



WATERRESOURCE
consulting engineers, inc.

MT. ROSE SERVICE COMPANY

PRELIMINARY WATER SYSTEM

MASTER PLAN AND REPORT

MARCH, 1980

URS COMPANY
Las Vegas, Nevada
RECEIVED
JUL 29 1985

PREPARED FOR

INTERMOUNTAIN DEVELOPMENT COMPANY
1200 RIVERSIDE DRIVE
RENO, NEVADA 89503

MT. ROSE SERVICE COMPANY
2970 CHAVEZ DRIVE
RENO, NEVADA 89502



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March 31, 1980
File 7838

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Reno, NV 89502

Subject: Mt. Rose Service Company - Preliminary Water System
Master Plan and Report

Gentlemen:

Enclosed are three copies of the referenced Master Plan and Report for your review and comments.

WATERESOURCE has compiled all of the data which has been gathered from private and government sources concerning the Mt. Rose Water System in the attached report. This information varies from well logs to water rights. In addition to the record information, well testing was undertaken to ascertain both quantity and quality. The report appendix contains all of the data gathered. With the data, a preliminary master plan was prepared to incorporate not only existing facilities and needs, but those facilities which may be required to serve the Galena Creek area in the foreseeable future.

The Master Plan, which was developed using zoning techniques along with the physical restraints of the area, indicates that ultimately the Mt. Rose Service Company will have to upgrade their facilities to meet the ultimate water demand obligation. This upgrading will take place in the form of increased well and booster pump capacity, as well as transmission and distribution improvements. The Master Plan should be used to guide future system improvements. Individual consideration should be given to each development which may necessitate alterations to the Master Plan.

In summary, the water system will require several improvements at this time to meet present commitments. The improvements include developing

Messrs. Jack Ferguson, Sr.
and Neil Moore

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March 31, 1980

the existing well field and the facilities presently being constructed for the Galena Forest project.

WATERESOURCE has appreciated the opportunity to be of service to Intermountain Development Company and the Mt. Rose Service Company. We look forward to assisting both companies in the future with respect to water development in the area. If there are any questions or interpretation is necessary, please call.

Sincerely,

WATERESOURCE CONSULTING ENGINEERS, INC.



Kenneth R. Freeman, P.E.

KRF/dmo

Enclosures

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SECTION 1 - INTRODUCTION

In December of 1979, WATERESOURCE entered into a contract with Intermountain Development Company, the purpose of which was to investigate the existing capabilities of the Mt. Rose Service Company to supply water to their service area. In conjunction with evaluation of existing facilities, WATERESOURCE contracted to develop a preliminary master plan of the service area including facility requirements for the ultimate needs of the service area.

Portions of this report will cover:

1. Permitted water rights.
2. Existing facilities.
3. Existing groundwater source capabilities.
4. Ultimate water demands.
5. Facilities--wells, pumps, tanks, and pressure reducing stations.

The basic intention of this report is to furnish a guide in planning the physical progression of installation of the water system facilities as they are required by development in the area. Because it is difficult to determine the direction and timing of development in various areas within the service area, a certain flexibility is required in designing the actual facilities at any given time. Therefore, this report should be used as a guide only and with individual consideration given to specific developments.

A byproduct of the report has been the development of a data base for the water service company. Prior to the report, information did not appear to be centralized for easy access.

SECTION 2 - PERMITTED WATER RIGHTS

Application for a certificated water right was initiated in 1978. The State Water Engineer approved the application of a permitted right and set the dates required to fulfill the requirements to obtain a certificated right. Portions of the application are contained in Appendix A denoting the requirements and dates various proofs are to be filed. In May 1979, application was made for an extension for proof of beneficial use. An extension was granted until May 30, 1980.

Applications No. 35147, 35148, 35149, 35150, 35151, and 35152 are inter-related in that maximum pumping rates were established combining all six applications.

Maximum diversion rate	- 5 cfs or 2,240 gpm
Maximum annual use rate	- 1,095.0 mg
Residence to be served by the six permits	- 3,000 homes

The permits also state that application No. 30261 by Uplands Inc. (Appendix A) would be honored ahead of Mt. Rose for 109.5 mg annually at a 3 cfs or 1,344 gpm diversion rate. If Uplands could not show beneficial use within the time restraints specified, the balance would revert back to the Mt. Rose Service Company. Proof of beneficial use is due by Uplands on March 11, 1983. If Uplands can support their application, this will reduce the Mt. Rose water rights quantities and ultimately reduce the

numbers of residences contained in the original permit as noted below:

Maximum diversion rate - 5 cfs or 2,240 gpm

Maximum annual use rate - 985.5 mg

Residence to be served by the six permits - 2,700 homes

Contained in the section on Water Demands under Master Plan Zoning, the ultimate demand was estimated to be 986 mg annually. This would indicate that the existing permitted rights are sufficient, excluding the Upland's rights, to meet the demands of the service area as presently outlined on the Master Plan map.

SECTION 3 - EXISTING WATER SYSTEM FACILITIES

A. Wells - At present, there are six wells which are owned by Mt. Rose. The wells lie within the southeast quarter of Section 2, T17N, R19E. Figure 3.1 shows the relationship of the six wells to each other and to the surrounding neighborhood.

Wells No. 2 and No. 4 are the only wells being used at this time to supply water to the system. The other four wells are not connected to the system. We have included in Appendix B copies of the driller's logs for each well as filed with the Division of Water Resources. The logs show that the wells were drilled between 1974 and 1977.

The following is an itemized list of data taken from the driller's log, plus observations made during the testing of each well:

Well No. 1:

- A. Drilled June, 1976.
- B. Driller--Glenn Pump & Drilling Company
- C. Cable tool drilled to a depth of 200 feet (present sounded depth = 134 feet).
- D. Eight-inch casing.
- E. Perforations--100 to 200 feet.

The only variance from the log found during testing was that the perforation may exist above 100 feet.

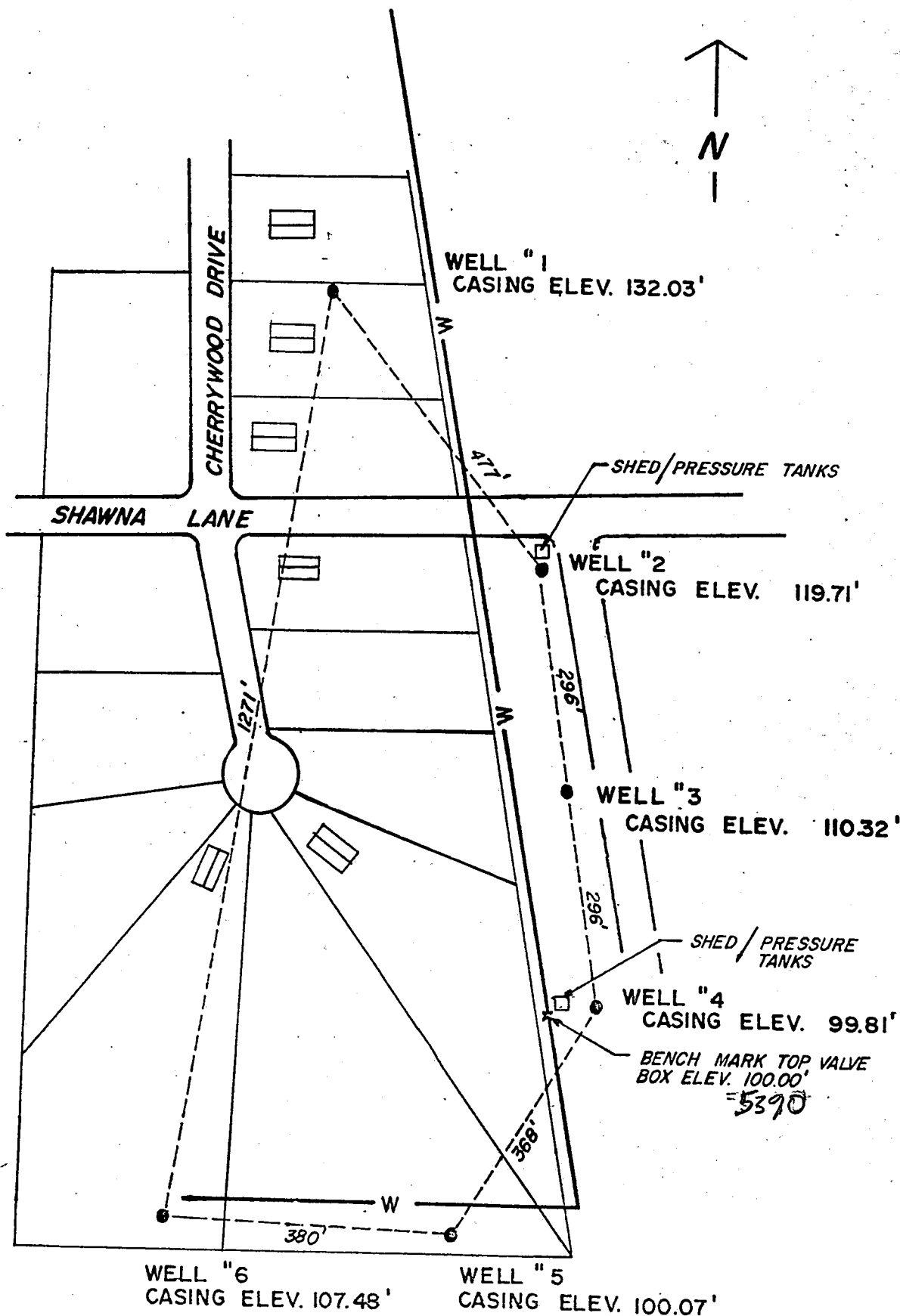


Figure 3.1

Well No. 2:

- A. Drilled March, 1974.
- B. Driller--Glenn Pump & Drilling Company.
- C. Cable tool drilled to a depth of 175 feet (present sounded depth = 170 feet).
- D. Eight-inch casing.
- E. Perforations--146 to 175 feet.

Nothing was found during testing which varied from the driller's log.

Well No. 3:

- A. Drilled June, 1976.
- B. Driller--Glenn Pump & Drilling Company.
- C. Rotary drilled and gravel-packed to a depth of 175 feet (present sounded depth = 147 feet).
- D. Eight-inch casing.
- E. Perforations--100 to 175 feet.

There appears to be a casing size reduction at 87 feet, probably to 6-inch.

Well No. 4:

- A. Drilled May, 1977.
- B. Driller--Marcin Drilling Company.
- C. Cable tool drilled to a depth of 235 feet (present sounded depth = 182 feet).
- D. Eight-inch casing to 163 feet.
- E. Perforations--100 to 235 feet.

Except for the depth, no variations were noted during testing.

Well No. 5:

- A. Drilled May, 1977.
- B. Driller--Andrew J. Foster.
- C. Cable tool drilled to a depth of 140 feet (present sounded depth = 195 feet).
- D. Eight-inch casing.
- E. Perforations--100 to 140 feet.

Several things varied from the log during testing. Given that the test pump was set at 150 feet and by sounding the bottom of the well at 195 feet, it appears that the well was deepened after the original drilling. It was also found that a six-inch liner may begin at 110 feet. This could explain how the well was deepened.

Well No. 6:

- A. Drilled May, 1977.
- B. Driller--Marcin Drilling Company.
- C. Cable tool drilled to a depth of 161 feet (present sounded depth = 172 feet).
- D. Eight-inch casing.
- E. Perforations--100 to 161 feet.

When the well was sounded, the depth appeared to be 172 feet. This variance could have resulted during the original drilling operation.

The only variable to show up on the field inspection was the depth of the

individual wells. Except for Well No. 5, the other wells all appear to be more shallow than described in the logs. It is possible, with time, that the well may have filled in with sand and silt. Developing and cleaning the wells could restore depth; however, if the well is of cable tool construction, it will silt in again with time.

In addition to the above-recorded data and observed data, the tops of the casings were surveyed to relate each well by elevation differences:

	<u>ELEVATION TOP CASING</u>
Well No. 1	132.03 ft.
Well No. 2	119.71 ft.
Well No. 3	110.32 ft.
Well No. 4	99.81 ft.
Well No. 5	100.07 ft.
Well No. 6	107.49 ft.

Basis of elevation: valve box cover, northeast corner of building at Well No. 4--set at 100.00 feet.

B. Well Pumping Equipment - Four of the six wells are equipped with pumps. As stated before, only Well No. 2 and No. 4 are operable at this time.

Well No. 1:

- A. One HP single phase pump and motor.
- B. Service pole lying on ground.
- C. One and one-half inch discharge with well cap.
- D. No discharge capability.

Well No. 2:

- A. Seven and one-half HP single phase pump and motor. Gould UH66KT12 (100 gpm at 200 TDH).
- B. Service pole operable.
- C. One and one-half inch discharge, 8-inch pitless adaptor.
- D. Two 80-gallon pressure tanks inside building.
- E. Discharge directly to main.

Well No. 3:

- A. Seven and one-half HP single phase pump and motor. Gould UH66KT12 (100 gpm at 200 TDH).
- B. Service pole operable.
- C. Three-inch discharge.
- D. No discharge capability.

Well No. 4:

- A. Seven and one-half HP single phase pump and motor. Gould UH66KT12 (100 gpm at 200 TDH).
- B. Service pole operable.
- C. Three-inch discharge, 8-inch pitless adaptor.
- D. One thousand gallon pressure tank inside building.
- E. Filters between well and tank.
- F. Discharge into system.

Well No. 5:

- A. No pump present.
- B. Service pole operable, single phase.

Well No. 6:

- A. No pump present.
- B. Service pole operable, single phase.

The capacity of each well will be discussed in Section 5.

C. Piping Network - The existing piping is made up of six-inch, eight-inch, and ten-inch asbestos cement pipe, Class 150. Appendix D contains a service map showing the existing system as of October, 1979. The system contains less than 6,000 lineal feet of pipe within the well field and beyond for distribution. There are several services in use at this time along with several fire hydrants.

Pressure within the system is supplied by the well pumps through the pressure sustaining tanks.

SECTION 4 - FACILITIES UNDER CONSTRUCTION

A. Storage Tank - There is a 420,000 gallon tank at Galena Forest under construction. Tank data is as follows:

1. Diameter--55 feet.
2. Height--24 feet.
3. Overflow height--6,248 feet.
4. Pad elevation--6,225 feet.

The tank was constructed to AWWA Standards for a welded steel tank.

B. Booster Pump Stations (Galena Creek Pump Station) - The high head pump station at the well field is as follows:

1. Design--two pumps at 175 gpm at 700 feet TDH.
2. Discharge elevation--approximately 5,400 feet.

The booster pump station is located next to Well No. 2. The suction side is connected to the existing ten-inch main now used in the service area. The discharge is to a new ten-inch main connecting the pump station to the tank located in Galena Forest Estates.

C. Secondary Booster Pump Station (Galena Forest Pump Station) - This station services a small area in Galena Forest Estates in the near vicinity of the tank.

1. Design two pumps at 53 gpm with 46 feet TDH.
2. Discharge elevation--6,227 feet.
3. Two pressure sustaining tanks--120 gallons capacity each.

This station receives its suction pressure from the storage tank located adjacent to the pump station.

D. Pressure Reducing Station - This station is located in Galena Forest Estates in the Douglas fir parklet. The purpose of the station is to reduce pressure from the ten-inch transmission main into an area to be served. This is required because the pressure in this area is greater than 100 psi inside the ten-inch main (see pressure zone 6,017-5,890 on the Preliminary Water System Master Plan map, Appendix F).

E. Ten-Inch Transmission Main - The above booster pump station and tank are connected by a ten-inch asbestos cement pipe. The pipe ranges in class from T-90 to T-40. The main is approximately 17,630 (3.3 miles) feet long with over 100 psi pressure over the lower 14,920 feet (2.8 miles). The pressure reaches static pressures of 360 psi and surge pressure in excess of 360 psi. Extreme care should be exercised when working in the vicinity of this main.

SECTION 5 - EXISTING WELL CAPACITIES

A. General - In determining the capacity of the well field and the individual wells, two evaluations need to be made. First, what is the capacity of the well as constructed and secondly, what is the capacity of the aquifer supplying the well?

The process of evaluation required pump test data. This was accomplished by testing each well by a stepping process in which increased pump rates are used for short durations (step test). We also tested Well No. 3 for a longer duration (24 hours) at a constant pumping rate of 250 gpm. In conjunction with the long duration test, we observed and recorded water level variation in Wells No. 4 and No. 5 to determine the effects of long-term pumping.

In general, the step test results were used to evaluate the capacity of the individual wells as constructed. The long duration test plus observation tests, were used to evaluate the aquifer (supply). The data taken from the step test and long duration test can be found in Appendix C.

B. Well Capacity - Individual well characteristics are itemized in Section 3 (A). With the test data and the well characteristics, the following evaluation was compiled:

Well No. 1 (0 gpm):

As shown in the step test data for Well No. 1 (Appendix C), we could not pump this well for more than four minutes at 35 gpm. Therefore, the well was eliminated for consideration as a production well. It could be used as a domestic well if properly developed.

Well No. 2 (100 gpm - limited durations):

This well is presently connected to the Mt. Rose Water System. Through the step test (figure 5.1), it is felt that the well, as constructed, can reliably supply 100 gpm for limited durations.

Well No. 3 (350 gpm):

Well No. 3 is by far the best constructed well. It appears to have been a rotary drilled, gravel-packed well. This type of drilling allows gravel to be packed around the casing, with a resulting increase of water flow to the casing and ultimately to the pump. No. 3 could be considered a limited production well. Figure 5.2 shows the relative strength of the well.

Well No. 3 was not pumped at the capacity we have estimated, but from experience, we feel that it could supply 350 gpm.

Well No. 4 (75 gpm - limited duration):

This well is identical in nature to Well No. 2 except that its construction is slightly more constricting on the flow volume. A comparison of Figure 5.1 and Figure 5.3 graphically shows the

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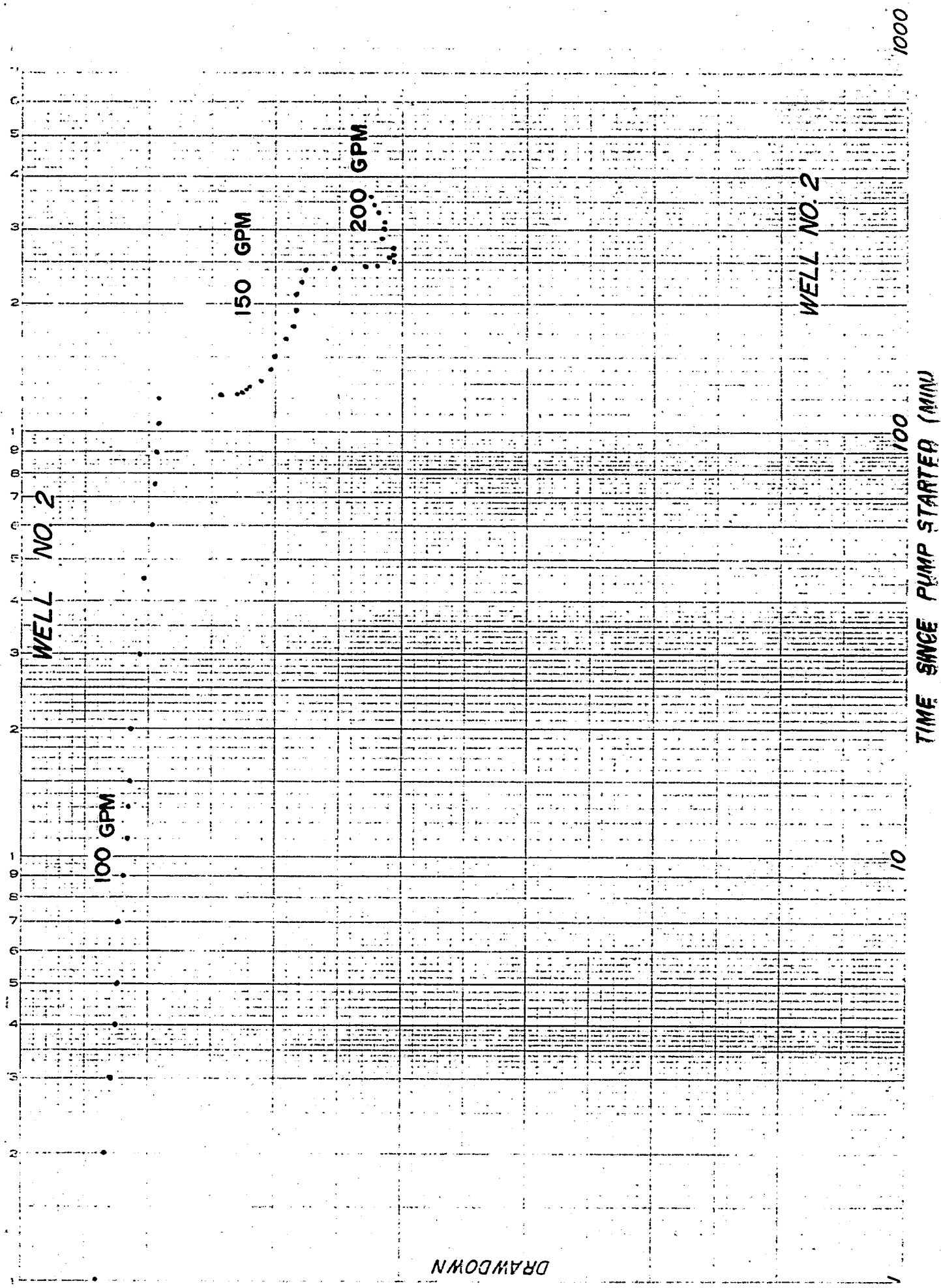


Figure 5.1

MADE IN U.S.A.
 NO. 1000 DIS-232N G-2000 (1000)
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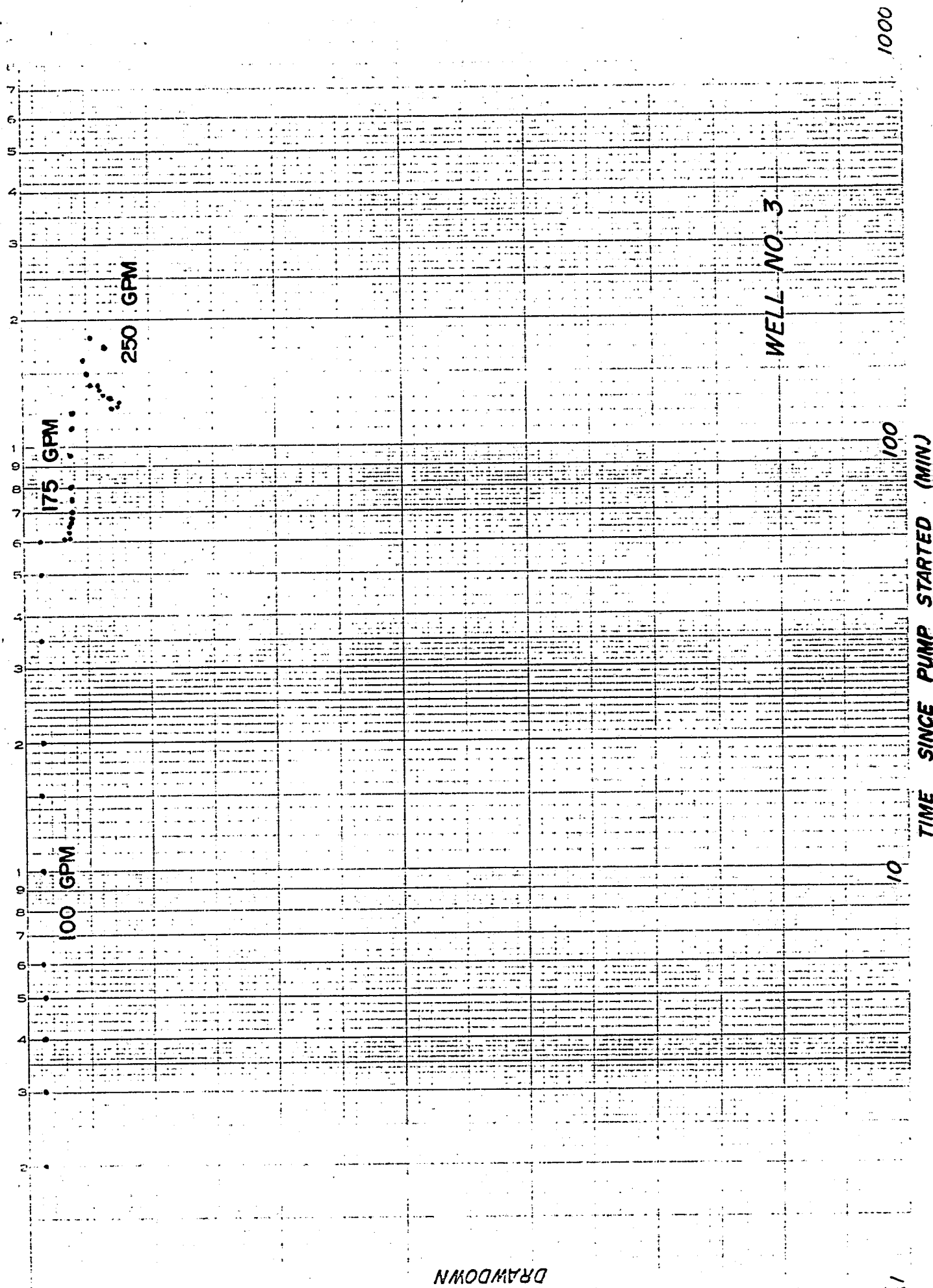
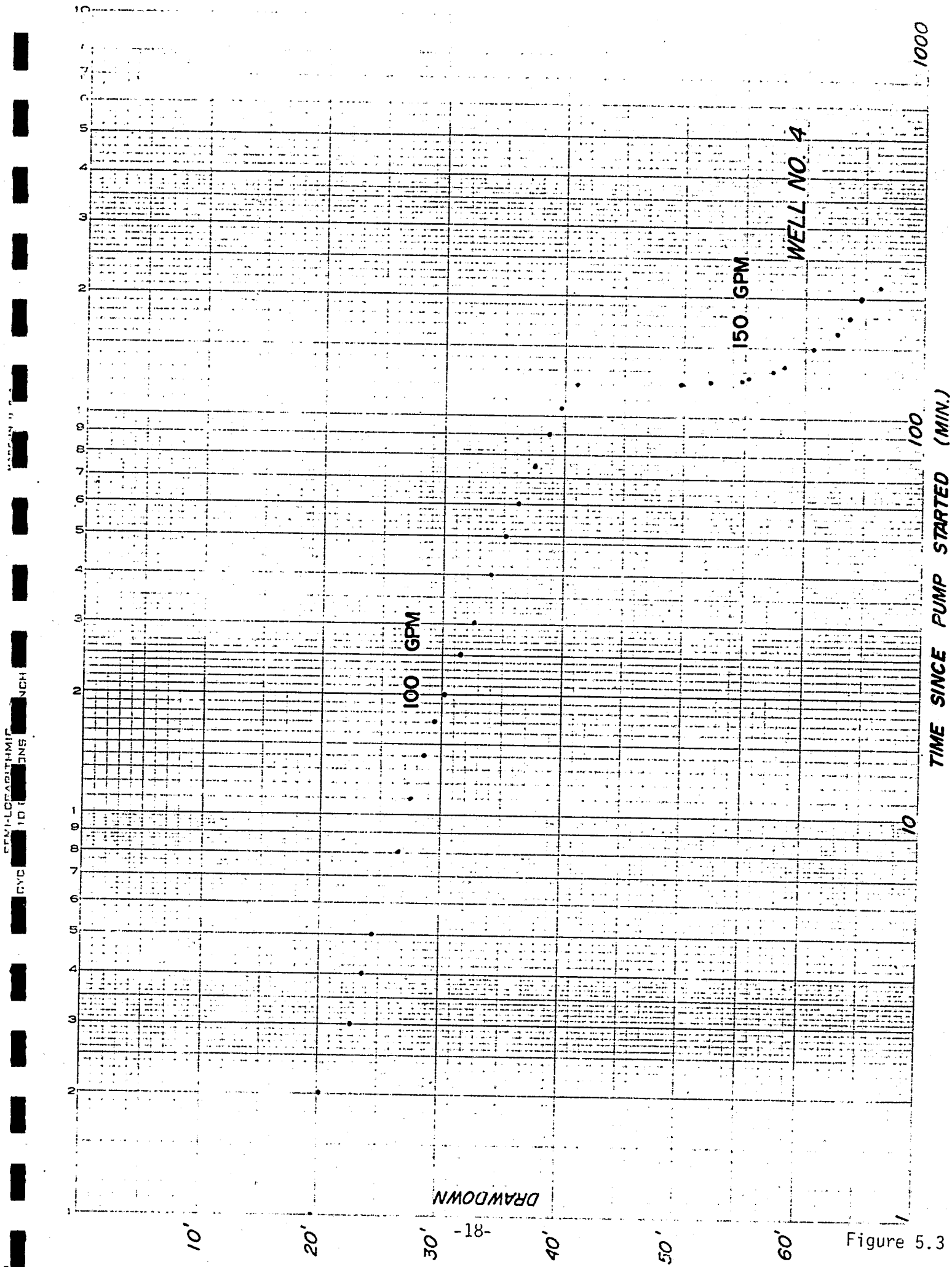


Figure 5.2



difference in each well's capacity. Well No. 4 is also connected to the existing water system.

Well No. 5 (75 gpm - limited duration):

Well No. 5 is rated at 75 gpm. It appears to tap a different water source than Wells No. 3, No. 4, and No. 6. This difference is indicated by the difference in static water elevations as contained in Appendix C. Figure 5.4 graphically shows the test data taken for Well No. 5.

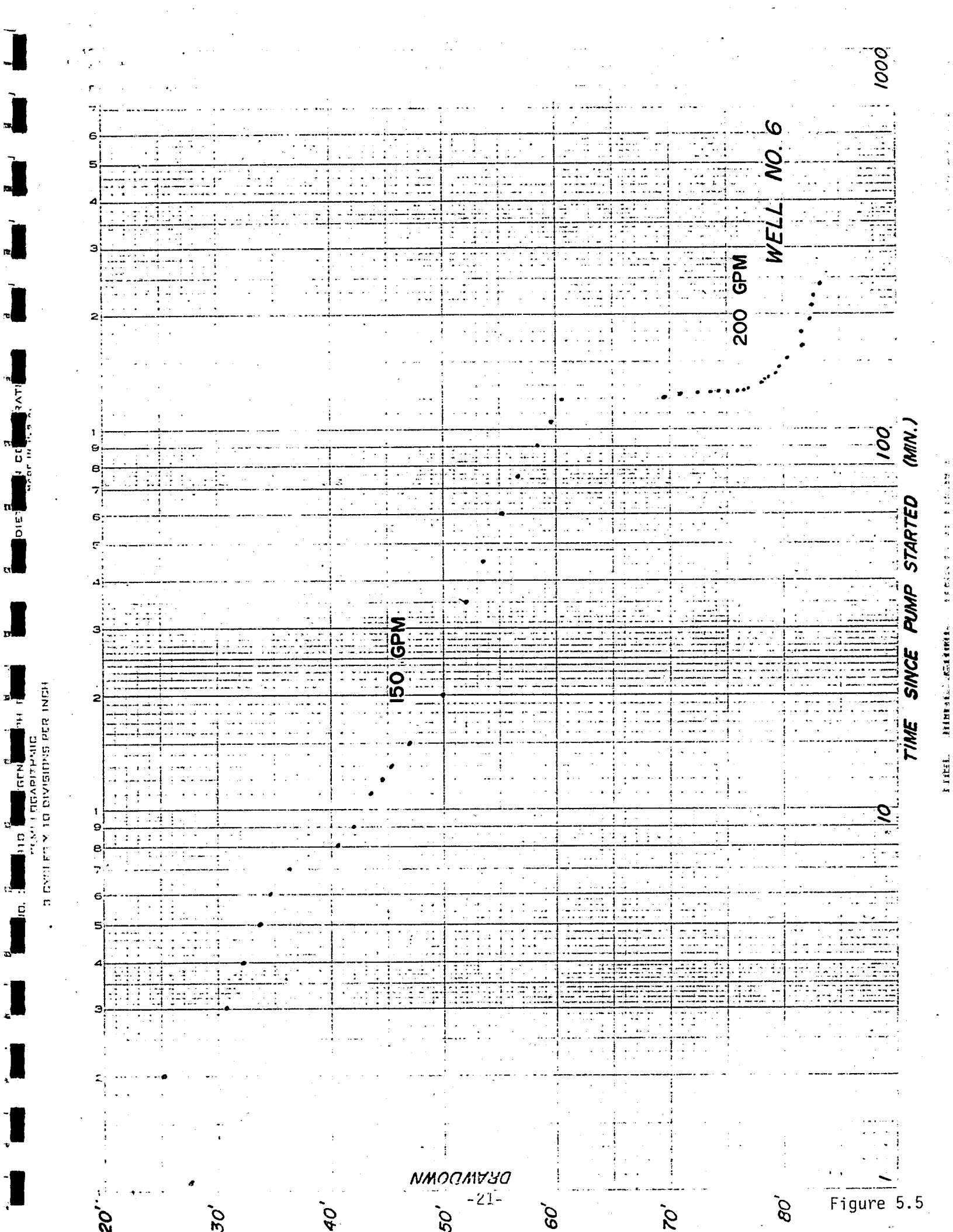
Well No. 6 (100 gpm - limited duration):

Figure 5.5 and the test data show that the well was stressed at 140 gpm. However, we feel that it should hold 100 gpm on a limited time duration.

Summation of Evaluated Quantities:

Well No. 1 -	0 gpm
Well No. 2 -	100 gpm
Well No. 3 -	350 gpm
Well No. 4 -	75 tpm
Well No. 5 -	75 gpm
Well No. 6 -	<u>100 gpm</u>
TOTAL:	700 gpm

The 700 gpm figure represents what the wells are capable of, as constructed. We believe reconstruction or development could improve each well's capabilities.



C. Aquifer Capabilities (Groundwater Supply) - It is difficult to evaluate the aquifer with the data developed from the pump testing. Because of the limitation resulting from the construction of the existing wells, limited data was developed from the test. We were unable to stress the aquifer through Well No. 3 with the limitation of pump size, i.e., the well could accept only a small pump capable of 275 gpm. A special pump could have been bought, however, cost considerations eliminated this possibility.

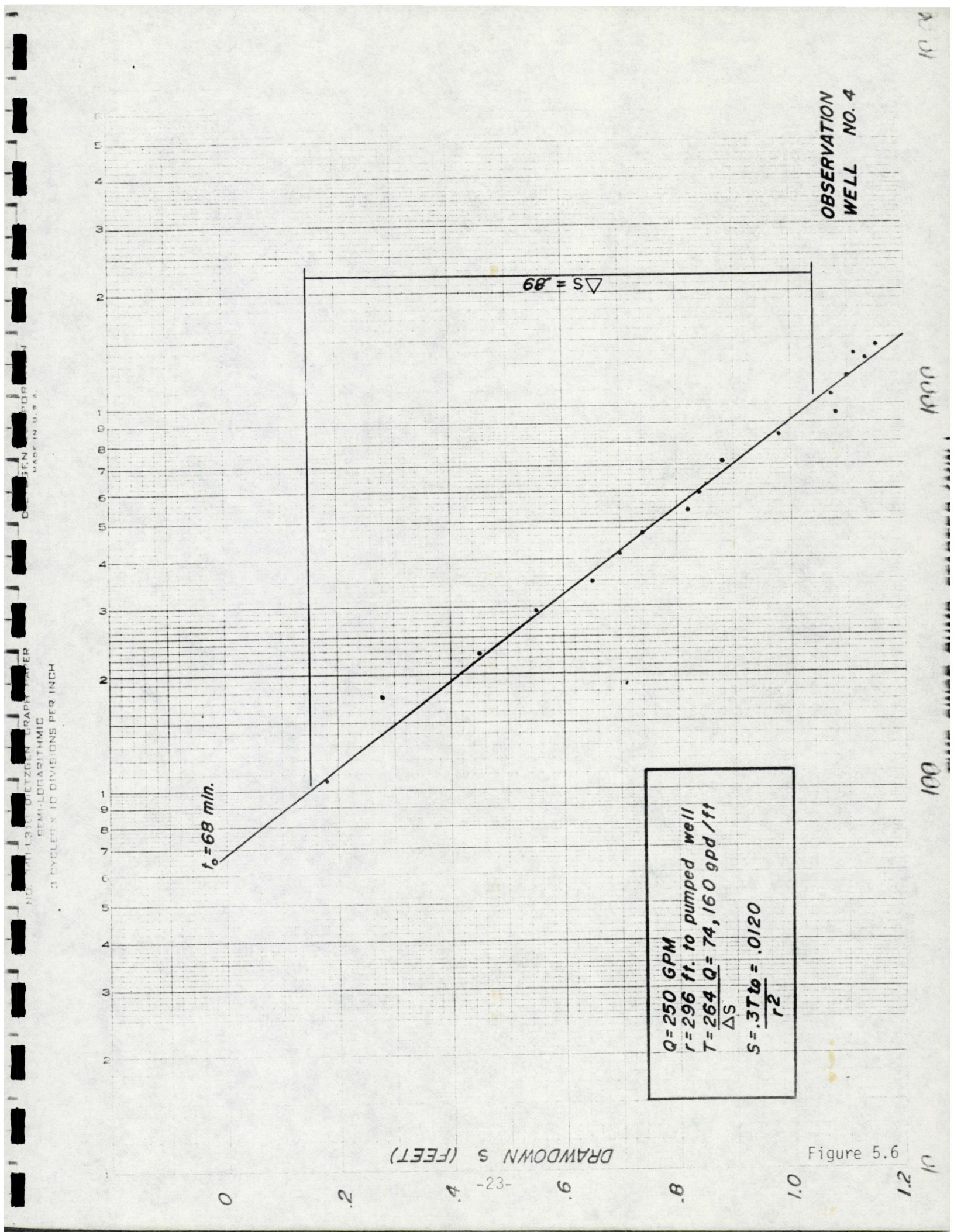
Although information from pumping Well No. 3 is insufficient to completely evaluate the aquifer, observation data taken concurrently on Well No. 4 is sufficient to preliminarily evaluate the aquifer from which water is being taken. Figure 5.6 represents a time vs. drawdown comparison. With this graph, two parameters of aquifer evaluation can be developed. They are:

Coefficient of Transmissibility (T) - of an aquifer is the rate at which water will flow through the aquifer and is measured in gallons per day per foot.

Coefficient of Storage (S) - of an aquifer is the volume of water released from storage, or taken into storage and is a dimensionless unit.

With these two parameters, we can make some predictions:

1. Specific capacity of the wells with different diameters.
2. Drawdowns in the aquifers at various distances from a pumped well.
3. The drawdown in a well at any time after pumping commences.



The T and S developed from Figure 5.6, with back-up data in Appendix C, indicates there exists an aquifer with capabilities significantly greater than the capabilities of the well field (700 gpm) as constructed. Without the ability to stress the aquifer, the developed T and S should be considered preliminary until such time as the aquifer can be stressed, possibly through a new well properly sized and constructed and a much higher rate pump test conducted.

SECTION 6 - PROJECTED WATER DEMANDS

A. General - Two elements make up the total water demand for the service area. The first element is the density or population which could inhabit this area. Second, the water usage projected for the individual person and then extended to the total water usage for the population.

B. Estimated Customers - To estimate the potential number of customers, several elements control the density or population in the service area. These elements consist of zoning, terrain, and existing areas already served by alternate sources.

1. Zoning - There are two zoning plans presently covering the service area. Both zoning plans were developed by the Regional Planning Commission of Washoe County. The first plan is defined by maps for Land Use Districts 4, 8, and 12. Table 6.1 gives a breakdown by zoning definition from residential to commercial of the acreage in each section for the service area.

The second plan was adopted by Washoe County in 1978 and represents a master plan for the area and is defined as, "Galena Fan Planning Area." Table 6.2 gives a breakdown by zoning definition from residential, commercial, and conservation-recreational area and shows the acreage in each section for the service area.

TABLE 6.1

PRESENT ZONING - RPC (Acres)

<u>SECTION</u>	<u>A-1</u>	<u>A-2</u>	<u>A-4</u>	<u>C-1</u>	<u>C-2</u>	<u>TOTAL</u>
1	360	---	280	---	---	640
2	640	---	---	---	---	640
3	545	60	---	20	15	640
4	10	---	150	---	---	160
9	110	---	215	55	20	400
10	635	---	5	---	---	640
11	640	---	---	---	---	640
12	480	---	160	---	---	640
25	---	80	---	---	---	80
34	10	310	---	---	---	320
35	210	270	---	---	---	480
36	250	70	---	---	---	320
TOTALS:	3,890	790	810	75	35	5,600

NOTES:

1. Zoning taken from Regional Planning Commission maps for Land Use Districts 4, 8 and 12.
2. Acreage estimated to nearest five acres.

TABLE 6.2

MASTER PLAN ZONING - RPC (Acres)

<u>SECTION</u>	<u>A-1</u>	<u>A-2</u>	<u>A-7</u>	<u>COMMERCIAL</u>	<u>ACTIVE RECREATION (A-R)</u>	<u>CONSERVATION (L-R)</u>	<u>TOTAL</u>
1	35	---	600	--	---	5	640
2	515	---	---	--	5	120	640
3	500	---	---	40	---	100	640
4	---	---	---	--	150	10	160
9	90	---	---	40	200	70	400
10	530	---	80	--	---	30	640
11	545	---	70	--	5	20	640
12	120	---	20	--	450	50	640
25	---	70	---	--	---	10	80
34	80	70	---	--	150	20	320
35	350	100	---	--	---	30	480
36	---	240	---	--	70	10	320
TOTALS:	2,765	480	770	80	1,030	475	5,600

Notes:

1. Zoning taken from Regional Planning Commission maps for master plan of Galena fan planning area.
2. Acreage estimated to nearest five acres.

In this report, we will use a combination of both plans in conjunction with engineering judgement in projecting the potential number of customers for the Mt. Rose Service Company.

2. Terrain - As shown on the master plan map, there are areas which, in our opinion, are not suitable for development because of vertical elevation changes or hazardous areas, i.e., stream channels or other natural conditions. We have removed these areas from our calculations of customer service densities. Most of these areas fall within the active-recreation zoning and, therefore, must be discounted.

3. Areas Already Served - Because of the nature of water reliability in Nevada, in this report we have assumed that at total build out, those existing private sources of water will be transferred to the Mt. Rose Service Company.

This assumption thereby will result in calculating the maximum demand. Any private system continuing in use will relieve the demands placed upon the service area.

C. Customer Water Usage - There are two criteria which must be met. First, Washoe County Public Health Department requires that a water system be capable of delivering 1 gpm per customer during peak demands. This would translate to 1,440 gallons per day. The second criteria is that the State Water Engineer evaluates a water system on 1,000 gallons per day per customer.

Therefore, the system will be designed as follows:

Delivery to customers--1,440 gpd.

Delivery by ground water source--1,000 gpd.

The difference of 440 gpd during peak demands will be met by storage from tanks within the system.

D. Annual Water System Demand Calculations from Ground Water Source -

1. Assumptions:

(a) Ten percent loss of area due to streets.

(b) Areas taken from Table 6.1 and 6.2.

2. Present Zoning:

A-1 (1 acre) - $3,890 \times 0.9 = 3,501$ acres or customers

A-2 ($2\frac{1}{2}$ acres) - $\frac{790 \times 0.9}{2.5} = 284$ customers

A-4 (5 acres) - $\frac{810 \times 0.9}{5} = 146$ customers

C-1 - estimate 20 customers

C-2 - estimate 10 customers

Total Demand:

A-1 - $3,501 \times 1,000$ gpd = 3.50 mgd

A-2 - $284 \times 1,000$ gpd = 0.28 mgd

A-4 - $146 \times 1,000$ gpd = 0.15 mgd

C-1 - $20 \times 1,000$ gpd = 0.02 mgd

C-2 - $10 \times 1,000$ gpd = 0.01 mgd

3.96 mgd or 1,445 mg/year

3. Master Plan Zoning:

A-1 (1 acre) - $2,765 \times 0.9 = 2,489$ acres or customers

A-2 ($2\frac{1}{2}$ acres) - $\frac{480 \times 0.9}{2.5} = 173$ customers

A-7 (40 acres) - $\frac{770 \times 0.9}{40} = 17$ customers

Commercial - estimate 20 customers

Active Recreational (A-4) - negligible compared to Residential

Conservation (L-R) - negligible compared to Residential

Total Demand

A-1 - $2,489 \times 1,000$ gpd = 2.49 mgd

A-2 - $173 \times 1,000$ gpd = 0.17 mgd

A-7 - $17 \times 1,000$ gpd = 0.02 mgd

Commercial - $20 \times 1,000$ gpd = 0.02 mgd

A-R = nil

L-R = nil

2.70 mgd or 986 mg /year

If we use the master plan figure of annual demand and compare it with the amount of water contained in the water rights permit for Mt. Rose Service Company of 985 to 1,095 mg/year, we can state the permitted rights and the source demand are compatible.

Galena Forest No. 1 - 420,000 gallons (existing)

Galena Forest No. 2 - 420,000 gallons (proposed)

Deer Forest - 420,000 gallons (proposed)

Well tank - 600,000 gallons (proposed)

SECTION 7 - MASTER PLAN

A. General

The Master Plan attempt to integrate the knowledge developed in Sections 2 through 6 and WATERESOURCE's experience. This integration includes the existing facilities, facilities under construction, ultimate water demands, and future facilities required to serve the ultimate demand.

The water system which was designed for Galena Forest Estates is the major factor involved in designing for the Master Plan. This water system extends from the well field to the tank site within Galena Forest. The location of the transmission main, as shown on the Master Plan map, Appendix F, traverses in a west to southwesterly direction through the service area. This main will be the major feed into the westerly portion of the service area. The east, north and south will require development of additional transmission capacity. The system will involve storage (tanks), pressure reducing stations, booster pump station, and additional well capacity.

B. Storage

In Section 6 (E)2, storage requirements were discussed to meet the peak day demand. The section indicated that in addition to the tank presently under construction, a minimum of three additional storage facilities would be required. One site exists next to the Galena Forest storage tank under

construction. A second and third site have been placed on the Master Plan as elevation requires. The sites are located in the:

NE $\frac{1}{4}$ of NE $\frac{1}{4}$, Section 10 - pad elevation 5,710 ft.

NE $\frac{1}{4}$ of SW $\frac{1}{4}$, Section 1 - pad elevation 5,590 ft.

Both sites were picked considering elevation required, land availability, and location relative to demand. The locations can be changed, but the elevation must be maintained.

It could be anticipated that the Section 1 site would be served directly from the existing well field. The Section 10 site could be served via the 10-inch transmission main through a pressure reducing station or more efficiently from a new well field, location to be determined.

It is believed that development of storage facilities should adhere to the following pattern:

1. Section 1.
2. Section 10.
3. Second tank at Galena Forest.

The list results from a knowledge of the existing conditions and the developments in the planning stage at this time. Of course, development may take a completely different progression, which would necessitate a change.

C. Booster Pumps

With the development of the storage at Galena Forest and the accompanying booster pump station, major booster pump facilities will not be required in

the near future.

Booster pumps would be required to transport water to the Section 1 tank site, possibly to the Section 10 site. However, the location of the major booster pump facilities will depend on the location of the new well field.

The secondary or distribution pump stations are totally dependent on the progression of development. Their location would be dictated as development required.

D. Pressure Reducing Stations

These stations, as far as location, are similar to the secondary booster pump stations. They will be required to tap the high pressure 10-inch transmission line. The Master Plan shows the proposed station for Unit 2 of Galena Forest.

E. Wells

No attempt has been made to locate the new well field. However, a possibility is in the vicinity of Galena Creek through Sections 2, 10, and 11. See Section 5 on requirements.

F. Pressure Zones

Utilizing the knowledge of storage and source (well) location, WATERESOURCE has developed the pump zones for the Master Plan. These zones are an ideal condition and may require modification due to development requirements.

The zones are based on operating at a high pressure of 100 psi and low of

45 psi. This range of operating pressures, therefore, results in a zone with an elevation difference between high and low of 127 feet. The base or control which dictates the location of the zones is the storage facility being built in Galena Forest under the condition of a full tank.

Access to the zones is controlled by booster pumps (above tank) and pressure regulator (below the tank gravity zone). The pressure zones can change if a new well field is developed.

The Master Plan represents a compilation of known data. It should be used as a guide in developing the water system as required.

SECTION 8 - CONCLUSIONS

1. Permitted water rights appear to be sufficient to meet the potential demands of the service area as presently defined.
2. Of the six wells, five were drilled by the cable tool method which is generally unacceptable for quasi-municipal use. The remaining well appears to have been drilled by rotary methods which should produce a production well, i.e., high volume. However, this well has a 6-inch liner which effectively mitigates the effects of the rotary drilling below what could be expected.
3. The wells are drilled into the same aquifer and, therefore, can be thought of as a single well system. It should be possible to drill a new well sufficient in capacity to eliminate all of the existing wells, with a resulting increase in efficiency.
4. The well field, as constructed, is capable of delivering 700 gpm which, with storage, should serve approximately 1,000 residences.
5. The existing pump capacity is capable of serving approximately 250 residences, i.e., the pumps in Wells No. 2 and No. 4. However, due to piping configuration of both discharges, the combined capability is less than 200 residences.

6. The capacity of Well No. 2 and No. 4 is INSUFFICIENT to meet the requirements of the Galena Creek pump station. It is possible that the pump could pump more water than delivered by the wells, thereby incurring damage.
7. Additional well capacity will be required as development takes place.
8. Wells No. 3, No. 5, and No. 6 could be developed on an interim basis if cost effective. A new well, properly constructed, may be more cost effective than utilizing the existing wells.
9. Water quality tests showed that the water is of high quality. Included in Appendix E are copies of the Nevada Division of Health lab tests for samples taken during the testing operation.
10. With the addition of the Galena Forest storage tank (420,000 gallons), storage capacity is sufficient to meet the present commitment to Galena Forest and the existing customers. Projects which are under way in Sections 3 and 11 may require additional storage when developed.
11. Additional storage tank sites will be required as development takes place. Ultimately, a total storage capacity of approximately 1.9 mg will be required in approximately four or more tanks.

A P P E N D I X A

WATER RIGHTS PERMITS

9. Estimated cost of works..... \$250,000.00 Permit No. 30261

10. Estimated time required to construct works..... five years

11. Estimated time required to complete the application to beneficial use..... seven years

12. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

System will be designed to service approx. 300½ acre homesites, plus commercial property fronting on Mount Rose Road.

Please use map filed under 22526

Applicant..... UPLANDS INC.

Protested 8-10-76; by Mt. Rose Property Owners Assoc., Inc

Pro. withdrawn 7/31/78

By..... s/ W. D. Snow

W. D. Snow - President.

Compared..... ga/lk

bl/bc

P. O. Box 745

Reno, Nevada 89504

APPROVAL..... OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit is issued subject to existing rights. It is understood that the amount of water herein granted is only a temporary allowance and that the final water right obtained under this permit will be dependent upon the amount of water actually placed to beneficial use. It is also understood that this right must allow for a reasonable lowering of the static water level. This well shall be equipped with a two (2) inch opening for measuring depth to water. If the well is flowing, a valve must be installed and maintained to prevent waste. A totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of water begins, or before the Proof of Completion of Work is filed. This source is located within an area designated by the State Engineer, pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The final allocation of water under this permit will be limited to that amount consistent with present zoning for the lands described under the place of use and shall be deducted from the annual duty under Permits 35147 through 35152.

The amount of water to be appropriated shall be limited to the amount which can be applied to beneficial use, and not to exceed..... 3.0..... cubic feet per second, but not to exceed 109.5 million gallons annually.

Actual construction work shall begin on or before..... February 11, 1979

Proof of commencement of work shall be filed before..... March 11, 1979

Work must be prosecuted with reasonable diligence and be completed on or before..... February 11, 1980

Proof of completion of work shall be filed before..... March 11, 1980

Application of water to beneficial use shall be made on or before..... February 11, 1983

Proof of the application of water to beneficial use shall be filed on or before..... March 11, 1983

Map in support of proof of beneficial use shall be filed on or before..... March 11, 1983

Commencement of work filed.....

IN TESTIMONY WHEREOF, I ROLAND D. WESTERGARD

Completion of work filed.....

State Engineer of Nevada, have hereunto set my hand and the seal of

12. Estimated cost of works.....\$200,000.00 total
13. Estimated time required to construct works.....completed
14. Estimated time required to complete the application of water to beneficial use.....10 years
15. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

3000 single family dwelling units to be served with comingling
from other wells. Date of Incorporation is: June 27, 1977

Prepared by lp/ga bl/bc Applicant
pro. 5/18/78 by Mt. Rose Prop. Own. Assoc., Inc.
5/22/78 by Robert & Barbara Kutnook By s/ Lee Hale, Pres.
185 Casazza Street, P.O. Box 292
Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the

following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28424 is issued subject to the terms and conditions imposed in said Permit 28424 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed

1095.0 million gallons annually.

Actual construction work shall begin on or before.....September 5, 1978

Proof of commencement of work shall be filed before.....October 5, 1978

Work must be prosecuted with reasonable diligence and be completed on or before.....September 5, 1978

Proof of completion of work shall be filed before.....October 5, 1978

Allocation of water to beneficial use shall be made on or before.....April 30, 1979

Proof of the application of water to beneficial use shall be filed on or before.....May 30, 1979

Map in support of proof of beneficial use shall be filed on or before.....May 30, 1979

Commencement of work filed

IN TESTIMONY WHEREOF, I, ROLAND M. WESTERGARD, have hereunto set my hand and the seal of

12. Estimated cost of works.....\$200,000.00 total
13. Estimated time required to construct works.....completed
14. Estimated time required to complete the application of water to beneficial use.....10 years
15. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

3000 single family dwelling units to be served with comingling
from other wells. Date of Incorporation is: June 27, 1977.

Compared 1p/ga bl/bc Applicant
Pro. 5/18/78 by Mt. Rose Prop. Own. Assoc., Inc.
: 5/22/78 by Robert & Barbara Kutnoch, s/ Lee Hale, Pres.
185 Casazza Street, P.O. Box 292
Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the

following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28425 is issued subject to the terms and conditions imposed in said Permit 28425 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed

1095.0 million gallons annually.

Actual construction work shall begin on or before.....September 5, 1978

Proof of commencement of work shall be filed before.....October 5, 1978

Work must be prosecuted with reasonable diligence and be completed on or before.....September 5, 1978

Proof of completion of work shall be filed before.....October 5, 1978

Application of water to beneficial use shall be made on or before.....April 30, 1979

Proof of the application of water to beneficial use shall be filed on or before.....May 30, 1979

Map in support of proof of beneficial use shall be filed on or before.....May 30, 1979

Commencement of work filed.....
Completion of work.....

IN TESTIMONY WHEREOF, I, ROLAND D. WESTERGARD,
State Engineer of Nevada, have hereunto set my hand and the seal of

12. Estimated cost of works.....\$200,000.00 total
13. Estimated time required to construct works.....completed
14. Estimated time required to complete the application of water to beneficial use.....10 years
15. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

3000 single family dwelling units to be served with comingling from other wells. Date of Incorporation is: June 27, 1977.

Prepared by lp/ga bl/bc Applicant
 Pro. 5/18/78 by Mt. Rose Prop. Own. Assoc., Inc.
 5/22/78 by Robert & Barbara Kutnoch By s/ Lee Hale, Pres.
 185 Casazza Street, P.O. Box 292
 Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28426 is issued subject to the terms and conditions imposed in said Permit 28426 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed 1095.0 million gallons annually.

Actual construction work shall begin on or before September 5, 1978

Proof of commencement of work shall be filed before October 5, 1978

Work must be prosecuted with reasonable diligence and be completed on or before September 5, 1978

Proof of completion of work shall be filed before October 5, 1978

Application of water to beneficial use shall be made on or before April 30, 1979

Proof of the application of water to beneficial use shall be filed on or before May 30, 1979

Map in support of proof of beneficial use shall be filed on or before May 30, 1979

Commencement of work filed
 Completion of work filed
 Proof of beneficial use filed

IN TESTIMONY WHEREOF, I ROLAND D. WESTERGARD
 State Engineer of Nevada, have hereunto set my hand and the seal of

12. Estimated cost of works.....\$200,000.00 total
13. Estimated time required to construct works.....completed
14. Estimated time required to complete the application of water to beneficial use.....10 yrs.
15. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.
- 3,000 single family dwellings will be served along with coming line from other sources. Date of incorporation is: June 27, 1977

Compared. lp/ga bl/bc
 o. 5/18/78 by Mt. Rose Prop. Own. Assoc. Inc. Applicant
 5/22/78 by Robert & Barbara Kutnoch By s/ Lee Hale, Pres.
 185 Casazza Street, P.O. Box 292
 Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28427 is issued subject to the terms and conditions imposed in said Permit 28427 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed

1095.0 million gallons annually.

Actual construction work shall begin on or before September 5, 1978

Proof of commencement of work shall be filed before October 5, 1978

Work must be prosecuted with reasonable diligence and be completed on or before September 5, 1978

Proof of completion of work shall be filed before October 5, 1978

Application of water to beneficial use shall be made on or before April 30, 1979

Proof of the application of water to beneficial use shall be filed on or before May 30, 1979

Map in support of proof of beneficial use shall be filed on or before May 30, 1979

Commencement of work filed

Completion of work filed

IN TESTIMONY WHEREOF, I ROLAND D. WESTERGAARD

1. Estimated cost of works. \$200,000.00 total
2. Estimated time required to construct works. completed
3. Estimated time required to complete the application of water to beneficial use. 10 years
4. Estimated time required to complete the application of water to beneficial use. 10 years
5. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual

consumptive use.

3,000 single family dwellings will be served along with comingling
from other sources. Date of incorporation is: June 27, 1977

Prepared by: lp/ga bl/bc Applicant
10.5/18/78 by Mt. Rose Prop. Own., Assoc., Inc.
5/22/78 by Robert & Barbara Kutnocy s/ Lee Hale, Pres.
185 Casazza Street, P.O. Box 292
Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the

following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28429 is issued subject to the terms and conditions imposed in said Permit 28429 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed

1095.0 million gallons annually.

Actual construction work shall begin on or before September 5, 1978

Proof of commencement of work shall be filed before October 5, 1978

Work must be prosecuted with reasonable diligence and be completed on or before September 5, 1978

Proof of completion of work shall be filed before October 5, 1978

Application of water to beneficial use shall be made on or before April 30, 1979

Proof of the application of water to beneficial use shall be filed on or before May 30, 1979

Map in support of proof of beneficial use shall be filed on or before May 30, 1979

Commencement of work filed
Completion of work filed
IN TESTIMONY WHEREOF, I, ROLAND D. WESTERGARD
State Engineer of Nevada, have hereunto set my hand and the seal of
5th day of JULY

12. Estimated cost of works.....\$200,000.00 total.....
13. Estimated time required to construct works.....completed.....
14. Estimated time required to complete the application of water to beneficial use.....10 yrs.....
15. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

.....3,000 single family dwellings will be served along with comingling
.....from other sources..... Date of incorporation is: June 27, 1977.....

Compared lp/ga bl/bc
Pro. 5/18/78 by Mt. Rose Prop. Own. Assoc., Inc.
By: s/ Lee Hale, Pres.
185 Casazza Street, P.O. Box 292
Reno, Nevada 89504

APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit to change the place of use of the waters of an underground source as heretofore granted under Permit 28430 is issued subject to the terms and conditions imposed in said Permit 28430 and with the understanding that no other rights on the source will be affected by the change proposed herein. The well shall be equipped with a 2-inch opening and a totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of the water begins or before the proof of completion of work is filed. If the well is flowing, a valve must be installed and maintained to prevent waste. This source is located within an area designated by the State Engineer pursuant to NRS 534.030. The State retains the right to regulate the use of the water herein granted at any and all times.

The place of use under this permit is limited to that area described in the agreement dated June 18, 1978 filed under 35147. The total combined annual duty of water under Permits 35147 through 35152 is limited to 1095.0 million gallons. The final allocation of water under Application 30261 shall be deducted from the annual duty under Permits 35147 through 35152 but shall not exceed 109.5 million gallons annually.

The amount of water to be changed shall be limited to the amount which can be applied to beneficial use, and not to exceed 5.0 cubic feet per second, but not to exceed 1095.0 million gallons annually.

Actual construction work shall begin on or before September 5, 1978
Proof of commencement of work shall be filed before October 5, 1978
Work must be prosecuted with reasonable diligence and be completed on or before September 5, 1978
Proof of completion of work shall be filed before October 5, 1978
Application of water to beneficial use shall be made on or before April 30, 1979
Proof of the application of water to beneficial use shall be filed on or before May 30, 1979
Map in support of proof of beneficial use shall be filed on or before May 30, 1979

Commencement of work filed
Completion of work filed
Proof of beneficial use filed
Cultural map filed
Certificate No. Issued

IN TESTIMONY WHEREOF, I, ROLAND D. WESTERGARD
State Engineer of Nevada, have hereunto set my hand and the seal of
my office, this 5th day of JULY

A.D. 1978

A P P E N D I X B

DRILLERS LOGS

DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY

Log No. 15663

Permit No. 28425

Basin

1. OWNER Lee Hale

ADDRESS 185 North Sierra
Hend, Nevada2. LOCATION NE 1/4 SE 1/4 Sec 2 T. 17 N 1/2 R. 19 E Washoe County
PERMIT NO.

3. TYPE OF WORK

New Well ☒ Recondition ☐
Deepen ☐ Other ☐

4. PROPOSED USE

Domestic ☐ Irrigation ☐ Test ☐
Municipal ☒ Industrial ☐ Stock ☐

5. TYPE WELL

Cable ☒ Rotary ☐
Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Top Soil		0	4	4
Clay & Boulders		4	19	15
Sand		19	23	4
Clay & Boulders		23	89	66
Sand	✓	89	101	12
Clay & Gravel		101	127	26
Sand	✓	127	149	22
Clay & Boulders		149	167	18
Gravel & Boulders	✓	167	200	33

8. WELL CONSTRUCTION

Diameter hole 8 inches Total depth 200 feet

Casing record

Weight per foot Thickness 188

Diameter	From	To
8 7/8 inches	0	200 feet
inches		feet
inches		feet
inches		feet
inches		feet
inches		feet
inches		feet

Surface seal: Yes ☒ No ☐ Type Gravel

Depth of seal

Gravel packed: Yes ☐ No ☒

Gravel packed from feet to feet

Perforations:

Type perforation Jetting

Size perforation 4x5 3

From 200 feet to 100 feet

From feet to feet

From feet to feet

From feet to feet

From feet to feet

9. WATER LEVEL

Static water level 40 Feet below land surface

Flow G.P.M.

Water temperature 60 F. Quality good

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Glenn Pump & Drilling

Address P.O. Box 99, Steamboat, Wyo.

Nevada contractor's license number 11139

Nevada driller's license number 658

Signed J. M. Sherrill

Date June 28, 1976

Date started June 2, 1976
Date completed June 19, 1976

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
3450	100	19	8

BAILER TEST

G.P.M. Draw down feet hours
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours

Log No. 17113Permit No. 28927

Basin.....

WELL DRILLERS REPORT

Please complete this form in its entirety

1. OWNER Mr. Hale ADDRESS Callahan Rd
Reno, Nev2. LOCATION 05 1/4 SE 1/4 Sec. 2 T. 17 N N/SR. 19 E Washoe County
PERMIT NO.3. TYPE OF WORK
New Well ☒ Recondition ☐
Deepen ☐ Other ☐
4. PROPOSED USE
Domestic ☐ Irrigation ☐ Test ☐
Municipal ☐ Industrial ☐ Stock ☐
5. TYPE WELL
Cable ☒ Rotary ☐
Other ☐

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thick- ness
Boulders		1	15	15
1st water		15	20	5
Boulders		20	35	15
gravel - 2d water		35	40	5
clay		40	75	35
clay - rock		75	110	35
3d water		110	120	10
rock		120	180	60
gravel - water brg		180	200	20
clay - rock		200	215	15
gravel - water brg		215	225	10
rock		225	235	10

8. WELL CONSTRUCTION

Diameter hole 8 inches Total depth 235 feet
Casing record.....
Weight per foot..... Thickness 1 inch

Diameter	From	To
<u>8</u> inches	<u>1</u> feet	<u>160</u> feet
<u>6</u> inches	<u>160</u> feet	<u>235</u> feet
..... inches feet feet
..... inches feet feet
..... inches feet feet
..... inches feet feet

Surface seal: Yes ☒ No ☐ Type cement

Depth of seal.....

Gravel packed: Yes ☐ No ☐

Gravel packed from..... feet to.....

Perforations:

Type perforation factory

Size perforation.....

From 60 ft feet to 8 inch feetFrom 74 ft 5 inch to 6 inch feet

From..... feet to..... feet

From..... feet to..... feet

From..... feet to..... feet

9. WATER LEVEL

Static water level..... Feet below land surface.....

Flow..... G.P.M.

Water temperature..... ° F. Quality.....

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true
the best of my knowledge.Name MARCIN DRILLING COAddress 4340 Hwy 50 ENevada contractor's license number 360Nevada driller's license number 7988

Signed.....

Date.....

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BAILER TEST

G.P.M. Draw down..... feet hours
G.P.M. Draw down..... feet hours
G.P.M. Draw down..... feet hours

Log No. 17114
Permit No. 28432
Basin

WELL DRILLERS REPORT

Please complete this form in its entirety

1. OWNER Mr. Hale ADDRESS Callahan Rd Well # 2

2. LOCATION N.E. 1/4 S.E. 1/4 Sec. 2 T. 170 N/SR 19 E. Washoe Com
 PERMIT NO. _____

3. TYPE OF WORK		4. PROPOSED USE			5. TYPE WELL							
New Well	<input checked="" type="checkbox"/>	Recondition	<input type="checkbox"/>	Domestic	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>	Test	<input type="checkbox"/>	Cable	<input checked="" type="checkbox"/>	Rotary
Deepen	<input type="checkbox"/>	Other	<input type="checkbox"/>	Municipal	<input type="checkbox"/>	Industrial	<input type="checkbox"/>	Stock	<input type="checkbox"/>	Other	<input type="checkbox"/>	

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thick-ness
Boulders - clay		1	25	25
1st water		25	30	5
gravel - sand - water		30	55	25
clay - sand		55	105	50
clay - sand		105	135	30
rock		135	150	15
sand - water		150	161	11
gravel				

Test bail 60 G.P.M.

8. WELL CONSTRUCTION

Diameter hole.....8.....inches Total depth.....161.....

Casing record.....

Weight per foot..... Thickness.....188.....

Diameter	From	To
.....8.....inches;161.....feet
.....inchesfeet
.....inchesfeet
.....inchesfeet
.....inchesfeet
.....inchesfeet
.....inchesfeet

Surface seal: Yes ☒ No ☐ Type.....cement.....

Depth of seal.....50.....

Gravel packed: Yes ☐ No ☐

Gravel packed from.....feet to.....

Perforations:

Type perforation..... torch.....
Size perforation.....
From..... 100..... feet to..... 161..... ft
From..... feet to..... ft
From..... feet to..... ft
From..... feet to..... ft
From..... feet to..... ft

9. WATER LEVEL

Static water level.....Feet below land surface...12
Flow.....G.P.M.....
Water temperature.....° F. Quality.....

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true
the best of my knowledge.

Name.....MARCIN DRILLING CO

Address.....4340 Hwy 50 E

Nevada contractor's license number.....360

Nevada driller's license number.....7988

Signed: Chas. H. Hargrave

Date.....5-13-77

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump

BALLER TEST

G.P.M.....	Draw down.....feet	hours.....
G.P.M.....	Draw down.....feet	hours.....
G.P.M.....	Draw down.....feet	hours.....

A P P E N D I X C

PUMP TEST DATA

	<u>PAGE</u>
<u>STEP TEST</u>	
C.1 Well No. 1	C-1
C.2 Well No. 2	C-2
C.3 Well No. 3	C-5
C.4 Well No. 4	C-8
C.5 Well No. 5	C-11
C.6 Well No. 6	C-15
 <u>24-HOUR TEST</u>	
C.7 Well No. 3	C-18
C.8 Well No. 4-Observation	C-22
C.9 Well No. 5-Observation	C-24



**WELL PUMPING TEST
DATA FORM**

Date January 25, 1980

Page 1 of 1

Location Mt. Rose Service Company, Galena Creek Area, Washoe County

Well Description Well No. 1

Static Water Surface 31.9 feet

Pump Setting 130 feet

Orifice Size 3 inch

Data Collected By Ken Freeman

Test Conditions clear, sunny, around 50°, next to house, discharge to street drain system

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:25	0 min			31.9			start pump 100 gpm
9:25.5	0.5			77.4	45.5		
9:26	1			87.3	55.4		
9:26.5	1.5	lost suction					pump off
11:30	0			31.1			start pump 35 gpm/stop watch & bucket
11:31	1			54.3	23.2		
11:32	2			75.5	44.4		
11:33	3			86.4	55.3		
11:34	4	lost suction					pump off



**WELL PUMPING TEST
DATA FORM**

Date January 26, 1980

Page 1 of 3

Location Mt. Rose Service Company, Galena Creek Area, Washoe County
Well Description Well No. 2

Static Water Surface 24.8 feet

Pump Setting 130 feet

Orifice Size 3 inch

Data Collected By Martin Smith

Test Conditions partly cloudy/ windy, around 45°, discharge to street drain system

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:10	0 min			24.8			start pump 100 gpm
9:11	1			30.8	6.0		dirty water
9:12	2			31.5	6.7		
9:13	3			31.8	7.0		
9:14	4			32.1	7.3		
9:15	5			32.3	7.5		
9:17	7			32.6	7.8		
9:19	9			32.8	8.0		
9:21	11			33.0	8.2		
9:23	13			33.2	8.4		
9:25	15			33.4	8.6		
9:30	20			33.5	8.7		
9:40	30			34.0	9.2		

LOCATION Mt. Rose Service CompanyWell No. 2PAGE 2 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:55	45			34.5	9.7		
10:10	60			34.9	10.1		clean water
10:25	75			35.2	10.4		
10:40	90			35.4	10.6		
10:55	105			35.6	10.8		
11:10	120			35.7	10.9		change flow to 150 gpm
11:11	121			40.7	15.9		
11:12	122			41.8	17.0		water cloudy
11:13	123			42.1	17.3		
11:14	124			42.4	17.6		
11:15	125			42.6	17.8		
11:20	130			43.8	19.0		
11:30	140			44.7	19.9		
11:40	150			44.8	20.0		
11:55	165			45.6	20.8		
12:10	180			46.0	21.2		
12:25	195			46.3	21.5		
12:40	210			46.5	21.7		
12:55	225			46.8	22.0		

LOCATION ML. Rose Service CompanyWell No. 2PAGE 3 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw-down S	Residual Drawdown S'	Remarks
1:10	240			47.0	22.2		change flow to 200 gpm
1:11	241						
1:12	242			47.5	22.7		
1:13	243			49.4	24.6		
1:14	244			51.8	27.0		
1:15	245			52.7	27.9		
1:20	250			54.1	29.3		
1:25	255			53.8	29.0		
1:30	260			53.9	29.1		
1:40	270			53.9	29.1		
1:55	285			52.9	28.1		
2:10	300			53.4	28.6		
2:25	315			53.0	28.2		
2:40	330			52.8	28.0		
2:55	345			52.6	27.8		3:00 water sample
3:10	360			52.4	27.6		pump off
NOTE	READINGS VARY BECAUSE OF LOCATION OF PERFORATION.						



**WELL PUMPING TEST
DATA FORM**

Date January 29, 1980

Page 1 of 3

Location Mt. Rose Service Company, Galena Creek Area, Washoe County

Well Description Well No. 3

Static Water Surface 16.8 feet

Pump Setting 130 feet

Orifice Size 3 inch

Data Collected By Ken Freeman

Test Conditions cold, broken clouds, below 30', discharge to street drain system

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:40	0 min			16.8			start pump 100 gpm
9:41	1			17.8	1.0		
9:42	2			17.9	1.1		
9:43	3			18.0	1.2		
9:44	4			18.0	1.2		
9:45	5			18.0	1.2		
9:46	6			17.9	1.1		
9:50	10			17.9	1.1		
9:55	15			18.0	1.2		
10:00	20			18.1	1.3		
10:15	35			18.0	1.2		
10:30	50			17.9	1.1		
10:40	60			18.0	1.2		change flow to 175 gpm

LOCATION Mt. Rose Service CompanyWell No. 3PAGE 2 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
10:41	61			20.2	3.4		
10:42	62			20.3	3.5		
10:43	63			20.3	3.5		
10:44	64			20.2	3.4		
10:45	65			20.4	3.6		
10:46	66			20.5	3.7		
10:48	68			20.5	3.7		
10:50	70			20.5	3.7		
10:55	75			20.6	3.8		
11:00	80			20.5	3.7		11:05 - water sample
11:15	95			20.6	3.8		
1:30	110			20.7	3.9		
11:40	120			20.7	3.9		change flow to 250 gpm
11:41	121			23.8	7.0		
11:42	122			23.9	7.1		
11:43	123			23.9	7.1		
11:44	124			23.9	7.1		
11:45	125			24.1	7.3		
11:46	126			24.1	7.3		

LOCATION Mt. Rose Service Company

Well No. 3

PAGE 3 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
11:48	128			24.1	7.3		
11:50	130			22.7	5.9		pitot tube 26"-215 gpm
11:52	132			22.2	5.4		23" - 201 gpm
11:54	134			22.1	5.3		23"
11:56	136			21.9	5.1		22.5"
11:58	138			21.8	5.0		22" - 197 gpm
12:00	140			21.8	5.0		22"
12:05	145			21.7	4.9		
12:10	150			21.8	5.0		22"
12:20	160			21.6	4.8		21" - 192 gpm
12:30	170			23.2	6.4		28" - 222 gpm
12:40	180			22.1	5.3		23"
NOTE: The variations in flow resulted from variations of the generator output.							



WELL PUMPING TEST DATA FORM

Date January 24, 1980

Page 1 of 3

Location Mt. Rose Service Company, Galena Creek Area, Washoe County

Well Description Well No. 4

Static Water Surface 8.1 feet

Pump Setting 130 feet

Orifice Size 3 inch

Data Collected By Martin Smith*

Test Conditions clear, sunny, around 50°, open area, overland discharge

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
10:10	0			8.1			start pump 100 gpm
10:11	1			28.0	19.9		
10:12	2			28.4	20.3		
10:13	3			30.9	22.8		
10:14	4			32.0	23.9		
10:15	5			32.5	24.4		
10:18	8			34.5	26.4		
10:21	11			35.8	27.7		
10:24	14			36.7	28.6		
10:27	17			37.4	29.3		
10:30	20			38.2	30.1		
10:35	25			39.8	31.7		
10:40	30			40.8	32.7		

LOCATION Mt. Rose Service CompanyWell No. 4PAGE 2 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
10:50	40			42.1	34.0		
11:00	50			43.2	35.1		
11:10	60			44.4	36.3		
11:25	75			45.6	37.5		
11:40	90			46.5	38.4		
11:55	105			48.0	39.9		
12:10	120			49.1	41.0		change flow to 150 gpm
12:11	121			58.0	49.9		
12:12	122			60.2	52.1		
12:13	123			62.2	54.1		dirty water
12:14	124			62.9	54.8		
12:15	125			63.4	55.3		
12:20	130			65.3	57.2		
12:25	135			66.5	58.4		
12:40	150			68.9	60.8		
12:55	165			70.8	62.7		
1:10	180			72.0	63.9		
1:25	195			73.0	64.9		
1:40	210			74.2	66.1		

LOCATION Mt. Rose Service CompanyWell No. 4PAGE 3 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
1:55	225			75.3	67.2		2:05 - water sample
2:10	240			76.1	68.0		change flow to 200 gpm
2:11	241			85.2	77.1		
2:12	242			86.7	78.6		dirty water
2:13	243			87.8	79.7		
2:14	244			88.4	80.3		
2:15	245			88.9	80.8		
2:20	250			90.4	82.3		
2:25	255			91.4	83.3		
2:40	270			93.9	85.8		
2:55	285			95.8	87.7		
3:10	300			96.8	88.7		
3:25	315			97.6	89.5		
3:40	330			98.4	90.3		
3:55	345			99.0	90.9		
4:00	350			99.3	91.2		pump off



**WELL PUMPING TEST
DATA FORM**

Date January 22, 1980

Page 1 of 4

Location Mt. Rose Service Company, Galena Creek Area, Washoe County
Well Description Well No. 5

Static Water Surface Normal 42.2
Pump Setting 155 feet
Orifice Size 2.5 inch and 3 inch

Data Collected By Ken Freeman

Test Conditions clear, sunny, around 45°, open area, overland discharge

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
8:32	0 min.			42.2			start pump 80 gpm
8:34	5 2.5			51.4	9.2		
8:35	5 3.5			52.5	10.3		
8:36	5 4.5			53.0	10.8		
8:37	5 5.5			52.5	10.3		
8:39	7			52.9	10.7		
8:40	8			53.3	11.1		
8:41	9			53.2	11.0		
8:42	10			53.8	11.6		
8:44	12			53.7	11.5		
8:46	14			54.2	12.0		
8:50	18			54.9	12.7		
8:55	23			55.2	13.0		

LOCATION Mt. Rose Service Company

Well No. 5

PAGE 2 OF 4

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:00	28			55.2	13.0		
9:15	43			56.0	13.8		9:20 #6 14.9
9:29	57			56.7	14.5		
9:30	58						change flow to 150 gpm
9:31	59			62.6	20.4		
9:32	60			63.5	21.3		
9:33	61			64.1	21.9		
9:34	62			65.1	22.9		
9:35	63			65.1	22.9		
9:36	64			65.8	23.6		
9:38	66			66.0	23.8		
9:40	68			66.5	24.3		
9:45	73			67.7	25.5		
9:50	78			68.1	25.9		9:55 #4 7.5
10:00	88			69.0	26.8		10:05 #6 14.8
10:15	103	sounder stuck--no reading					
10:30	118	pump off--drawdown unknown					pump off
		start new test					
12:15	223			43.6			start pump 150 gpm

LOCATION Mt. Rose Service CompanyWell No. 5PAGE 3 OF 4

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
12:15	5 223.5			54.4	10.8		
12:16	224			56.4	12.8		
12:17	225			58.0	14.4		
12:18	226			59.9	16.3		
12:20	228			61.5	17.9		
12:22	230			62.8	19.2		
12:24	232			63.6	20.0		
12:26	234			64.3	20.7		
12:30	238			65.3	21.7		
12:35	243			65.1	21.5		
12:40	248			67.1	23.5		
12:50	258			68.3	24.7		
12:59	267			68.6	25.0		
1:00	268						change flow to 200 gpm
1:05	273			76.7	33.1		
1:07	275			78.2	34.6		
1:10	278			78.5	34.9		
1:15	283			79.2	35.6		
1:20	288			79.3	35.7		

LOCATION Mt. Rose Service Company
Well No. 5

PAGE 4 OF 4

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
1:30	298			80.0	36.4		1:35 water sample
1:45	313			81.2	37.6		
2:00	328			83.2	39.6		2:08 #4 7.7
2:15	343			84.0	40.4		
2:30	358			84.5	40.9		
2:45	373			84.7	41.1		
3:00	388			84.7	41.1		pump off
THE FOLLOWING ARE SOME RECOVERY READINGS:							
3:02				63.3	19.7		
3:04				59.6	16.0		
3:06				57.4	13.8		
3:10				55.0	11.4		
3:25				51.0	7.4		
3:40				47.8	4.2		



**WELL PUMPING TEST
DATA FORM**

Date January 23, 1980

Page 1 of 3

File 7838

Location Mt. Rose Service Company, Galena Creek Area, Washoe County
Well Description Well No. 6

Static Water Surface normal 14.8 feet
Pump Setting 155 feet
Orifice Size 3 inch

Data Collected By Ken Freeman

Test Conditions clear sunny day, around 45°, open area, overland discharge

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
8:45	0 min.			19.0 ft.			start pump 140 GPM
8:45.5	0.5			38.0	19.0		
8:46	1			41.4	22.4		
8:47	2			44.1	25.1		
8:48	3			49.9	30.9		
8:49	4			51.1	32.1		
8:50	5			52.6	33.6		
8:51	6			53.8	34.8		correct flow to 150 gpm
8:52	7			55.2	36.2		
8:53	8			59.7	40.7		
8:54	9			61.0	42.0		
8:56	11			62.9	43.9		
8:58	13			64.2	45.2		

LOCATION ML. Rose Service CompanyWell No. 6PAGE 2 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:00	15			66.0	47.0		
9:05	20			69.0	50.0		
9:10	25			70.0	51.0		
9:20	35			71.5	52.5		
9:30	45			72.8	53.8		9:34 #5 42.7 9:37 #4 8.7
9:45	60			74.3	55.3		9:50 - water sample
10:00	75			75.9	56.9		
10:15	90			77.3	58.3		
10:30	105			78.7	59.7		
10:44	119			79.5	60.5		
10:45	120						flow change to 200 gpm
10:46	121			88.5	69.5		
10:47	122			90.0	71.0		
10:48	123			91.6	72.6		
10:49	124			92.6	73.6		
10:50	125			93.1	74.1		
10:51	126			94.1	75.1		
10:52	127			95.0	76.0		
10:53	128			95.5	76.5		

LOCATION Mt. Rose Service CompanyWell No. 6PAGE 3 OF 3

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
10:54	129			95.8	76.8		
10:56	131			96.2	77.2		
10:58	133			96.2	77.2		
11:00	135			97.5	78.5		
11:05	140			98.3	79.3		
11:10	145			98.6	79.6		
11:20	155			99.3	80.3		
11:30	165			99.9	80.9		11:34 #5 42.4 11:37 #4 12.6
11:45	180			100.7	81.7		
12:00	195			101.3	82.3		
12:15	210			101.7	82.7		
12:30	225			101.9	82.9		
12:45	240			102.3	83.3		pump off



**WELL PUMPING TEST
DATA FORM**

Date March 7, 1980

Page 1 of 4

Location Mt. Rose Service Company, Galena Creek Area, Washoe County

Well Description Well No. 3

Static Water Surface normal 14.8 feet

Pump Setting 130 feet

Orifice Size 3 inch

Data Collected By Martin Smith

Test Conditions cloudy day, around 40°, discharge to street drain system

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:15 AM	0 min.			14.71			start pump 275 gpm
9:15.5	0.5			22.54	7.83		
9:16.5	1.5			23.26	8.55		
9:17	2			23.57	8.86		
9:17.5	2.5			23.79	9.08		
9:18	3			23.75	9.04		
9:19.5	4.5			23.82	9.11		
9:20	5			23.97	9.26		
9:22	7			23.68	8.97		
9:24	9			23.75	9.04		41" 269 gpm
9:26	11			23.69	8.98		
9:30	15			23.76	9.05		
9:35	20			23.65	8.94		39" 265 gpm

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:40	25			23.64	8.93		
9:50	35			23.58	8.87		38" 260 gpm
10:00	45			23.55	8.84		
10:15	60			23.58	8.87		
10:30	75			23.59	8.88		36.5"
11:00	105			23.54	8.83		36"
11:30	135			23.54	8.83		35.5"
Noon	165			23.54	8.83		35.5"
1:00	225			23.53	8.82		35.25"
2:00	285			23.52	8.81		35"
3:00	345			23.52	8.81		34.5"
4:00	405			23.50	8.80		34.25"
5:00	465			23.49	8.78		34"
6:00	525			23.50	8.79		34" 246 gpm
7:00	585			23.55	8.84		
8:00	645			23.50	8.79		
9:00	705			23.50	8.79		
11:00	825			23.51	8.80		
1:00	945			23.51	8.80		

LOCATION Mt. Rose Service Company

Well No. 3

PAGE 3 OF 4

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
3:00	1,065			23.57	8.86		
5:00	1,185			23.52	8.81		
7:00	1,305			23.56	8.85		
8:00	1,365			23.59	8.88		33" 242 gpm
9:00	1,425			23.61	8.90		33.75"
9:15	1,440			23.65	8.94		pump off
RECOVERY DATA							
9:15.5		0.5		16.37		1.66	
9:16		1.0		15.52		0.81	
9:16.5		1.5		15.33		0.62	
9:17		2.0		15.34		0.63	
9:17.5		2.5		15.41		0.70	
9:18		3.0		15.38		0.67	
9:19		4.0		15.17		0.46	
9:20		5.0		15.31		0.60	
9:22		7.0		15.17		0.46	
9:24		9.0		15.14		0.43	
9:26		11.0		15.24		0.53	
9:28		13.0		15.34		0.63	

LOCATION- Mt. Rose Service Company

Well No. 3

PAGE 4 OF 4

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
9:30		15		15.17		0.46	
9:40		25		15.17		0.46	
9:45		30		15.09		0.38	
9:50		35		15.07		0.36	
9:55		40		15.04		0.33	
10:00		45		15.07		0.36	
10:10		55		15.14		0.43	
10:20		65		15.13		0.42	
10:30		75		15.06		0.35	
10:45		90		15.13		0.42	
11:00		105		15.06		0.35	
11:15		120		14.99		0.28	
11:30		135		15.07		0.36	
11:45		150		15.11		0.40	
12:00		165		15.08		0.37	end test



WELL PUMPING TEST
DATA FORM

Date March 7, 1980

Page 1 of 2

Location MT. Rose Service Company, Galena Creek Area, Washoe County

Well Description Well No. 4 Observation

Static Water Surface _____

Pump Setting _____

Orifice Size _____

Data Collected By Martin Smith

Test Conditions cloudy day, around 40°, open area, overland discharge

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
3:20 AM	0 min.			5.44			
3:45	30			5.44	0		
4:02	107			5.62	0.18		
4:10 PM	175			5.72	0.28		
4:12	227			5.89	0.45		
4:17	292			5.99	0.55		
4:22	347			6.09	0.65		
4:27	412			6.14	0.70		
4:32	467			6.18	0.74		
4:36	531			6.26	0.82		
4:47:05	590			6.28	0.84		
4:49:08	713			6.32	0.88		
4:51:03	828			6.42	0.98		

DATE 3/7/80

LOCATION Mt. Rose Service Company

Well No. 4 Observation

PAGE 2 OF 2

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
1:08	953			6.52	1.08		
3:03	1,068			6.51	1.07		
5:08	1,193			6.54	1.10		
7:03	1,308			6.57	1.13		
8:04	1,369			6.55	1.11		
9:02	1,427			6.59	1.15		
		RECOVERY TEST					
9:34		19		6.60		1.16	
10:02		47		6.50		1.06	
10:36		81		6.47		1.03	
11:02		107		6.42		0.98	
11:37		142		6.35		0.91	
11:54		159		6.32		0.88	



**WELL PUMPING TEST
DATA FORM**

Date 3/7/80

Page 1 of 2

Location Mt. Rose Service Company, Galena Creek Area, Washoe County
Well Description Well No. 5 observation

Static Water Surface _____

Pump Setting _____

Orifice Size _____

Data Collected By Martin Smith

Test Conditions cloudy day, around 40°, open area, overland discharge

Time	Time Since Pumping Started t	Time Since Pump Stopped t'	t/t'	Water Surface	Draw- down S	Residual Drawdown S'	Remarks
8:20 AM				40.36			
9:43	28			40.36	0		
11:05	110			40.32			
12:02 PM	167			40.35			
1:06	231			40.33			
2:03	288			40.34			
3:06	351			40.33			
4:04	409			40.35			
5:06	471			40.34	NO EFFECT		
6:03	528			40.32			
7:07	582			40.31			
9:05	700			40.28			
11:07	822			40.29			

LOCATION Mt. Rose Service Company

Well No. 5 observation

PAGE 2 OF 2

[illegible]

A P P E N D I X E

WATER QUALITY TESTS

IN TRIPLICATE)
PLEASE PRINT)

BUREAU OF LABORATORIES AND RESEARCH
NEVADA DIVISION OF HEALTH

7530

52404

WATER CHEMISTRY:

1660 N. Virginia Street
Reno, Nevada 89503

WELL WATER: Pump should be delivering clear water before sampling.

Date sampled 1/26/80 Date submitted 1/29/80

Owner Mt. Rose Water Company

County Washoe
Township 17N
Range 19E Section 2
Area Mt. Rose Water Company
Well #

Report to:

**WATERESOURCE
CONSULTING ENGINEERS**

Name

Address

City 28 Vine Street * Reno, Nevada 89503

State

WATER SOURCE:

Well Spring Surface

Hot Cold Depth

Casing diameter in depth

Now in use Yes ☐ No ☒

ROUTINE DOMESTIC ANALYSIS

PLEASE CHECK BOX

FOR PARTIAL ANALYSIS

CIRCLE CONSTITUENT DESIRED

FOR CONSTITUENTS NOT LISTED BELOW PRINT IN
CONSTITUENT DESIRED IN SPACE BELOW

Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.
Chloride	3	Iron	0.03						
Nitrate	2.0	Manganese	0.00						
Alkalinity	62	Color	25						
Bicarbonate	79	Turbidity	13.0						
Carbonate	0	p.H.	7.32						
Fluoride	0.15								
Arsenic	0.001								

RECEIVED FEB 13 1980

marks

Circled items exceed State of Nevada

Drinking Water Std. The limits are

Color - 15

IN TRIPLICATE
PLEASE PRINT

BUREAU OF LABORATORIES AND RESEARCH
NEVADA DIVISION OF HEALTH

7530

1660 N. Virginia Street

Reno, Nevada 89503

County Washoe

52405

Township 17N

Range 17E Section 2

Area Mt. Rose Water Company

Well 41

WATER CHEMISTRY:

WELL WATER: Pump should be delivering clear water before sampling.

Date sampled 1/29/80 Date submitted 2/20/80

Owner Mt. Rose Water Company

Report to: WATER RESOURCE

Name CONSULTING ENGINEERS

Address 28 Vine Street ★ Reno, Nevada 89503

City State

WATER SOURCE:

Well ☒ Spring ☐ Surface ☐

Hot ☐ Cold ☒ Depth ☐ Ft.

Casing diameter ☐ in depth ☐ Ft.

Now in use ☐ Yes ☐ No ☐

ROUTINE DOMESTIC ANALYSIS

PLEASE CHECK BOX

FOR PARTIAL ANALYSIS

CIRCLE CONSTITUENT DESIRED

FOR CONSTITUENTS NOT LISTED BELOW PRINT IN

CONSTITUENT DESIRED IN SPACE BELOW

Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.
Chloride	113	Iron					
Nitrate	51	Manganese	0.00				
Alkalinity	12	Color					
Bicarbonate	5	Turbidity	0.5				
Carbonate	8	p.H.	7.1				
Fluoride	3						
Arsenic	2						

Remarks

Chemical quality meets the State of
Nevada Drinking Water Standards.

RECEIVED FEB 13 1980

TRIPPLICATE
PLEASE PRINT

BUREAU OF LABORATORIES AND RESEARCH
NEVADA DIVISION OF HEALTH

7530

1660 N. Virginia Street

Reno, Nevada 89503

52407

WATER CHEMISTRY:

WELL WATER: Pump should be delivering clear water before sampling.

Date sampled 1/22/80 Date submitted 1/22/80

Owner Mt. Rose Water Company 1/22/80

Report to:

Name WATER RESOURCE
CONSULTING ENGINEERS, INC.

Address 28 Vine Street Reno, Nevada 89503

City State

WATER SOURCE:

Well..... Spring..... Surface.....

Hot..... Cold..... Depth.....

Casing diameter..... in depth.....

Now in use..... Yes ☐ No ☐

ROUTINE DOMESTIC ANALYSIS

PLEASE CHECK BOX

FOR PARTIAL ANALYSIS
CIRCLE CONSTITUENT DESIRED

FOR CONSTITUENTS NOT LISTED BELOW PRINT IN
CONSTITUENT DESIRED IN SPACE BELOW

Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.	Constituent	P.P.M.
S.	144	Chloride	3	Iron	0.1		
ness	66	Nitrate	1.1	Manganese	0.05		
ium	15	Alkalinity	30	Color	7		
nesium	7	Bicarbonate	92	Turbidity	3.5		
ium	7	Carbonate	0	p.H.	7.00		
ssium	4	Fluoride	0.12				
ate	2	Arsenic	0.007				

Remarks

Chemical quality meets the State of
Nevada Drinking Water Standards