

ATTACHMENT

MMMWC WATER SYSTEM MAP

APPENDIX A  
WATER SYSTEM ANALYSIS

APPENDIX B  
FINANCIAL STATEMENT

**ENGINEER'S REPORT**  
**OF THE**  
**MOUNTAIN MEADOWS MUTUAL WATER COMPANY**  
**FOR THE**  
**SIERRA MEADOWS**  
**PERMIT FOR SHARES**

April, 2005

Prepared By:

**TRIAD/HOLMES ASSOCIATES**  
P.O. Box 1570  
Mammoth Lakes, CA 93546  
760) 934-7588



---

Thomas A. Platz, Pres.  
P.E. C-41039

## **TABLE OF CONTENTS**

	<u>PAGE</u>
INTRODUCTION	1
GEOGRAPHICAL LOCATION	1
SERVICE AREA CHARACTERISTICS	2
WATER COMPANY SERVICE AREA	2
ULTIMATE AND EXISTING WATER DEMANDS	3
EXISTING MMMWC SYSTEM	5
Water Supply System and Groundwater Resources	5
Water Storage System	6
Distribution System	7
SERVICE PRESSURES	8
MAINTENANCE AND REPLACEMENT COSTS	8
ENGINEER'S STATEMENT	11

## **LIST OF FIGURES**

FIGURE 1	LOCATION MAP
FIGURE 2	VICINITY MAP
FIGURE 3	SERVICE AREA MAP

## LIST OF TABLES AND ATTACHMENT

		<u>PAGE</u>
TABLE 1	POTENTIAL WATER SERVICES WITHIN THE MMMWC	2
TABLE 2	ULTIMATE WATER DEMANDS	3
TABLE 3	EXISTING WATER DEMANDS	4
TABLE 4	MMMWC WELL CHARACTERISTICS	5
TABLE 5	ESTIMATED WATER SYSTEM REPLACEMENT COST ESTIMATE	9
TABLE 6	REVENUE REQUIREMENTS	10
APPENDIX A	WATER SYSTEM ANALYSIS	
APPENDIX B	FINANCIAL STATEMENT	
ATTACHMENT:	MMMWC WATER SYSTEM MAP	

## **INTRODUCTION**

The purpose of this report is to amend the Engineer's Report submitted July, 2003, for the Mountain Meadows Mutual Water Company (MMMWC). The original Engineer's Report was prepared in May, 1980, for the MMMWC and amended several times since.

This report is submitted in conjunction with an application by the MMMWC for a permit to issue shares within the MMMWC service area to serve Sierra Meadows (SM), a residential subdivision. The Sierra Meadows property, originally was a part of Rocking R Estates (RRE), which was tentatively approved by Mono County in 1981 as a 50-lot subdivision. RRE property was annexed into the MMMWC service area in 1981 as a planned 50 lot residential subdivision. 21 of the planned 50 lots were created through the recording of the first phase of the RRE and to date 19 shares have been issued for the RRE subdivision. MMMWC supply and storage facilities were sized to accommodate the 50 lots originally planned. Sierra Meadows was tentatively approved in 2003 as an 11 lot subdivision by Mono County based on a "Will Serve" letter issued by the MMMWC.

## **GEOGRAPHICAL LOCATION**

The MMMWC service area is located in east central California in the unincorporated community of Crowley Lake in Mono County. Crowley Lake is located on the slopes of the Eastern Sierra, approximately 28 miles northwest of the city of Bishop and twelve miles southeast of the Town of Mammoth Lakes. A location map showing the Crowley Lake community with respect to the rest of California is presented on Figure 1. Figure 2 presents the physical features within the vicinity of Crowley Lake.

### **SERVICE AREA CHARACTERISTICS**

The MMMWC service area is generally located at an elevation of 7,000 feet AMSL. The elevation ranges between 6,800 feet AMSL in the northern portion of the service area to 7,200 feet AMSL along the southern edge of the service area.

The climate is characterized by four distinct seasons. Temperatures in the winter range from lows of -10°F to highs of 40°F, and in the summer range from lows of 40°F to highs of 95°F. The average annual precipitation is 15 inches, which almost entirely falls in the form of snow between the months of December and March.

### **WATER COMPANY SERVICE AREA**

The MMMWC service area is shown on Figure 3. The service area presently encompasses 210.9 acres. The present total possible shares that can be issued by the MMMWC within the service area are tied to the development of a number of parcels of land, which includes Sierra Meadows, Lakeridge Bluffs, Sierra Springs, Rocking R Estates and the Mono County Community Center. The possible shares for each development and the current status of active water services in each property are summarized below in Table 1.

**Table 1. Potential Water Services Within MMMWC**

<u>Development</u>	<u>Status</u>	<u>Area</u>	<u>Possible Service Shares</u>	<u>Active Services</u>
Mountain Meadows Subd.	Active	33.5	23	21
Mountain Meadows Condos	Active	3.6	38	38
Whiskey Creek Condos	Active	0.7	12	12
Lakeridge Bluffs Est.	Active & Future*	79.5	114	32
Sierra Springs	Active	58.5	70	70
Apt/Condo Dev APN 60-210-27	Future	1.2	10	0
Church APN (60-210-21)	Active	2.2	2	2
Par.2 of PM 37-136	Active	0.3	1	1
Rocking R Phase I & II	Active	22.2	31	31
Sierra Meadows Phase I	Application	6.1	13	13
Mono Co. Community Center	Active	3.0	5	5
	Total:	210.9	319	225

\* Application for 32 Phase 1 shares with 82 future shares to be issued with later phases.

## ULTIMATE AND EXISTING WATER DEMANDS

Average daily demands (ADD) in the service area are estimated at 440 gallons per day (gpd) per residence. The average daily demand is based on record flows obtained from meter readings at each of the supply wells. The record use equates to a per capita consumption of 125 gpd based on an average household of 3.5 persons. During the summer irrigation months, maximum daily demands (MDD) approach 300% of the average daily demand, or 1,350 gpd per household for single family residential users (SFR) Multi-family residential projects such as Whiskey Creek Condominiums use 80% of the MDD of a user or 1,100 gpd.

The ultimate projected average and maximum daily water demands associated with all of the shares issued by the MMMWC including the proposed annexation properties are summarized in Table 2. The projected demands assume each share is equivalent to the water supply demand (EDU) of a single family residential household.

The estimated water demands for the Sierra Meadows 13 services in Phase I were calculated utilizing the ADD and MDD for a single family residence. The combined ADD for Phase 1 is expected to be 5,720 gpd. The anticipated MDD equates to 17,550 gpd.

**Table 2. Ultimate Water Demands**

<u>Development</u>	<u>Service Shares</u>	<u>Avg. Daily Demand, gpd</u>	<u>Max. Daily Demand, gpd</u>
Mountain Meadows Subd.	23	10,120	31,050
Mountain Meadows Condos	38	13,490	41,800
Whiskey Creek Condos	12	4,260	13,200
Lakeridge Bluffs Est.	114	50,160	153,900
Sierra Springs Subd.	70	30,800	94,500
Rocking R Subd. (Ph. I & II)	31	13,640	41,850
Mono Co. Community Center	5	2,000	9,000
Sierra Meadows Phase I	13	5,720	17,550
Church (APN 60-210-21)	2	880	2,700
Apt./Condo Dev. (APN 60-210-27)	10	3,550	11,100
Par.2 of PM 37-136	1	440	1,350
Totals:	319	135,060	418,000

Existing water service demands are summarized in Table 3. The existing demands are based on the anticipated full buildout of the 13 Sierra Meadows Phase I sites, the 32 Lakeridge Bluffs Phase 1 sites, the 31 Rocking R Estates sites, the Sierra Springs subdivision (70 shares) and the Community Center.

**Table 3. Existing Water Demands**

<u>Development</u>	<u>Current Shares</u>	<u>Avg. Daily Demand, gpd</u>	<u>Max. Daily Demand, gpd</u>
Mountain Meadows Subd.	23	10,120	31,050
Mountain Meadows Condos	38	13,490	41,800
Whiskey Creek Condos	12	4,260	13,200
Rocking R Estates	31	13,640	41,850
Church (APN 60-210-21)	2	880	2,700
Sierra Springs	70	30,800	94,500
Sierra Meadows Phase I*	13	5,720	17,550
Community Center	5	2,000	9,000
Lakeridge Bluffs Phase 1	32	14,000	43,200
Parcel 2 PM 37-136	1	440	1,350
Totals:	227	95,350	296,200

\*When permitted for shares.

The fire flow requirement, for the Mountain Meadows and Whiskey Creek Condominiums, is 2000 gpm for a duration of 2 hours. Single family residential fire flow requirements are 1000gpm for a 2 hour duration.

The calculated average daily demands (ADD) determine the required long-term groundwater resource capacity. The maximum daily demand determines the needed well supply capacity for the water system. Existing water demands of 95,350 gpd, including Phase I of Sierra Meadows will require a groundwater resource capacity of 106 acre feet annually. The well supply capacity necessary to satisfy the maximum daily demand will be 296,200 gpd, which equates to 203 gallons per minute. Ultimate projected water demands as listed in Table 2 will require a groundwater resource capacity of 154 acre feet per year and a well supply capacity of 300 gpm.

The combined demand of MDD and fireflow is established as the peak demand for the system. The existing combined peak demand is 2,203 gpm and the ultimate combined peak demand is 2,300 gpm (300 + 2,000).

### **EXISTING MMMWC WATER SYSTEM FACILITIES**

A schematic layout of the major facilities of the existing MMMWC system is presented on the attached water map. A description of the major supply storage and distribution facilities follows.

### **Water Supply System and Groundwater Resources**

The water supply system consists of three wells equipped with submersible pumps. A tabulation of the characteristics of each well are as follows:

**Table 4. MMMWC Well Characteristics**

	<u>Well No. 1</u>	<u>Well No. 2</u>	<u>Well No. 3</u>
Depth	100	300	160
Casing	6" Steel	10" Steel	8 5/8" Steel
Submersible Pump Type	15 hp	30 hp	40 hp
Well Production	100 gpm	250 gpm	170 gpm
Date Drilled	1980	1980	1982

Previous controversy existed regarding the extent of the groundwater resource available in the vicinity of the existing MMMWC supply wells. A 1979 preliminary hydrogeologic study conducted by Slade and Blevins for development of historical spring flows indicated that the available resource was approximately 25 to 30 acre-feet per year. Although the report primarily focused on spring and shallow groundwater development, two relatively deep (over 100 feet) supply wells (Wells 1 & 2) were actually installed. Subsequent hydrologic analyses and well drawdown and recovery tests conducted by Gram/Phillips Associates in 1981 indicated that the long-term, groundwater supply capacity is approximately 330 acre-feet per year (206 gpm).

---

Although the well pumping tests conducted by Gram/Phillips Associates were considered to provide more reliable information than the preliminary study by Slade and Blevins, the State Public Health Department questioned the wide discrepancy in the estimated groundwater resource capacity. In response to Health Department concerns, J.H. Kleinfelder conducted additional groundwater supply studies in 1983 for Dempsey Construction Corporation. These studies determined that the available groundwater supply capacity at the location of the MMMWC Well No. 3 site (see attached water system map) was approximately 407 acre-feet per year. The capacity of the well pump installed at this location is approximately 170 gpm.

The existing well production and supporting geohydrologic studies indicate that significant groundwater resources are available within the service area of MMMWC. Based on the Kleinfelder Water Resources Study the groundwater basin has the capacity to meet ultimate MMMWC water system demands of 154 acre-feet per year.

Groundwater from Wells 1 and 2 have been tested to have levels of uranium exceeding the State and Federal standard of 25 pico curries (pc)/liter. Test results have been as high as 30 pc/l. In order to reduce uranium levels to meet drinking water standards the MMMWC has been mixing water from the uranium free Well #3 with water from Wells 1 and 2 at a 50/50 ratio. This can be increased to a 40/60 ratio to produce water well within the 25 pc/l requirement. The supply capacity has been affected by the need to mix water and has reduced overall instantaneous capacity flow of 400 gpm in lieu of the 520 gpm available if all wells are producing together.

### **Water Storage System**

The MMMWC storage system consists of a 235,000 gallon bolted steel tank located as shown on the water system map attached with this report. The tank was constructed in 1980. A telemetry control system was installed in 1987 to insure the tank is kept full in order to meet the storage requirements set by the Long Valley Fire Protection District.

The water storage and well system combined flows equate to a two hour flow rate of 2,400 gpm (Wells 2 and 3 producing). Therefore, the system is capable of meeting the ultimate peak flow (fireflow + MDD) requirement of 2,300 gpm.

---

### **Distribution System**

The MMMWC distribution system consists of 10-inch PVC main from Crowley Lake Drive to the south line of Rocking R Estates and 8-inch PVC main throughout the rest of the system. A pressure reducing station was also installed near Rocking R Estates. Water services consist of 3/4 inch single and 1-1/4 inch double services throughout the MMMWC. The water mains serving the Mountain Meadows Subdivision and Condominiums and the Whiskey Creek Condominiums were constructed in 1980 and 1981 respectively. The Rocking R Estates' distribution system, consisting of 8" and 10" mains, were constructed in August 1994. All water services beginning in 1995 were installed with meters. An 8-inch P.V.C. main with single service connections including meters was installed in 1996 to supply the church and apartment/condo properties. Eight-inch and six-inch PVC water mains with metered services were installed within the Sierra Springs subdivision in the spring of 1999. The improvements to the distribution system during construction of the Sierra Springs infrastructure included the installation of a 10-inch water main in Pearson Road connecting with the 8-inch main installed in 1996 in South Landing Road. This provided a second loop of the lower pressure zone portion of the system. No improvements were installed other than a water connection to the system as part of the Community Center Project. The Lakeridge Bluffs distribution system improvements included the installation of an 8-inch PVC high pressure zone water main from the area of Well #3 to the subdivision. A pressure reducing station was also installed within the subdivision to connect between the two pressure zones. 8-inch mains and metered services were also installed in Phase 1. The Phase 1 Lakeridge Bluffs water mains were installed in May 2003. The mains consist of 8" PVC C900 pipe. The Sierra Meadows distribution system improvements will include the installation of an 8-inch PVC low pressure zone water main through the subdivision. 8-inch mains and metered services were also installed in Phase I. The mains consist of 8" PVC C900 pipe which will be installed in the Spring of 2005.

Two additional water storage tanks are planned to be constructed within the next five years. The first will be a 100,000 gallon tank constructed next to the existing tank planned for the summer of 2005. The second will be constructed between 2008 and 2010 in the southeast corner of the Lakeridge Bluffs subdivision. The second tank will serve the lower pressure zone of the MMMWC. The tank size will be determined prior to design through a new water use study to insure adequate capacity.

---

### **SERVICE PRESSURES**

The complete water system was analyzed for future peak flow conditions of 2,300 gpm with the 2,000 gpm fire flow applied at the Mountain Meadows Condominiums and a 1,300 gpm flow with a 1,000 gpm fireflow at the northerly terminus of the Sierra Springs subdivision. A printout of the Hardy-Cross computer analysis using Water Cad software produced by Haestad Methods for the two conditions are presented in Appendix A. The results of the analysis show the system will provide a minimum service pressure of 35 psi to all areas even during fire flow conditions.

### **MAINTENANCE AND REPLACEMENT COSTS**

Annual maintenance and operation costs for the existing water system average approximately \$39,000 based on the 2004 financial statement for the mutual water company. This maintenance cost includes labor, supplies, power, and miscellaneous operating expenses. No additional O & M costs are expected from the addition of Sierra Meadows.

Annual water system replacement costs were calculated using estimated 2004 construction costs and depreciating the costs over the period of the useful life of each item within the system. The itemized quantity, estimated construction costs and annual replacement costs are presented in Table 5 on the following page. The water system replacement costs include the additional facilities to be installed to serve the Sierra Meadows subdivision. The MMMWC expenses \$37,000 per year toward system depreciation which covers the \$30,395 per year replacement costs estimated in Table 5.

**TABLE 5. ESTIMATED WATER SYSTEM REPLACEMENT COST  
 2000 REPLACEMENT COST**

Item Description	Quantity	Unit	Unit Cost	Item Subtotal	Est. of Service Life	Annual Deprec. Rate	Annual Deprec. Cost
<b>1. Well Supply System</b>							
a. 6" well drilling, casing & seal	100	VF	\$ 40.00	\$ 4,000	50	.020	\$ 80
b. 8 5/8" well casing & seal	280	LF	60.00	16,800	50	.02	336
c. 10" well drilling, casing & seal	130	VF	75.00	9,750	50	.02	195
d. 15HP submersible well pump	1	EA	4,500.00	4,500	15	.067	302
e. 30HP submersible* well pump	1	EA	9,000.00	9,000	15	.067	402
f. 40 hp submersible well pump	1	EA	8,000.00	8,000	15	.067	533
g. Pump vault & piping	3	EA	5,000.00	15,000	30	.033	500
h. Control building, chlorinator & meter	--	LS	--	25,000	50	.020	500
i. Misc.yard piping	--	LS	--	4,000	30	.033	132
j. Elec.panels, wiring & telemetry supp	--	LS	--	31,000	15	.067	2,077
k. 6"well dischrg.line	500	LF	30.00	15,000	50	.020	300
l. Direct burial cable	500	LF	15.00	7,500	40	.025	188
m. Roadway paving	9,000	SF	1.25	11,250	15	.067	754
Subtotal:				\$155,800			\$6,299
<b>2. Water Storage Reservoir</b>							
a. 235,000 gallon steel tank	--	LS	--	\$ 91,000	50	.020	\$1,820
b. Valve vault & piping	--	LS	--	15,000	20	.050	750
c. 8" reservoir inlet line	550	LF	37.00	20,350	50	.020	407
d. 6" reservoir drain line	550	LF	30.00	16,500	50	.020	330
Subtotal:				\$142,850			\$3,307
<b>3. Distribution System</b>							
a. 8" line-well to reservoir	1,100	LF	\$ 32.00	\$ 35,200	50	.020	\$ 704
b. 8" PVC C1150 Main	8,080	LF	34.00	274,720	50	.020	5,495
c. 10" PVC C1200 Main	840	LF	38.00	31,920	50	.020	638
d. 10" PVC C1150 Main	1,190	LF	36.00	42,840	50	.020	857
e. 6" PVC C1150 Main	1,830	LF	30.00	54,900	50	.020	1,098
f. Fire hydrants	27	EA	3,000.00	81,000	40	.025	2,025
g. Service connections	176	EA	500.00	88,000	40	.025	1,760
h. Gate Valves	20	EA	600.00	12,000	40	.025	300
i. Pressure Reduc. Vlt.	1	EA	18,000.00	18,000	40	.025	450
j. Blowoff Ass'y.	6	EA	800.00	4,800	40	.025	120
Subtotal:				\$643,380			\$13,447
<b>TOTAL SYSTEM REPLACEMENT COST:</b>			<b>\$942,030</b>				<b>\$23,053</b>

\* Pump was installed in 1986 per Dave Richmond.

The annual revenue requirements are presented in Table 6.

**Table 6. Revenue Requirements**

<u>Type of Cost</u>	<u>Annual Cost</u>
Supply Storage & Distribution System Replacement:	\$30,395
Operation & Maintenance:	<u>39,000</u>
Total:	\$69,395

The revenue requirements presented above are based on past financial reports.

The Mountain Meadows Mutual Water Company currently levies an annual user water service charge of \$340 per lot. There is also an \$84.00 non-user charge applied annually to the unpermitted subdivisions or issued service shares not active.

The total fees collected annually as water assessments at present are \$50,840 as shown on Item 1 in Exhibit C of the financial report. With the addition of the 13 Sierra Meadows lots the annual revenues will increase to \$51,930. Presently the cost of O & M is covered by the user fees. However only \$12,000 of the \$30,400 annual system replacement needs are covered presently. At least 210 connections are necessary to cover the revenue requirements listed in Table 6. This will be accomplished once all active services are connected to the system and charged the annual water service fee.

At an estimated growth of 8 connections per year it will take a minimum of 5 years to obtain enough user fees to cover revenue requirements. The need to raise the service fee to cover system replacement costs should be considered by the Board of Directors. Otherwise an assessment may be necessary if a major system replacement project was necessary to continue to provide service.

**ENGINEER'S STATEMENT**

This Engineer's Report was prepared under my supervision and to the best of my knowledge presents an accurate description of the existing facilities. Even during periods of drought it is my conclusion that the water system has adequate capacity to dependably and safely provide water served by the water company to the present and future customers within the proposed service area.