Water Calculations and Cost Estimates
Truckee Meadows

Available Truckee Meadows Water Resources

Verdi Area Current Demand and Water Resources

The majority of the present single family residential water needs of the Verdi area are currently met by domestic wells. The exception to the domestic well source for single family residential use is the Verdi Meadows Water Company, which supplies 171 single family detached homes. In addition, commercial/industrial development and several mobile home parks are supplied by small private water systems. The Verdi Mutual Water Company supplies Firth-Rixon and Wells Manufacturing Co. The Gold Ranch and Boomtown Casinos are self supplied by means of their own respective water supply facilities.

A significant feature of the Verdi Area is that the Truckee River flows through it. The Highland Ditch diversion to the Truckee Meadows Water Authority (TMWA) Chalk Bluff Water Reclamation facility is located in the Verdi Area.

The local geology plays a major role in determining groundwater availability and quality in the Verdi Area. Three primary geologic units act as aquifers in the area including fractured volcanic rocks, partially cemented lake sediments and the overlying unconsolidated alluvial materials. The fractured volcanic rocks exhibit typical rock hydraulic properties and do not generally yield more than a few hundred gallons per minute to a well. These fractured volcanic rocks also contain water that in the western part of the area contains arsenic in concentrations that exceed the drinking water standards.

The water supply wells for the Verdi Meadows Water Company are completed in the fractured volcanic rocks. Throughout the area the volcanic rocks also contain dissolved ammonia and hydrogen sulfide in concentrations that can present an odor problem for domestic use without treatment. The lake sediments are generally considered to be “tight” aquifers with minimal yields even to domestic wells. The overlying unconsolidated alluvial deposits are not generally extensive and in some areas may not have sufficient thickness to permit construction of wells with the required surface seals. The unconsolidated alluvial deposits do act as a significant aquifer in some portions of the Verdi Area supplying the well field for Boomtown and supplying the spring utilized by Verdi Mutual Water Company. The Gold Ranch water supply may also be derived from this aquifer or the underlying volcanic rocks. In other portions of the Verdi area, the unconsolidated alluvial aquifer is generally not present in sufficient thickness to provide a significant beneficial supply for municipal supply purposes.

Washoe County Water Resources is undertaking a water resource investigation of the groundwater resources in the Verdi Area.

The Verdi Area is mostly in the Washoe County water service area. In addition to developing the local groundwater resources, the expanded supply for future development will be derived from the conversion of agricultural surface water rights from the area and elsewhere along the Truckee River. The surface water supply will be provided to the area through wholesale supply from TMWA with treatment at the Chalk Bluff Water Reclamation facility. New additional

treatment facilities in the Verdi Area could also be considered to treat a portion of the Truckee River supply.

The water rights associated with some of the major pending developments and the water purveyors are listed in Table AAA. Additional water rights exist in the area, and some of the area surface water rights have recently been sold for development purposes in other areas. Due to the changing balance of these rights that are not associated with pending developments, they are not listed. Additional surface water rights are available in the Truckee Meadows area that can be potentially acquired to support development in the Verdi Area.

Table B-1 - Verdi Area Water Rights
(Partial list related to purveyors and some of the properties under development)

Water Right	**Amount (AF)**
Groundwater	
Boomtown	880
Verdi Meadows	255
Washoe County (for domestic wells)	200
Verdi Mutual Water Co	724
Verdi Business Park	34
Total Groundwater Rights	2,093
Surface water	
Mortensen	43
Verdi Mutual Water Co (Spring)	1,200
Quilici	330
Verdi Meadows	194
Boomtown	700
Total Surface Water	2,467
Total	**4,560**

Truckee Meadows Area Current Demand and Water Resources

Total commitments of TMWA are approximately 102,000 AF and rely upon water from a variety of resources listed in Table B-1. These 142,900 AF of water rights provide the reliable drought supply to support the 102,000 AF of commitments. These commitments also include demands in Sparks and outside of the Truckee Meadows basin. The estimated distribution of the TMWA demand is listed in Table B-2. The TMWA water supply is planned to grow through the addition of approximately 18,870 AF of converted agricultural surface water rights from lands generally located in the Truckee Meadows vicinity. This conversion of agricultural surface water rights to municipal use is supported through the drought storage, which results from the Truckee River Operating Agreement (TROA). The Final EIS/EIR on TROA is expected to be published in the next several months and the agreement is expected to become effective sometime in 2009.

Table B-2 - TMWA Water Resources (including wholesale)

Municipal Supply Decreed rights	Current (AF)	Future (AF)
Truckee (40 cfs)	28,959	28,959
Hunter Creek (13.6 cfs)	9,847	9,847
Total Decreed Municipal Rights	38,806	38,806
Storage Rights (which are also refilling appropriations)		
Independence Lake	17,500	17,500
Donner Lake (1/2 interest)	4,750	4,750
Total Storage	22,250	22,250
Groundwater Rights		
Truckee Meadows Basin	16,010	16,010
Lemmon Valley West Basin	883	883
Spanish Springs Basin	410	410
Total Groundwater	17,303	17,303
Main stem Truckee River Irrigation Rights	64,541	83,411
Total rights	142,900	161,770
Commitment associated with rights	102,000	120,353

The water supply for the South Truckee Meadows area supplied by STMGID and Washoe County is planned to grow primarily through the conversion of agricultural surface water rights to municipal use. These water rights would be provided by a wholesale supply from TMWA and through facilities owned by Washoe County, including the Longley Lane Water Reclamation Facility and a planned surface water reclamation facility, which will utilize water from the local stream resources in the South Truckee Meadows (Galena, Whites, Thomas, and Steamboat Creeks). The growth in this supply is addressed in the 2002 South Truckee Meadows Facility Plan and the October 2006 Steamboat and Tributary Municipal Water Supply Yield Analysis, both prepared by ECO:LOGIC for Washoe County (see Table B-3).

Table B-3 – Water Resources - South Truckee Meadows and Pleasant Valley

	Current (AF)	Future (AF)
Groundwater (fully committed to projects)	9,575	9,575
Surface water (yield of resources utilized)	n/a	4,679
Wholesale from TMWA	2,166	3,472
Total supply	11,741	17,726
Total water demand (normalized 2006)	6,939	

The Hidden Valley portion of the Truckee Meadow is supplied by Washoe County utilizing a combination of treated surface water and groundwater. The surface water supply may be increased through the acquisition of agricultural surface water rights and groundwater rights. These resources are managed conjunctively with drought protection provided by high capacity wells that are generally reserved for drought and emergency conditions. Table B-4 describes the existing water rights and demands placed upon the Hidden Valley water system.

Table B-4 – Water Resources and Demand - Hidden Valley

	(AF)
Groundwater Rights	803.7
Main stem Truckee River Irrigation Rights	608.8
Total rights (fully committed)	1,412.5
Total water demand (normalized 2006)	1,329

Estimated Costs for the Water Facilities in the Verdi Area

No.	Description	Qty.	Unit	Unit Cost	Total Cost		Reno TMSA	County TMSA
1	**Water Facility Improvements Within TMWA System (Source TMWA)[1]**							
1.1	***Transmission***							
	16" Pipe	6,300	L.F.	$352	$2,217,600		$1,663,200	$554,400
	20" Pipe	3,500	L.F.	$400	$1,400,000		$1,050,000	$350,000
	18" Pipe	3,300	L.F.	$360	$1,188,000		$891,000	$297,000
	24" River Crossing (Mayberry)	625	L.F.	$800	$500,000		$375,000	$125,000
	US 40 Pump Station Rebuild	1	L.S.	$200,000	$200,000		$150,000	$50,000
	Pump Station Verdi 1	1	L.S.	$1,100,000	$1,100,000		$825,000	$275,000
					Subtotal =	**$ 6,605,600**		
2	**Backbone Water Facility Improvements From West Mogul to River Crossing (Source TMWA)[1]**							
2.1	***Transmission***							
	18" Pipe	4,900	L.F.	$270.00	$1,323,000		$992,250	$330,750
	18" Pipe	6785	L.F.	$360	$2,442,600		$1,831,950	$610,650
	18" River Crossing	200	L.F.	$180	$36,000		$27,000	$9,000
					Subtotal =	**$ 3,801,600**		
3	**Backbone Water Facility Improvements From River Crossing to the Boomtown Tank (Source TMWA)[1]**							
3.1	***Transmission***							
	16" Pipe	5,530	L.F.	$240.00	$1,327,200		$1,327,200	-
	18" Pipe	6,500	L.F.	$270.00	$1,755,000		$1,755,000	-
	Pump Station Verdi 2	1	L.S.	$850,000	$850,000		$850,000	-
	16" I-80 Crossing	500	L.F.	$400.00	$200,000		$200,000	-
3.2	***Storage***							
	Boomtown Tank	1,500,000	Gal	$1.25	$1,875,000		$1,875,000	-
					Subtotal =	**$ 6,007,200**		
4	**Backbone Water Facility Improvements From U.S. 40 to the Tank #1 (Source TMWA)[1]**							
4.1	***Transmission***							
	12" Pipe	3,450	L.F.	$180.00	$621,000		$310,500	$310,500
	18" Pipe	5,300	L.F.	$270.00	$1,431,000		$715,500	$715,500
4.2	***Storage***							
	Lower Verdi Tank	1,500,000	Gal	$1.25	$1,875,000		$937,500	$937,500
					Subtotal =	**$ 3,927,000**		
5	**Improvements from Viking Metalurgical to Gold Ranch Tank**							
5.1	***Transmission***							
	16" Pipe	9,000	L.F.	$192.00	$1,728,000		$864,000	$864,000
	18" Pipe	4,800	L.F.	$216.00	$1,036,800		$518,400	$518,400
	Pump Station 4	1	L.S.	$400,000	$400,000		$200,000	$200,000
	Wholesale Meter	1	L.S.	$60,000	$60,000		$30,000	$30,000
	River Crossing (Bore & Jack)	400	L.F.	$1,000	$400,000		$200,000	$200,000
	Ditch Crossing	100	L.F.	$800	$80,000		$40,000	$40,000
5.2	***Storage***							
	Gold Ranch Tank	1,500,000	Gal	$1.00	$1,500,000		$750,000	$750,000
					Subtotal =	**$ 5,204,800**		
6	**Improvements from Lower Verdi Tank to Tank #1**							
6.1	***Transmission***							
	14" Pipe	2,750	L.F.	$168.00	$462,000		$462,000	-
	Pump Station 3	1	L.S.	$400,000	$400,000		$400,000	-
6.2	***Storage***							
	Tank #1	400,000	Gal	$1.00	$400,000		$400,000	-
					Subtotal =	**$ 1,262,000**		
7	**Improvements from Boomtown Area to Tank #4**							
7.1	***Transmission***							
	14" Pipe	7,000	L.F.	$168.00	$1,176,000		$1,176,000	-
	16" Pipe	10,000	L.F.	$192.00	$1,920,000		$1,920,000	-
	Pump Station 1	1	L.S.	$400,000	$400,000		$400,000	-
	Pump Station 2	1	L.S.	$400,000	$400,000		$400,000	-
7.2	***Storage***							
	Tank #3	1,400,000	Gal	$1.00	$1,400,000		$1,400,000	-
	Tank #4	700,000	Gal	$1.00	$700,000		$700,000	-
					Subtotal =	**$ 5,996,000**		
					Proposed TMWA Facilities Total[2] =	**$ 20,341,400**	**$15,776,100**	**$4,565,300**
					Planned facilities Total (not including TMWA) =	$ 12,462,800	$ 9,860,400	$ 2,602,400
					Construction Total =	**$ 32,804,200**	**$ 25,636,500**	**$ 7,167,700**
8	**Other Costs**							
	Engineering (20%)[2]						$ 1,972,000	$ 520,000
	Contingency (20%)[2]						$ 1,972,000	$ 520,000
					Total =	**$ 37,789,000**	**$ 29,581,000**	**$ 8,208,000**

Note: 20 Cities ENRCCI = 7,942, May 2007
1 - TMWA Cost Estimates Used
2-Engineering and Contingency costs were already included for TMWA's planned improvements

Estimated Costs for the Facilities in Sunny Hills

No.	Description	Qty.	Unit	Unit Cost	Total Cost	
1	**From Rio Wrangler Pkwy to Tank 1 (T 1)**					
1.1	***Transmission***					
	14" Pipe	9,640	L.F.	$168	$1,619,520	
	Pump Station 1	232	hp	$637,151	$637,150	
1.2	***Storage***					
	Tanks	750,000	Gal	$1	$750,000	
					Subtotal =	**$ 3,006,700**
2	**From South Meadows Pkwy to the Main from Tank 1**					
2.1	***Transmission***					
	14" Pipe	11,100	L.F.	$168	$1,864,800	
	Pump Station 2	232	hp	$637,151	$637,150	
					Subtotal =	**$ 2,502,000**
3	**From Tank 1 Main to East Boundary of Development in Washoe County**					
3.1	***Transmission***					
	12" Pipe	25,060	L.F.	$144	$3,608,600	
	10" Pipe	1,400	L.F.	$120	$168,000	
	Pump Station 3	238	hp	$646,293	$646,290	
	Pump Station 4	115	hp	$430,694	$430,690	
	Pump Station 5	25	hp		$400,000	
	Pump Station 6	10	hp		$400,000	
3.2	***Storage***					
	Tanks	1,000,000	Gal	$1	$1,000,000	
					Subtotal =	**$ 6,653,600**
					Construction Total	**$ 12,162,000**
4	**Other Costs**					
	Engineering Cost (20%)				$ 2,432,400	
	Contingency (20%)				$ 2,432,400	
					Subtotal	**$ 4,865,000**
					Total =	**$ 17,027,000**

Note: 20 Cities ENRCCI = 7,942, May 2007