

[70] State Engineer's Office, Water for Nevada, State of Nevada Water Planning Report No. 3, pp. 23, 48, Oct. 1971.

Table 1-2
Overview Inflow/Outflow Values for the 11 Northern WRFS Basins used in this Report

Basin No.	HA Name	Inflow to WRFS (afa)	Precipitation Recharge within WRFS (afa)	Outflow from WRFS (afa)
175	Long Valley	0.00	17,540.00	0.00
174	Jakes Valley	6,700.00	10,833.00	0.00
180	Cave Valley	0.00	12,860.00	0.00
207	White River Valley	0.00	36,109.00	0.00
208	Pahroc Valley	0.00	4,577.00	0.00
172	Garden Valley	0.00	20,701.00	0.00
171	Coal Valley	0.00	3,847.00	0.00
181	Dry Lake Valley	0.00	14,969.00	0.00
182	Delamar Valley	0.00	6,067.00	
209	Pahranagat Valley	0.00	5,347.00	39,000.00
206	Kane Springs Valley	0.00	3,852.00	
Total		6,700.00	136,702.00	39,000.00

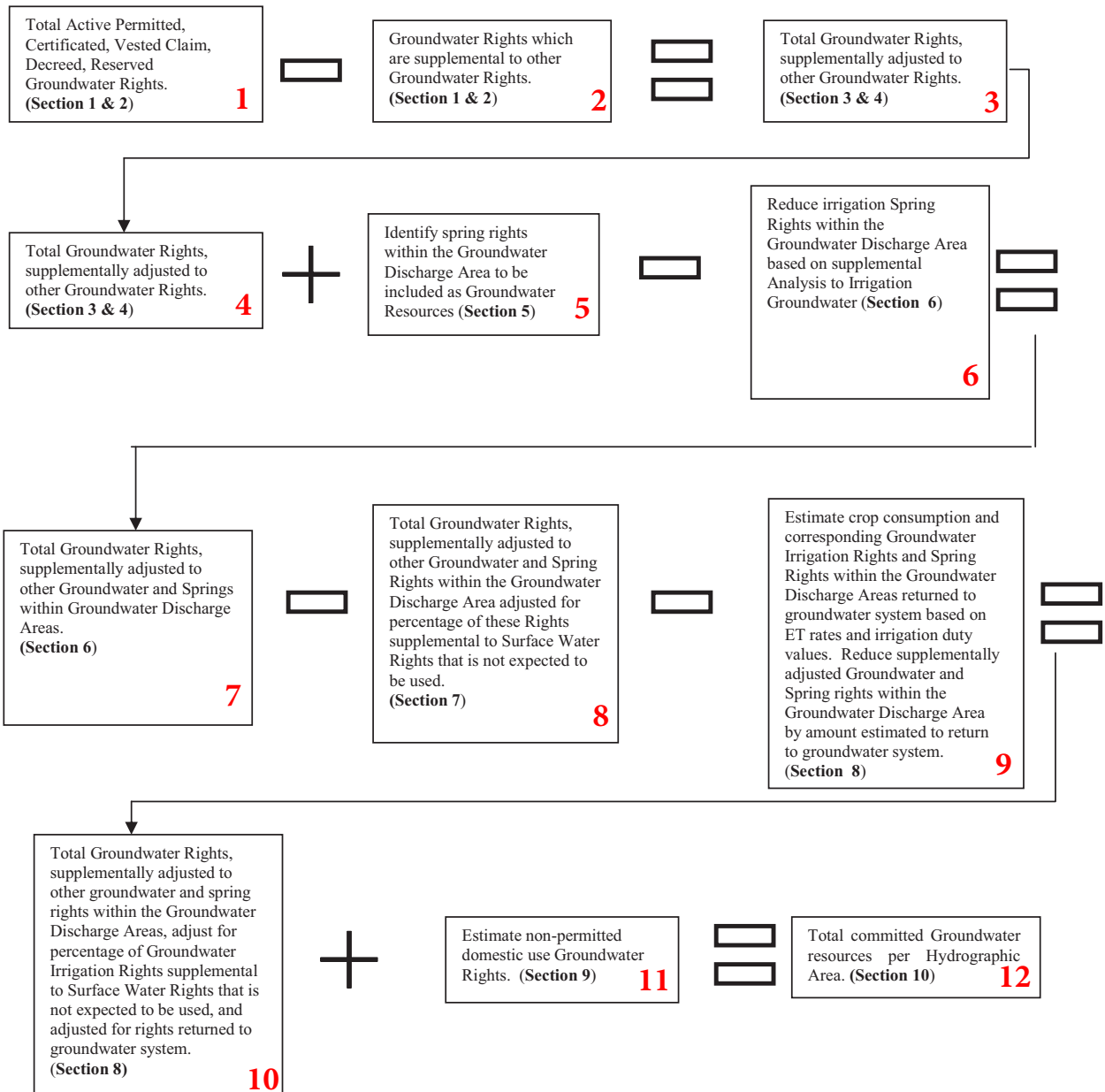
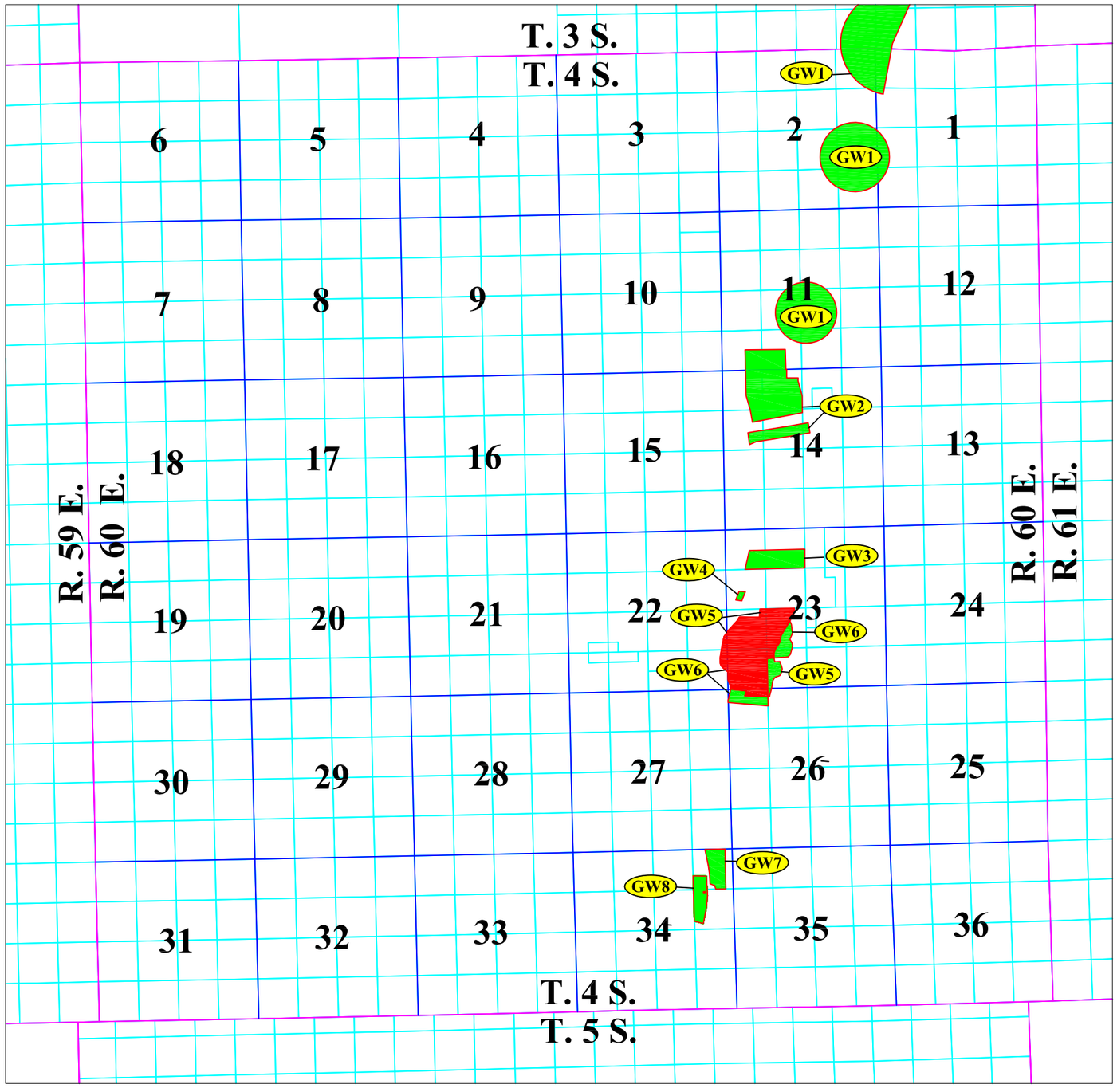


Figure 2-1
Flow Chart Showing Process and Steps to Analyze and Quantify Existing Groundwater Rights



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Groundwater

ID N0	Application No.	Status	Notes
GW-1	79486	Certificate	79486-79490 and 81869-81871 share a common POU
	79487	Certificate	
	79488	Certificate	
	79490	Certificate	
	81869	Certificate	
	81870	Certificate	
	81871	Certificate	
GW-2	32354	Certificate	32354, 35054, 35055, 70990, and 72770-72772 have a TCD Term
	35054	Certificate	
	35055	Certificate	
	70990	Permit	
	72770	Permit	
	72771	Permit	
	72772	Permit	
GW-3	35739	Certificate	
GW-4	70505	Certificate	
GW-5	25906	Certificate	25906 and 25913 have a TCD Term
GW-6	25913	Certificate	25906 and 25913 have a TCD Term
GW-7	68334	Certificate	68334 and 62864 have a TCD Term
	62864	Certificate	
GW-8	19475	Certificate	

Legend

- Quarter - Quarter Subdivisions Lines
- Section Lines
- Township and Range Lines
- Boundary of Place of Use of Water Rights
- Potential Groundwater Supplemental to Groundwater
- Groundwater Place of Use
- GW1 Groundwater Reference Label
- 14 Section Number

N

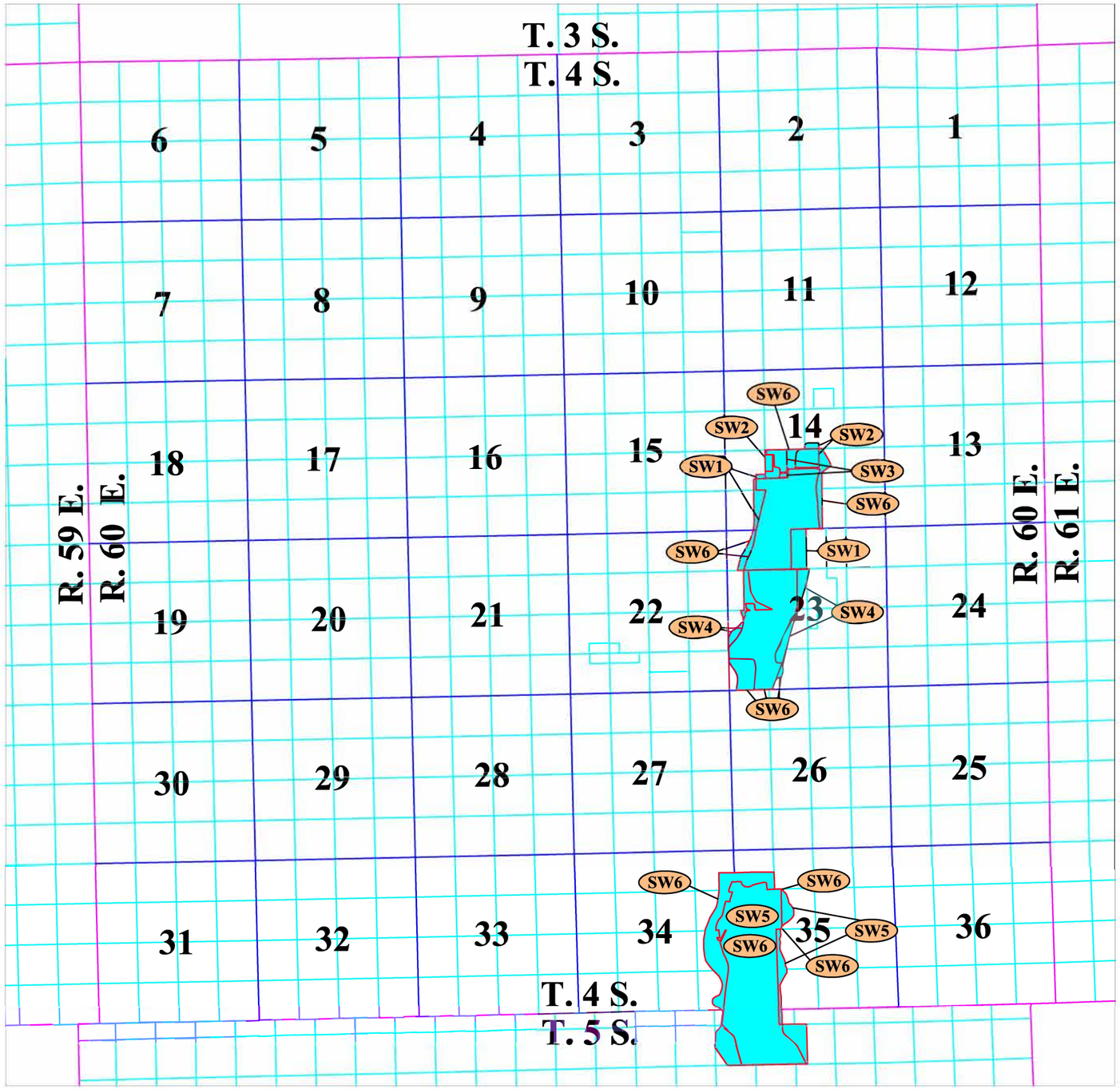
Notes

Quarter-Quarter Sections, Sections, Township, and Range Lines obtained from Nevada BLM on-line database. Reference is NAD 83 and State Plane Coordinate System [feet]

SCALE

4,000 0 2,000 4,000 8,000 FEET

Groundwater Places of Use
Township 4 South, Range 60 East;
Mount Diablo Baseline and Meridian



Index Key

SNWA 484

Surfacewater

ID N0	Application No.	Status	Notes
SW-1	V01765	Decreed	
SW-2	V01788	Decreed	
SW-3	V01797	Decreed	
SW-4	V01796	Decreed	
SW-5	V01798	Decreed	
SW-6	12882	Certificate	12882 and 20544 share a common PBU Map. Acreage known, but exact POU not clearly marked on PBU Map for select quarter-quarters.
	20544	Certificate	

Legend

- Quarter - Quarter Subdivisions Lines
- Section Lines
- Township and Range Lines
- Boundary of Place of Use of Water Rights
- Basin Boundary
- Surfacewater Place of Use
- SW1 — Surfacewater Reference Label
- 14 — Section Number

Notes

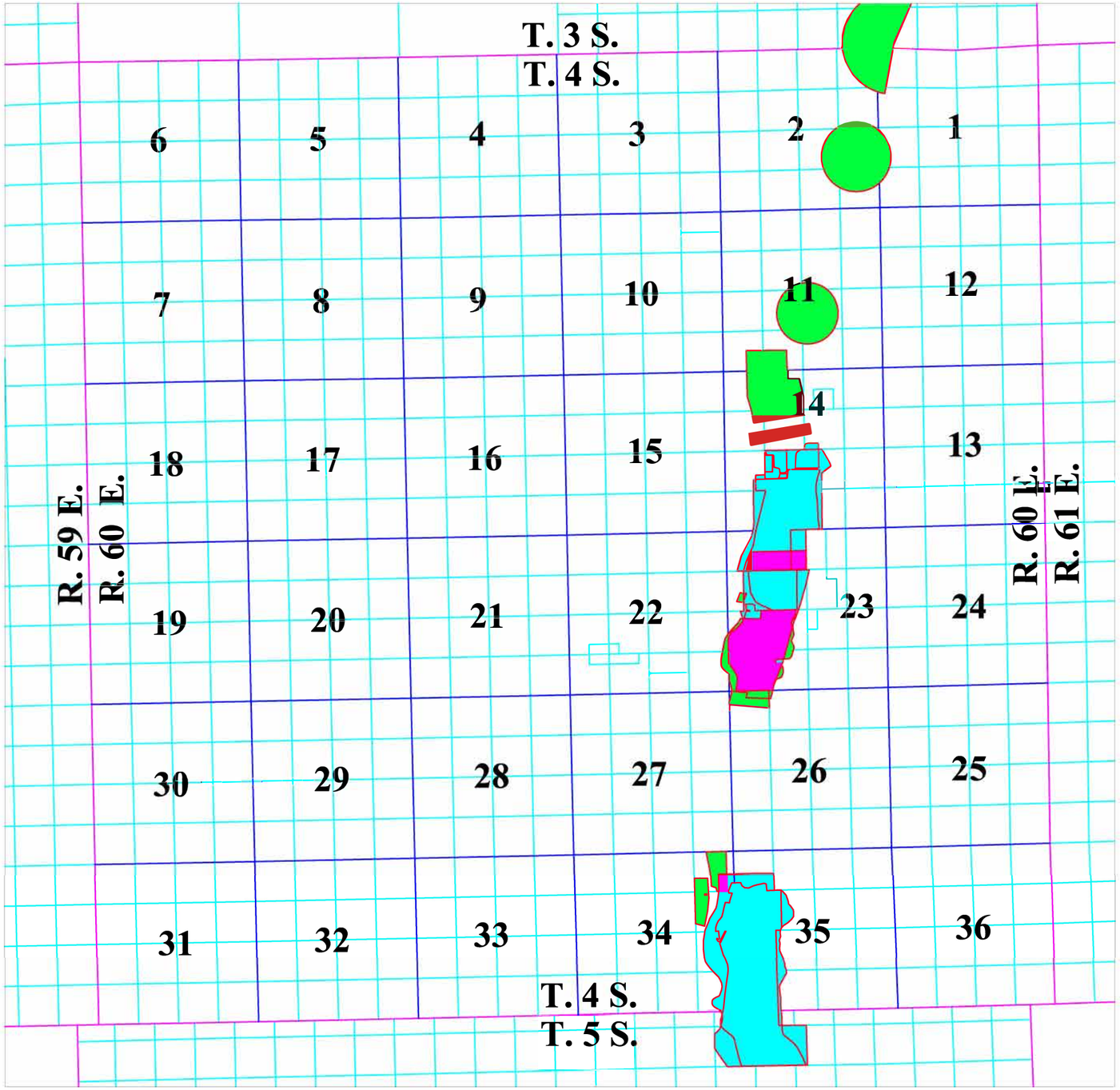
Quarter-Quarter Sections, Sections, Township, and Range Lines obtained from Nevada BLM on-line database. Reference is NAD 83 and State Plane Coordinate System [feet]

N

SCALE

4,000 0 2,000 4,000 8,000 FEET

Spring Water Places of Use
Township 4 South, Range 60 East;
Mount Diablo Baseline and Meridian



Index Key

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Spring Water And Groundwater ID No., Application No., and Status Previously Listed in Groundwater Map and Spring Water Map. These are omitted from this map for clarity.

Legend

- Quarter - Quarter Subdivisions Lines
- Section Lines
- Township and Range Lines
- Boundary of Place of Use of Water Rights

Spring Water Place of Use

Groundwater Place of Use

Shared Spring and Groundwater Place of Use

14 Section Number

N

Notes

Quarter-Quarter Sections, Sections, Township, and Range Lines obtained from Nevada BLM on-line database. Reference is NAD 83 and State Plane Coordinate System [feet]

SCALE

4,000 0 2,000 4,000 8,000 FEET

Spring and Groundwater Places of Use
Township 4 South, Range 60 East;
Mount Diablo Baseline and Meridian

Table 3-6
Committed Groundwater/Rights, Adjusted for Supplemental and Consumptive Use

Manner of Use	Total			With Priority Dates After October 17, 1989			With Priority Dates Prior to, or on October 17, 1989		
	Current Analysis (afa)	Adjusted for GW Sup. To SW (afa)	Adjusted for Consumptive Use (afa)	Current Analysis (afa)	Adjusted for GW Sup. To SW (afa)	Adjusted for Consumptive Use (afa)	Current Analysis (afa)	Adjusted for GW Sup. To SW (afa)	Adjusted for Consumptive Use (afa)
Domestic (exempt from permitting)	8.00	N/A	8.00	0.00	N/A	0.00	8.00	N/A	8.00
Irrigation GW & Spring	480.00	N/A	324.00	449.20	N/A	303.21	30.80	N/A	20.79
Stockwater	269.51	N/A	269.51	35.84	N/A	35.84	233.67	N/A	233.67
Mining and Milling	0.00	N/A	0.00	0.00	N/A	0.00	0.00	N/A	0.00
Total	**757.51**		**601.51**	**485.04**		**339.05**	**272.47**		**262.46**

N/A = Not applicable.
GW = Groundwater.
SW = Surface water.

Table 14-1
Estimated Committed Groundwater/Groundwater Discharge Area Spring Resources in WRFS

Basin No.	HA Name	Committed Groundwater and Spring Water Rights (afa)		
		Before and After October 17, 1989	After October 17, 1989	Before October 17, 1989
175	Long Valley	601.51	339.05	262.46
174	Jakes Valley	42.95	2.24	40.71
180	Cave Valley	5,759.06	33.60	5,725.46
207	White River Valley	36,536.48	9,127.87	27,408.61
208	Pahroc Valley	52.88	31.54	21.34
172	Garden Valley	920.24	579.33	340.91
171	Coal Valley	65.80	38.94	26.86
181	Dry Lake Valley	12,427.14	746.66	11,680.48
182	Delamar Valley	6,101.24	0.00	6,101.24
209	Pahranagat Valley	29,641.30	3,495.43	26,145.87
206	Kane Springs Valley	1,000.00	1,000.00	0.00
	Total	93,148.60	15,394.66	**77,753.94**

Groundwater Quantification Rebuttal Report in Response to Myers (2017)

PRESENTATION TO THE OFFICE OF THE NEVADA STATE ENGINEER

Prepared for

SOUTHERN NEVADA WATER AUTHORITY

Prepared by

Stanka Consulting, LTD

A Professional Engineering Company

August 2017

error is that he has ignored additional springs that should be considered as committed groundwater and stream rights that are also groundwater which causes an underestimate of committed groundwater rights.

I selected the spring rights shown in Figure 9 within the valley bottom Qal, Qflv, and the Qas for alluvial slope. This added application #s 699, 2420, 4163, 5336, 5337, 69363, V001166, V01170, V01167, V01171, and V01169 to the list of spring rights using groundwater. Including these water rights would add 1787 afa to the total. However, several of the vested water rights probably have a duty listed in the White River Decree, so my estimated amount still would be low.

4.33 Stream Rights as Committed Groundwater

Most WRV surface water depends on spring flow, not runoff. The surface flows would be much more consistent, as may be seen in the hydrograph (Figure 10) for Hot Creek near Sunnyside gage (gage 9415558 on Figure 9). This site is downstream from various springs which in combination created the consistent streamflow seen in Figure 10. Considering the number of large regional springs in WRV (Figure 12), most surface water in the valley bottom would be a sum of spring flow. If surface water depends on spring discharge, as it does in the WRV, stream rights should be considered dependent on groundwater.

Table A 1: Valley bottom stream water rights for White River Valley, selected as being within the Qa or Qflv formation. All duty units in AFA or AFS.

App	Cert	Filing_Dt	Status	Div_Rate CFS_	Use	Priority	Duty	Owner_of_Record	Div__Balance	Duty_Balance	POU_Acre_Total	Source_Description	
V01519		10/5/1917	VST	0	IRR	1/1/1902	1200	KENNECOTT NEVADA COPPER COMPANY	0	0.00 ~~1200~~	200	WATER CANYON CREEK	A
2334	220	2/7/1912	CER	2	IRR	2/7/1912	800	CARTER-GRIFFIN, INC.	2	0.00 ~~800~~	200	W. BRANCH OF WHITE RIVE	A
2384	444	3/25/1912	CER	3.29	IRR	3/29/1912	1316	CARTER-GRIFFIN, INC.	3.29	0.00 ~~1316~~	329	WHITE RIVER	A
2896	773	2/27/1914	CER	0.995	IRR	2/27/1914	398	C4 HOLDING, LLC	0.995	0.00 ~~398~~	99.5	EPH CREEK	A
3232	1869	1/11/1915	CER	1.929	IRR	1/11/1915	817.36	NEVADA-DEPARTMENT OF WILDLIFE	1.929	0.00 ~~817.36~~	192.9	WHITE RIVER SLOUGH	A
3235	1872	1/11/1915	CER	1.222	IRR	1/11/1915	443	NEVADA-DEPARTMENT OF WILDLIFE	1.222	390.45 ~~443~~	122.2	HOT CREEK	B
10118	3021	5/17/1937	CER	8.206	IRR	5/17/1937	3482.36	PRESTON IRRIGATION CO.	8.206	0.00 ~~3482.36~~	820.61	WHITE RIVER	A
10174	2836	10/4/1937	CER	1	IRR	10/4/1937	544	C4 HOLDING, INC 2/3 UDI; PEACOCK, JOSEPH W. 1/3 UDI	1	0.00 ~~544~~	114.02	ROWE CREEK	A
11076	3351	3/4/1944	CER	1.461	IRR	3/4/1944	260.35	CARTER-GRIFFIN, INC.	0.73	0.00 ~~130.09~~	146.1	WHITE RIVER SLOUGH	A
78946		10/7/2009	PER	0.731	IRR	3/4/1944	130.26	CARTER-GRIFFIN, INC.	0.731	0.00 ~~130.26~~	0	WHITE RIVER SLOUGH	A
11078	3352	3/6/1944	CER	1.024	IRR	3/6/1944	182.51	GUBLER, ERNEST	1.024	0.00 ~~182.51~~	102.42	WHITE RIVER SLOUGH	A
20466	6663	5/14/1962	CER	0	WLD	5/14/1962	3040	NEVADA-DEPARTMENT OF WILDLIFE	0	0.00 ~~3040~~	0	MOORMAN SPRINGS WASH	A
20819	7451	10/30/1962	CER	0	IRR	10/30/1962	507	NEVADA-DEPARTMENT OF WILDLIFE	0	0.00 ~~507~~	218	WHITE RIVER	A
22354	7716	12/7/1964	CER	0	IRR	12/7/1964	9	PEACOCK, JOSEPH W. 1/3 UDI; C4 HOLDING, LLC 2/3 UDI	0	0.00 ~~9~~	3	ROWE CR.&TRIBUTARIES	A

23624	7468	1/20/1967	CER	2.403	WLD	1/20/1967	1120	NEVADA-DEPARTMENT OF WILDLIFE	2.403	0.00 ~~1120~~	0	WHITE RIVER	A
38205	12850	5/17/1979	CER	80	WLD	5/17/1979	1230	NEVADA-DEPARTMENT OF WILDLIFE	80	000 ~~1230~~	0	SUNNYSIDE CR, HOT CREEK	C
V10515		4/28/2014	VST	12.9	IRR	1/1/1874	0	JENSEN, BRUCE A. AND PAMELA G.	12.9	0.00 0	0	HOT CREEK CHANNEL, WHITE RIVER CHANNEL AND TRIBUTARIES	D
V04605		7/16/1987	VST	7.69	IRR	1/1/1880	0	NEVADA-DEPARTMENT OF WILDLIFE	7.626	0.00 ~~2187.98~~	551.596	SUNNYSIDE CREEK	C
V01351		1/11/1915	VST	0	IRR	1/1/1885	11600	NEVADA-DEPARTMENT OF WILDLIFE	0	2,089.80 ~~11600~~	29000	HOT CREEK	B
V00801		1/1/1915	VST	0	IRR	1/1/1891	0	NEVADA-DEPARTMENT OF WILDLIFE	0	0.00 0	0	HOT CREEK	D
Total							27079.84			2,480.25 ~~29137.56~~	32099.346		

A. Water Sourced from outside Ground Water Discharge Areas

B. Adjusted based on Irrigated acreage and consumptive use

C. V04605 accounted for in White River Basin Analysis Chapter 5. 38205 Multiple Surface Water Sources with excess Flood Waters

D. Concur with NDWR Database - Duplicate or insufficient info to Quantify

14.0 SUMMARY

Table 14-1 lists the estimated committed groundwater resources in the WRFS per HA resulting from the analyses of the existing groundwater rights and spring rights within the groundwater discharge areas. It is estimated that 104,402 afa of groundwater is available for appropriation in the WRFS. The results of this analysis show that there are ~~77,753.94~~ afa of committed groundwater rights and spring rights within the groundwater discharge areas with a priority date prior to or on October 17, 1989. There are a total of ~~93,148.60~~ afa, of committed groundwater rights and spring rights within the groundwater discharge areas with priority dates prior to, on, and after October 17,1989.

Therefore based on this analysis, no reduction of SWNA DDC permit volumes needs to be performed, as there is more than enough water in the 11-basin WRFS both for SNWA DDC permits and down-gradient water rights. This analysis shows that there is no over-appropriation of water rights within the 11-basin WRFS. In fact, it appears that additional water is available for appropriation.

Table 14-1
Estimated Committed Groundwater/Groundwater Discharge Area Spring Resources in WRFS

Basin No.	HA Name	Committed Groundwater and Spring Water Rights (afa)		
		Before and After October 17, 1989	After October 17, 1989	Before October 17, 1989
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180	Cave Valley	5,759.06	33.60	5,725.46
207	White River Valley	~~36,536.48~~ 39,016.73	9,127.87	~~27,408.61~~ 29,888.86
208	Pahroc Valley	52.88	31.54	21.34
172	Garden Valley	920.24	579.33	340.91
171	Coal Valley	65.80	38.94	26.86
181	Dry Lake Valley	12,427.14	746.66	11,680.48
182	Delamar Valley	6,101.24	0.00	6,101.24
209	Pahranagat Valley	29,641.30	3,495.43	26,145.87
206	Kane Springs Valley	1,000.00	1,000.00	0.00
	Total	~~93,148.60~~ 95,628.85	15,394.66	~~77,753.94~~ 80,234.19