WELL COMPLETION REPORT FOR NEARBY PRODUCTION WELL: APPLICABLE FOR TESSA EAST MWA

REDFIELD/TESSA
PW-1 (WEST) AND PW-2 (EAST)
WELL CONSTRUCTION AND TESTING FINAL REPORT

Redfield/Tessa
PW- 1 (West) and PW- 2 (East)
Well Construction and Testing
Final Report
November 2000

WASHOE COUNTY
DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION
4930 ENERGY WAY RENO, NEVADA 89502

Department of Water Resources

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SUMMARY AND CONCLUSIONS

1. Galena Water Enterprises (GWE), the owner of water rights and property adjacent to the State Route 431 (See Location Map, Figure 1.) consulted with Washoe County to determine what requirements would be necessary to develop the property. Washoe County told GWE that the paper water rights would have to be backed up by "wet water." Backing up the rights would require the development of at least two municipal supply wells that would be accepted by the County. Galena Water Enterprises chose to fund some County Hydrologist staff time to assist in the design, construction supervision and test pumping of wells drilled.

2. Galena Water Enterprises, acting through Randy Bowling of Randy Bowling Consulting, contracted with Layne Christensen Company to construct two municipal supply wells that would meet County standards for construction. The Contract was signed May 31, 1999.

3. Drilling began at Site No. 1 (west) on June 9, 1999. Because the County desired to determine the depth to bedrock in that area, the County participated in the extra costs associated with drilling the test hole deeper than the 700 feet authorized by the Contract between Layne and GWE. Ultimately, the test hole was drilled to a depth of 1000 feet and terminated in fractured volcanics. The test hole was completed with 2-inch steel casing to a depth of 1000 feet. The test well was completed June 24, 1999.

4. Production Well No. 1 (west) was completed, including air-lift development on August 14, 1999. The well was constructed with a 24-inch diameter surface casing to 100 feet and 14-inch casing and screen to 780 feet (detailed construction diagram included in this report). Static water level was around 280 feet below ground surface.

5. Drilling of the test hole at site No. 2 began on June 24, 1999. Difficulty in drilling delayed completion of test hole No. 2 until October 14, 1999. Test hole No. 2 was drilled and cased with 3-inch casing to a depth of 720 feet.

6. Difficulty in drilling and loss of bit in the borehole delayed completion of Production Well No. 2 (east) until March 25, 2000. Well No. 2 was constructed with a 24-inch diameter surface casing to 157 feet and 14-inch diameter casing and screen to 735 feet (detailed construction diagram included in this report). Static water level was about 220 feet below ground surface.

7. A series of aquifer stress tests were run on each well. An initial step-drawdown test was followed by a 72-hour constant discharge test on each well. The testing indicated aquifer transmissivities of about 9,800 gpd/ft for PW 1 and about 7,400 gpd/ft for PW 2. Well efficiencies were good with the efficiency for each well

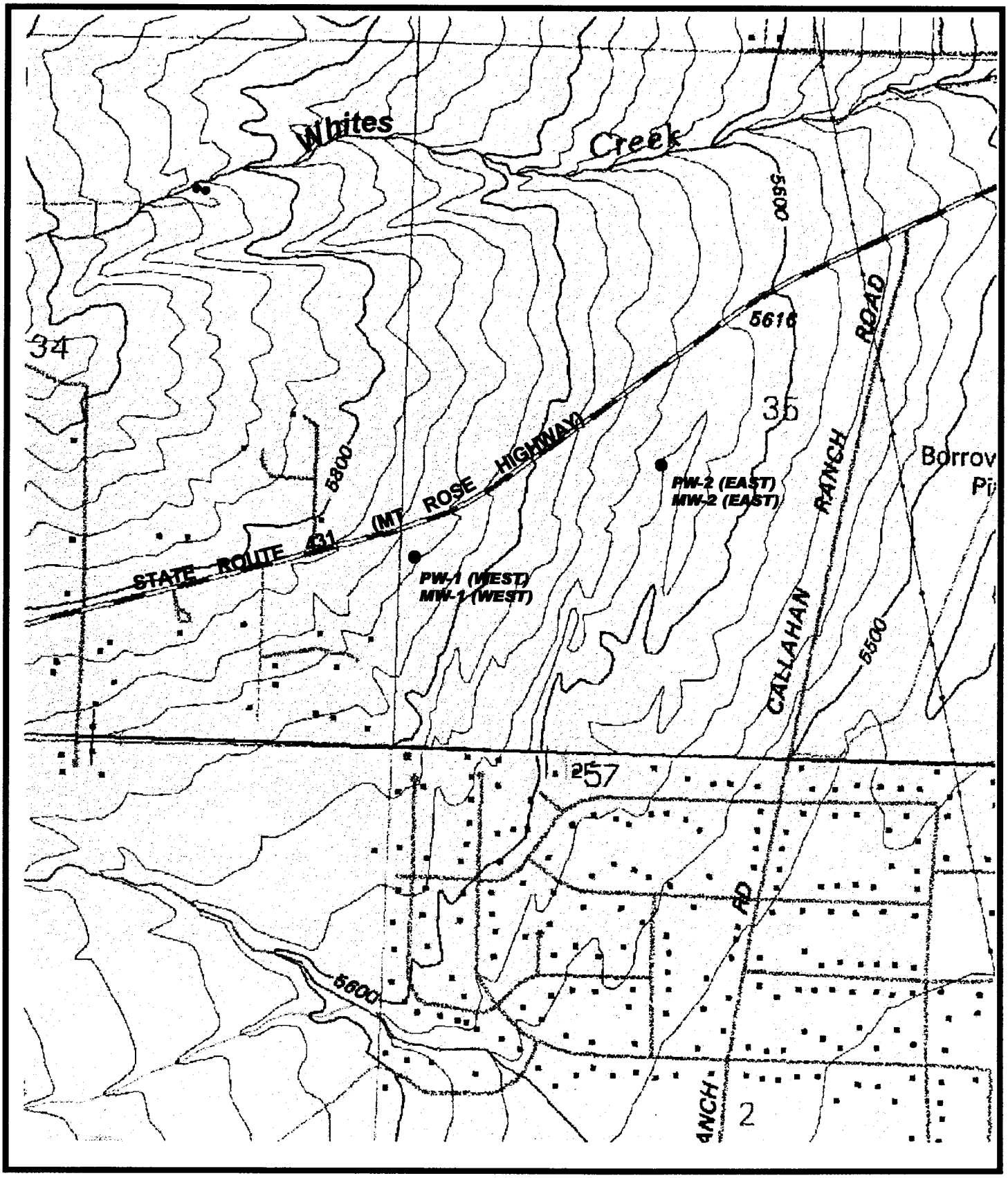


FIGURE 1. LOCATION MAP

TESSA PRODUCTION & MONITORING WELLS

November, 2000

0 100 200 300 Feet

LEGEND

- WELL LOCATIONS

Department of Water Resources

being above 80% at the recommended design capacity. Storage coefficients ranging from 0.001 to 0.1 suggested unconfined or semi-confined aquifers. There were no measurable interference effects between the wells during testing.

8. Based on the assumption that the wells will not pump continuously for more than 30 days, and the County generally does not like pumping levels to drop below the top of the screened interval, the recommended pumping rates for the wells are:

PW 1----------	650 gallons per minute
PW 2----------	850 gallons per minute

The wells could be rated about 100 gpm higher for short-term peak pumping if equipped with a variable speed pump that could be adjusted to respond to a maximum recommended pumping level. The variable speed pump could pump the higher rate until the pumping level approaches the top of the screened interval.

9. Sand content during testing showed both wells meet County criteria for sand production (less than 5 parts per million by volume).

10. Water quality analyses showed water from both wells meet all current drinking water standards. In general, the water quality is excellent, with total dissolved solids below 200 parts per million in each well.

11. Both wells met standards for plumbness and alignment.

INTRODUCTION

Tessa Production Well No. 1 (west) and No. 2 (east) are located on the Mount Rose alluvial fan near the intersection of Mount Rose Highway (State Route 431) and Callahan Ranch Road. Figure 1 is a location map showing the approximate location of the wells.

Layne Christensen Company constructed each of the wells and the contract for construction was between Layne and Galena Water Enterprises. Randy Bowling of Randy Bowling Engineering was hired by Galena Water Enterprises to manage the contract.

Galena Water Enterprises wanted to insure the wells would meet County standards for construction and eventually be accepted by the County as municipal water supply wells. Galena Water Enterprises provided Washoe County with $23,000.00 in exchange for County supervision of some of the construction aspects of the wells and the data collection during test pumping of the wells. As a result, County staff was directly involved in the construction and testing process. The result was that the wells meet current County standards and would be acceptable as municipal supply wells.

DRILLING OPERATIONS

Test drilling and well construction began June 9, 1999 and was not completed until March 25,2000. The contract was for a test hole and monitoring well at each site. Test holes and wells were named: Test Hole No. 1 (TH-1), Production Well No. 1 (PW-1), Test Hole No. 2 (TH-2) and Production Well No. 2 (PW-2). The No. 1 site was the west location and the No. 2 site was the east location. Difficulties in drilling, loss-circulation problems, twisting off a bit in the borehole and equipment changes all contributed to delays in construction of the wells. Following is a summary of the drilling progress:

June 9, 1999	Drilling of a test hole began at Site No. 1 (TH-1, west).
June 21, 1999	TH-1 was completed, developed and cased as a 2-inch monitoring well to a total depth of 1000 feet.
June 24, 1999	Changed from mud rotary rig to air rotary rig to drill TH-2 (east) Drilling problems prevented completion of TH-2. Rig was pulled off August 23, 1999.
July 23, 1999	Mud rotary rig began drilling production well at PW-1 (west).
August 10, 1999	Well completed, air-lift development begins.
August 14, 1999	Air-lift development completed at PW-1 (west).
September 28,1999	Different rig brought in to drill TH-2
October 14, 1999	TH-2 construction and development completed. Completed with 3-inch casing.
October 14, 1999	Drilling began for PW-2 (east).
October 25, 1999	Conductor casing set and cemented
November 5, 1999	Completed first pass with 17.5 inch bit
November 15, 1999	Twisted off reamer at about 130 feet.
January 25, 2000	Abandoned attempts to fish out or mill-up stuck bit. Abandoned hole.
January 30, 2000	Began drilling new hole.

March 11, 2000	Set and cemented surface casing.
March 25, 2000	Finished construction and air-lift development of Production Well No. 2 (east).

HYDROLOGY

The source of groundwater for the area is recharge from precipitation falling primarily in the Carson Range. Precipitation is influenced greatly by oroclinal effects from the Carson Range, which creates a strong rain-shadow effect. Annual precipitation, falling primarily as snow, averages 58 inches at higher elevations in the Carson Range (based on 19 year average at Marlette Lake), whereas the average annual precipitation in Reno, falling primarily as rain, is only about 7 inches (based on 54 year average at Reno/Tahoe International Airport; Desert Research Institute, 2000). Steamboat Creek is the principal drainage within the area and is a major tributary to the Truckee River. The majority of runoff comes from the east flank of the Carson range due to snowmelt with the predominant tributaries in the area being Galena Creek, Whites Creek, and Thomas Creek. The Steamboat Springs geothermal area is located on the northeastern flank of the Steamboat Hills. Groundwater is found at ground surface near the Serendipity Fault to depths of greater than 300 feet near the north flank of the Steamboat Hills. The general groundwater flow direction in the alluvial aquifer is toward the east.

GEOLOGY

The Tessa 1 and 2 wells are located along the southern margin of the upper portion of an alluvial basin known as the Mount Rose Fan. The geology of the area was mapped by Bonham and Rogers (1983). The primary basement bedrock is fractured Cretaceous granodiorite (Kg) which is prominent in the Carson Range and the Virginia Range. These plutonic rocks were intruded into older sedimentary and volcanic rocks (pKm) that are deformed, regionally metamorphosed, and further thermally metamorphosed near granodiorite contacts. Overlying the basement rocks is the Tertiary Kate Peak Formation (Tkf, Tkb, Tku) which consists of weathered, faulted, and hydrothermally altered andesite and basalt flows, flow breccias, intrusive bodies, and tuff-breccias. Quaternary alluvial fan deposits of the Mount Rose Fan Complex are derived primarily from the east flank of the Carson Range and the west flank of Steamboat Hills. These deposits consist of generally sandy cobble to boulder gravel sediments but contain discontinuous layers of silt and clay. The alluvial deposits and fractured volcanics are the water primary source for Washoe County and domestic wells.

At least three prominent fault systems that trend north (range front system), northeast, and northwest occur in the area. North trending faults along Callahan Ranch Road, evident in west-facing and east-facing scarps in alluvial deposits, indicate recent (<10,000 years before present) seismic activity. The Tessa 1 well is located on the western margin of this

fault swarm while the Tessa 2 well is situated within the fault swarm. This faulting has produced compartmentalization of groundwater flow within the alluvial aquifer as indicated by variable hydraulic gradients (0.1 to 0.04 ft/ft). The prominent north-trending Serendipity Fault, located approximately 2000 feet east of the Tessa 2 well, produces the greatest hydraulic gradient and appears to act as a barrier to groundwater flow.

Test hole TH-1 near the Tessa 1 well was drilled to a total depth of 1000 feet and test hole TH-2A near the Tessa 2 well was drilled to a total depth of 720 feet. Logs for these test holes supplied by the drilling company (Layne Christensen) provided detailed descriptions of the lithology encountered and are provided in the Appendix. The log for TH-1 indicates sand, gravel, cobbles, and granite boulders with some sand and clay occurs from 0 to 242 feet below ground surface (bgs). Cobbles and boulders include a mixture of granodiorite, andesite, and rhyolite lithology. A brown clay lense occurs from 242 to 246 feet bgs and hard black basaltic andesite is found from 246 to 574 feet bgs. Red cinders and swelling clay are encountered from 574 to 670 feet bgs. Fractured black basalt is logged from 670 to 1000 feet bgs. The log for TH-2A indicates sand, cobbles, and boulders from 0 to 260 feet bgs. Red and black volcanic rock with occasional sandy brown clay is found from 260 to 440 feet bgs. Gray to black volcanic rock (possibly andesite) with minor amounts of sandy brown clay is logged from 440 to 720 feet bgs.

Washoe county hydrogeologists reviewed these logs for interpretation of depth to Kate Peak volcanics and whether granodiorite was encountered. Identification of lithologic contacts in an alluvial fan depositional environment is subjective and requires prior knowledge of the local geology. Based on similar lithology encountered in other Washoe County wells (Mt Rose 3, 4, 6) located south of the Tessa wells, depth to volcanics at Tessa 1 is 246 feet and at Tessa 2 is 260 feet. Granodiorite was not encounter at either well site. Using the surface elevations for Tessa 1 (5750 ft) and Tessa 2 (5620 ft), the elevation of the top of Kate Peak volcanics is calculated at 5474 feet for Tessa 1 and 5360 feet for Tessa 2.

References

Bonham, H. F., Jr., and Rogers, D. K., 1983. Geologic map, Mt. Rose NE quadrangle: Nevada Bureau of Mines and Geol., Map 4Bg.

Desert Research Institute, 2000. Western Regional Climate Center, Western U.S. Climate Historical Summaries and SNOWTEL Data, World Wide Web Site, http://www.wrcc.dri.edu/.

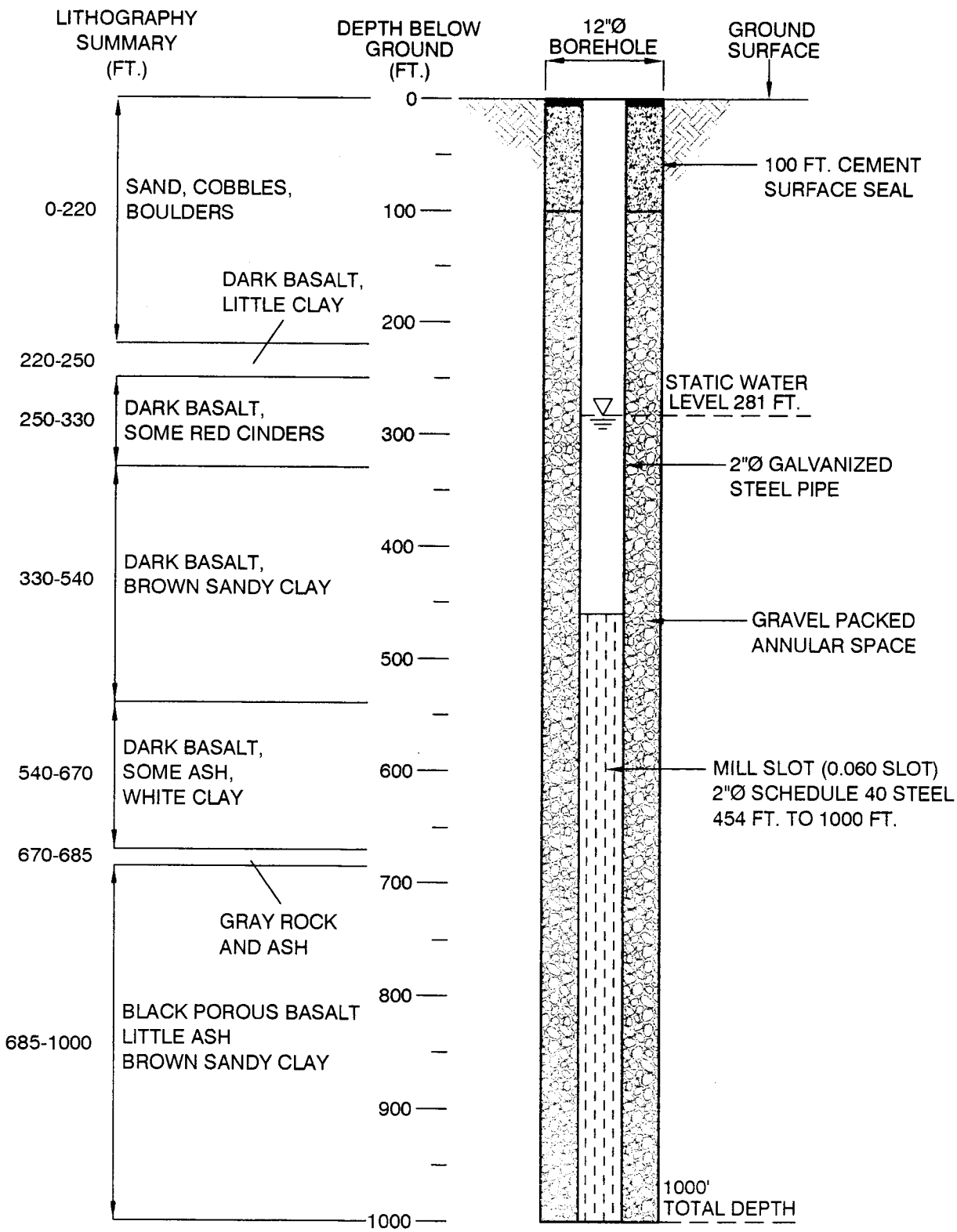
WELL CONSTRUCTION

Table No. 1 shows the well construction details for the two completed monitoring wells and the two completed production wells. Figures 2 through 5 show the individual well construction details in a cross-sectional diagram for the two test holes and the two production wells. Drillers Logs are included in the Appendix.

Table 1	Well Construction Details	
Well Number	**Total Depth**	**Description**
MW-1 (west)	1000 feet	2-inch diameter steel pipe set to 1000 feet. Blank 2-in to 454 feet. Mill slotted pipe from 454 feet to 1000 feet. Grout seal from ground surface to 100 feet. Gravel packed from 100 to 1000 feet.
PW-1 (west)	780 feet	Blank 24-inch conductor casing cemented to 100 feet. Blank 14-inch casing to 400 feet with a blank section between 620 and 640 feet (for future deeper pump set). 14-inch wire-wrap screen (0.065 slot) from 400 to 620 and 640 to 760. Static water level in June, 00 – 280 feet below ground surface. Gravel packed with 50/50 blend of Silica Resources #6 and #8 gravel.
MW- 2A (East)	725 feet	3-inch diameter schedule 40 steel pipe. Blank casing to 467 feet. Mill slot steel casing from 467 to 698 feet. 100 ft surface seal, gravel packed to 725 feet.
PW- 2 (East)	715 feet	Blank 24-inch conductor casing set and cemented to 157 feet. Blank 14 inch casing to 440 feet with another blank section between 540 and 560 feet. Wire wrap screen (0.065 slot) from 440 to 540 and 560 to 710. Gravel packed with 50/50 blend of Silica Resources #6 and #8 gravel.

WELL DEVELOPMENT

Immediately following completion of well construction, the wells were developed using a ten- (10) foot double surge block and perforated pipe. Development began at the top of the screen and moved gradually downward to within 5 feet of the bottom of each well. Once one complete pass of the well was made, development by surging continued until it was the opinion of Washoe County that development by surging was complete. Additional development by pumping occurred just prior to running the aquifer stress tests. Each well was pumped intermittently and the water in the pump column was allowed to surge back through the pump bowls and into the well. During pumping development, a mixture of NuWell 220™, a product of Baroid was mixed into the well. NuWell 220™ assists in breaking down drilling mud and cleaning of the well.



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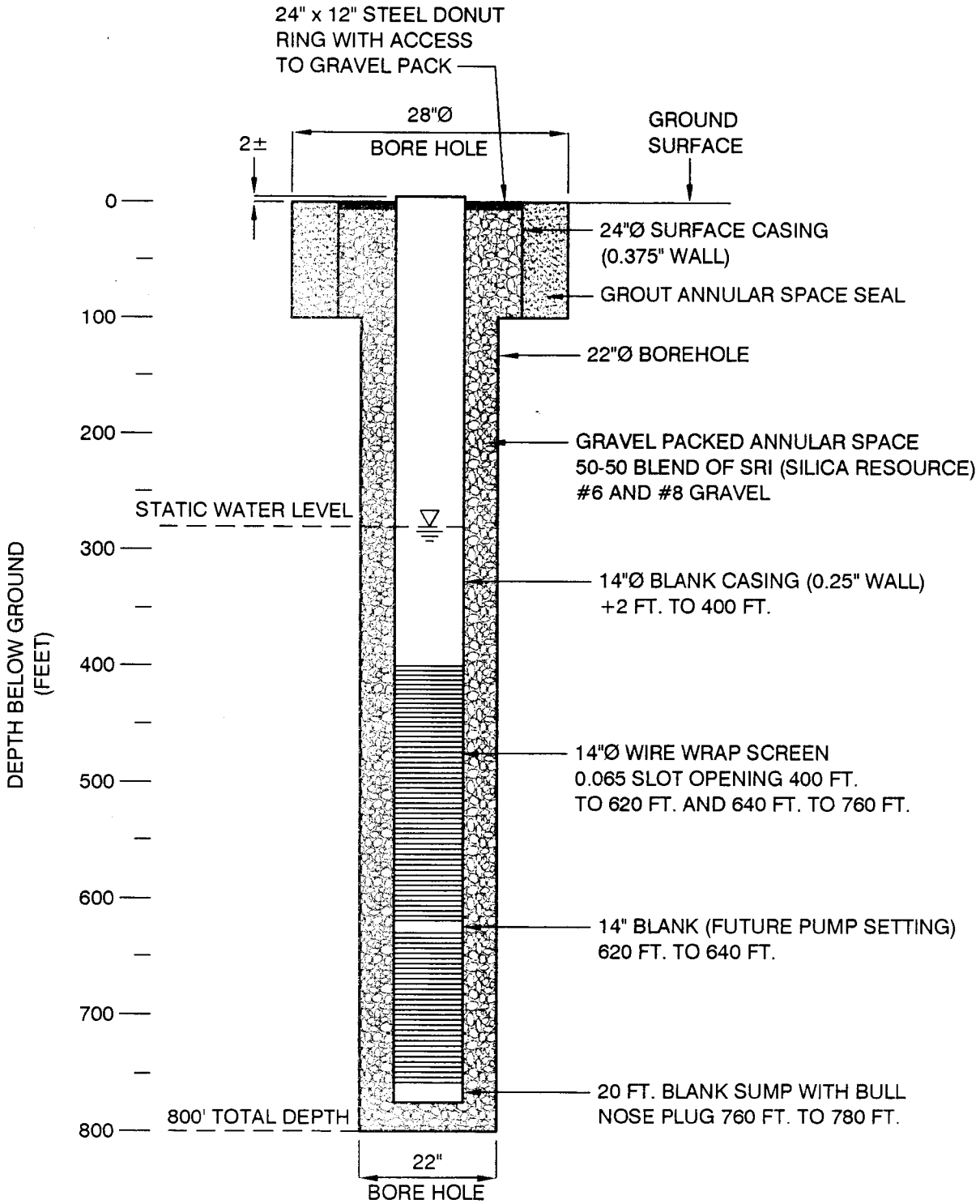
TESSA TH-1 (WEST)

CONSTRUCTION DETAILS

FIGURE 2



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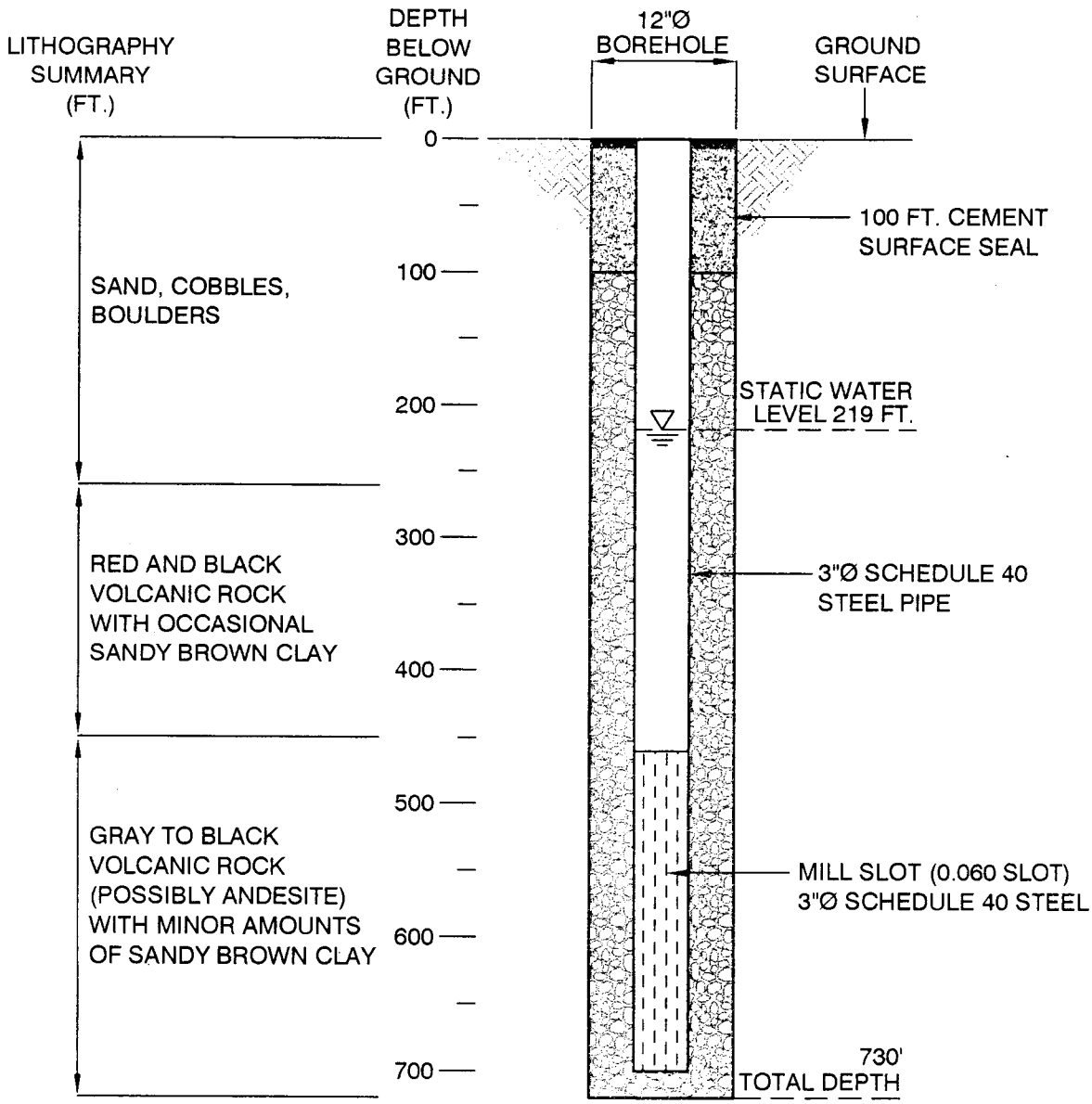
TESSA PW-1 (WEST)

CONSTRUCTION DETAILS

FIGURE 3



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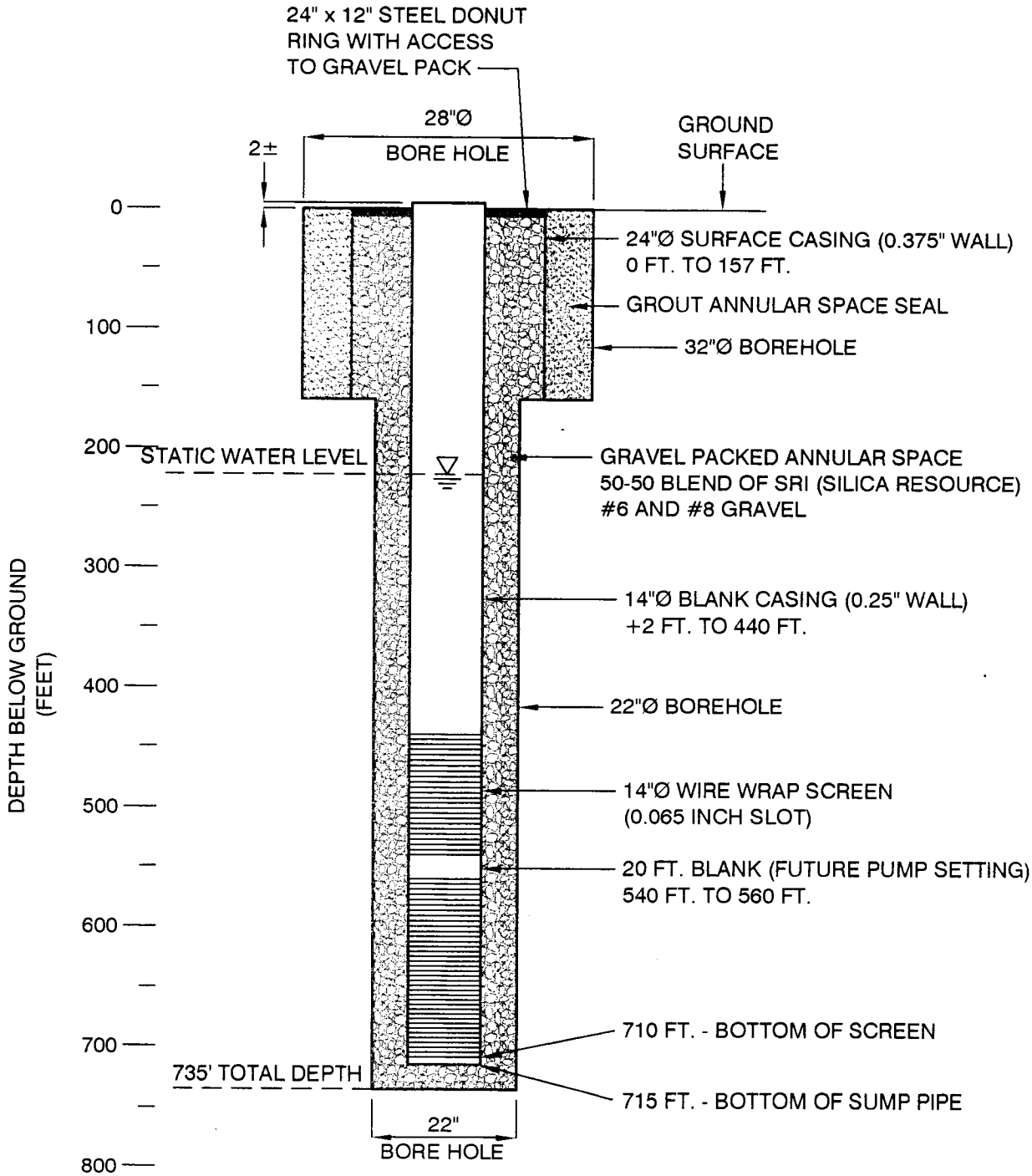
TESSA TH-2 (EAST)

CONSTRUCTION DETAILS

FIGURE 4



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TESSA PW-2 (EAST)

CONSTRUCTION DETAILS

FIGURE 5

Sand content was monitored during development pumping and development was judged to be complete once the sand content was less than 5 parts per million as measured with a Rossum™ sand tester and the water was visibly clear.

The effectiveness of development is determined by analysis of step drawdown data during aquifer stress tests. Results showed the wells to be highly efficient and were fully developed. Details of the efficiency test are included in the section titled "Aquifer Stress Tests."

WELL TESTING SUMMARY

The line-shaft turbine pump used for well development was also used for testing purposes. The testing program consisted of a step drawdown test where each well is pumped at rates selected by the hydrogeologists for 100 minutes each. The step drawdown tests were followed by a 72-hour constant discharge test where the well(s) were pumped continuously at a rate selected by the hydrogeologists for a 72-hour duration.

Step Drawdown Testing

The results of the step drawdown testing showed the wells to be fully developed and highly efficient. Table 2 shows a summary of the efficiency results at various pumping rates for each well. At the recommended design capacity for PW-1 (west) of about 650 gallons per minute, the efficiency is above 90%. At the recommended design capacity for PW-2 (east) of about 850 gallons per minute, the efficiency is about 80 %. Tables 3 and 4 show the data summary from each step drawdown test, including pumping rates, drawdowns, and specific capacities. Graphs from the step drawdown testing are shown in Figures 6 and 7.

TABLE 2-Well Efficiency at Various Pumping Rates

WELL NUMBER/STEP	PUMPING RATE (gpm)	EFFICIENCY (%)
Pw-1 (west)	500	94
	600	92
	700	91
	800	90
PW-2 (east)	500	88
	600	87
	700	84
	800	82

Figure 6
Tessa PW-1 (West)
Step Drawdown Test, Total Drawdown Graph

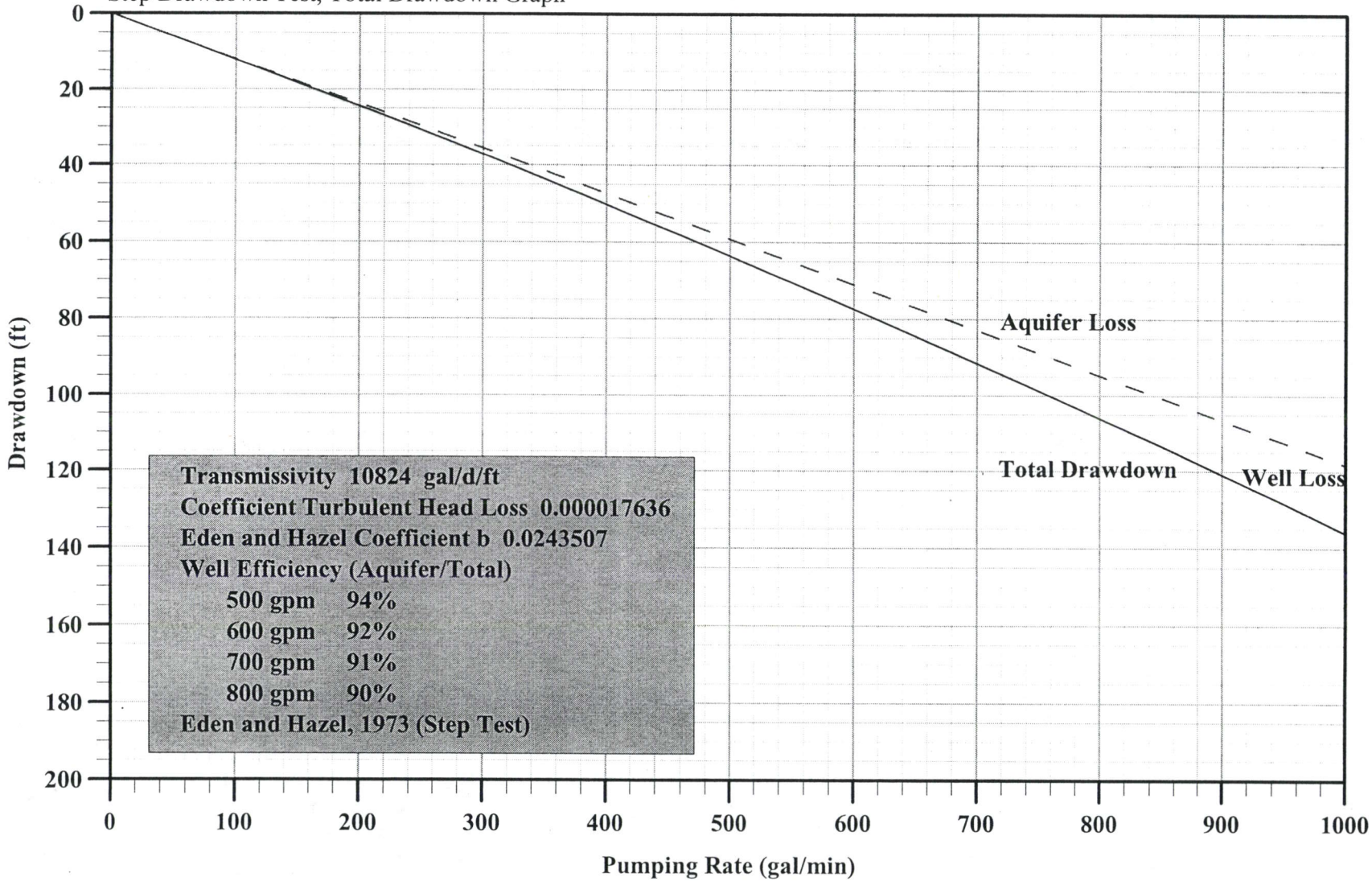


Figure 7
Tessa PW-2 (East)
Step Drawdown Test, Total Drawdown Graph

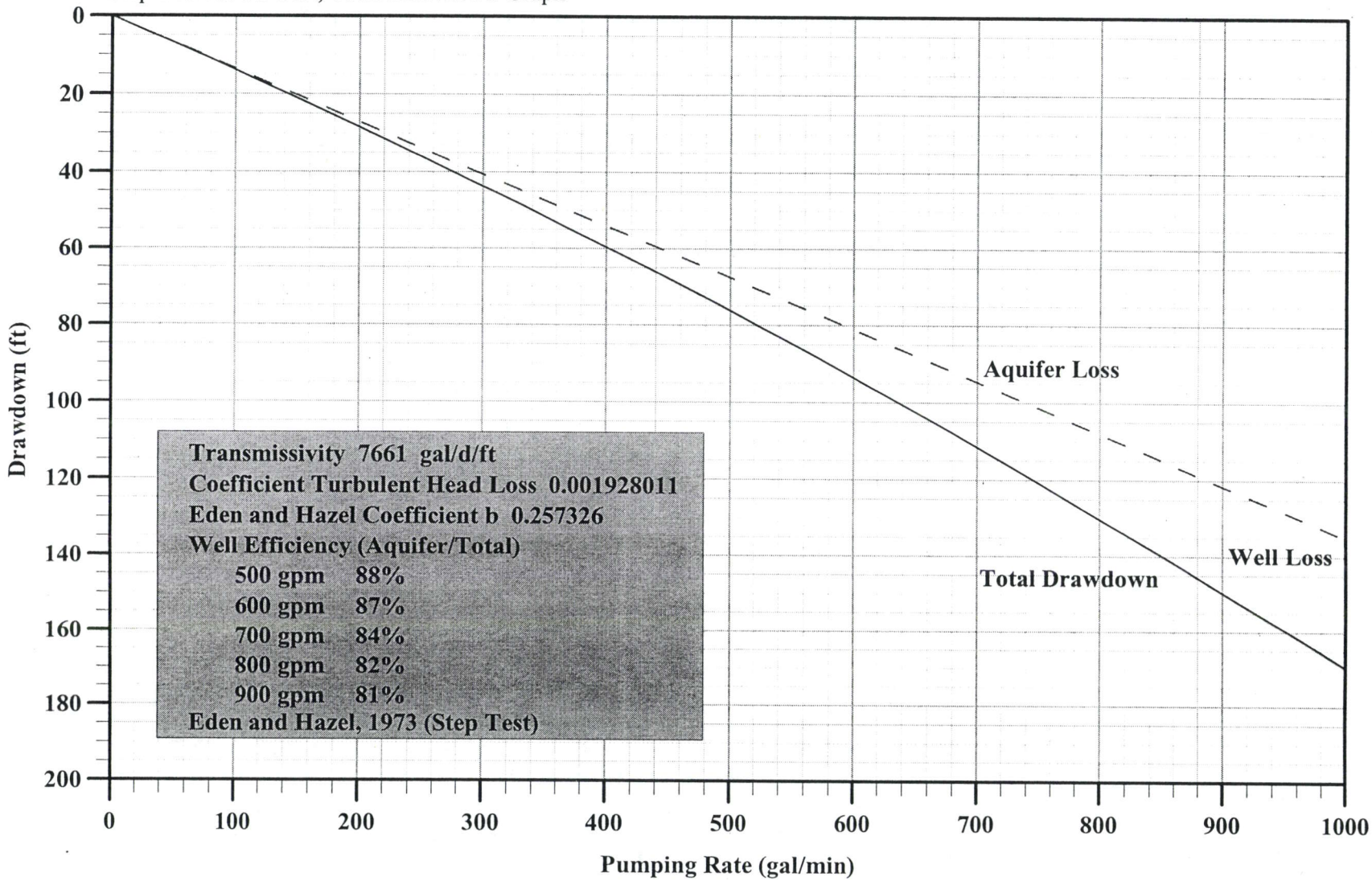


TABLE 3-Step Drawdown test, PW-1 (west), Data Summary

Step	Duration t (minutes)	Pumping Rate Q (gpm)	Drawdown S (feet)	Specific Capacity Q/s
I	100	500	63.51	7.87
II	100	604	83.86	7.20
III	100	690	99.65	6.92
IV	100	800	118.19	6.76

TABLE 4-Step Drawdown test, PW-2 (east), Data Summary—Note that steps V and VI were run the following day after 12 hours of recovery.

Step	Duration t (minutes)	Pumping Rate Q (gpm)	Drawdown s (feet)	Specific Capacity Q/s
I	100	506	79.29	6.38
II	100	604	100.89	5.99
III	100	716	124.82	5.73
IV	100	831	151.93	5.47
V	100	950	164.22	5.78
VI	100	1050	192.63	5.45

Constant Discharge Testing

The purpose of constant discharge testing is to determine aquifer hydraulic properties that, once determined, allow predictions regarding the long-term performance of a well. The test data was analyzed using the computer program "Aquifer Win32" by Environmental Simulations, Inc. Aquifer transmissivities in gallons per day per foot of aquifer width (gpd/ft.) were about 8,100 gpd/ft for PW-1 (west) and 7,400 gpd/ft for PW-2 (east). Storage coefficients based on drawdowns from nearby observation wells ranged from 0.1 to 0.001.

Results from the constant discharge tests are depicted in Figures 8 (drawdown PW-1 west), 9 (recovery PW-1 west), 10 (drawdown PW-2 east) and 11 (recovery PW-2 east). The flattening of the drawdown curves near the end of each test indicate a recharge boundary affected the results. The recharge boundary may be the result of leakage from an overlying aquifer or perhaps some other recharge source. In any case the recharge boundary provides a conservative buffer in the yield recommendations for the wells.

Figures 12 and 13 show drawdown predictions vrs time at various pumping rates. The predictions are made without the conservative impact of the recharge boundary. The

Figure 8

Tessa PW-1 (West)

Constant Discharge Test, 5/23/00-5/26/00

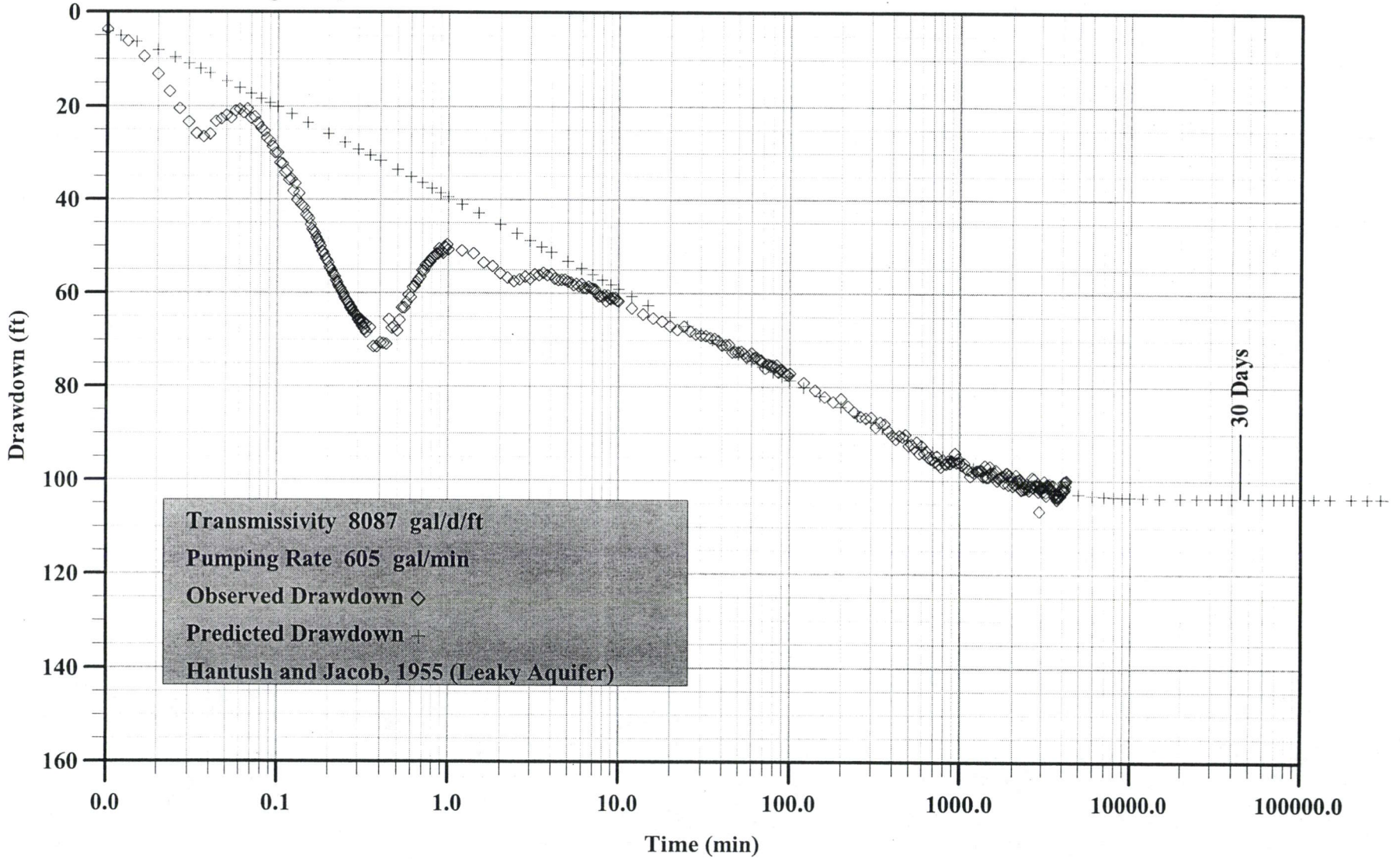


Figure 9

Tessa PW-1(West)

Constant Discharge Recovery Test

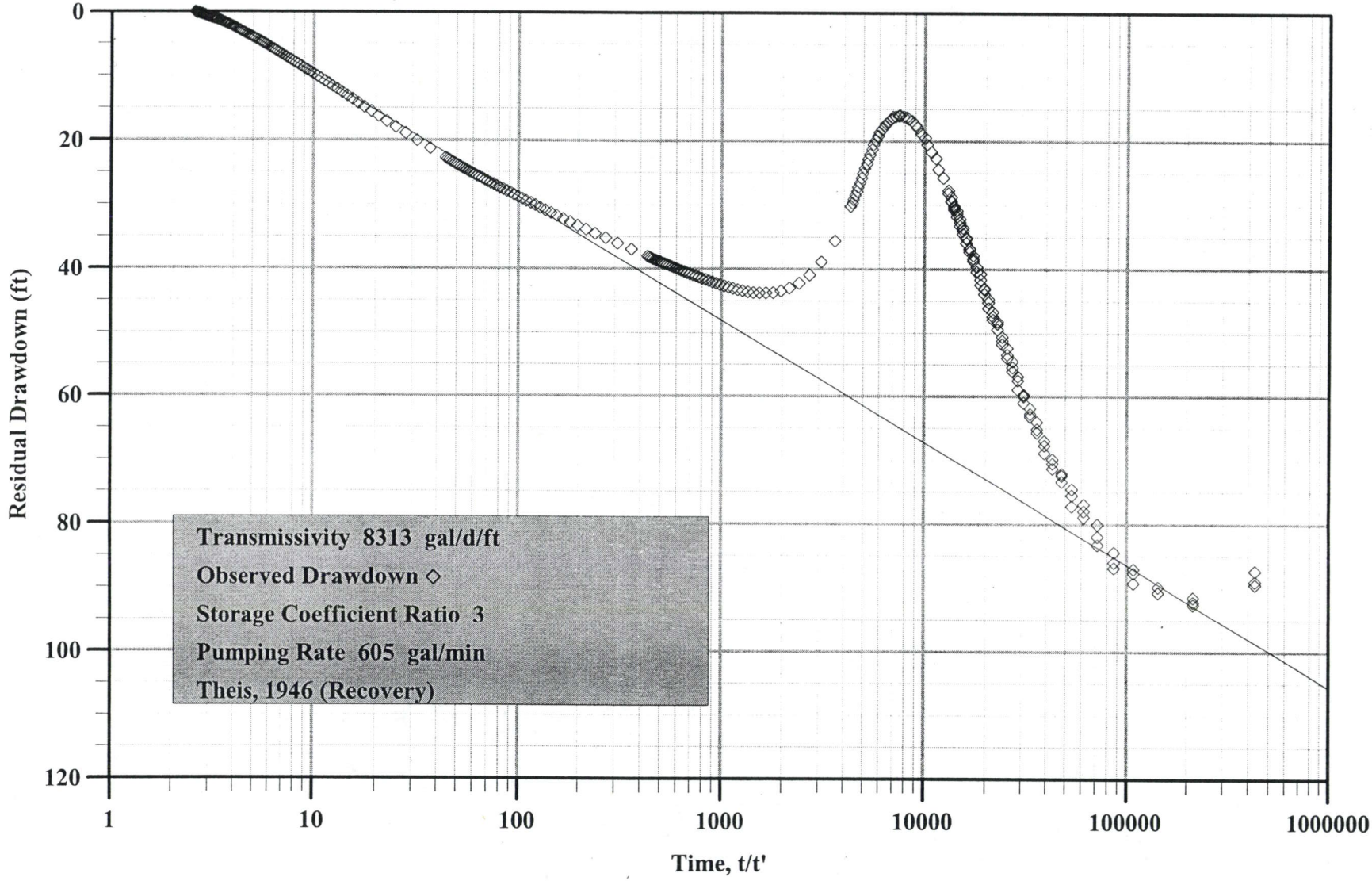


Figure 10

Tessa PW-2 (East)

Constant Discharge Test #3, 6/14/00-6/17/00

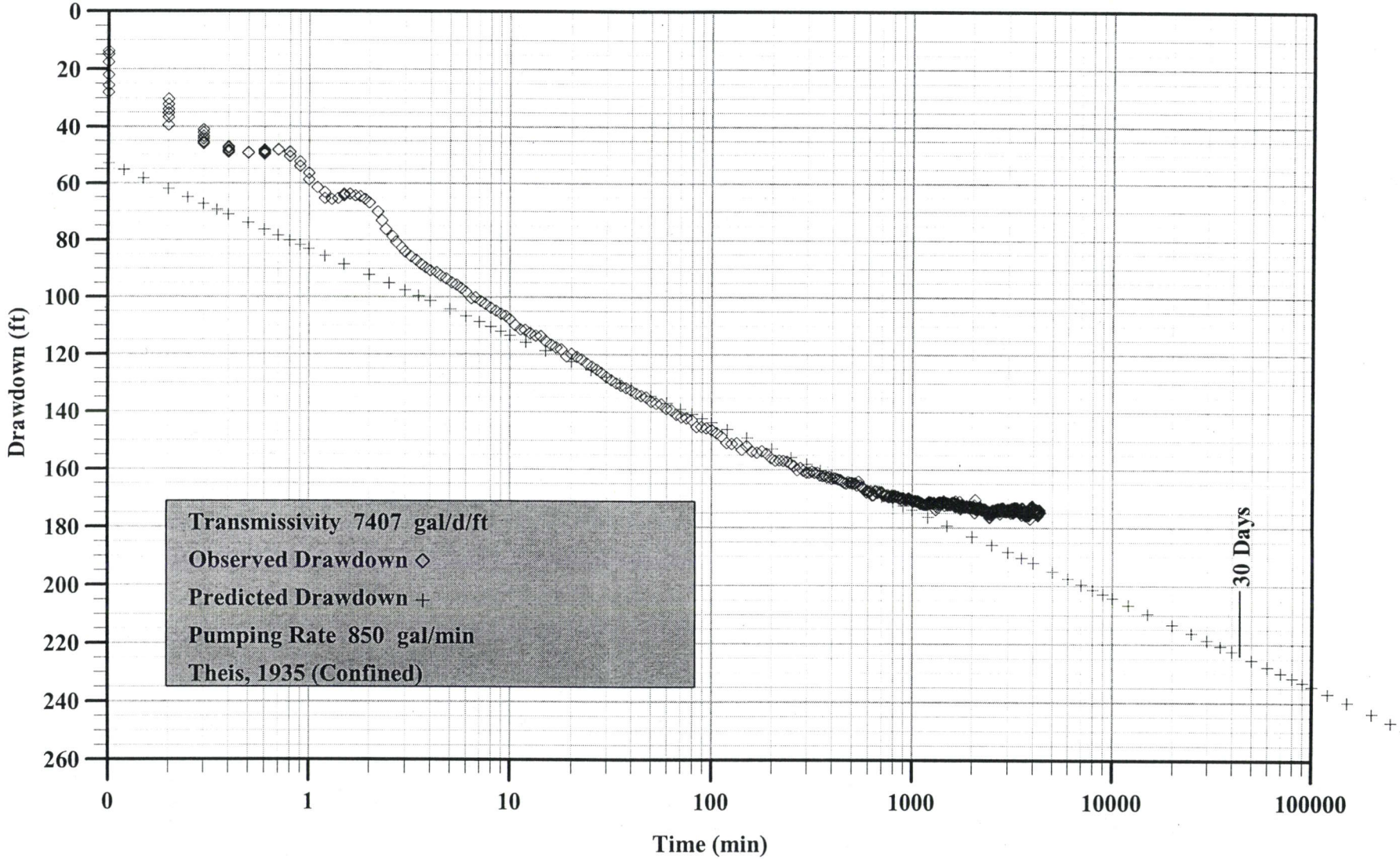


Figure 11

Tessa PW-2 (East)

Constant Discharge Recovery Test

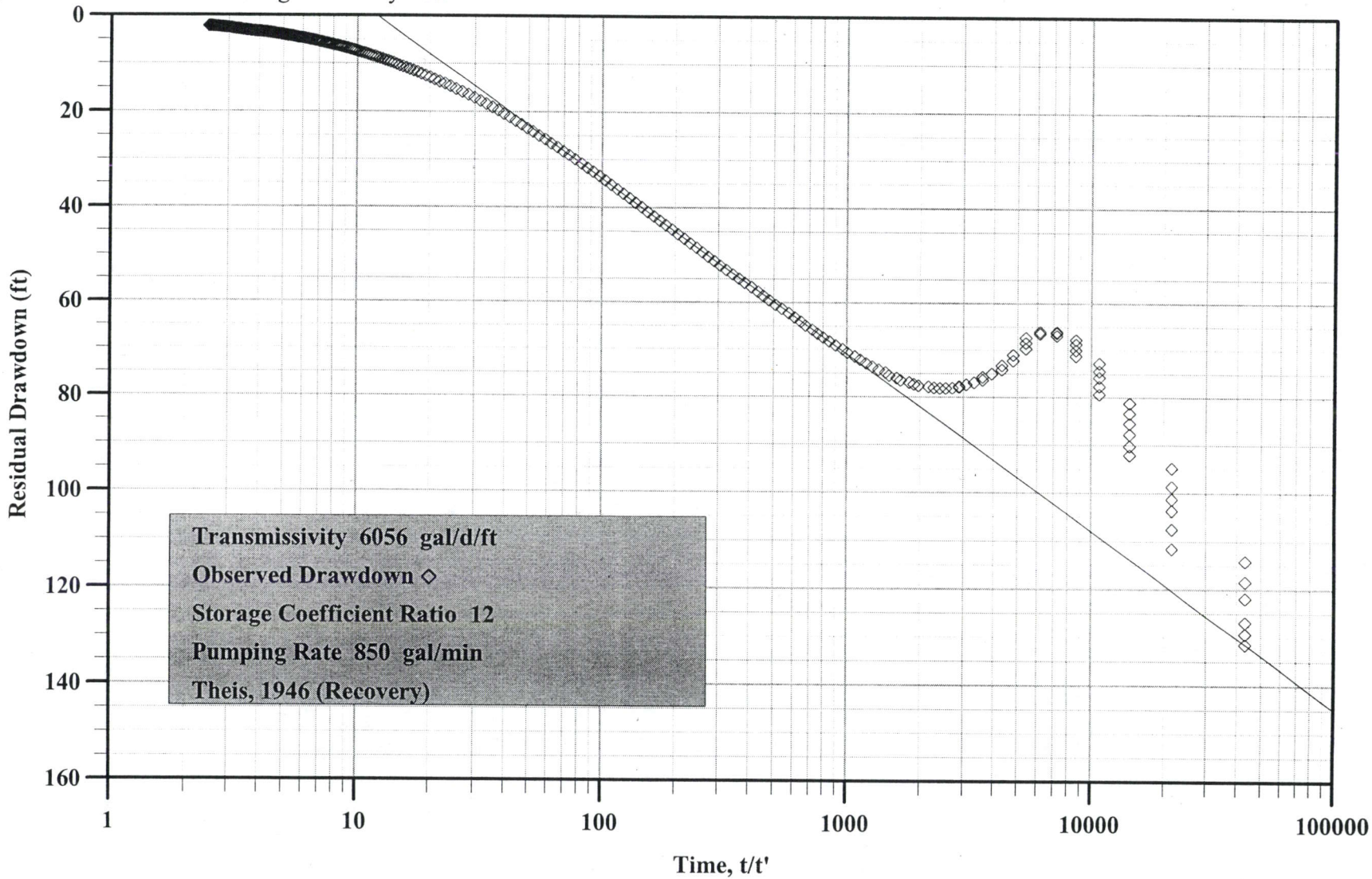


Figure 12
Tessa PW-1 (West)
Simulated Pumping Rates

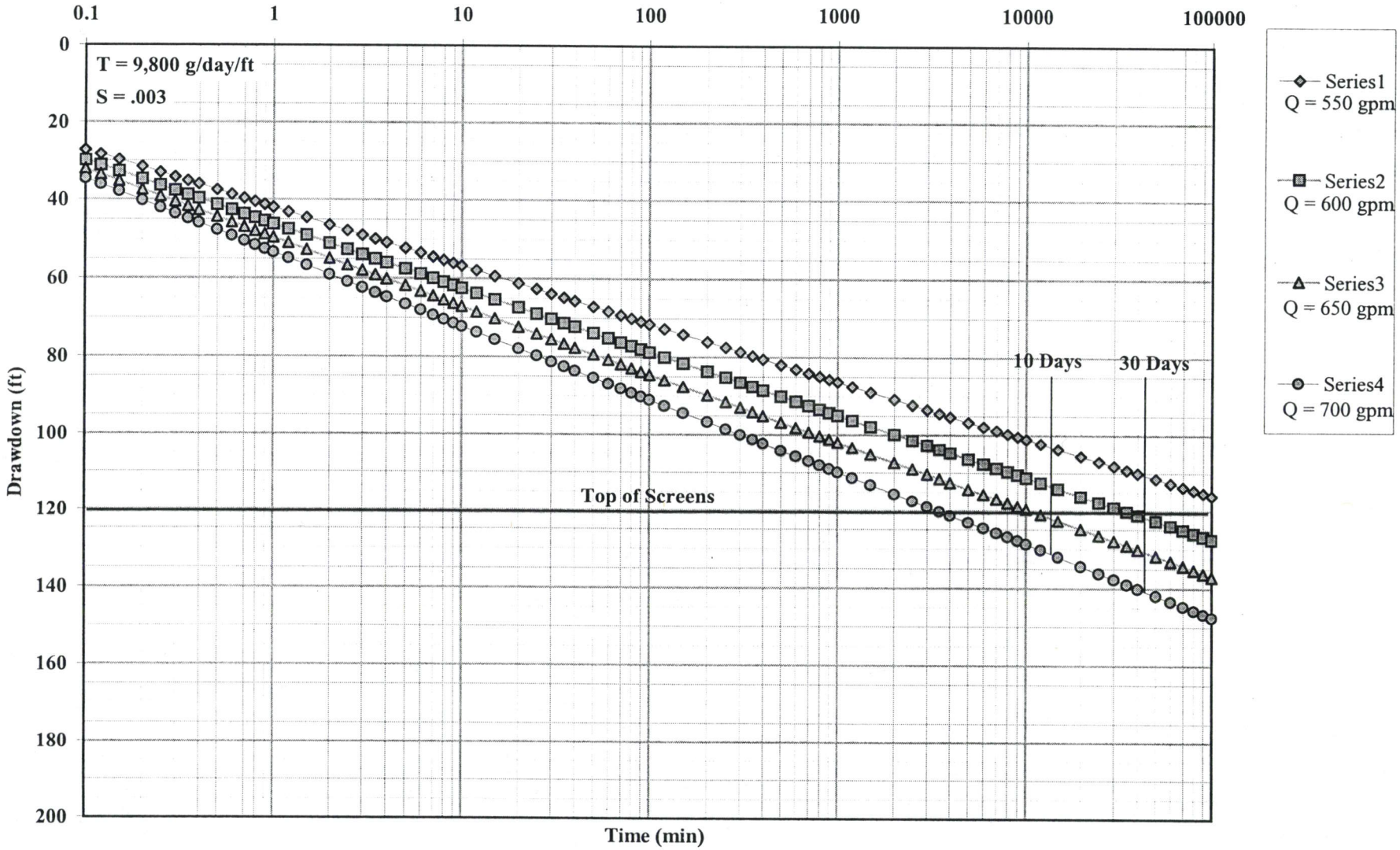
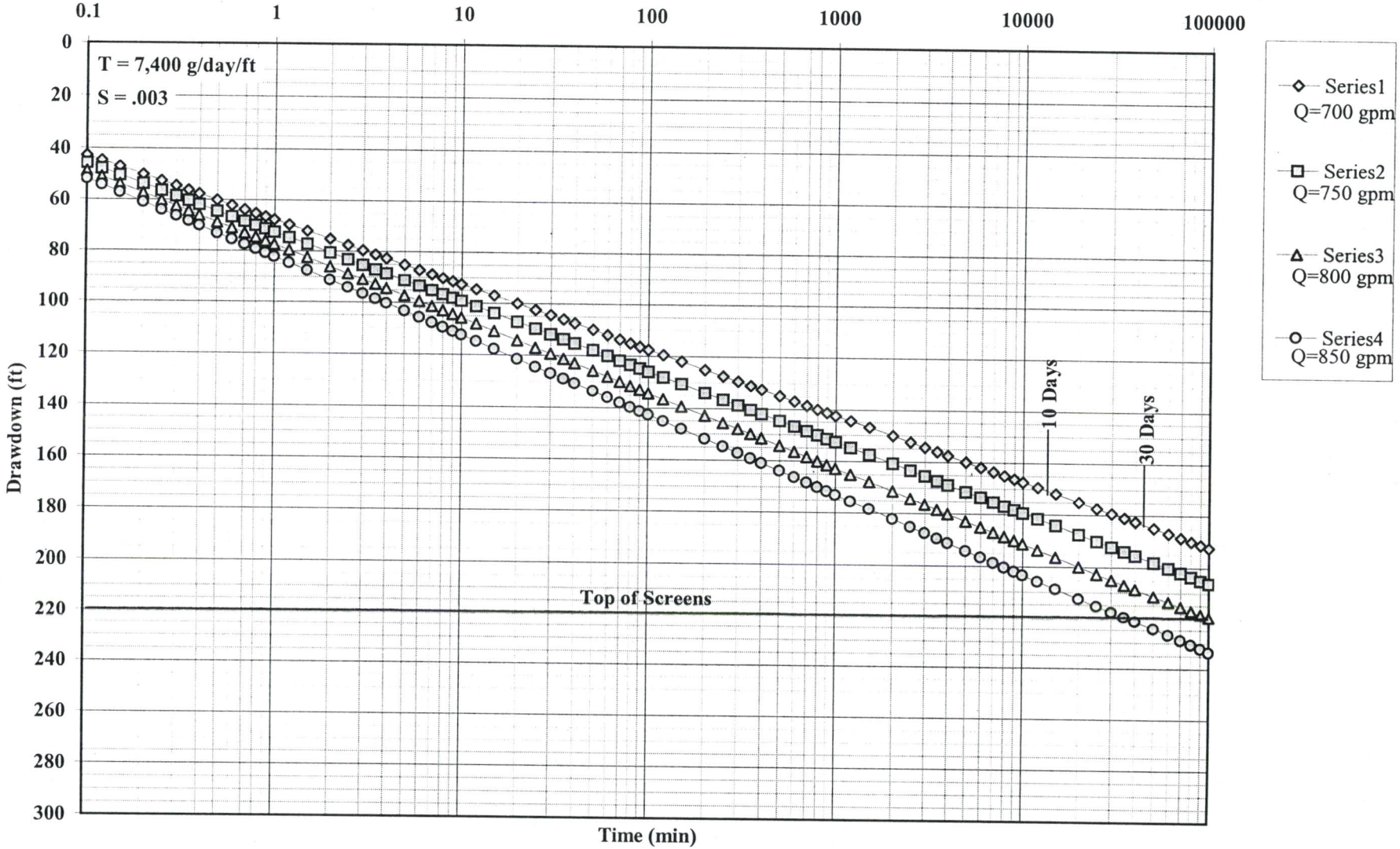


Figure 13
Tessa PW-2 (East)
Simulated Pumping Rates



plots also show the depth to the top of the screened interval for each well. Without the conservative impact of the recharge boundary, the figures show what pumping levels should be at various pumping rates for a specific period of time. The recommended yields are based on the assumption that the wells will never pump continuously for more than 30 days. If pumping scenarios are reduced such that the wells are not likely to pump continuously for 30 days, the rates could be increased by about 100 gallons per minute for each well.

The ideal mechanism to achieve the maximum yield without dropping the pumping level below the top of the screens would be to install a variable speed pump. A variable speed pump could be adjusted to a specific pumping level, rather than a specific pumping rate. Depending on the pump curve, the well could pump significantly higher rates for short periods of time which would allow better "peaking capacity" from the wells. Setting the rate to the maximum pumping level would allow the well to perfectly match the aquifer yield.

WATER QUALITY

Samples were collected according to sample collection protocol outlined in Standard Methods for the Analysis of Water and Wastewater then submitted to State and/or Federally certified analytical laboratories for water quality analysis. The samples were analyzed for primary and secondary inorganic constituents, volatile and synthetic organic compounds, and radiochemistry. All analysis results are included in the Appendix.

Tessa PW-1 (west)

Water quality analysis was performed following 48 hours of constant rate discharge of approximately 600 gallons per minute. Laboratory analysis indicates water quality meets all current State of Nevada drinking water standards.

Tessa PW-2 (east)

Water quality analysis was performed following 20 hours of constant rate discharge. Laboratory analysis indicates water quality meets all current State of Nevada drinking water standards.

APPENDIX A-Drillers Logs, Geologists Logs

PAGE I OF II

Production Well #1

TESSA -PW-1 (west)

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 42556

1. OWNER Galena Water Enterprises
MAILING ADDRESS C/O Randy Bowling
P.O. Box 12926 Reno, NV 89510

ADDRESS AT WELL LOCATION 4.5 Miles West of Highway 395 on Mount Rose Highway

2. LOCATION NW ¼ SW ¼ Sec. 35 T 18 N/S R 19 E Washoe County

PERMIT NO. 61267 & 61268 (Issued by Water Resources) | 150-102-01 (Parcel No.) | Not Applicable (Subdivision Name)

3. WORK PERFORMED: ☒ New Well ☐ Replace ☐ Recondition ☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE: ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE: ☐ Cable ☐ Rotary ☒ RVC ☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Boulders and SAnd		0	6	
Boulders		6	16	
Granite Boulders		16	22	
Boulders, Cobbles, and Sand		22	200	
Sand and Gravel with a Little Clay		200	210	
Boulders, Cobbles, and Sand		210	220	
Boulders and Hard Rock		220	230	
Cobbles, Sand, and Blue Clay		230	235	
Cobbles and Sand		235	310	
Sandstone, Volcanic Rock, and Sand		310	320	
Volcanic Rock and Black Rock		320	440	
Volcanic Rock, Red and Black Rock with Sands		440	450	
Black Rock with Blue Sandy Clay		450	480	
Coarse Sand with Blue Clay		480	520	
Volcanic Rock and a Little Blue Clay		520	530	
Volcanic Rock with Sands		530	650	
Volcanic Rock with Sandy Blue Clay		650	660	

Date started June 30, 19 99
Date completed August 20, 19 99

7. WELL TEST DATA

TEST METHOD: ☐ Bailer ☐ Pump ☒ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
150	320	90+

8. WELL CONSTRUCTION
Depth Drilled 795 Feet Depth Cased 780 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
28 Inches	0 Feet	100 Feet
22 Inches	100 Feet	795 Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
24		0.375	0	100
14		0.250	0	780

Perforations:
Type perforation Wire Wrap Screen
Size perforation 0.065
From 400 feet to 620 feet
From 640 feet to 760 feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 100'
Placement Method: ☒ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☒ Cement Grout ☐ Concrete Grout

Gravel Packed: ☒ Yes ☐ No
From 0 feet to 795 feet

9. WATER LEVEL
Static water level 282 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name Layne Christensen Company (Contractor)
Address 275 County Road 98 (Contractor)
Woodland, CA 95695
Nevada contractor's license number issued by the State Contractor's Board 0019101
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2113
Signed (driller performing actual drilling on site or contractor)
Date September 2, 1999

(Rev. 3-91)

USE ADDITIONAL SHEETS IF NECESSARY

(O)-627

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

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STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO.

1. OWNER Galena Water Enterprises
MAILING ADDRESS C/O Randy Bowling
P.O. Box 12726 Reno, NV 89510

ADDRESS AT WELL LOCATION 4.5 Miles West of Highway 395 on Mount Rose Highway

2. LOCATION NW ¼ SW ¼ Sec. 35 T. 18 N/S R. 19 E. Washoe County
PERMIT NO. 61267 & 61268 (Issued by Water Resources) | 150-102-01 (Parcel No.) | Not Applicable (Subdivision Name)

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Black Volcanic Rock with some Blue Clay and Sands		660	795	

Date started ..... 19.....
Date completed ..... 19.....

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled ..... Feet Depth Cased ..... Feet

HOLE DIAMETER (BIT SIZE)

	From	To
..... Inches	..... Feet	..... Feet
..... Inches	..... Feet	..... Feet
..... Inches	..... Feet	..... Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)

Perforations:
Type perforation .....
Size perforation .....
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet
From ..... feet to ..... feet

Surface Seal: ☐ Yes ☐ No
Depth of Seal .....
Placement Method: ☐ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☐ Cement Grout ☐ Concrete Grout

Gravel Packed: ☐ Yes ☐ No
From ..... feet to ..... feet

9. WATER LEVEL
Static water level ..... feet below land surface
Artesian flow ..... G.P.M. ..... P.S.I.
Water temperature ..... °F Quality .....

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Layne Christensen Company (Contractor)
Address 275 County Road 98 (Contractor)
Woodland, CA 95695

Nevada contractor's license number issued by the State Contractor's Board 0019101
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2113

Signed Ricky Cooper (By driller performing actual drilling on site or contractor)
Date September 2, 1999

(Rev 1-91)

USE ADDITIONAL SHEETS IF NECESSARY

(O)-627

Monitoring well #1

TESSA MW-1 (West)

WHITE–DIVISION OF WATER RESOURCES
CANARY–CLIENT'S COPY
PINK–WELL DRILLER'S COPY

THI

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STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 42556

1. OWNER Galina Water Enterprises
MAILING ADDRESS c/o Randy Bowling PO BOX 12926 Reno, Nevada 89510
ADDRESS AT WELL LOCATION 4.5 miles west of highway 395 on Mount Rose Highway

2. LOCATION NW ¼ SW ¼ Sec. 35 T 18 N/S R 19 E Washoe County
PERMIT NO. 61267, 61268 (Issued by Water Resources) APN 150-102-01 (Parcel No.) N/A (Subdivision Name)

3. WORK PERFORMED: [X] New Well [ ] Replace [ ] Recondition [ ] Deepen [ ] Abandon [ ] Other

4. PROPOSED USE: [ ] Domestic [ ] Irrigation [ ] Test [ ] Municipal/Industrial [X] Monitor [ ] Stock

5. WELL TYPE: [ ] Cable [X] Rotary [ ] RVC [ ] Air [ ] Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Boulders/cobbles		0'	220'	220'
Little sand				
Dark basalt		220'	250'	30'
Little brown clay				
Dark basalt		250'	330'	80'
Some red cinders				
Dark basalt/		330'	540'	210'
Brown sandy clay				
Dark basalt		540'	670'	130'
Some ash and white clay				
Gray rock with gray ash		670'	685'	15'
Black porous basalt		685'	1000'	
Little ash/brown sandy clay			T.D.	

Date started June 6th, 19 99
Date completed June 29th, 19 99

7. WELL TEST DATA
TEST METHOD: [ ] Bailer [ ] Pump [X] Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
Airlift through 2" casing. Could not be monitored.		38 Total

8. WELL CONSTRUCTION
Depth Drilled 1000 Feet Depth Cased 1000 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
12 1/4" Inches	0 Feet	1000 Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
2"			0	1000'
2"		Blank	+ 2'	454'
2"		Screen	454'	1000'

Perforations:
Type perforation Mill Slot
Size perforation .07
From 454' feet to 1000' feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: [X] Yes [ ] No
Depth of Seal 100'
Placement Method: [X] Pumped [ ] Poured
Seal Type: [ ] Neat Cement [X] Cement Grout [ ] Concrete Grout

Gravel Packed: [X] Yes [ ] No
From 100' feet to 1000' feet

9. WATER LEVEL
Static water level 281 feet below land surface
Artesian flow None G.P.M. P.S.I.
Water temperature cool °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name Layne Christensen Company (Contractor)
Address 275 County Road 98 (Contractor)
Woodland, CA 95695
Nevada contractor's license number 0019101 issued by the State Contractor's Board
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2013
Signed (By driller performing actual drilling on site or contractor)
Date July 1, 1999

(Rev. 3/91)

USE ADDITIONAL SHEETS IF NECESSARY

(1) 627

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PW-2

EAST WELL
PW2
TESSA PW-2 (east)

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO.

1. OWNER GALENA WATER ENTERPRISES
MAILING ADDRESS C/O RANDY BOWLING CONSULTING PO BOX 12926/RENO, NV/89510
ADDRESS AT WELL LOCATION 4.5 MILES UP MOUNT ROSE HIGHWAY FROM HIGHWAY 395 ON SOUTH SIDE OF ROAD

2. LOCATION NE ¼ SW ¼ Sec. 35 T 18 N/S R 19 E WASHOE County
PERMIT NO. 61269 & 61270 (Issued by Water Resources) | 150-102-01 (Parcel No.) | NOT APPLICABLE (Subdivision Name)

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☒ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☒ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
SAND, GRAVEL, COBBLES AND BOULDERS		0	160	
SAND, GRAVEL, COBBLES BOULDERS WITH VOLCANICS, MINOR CLAY		160	310	
RED AND BLACK VOLCANIC ROCK, SANDY CLAY, GRANITE		310	404	
BLACK AND RED VOLCANICS, SAND, CLAY		404	673	
BLACK ROCK WITH SANDY BROWN CLAY, FRACTURED ROCK WITH VOLCANICS		673	735	

Date started JANUARY 20, 2000
Date completed MARCH 25, 2000

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☒ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
100	250	47

8. WELL CONSTRUCTION
Depth Drilled 735 Feet Depth Cased 715 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
32 Inches	0 Feet	157 Feet
22 Inches	157 Feet	735 Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
14		.250	0	715
24			0	157

Perforations:
Type perforation WIRE WRAP SCREEN
Size perforation 0.065
From 440 feet to 540 feet
From 560 feet to 710 feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 157'
Placement Method: ☒ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☒ Cement Grout ☐ Concrete Grout

Gravel Packed: ☒ Yes ☐ No
From 0 feet to 735 feet

9. WATER LEVEL
Static water level 180 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name LAYNE CHRISTENSEN COMPANY (Contractor)
Address 275 COUNTY ROAD 98 (Contractor)
WOODLAND, CA 95695
Nevada contractor's license number issued by the State Contractor's Board 0019101
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2141
Signed (By driller performing actual drilling on site or contractor)
Date APRIL 12, 2000

(Rev. 3-91)

USE ADDITIONAL SHEETS IF NECESSARY

(O)-627

TH-2A

TESSA MW-2 (east)

WHITE—DIVISION OF WATER RESOURCES
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STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO.

1. OWNER Galena Water Enterprises
MAILING ADDRESS C/O Randy Bowling Consulting P.O. Box 12926 Reno, NV 89510
ADDRESS AT WELL LOCATION 4.5 Miles up Mount Rose Highway from Highway 395 on south side of Road

2. LOCATION NE ¼ SW ¼ Sec. 35 T 18 N/S R 19 E Washoe County
PERMIT NO. 61269 & 61270 (Issued by Water Resources) | 150-102-01 (Parcel No.) | Not Applicable (Subdivision Name)

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☒ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Sand and Boulders		0	22	
Boulders with Quartz		22	36	
Sand and Cobbles		36	52	
Cobbles and Sand		52	59	
Boulders and Sand		59	87	
Sands and Gravel with some Brown Clay		87	97	
Cobbles and Sands with Quartz		97	107	
Cobbles with Quartz and Sand		107	137	
Cobbles and Sand with Boulders		137	169	
Boulders		169	174	
Cobbles and Sand		174	238	
Sand and Gravel		238	242	
Sand and Volcanic Gravel		242	250	
Fine to Medium Sand and Volcanic Gravel		250	255	
Medium Volcanic Gravel		255	260	
Coarse Sand and Gravel		260	263	
Red and Black Roack with Sands		263	280	
Red-Black Rock with Brown Clay and Sands		280	300	
Boulders		300	302	
Black Rock and Sandy Clay		302	310	

Date started September 27----, 1999
Date completed October 13------, 1999

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☒ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)
15	N/A	N/A

8. WELL CONSTRUCTION
Depth Drilled 725 Feet Depth Cased 698.43 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
12 1/4" Inches	0 Feet	725 Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
3"		SCH 40 Steel	+5.43	467.43
			467.43	698.43

Perforations:
Type perforation Mill Slot
Size perforation .060 Slot
From 467.43 feet to 698.43 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 100 feet
Placement Method: ☒ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☒ Cement Grout ☐ Concrete Grout

Gravel Packed: ☒ Yes ☐ No
From 100 feet to 725 feet

9. WATER LEVEL
Static water level 219 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature °F Quality Good

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Layne Christensen Company (Contractor)
Address 275 County Rd. 98 (Contractor)
Woodland, CA 95695

Nevada contractor's license number issued by the State Contractor's Board 0019101
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2113

Signed Ricky Cooper (Driller performing actual drilling on site or contractor)
Date October 21, 1999

(Rev. 3-91)

USE ADDITIONAL SHEETS IF NECESSARY

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WHITE—DIVISION OF WATER RESOURCES
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STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO.

1. OWNER
MAILING ADDRESS
ADDRESS AT WELL LOCATION

2. LOCATION ¼ ¼ Sec. T. N/S R. E. County
PERMIT NO. (Issued by Water Resources) Parcel No. Subdivision Name

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Red and Black Rock,				
Sandy Brown Clay		310	324	
Brown Clay with Black				
Rock with Red Volcanic				
Rock		324	340	
Black Rock with				
Volcanics "with some				
Gravel"		340	370	
Black Rock with Sandy				
Brown Clay and				
Volcanics		370	419	
Black Rock with Sandy				
Brown Clay and				
Volcanics		419	426	
Fractured Black Rock				
and Volcanics		426	428	
Black Rock with Sandy				
Brown Clay and				
Volcanics		428	440	
Fractured Black Rock				
with Volcanics		440	448	
Black Rock with Sandy				
Brown Clay and				
Volcanics		448	505	
Boulders		505	508	
Black Rock with Sandy				
Brown Clay and				
Volcanics		508	540	
Black Rock with Sandy				

Date started , 19
Date completed , 19

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

	G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled Feet Depth Cased Feet

HOLE DIAMETER (BIT SIZE)

	From	To
Inches	Feet	Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)

Perforations:
Type perforation
Size perforation
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☐ Yes ☐ No
Depth of Seal
Placement Method: ☐ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☐ Cement Grout ☐ Concrete Grout
Gravel Packed: ☐ Yes ☐ No
From feet to feet

9. WATER LEVEL
Static water level feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name (Contractor)
Address (Contractor)

Nevada contractor's license number issued by the State Contractor's Board
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2113

Signed (By driller performing actual drilling on site or contractor)
Date

(Rev. 3-91)

USE ADDITIONAL SHEETS IF NECESSARY

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WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
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STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO.

1. OWNER
MAILING ADDRESS
ADDRESS AT WELL LOCATION

2. LOCATION ¼ ¼ Sec. T N/S R E County
PERMIT NO. (Issued by Water Resources) Parcel No. Subdivision Name

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☐ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☐ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Brown Clay and				
Volcanics		540	560	
Brown Clay with very				
little Rock		560	570	
Black Rock with				
Volcanics and very				
little Clay		570	578	
Brown Clay and Volcanic				
Rock		578	620	
Fractured Rock with				
Volcanics and some				
Brown Clay		620	686	
Volcanic Rock with				
Sandy Brown Clay		686	700	
Volcanic Rock with				
Sands and Sandy Clay		700	710	
Sands		710	715	
Volcanic Rock and				
Sandy Clay		715	725	

Date started , 19
Date completed , 19

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled Feet Depth Cased Feet

HOLE DIAMETER (BIT SIZE)

	From	To
Inches	Feet	Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)

Perforations:
Type perforation
Size perforation
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☐ Yes ☐ No
Depth of Seal
Placement Method: ☐ Pumped ☐ Poured
Seal Type: ☐ Neat Cement ☐ Cement Grout ☐ Concrete Grout
Gravel Packed: ☐ Yes ☐ No
From feet to feet

9. WATER LEVEL
Static water level feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.

Name (Contractor)
Address (Contractor)

Nevada contractor's license number issued by the State Contractor's Board
Nevada driller's license number issued by the Division of Water Resources, the on-site driller 2113

Signed (By driller performing actual drilling on site or contractor)
Date

(Rev. 3-91)

USE ADDITIONAL SHEETS IF NECESSARY

(O)-627

TESSA MW-1 (west)

GALENA WATER WELL SERIES #1-4

DRILLING CHARACTERISTICS TH #1

0-10' - SAND/GRANITE BOULDERS SURFACE DRILLING HARD + ROUGH

10-60' - MOSTLY BOULDERS PATCHES OF SANDY CLAY VERY ROUGH WHEN BROKEN / DRILLING BOULDERS IS SMOOTH EXTREMLY HARD

60-80' - STILL SOME BOULDERS BUT MOSTLY COBBLES SAND DRILLING IS VERY ROUGH BUT PENT. RATES INCREASING. STRINGERS OF CLAY (BROWN) PRESENT

80-128' - SMALLER COBBLES W/ A LOT OF FINE RED SAND, GRAVY DRILLING, EXCELLENT PENT. RATES. 90'-100' ENCOUNTERED SOME BROWN SANDY CLAY (NOT EVIDENT IN SAMPLES) GOOD DRILLING.

128-132' HIT SOMETHING VERY SOLID COULD BE FORMATION OR 1 HUGE BOULDER, REGARDLESS, PENT RATES SUCK VERY LOW 1-2'/HR. IF LUCKY. EXTREMELY ROUGH GEARED DOWN TO DRILL!

132-175' ROUGH DRILLING VERY BOUNCY, PENT RATES OK ± 2 HRS. TO A KELLY NO SUBSTANTIAL FLUID LOSS YET. MOSTLY COBBLES & SAND SOME SMALLER BOULDERS

175-189' ANOTHER HARD SPOT, EXTREMELY SLOW PENT. RATES - THIS COULD BE LIMESTONE EXTREMELY HARD, MOSTLY SMOOTH DRILLING.

189-215' GOOD DRILLING, COBBLES GRAVEL/SAND CLAY

215-258' HARD! BOULDERS AGAIN! BLACK ROCK VERY FRACTURED & HARD PENT. RATES MODERATE TO SLOW 6-12'/HR (AVERAGE). CLAY LENS FROM 242'-246'. EXPERIENCING SOME FLUID LOSS (SMALL AMT)

258' +- 300' VERY ROUGH DRILLING PENT. RATES VARY FROM 5'-25'/HR. VERY FRACTURED BLACK ROCK WITH STREAKS of BLACK SAND IN IT (SAND LENS DRILL GOOD & SMOOTH FAST DRG. STILL LOSING A LITTLE FLUID

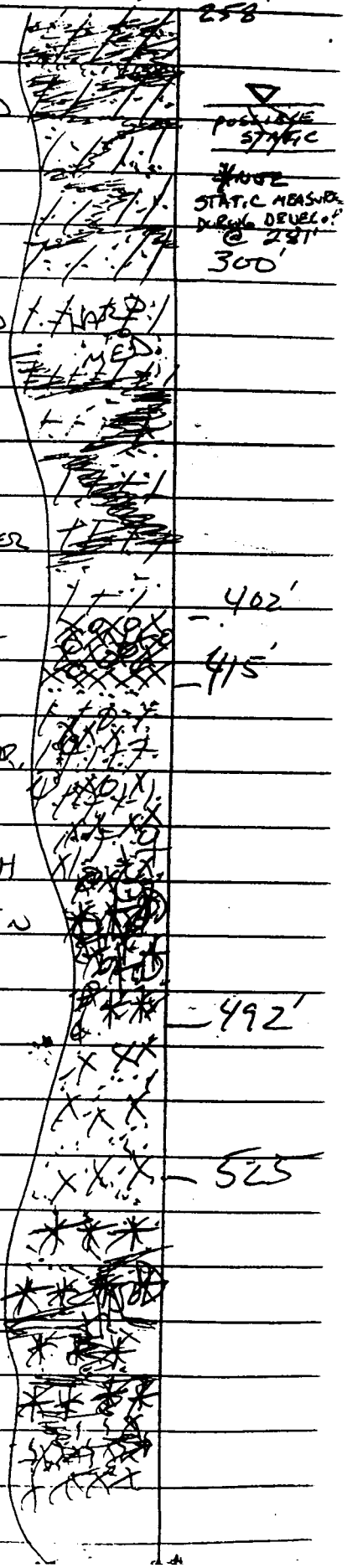
300' +- 402' STILL VERY FRACTURED. A LITTLE BLACK SAND PRESENT. PENT. STILL VARYING 5'-25'/HR. DRILLING IS VERY ROUGH. MUD VISC. SEEMS TO BE BREAKING DOWN FREQUENTLY NOW. POSSIBLE H_2O INTRUSION. FINE GRAINED BLACK ROCK. SOME LIGHTER ROCK PRESENT

402' - 415' - ALOT OF CLAY (BROWN SANDY) W/ FITTER BASALT BOULDERS OR FORMATION MIXED. SEMI ROUGH. EXCELLENT PENT RATES 40'+/HR. VERY SHALLOW LAYER UNFORTUNATELY

415' - 492' BACK INTO BASALIC FORMATION ROUGH & VERY HARD IN AREAS EASIER DRILLING IN OTHERS PENT AVG. @ 12'-14'/HR.

492' - 525' BLACK COARSE SAND W/ SANDY BROWN CLAY PENT. RATES 20'-30'/HR. SMOOTH DRG. LOSING A LITTLE FLUID. SOME AREAS ARE VERY CONSOLIDATED & ROUGH.

525- BLACK BASALT, SOME FINE CRYSTALS IN IT DRILLING IS FRACTURED & ROUGH BUT PENETRATABLE 20'+/HR SLOWER IN SOME AREAS. SOME GRAY ASH OR CLAY IS PRESENT



569-574 EXTREMELY HARD, FRACTURED BASALT DRILLING IS POOR PENT RATES 3-5 FT/HR. EXPERIENCING LITTLE TO NO FLUID LOSS STRING WT. IS APPROX. 17,000 #S. RUNNING MOST OF THAT TO DRILL

574-670. MOSTLY VOLCANIC BASALT. LITTLE PRESENCE OF RED CINDERS. HITTING LENS OF WHITE CLAY & ALSO BRN. SANDY CLAY. PENT RATES VARY 10 FT. - 40 FT/HR. SOME CLAY SWELLING HERE.

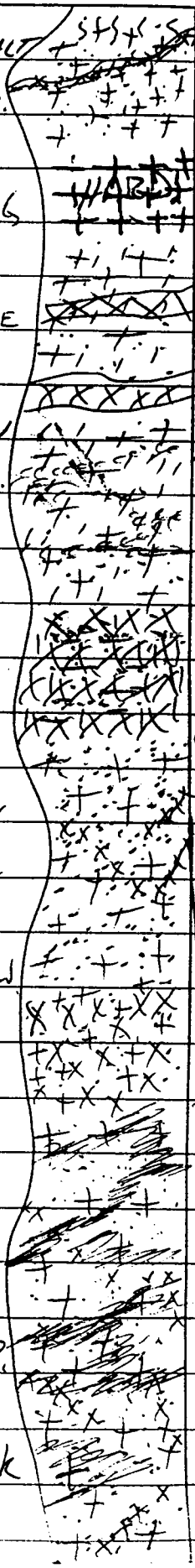
670-685 LITTLE DIFFERENT FORMATION HERE SHOWING GRAY ROCK W/ ALOT OF GRAY CLAY/POSSIBLY ASH. PENT. RATES ARE VERY GOOD AND MY PEN IS LYING. SUPER FAST DRILLING. RUNNING VERY LITTLE WT. TO PENETRATE. HOW LONG WILL IT LAST?

685-728 - NOT LONG ENOUGH! HARD FORMATION VERY FRACTURED & ROUGH TO DRILL. BASALT IS POUROUS IN PLACES VERY SMALL CRYSTALS. COULD BE GOOD H_2O HERE. 8-12 FT/HR. AVG.

728-743 BLACK BASALT W/ ALOT OF BROWN CLAY & SAND. PENT. RATES EXCELLENT 20-30 FT/HR. AVG.

743-900. DRILLING IS PRETTY UNIFORM HERE. PENT RATES ARE FAIR 8-20 FT/HR. SOME FLUID LOSS EXPERIENCED IN FRACTURED AREAS. BASALT/VOLCANIC ROCK

↓



245 Cont'd

ARE COMMONPLACE NOW. STILL SEEING STRINGERS OF BLACK SAND & LENS OF WHITE & BROWN SANDY CLAY, BUT IT'S NOT VERY EVIDENT IN THE DRILLING. STRING WT. IS AROUND 28K RUNNING AROUND 20,000 #'s ON BIT. ROTARY IS TURNING 35-48 R's. SOME VERY ROUGH AREAS.

900' 968' SOME GRAY ROCK W/ ASH ALOT OF BLACK BASALT W/ LITTLE BROWN CLAY PENT RATES STILL AROUND 8-20 FT./HR. NO FLUID LOSS ~~HERE~~ HERE.

968'-1000' T.D. - BLACK BASALT, SOME BROWN CLAY MIXED W/ GRAY ASH/CLAY MOSTLY HARD DRILLING, VERY FRACTURED. SOME POUROUS BASALT ENCOUNTERED, MAY BE LOSING SOME FLUID CLOSE TO THE BOTTOM. PENT. RATES 6-15 FT/HR.

900'

968'

1000'

T.D.

LEGEND

FINE TO MED. SAND

MED. TO LARGE COBBLES

BOULDERS

DIFFERENT CLAY VARIETIES

mostly GRAY ASH/CLAY

HARD ROCK FORMATION

EXTREME HARD ROCK FORMATION

SAND/CLAY & VOLCANIC GRAY ROCK

APPENDIX B-Test Pumping-Field Data and Graphs

DATA AND FIELD PLOTS FOR PW-1 (west)

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL TESSA PW1
(PUMPING)/OBSERVATION WELL
(PUMPING)/RECOVERY DATA

TYPE of PUMPING TEST STEP DRAWDOWN TEST
HOW Q MEASURED 5"x8" ORIFICE WEIR
HOW WL's MEASURED TRANSDUCER 250 PSI TEST 1
PUMPED WELL NO. TESSA PW1
RADIUS of PUMPED WELL DIAMETER 14"
DISTANCE from PUMPED WELL —

M.P. for WL's 1" PVC STILLWELL elev. —
DEPTH of PUMP/AIRLINE 450 wrt —
% SUBMERGENCE: initial —; pumping —
PUMP ON: date 5/22/00 time 0950
PUMP OFF: date — time —

TIME t= at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 279.79					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or s'	Q/s	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
		1			333.50	STEP I		53.71		25.5	500	SWL TH1 282.24
		2			346.44			66.65				
		3			329.26			49.47				Q↓
		4			327.97			48.18				
		5			327.84			48.05				
		6			329.04			49.25				
		7			329.35			49.56				
		8			330.14			50.35				
		9			330.61			50.82		25½-26		
		10			329.92			50.13				Q↑
		12			331.39			51.60		24¾		Q↑
		14			331.99			52.20				
		16			332.21			52.42				
		18			333.19			53.40				TH1 288.52
		20			334.91			55.12	9.10			SAND 0.3 mℓ in 20 MINUTES
		24			335.48			55.69				
		28			335.86			56.07				
		30			336.52			56.73		25½		
		34			336.77			56.98				
		38			337.27			57.48				
		40			338.06			58.27				
		44			338.53			58.74		25½-26'		Q OK
		48			338.90			59.11				
		50			339.44			59.65		25+		Q↑
1050		60			340.82			61.03				Q↑
1100		70			341.14			61.35	8.14			
1110		80			341.42			61.63				
1120		90			343.30			63.51	7.9			
1123		98										Q↑
1130		100				STEP II				37"	604	98 min = 293.41 on TH1
		102	2		351.88			72.09				Sand = 0.35 mℓ @ 10 / min
		104	4		352.44							
		106	6		353.82			74.03				
		108	8		355.52							
1140		110	10		354.01			74.22				
1142		112	12		355.27			74.58				Q↓ @ 1145 33"
		116	16		356.21			76.42				
		120	20		356.97			77.18				
		130	30		357.84			78.05				
		140	40		358.72			78.93	7.6			

WASHOE COUNTY

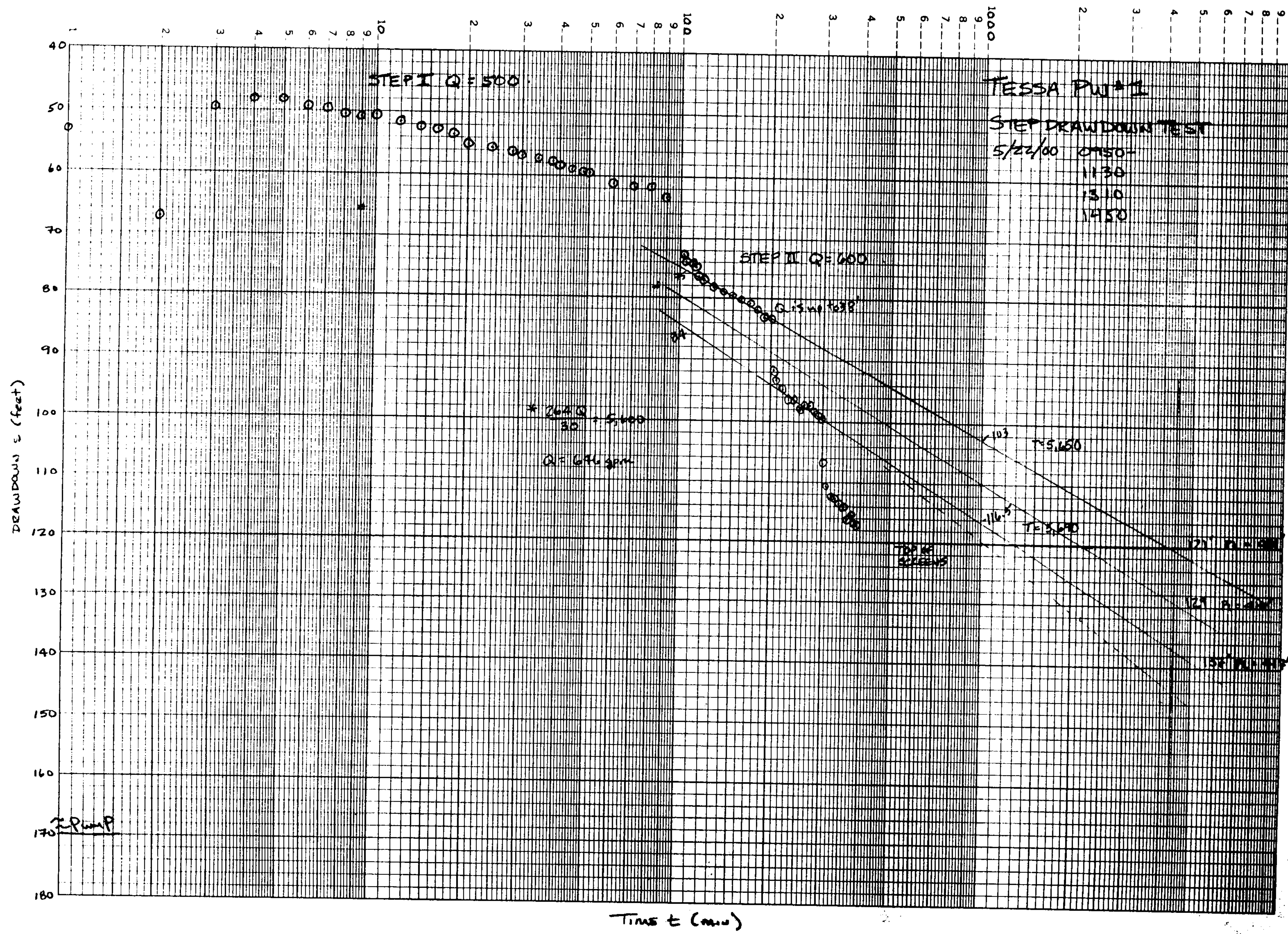
DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL TESSA PW1 - (west)
~~PUMPING~~/OBSERVATION WELL
~~PUMPING~~/RECOVERY DATA

TYPE of PUMPING TEST STEP Drawdown Test
HOW Q MEASURED _____ M.P. for WL's _____ elev. _____
HOW WL's MEASURED _____ DEPTH of PUMP/AIRLINE _____ wrt _____
PUMPED WELL NO. _____ % SUBMERGENCE: initial _____ ; pumping _____
RADIUS of PUMPED WELL _____ PUMP ON: date 5/22/00 time 0950
DISTANCE from PUMPED WELL _____ PUMP OFF: date _____ time _____

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'	Q/s		Q	(NOTE ANY CHANGES IN OBSERVERS)
		150			359.41			79.62				
		160			360.29			80.50				
		170			360.58			80.79			Q=38"	
1250		180			361.74			81.95			Q=38"	
		190			362.84			83.05			Q=38"	
		198			363.56			83.77			Q=38"	
		200			363.65	STEP III		83.86	7.2		Q=50" = 690 gpm	
		202			369.52			89.73				
		204			371.78			91.99				
		206			372.44			92.65				
		208			372.32			92.53				
		210			372.91			93.12				
		220			374.58			94.79				
		230			375.96			96.17				
1350		240			375.89			96.10				
		250			377.84			98.05				
		260			377.06			97.27				
		270			377.31			97.52				
		280			377.90			98.11				Sand = 0.40
		290			378.97			99.18				
		298			379.44			99.65	7.0		Q=51.5"	
1450		300			386.66	STEP IV		106.87			Q=65" = 800 gpm	
		302	2		387.88			108.09				
		310	10		390.11			110.32				
		320	20		392.12			112.33			65-66"	
		330	30		392.37			112.58				
		340	40		393.21			113.42				TH1 303 03 @ 346'
1640		350	50		394.00			114.21	7.0			
1550		360	60		395.97			116.18			66"+	
1600		370	70		395.63			115.57			65½+	VALVE CLOSE TO WIDE OPEN
1610		380	80		396.91			117.12			65-66	
1620		390	90		396.88			117.09				
1630		400	100		397.98			118.19	6.8			



WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA PW1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Discharge
HOW Q MEASURED
HOW WL's MEASURED Pressure Transducer
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's Top PVC elev.
DEPTH OF PUMP/AIRLINE ~440' wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date 5/26/00 time 1045

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q/s	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
1046		1			332.77			50.72		37"	604	
		2			337.80			55.75				
		3			338.96			56.91				
		4			338.02			55.97				
		5			339.56			57.51				
		6			340.12			58.07				
		7			341.07			59.02				
		8			342.76			60.71				
		9			343.27			61.22				
1055		10			343.71			61.66				
		12			345.21			63.16				
		14			346.50			64.45				
		16			347.35			65.30				
		18			348.01			65.96				
		20			349.01			66.96				
		26			350.05			68.00				
1115		30			350.93			68.88		37¾"		Q↓
		36			351.62			69.57		37¼"		Q↑@ 1118
		40			353.07			71.02				
		46			354.54			72.49				
		50			354.51			72.46				
1145	0 1	60			354.70			72.65				
1155		70			356.74			74.69		37½ -	38"	Q↓
1205		80			357.40			75.35		37"		Q↑
1215		90			358.28			76.23				
		100			359.09			77.04		37"		SDS
1245	0 2	120			361.10			79.05				
		140			362.77			80.72		37"		
		160			364.18			82.13				
1315	0 3	180			365.28			83.23		37¾"		SDS Q↓, Up + Down
		200			364.56			82.51		37		
		220			366.19			84.14				
1445	0 4	240			367.48			85.43				
		260			368.39			86.34		37½		
		280			368.76			86.71				
1545	0 5	300			368.58			86.53		37½		LAYNE PUMPER SAYS FLOW HAS BEEN CLOSER TO 37½"
1605		320			370.58			88.53				
		340			369.35			87.53		37¼		
1645	0 6	360			369.99			87.94				
		380			371.43			89.38		37¼		
		400			372.34			90.29				
1745	0 7	420			373.19			91.14		37½		
		440			372.90			90.85				
		460			372.69			90.64		37½		
1845	0 8	480			372.22			90.17		36½		PW1

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA PW1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST _____
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date _____ time _____
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'		h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
		500			374.57			92.52		37.5		
		520			374.26			92.21				
1945	09	540			375.04			92.99		37 7/8		
		560			373.75			91.70				
		580			376.20			94.15		38		
2045	0 10	600			374.57			92.52				
		620			376.14			94.04		37 1/4		
		640			375.70			94.48				
2145	0 11	660			377.08			95.03				
		680			377.40			95.35		37 1/4		
		700			377.40			95.35				
2245	0 12	720			377.99			95.94				
		740			376.77			94.72		37 1/2		
		760			378.43			96.38				
2345	0 13	780			379.09			97.04				
		800			377.43			95.38		38 1/4		
		820			378.34			96.29				
0045	0 14	840			378.46			96.41				
		860			377.68			95.63		36 1/2		
		880			378.27			96.22		37 1/4		
0145	0 15	900			377.71			95.66				
		920			377.91			95.85				
		940			376.17			94.12		- "		
0245	0 16	960			378.12			96.07				
		980			377.30			95.2				
0345		1000			378.15			96.10				
0445		1020			378.71			96.66		38 1/4		
		1040			378.20			96.25				
		1060			378.40							
		1080			377.45			97.41				
		1100			381.02			99.82				
0625		1160			380.06			98.01				
0655		1210			380.31			98.26				
0725		1240			379.87			97.82				
0755		1270			379.81			97.76				
0825		1300			379.78			97.73		36 3/4		
0855		1330			379.78			97.78				shift change
0925		1360			381.13			99.08				
0955		1390			378.84			96.79				
1025		1420			381.29			99.24		34 1/2		↑ = 37

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

VELL Tessa PW1
~~PUMPING~~ / OBSERVATION WELL
~~PUMPING~~ / RECOVERY DATA
PAGE 3 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
1055		1450			381.29		99.24					
1125		1480			378.96		96.91					
1155		1510			380.31		98.26					
1225		1540			381.04							
1255		1570			380.31							
1325		1600			379.72		97.67					
1354		1630			382.01							
1425		1660			381.51		99.46					
1455		1690			381.51		99.46					
1555		1750			381.00		98.95				37 1/8	EE @ 3:30
		1780			382.45		100.40				37 1/2"	EE @ 4:00
1655		1810			381.00	✓✓	98.95					
		1840			380.38		98.33					
1755		1870			380.84							
		1900			382.89		100.84					
1855		1930			380.72							
		1960			381.47							
1955		1990			382.26		100.21					
2025		2020			383.14		101.09					
2155		2110			380.82							MW: pumpers shift
		2140			381.85					37		left site
2255		2170			382.45					37 1/4		GPS 0600
		2200			381.76		99.71					
2355		2230			381.66							
		2260			383.98							
0055		2290			383.89		101.94					
		2320			382.48							
0155		2350			383.80							
		2380			383.36							
0255		2410			383.67		101.62					
		2440			383.[illegible]							
0355		[illegible]			382.[illegible]							
		[illegible]			383.53		101.53					
0455		[illegible]			38[illegible]							
		[illegible]			383.[illegible]							
0555		2530			383.17		101.12					
		2620			382.92							
0655		2650			381.32		[illegible].27					
		2680			383.45							
0755		2740			382.55		[illegible].50			37"		GPS LV Site 0740
		2800			383.23							
		2860			382.57							
[illegible]		2920			359.60	✓✓	[illegible].55					
		2980			383.31							
[illegible]		3010			383.17		[illegible].12					

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL Tessa PW 1
(PUMPING) / OBSERVATION WELL
(PUMPING) / RECOVERY DATA
PAGE 4 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED
HOW WL's MEASURED
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date 5/26/00 time 1045

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'		Q/s	Q	(NOTE ANY CHANGES IN OBSERVERS)
1355		3070			384.27		102.20					EM
1455		3130			382.13		100.08					
1525		3160			383.23		101.18					
1555		3190			384.52		102.47					
		3220			385.21		103.16					
1655		3250			382.82		100.77				37"	MW
1925		3400			383.42		101.37					EE
2125		3520			381.95		100.90				37 1/8"	EE @ 2130
2155		3550			383.04		100.99					
		3700			384.71		102.66					
		3880			385.40		103.35					
		4120			384.14		102.09					
0925	40 / 70	4240			381.98		99.93			5.9		
		4300			384.71		102.66				37 1/4	@ 0945

OTIL-16

TESSA PWT-(LOWER)
CONSTANT DISCHARGE TEST
Q = 600 gpm
S/123/60 - 5/24/60
DRAWDOWN
T = 264 x 600 / 2
T = 15,200 gpd/ft
Time (minutes since pumping started)
DRAWDOWN (ft)
46 6010
KEUFFEL & ESSER CO. MADE IN U.S.A.
SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

TESSA
WELL TH1 MW-1 (west)
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF 4

TYPE of PUMPING TEST Constant Discharge
HOW Q MEASURED
HOW WL's MEASURED Pressure Transducer
PUMPED WELL NO. Tessa PW1
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's elev.
DEPTH of PUMP/AIRLINE wrt
% SUBMERGENCE: initial ; pumping
PUMP ON: date 5/23/00 time
PUMP OFF: date time

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 284.47					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
1046		1			284.97			0.50				
		2			285.67			1.20				
		3			286.23			1.76				
		4			286.71			2.24				
		5			287.12			2.65				
		6			287.47			3.00				
		7			287.81			3.34				287.79 @ 7' SOUNDER
		8			288.13			3.66				
		9			288.41			3.94				
1055		10			288.66			4.19				
		12			289.17			4.70				
		14			289.58			5.11				
		16			289.96			5.49				
		18			290.34			5.87				
		20			290.65			6.18				
		26			291.47			7.00				
		30			291.92			7.45				
		36			292.52			8.05				
		40			292.83			8.36				
		46			293.34			8.87				
		50			293.62			9.15				
	0/1	60			294.22			9.75				
		70			294.76			10.29				
		80			295.26			10.79				
1215		90			295.70			11.23				
		100			296.08			11.61				
	0/2	120			296.78			12.31				
		140			297.38			12.91				
		160			297.91			13.44				
1345	0/3	180			298.42			13.95				
		200			298.80			14.33				
		220			299.17			14.70				
1445	0/4	240			299.52			15.05				
		260			299.87			15.40				
		280			300.18			15.71				
1545	0/5	300			300.40			15.96				
		320			300.72			16.25				
		340			300.91			16.44				
1644	0/6	360			301.03			16.56				
		380			301.29			16.82				

TH1

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TH1 TESSA MW-1 (west)
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST CONSTANT DISCHARGE TEST
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. TESSA PW 1
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date _____ time _____
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 284.47					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
		400			301.48		17.01					
1745	0 7	420			301.73		17.26					
		440			301.92		17.45					
		460			302.04		17.57					
1845	0 8	480			302.17		17.70					
		500			302.39		17.92					
		520			302.58		18.11					
1945	0 9	540			302.71		18.24					
		560			302.80		18.33					
		580			303.02		18.55					
2045	0 10	600			303.12		18.65					
		620			303.27		18.80					
		640			303.43		18.96					
2145	0 11	660			303.56		19.08					
		680			303.68		19.20					
		700			303.78		19.30					
2245	0 12	720			303.94		19.46					
		740			303.94		19.46					
		760			304.09		19.62					
2345	0 13	780			304.22		19.75					
		3600			304.28		19.81					
		820			304.32		19.85					
0045	0 14	840			304.38		19.91					
		860			304.47		20.00					
		880			304.44		19.97					
0145	0 15	900			304.54		20.07					
		920			304.54		20.07					
		940			304.57		20.10					
0245	0 16	960			304.57		20.10					
		980			304.57		20.10					
0345		1000			304.64		20.17					
0445		1030			304.74		20.27					
0545		1060			304.85		20.38					
0645		1090			304.97		20.48					
0745		1120			305.10		20.63					
0845		1150			305.26		20.79					
0625		1180			305.23		20.76					
0655		1210			305.26		20.79					
0725		1240			305.17		20.70					
0755		1270			305.39		20.92					
0825		1300			305.36		20.89					
0855		1330			305.32		20.85					
0925		1360			305.39		20.92					
0955		1390			305.36		20.89					
1025		1420			305.42		20.95					TH1

UTIL-16

TESSA MW-1 (west)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL Tessa T 1f 1
PUMPING / (OBSERVATION WELL)
(PUMPING) / RECOVERY DATA
PAGE 3 OF 4

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED
HOW WL's MEASURED
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date time

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 284.47					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S)or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
1055		1450			305.45		20.98					
1125		1480			305.45							
1155		1510			305.45		20.98					
1225		1540			305.61		21.14					
1255		1570			305.61							
1325		1600			305.61		21.14					
1355		1630			305.67		21.20					
1425		1660			305.70		21.23					
1455		1690			305.67		21.20					
1555		1750			305.70		21.23					EE
		1780			305.77							
1655		1810			305.83		21.36					
		1840			305.77		21.30					
1755		1870			305.80							
1825		1900			305.86		21.39					
		1930			305.83							
1925		1960			305.92							
1955		1990			305.92		21.45					
2025		2020			305.95		21.48					
2155		2110			306.02		21.55					
		2140			306.02							
2255		2170			305.99							gps
		2200			306.02		21.55					
2355		2230			306.05							
		2260			306.11							
0055		2290			306.21		21.74					
		2320			306.18							
0155		2350			306.21							
		2380			306.18							
0255		2410			306.21		21.74					
		2440			306.21							
0355		2470			306.21							
		2500			306.21		21.74					
0455		2530			306.27							
		2560			306.24							
0555		2590			306.24		21.77					
		2620			306.27							
		2650			306.21							
0725		2680			306.24		21.77					gps Lv site
		2740			306.11							
		2800			306.21							
1025		2860			306.15		21.71					
		2920			306.65							
		2980			306.49							
1255		3010			306.46		21.77					

TESSA MW-1 (west)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

VELL TESSA TH1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 4 OF 4

PUMPING TEST DATA

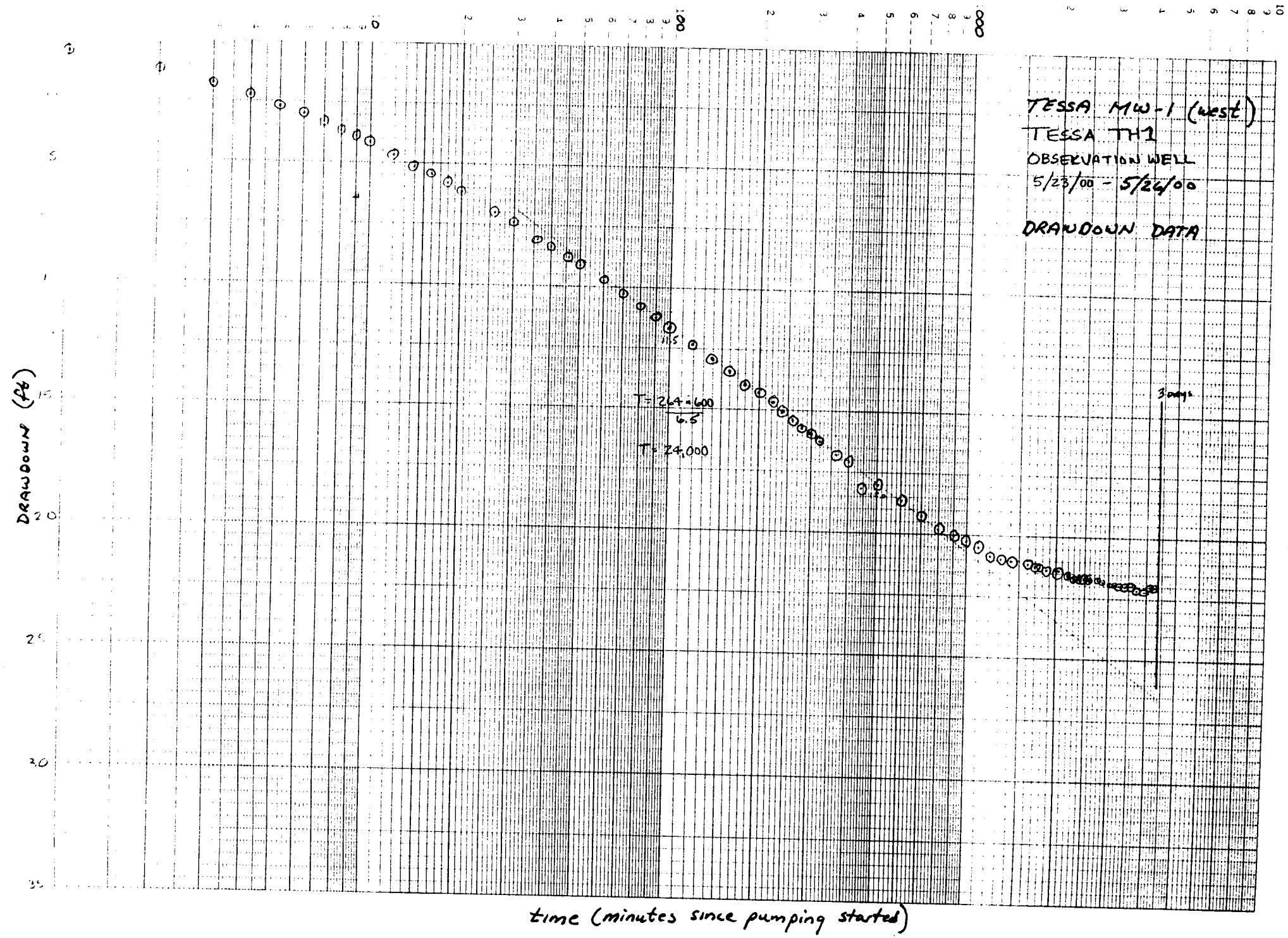
TYPE OF PUMPING TEST Constant Q
HOW Q MEASURED
HOW WL's MEASURED
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date 5/26/00 time 1045

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 284.47				WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'		Q	(NOTE ANY CHANGES IN OBSERVERS)
1355		3070			306.55			22.08			BM
1455		3130			306.43			21.96			
1525		3160			306.40			21.93			
		3190			306.46			21.99			
		3160			306.40			21.93			
		3190			306.46			21.99			
		3220			306.43			21.96			
		3250			306.43			21.96			
		3400			306.49			22.02			
		3520			306.43			21.96			
		3700			306.65			22.18			
		3880			306.74			22.27			
		4120			306.46			21.99			
		4240			306.49			22.02			
		4300			306.52			22.05			

UTIL-16

46 6010



WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

VELL TESSA PW 1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST: CONSTANT RECOVERY
HOW Q MEASURED:
HOW WL's MEASURED: PRESSURE TRANSDUCER
PUMPED WELL NO.: PW1
RADIUS of PUMPED WELL:
DISTANCE from PUMPED WELL:

M.P. for WL's: TOP PVC WELL elev.:
DEPTH OF PUMP/AIRLINE: wrt:
% SUBMERGENCE: initial: pumping:
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date 5/26/00 time 1045

TIME t = 4320 at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs t	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or (S')	102.66	% REC	Q	(NOTE ANY CHANGES IN OBSERVERS)
1046		4321	1	4321	312.25							
		4322	2	2161	325.04			30.20				
		4323	3	1441	325.73			42.99				
		4324	4	1081	324.91			43.68		58		
		4325	5	865	323.91			42.86				
		4326	6	721	323.00			41.86				
		4327	7	618	322.15			40.95				
		4328	8	541	321.36			40.10				
		4329	9	481	320.70			39.31				
1055		4330	10	433	320.07			38.65				
		4332	12	361	319.01			38.02				
		4334	14	310	318.06			36.96				
		4336	16	271	317.24			36.01				
		4338	18	241	316.55			35.19				
1105		4340	20	217	315.89			34.50				
		4344	24	181	314.76			33.84		67		
		4350	30	145	313.85			32.71				
		4354	34	128	312.53			31.80				
		4360	40	109	311.46			30.48				
		4364	44	99	310.83			29.41		71		
		4370	50	87	309.95			28.78				
		4374	54	81	309.42			27.90				
		4380	60	73	308.66			27.37				
		4384	64		308.19			26.61				
		4390	70	63	307.53							
		4394	74		307.09			25.48				
		4400	80	55	306.52							
		4404	84		306.14			24.47				
		4410	90		305.61							
		4414	94		305.26							
		4420	100	44	304.79							
		4440	120		303.91			22.74				
		4460	140	32	302.06							
		4480	160		300.96			20.01		81		
		4500	180		299.98							
		4520	200	23	299.10							
		4540	220		298.28			17.05				
		4560	240		297.56							
		4580	260		296.90							
		4600	280		296.27							
		4620	300	15	295.67							
		4660	340		294.63			13.62				
		4720	400	12	293.28							
		4760	440		292.49			11.23				
		4820	500	10	291.49							
		4860	540	9	290.99			9.40				TESSA PW 1
								5.84		91		Recovery

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA PW1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF 2

PUMPING TEST DATA

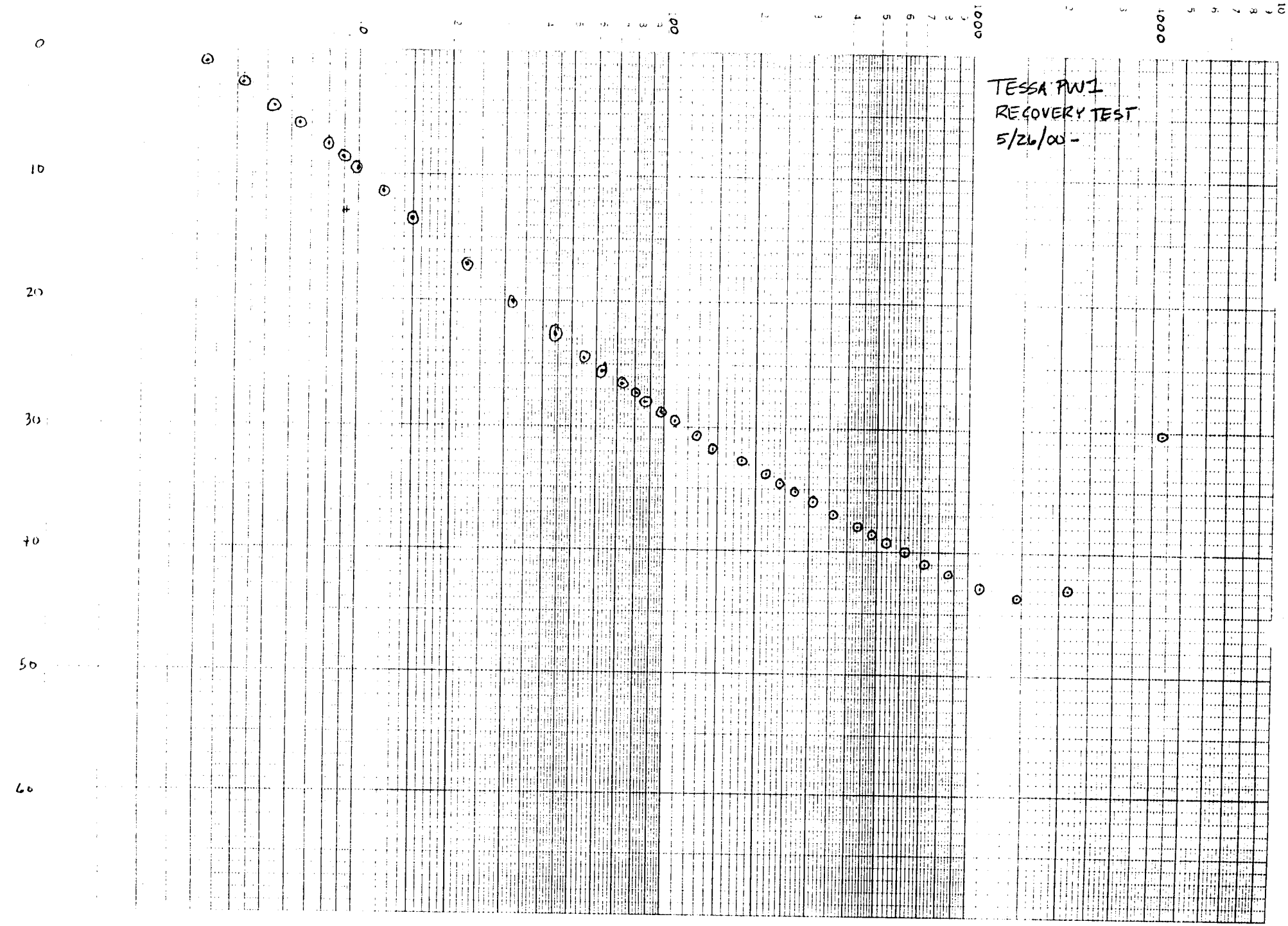
TYPE OF PUMPING TEST Recovery
HOW Q MEASURED
HOW WL's MEASURED
PUMPED WELL NO.
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date time
PUMP OFF: date time

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 282.05					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
		4820	500		291.49							
		4880	560		290.61							
		4940	620	7.9	289.82			7.77				
			680		289.13							
			740		288.53							
		5120	800	6.4	287.96			5.91				
			900		287.14							
		5320	1000	5.3	286.42			4.43				
			1120		285.82							
			1210		285.38							
			1300		284.97							
		5650	1370	4.2	284.85			2.00				
			1360		284.72							NW 0930
			1420		284.47							
			1510		284.15							
			1570		283.97			1.94				NW 1258
			1630		283.81							SOS
			1750		283.49							
			1810		283.34			1.29				
			1870		283.21							
			1930		283.12							
		6280	1960	3.2	283.05			1.00				SOS
			2020		282.99							
			2140		282.80							
			2260		282.61							
			2380		282.42			0.37				
			2500		282.30			0.25				
			2620		282.20							
			2740		282.05							
			2860		281.92			0.13				NW 1048 on 5-28
			2980		281.76							
			3100		281.64							
			3160		281.60							

UTIL-16

Post it note


TESSA PW1
RECOVERY TEST
5/26/00 -

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TH1
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 1 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Recovery
HOW Q MEASURED
HOW WL's MEASURED Pressure Transducer
PUMPED WELL NO. Tessa PW1
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's Top of Casing elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 5/23/00 time 1045
PUMP OFF: date 5/26/00 time 1045

TIME t = 4320 at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 284.47					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or (S')	22.05	%Rec	Q	(NOTE ANY CHANGES IN OBSERVERS)
1046		4321	1		306.11							
			2		305.39							
			3		304.91							
			4		304.57							
			5		304.25							
			6		303.97							
			7		303.68							
			8		303.43							
			9		303.21							
			10		302.99							
			12		302.61							
			14		302.23							
			16		301.92							
			18		301.63							
			20		301.35							
			24		300.88							
			30		300.25							
			34		299.90							
			40		299.39							
			44		299.08							
			50		298.67							
			54		298.42							
		4380	60		298.07							
			64		297.85							
			70		297.56							
			74		297.38							
			80		297.06							
			84		296.90							
			90		296.65							
			94		296.45							
			100		296.24			11.77	47			
			120		295.55							
			140		294.91							
			160		294.38							
			180		293.90							
			200		293.49							
			220		293.08							
			240		292.71							
			260		292.36							
			280		292.04							
			300		291.73							
			340		291.19							
			400		290.60							
			440		290.05							
			500		289.52							Tessa Observation Recovery
			540		289.17			4.70	79			

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WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA MW 1
PUMPING / ~~OBSERVATION WELL~~
PUMPING / ~~RECOVERY DATA~~
PAGE 2 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST Recovery
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date _____ time _____
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 284.47					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSION or CORRECTIONS	WATER LEVEL	S or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
			500		289.52							
			560		289.04							
			620		288.60							
			660		288.35							
			740		287.91							
			860		287.62							
			900		287.18							
			1000		286.87							
			1120		286.52							
			1210		286.30							
			1300		286.08							
			1360		285.92			1.45				
			1420		285.79							
			1480		285.70							
			1540		285.60							
			1570		285.54			1.07				
			1630		285.44							
			1690		285.38							
			1750		285.29							
			1810		285.19							
			1870		285.13							
			1930		285.10							
		6280	1960		285.07			0.60				288
			2020		285.03							
			2260		284.81							
			2500		284.62							
			2860		284.40			0.07				MW 1048@5-28-00
			2980		284.31							
			3100		284.21							
			3160		284.18							

UTIL-16

Till [illegible]

DATA AND FIELD PLOTS FOR PW-2 (east)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA PWZ
(PUMPING) OBSERVATION WELL
(PUMPING) RECOVERY DATA
PAGE 1 OF 3?

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q Test 3
HOW Q MEASURED Orifice Weir
HOW WL's MEASURED Pressure Transducer
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's Top 1" Steel well elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 6/14/00 time 0815
PUMP OFF: date 6/17/00 time 0815

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 220.13					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'		h"	Q_{gpm}	(NOTE ANY CHANGES IN OBSERVERS)
0816		1			276.64			56.51		29"	850	PW1 - 281.70 (281.17?)
		2			285.81			65.68				TH2 - 222.63
		3			302.99			82.86				
		4			309.82			89.69				
		5			313.66			93.53				
0821		6			317.11			96.98				
		7			320.27			100.14				
		8			322.64			102.51				
		9			324.97			104.84				
0825		10			326.81			106.68				
0827		12			331.44			111.31				
0829		14			333.63			113.50				
		16			335.53			115.40				
		18			337.72			117.59				
0835		20			340.81			120.68				
0840		25			343.35			123.22				
0845		30			346.58			126.45				
0850		35			350.17			130.04				
0855		40			351.86			131.73				
0900		45			353.87			133.74				
0905		50			355.16			135.03				
0915		60			357.60			137.47				
0925		70			361.15			141.02				
0935		80			362.37			142.24				
0945		90			365.34			145.21				
0955		100			365.81			145.68			850 gpm	
1015		120			368.64			148.51				
1035		140			370.97			150.84				
1055		160			372.04			151.91				
1115		180			374.30			154 17				
1120		185			373.81			153.68				
1145		210			376.20			156 07				
1205		230			377.00			156.87				
1230		255			378.10			157.97				
1300		285			379.57			159 44				
1330		315			381.26			161.13				
1400		345			381.26			161.13				
1430		375			382.37			162.24				
1500		405			383.26			163 13				
1530		435			383.55			163.42				
1600	45 / 7	465			384.70			164.57				
1630	15 / 8	495			384.77			164.64				
1700	45 / 8	525			384.88			164 75				
1715	- / 9	540			385.67			165.54				
1745	30 / 9	570			386 35			166.22				PWZ

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WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL TESSA PW2
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF 3?

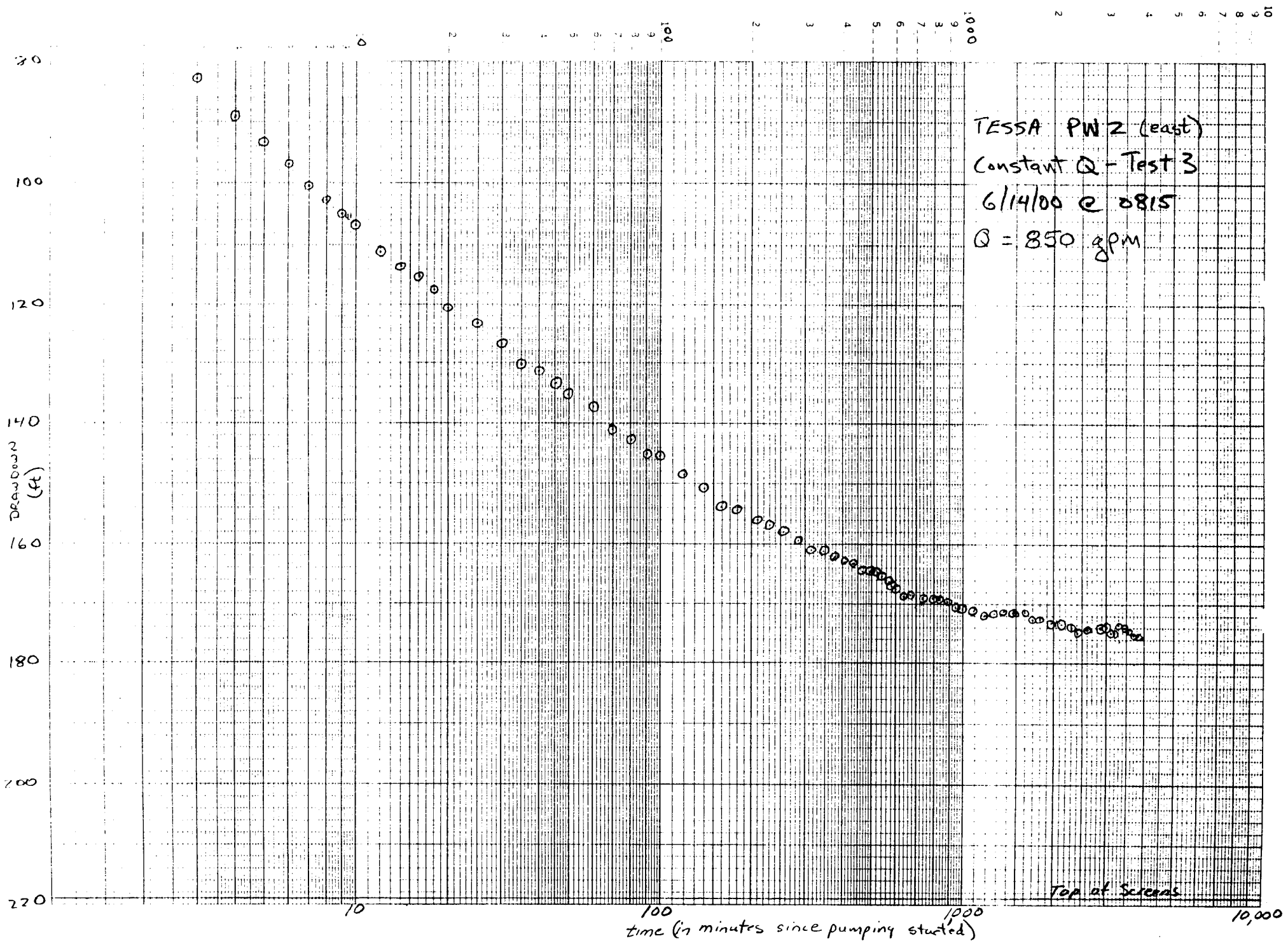
PUMPING TEST DATA

TYPE OF PUMPING TEST: CONSTANT Q TEST 3
HOW Q MEASURED:
HOW WL's MEASURED:
PUMPED WELL NO.:
RADIUS of PUMPED WELL:
DISTANCE from PUMPED WELL:

M.P. for WL's TOP OF 1" CASING elev.:
DEPTH OF PUMP/AIRLINE: wrt:
% SUBMERGENCE: initial: pumping:
PUMP ON: date 6/14/00 time 0815
PUMP OFF: date: time:

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 220.13					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
1800	45 9	585			387.10			166.97				Shift change was AT
1815	10	600			387.99			167.86				7:00pm NOT midnight EG
1830		615			387.81			167.68				EM
1900		645			388.89			168.76				
1930		675			388.17			168.04				
2000		705			387.85			167.72				
2030		735			389.03			168.90				
2100		765			389.01			168.88				
2130		795			389.03			168.90				
2200		825			389.14			169.01				
2230		855			389.46			169.33				
2300		885			389.96			169.83				
2330		915			390.14			170.01				
0000		945			390.47			170.34				
0100		1005			390.82			170.69				EG
0230		1095			391.25			171.12				
0400		1185			392.19			172.06				
0530		1275			391.87			171.74				
0700		1365			391.47			171.34				
0815	24	1440			391.65			171.52				EE SMOOTH @ 0800
0915	25	1500			391.65			171.52				
1055	40 26	1600			391.43			171.30				
1235	20 28	1700			392.65			172.52				
1415	30	1800			392.40			172.27				DAN
1715		1980			393.26			173.13				+ Q SMOOTH
1935		2120			393.33			173.20				EM
2235		2300			394.05			173.92				Feels 29 3/8 : 29.375"
0035		2360			395.12			174.99				
0035		2420			395.30			175.17			29 1/8	JDS @ 8:30 AM
0135		2480			394.98			174.77				
0235		2540			394.12			173.99				
0335		2600			394.41			174.28				
0435		2660			394.15			173.97				
0535		2720			394.44			174.31				
0635		2780			393.51			172.97				
0735		2840			394.23			174.10				
0835		2900			394.12			173.99				
0935		3000			393.94			173.81				
		3100			395.05			174.92				
1935	20 53	3200			394.98			174.85				
1735		3240			394.41			174.28				EM
1		3330			393.29			173.16				
		3390			394.37			174.24				
		3450			394.1			173.99				
15		3510			395.8			175.67				PW2

UTIL-16



pw-2 (east)

WASHOE COUNTY

DEPARTMENT OF PUBLIC WORKS
UTILITY DIVISION

PUMPING TEST DATA

WELL Tessa P2
(PUMPING) / OBSERVATION WELL
PUMPING / (RECOVERY DATA)
PAGE 1 OF 1

TYPE of PUMPING TEST _____
HOW Q MEASURED _____ M.P. for WL's _____ elev. _____
HOW WL's MEASURED _____ DEPTH of PUMP/AIRLINE _____ wrt _____
PUMPED WELL NO. _____ % SUBMERGENCE: initial _____ ; pumping _____
RADIUS of PUMPED WELL _____ PUMP ON: date 6/14/00 time 0815
DISTANCE from PUMPED WELL _____ PUMP OFF: date 6/17/00 time 0815

TIME t = at t'=0					WATER LEVEL DATA STATIC WATER LEVEL 220.13					WATER PRODUCT.		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	S or (S')	Hmp		Q	(NOTE ANY CHANGES IN OBSERVERS)
5/21					280.33	TESSA PW1			1.0'			BACKGROUND H2O
5/21					283.12	TESSA TH1			2.1'			
5/22		1240			279.76	TESSA PW1						
5/22		1240			280.46	TH1						STOP BACKGROUND @ 9:16 5/22
												98 min = 293.41
0816	1/72	4321	1	4321	293.47			73.34				
			2		297.99			77.86				Max DD = 394.91 - 220.13
			3		295.01			74.88				= 174.78
			4		291.63			71.50				
		4325	5	865	288.47			68.34				
			6		285.95			65.82				
			7		283.33							
			8		281.53							
			9		279.69							
0825		4330	10	433	277.86							
			12		275.13							
			14		272.32							
			16		270.45							
			18		268.54							
0835		4340	20	217	266.67							
			25		262.89							
0845		4350	30	145	260.09			39.96				%rec = 77.1%
		4355	35		257.28							0905 WL = 249.25' in TH2
0855		4360	40	109	255.44							Hermit=
0900		4365	45		253.61							
0905		4370	50	87.4	251.92							
0915		4380	60	73	249.21			29.08				83.4% rec
			70									
			80									
			90									
			100									

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

ELL TESSA PW2
(PUMPING) OBSERVATION WELL
(PUMPING) RECOVERY DATA
PAGE 1 OF 2

PUMPING TEST DATA

TYPE OF PUMPING TEST STEP DRAWDOWN TEST
HOW Q MEASURED
HOW WL's MEASURED PRESSURE TRANSDUCER
PUMPED WELL NO. PW2
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's TOP OF PVC 1" STILLWELL elev.
DEPTH OF PUMP/AIRLINE wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 6/6/00 time 0945
PUMP OFF: date time

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 218.70					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q/s	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
		1			269.40	STEP I		50.70		26"	506	
		2			265.34			46.64				DISCHARGE ONLY FOR 2 MINUTES
		3			267.93			49.23				
		4			271.02			52.32		26-28"		
		5			272.53			53.83				
		6			273.14			54.44				
		7			274.94			56.24				
		8			276.63			57.93				
		9			278.11			59.41				
0955		10			278.97			60.27		27 1/2		.1 ml save in 10 minutes
		12			280.62			61.92				
		14			281.06			62.36		26"		
		16			281.85			63.15				
		18			282.71			64.01				
		20			283.32			64.62				.15 ml in 25 minutes
		25			286.13			67.43				
1015		30			287.56			68.86	7.3	26 1/4		
		35			289.12			70.42				
		40			290.05			71.35				
1030		45			291.84			73.14				
		50			292.67			73.97				
1045		60			293.14			74.44		26"		
1055		70			244.72			76.02		26"		
1105		80			296.05			77.35				
1115		90			297.20			78.50	6.4			
1125		100			297.99	✓		79.29	6.4			
1130		105	5		308.88	STEP II		90.18		37"	604	
1135		110	10		309.81			91.11				
1140		115	15		312 18			93 48				
1145		120	20		313.12			94.42				
1155		130	30		313.58			94.88				
1200		135	35		313.69			94 99				
1205		140	40		314.81			96.11				
1210		145	45		315.06			96.36				
1215		150	50		316.06			97.36				
1220		155	55		315.34			96.64				ENGINE HAS FLUCTUATION AT THIS RPM
1225		160	60		317.54			98.84				
1235		170	70		317.07			98.37				
1245		180	80		318.94			100.30				
1255		190	90		318.33			99.63				
1305		200	100		319.58	✓		100.89	6.0			
										52"	716	

TESSA PW2 / STEP

UTIL-16

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

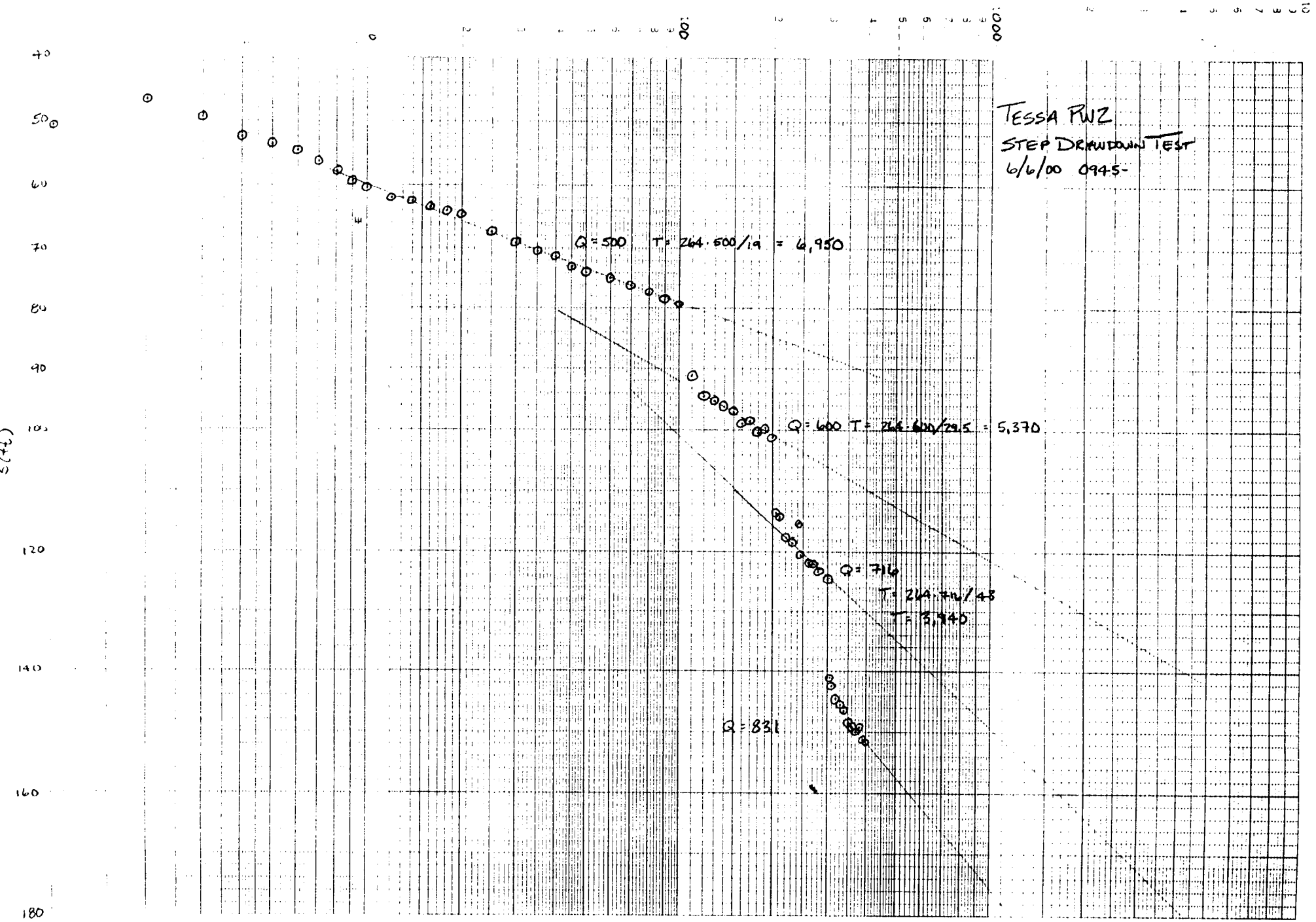
WELL TESSA PWZ
(PUMPING) / OBSERVATION WELL
PUMPING / (RECOVERY DATA)

PUMPING TEST DATA

TYPE OF PUMPING TEST STEP TEST 1
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date _____ time _____
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 218.70					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'	Q/s	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
1310		205	5		332.43	STEP III		113.73		52	716	
1315		210	10		333.08			114.38				ENGINE PROBLEMS OR
1325		220	20		336.42			117.72				SHAFT IMBALANCE. ENGINE
1335		230	30		337.35			118.65				IS LABORING OFTEN. FLOW
1345		240	40		333.76			115.06				HAND TO KEEP STABLE.
1347		242	42		336.31			117.61				
1350		245	45		339.25			120.55				
1355		250	50		339.11			120.41				
1405		260	60		340.62			121.92	5.9			
1415		270	70		340.69			121.99				
1425		280	80		342.34			123.64				
1435		290	90									
1445		300	100		343.52			124.82	5.7	70"	831	
1450		305	5		359.73	STEP IV		141.03				
1455		310	10		361.10			142.40	5.8			
1505		320	20		363.11			144.41				
1515		330	30		364.04			145.34	5.7			
1525		340	40		365.47			146.77				
1535		350	50		367.30			148.60				
1545		360	60		367.73			149.03				
		370	70		368.66			149.96				
		380	80		367.52			148.82				
		390	90		370.06			151.36				
		400	100		370.63			151.93	5.5			


TESSA PW2
STEP DRAWDOWN TEST
6/6/00 0945-
Q = 500 T = 264 · 500/19 = 6,950
Q = 600 T = 264 · 600/29.5 = 5,370
Q = 716
T = 264 · 716/48
T = 3,940
Q = 831
s (ft)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL Tessa PW2 Step Test 2
PUMPING / OBSERVATION WELL
(PUMPING) / RECOVERY DATA
PAGE 1 OF 1

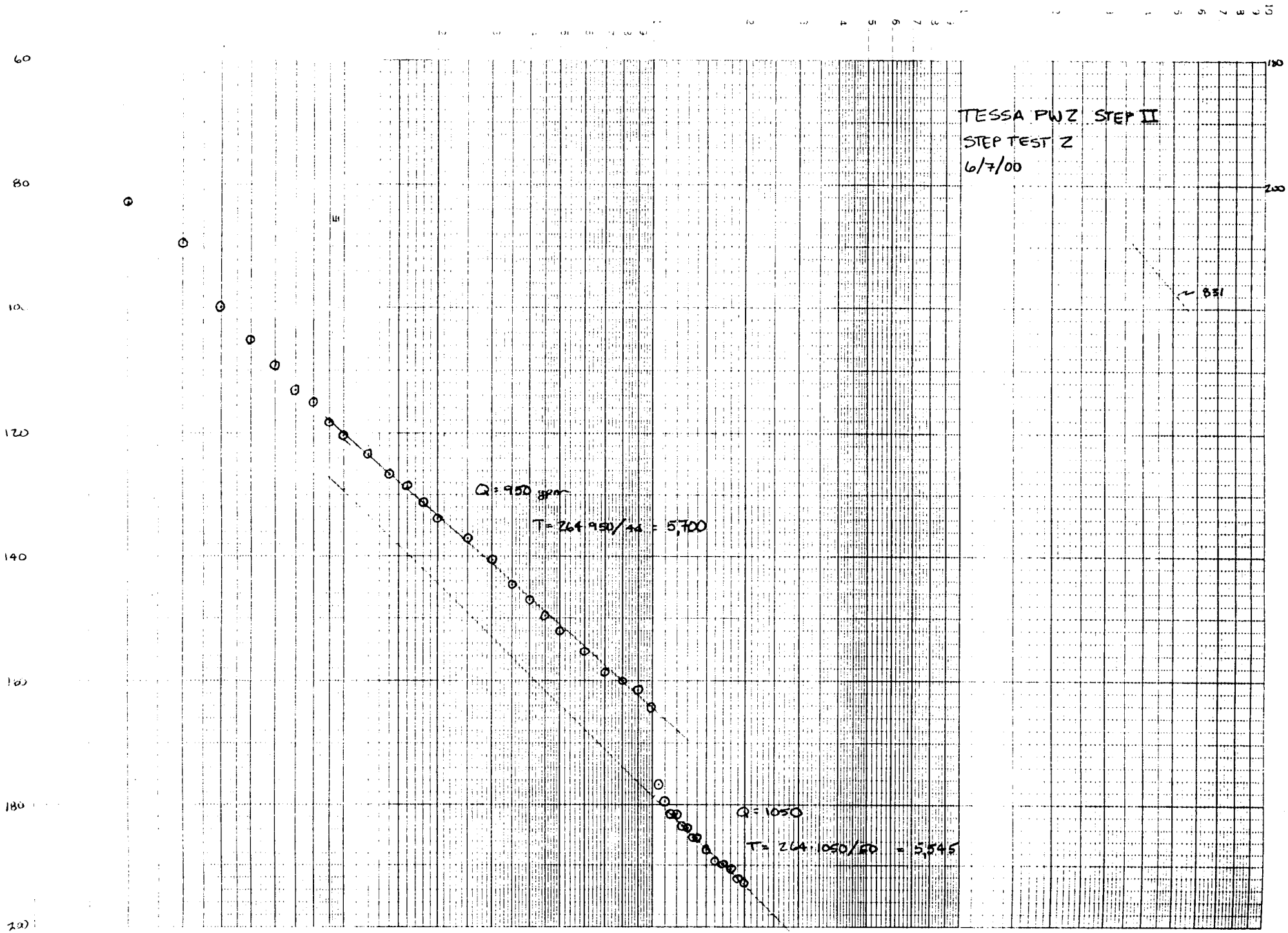
PUMPING TEST DATA

TYPE OF PUMPING TEST Step Test 2
HOW Q MEASURED 8x6" ORIFICE
HOW WL's MEASURED PRESSURE TRANSDUCER
PUMPED WELL NO. PW2
RADIUS of PUMPED WELL
DISTANCE from PUMPED WELL

M.P. for WL's TOP of PVC elev.
DEPTH OF PUMP/AIRLINE ~430-440 wrt
% SUBMERGENCE: initial pumping
PUMP ON: date 6/7/00 time 0915
PUMP OFF: date 6/7/00 time 1235

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 219.67					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t/t'	READING	CONVERSION or CORRECTIONS	WATER LEVEL	(S) or S'	Q/s	h"	Q	(NOTE ANY CHANGES IN OBSERVERS)
0916		1			276.51	STEP I		56.84		36	950	THZ 221.98
		2			302.94			83.27				
		3			309.48			89.81				ADJUST ENGINE RPM
		4			319.72			100.05				
		5			324.96			105.29		36½		
		6			328.98			109.31				
		7			333.25			113.58				
		8			334.94			115.27				
		9			337.88			118.21				
0925		10			340.00			120.33				
		12			342.94			123.27				
		14			346.28			126.61				
0931		16			348.25			128.58		36+		
		18			351.02			131.35				
0935		20			353.56			133.89	7.1			
0940		25			356.58			136.91				
0945		30			360.09			140.42				
0950		35			364.39			144.72				ADJUST ENGINE Q ↓↑
0955		40			366.73			147.06				
1000		45			369.45			149.78				
1005		50			371.82			152.15	6.2	36½		
1015		60			375.19			155.52	6.1			
1025		70			378.45			158.78				
1035		80			379.70			160.03	5.9			
1045		90			381.31			161.64				
1055		100			383.89			164.22	5.8			
1100		105	5		396.43	STEP II		176.76		44"	1050	
1105		110	10		399.44			179.77	5.8			
1110		115	15		401.41			181.74				
1115		120	20		401.30			181.63				
1120		125	25		403.20			183.53				
1125		130	30		403.49			183.82	5.7			FLOW STABLE
1130		135	35		404.99			185.32				
1135		140	40		405.31			185.64				
1145		150	50		407.10			187.43		44"		
1155		160	60		409.15			189.48				
1205		170	70		409.54			189.87	5.5			
1215		180	80		410.36			190.69				
1225		190	90		411.83			192.16	5.5			
1235		200	100		412.30			192.63				

UTIL-16


TESSA PW2 STEP II
STEP TEST 2
6/7/00
Q = 950 gpm
T = 264 950/44 = 5,700
Q = 1050
T = 264 1050/60 = 5,545
60
80
100
120
140
160
180
200
150
200

PW-2 (east)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

VELL TESSA TH2
PUMPING (OBSERVATION) WELL - TH2
PUMPING / RECOVERY DATA
PAGE 1 OF _____

PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q Test 3
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. _____
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 6/14/00 time 0815
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 222.63					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins/hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
0816		1			224.68			2.05			29"	
0817		2			226.53			3.90				
0818		3			228.09			5.46				
0819		4			229.62			6.99				
0820		5			231.03			8.40				
0821		6			232.16			9.53				
22		7			233.45			10.82				
23		8			234.34			11.71				
24		9			235.28			12.65				
0825		10			236.27			13.64				
0827		12			237.85			15.17				
0829		14			239.54			16.77				
0831		16			240.69			18.06				
0833		18			241.89			19.26				
0835		20			243.15			20.52				
0840		25			245.66			23.03				
0845		30			247.63			25.00				
		35			249.73			27.10				
0855		40			251.09			28.46				
		45			252.41			29.78				
0905		50			253.75			31.12				
0915	10	60			255.70			33.07				
0925		70			257.78			35.15				
0935		80			259.04			36.41				
0945		90			260.37			37.74				
0955		100			261.62			38.99				
1030		135			264.87			42.24				
1100		165			267.08			44.45				
1130		195			268.40			45.77				
1200		225			269.71			47.08				
1230		255			270.65			48.02				
1300		285			271.60			48.97				
1330		315			272.42			49.79				
1400		345			272.92			50.29				
1430		375			273.48			50.85				
1500		405			273.98			51.35				
1530		435			274.36			51.73				
1600		465			274.71			52.08				
1630		495			275.03			52.40				
1700		525			275.29			52.66				
1745		570			275.88			53.25				
1800		585			276.13			53.50				
1815	10	600			276.29			53.66				
1[illegible]		615			276.49			53.86				
[illegible]		675			276.99			54.03				THZ

UTIL-16

PW-2 (east)

WASHOE COUNTY

DEPARTMENT OF WATER RESOURCES
UTILITY SERVICES DIVISION

Department of Water Resources

WELL THZ
PUMPING / OBSERVATION WELL
PUMPING / RECOVERY DATA
PAGE 2 OF _____

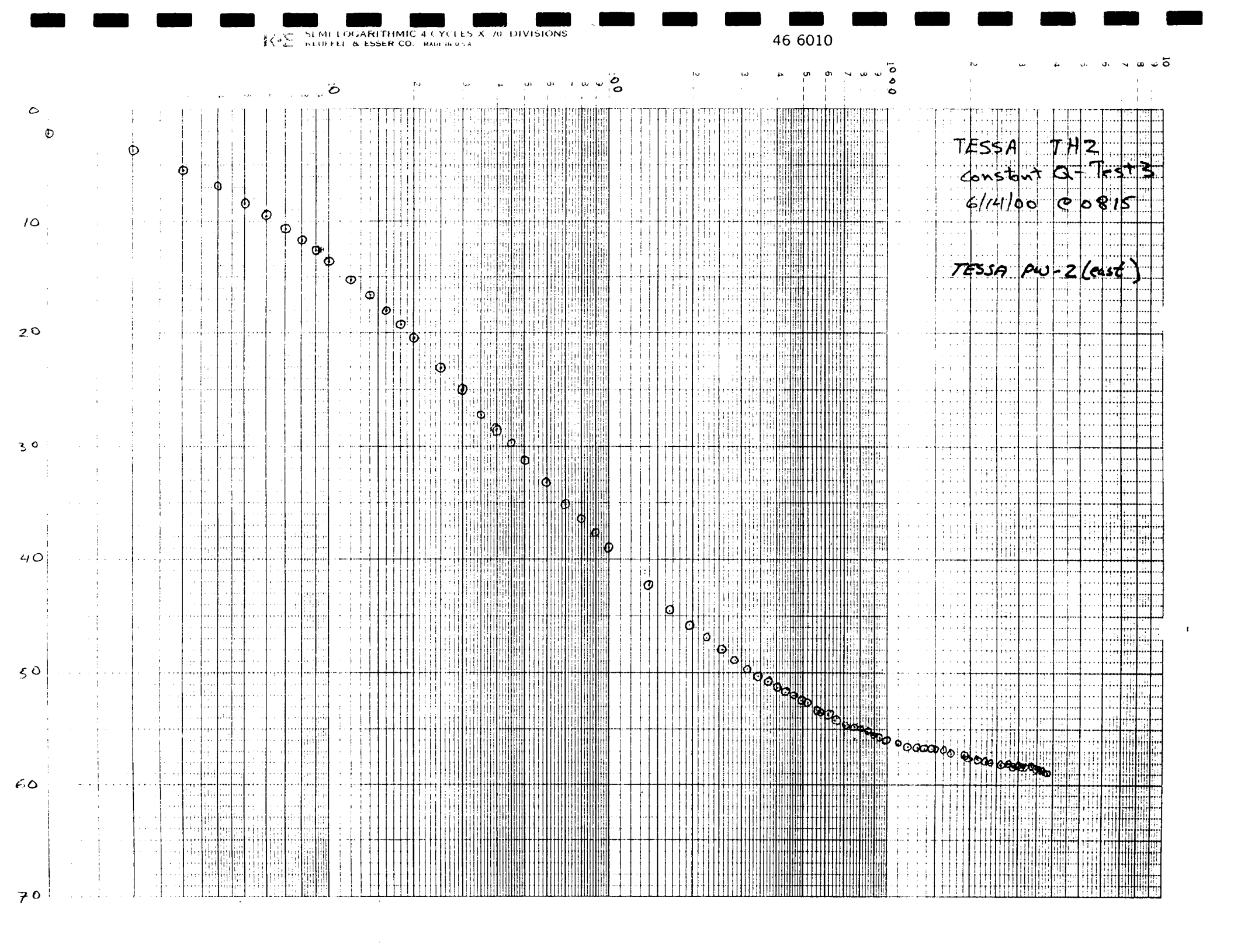
PUMPING TEST DATA

TYPE OF PUMPING TEST Constant Q Test 3
HOW Q MEASURED _____
HOW WL's MEASURED _____
PUMPED WELL NO. Tessa PW2
RADIUS of PUMPED WELL _____
DISTANCE from PUMPED WELL _____

M.P. for WL's _____ elev. _____
DEPTH OF PUMP/AIRLINE _____ wrt _____
% SUBMERGENCE: initial _____ pumping _____
PUMP ON: date 6/14/00 time 0815
PUMP OFF: date _____ time _____

TIME t = at t'=O					WATER LEVEL DATA STATIC WATER LEVEL 222.63					WATER PRODUCT		COMMENTS
CLOCK TIME	ELAPSED TIME mins / hrs	t	t'	t /t'	READING	CONVERSIONS or CORRECTIONS	WATER LEVEL	(S) or S'			Q	(NOTE ANY CHANGES IN OBSERVERS)
1930		675			276.78			54.15				
2000		705			277.05			54.42				
2030		735			277.35			54.72				
2100		765			277.49			54.86				
2130		795			277.61			54.98				
2200		825			277.79			55.16				
2230		855			277.91			55.28				
2300		885			278.09			55.41				
2330		915			278.20			55.57				
15 0000		945			278.30			55.67				
0100		1005			278.57			55.94				EE
0230		1095			278.80			56.25				
0400		1185			279.13			56.50				
0530		1275			279.17			56.54				
0700		1365			279.34			56.71				
0015		1440			279.33			56.70				
0915		1500			279.43			56.80				
1055		1600			279.50			56.87				
1235		1700			279.72			57.09				
1415		1800										
1555		1900			279.93			57.30				
1715		1980			280.05			57.42				DAN
1935		2120			280.25			57.62				EM
2235		2330			280.43			57.80				
2335		2360			280.59			57.96				
6 0035		2420			280.77			58.14				
0135		2480			280.92			58.29				
0235		2540			280.76			58.13				
0335		2600			280.79			58.16				
0435		2660			280.73			58.10				
0535		2720			280.73			58.10				
0635		2780			280.72			58.09				
0735		2840			280.70			58.07				
0835		2900			280.85			58.22				
		3000			280.86			58.23				
		3100			280.96			58.33				
1335		3200			281.08			58.45				
1435		3260			280.89			58.53				EM
1535		3330			280.82			58.19				
1635		3390			280.89			58.53				
1735		3450			280.93			58.30				
1835		3510			281.22			58.59				
1915		3550			280.75			58.32				
2015		3610			281.01			58.43				THZ
		3700			281.37			58.75				
		3750			281.37			58.75				

UTIL-16


K+E SEMI LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 6010
TESSA TH2
Constant Q-Test3
6/14/00 e0815
TESSA PW-2 (east)

APPENDIX C-Water Quality Reports

WATER QUALITY RESULTS FOR PW-1 (west)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

00 MAY 25 PM 2:53

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

146131
TESSA PW-1 (west)

WATER CHEMISTRY ANALYSIS:
Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:
(1) Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State Nevada County Washoe
Township 18 Range 19 Section 35 ?
General Location Mt Rose Highway
Source Address Tessa well (west pump)

SAMPLING INSTRUCTIONS:
The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by John Hulett Date 5-25-00
Owner Washoe County Phone
Address P.O. Box 11130
City Reno State Nevada

REASON FOR ANALYSIS:
- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other SDWA

USE OF WATER:
- ☒ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

REPORT TO:
Name Terri Svetich (Washoe County)
Address P.O. Box 11130
City Reno
State Nevada Zip 89520-0027

SOURCE OF WATER:
Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well X Depth ft.
Hot Cold
IN USE: ☐ Yes ☑ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent		Constituent		Constituent		Constituent		Constituent	
T.D.S. @ 180° C.	182 ppm 166	Constituent	29.1 ppb	Constituent	0.0 – 3pm	Constituent	7.31 S.U.		
Hardness	88	Nitrate-N	0.7	Manganese	0.00	Turbitity	0.9		
Calcium	17	Alkalinity	112	Copper	0.01	pH	7.55		
Magnesium	11	Bicarbonate	137	Zinc	0.00	EC	230		
Sodium	9	Carbonate	0	Barium	0.09	SI@20C	-0.68		
Potassium	4	Fluoride	0.07	Boron	0.0				
Sulfate	3	Arsenic	< 0.003	Silica	62				
MBAS	<0.1	CN^-	<0.005	NO_2	<0.01	gross α	2.3 pCi/L	TL	<0.001
Ammonia	<0.1			Pb	0.001	gross β	4 pCi/L	Li	<0.2

Constituent	ppm
Cd	<0.001
Cr	0.001
Hg	<0.0005
Se	<0.001
Sb	<0.001
Be	<0.001
Ni	<0.001
TL	<0.001
Li	<0.2

PRINT OTHER DESIRED CONSTITUENTS BELOW

Fee
Collected by
PWS I.D.
DWA — Pri. Sec.
2nd 3rd
Date Rec'd Init.

Remarks
Jm 6/6/00 JM 6-27-00
AR 6/2/00 JM
Lithium added per John
RESULTS REPORTED JUN 30 2000
~~MAILED BOTH SHEETS 6/15~~

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

TESSA PW-1 (west)

CASE NARRATIVE
June 14, 2000

One sample was received on 05/25/00 for the analysis of SOC compounds for source compliance monitoring in the state of Nevada. Sample containers were received in good condition.

Alpha Analytical ID	Client ID	Date	Time Collected
WCW00052524-01	Tessa Well	05/25/00	11:00

METHOD 504.1:
Your sample was spiked as the batch Laboratory Fortified Matrix (LFM). All QC criteria were met with no abnormalities.

METHOD 505:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 515.1:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 525.2:
All QC criteria were met with no abnormalities.

METHOD 531.1:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 547:
All QC criteria were met with no abnormalities.

METHOD 548.1:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 549.2:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

Walter J. Hinchman
Quality Assurance Officer

6/14/00
Date

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

TESSA AW-1 (West)

ANALYTICAL REPORT

Client: Washoe County Water Resources
4930 Energy Way
Reno, NV, 89502
Attn: Terri Svetich
Client Sample ID: Tessa Well

Lab Sample ID: 00052524-01A
Date Sampled: 5/25/00
Date Received: 5/25/00
Matrix: Aqueous
PWS/DWR#:

National Primary Drinking Water Phase II and Phase V - Regulated and Unregulated Synthetic Organic Compounds (SOCs)

Analyte	Result	R.L.	Units	Date Analyzed
E504.1 EDB AND DBCP				
1,2-Dibromoethane	ND	0.010	µg/L	5/31/00
1,2-Dibromo-3-chloropropane	ND	0.020	µg/L	5/31/00
E505 ORGANOHALIDE PESTICIDES AND PCBS				
Hexachlorocyclopentadiene	ND	0.10	µg/L	5/26/00
Hexachlorobenzene	ND	0.10	µg/L	5/26/00
gamma-BHC	ND	0.020	µg/L	5/26/00
Alachlor	ND	0.20	µg/L	5/26/00
Heptachlor	ND	0.040	µg/L	5/26/00
Aldrin	ND	0.20	µg/L	5/26/00
Heptachlor epoxide	ND	0.020	µg/L	5/26/00
Dieldrin	ND	0.20	µg/L	5/26/00
Endrin	ND	0.010	µg/L	5/26/00
Methoxychlor	ND	0.10	µg/L	5/26/00
Chlordane	ND	0.20	µg/L	5/26/00
Toxaphene	ND	1.0	µg/L	5/26/00
Aroclor 1016	ND	0.080	µg/L	5/26/00
Aroclor 1221	ND	20	µg/L	5/26/00
Aroclor 1232	ND	0.50	µg/L	5/26/00
Aroclor 1242	ND	0.30	µg/L	5/26/00
Aroclor 1248	ND	0.10	µg/L	5/26/00
Aroclor 1254	ND	0.10	µg/L	5/26/00
Aroclor 1260	ND	0.20	µg/L	5/26/00
E515.1 CHLORINATED ACID HERBICIDES				
Dalapon	ND	1.0	µg/L	6/3/00
Dicamba	ND	0.50	µg/L	6/3/00
2,4-D	ND	0.10	µg/L	6/3/00
PCP	ND	0.040	µg/L	6/3/00
2,4,5-TP	ND	0.20	µg/L	6/3/00
Dinoseb	ND	0.20	µg/L	6/3/00
Pichloram	ND	0.10	µg/L	6/3/00

Analyte	Result	R.L.	Units	Date Analyzed
E525.2 SVOCS BY GCMS				
Propachlor	ND	1.0	µg/L	6/5/00
Simazine	ND	0.070	µg/L	6/5/00
Atrazine	ND	0.10	µg/L	6/5/00
Metribuzin	ND	1.0	µg/L	6/5/00
Alachlor	ND	0.20	µg/L	6/5/00
Metolachlor	ND	1.0	µg/L	6/5/00
Butachlor	ND	1.0	µg/L	6/5/00
bis(2-Ethylhexyl)adipate	ND	0.60	µg/L	6/5/00
bis(2-Ethylhexyl)phthalate	ND	0.60	µg/L	6/5/00
Benzo(a)pyrene	ND	0.020	µg/L	6/5/00
E531.1 CARBAMATES				
Aldicarb sulfoxide	ND	0.50	µg/L	6/1/00
Aldicarb sulfone	ND	0.80	µg/L	6/1/00
Oxamyl	ND	2.0	µg/L	6/1/00
Methomyl	ND	1.0	µg/L	6/1/00
3-Hydroxycarbofuran	ND	1.0	µg/L	6/1/00
Aldicarb	ND	0.50	µg/L	6/1/00
Carbofuran	ND	0.90	µg/L	6/1/00
Carbaryl	ND	1.0	µg/L	6/1/00
E547 GLYPHOSATE				
Glyphosate	ND	6.0	µg/L	5/30/00
E548.1 ENDOTHALL				
Endothall	ND	9.0	µg/L	5/31/00
E549.2 DIQUAT/PARAQUAT				
Diquat	ND	0.40	µg/L	5/30/00

ND = Not Detected

Approved By: Walter Hinchman (signature)
Walter Hinchman
Quality Assurance Officer

Date: 6/14/00

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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TESSA PW-1 (West)

ANALYTICAL REPORT

Washoe County Water Resources
4930 Energy Way
Reno, NV 89502

Job#:
Phone: (775) 954-4641
Attn: Terri Svetich

Alpha Analytical Number: WCW00052524-01A
Client I.D. Number: Tessa Well

Sampled: 05/25/00
Received: 05/25/00
Analyzed: 05/25/00

SDWA Volatiles (plus Lists 1 & 3 Unregulated)
EPA Method 524.2

	Compound	Concentration µg/L	Reporting Limit		Compound	Concentration µg/L	Reporting Limit	
1	Benzene	ND	0.500	µg/L	38 trans-1,3-Dichloropropene	ND	0.500	µg/L
2	Vinyl chloride	ND	0.500	µg/L	39 2,2-Dichloropropane	ND	0.500	µg/L
3	Carbon tetrachloride	ND	0.500	µg/L	40 1,1,1,2-Tetrachloroethane	ND	0.500	µg/L
4	1,2-Dichloroethane	ND	0.500	µg/L	41 1,1,2,2-Tetrachloroethane	ND	0.500	µg/L
5	Trichloroethene	ND	0.500	µg/L	42 1,2,3-Trichloropropane	ND	0.500	µg/L
6	1,4-Dichlorobenzene	ND	0.500	µg/L	43 Bromochloromethane	ND	0.500	µg/L
7	1,1-Dichloroethene	ND	0.500	µg/L	44 n-Butylbenzene	ND	0.500	µg/L
8	1,1,1-Trichloroethane	ND	0.500	µg/L	45 Dichlorodifluoromethane	ND	0.500	µg/L
9	cis-1,2-Dichloroethene	ND	0.500	µg/L	46 Trichlorofluoromethane	ND	0.500	µg/L
10	1,2-Dichloropropane	ND	0.500	µg/L	47 Hexachlorobutadiene	ND	0.500	µg/L
11	Ethylbenzene	ND	0.500	µg/L	48 Isopropylbenzene	ND	0.500	µg/L
12	Chlorobenzene	ND	0.500	µg/L	49 4-Isopropyltoluene	ND	0.500	µg/L
13	1,2-Dichlorobenzene	ND	0.500	µg/L	50 Naphthalene	ND	0.500	µg/L
14	Styrene	ND	0.500	µg/L	51 n-Propylbenzene	ND	0.500	µg/L
15	Tetrachloroethene	ND	0.500	µg/L	52 sec-Butylbenzene	ND	0.500	µg/L
16	Toluene	ND	0.500	µg/L	53 tert-Butylbenzene	ND	0.500	µg/L
17	trans-1,2-Dichloroethene	ND	0.500	µg/L	54 1,2,3-Trichlorobenzene	ND	0.500	µg/L
18	Xylenes, total	ND	0.500	µg/L	55 1,2,4-Trimethylbenzene	ND	0.500	µg/L
19	Dichloromethane	ND	0.500	µg/L	56 1,3,5-Trimethylbenzene	ND	0.500	µg/L
20	1,1,2-Trichloroethane	ND	0.500	µg/L	57 Methyl tert-butyl ether (MTBE)	ND	0.500	µg/L
21	1,2,4-Trichlorobenzene	ND	0.500	µg/L				
22	Bromobenzene	ND	0.500	µg/L				
23	Bromodichloromethane	ND	0.500	µg/L				
24	Bromoform	ND	0.500	µg/L				
25	Bromomethane	ND	0.500	µg/L				
26	Dibromochloromethane	ND	0.500	µg/L				
27	Chloroethane	ND	0.500	µg/L				
28	Chloroform	ND	0.500	µg/L				
29	Chloromethane	ND	0.500	µg/L				
30	2-Chlorotoluene	ND	0.500	µg/L				
31	4-Chlorotoluene	ND	0.500	µg/L				
32	Dibromomethane	ND	0.500	µg/L				
33	1,3-Dichlorobenzene	ND	0.500	µg/L				
34	1,1-Dichloroethane	ND	0.500	µg/L				
35	1,1-Dichloropropene	ND	0.500	µg/L				
36	1,3-Dichloropropane	ND	0.500	µg/L				
37	cis-1,3-Dichloropropene	ND	0.500	µg/L				

pH = 2

ND = Not Detected
Phase I Regulated Compounds (1-8); Phase II Regulated Compounds (9-18); Phase V Regulated Compounds (19-21); List 1 Unregulated Compounds (22-41); List 3 Unregulated Compounds (42-56); and, Additionally requested Compounds (57+)

Approved By: R Scholl Date: 6/7/00

Roger L. Scholl, Ph.D.
Laboratory Director

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

TESSA PW-1 (West)

RECEIVED
JUN 12 2000
WASHOE COUNTY
DEPT. OF WATER RESOURCES

Laboratory Report

for

Washoe County Dept. of Water
Resources
4930 Energy Way

Reno , NV 89502-4106

Attention: John Hulett
Fax: (775) 954-4610

DATE OF ISSUE
JUN 06 2000
MONTGOMERY WATSON LABS

HDS Hillary Strayer

Report#: 66400
DRINKING

: ıtgomery Watson Laboratori(
555 E. Walnut St., Pasadena, CA 91101
PHONE: 626-568-6400/FAX: 626-568-6324

TESSA PW-1 (west)

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Washoe County Dept. of Water Resources
4930 Energy Way
Reno, NV 89502-4106
Attn: John Hulett

Customer Code: WASHOE
PO#: 179701
Group#: 66400
Project#: DRINKING
Proj Mgr: Hillary Strayer
Phone: (626) 568-6412

The following samples were received from you on 05/26/00. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Montgomery Watson Laboratories.

Sample#	Sample Id	Matrix	Sample Date
	Tests Scheduled		
2005260055	TESSA WELL	Water	05/25/00
	@RN		

Test Acronym Description

Test Acronym	Description
@RN	Radon 222

TESSA PW-1 (west)

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory Report #66400

Washoe County Dept. of Water Resources
John Hulett
4930 Energy Way
Reno , NV 89502-4106

Samples Received
26-may-2000 09:30:00

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
TESSA WELL (2005260055) Sampled on 05/25/00								
				Radon 222				
	05/26/00	116939	(SM7500RN)	Radon 222	890	pCi/l	50	1
	05/26/00	116939	(SM7500RN)	Radon 222, Two Sigma Error	27	pCi/l	0.0000	1

TESSA PW-1 (west)

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory
QC Summary Report
#66400

Washoe County Dept. of Water Resources

QC Batch #116939 - Radon 222

Analysis Date: 05/26/2000

2005260055 TESSA WELL

TESSA PW-1 (west)

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
QC Report
#66400

Washoe County Dept. of Water Resources

QC Batch #116939 Radon 222

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Radon 222	1000	948	94.8	(80.00 - 120.00)	
LCS2	Radon 222	1000	908	90.8	(80.00 - 120.00)	4.3
MBLK	Radon 222	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only and not applicable for ICR monitoring.

WATER QUALITY RESULTS FOR PW-2 (east)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

TESSA PW-2 (east)
146299

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State Nevada County Washoe
Township 18 Range 19 Section 35
General Location Mt. Rose Highway
Source Address Tessa PW #2 (east) (Pump test)

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by John Hulett Date 6-9-00
Owner Washoe County Phone
Address P.O. Box 11130
City Reno State Nevada

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other SDWA

USE OF WATER:

- ☒ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

REPORT TO:

Name Terri Svetich (Washoe County)
Address P.O. Box 11130
City Reno
State Nevada Zip 89520-0027

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☒ Yes ☐ No
Spring
Well X Depth ft.
Hot Cold
IN USE: ☐ Yes ☒ No

Type
Name Tessa PW #2
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent		Constituent		Constituent		Constituent		Constituent	
T.D.S. @ 180° C.	206 ppm	Chloride	28.2 ppm	Iron	0.0 312 ppb	Color	299 S.U.	Cd	<0.001
	173		2		0.03		3		
Hardness	105	Nitrate N	0.6	Manganese	0.00	Turbitity	0.3	Cr	0.001
Calcium	19	Alkalinity	124	Copper	0.01	pH	7.79	Hg	<0.0005
Magnesium	14	Bicarbonate	151	Zinc	0.00	EC	250	Se	<0.001
Sodium	10	Carbonate	0	Barium	0.08	SI@20C	-0.35	Sb	<0.001
Potassium	5	Fluoride	0.04	Boron	0.0			Be	<0.001
Sulfate	4	Arsenic	< 0.003	Silica	60			Ni	<0.001
CN⁻	<0.005	NO_2	<0.01	Li	<0.2	gross α	5pCi/L	Tl	<0.0005
MBAS	<0.1	Ammonia	<0.1	Pb	<0.001	gross β	5pCi/L		

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
Jan 7-10-00 JM
This is a new well - No PWS ID
JM 7-14-00
SJC 6/20/00
RESULTS REPORTED
JUL 18 2000

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

TESSA PW-2 (east)

CASE NARRATIVE

July 3, 2000

One sample was received on 06/09/00 for the analysis of SOC compounds for source compliance monitoring in the state of Nevada. Sample containers were received in good condition.

Alpha Analytical ID	Client ID	Date Time Collected
WCW00060947-01	Tessa Well #2 East	06/09/00 10:00

METHOD 504.1:
Your sample was spiked as the batch Laboratory Fortified Matrix (LFM). All QC criteria were met with no abnormalities.

METHOD 505:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 515.1:
Your sample was spiked as the batch LFM. All QC criteria were met with no abnormalities.

METHOD 525.2:
Your sample was extracted with batch #3828. All QC criteria were met with no abnormalities except for the recovery of metribuzin a non-regulated compound. Metribuzin had a recovery in the Laboratory Fortified Blank (LFB) and LFBdup of 43% and 43% respectively with a window of acceptability of 70% to 130%. The recovery of metribuzin in the batch LFM was 35%. Metribuzin may be suspect.

METHOD 531.1:
All QC criteria were met with no abnormalities.

METHOD 547:
All QC criteria were met with no abnormalities.

METHOD 548.1:
All QC criteria were met with no abnormalities.

METHOD 549.2:
Your sample was spiked as the batch LFM. The recovery of diquat was 62% with a window of acceptability of 70% to 130%. The Laboratory Fortified Blank (LFB) and LFBdup had recoveries of 80% and 84% respectively. The recovery of diquat in your sample may be suspect due to matrix effects. All other QC criteria were met with no abnormalities.

Walter Hinchman
Walter J. Hinchman
Quality Assurance Officer

7/3/00
Date

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

TESSA PW-2 (East)

ANALYTICAL REPORT

Washoe County Water Resources
4930 Energy Way
Reno, NV 89502

Job#:
Phone: (775) 954-4641
Attn: Terri Svetich

Alpha Analytical Number: WCW00060947-01A
Client I.D. Number: Tessa Well #2 (East)

Sampled: 06/09/00
Received: 06/09/00
Analyzed: 06/13/00

SDWA Volatiles (plus Lists 1 & 3 Unregulated)
EPA Method 524.2

	Compound	Concentration µg/L	Reporting Limit		Compound	Concentration µg/L	Reporting Limit	
1	Benzene	ND	0.500	µg/L	38 trans-1,3-Dichloropropene	ND	0.500	µg/L
2	Vinyl chloride	ND	0.500	µg/L	39 2,2-Dichloropropane	ND	0.500	µg/L
3	Carbon tetrachloride	ND	0.500	µg/L	40 1,1,1,2-Tetrachloroethane	ND	0.500	µg/L
4	1,2-Dichloroethane	ND	0.500	µg/L	41 1,1,2,2-Tetrachloroethane	ND	0.500	µg/L
5	Trichloroethene	ND	0.500	µg/L	42 1,2,3-Trichloropropane	ND	0.500	µg/L
6	1,4-Dichlorobenzene	ND	0.500	µg/L	43 Bromochloromethane	ND	0.500	µg/L
7	1,1-Dichloroethene	ND	0.500	µg/L	44 n-Butylbenzene	ND	0.500	µg/L
8	1,1,1-Trichloroethane	ND	0.500	µg/L	45 Dichlorodifluoromethane	ND	0.500	µg/L
9	cis-1,2-Dichloroethene	ND	0.500	µg/L	46 Trichlorofluoromethane	ND	0.500	µg/L
10	1,2-Dichloropropane	ND	0.500	µg/L	47 Hexachlorobutadiene	ND	0.500	µg/L
11	Ethylbenzene	ND	0.500	µg/L	48 Isopropylbenzene	ND	0.500	µg/L
12	Chlorobenzene	ND	0.500	µg/L	49 4-Isopropyltoluene	ND	0.500	µg/L
13	1,2-Dichlorobenzene	ND	0.500	µg/L	50 Naphthalene	ND	0.500	µg/L
14	Styrene	ND	0.500	µg/L	51 n-Propylbenzene	ND	0.500	µg/L
15	Tetrachloroethene	ND	0.500	µg/L	52 sec-Butylbenzene	ND	0.500	µg/L
16	Toluene	ND	0.500	µg/L	53 tert-Butylbenzene	ND	0.500	µg/L
17	trans-1,2-Dichloroethene	ND	0.500	µg/L	54 1,2,3-Trichlorobenzene	ND	0.500	µg/L
18	Xylenes, total	ND	0.500	µg/L	55 1,2,4-Trimethylbenzene	ND	0.500	µg/L
19	Dichloromethane	ND	0.500	µg/L	56 1,3,5-Trimethylbenzene	ND	0.500	µg/L
20	1,1,2-Trichloroethane	ND	0.500	µg/L	57 Methyl tert-butyl ether (MTBE)	ND	0.500	µg/L
21	1,2,4-Trichlorobenzene	ND	0.500	µg/L				
22	Bromobenzene	ND	0.500	µg/L				
23	Bromodichloromethane	ND	0.500	µg/L				
24	Bromoform	ND	0.500	µg/L				
25	Bromomethane	ND	0.500	µg/L				
26	Dibromochloromethane	ND	0.500	µg/L				
27	Chloroethane	ND	0.500	µg/L				
28	Chloroform	ND	0.500	µg/L				
29	Chloromethane	ND	0.500	µg/L				
30	2-Chlorotoluene	ND	0.500	µg/L				
31	4-Chlorotoluene	ND	0.500	µg/L				
32	Dibromomethane	ND	0.500	µg/L				
33	1,3-Dichlorobenzene	ND	0.500	µg/L				
34	1,1-Dichloroethane	ND	0.500	µg/L				
35	1,1-Dichloropropene	ND	0.500	µg/L				
36	1,3-Dichloropropane	ND	0.500	µg/L				
37	cis-1,3-Dichloropropene	ND	0.500	µg/L				

pH = 2

ND = Not Detected
Phase I Regulated Compounds (1-8); Phase II Regulated Compounds (9-18); Phase V Regulated Compounds (19-21); List 1 Unregulated Compounds (22-41); List 3 Unregulated Compounds (42-56); and, Additionally requested Compounds (57+)

Approved By: Walter Hinchman Date: 6/21/00

Walter Hinchman
Quality Assurance Officer

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

TESSA PW-2 (east)

ANALYTICAL REPORT

Client: Washoe County Water Resources
4930 Energy Way
Reno, NV, 89502
Attn: Terri Svetich
Client Sample ID: Tessa Well #2 (East)

Lab Sample ID: 00060947-01A
Date Sampled: 6/9/00
Date Received: 6/9/00
Matrix: Drinking Water
PWS/DWR#:

National Primary Drinking Water Phase II and Phase V - Regulated and Unregulated Synthetic Organic Compounds (SOCs)

Analyte	Result	R.L.	Units	Date Analyzed
E504.1 EDB AND DBCP				
1,2-Dibromoethane	ND	0.010	µg/L	6/15/00
1,2-Dibromo-3-chloropropane	ND	0.020	µg/L	6/15/00
E505 ORGANOHALIDE PESTICIDES AND PCBS				
Hexachlorocyclopentadiene	ND	0.10	µg/L	6/14/00
Hexachlorobenzene	ND	0.10	µg/L	6/14/00
gamma-BHC	ND	0.020	µg/L	6/14/00
Alachlor	ND	0.20	µg/L	6/14/00
Heptachlor	ND	0.040	µg/L	6/14/00
Aldrin	ND	0.20	µg/L	6/14/00
Heptachlor epoxide	ND	0.020	µg/L	6/14/00
Dieldrin	ND	0.20	µg/L	6/14/00
Endrin	ND	0.010	µg/L	6/14/00
Methoxychlor	ND	0.10	µg/L	6/14/00
Chlordane	ND	0.20	µg/L	6/14/00
Toxaphene	ND	1.0	µg/L	6/14/00
Aroclor 1016	ND	0.080	µg/L	6/14/00
Aroclor 1221	ND	20	µg/L	6/14/00
Aroclor 1232	ND	0.50	µg/L	6/14/00
Aroclor 1242	ND	0.30	µg/L	6/14/00
Aroclor 1248	ND	0.10	µg/L	6/14/00
Aroclor 1254	ND	0.10	µg/L	6/14/00
Aroclor 1260	ND	0.20	µg/L	6/14/00
E515.1 CHLORINATED ACID HERBICIDES				
Dalapon	ND	1.0	µg/L	6/24/00
Dicamba	ND	0.50	µg/L	6/24/00
2,4-D	ND	0.10	µg/L	6/24/00
PCP	ND	0.040	µg/L	6/24/00
2,4,5-TP	ND	0.20	µg/L	6/24/00
Dinoseb	ND	0.20	µg/L	6/24/00
Pichloram	ND	0.10	µg/L	6/24/00
E525.2 SVOCS BY GCMS				
Propachlor	ND	1.0	µg/L	6/26/00
Simazine	ND	0.070	µg/L	6/26/00
Atrazine	ND	0.10	µg/L	6/26/00
Metribuzin	ND	1.0	µg/L	6/26/00
Alachlor	ND	0.20	µg/L	6/26/00
Metolachlor	ND	1.0	µg/L	6/26/00
Butachlor	ND	1.0	µg/L	6/26/00
bis(2-Ethylhexyl)adipate	ND	0.60	µg/L	6/26/00
bis(2-Ethylhexyl)phthalate	ND	0.60	µg/L	6/26/00
Benzo(a)pyrene	ND	0.020	µg/L	6/26/00
E531.1 CARBAMATES				
Aldicarb sulfoxide	ND	0.50	µg/L	6/22/00
Aldicarb sulfone	ND	0.80	µg/L	6/22/00
Oxamyl	ND	2.0	µg/L	6/22/00
Methomyl	ND	1.0	µg/L	6/22/00
3-Hydroxycarbofuran	ND	1.0	µg/L	6/22/00
Aldicarb	ND	0.50	µg/L	6/22/00
Carbofuran	ND	0.90	µg/L	6/22/00
Carbaryl	ND	1.0	µg/L	6/22/00
E547 GLYPHOSATE				
Glyphosate	ND	6.0	µg/L	6/12/00
E548.1 ENDOTHALL				
Endothall	ND	9.0	µg/L	6/16/00
E549.2 DIQUAT/PARAQUAT				
Diquat	ND	0.40	µg/L	6/14/00

ND = Not Detected

Approved By: Walter Hinchman
Walter Hinchman
Quality Assurance Officer

Date: 7/3/00

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

TESSA PW-2 (east)

Laboratory Report

for

Washoe County Dept. of Water
Resources
4930 Energy Way

Reno , NV 89502-4106

Attention: John Hulett
Fax: (775) 954-4610

HDS Hillary Strayer
Project Manager

Report#: 66925
DRINKING

aboratory certifies that the test results meet all QA/QC requirements unless oted in the Comments section or the Case Narrative. Following the cover page are QC Report,QC Summary,Data Report, totaling 3 page[s].

ontgomery Watson Laboratories
555 E. Walnut St., Pasadena, CA 91101
PHONE: 626-568-6400/FAX: 626-568-6324

TESSA PW-2 (east)

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Washoe County Dept. of Water Resources
4930 Energy Way
Reno, NV 89502-4106
Attn: John Hulett

Customer Code: WASHOE
PO#: 179701
Group#: 66925
Project#: DRINKING
Proj Mgr: Hillary Strayer
Phone: (626) 568-6412

The following samples were received from you on 06/12/00. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Montgomery Watson Laboratories.

Sample#	Sample Id	Matrix	Sample Date
	Tests Scheduled		
2006120121	TESSA PW 2	Water	06/09/00
	RN		

Test Acronym Description

Test Acronym	Description
RN	Radon 222

TESSA PW.2 (last)

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory
Data Report
#66925

Washoe County Dept. of Water
Resources
John Hulett
4930 Energy Way
Reno , NV 89502-4106

Samples Received

06/12/00

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MRL	Dilution
TESSA PW 2 (2006120121) Sampled on 06/09/00 10:00								
				Radon 222				
	06/12/00 10:34	117765	(SM7500RN)	Radon 222	1000	pCi/l	50	1
	06/12/00 10:34	117765	(SM7500RN)	Radon 222, Two Sigma Error	31.7	pCi/l	0.0000	1

TESSA PW-2 (east)

MONTGOMERY WATSON LABORATORIES
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Pasadena, California 91101
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1 800 566 LABS (1 800 566 5227)

Laboratory
QC Summary
#66925

Washoe County Dept. of Water Resources

QC Batch #117765 - Radon 222

Analysis Date: 06/12/2000

2006120121 TESSA PW 2

(TESSA PW-2 (east)

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory
QC Report
#66925

Washoe County Dept. of Water Resources

QC Batch #117765 Radon 222

QC	Analyte	Spiked	Recovered	Yield (%)	Limits (%)	RPD (%)
LCS1	Radon 222	1000	919	91.9	(80.00 - 120.00)	
LCS2	Radon 222	1000	941	94.1	(80.00 - 120.00)	2.4
MBLK	Radon 222	ND				

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining. Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

APPENDIX D-Cost Proposal and Specifications

Layne Christensen Company

P.O. Box 1326 Zip: 95776 • 275 County Road 98 • Woodland, California 95695 • (916) 662-2825 • Fax: (916) 662-2896

October, 12 1998

Randy Bowling Consulting
5310 Kietzke Lane
Suite 204
Reno, Nevada 89502

Subject: Proposal for drilling Galena Water Enterprises Wells in the Vicinity of Mount Rose Highway.

Dear Mr. Bowling:

Thank you for the opportunity to bid on Galena Water Enterprises up coming well drilling project near the Mount Rose highway. We have incorporated into the cost the necessary engineering and a project manager for the project. Please find below the bid items for the two production wells and two monitoring wells.

Galena Water Enterprises, LLC
Two Production Wells, With 2-inch Completed Test Holes

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.	Mobilization & Demobilization for construction, testing and site rehabilitation for test holes and monitoring wells and two production wells.	1	L.S.	$25,000.00	$25,000.00
2.	Standby hours at Owner's request.	24	Hr.	$120.00	$2,880.00
3.	Drill 26-inch minimum diameter borehole to a depth of 100 feet per well.	200	L.F.	$166.00	$33,200.00
4.	Furnish and install 22-inch diameter conductor casing to a depth of 100 feet per well.	202	L.F.	$64.00	$12,928.00
5.	Furnish and install 100-foot sanitary grout seal per well monitoring and production wells.	1	L.S.	$10,000.00	$10,000.00
6.	Drill 20-inch minimum diameter production casing borehole from 100 to approximately 700 per well.	1,200	L.F	$80.00	$96,000.00
6a.	Drill 6-inch minimum diameter borehole to a depth of 700 feet per well	1,400	L.F.	$10.00	$14,000.00
6b.	Geophysical logs for two boreholes	2	Log	$1,500.00	$3,000.00
7.	Furnish and install 14-inch diameter blank production casing, approximately 460 feet per well.	920	L.F.	$35.00	$32,200.00
7a.	Furnish and install 2-inch diameter blank steel well casing, approximately 460 feet per well.	920	L.F.	$7.00	$6,440.00
8.	Furnish and install 14-inch diameter wire wrap well screen, approximately 240 feet per well.	480	L.F.	$47.00	$22,560.00
8a.	Furnish and install 2-inch diameter slotted steel casing, approximately 240 feet per well.	480	L.F.	$10.00	$4,800.00

9.	Furnish and install design gravel pack.	55	Cu. Yd.	$200.00	$11,000.00
10.	Airlift development by surging.	110	Hr.	$225.00	$24,750.00
11.	Furnish, install, and remove necessary equipment for development and test pumping	900	L.F.	$12.00	$10,800.00
12.	Well development by pumping.	48	Hr.	$130.00	$6,240.00
13.	Operate and maintain necessary equipment for test pumping.	160	Hr.	$130.00	$20,800.00
14.	Video survey of the wells	1	L.S.	$2400.00	$2,400.00
15.	Plumbness and alignment test using Gyroscopic Deviation survey.	1	L.S.	$4800.00	$4,800.00
16.	Well disinfection and capping, including welding doughnut ring seal.	1	L.S.	$2000.00	$2,000.00
16a.	Lockable, protective well caps for two monitoring wells.	2	Each	$500.00	$1000.00
	TOTAL				$346,798.00

To help clarify all the services Layne Christensen Company is providing, I have included a detail description with specifications of the entire project.

WELL CONSTRUCTION:

Borehole- The conductor boreholes shall be a minimum diameter of 26-inches to a depth of 100 feet. The production boreholes shall be a minimum diameter of 20-inches. The anticipated total depth for the production boreholes are 720 feet. It is our intention to drill a 12-1/4 inch pilot hole to a total depth of 720 feet before reaming the production hole out to 20-inches.

Formation samples shall be collected at 10-foot intervals and at each change in formation. Samples shall be labeled and stored in Ziploc freezer bags or approved equal. Layne Christensen shall have a grain size analysis performed on a minimum of four formation samples for engineering the final gravel pack and screen slot size for each well.

Drilling Fluid- When it becomes necessary to add clays and chemicals to the drilling fluid, Layne Christensen will maintain a mud system containing a minimum of clay and fine sand and shall deposit a thin, easily removable filter cake on the face of the borehole. Drilling fluid properties shall be monitored at each 100 feet of borehole drilled. Properties that will be monitored will include density, viscosity, fluid-loss control effectiveness, and mud cake thickness. Records of the fluid properties will be logged on the daily drill reports.

Conductor and Production Well Casing- All conductor and production well casing shall be of new, first quality materials and free of defects in workmanship and handling. Conductor and production well casing shall be black steel pipe, spiral welded or invisible straight seam. Steel for fabricated pipe shall conform to ASTM Standard A 283 Grade B or better. For the conductor casing, the outside diameter shall be 22 inches with a minimum wall thickness of 0.375 inches. For the production well casing, the outside diameter shall be 14 inches with a minimum wall thickness of 0.250 inches.

Well Screen- Well screen shall be wire wrap or continuous slot. Well screen will be of new, first quality material, free of defects in workmanship or handling. The well screen will be constructed of low carbon steel and have a minimum strength of construction recommended by the manufacturer. Well screen shall have an outside diameter of 14 inches. A blank casing sump, five feet in length shall be added to the well screen. The bottom of the sump shall be covered with a steel rounded bullnose plug fabricated of the same material as the 14-inch diameter production casing. Final selection for the well screen slot size will be

determined from the sieve analysis with recommendations. For bid purposes, Layne Christensen has anticipated a design size of 80 slot (0.08 inches).

Conductor Casing Installation- Conductor casing shall be equipped with centering guides that will be placed starting five (5) feet above the bottom of the casing and approximately every thirty (30) feet thereafter. The top of the conductor casing shall extend one (1) foot above land surface.

Grout Surface Seal Installation- The annular space between the 26-inch borehole and conductor casing shall be sealed with a cement grout slurry mix from borehole bottom to the ground surface. The slurry mix shall be placed by positive displacement through a tremmie pipe. The seal shall be placed in one continuous operation once the process begins. The sanitary seal shall be left undisturbed for 24 hours for the cement to curry properly.

Casing, Screen and Gravel Installation- The casing and screen will be suspended above the bottom of the hole at a sufficient distance to insure that neither will be supported from the bottom. Centering guides shall be installed every fifty-(50) foot on the casing and screen. A gravel feed tube shall be installed to allow periodic checking of the gravel pack level.

Gravel- The gravel will be composed of sound, durable, well-rounded particles containing no silt, clay, organic matter or deleterious materials. Placement of gravel shall be through a two-(2) inch minimum diameter tremmie pipe. The gravel pack will be sterilized by mixing a minimum of thirty (30) pounds of 65% granulated calcium hypochlorite with the gravel during placement.

DEVELOPMENT

Surging- Initial development of the well will be airlift development using a ten-(10) foot double surge block and perforated pipe. Development by surging will begin at the top of the screen and shall move downward gradually to within five (5) feet of the bottom of the well. Once one complete pass of the well has been made, development by surging shall continue back up the screen intervals until it is the opinion of the owner and Washoe County that development is complete. A temporary discharge permit from the State of Nevada of Environmental Protection will be required for each well. Layne Christensen shall obtain these permits and submit the required monthly discharge monitoring reports.

Development Pumping- Layne Christensen shall furnish, install, operate and remove a lineshaft turbine pump for developing the well. Discharge piping of sufficient size and length to divert water away from the wellhead and pumping equipment will also be supply by contractor. A one (1) inch diameter PVC stilling well will be installed in the well so that Washoe County can record pumping water levels at their discretion. The initial pumping rate shall be restricted and as the water clears, the rate shall be gradually increased until the maximum is reach. Washoe County will determine the maximum rate after consideration of the well drawdown and discharge characteristics. At periodic intervals, the pump shall be stopped and water in the pump column shall be allowed to surge back through the pump bowls and into the well. While pumping and surging, Layne Christensen shall periodically measure the gravel level through the gravel feed tube and add gravel if necessary.

PUMPING TESTS AND DISINFECTION

Layne Christensen shall perform a complete pumping test of the wells. Test pumping shall be directed by the Washoe County Department of Water Resources with a pumping scenario to include:

Step Test- The two wells will be pumped at four different rates for a minimum of 100 minutes. Following the completion of the step test, the well will be given a minimum of twelve (12) hours to recover before beginning the constant rate discharge test. Actual measurements taken while testing for yield and drawdown will be the dual responsibility of Layne Christensen and Washoe County Department of Water Resources. Each constant rate discharge test will be maintained for a minimum of 72 hours. At the end of the 72-hour pumping period, the pump will remain in the well for 24 hours so that Washoe County can collect recovery data on the well. Before the pump is removed, the well shall be disinfected by adding 20

pounds of approximately 65-70 percent calcium hypochlorite tablets. The pump shall be turned on and off several times to thoroughly mix the disinfection solution in the well.

PLUMBNESS AND ALIGNMENT

Layne Christensen shall guarantee that the well when completed, shall be sufficiently straight and plumb to permit the free installation and operation of a submersible or line shaft turbine regularly recommended to be installed in 14-inch diameter well casing. Layne Christensen shall conduct a Gyroscopic directional survey of the total depth of the well to verify plumbness and alignment. The Gyroscopic directional tool shall record the measured depth, the direction the casing is traveling and the angle or inclination of the casing. The survey shall be recorded on VHS tape format with reading every 10 to 50 feet. A deviation from plumbness not greater than two-thirds (2/3) the well's inside diameter per 100 feet to the top of the well screen will be guaranteed by Layne Christensen Company.

VIDEO SURVEY

Each well will be surveyed by a downhole video camera capable of viewing the well both vertically and horizontally. The survey will be recorded on a VHS format with a copy of the tape given to the owner.

WELL CAP

The production casing shall be capped with a 0.250-inch minimum thickness steel plate fully welded to the casing. A lockable access cap with a minimum outside diameter of 2.375 inches shall be welded to the plate to allow access for measuring the static water level in the well.

All costs include materials, labor, permits, and taxes to complete two test holes and two production wells. All final well designs will be approved by the Washoe County Department of Water Resources.

Surveying of the exact locations for the test holes and production wells will be the responsibility of Galena Water Enterprises. If access to the test hole locations and well locations require the development of roads, it will be the responsibility of Galena Water Enterprises to construct the necessary access roads for Layne Christensen's equipment to reach the sites. If you have any questions or concerns regarding this proposal, please do not hesitate to call.

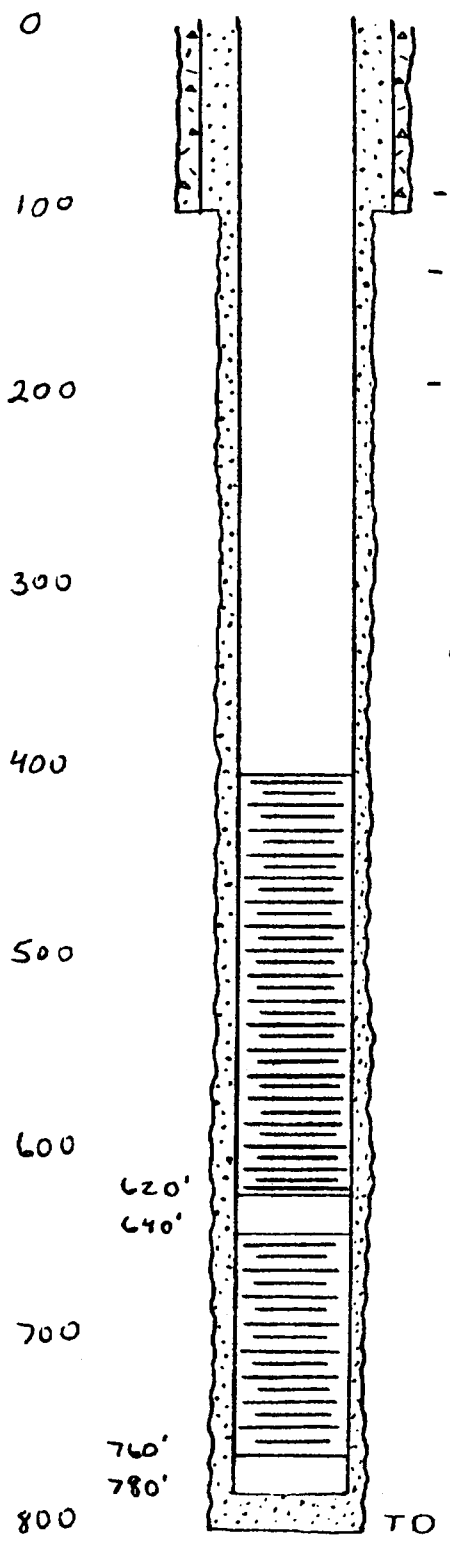
Sincerely,

Michael Hardy
Contracting Engineer

Layne Christensen Company

Subject Galena Water Enterprises Date 7-14-99

Production Well #1 (Final Design)



Material List

Item	Quenity
- 14" Blank Casing L.C.S. ¼" wall	440'
- 14" Wire Wrap Screen L.C.S. 0.065 slot	340'
- Gravel Pack: A 50/50 blend of S.R.I. #6 and #8 gravel.	Approx 50 yd³

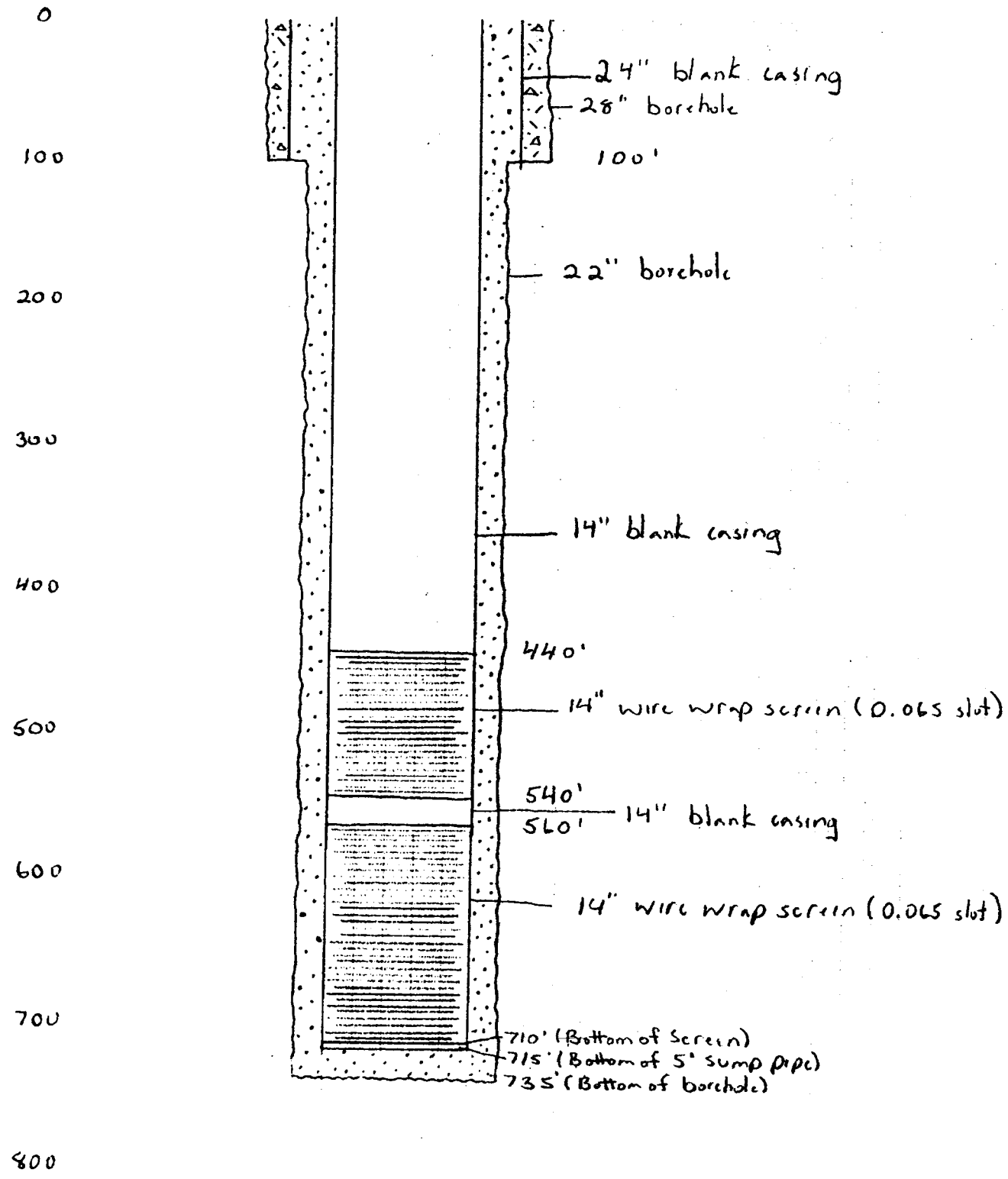
All Materials were ordered 7-14-99

Blank casing shipped 7-19-99
Gravel Pack " 7-19-99
Screen " 7-19-99

Layne Christensen Company

Subject Galena Water Enterprises PW-2 Date 10-18-99

Final Well Design For Production Well #2



APPENDIX E-List of Available Information at Washoe County

List of Available Information @ Washoe County Department of Water Resources:

Electronic data files (test pumping)
Plumbness and Alignment Tests
Video Camera Logs of Completed Wells
Geophysical Logs
Detailed Geologists Logs
Water Right Documents
Drillers Daily Work Logs