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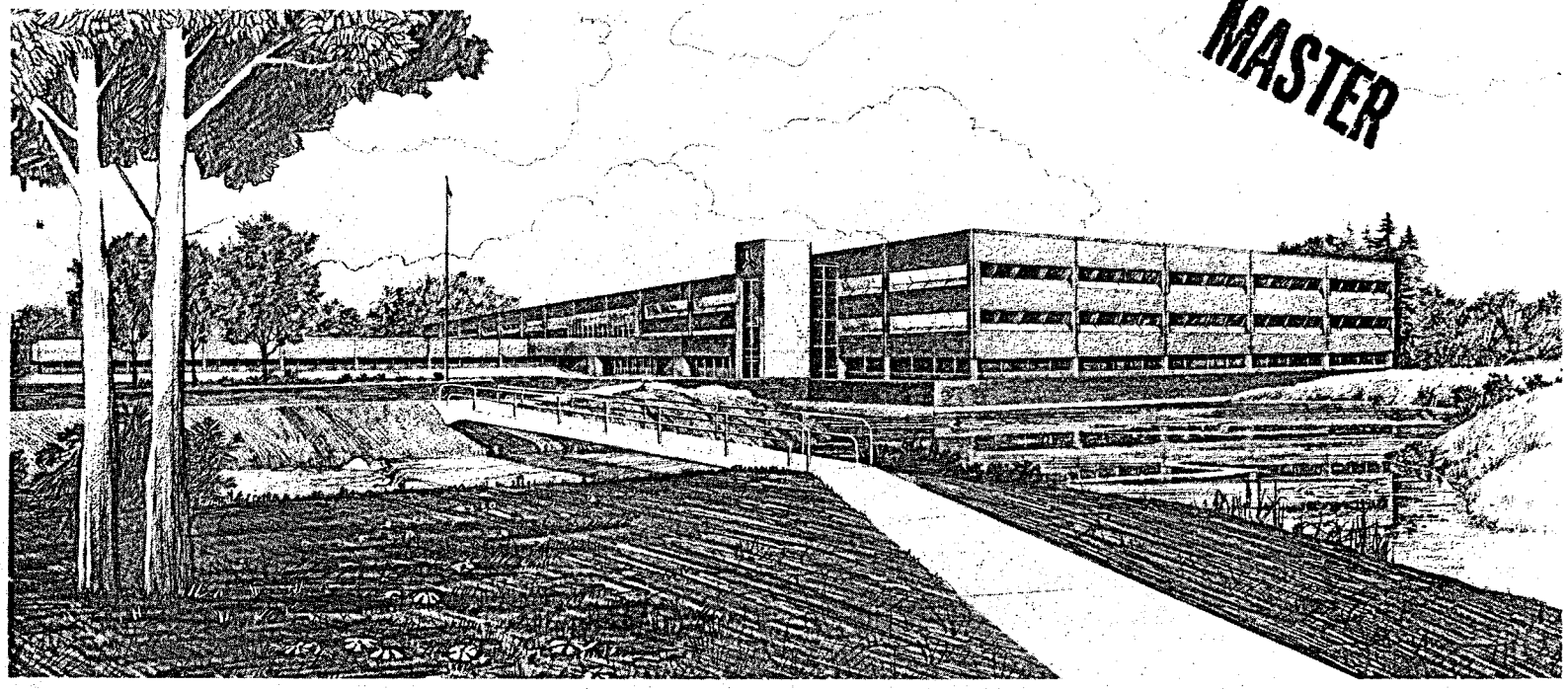

U.S. Department of Energy
Idaho Operations Office • Idaho National Engineering Laboratory

Inventory of Thermal Springs and Wells Within a One-Mile Radius of Yucca Lodge, Truth or Consequences, New Mexico

Geraldine E. Schwab
W. K. Summers and Associates, Inc.

February 1982

Prepared for the
U.S. Department of Energy
Under DOE Contract No. DE-AC07-76ID01570

EG&G Idaho

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INVENTORY OF THERMAL SPRINGS AND WELLS WITHIN A ONE-MILE RADIUS OF YUCCA LODGE, TRUTH OR CONSEQUENCES, NEW MEXICO

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PREFACE

This report was prepared for EG&G Idaho by W. K. Summers and Associates, Inc. on Subcontract No. K-7836 under the Department of Energy's Outreach Program. It is now being reissued without modification as an EG&G Formal report in order to make it available to others that may be interested in this geothermal application.

FOREWORD

The Geothermal Technical Assistance Program was developed under the premise that the majority of groups or individuals with available geothermal resources do not have the experience or manpower necessary to do a preliminary engineering and economic feasibility evaluation for geothermal energy projects. In order to disseminate technical information and to facilitate expanded use of geothermal energy resources, assistance was provided through FY-1981 in a consulting format on a first-come, staff-and-funds-available basis. Technical assistance can relate to conceptualization; engineering; economics; water chemistry implications for environmental, disposal, and material selection considerations; and planning and development strategies. This report is one of a series adapted from consultation provided to requestors either through in-house efforts or through limited efforts subcontracted to local engineering firms. The Geothermal Technical Assistance (GTA) Reports in this series, which are listed below, will be available early in 1982 to those with interest in specific geothermal applications.

GTA Report Number	EG&G Report Number	Title
1.	EGG-GTH-5512	*Aquaculture Facility Potential at Boulder Hot Springs, Boulder, Montana*
2.	EGG-GTH-5521	*Preliminary Geothermal Disposal Considerations, State Health Laboratory, Boise, Idaho*
3.	EGG-GTH-5573	*Geothermal Conversion at Veterans Hospital, Boise, Idaho*
4.	EGG-GTH-5574	*Geothermal Applications for Highway Rest Areas*
5.	EGG-GTH-5575	*Geothermal Applications for a Tannery*
6.	EGG-GTH-5599	*Preliminary Conceptual Design for Geothermal Space Heating Conversion of School District 50 Joint Facilities at Pagosa Springs, Colorado*
7.	EGG-GTH-5617	*Selected Geothermal Technical Assistance Efforts* (comprising short descriptions of ten space heating projects, five district heating projects, and three heat exchanger projects)
8.	EGG-2137	*Geothermal Source Potential and Utilization for Methane Generation and Alcohol Production* (subcontractor report)
9.	EGG-2138	*Geothermal Source Potential and Utilization for Alcohol Production* (subcontractor report)
10.	EGG-2139	*Potential Geothermal Energy Applications for Idaho Elks Rehabilitation Hospital* (subcontractor report)
11.	EGG-2144	*Technical Assistance Report on a Geothermal Heating Utility for Lemmon, South Dakota* (subcontractor report)
12.	EGG-2145	*Economic Analysis for Utilization of Geothermal Energy by North Dakota Concrete Products Company* (subcontractor report)

GTA Report Number	EG&G Report Number	Title
13.	EGG-2146	*Geothermal Feasibility Analysis for Polo School District No. 29-2, South Dakota* (subcontractor report)
14.	EGG-2147	*Preliminary Feasibility Study of Heating and Cooling Alternatives for Nebraska Western College, Scottsbluff, Nebraska* (contractor report)
15.	EGG-2148	*Inventory of Thermal Springs and Wells Within a One-Mile Radius of Yucca Lodge, Truth or Consequences, New Mexico* (subcontractor report)
16.	EGG-2149	*Space Heating for Spa Facilities at Ojo Caliente, New Mexico* (subcontractor report)
17.	EGG-2150	*Space Heating for Office Building at Glenwood Springs, Colorado* (subcontractor report)
18.	EGG-2151	*District Heating for Subdivision in Dickinson, North Dakota* (subcontractor report)
19.	EGG-2152	*Space Heating for Subdivision in Truth or Consequences, New Mexico* (subcontractor report)
20.	EGG-2153	*Space Heating for Veterans Administration Medical Center, Marlin, Texas* (subcontractor report)
21.	EGG-2154	*District Heating for Subdivision in Castle Rock, Colorado* (subcontractor report)
22.	EGG-2155	*Space Heating for Twin Lakes School Near Gallup, New Mexico* (subcontractor report)
23.	EGG-2156	*Pumping Tests at Well Campbell Et Al. No. 2, Gila Hot Springs, Grant County, New Mexico* (subcontractor report)
24.	EGG-GTH-5739	*Geothermal Deicing of Bridge Structures*
25.	EGG-GTH-5740	*Assessment of a Geothermal Application at Tucson, Arizona*
26.	EGG-GTH-5741	*Heat Pump Systems for Spring Creek, Montana*

ABSTRACT

Equity Management Corporation proposes (1) to build about 30 condominiums at the present site of the Yucca Lodge, Truth or Consequences, New Mexico and (2) to heat the condominiums with the natural thermal waters that discharge from the property. To do so the corporation must satisfy the rules and regulations of four state and federal agencies.

To satisfy some of the data requirements of these agencies and to provide basic data on the geohydrology of the area this report provides the results of a field inventory of the springs and wells within one mile of the lodge.

Table 1 summarizes the data for eight springs and three sites where springs once issued. Table 2 summarizes the data on forty-four operable wells and thirty wells that are unusable in their present condition.

Appendices list (1) wells presumed to be in the area but not located during field inspection and (2) wells that could be in the area, but were found to be beyond the one-mile radius.

Temperature and specific conductance of the water show only minor variation within the recognized hot-water area.

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Socorro, New Mexico 87801

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ACKNOWLEDGMENTS

We gratefully acknowledge the helpful cooperation of the water right owners of Truth or Consequences, both the private citizens and business representatives, who allowed us to visit their wells and springs and to make such measurements as seemed practical. Talking with owners, owner's representatives, and long-time residents provided valuable insight into the history of water use in the Truth or Consequences area and speeded the procedure of locating specific sites.

We especially thank Bill Johnson of Johnson Drilling Company of Truth or Consequences, who helped immeasurably during our field work in the area.

We also extend thanks to Dennis Fedor of the New Mexico State Energy and Minerals Department and Ivar Engen and M.C. Stone of EG&G Idaho, Inc. for support and guidance during the initial and final phases of this project.

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INVENTORY OF THERMAL SPRINGS AND WELLS WITHIN A ONE-MILE RADIUS OF YUCCA LODGE, TRUTH OR CONSEQUENCES, NEW MEXICO

INTRODUCTION

Background

Truth or Consequences, New Mexico, a city of 7500, occupies the west bank of the Rio Grande east of U.S. Interstate Highway 25 at a bend in the river about 150 miles south of Albuquerque, New Mexico and 120 miles north of El Paso, Texas.

Originally named Hot Springs, the community developed around the natural hot mineral waters found near the present downtown area. Some springs were enclosed to become the first bath houses while other entrepreneurs dug or drilled wells to use the thermal mineral waters where nature had not provided a spring.

Discussions with longtime residents indicate that the area of town south of the present location of Broadway was all swampy during the early days of Hot Springs. One of the town's first public baths was the Hot Springs Bath House, which sat down in the swamp and offered hot mud baths in addition to hot spring baths and hot spring water for drinking. The Hot Springs Bath House still operates on the corner of Austin and Pershing (down the block from the Yucca Lodge and under the same ownership) although it no longer offers mud baths.

This swampy land became more useable after the hot water drain was installed, and the construction of Elephant Butte Dam (1911-1916) reduced the danger of flooding. Figure 1 shows the approximate location of the hot water drain, as shown by Theis, Taylor and Murray in their 1942 report. This drainage ditch is now covered except where it crosses the block that contains the Yucca Lodge, Hot Springs Bath House, and Marshall Baths. More bath houses were built in the old swamp, and housing for both

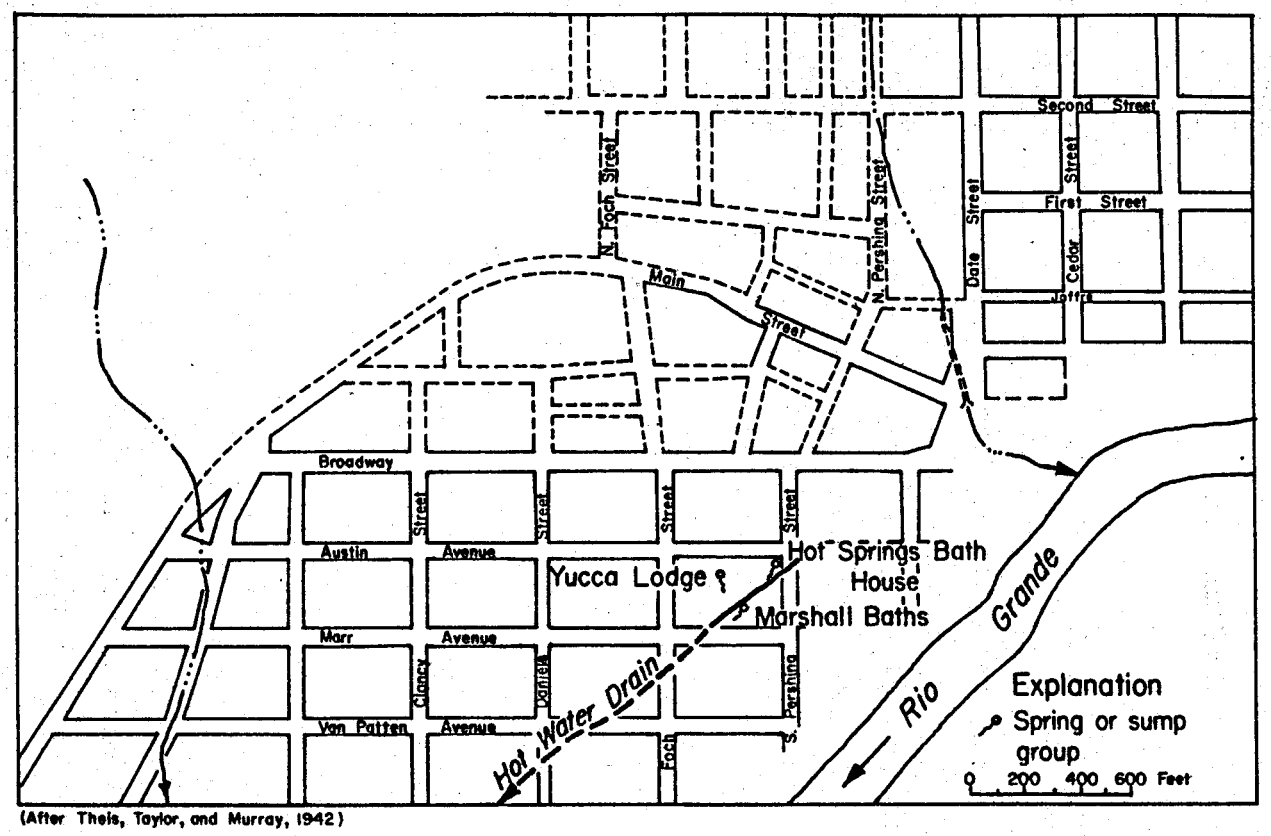

Figure 1. Map showing approximate location of Hot Water Drain in Truth or Consequences, New Mexico.

permanent residents and visitors followed.

By 1935, use of the natural hot mineral waters had become so extensive that the State Engineer declared the waters of the Hot Springs Basin to be fully appropriated. Since then, the State Engineer has had legal control over water use in the Hot Springs Basin.

Purpose and Scope

Equity Management Corporation, owners and operators of the Yucca Lodge--a hot water spa in Truth or Consequences--proposes to build condominiums in place of aging apartments and to heat the new structure with the naturally occurring thermal water.

This report arose from efforts to provide Equity Management Corporation with enough appropriate information to allow implementation of the development plan without having a detrimental effect on the flow of springs in the existing bath house and to satisfy all the relevant regulations.

The well and spring inventory serves two purposes:

1. It identifies points of existing water use or extant potential use (at which the State Engineer might rule impairment); and

2. It provides data for the geologic and hydrologic evaluation.

This inventory of wells and springs identifies, insofar as possible within the constraints of time and budget, the owner, location, configuration, yield, and type of use of each spring, and the owner, location, well depth, depth to water, construction method, age, pump type, yield, temperature, and annual volume and type of water use for each well within a one-mile radius of the

Yucca Lodge.

This is a basic data report. It does not include data interpretations.

Description of Development Site

Location

The property to be developed for geothermally-heated condominiums, including the present Yucca Lodge (see Plate 1), is in the north half of the northwest quarter of the northeast quarter of Section 4, Township 14 South, Range 4 West, Sierra County, New Mexico. Specifically, it is in the southern part of the city of Truth or Consequences, New Mexico, in the western part of the block bounded on the north by Austin Avenue, on the east by South Pershing Street, on the south by Marr Avenue, and on the west by South Foch Street.

The property is part of the flood plain of the Rio Grande and slopes gently southward toward that river. The altitude of the Yucca Lodge is about 4240 feet. It is about 1000 feet northwest of the Rio Grande and the springs now used in the baths issue about four feet above the river.

Truth or Consequences maintains a hot water drainage ditch to convey the discharge from several thermal springs to the Rio Grande. The hot water drainage ditch crosses the Yucca Lodge property and the overflow of springs there discharges into this ditch and ultimately reaches the Rio Grande.

The area around the Yucca Lodge is covered by the following U.S. Geological Survey topographic quadrangle maps:

Cuchillo, 1961, 7½';

Elephant Butte, 1959, 7½';

Williamsburg, 1961, 7½'; and

Engle, 1959, 15'.

We combined these maps to form the base map for Plate 1.

Hydrogeologic Setting

Based on a brief review of the published literature, conversations with well drillers, and examination of a few drillers' logs, the rocks beneath the Yucca Lodge probably include:

1. A relatively thin (40 to 60 feet) veneer of sand;

2. Shales, sandstones, limestones and siliceous limestones of Cambrian, Ordovician and Pennsylvanian age; and

3. Igneous and metamorphic rocks of Precambrian age.

The sand is an alluvial deposit. Incomplete descriptions indicate it is a fairly uniform, fine-grained unit that probably represents floodplain deposits of the Rio Grande.

The shales, sandstones, and limestones of Cambrian and Ordovician age are known only from outcrop, but may be as much as 1000 feet thick. The thickness of the limestones of Pennsylvanian age may be as much as 1000 feet.

Faults with displacement of several hundred to several thousand feet occur along the mountain fronts both east and west of the area and lesser faults probably occur in the area covered by alluvium. At least one geologic map shows that the rocks are extensively folded as well as fractured.

Many wells in the Truth or Consequences area discharge thermal water; some of these wells flow naturally. The wells tap both the sand and the sedimentary rocks. The alluvium is a common source of water for irrigation.

The thermal waters also discharge to springs which in turn flow into the hot water drainage ditch that discharges to the Rio Grande. The temperature of the discharging spring water, according to some people we talked with, varies with the stage of the Rio Grande.

Published analyses of the thermal water show as much as 2500 mg/l dissolved solids, with sodium and chloride the most abundant ions. Some fluoride concentrations exceed 3 mg/l.

Regulations

In New Mexico several regulations affect the use of water. Three agencies of state government and one federal agency have legal jurisdiction over various aspects of the proposed operation.

The New Mexico State Engineer Office must approve any change of location of point of diversion or change of use of water.

The State Engineer has jurisdiction over water rights and in that capacity will determine, from evidence presented to him, whether the water can be pumped for non-consumptive purposes without impairing nearby ground-water rights or rights to the flow of the Rio Grande. If he rules impairment, then a plan of replacement may be offered to the impaired rights, but that plan must be approved by the State Engineer.

The New Mexico Environmental Improvement Division and the U.S. Environmental Protection Agency have jurisdiction over the disposal of used water. Both agencies must be satisfied if the used water is disposed of to a surface drain that discharges to

the Rio Grande--especially if the waste water would add to the dissolved solids load of the water in the Rio Grande.

The New Mexico Environmental Improvement Division has jurisdiction over and must approve any plan to re-inject the used water into the ground-water system.

The New Mexico Conservation Commission has jurisdiction over the geothermal resources of the state.

To satisfy the Oil Conservation Commission requirements, a potential user of geothermal energy should survey the area within a mile radius of the proposed site of use to locate other users or potential users. The State Engineer Office will also need to know the locations of other water users or potential users and the current conditions at their points of diversion.

Proposed Development

Equity Management Corporation proposes to tear down some existing structures and build about 30 condominiums. Space heating for these condominiums could be provided by using natural thermal water, presence of which is exemplified by the long-used thermal baths on the property. Calculations by engineers and architects indicate that water at the temperature of the present baths (38°C-41°C) would be hot enough to effectively heat the planned structures using available technology.

DATA COLLECTION

State Engineer Office

Knowing that the New Mexico State Engineer Office (SEO) in Deming maintains files pertaining to water rights in the Hot Springs Basin, we began our data collection program with a trip to Deming. We collected pertinent information about every water

right we could identify as being within one mile of the Yucca Lodge. There are two sets of files: A well record file organized according to the location given; and a file containing all other information organized according to the SEO permit or declaration number. For this area in Truth or Consequences, all the SEO numbers have an HS prefix because they are in the Hot Springs Basin. Those wells across the river from Truth or Consequences do not have SEO (HS) numbers because they are not within the basin. Some other wells or springs on our map (Plate 1) do not have any HS number because either (a) the water right was never declared, or (b) we couldn't find the records in the SEO in Deming and the current owner (or owner's representative) we spoke with didn't know the assigned number.

Theis

Theis, Taylor, and Murray[1] in 1942 published a report titled "Thermal Waters of the Hot Springs Artesian Basin, Sierra County, New Mexico" which presented data collected in 1939 and 1940. We located some of these wells and springs, and attempted to locate a few more. Because the passage of time has changed ownership of most of these waters, and some have apparently been obliterated, we did not give as high a priority to the search for these sites as we gave to the search for those filed with the SEO.

Theis, Taylor and Murray[1] use the word "sump" to describe a spring that has been developed for bathing. These structures have been dug into the ground (as opposed to tubs built above the ground) and water enters through the gravel bottom and exits through a drain near the top.

United States Geological Survey

We obtained computer-printed records from the United States Geological Survey office in Albuquerque, New Mexico for all the wells and springs in the area for which they had information.

These records supplement or duplicate the data reported by Theis[1] and the SEO files, but did not turn up any previously-unreported wells or springs.

Field Work

After gathering documentation at the SEO in Deming, we set out to locate the wells and springs in Truth or Consequences and determine their present status. We soon learned that we would have to assign some sort of priority to items in the search. This was done on the basis of what information we already had. For example, water users with declared water rights received more attention than water users who apparently had not filed any declaration. Also, nearby water users were more diligently sought than ones over half a mile away. Such apparently practical priorities led to a few startling results, most noteworthy of which was the near-omission of Geronimo Hot Spring, which was previously known as Goverment Spring (Theis, Taylor, and Murray[1]) and was once the water source for a bath house owned by the U.S. Government. This spring, located about 15 feet north of Main Street across from the post office, currently serves as a tourist attraction and as such supplies some drinking water, but is no longer used for baths and was not documented during our search of the SEO files (prehaps because we did not check the owner index for "U.S.A.").

As we became more pressed for time, we had to forego the collection of water samples, and to limit measurements of depth to water, temperature, and specific conductance to those sites where measurements were very easy to obtain and owners very cooperative.

Theis, Taylor, and Murray[1] present more chemical analyses, and water levels. Comparing our partial field chemistries with published analyses, it would seem that our field determinations of bicarbonate, silica, and chloride are all somewhat high. Sample aging (chemical changes in the sample between the time it

was collected and the time it was analysed) could account for these differences.

The presence of such a large number of wells inside the city limits, where land ownership, buildings, business names, street names, and even a few street locations have changed through the years of development created several problems in actually locating specific sites on the ground and clearly correlating these sites with previous reports.

One of the greatest problems was the lack of precision in well location as filed with the SEO: Looking for a windmill in 10 acres of farm land isn't so difficult, but finding a thermal well in 10 acres of buildings requires more information or more luck or both.

Subdivision maps showing block and lot numbers resolved some location problems, and discussions with Bill Johnson about specific wells he drilled or worked on made others easy to find. In some cases, well locations given on the permit application and well record include both a block-lot description and a township-range location which are contradictory. If the owner or driller informed us which location was correct and that information showed that the well was over a mile from the Yucca Lodge, we did not pursue the search for that well further. When we found a well at one of the reported locations, we assumed that was the well being described and did not examine other reported locations for the same well.

INFORMATION COLLECTED

We collected data from three sources: (a) public records in the SEO or Theis, Taylor, and Murray[1], (b) owner's records or recollection, and (c) observation or measurement. For most recorded water rights, information came from all three sources.

For springs, we attempted to identify the owner, describe spring location and configuration, learn the type of use and annual amount used, measure the temperature and specific conductance of the water, and record the date of our visit and the names of individuals we spoke with.

For wells, we again sought to identify the owner, describe the location, determine the use by volume and purpose, measure the temperature and specific conductance of the water pumped, measure the depth to water, determine whether it is pumped and if so what kind of pump is used, confirm information we've gathered about total depth of well, date of construction, and method of construction, and record the date of our visit and the names of individuals we spoke with.

In tabulating the data, we have expressed locations in the standard format used by the SEO, which is diagrammed in Figure 2.

Table 1 presents data we collected for springs we found within a mile of the Yucca Lodge.

Table 2 presents data we collected for wells we found within one mile of the Yucca Lodge. This table includes wells reported in the SEO files as destroyed or plugged, whether found or not.

Appendix 1 lists wells we did not find which we believe are within a mile of the Yucca Lodge. These include wells whose current owners we could not locate or could not identify, wells for which we have no records other than Theis, Taylor, and Murray[1], and one well mentioned to us by another party. We looked for some of these without seeing any sight of them, but did not make a thorough enough search to say they have certainly been destroyed.

Plate 1 shows the locations of wells and springs listed in Tables 1 and 2 and Appendix 1.

Appendix 2 lists wells we discovered were over a mile away from the Yucca Lodge.

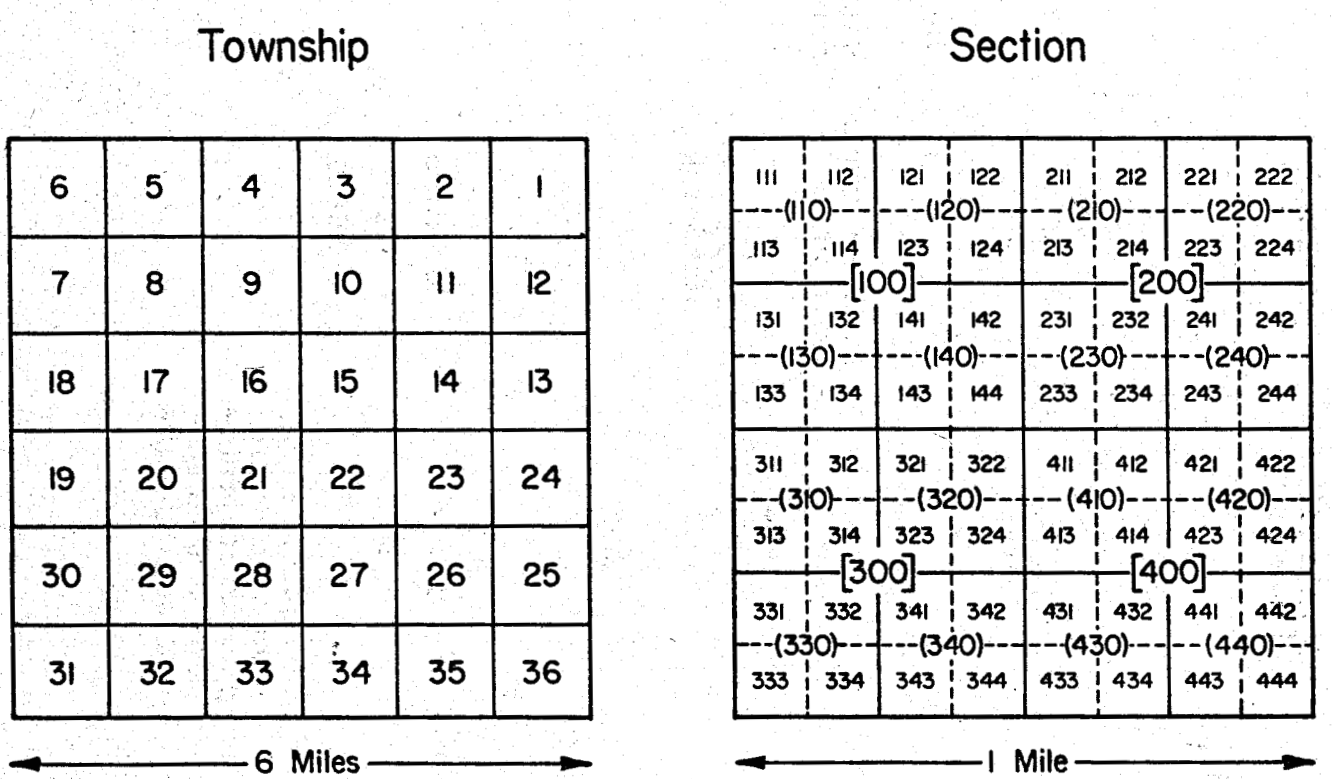

Figure 2. Method of numbering sections in a township and tracts in a section.

TABLE 1. SPRINGS IDENTIFIED WITHIN ONE MILE OF THE YUCCA LODGE

No. on Plate 1	1	2	3
HS No.[a]	None	None	None
Owner's Name	State of New Mexico[h]	U.S.A.[h]	Unknown
Business Name (if commercial)			
Location			
Township	13S	13S	13S
Range	4W	4W	4W
Section	33	33	34
Numbered ¼¼¼[b]	433	434	313
We spoke to:			
Name			Matt Hamilton
Title			neighbor
Configuration	Dry?	Pile of rocks in a sump	Seeps in swampy arroyo bottom
Yield (gpm)[c]	None	1	5
Type of use		Display and drinking	None
Annual Useage[d] (Ac-ft/yr)	None		
Temperature (°C)		Warm	Cool
Specific Conductance[e]			
Name of Spring	State	Geronimo	
Theis No.[f]	22	23	
Date of visit		8-28-81	9-11-81
Remarks	No spring seen; location would put it on hillside near plugged well HS-476		

TABLE 1. (continued)

No. on Plate 1	4	5	6
HS No.[a]	None	216	459
Owner's Name	V. Karl Kortemeier	V. Karl Kortemeier	Norm Brookfield
Business Name (if commercial)	Yucca Bath House	Yucca Bath House	
Location			
Township	14S	14S	14S
Range	4W	4W	4W
Section	4	4	4
Numbered ¼¼¼[b]	211	211	211
We spoke to:			
Name	Max Sanchez	Max Sanchez	Norm Brookfield
Title	Manager	Manager	Owner
Configuration	Piped	3 sumps	Sump
Yield (gpm)[c]	2		
Type of use	Drinking	Therapeutic and bathing	Domestic
Annual Useage[d] (Ac-ft/yr)		303.2	0
Temperature (°C)		38-41	40
Specific Conductance[e]		5700-6000	5400
Name of Spring	Ponce de Leon		
Theis No.[f]	13	13	28
Date of visit	8-27-81	8-27-81	9-3-81
Remarks			

TABLE 1. (continued)

No. on Plate 1	7	8	9
HS No.[a]	285	220	215
Owner's Name	Maria Wagnor[g]	V. Karl Kortemeier	Raymond Jones
Business Name (if commercial)	Roadrunner Apts.	Hot Springs Bath House	Marshall Baths
Location			
Township	14S	14S	14S
Range	4W	4W	4W
Section	4	4	4
Numbered ¼¼¼[b]	212	212	212
We spoke to:			
Name		Mr. Chitwood	Mr. McJennett
Title		Manager	ersatz caretaker
Configuration	Sump	6 sumps	4 sumps
Yield (gpm)[c]			
Type of use	Bathing	Therapeutic and bathing	Therapeutic and bathing
Annual Useage[d] (Ac-ft/yr)	16	101.5	214
Temperature (°C)		41-45	44
Specific Conductance[e]		5900-6000	6000
Name of Spring			
Theis No.[f]	9	37	
Date of visit		8-26-81	9-2-81
Remarks			

TABLE 1. (continued)

No. on Plate 1	10	11
HS No.[a]	None	None
Owner's Name	None (previously John C. Morgan)	None (previously Mrs. May Wiggins)
Business Name (if commercial)		
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered ¼¼¼[b]	212	213
We spoke to:		
Name	Mrs. Helen Morgan Stump	Mr. and Mrs. Delbert Baker
Title	Previous owner	Current owners
Configuration	Destroyed	Destroyed
Yield (gpm)[c]	None	None
Type of use	None	None
Annual Useage[d] (Ac-ft/yr)	None	None
Temperature (°C)		
Specific Conductance[e]		
Name of Spring		
Theis No.[f]	29	14
Date of visit		9-4-81
Remarks	Mrs. Stump told me they filled the sump and converted the bathhouse to a storage room.	Location also given as lot 13 block 39, which the Bakers own; no well or sump present-an old timer told Mr. Baker there used to be a well.

TABLE 1. (continued)

a. "None" means we could not definitely associate this spring with a Hot Springs Basin number in the water rights files of the Deming SEO.

b. See graphic explanation in Figure 2.

c. Visually estimated, represents only an order-of-magnitude value, gpm = gallons per minute.

d. Maximum, based on Declaration filled with the State Engineer Office, using 3 acre-feet per annum for domestic use, no number where not declared.

e. Specific conductance measured at field temperature, expressed as micromhos/cm.

f. Number used by Theis, Taylor, and Murray to identify this spring on their map (their Plate 1) and tables.

g. Reported owner, not confirmed by first-hand discussion as business was closed when we were doing field work.

h. Reported owner, not confirmed by first-hand discussion.

TABLE 2. WELLS IDENTIFIED WITHIN ONE MILE OF THE YUCCA LODGE

No. on Plate 1	12	13
HS No.[a]	420	68
Owner's Name	Charles Hibler	Shirley O'Connell
Business Name (if commercial)		
We Spoke to:		
Name	Mrs. Hibler	Shirley O'Connell
Title	owner	owner
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4, 1/4 1/4[b]	312	342
Type of Use	Domestic Irrisation	None
Annual Usage[c] (Ac-ft/yr)	3	6
Pump Type	submerisible	Turbine
Pump Capacity[d]	4 gpm	
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]	420	68
Construction		
Method	Drilled-cable	Drilled
Date[g]	July 25 1975	1949
Total Depth[h]	230	47
Depth to Water[i]	72r	
Date of Visit	9-11-81	9-2-81
Present Status	operable	Not in Use
Remarks		Bathhouse made over into apartments.

TABLE 2. (continued)

No. on Plate 1	14	15
HS No.[a]	1	None
Owner's Name	Hazel June Whitaker	Western Bank Truth or Consequences
Business Name (if commercial)	Sierra Grande Helth Spa	Western Bank Truth or Consequences
We Spoke to:		
Name	Mrs. Whitaker	Mr. C. A. Rohne
Title	Manager	Bank Official
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	344	344
Type of Use	Baths & drinking	Bathing
Annual Usage[c] (Ac-ft/yr)	3.36	1/2 r
Pump Type	Centrifugal	
Pump Capacity[d]		
Temperature (C)	35.5	
Spec. Cond.[e]	5600	
Theis No.[f]	1	4
Construction Method	Drilled	Drilled
Date[g]	1929	1924
Total Depth[h]	110/125t/80e	105t
Depth to Water[i]		
Date of Visit	8-28-81	9-9-81
Present Status	In Use	Operable
Remarks	Measured first bath; Water reportedly gets hotter.	Old James Bath House Property

TABLE 2. (continued)

No. on Plate 1	16	17
HS No.[a]	55	56
Owner's Name	Stewart Investments Inc.	Stewart Investments Inc.
Business Name (if commercial)	Charles Bath House	Charles Bath House
We Spoke to:		
Name	Mrs. Bonnie Sloan	Mrs. Bonnie Sloan
Title	operator	operator
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	344	344
Type of Use	Mineral baths and domestic purposes	Mineral baths and domestic purposes
Annual Usage[c] (Ac-ft/yr)	12.4 or 24.8 with HS-56	12.4 or 24.8 with HS-55
Pump Type	Centrifugal	Turbine
Pump Capacity[d]		
Temperature (C)	42.5	42.5
Spec. Cond.[e]	6100	6100
Theis No.[f]	2 or 3	2 or 3
Construction		
Method	Drilled	Drilled
Date[g]	1930	1930
Total Depth[h]	208	208
Depth to Water[i]	2.44	
Date of Visit	9-3-81	9-2-81; 9-3-81
Present Status	In Use	In Use
Remarks	Temp. & spec. cond. of bath water from both HS-55 & HS-56.	Temp. & spec. cond. of bath water from both HS-55 & HS-56.

TABLE 2. (continued)

No. on Plate 1	18	19
HS No.[a]	8	24-abandoned
Owner's Name	Sierra County	City of Truth or Consequences
Business Name (if commercial)	Sierra County Courthose	
We Spoke to: Name	Mr. Charles S. Cox	
Title	Sierra County Sheriff	
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	423	433
Type of Use	None	None (previous State Bath House)
Annual Usage[c] (Ac-ft/yr)	None	None
Pump Type	None	None
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]	38	15(?)
Construction Method	Drilled	Drilled
Date[g]	1940	about 1923/ 1924t
Total Depth[h]	210	160/125t
Depth to Water[i]		
Date of Visit	8-27-81	
Present Status	Destroyed	Plugged or destroyed
Remarks	Theis et al. also list no use	Reportedly located under Recreation Center.

TABLE 2. (continued)

No. on Plate 1	20	21
HS No.[a]	24	476
Owner's Name	City of Truth or Consequences	City of Truth or Consequences
Business Name (if commercial)	City of Truth or Consequences Senior Citizens Center	
We Spoke to:		
Name	Otis Barnes	Otis Barnes
Title	City of Truth or Consequences Water Manager	City of Truth or Consequences Water Manager
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	433	433
Type of Use	Geothermal Space Heating	None
Annual Usage[c] (Ac-ft/yr)	30	None
Pump Type	Centrifugal	None
Pump Capacity[d]		
Temperature (C)	37.8	
Spec. Cond.[e]	5400	
Theis No.[f]		
Construction Method	Drilled	Drilled
Date[g]	1942	1981
Total Depth[h]	120	250
Depth to Water[i]	1.96	
Date of Visit	8-25-81	8-25-81
Present Status	Operable	Plugged
Remarks	Water right transfered in from HS-476 which is now plugged	Water right of 30 Ac-ft/yr transfered to HS-24

TABLE 2. (continued)

No. on Plate 1	22	23
HS No.[a]	None	None
Owner's Name	Mrs. D. Rush	Ben & Millie Baker
Business Name (if commercial)		Texas Home Baths
We Spoke to:		
Name	Mrs. Rush	Thelma Clark
Title	owner	Manager
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	433	433
Type of Use	None (previously bathing and drinking)	Bathing
Annual Usage[c] (Ac-ft/yr)		
Pump Type	None	Centrifugal(?)
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]	17	18
Construction		
Method	Drilled	Drilled
Date[g]	1928	1928
Total Depth[h]	101t	55t
Depth to Water[i]		
Date of Visit	9-10-81	9-9-81
Present Status	Capped	In Use
Remarks	Old Arizona Hotel property	

TABLE 2. (continued)

No. on Plate 1	24	25
HS No.[a]	92	203 to be abandoned
Owner's Name	Oliver Fry	Sierra County Historical Society
Business Name (if commercial)		Geronimo Springs Museum
We Spoke to:		
Name		Barry Stout
Title		President of Society
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	434	434
Type of Use	None	None
Annual Usage[c] (Ac-ft/yr)		9.2
Pump Type		
Pump Capacity[d]		
Temperature (C)		29.5
Spec. Cond.[e]		6100
Theis No.[f]		
Construction		
Method	Drilled	Drilled
Date[g]	Dec. 4 1950	1980
Total Depth[h]	80	20
Depth to Water[i]	6.36r	5.42
Date of Visit		8-28-81
Present Status		Unequipped
Remarks	Permit cancelled February 17 1953	To be plugged-temperature and yield too low

TABLE 2. (continued)

No. on Plate 1	26	27
HS No.[a]	203-abandoned	505
Owner's Name	First Sierra National Bank	Alma Schank
Business Name (if commercial)	First Sierra National Bank	Downtown Apartments
We Spoke to:		
Name	Helen Morgan Stump	Alma Schank
Title	Attendant at Geronimo Springs Museum	owner
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	434	434
Type of Use	None	None (previously domestic & tenant baths)
Annual Usage[c] (Ac-ft/yr)	None	9
Pump Type	None	Centrifugal
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]	32?	31?
Construction		
Method	Drilled	Drilled
Date[g]	1926t	Unknown/1928t
Total Depth[h]	239t	60/258t
Depth to Water[i]	.06t	+1t
Date of Visit		9-3-81
Present Status	Destroyed	Inoperable
Remarks	Old well 203- water right transferred to Sierra County Historical Society	

TABLE 2. (continued)

No. on Plate 1	28	29
HS No.[a]	None	221
Owner's Name	Clifford Kear	Kenneth W. James
Business Name (if commercial)	Cozy Corner Apts.	
We Spoke to:		
Name	Clifford Kear	Kenneth W. James
Title	owner	owner
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	434	434 or 443
Type of Use	None (previously and planned - baths)	baths
Annual Usage[c] (Ac-ft/yr)		160
Pump Type	None	Centrifugal
Pump Capacity[d]		
Temperature (C)		42.5
Spec. Cond.[e]		5900
Theis No.[f]	30?	24?
Construction Method	Drilled	Drilled
Date[g]	1929t	Unknown/1926t
Total Depth[h]	125t	100t/14e
Depth to Water[i]		0r
Date of Visit	9-11-81	9-4-81
Present Status	Capped	In use
Remarks	Owner intends to use for baths later but not as public bath house.	

TABLE 2. (continued)

No. on Plate 1	30	31
HS No.[a]	453	69
Owner's Name	Mrs. Jamie Bishop	V. E. Yessler
Business Name (if commercial)		
We Spoke to: Name Title		
Location		
Township	13S	13S
Range	4W	4W
Section	33	33
Numbered 1/4 1/4 1/4[b]	441	440
Type of Use		None
Annual Usage[c] (Ac-ft/yr)		
Pump Type		
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled-cable	Drilled
Date[g]	February 26 1978	August 20 1948
Total Depth[h]	60	118
Depth to Water[i]		
Date of Visit		
Present Status	Destroyed	
Remarks	Well record states ...water was bad so no casing used and well was filled up.	Permit cancelled July 20 1954; location might be 13S.4W.33.321

TABLE 2. (continued)

No. on Plate 1	33	34
HS No.[a]	296	132
Owner's Name	Matt Hamilton	V. M. Akin
Business Name (if commercial)		
We Spoke to: Name	Matt Hamilton	V. M. Akin
Title	owner	owner
Location		
Township	13S	13S
Range	4W	4W
Section	34	34
Numbered 1/4 1/4 1/4[b]	311	313 or 311
Type of Use	None (previously domestic irrisation)	domestic irrisation
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	None	eletric
Pump Capacity[d]		2-3gpm
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Drilled
Date[g]	November 4 1967	March 15 1956
Total Depth[h]	83	115/50e now
Depth to Water[i]	15r	12r
Date of Visit	9-10-81	9-10-81
Present Status	capped	operable
Remarks	Owner does not plan to recommence use	Used to water trees- owner reports sulfur odor when pumping

TABLE 2. (continued)

No. on Plate 1	34	35
HS No.[a]	None	None
Owner's Name	V. M. Akin	Mrs. Howard(?)
Business Name (if commercial)		
We Spoke to:		
Name	V. M. Akin	Bill Johnson
Title	owner	Local Driller
Location		
Township	13S	13S
Range	4W	4W
Section	34	34
Numbered 1/4 1/4 1/4 [b]	313	313
Type of Use	None	None
Annual Usage[c] (Ac-ft/yr)		
Pump Type	None	None-flowing
Pump Capacity[d]		1-2gpm
Temperature (C)		cool
Spec. Cond.[e]		
Theis No.[f]	36	35A
Construction		
Method	Drilled	Drilled
Date[g]	1929	Unknown
Total Depth[h]	182t	120t
Depth to Water[i]		flowing
Date of Visit		9-11-81
Present Status	capped	abandoned
Remarks		Flowing; owner is Mrs. Howard according to Theis et al.

TABLE 2. (continued)

No. on Plate 1	36	37
HS No.[a]	162	493
Owner's Name	Dorothy Mauldin	Leon Johnson
Business Name (if commercial)	Mauldin Drilling Co.	
We Spoke to:		
Name	Dorothy Mauldin	Leon Johnson
Title	owner	owner
Location		
Township	13S	13S
Range	4W	4W
Section	34	34
Numbered 1/4 1/4 1/4[b]	341	341
Type of Use	None	Domestic Irrigation
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	None	Submersible
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction		
Method	Drilled	Drilled-cable
Date[g]	March 28 1960	January 3 1980
Total Depth[h]	90	100
Depth to Water[i]	23r	20r
Date of Visit	9-10-81	9-10-81
Present Status	capped	Operable
Remarks	Owner reports water is too mineralized for sprinkler irrigation	

TABLE 2. (continued)

No. on Plate 1	38	39
HS No.[a]	464	None
Owner's Name	Robert Middleton	Mr. & Mrs. Guynn
Business Name (if commercial)		
We Spoke to: Name	Mr. Middleton	Bill Johnson
Title	owner	driller who removed windmill head for owner
Location		
Township	13S	13S
Range	4W	4W
Section	34	34
Numbered 1/4 1/4 1/4[b]	343	411
Type of Use	Domestic Irrigation	Domestic
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	Centrifugal	Submersible?
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled-cable	
Date[g]	July 24 1978	
Total Depth[h]	34	130r
Depth to Water[i]	8r	
Date of Visit	9-11-81	9-11-81
Present Status	Operable	Apparently in Use
Remarks		Well seen from street owners not at home so well not visited

TABLE 2. (continued)

No. on Plate 1	40	41
HS No.[a]	368	395
Owner's Name	Ted Marshall	Charles Ploen
Business Name (if commercial)		
We Spoke to: Name	Bill Johnson	Charles Ploen
Title	driller who drilled well	owner
Location		
Township	13S	13S
Range	4W	4W
Section	34	34
Numbered 1/4 1/4 1/4[b]	433	433
Type of Use	Domestic Irrigation	Domestic Irrigation
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type		Submersible
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Drilled-cable
Date[g]	August 12 1972	May 10 1974
Total Depth[h]	50	96
Depth to Water[i]	9r	9r
Date of Visit		9-11-81
Present Status	Unknown	Operable
Remarks	Mr. Marshall unavailable; reportedly has sold to unnamed person	Disconnected for winter

TABLE 2. (continued)

No. on Plate 1	42	43
HS No.[a]	None[j]	None[j]
Owner's Name	City of Truth or Consequences	Robley Hedrick
Business Name (if commercial)	City of Truth or Consequences	
We Spoke to:		
Name	Otis Barnes	Robley Hedrick
Title	City of Truth or Consequences Water Manager	owner
Location		
Township	14S	14S
Range	4W	4W
Section	3	3
Numbered 1/4 1/4 1/4[b]	121	124
Type of Use	Irrigation	None (previously domestic)
Annual Usage[c] (Ac-ft/yr)	135r	
Pump Type	Turbine	None
Pump Capacity[d]	200gpm	
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction		
Method	Drilled	Drilled
Date[g]	Unknown	Unknown
Total Depth[h]	Unknown	Unknown
Depth to Water[i]		14.10
Date of Visit	9-1-81	9-1-81
Present Status	In Use	Inoperable
Remarks		

TABLE 2. (continued)

No. on Plate 1	44	45
HS No.[a]	None	462
Owner's Name	Unknown	Sam Colombo
Business Name (if commercial)		
We Spoke to: Name		Sam Colombo
Title		owner
Location		
Township	14S	14S
Range	4W	4W
Section	3	3
Numbered 1/4 1/4 1/4[b]	211	211
Type of Use	Domestic(?)	Domestic Irrisation
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type		Submersible
Pump Capacity[d]		
Temperature (C)		not hot
Spec. Cond.[e]		
Theis No.[f]		
Construction Method		Drilled-cable
Date[g]		June 22 1978
Total Depth[h]		30
Depth to Water[i]		5r
Date of Visit	9-11-81	9-10-81
Present Status	Unknown	Operable
Remarks	A neighbor and a local driller both believe there is a well	

TABLE 2. (continued)

No. on Plate 1	46	47
HS No.[a]	None[j]	2
Owner's Name	Robley Hedrick	Carrie Tinsley Hospital
Business Name (if commercial)		
We Spoke to: Name	Robley Hedrick	Bob Baize and Gordon Blanchard
Title	owner	Hospital Maintenance Staff
Location		
Township	14S	14S
Range	4W	4W
Section	3	4
Numbered 1/4 1/4 1/4[b]	212	121
Type of Use	Irrigation	None (previously baths and medicinal purposes)
Annual Usage[c] (Ac-ft/yr)		50.4
Pump Type	Turbine	Centrifugal
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		8
Construction Method	Drilled	Drilled
Date[g]	Unknown	1929t
Total Depth[h]	Unknown	212
Depth to Water[i]		
Date of Visit	9-1-81	8-27-81
Present Status	Presumably Operable	Operable
Remarks		Hospital moved to Albuquerque NM

TABLE 2. (continued)

No. on Plate 1	48	49
HS No.[a]	58	53
Owner's Name	M. M. Davis	James R. Lotz
Business Name (if commercial)	Royce Baths	Hoosier Motel
We Spoke to:		
Name	Dale Davis	James R. Lotz
Title	Assistant Manager	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	121	122
Type of Use	Baths	Baths for motel guests
Annual Usage[c] (Ac-ft/yr)		18.6
Pump Type	Centrifugal	Centrifugal
Pump Capacity[d]		50
Temperature (C)	38	
Spec. Cond.[e]	5900	
Theis No.[f]		
Construction		
Method	Drilled	Drilled
Date[g]	1948	April 26 1973
Total Depth[h]	135	50
Depth to Water[i]		5.51
Date of Visit	9-2-81	9-2-81
Present Status	In Use	Inoperable
Remarks	Being purchased from Irene Kuykendall	Owner has contacted a driller to repair or replace pump

TABLE 2. (continued)

No. on Plate 1	50	51
HS No.[a]	53 abandoned	None
Owner's Name	James R. Lotz	Jack Hardacker
Business Name (if commercial)		Southern Hotel
We Spoke to: Name	James R. Lotz	Bill Howell
Title	owner	realtor
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	122	122
Type of Use	None - replaced by HS-53	None (previously bathing drinking)
Annual Usage[c] (Ac-ft/yr)		
Pump Type	None	None
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		10?
Construction Method	Drilled	Drilled
Date[g]	1948	1936
Total Depth[h]	196	165t
Depth to Water[i]		
Date of Visit		9-11-81
Present Status	Plugged & Abandoned	Capped
Remarks		Theis et al. show: well 10 here; owner Virginia Ann Hospital; use Hoosier Apts.

TABLE 2. (continued)

No. on Plate 1	52	53
HS No.[a]	None	62
Owner's Name	Howell Associates Inc.	Mr. J. D. Lipsey
Business Name (if commercial)	Howell Associates Inc. Century 21	Brooks Apartments
We Spoke to:		
Name	Bill Howell	J. D. Lipsey
Title	part-owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	122	122
Type of Use	baths	baths (for tenants not public)
Annual Usage[c] (Ac-ft/yr)		9
Pump Type	Unknown	Centrifugal
Pump Capacity[d]		
Temperature (C)		40.5
Spec. Cond.[e]		5800
Theis No.[f]		
Construction		
Method	Unknown	Drilled
Date[g]	Unknown	1950
Total Depth[h]	Unknown	170/89e
Depth to Water[i]		
Date of Visit	9-11-81	9-2-81
Present Status	Presumed Operable	In Use
Remarks	Old Virginia Ann Hospital buildings	Mr. Lipsey recalls that Mr. Brooks told him well was recased and is now 89' deep

TABLE 2. (continued)

No. on Plate 1	54	55
HS No.[a]	4	76
Owner's Name	M. M. Davis	M. M.Davis
Business Name (if commercial)	La Casita Bath House	Dave's Clover Leaf Baths
We Spoke to:		
Name	Cliff Weaver	M. M. Davis
Title	Manager and Therapist	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	122	122
Type of Use	baths	Therapeutic and baths
Annual Usage[c] (Ac-ft/yr)	3	21
Pump Type	Centrifugal	Centrifugal
Pump Capacity[d]		
Temperature (C)	42	42
Spec. Cond.[e]	5800	6000
Theis No.[f]	10A	
Construction		
Method	Drilled	Drilled
Date[g]	July 1938	November 10 1949
Total Depth[h]	205	219
Depth to Water[i]	Or	Or
Date of Visit	9-1-81	9-1-81
Present Status	In Use	In Use
Remarks	Well delivers about 5-10gpm to tub without pumping	

TABLE 2. (continued)

No. on Plate 1	56	57
HS No.[a]	None	107
Owner's Name	William Smith	Unknown
Business Name (if commercial)		
We Spoke to: Name	Mr. & Mrs. Smith	Mrs. William Smith
Title	owners	neighbor
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	123	123
Type of Use	None (previously domestic irrigation)	None
Annual Usage[c] (Ac-ft/yr)		
Pump Type	None	None (previously pitcher pump)
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Driven	Drilled
Date[g]	Unknown	August 28 1954
Total Depth[h]	20e	100
Depth to Water[i]		6r
Date of Visit	9-9-81	9-9-81
Present Status	Capped	Inoperable
Remarks		Well drilled for Ada Forrest. Mrs. Smith heard it was sold to out-of-state buyers.

TABLE 2. (continued)

No. on Plate 1	58	59
HS No.[a]	401-1	282
Owner's Name	City of Truth or Consequences	Joe Merrell
Business Name (if commercial)	City of Truth or Consequences	
We Spoke to:		
Name	Otis Barnes	Mr. & Mrs. Merrell
Title	City of Truth or Consequences Water Manager	owners
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	124	124
Type of Use	Domestic and sanitary purposes & swimming pool	Domestic baths
Annual Usage[c] (Ac-ft/yr)	20	3
Pump Type	Centrifugal	Centrifugal
Pump Capacity[d]		
Temperature (C)	31.8	warm
Spec. Cond.[e]	4950	
Theis No.[f]		
Construction		
Method	Drilled-cable	Drilled
Date[g]	July 31 1974	September 1 1966
Total Depth[h]	45	41
Depth to Water[i]	9.36	9r
Date of Visit	8-25-81	9-9-81
Present Status	Not in Use Now	In Use
Remarks	Swimming pool closed for winter	

TABLE 2. (continued)

No. on Plate 1	60	61
HS No.[a]	None	475
Owner's Name	Unknown	Mr. & Mrs. William B. Chownins
Business Name (if commercial)		
We Spoke to:		
Name	Bill Johnson	
Title	well driller	
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	144	210
Type of Use	None	Domestic baths
Annual Usage[c] (Ac-ft/yr)		3
Pump Type		
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Driven
Date[g]		October 16 1979
Total Depth[h]	43r	30
Depth to Water[i]		5.5r
Date of Visit		
Present Status	Destroyed	Presumably Operable
Remarks	Dewatering well used durins construction of lift plant.	Owners were not available so well was not seen; reported location & use

TABLE 2. (continued)

No. on Plate 1	62	63
HS No.[a]	459	217
Owner's Name	Norm Brookfield	V. Karl Kortemeier
Business Name (if commercial)		Yucca GardensBaths
We Spoke to:		
Name	Norm Brookfield	Max Sanchez
Title	owner	manager
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	211	211
Type of Use	None (previously domestic baths)	Jacuzzi baths now
Annual Usage[c] (Ac-ft/yr)	4	241.9
Pump Type	None	Centrifugal
Pump Capacity[d]		
Temperature (C)	42.5	42
Spec. Cond.[e]	5800	6000
Theis No.[f]		13a?
Construction		
Method	Drilled-cable	Driven
Date[g]	January 2 1979	Prior to 1931
Total Depth[h]	35	8/14t
Depth to Water[i]	3.67	1.52
Date of Visit	9-3-81	8-27-81
Present Status	Inoperable	In Use
Remarks	Owner intends to install another pump and use the well for domestic purposes	Well inside bath house between Jacuzzi tub and back wall near hot water drain

TABLE 2. (continued)

No. on Plate 1	64	65
HS No.[a]	9	450 abandoned
Owner's Name	Paul & Marlene Harrington	Dr. Mark Romney
Business Name (if commercial)	Blackstone Apartments	
We Spoke to:		
Name	Mary Hix	
Title	Manager	
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	211	211
Type of Use	baths	None
Annual Usage[c] (Ac-ft/yr)		
Pump Type	Centrifugal	None
Pump Capacity[d]		
Temperature (C)	43	
Spec. Cond.[e]	6000	
Theis No.[f]	11A	
Construction		
Method	Drilled	
Date[g]	1930	Unknown
Total Depth[h]	185(1938)/186(t/ 196(1973)	Unknown
Depth to Water[i]	1.33	
Date of Visit	9-2-81	9-9-81
Present Status	In Use	Capped
Remarks	Well cleaned out to 196 feet in 1973	Old well replaced by HS-450

TABLE 2. (continued)

No. on Plate 1	66	67
HS No.[a]	483	209-S-2
Owner's Name	Mr. & Mrs. C. L. Vincent	Richard Harriman
Business Name (if commercial)		Artesian Bath House
We Spoke to:		
Name	C. L. Vincent	Richard Harriman
Title	owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	212	212
Type of Use	Domestic baths (previously and planned baths)	Drinking (?) will be hot mineral baths
Annual Usage[c] (Ac-ft/yr)	3	With other HS-209 wells 6.72
Pump Type	Centrifugal	None
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]	5(?)	
Construction Method	Drilled	Drilled
Date[g]	1928	May 11 1951
Total Depth[h]	28;125t;40e	172
Depth to Water[i]		flowing (r)
Date of Visit	9-9-81	9-3-81
Present Status	Presumably Operable	Presumably Operable
Remarks	Owner hopes to remodel; used for tenants and friends on irregular basis	Originally drilled as HS-85 then renumbered Hs-187

TABLE 2. (continued)

No. on Plate 1	68	69
HS No.[a]	214	86
Owner's Name	Raymond Jones	R. C. Witt
Business Name (if commercial)	Marshall Baths	
We Spoke to: Name	Mrs. White	Mrs. Eleanor Witt
Title	Manager	owner's wife
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	212	213
Type of Use	None (previously drinking)	None
Annual Usage[c] (Ac-ft/yr)	3	
Pump Type	None	None
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Drilled-cable
Date[g]	Pre 1931	April 7 1950
Total Depth[h]	20	40
Depth to Water[i]		
Date of Visit	9-2-81	9-8-81
Present Status	Inoperable	Capped
Remarks	Mrs. White says they intend to repair well install a pump and use well again	Enclosed in concrete patio pad in trailer court

TABLE 2. (continued)

No. on Plate 1	70	71
HS No.[a]	73	87
Owner's Name	Mr. & Mrs. Andy Carr	Mr. & Mrs. Andy Carr
Business Name (if commercial)		
We Spoke to: Name	Mr. & Mrs. Andy Carr	Mr. & Mrs. Andy Carr
Title	owners	owners
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	213	213
Type of Use	Domestic	Domestic
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	Flowing	Centrifugal
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled-cable	Drilled-cable
Date[g]	June 1 1950	April 9 1950
Total Depth[h]	335	40
Depth to Water[i]	Flowing (r)	
Date of Visit	9-8-81	9-8-81
Present Status	In Use	Presumably Operable
Remarks	Well is sealed presently covered by back steps of mobile home	

TABLE 2. (continued)

No. on Plate 1	72	73
HS No.[a]	449	None[j]
Owner's Name	Dr. Glen S. Bolton	Marshall Doolittle
Business Name (if commercial)		
We Spoke to:		
Name	Dr. Glen S. Bolton	Marshall Doolittle
Title	owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	214	214
Type of Use	None (planned for domestic space heating	Domestic
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type		Centrifusal
Pump Capacity[d]		
Temperature (C)	102 F r	
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled-cable	Drilled
Date[g]	September 21 1977	circa 1950
Total Depth[h]	40	200e
Depth to Water[i]	7r/8.5 now r	4.65
Date of Visit	9-8-81	9-1-81
Present Status	Inoperable	Operable
Remarks	Owner plans to install pump and use the system this winter	Located on east side of Rio Grande

TABLE 2. (continued)

No. on Plate 1	74	75
HS No.[a]	209-S	209
Owner's Name	Richard Harriman	Richard Harriman
Business Name (if commercial)	Artesian Bath House	Artesian Bath House
We Spoke to: Name	Richard Harriman	Richard Harriman
Title	owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	214	214
Type of Use	hot mineral baths	hot mineral baths
Annual Usage[c] (Ac-ft/yr)	6.72 with other HS-209 wells	6.72 with other HS-209 wells
Pump Type	None/artesian	None/artesian
Pump Capacity[d]		
Temperature (C)	42	42
Spec. Cond.[e]	5800	5800
Theis No.[f]		12
Construction Method	Drilled	Drilled
Date[g]	March 24 1962	1930/1929t
Total Depth[h]	177	176
Depth to Water[i]	+4r	+3r
Date of Visit	9-3-81	9-3-81
Present Status	In Use	In Use
Remarks	Water flows from HS-209 and 209-S into bath house; temp. & spec. cond. of bath.	Water flows from HS-209 and 209-S into bath house; temp. & spec. cond. of bath.

TABLE 2. (continued)

No. on Plate 1	76	77
HS No.[a]	379	450
Owner's Name	Mr. & Mrs. Richard C. Smith	Dr. Mark Romney
Business Name (if commercial)	Smith's Baits	
We Spoke to:		
Name	Dorothy J. Smith	Dr. Mark Romney
Title	owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	4	4
Numbered 1/4 1/4 1/4[b]	221	221 or 212
Type of Use	Minnow tank	Therapeutic Baths
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	Centrifugal	Centrifugal(?)
Pump Capacity[d]		
Temperature (C)	97 Fr	
Spec. Cond.[e]		
Theis No.[f]		
Construction		
Method	Driven	Drilled
Date[g]	April 1 1973	
Total Depth[h]	10	43
Depth to Water[i]	4.5r	5r
Date of Visit	9-9-81	9-9-81
Present Status	In Use	Presumably Operable
Remarks	Owner has two centrifugal pumps; both installed and operable	

TABLE 2. (continued)

No. on Plate 1	78	79
HS No.[a]	393	497
Owner's Name	Carrie Tinsley Hospital	Mrs. Elizabeth Cornelius
Business Name (if commercial)		
We Spoke to: Name Title	Bob Baize and Gordon Blanchard; Hospital Maintenance Staff	
Location		
Township	14S	14S
Range	4W	4W
Section	4	5
Numbered 1/4 1/4 1/4[b]	313	212
Type of Use	Irrigation	Domestic
Annual Usage[c] (Ac-ft/yr)	Combined well & surface water pump 97.1	3
Pump Type	Centrifugal	Submersible
Pump Capacity[d]	500 gpm/present yield about 160gpm	
Temperature (C)	19.5	
Spec. Cond.[e]	1300	
Theis No.[f]		
Construction Method Date[g]	Drilled-cable April 14 1974	Drilled 1946
Total Depth[h]	49	130r/125r now
Depth to Water[i]	1r	91r/89r
Date of Visit	8-27-81	
Present Status	In Use	Presumably Operable
Remarks	Temperature and Sp. Cond. measured in water leakage puddle in pump housing	Location given is 720 Morgan St. by 1980 permit to clean well

TABLE 2. (continued)

No. on Plate 1	80	81
HS No.[a]	89	271
Owner's Name	Lois Boone	C. H. McCauley
Business Name (if commercial)		
We Spoke to: Name		C. H. McCauley
Title		owner
Location		
Township	14S	14S
Range	4W	4W
Section	5	5
Numbered 1/4 1/4 1/4[b]	221	442
Type of Use	None	None
Annual Usage[c] (Ac-ft/yr)	None	
Pump Type	None	Centrifugal
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Drilled
Date[g]	April 18 1950	September 24 1965
Total Depth[h]	247	42
Depth to Water[i]	110r	12r
Date of Visit		9-9-81
Present Status	Plugged	Inoperable
Remarks	Begun as HS-59 a shallow well; deepened as HS-89 plugged in 1959	

TABLE 2. (continued)

No. on Plate 1	82	83
HS No.[a]	357	465
Owner's Name	Mrs. Donna Kannin	Jerry T. Rivera
Business Name (if commercial)		
We Spoke to:		
Name	Mrs. Sammy Johnson	Jerry T. Rivera
Title	owner's cousin	owner
Location		
Township	14S	14S
Range	4W	4W
Section	5	5
Numbered 1/4 1/4 1/4[b]	421 or 412	423
Type of Use	None (previously domestic irrigation)	Domestic Irrigation
Annual Usage[c] (Ac-ft/yr)	3	3
Pump Type	Submersible(?)	Submersible
Pump Capacity[d]		about 35GPM
Temperature (C)		22
Spec. Cond.[e]		4220
Theis No.[f]		
Construction		
Method	Drilled	Drilled-cable
Date[g]	March 20 1972	July 24 1978
Total Depth[h]	65	73
Depth to Water[i]	43r	26r
Date of Visit	9-9-81	9-9-81
Present Status	Presumably Operable	In Use
Remarks		

TABLE 2. (continued)

No. on Plate 1	84	85
HS No.[a]	329	None
Owner's Name	Mrs. Debbie Barnes	C. H. McCauley
Business Name (if commercial)		
We Spoke to: Name	Mrs. Barnes	C. H. McCauley
Title	owner	owner
Location		
Township	14S	14S
Range	4W	4W
Section	5	5
Numbered 1/4 1/4 1/4 [b]	424 or 423	442 or 424
Type of Use	None	None
Annual Usage[c] (Ac-ft/yr)		
Pump Type	None	None
Pump Capacity[d]		
Temperature (C)		
Spec. Cond.[e]		
Theis No.[f]		
Construction Method	Drilled	Drilled
Date[g]	June 17 1970	Unknown
Total Depth[h]	50/24 now	40e
Depth to Water[i]	25r	
Date of Visit	9-9-81	9-9-81
Present Status	Inoperable	Unused
Remarks		

TABLE 2. (continued)

a. "None" means we could not definitely associate this well with a Hot Springs Basin number in the water rights files of the Deming SEO.

b. See graphic explanation in Figure 2.

c. Maximum useage, based on documents filed with the SEO; using 3 acre-feet per annum for domestic use; no number or owner's statement (r) for commercial use for which we have no SEO records.

d. Owner's report of capacity, or visual estimate of current yield; gpm = gallons per minute.

e. Specific conductance measured at field temperature, expressed as micromhos/cm.

f. Number used by Theis, Taylor, and Murray to identify this well on their Plate 1 map and tables.

g. Completion date for drilling or deepening that corresponds to total depth stated; t = reported by Theis, Taylor, and Murray.

h. Total depth measured in feet, taken from SEO record; t = reported by Theis, Taylor, and Murray; e = owner's recollection, used if there is no record or depth has changed.

i. Depth to water measured in feet from top of casing; r = reported on well record or by owner; t = reported by Theis, Taylor, and Murray.

j. Outside Hot Springs Basin boundary.

WATER ANALYSES

We performed limited water sampling and partial chemical analyses for $CO_3^{=}$ and HCO_3^{-}, Cl^{-}, and SiO_2. These four analyses (two wells and two springs) are included in Appendix 3.

We measured the temperature and specific conductance of the water at several wells and springs. While all the measurements of specific conductance we report here are the actual measurements made and not the equivalent specific conductance at 25°C, which is standardly reported by laboratories, these measurements still indicate the order of magnitude of specific conductance and show that variations among hot-water sources are small. Temperature likewise shows little variation among hot-water sources.

REFERENCE

1. C.V. Theis, G.C. Taylor, Jr., C.R. Murray, "Thermal Waters of the Hot Springs Artesian Basin Sierra County, New Mexico," Biennial Reports of the State Engineer of New Mexico, 14-15, 1942, pp. 421-493.

APPENDIX 1. WELLS WE DID NOT FIND WHICH APPARENTLY ARE WITHIN ONE MILE OF THE YUCCA LODGE

HS#[a]	Pl.1 #[b]	Theis #[c]	Reported Location Tsp.	Rge.	Sec.	¼¼¼[d]	Owner's Name as reported	Remarks
131	86		14S	4W	5	210	P.M. Tuttle	No P.M. Tuttle in phone book, well not seen in drive through area, but it probably is there.
197	87		13S	4W	34		Dick Gray	Location given is lot 1 block 9, and an X on the township plot on back of the application-well not found at X, nor at lot 1 block 9 of Riverside or Yucca Heights subdivisions.
	88	7	14S	4W	4	211	A.J. Howe	Amin's Department Store now at this location.
	89	11	14S	4W	4	122	Hotel Buena Vista	Theis et al. list: capped.
	90	16	13S	4W	33	433	State of New Mexico	Theis et al. list: no use, no pump, well covered.
	91	19	13S	4W	33	433	Central Bath House	Mrs. Helen Morgan Stump, long-time area resident, reports this well was located in what is now an auto store parking lot.
	92	20	13S	4W	33	433	Sanitary Baths	
	93	20A	13S	4W	33	433	Sanitary Baths	
	94	21	13S	4W	33	433	Sunshine Apts.	Theis et al. list: no use, capped.
	95	25	13S	4W	33	433	Jim Knox	Theis et al. list: no use, recorder well.
	96	26	13S	4W	33	433	Town of Hot Springs	Theis et al. list: sump; free public bath.
	97	27	14S	4W	4	212	Mr. Graham	Theis et al. list: no use, oil prospect well.

APPENDIX 1. (continued)

HS#[a]	Pl.1 #[b]	Theis #[c]	Reported Location Tsp.	Rge.	Sec.	¼¼¼[d]	Owner's Name as reported	Remarks
	98	33	13S	4W	33	433	C.E. James	Theis et al. list: no use, recorder well; area is now grocery store and its parking lot.
	99	34	13S	4W	33	434	J.C. Gilbert	Theis et al. list: no use, capped.
	100	37A	13S	4W	34	410	G.W. Stokes	Theis et al. list: no use, well filled.
	101	39	13S	4W	33	422	Max Hill	Theis et al. list: windmill.
	102	40	13S	4W	33	314	Mr. Brown	Theis et al. list: bucket lift.
	103	41	13S	4W	33	411	Dad Jones	Theis et al. list: windmill.
	104	42	13S	4W	33	320	Maude Copeland	Theis et al. list: windmill.
	105	43	13S	4W	33	312	Mr. Wolfe	Theis et al. list: no use, no method of lift.
	106	44	13S	4W	33	143	Unknown	Theis et al. show well on Plate 1, give no other information.
	107	45	13S	4W	33	134	Mr. Brown	Theis et al. list: windmill.
	108	46	13S	4W	33	321	Ned Bergman	Theis et al. list: no use, no method of lift.
	109	47	13S	4W	33	322	Unknown	Theis et al. list: no use, no method of lift.
	110		14S	4W	4	213	S.T. Bangs	Mrs. Delbert Baker recalled this well at her brother's place at 525 Van Patten, which he bought from Harrington.
	111	6	14S	4W	4	211	C.E. James	Theis et al. list: no use, no pump, recorder well; art gallery at this location now.

APPENDIX 1. (continued)

HS#[a]	Pl.1 #[b]	Theis #[c]	Reported Location Tsp.	Rge.	Sec.	¼¼¼[d]	Owner's Name as reported	Remarks
	112	35	14S	4W	4	213	T.M. Holder	Location suggests this is the precursor to HS-87, which was supposed to be plugged and abandoned.

a. Hot Springs Basin number; none entered where we could not associate this well with any record in the Deming SEO.

b. Number on Plate 1 of this report which identifies this well location.

c. Number used by Theis, Taylor, and Murray to identify this well on their Plate 1 map and tables.

d. See graphic explanation in Figure 2.

APPENDIX 2. WELLS MORE THAN ONE MILE FROM YUCCA LODGE, AS SHOWN BY REPORTED LOCATION

HS#[a]	Reported Location Tsp.	Rge.	Sec.	¼¼¼	Owner's Name as recorded	Remarks
36	13S	4W	34	421	Douglass K. Fitzhugh	
130	13S	4W	34	420	Earl H. Huntington	
188	13S	4W	34	440	William I. Buhler	
189	13S	4W	34	443	Claude Owens	
263	13S	4W	34	440	Garland Earwood	
270	13S	4W	34	440	William I. Buhler	
283	14S	4W	5	413	Pete E. Martinez	Location used is 2210 Veater St. where application says well is; reported by section as 14S.4W.5.422.
336	13S	4W	34	440	Leon Lennox	
369	14S	4W	5	410	Harry Hewitt	Location used is 304 Ore St., where driller reports well was drilled.
388	14S	4W	5	441	Frank Luchini	Location used is where driller reports well was drilled.
417	13S	4W	34	423	George Burfiend	Location used is lot 1 block 4 Yucca Heights Addition, as reported on well record.
434	14S	4W	5	413	Lewis H. Cason	Location used is 408 Steel, the address given on well record.
477	14S	4W	5	431	Delma L. Weatherford	Location used is 503 Steel, as reported on application; could be 14S.4W.5.342.
-	13S	4W	34	444	Mr. & Mrs. Neil S. Bresler	Located on southeast side of Rio Grande, outside Hot Springs Basin.
106	13S	4W	34	423	Arlie J. Osburn	Permit cancelled 10-11-54; note typed on well record says: Pipe pulled and hole plugged Sept. 29, 1953, no water.

APPENDIX 2. (continued)

HS#[a]	Reported Location Tsp.	Rge.	Sec.	¼¼¼	Owner's Name as recorded	Remarks
164	14S	4W	5	300	Richard E. Potter	Application gives location as lot 10 block 27 Currey-Laiminger Addition, which is beyond our map boundary.
184	14S	4W	5	300	Helen Robbins	Location used is on Cottonwood Lane, where driller reports wells were drilled.
185	14S	4W	5	300	Helen Robbins	Second well on Cottonwood Lane, near HS-184.
199	14S	4W	5	300	Ray Ashbaugh	Location used is El Rio Gardens, as reported on application.
342	14S	4W	5	300	Truth or Consequences Municipal Schools, District 6	Location used is that shown on map submitted to SEO.
353	14S	4W	5	300	Howard Bartoo	Location used is Hackberry Lane where driller reports well was drilled.
354	14S	4W	5	431	H.E. Williamson	Location used corresponds to map submitted to SEO and drillers report.
370	14S	4W	5	400	Richard R. and Cecelia Wirt Sims	Location used corresponds to map submitted to SEO.
370A	14S	4W	5	400	Beverly Jean Morehead	Location used corresponds to map submitted to SEO.
370B	14S	4W	5	400	Morris H. and Wandah L. Scott	Location used corresponds to map submitted to SEO.
378	13S	4W	34	440	David L. Underwood	
380	14S	4W	5	300	Glen Bartoo	Location used is Hackberry Lane, where driller reports well was drilled.
400	14S	4W	6	300	Lee G. Williamson	Location used is 201 First St., Williamsburg, in the West Suburban addition, as stated on well record, even though SEO has location No. 13.4.34.3.

APPENDIX 2. (continued)

HS#[a]	Reported Location Tsp.	Rge.	Sec.	¼¼¼	Owner's Name as recorded	Remarks
451	14S	4W	5	410	Mrs. Kay J. Jordan	Location used is 407½ Steel St., as reported on application.
458	14S	4W	5	100	James J. Deal	Location given is 2701 S. Broadway, where well is located--seen on 9-10-81.
375	14S	4W	6	200	John B. Hilger	Location used is that given on well record, even though the SEO section of this form is recorded as: HS-379, Location No. 14.4.4.222.

a. Hot Springs Basin number.

APPENDIX 3. PARTIAL CHEMICAL ANALYSES PERFORMED FOR THIS REPORT

Pl.1 #[a]	Location Tsp.	Rge.	Sec.	¼¼¼[b]	Date Sampled	Temp. (°C)	Specific Cond.[c]	$CO_3^{=}$ (mg/l)	HCO_3^{-} (mg/l)	Cl^{-} (mg/l)	SiO_2 (mg/l)
5	14S	4W	4	211	8-27-81	41	6000	0	270	1400	40
6	14S	4W	4	211	9-3-81	40	5400	0	290	1400	50
48	14S	4W	4	121	9-2-81	38	5900	0	240	1400	40
29	13S	4W	33	434 or 443	9-4-81	42½	5900	0	260	1600	40

a. Number on Plate 1 of this report that identifies the location of this water source. See tables 1 and 2 for further information about each water source.

b. See graphic explanation in Figure 2.

c. Specific conductance measured at field temperature, expressed as micromhos/cm.