



WATER-RIGHT DOCKET

Pipe Spring National Monument

Docket No: 3

OBSERVATION WELL

State Water Rights Documentation

09-01-1989: notice of intention to drill monitor/piezometer well

MONITOR/PIEZOMETER WELL
FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES (DWR)
NOTICE OF INTENTION TO DRILL
MONITOR/PIEZOMETER WELL

MONITOR PIEZOMETER WELL
Monitor Well # 1

Section 45-596, Arizona Revised Statutes and Rule R12-15-817 provide: Prior to drilling a monitor or piezometer well, the well owner or lessee shall file a Notice of Intention to Drill on a form provided by the Department.

WELL/LAND LOCATION

1. Township T 40 N N/S
Range R 4 W E/W
Section 17

List 10-acre subdivision
SW 1/4, NE 1/4, NE 1/4

2. County Mohave

3. Applicant:

National Park Service
Name

301 S. Howes Room 353
Address

Ft. Collins, CO 80521
City State Zip

4. Richard Inglis
NAME OF CONTACT PERSON

Phone: (303) 221-8331

Agency: National Park Service

5. Owner of well: #3
United States of America
Name Dept of Interior

Address

City State Zip

6. Purpose of well drilled pursuant to this Notice:

Monitor

Piezometer

X

7. Owner of land:

Kaibab-Dendro Wildlife
Name

Tribal Affairs Building
Address

Pipe Spring, AZ 86022
City State Zip

(602)-643-7245
Telephone number

8. Construction will start:

September 6 1989
Month Day Year

9. Period well will remain in use: 5 months years

10. For monitoring wells, is pump equipment to be installed? N/A

(a) If so, what will be the design pump capacity? N/A gallons per minute

(b) Type of pump (submersible, turbine, etc.)

N/A

(c) What use will be made of the water? N/A

11. Proposed method of abandonment of well after project is completed:

pulling casing and plugging

PER ADWR

R12-15-816

12. Drilling firm:

Ballard Drilling
Name

243 W 300 South 97-7
Address

Hurricane, UT 84737
City State Zip

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

File No. B140-4117acc

Filed 9-5-89 By sk

Input _____ By _____

Duplicate

Mailed 10-3-89 By sk

Registration No. 55-526126

AMA/INA _____

W/S 02 S/B _____

GENERAL INSTRUCTIONS

Fill out this form in duplicate and mail to Department of Water Resources, Suite 100, 99 East Virginia, Phoenix, Arizona 85004. Filing fee must accompany Notice.

I state that this Notice is filed in compliance with Rule R12-15-809 and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DATE 9/1/89

Owen Williams
Signature of Applicant
Owen Williams

DWR 55-82-8/86 (Revised)

13. Is this well to monitor existing contamination? _____ ential contamination? _____
Please explain Monitor, declining Ground Water Levels
14. If construction plans have been coordinated with Az. Dept. Health Services, Environmental Health Division, who is the agency contact? N/A
If construction plans have been coordinated with Az. Dept. Water Resources, Hydrology/Remedial Action Division, who is the division contact? N/A
15. WELL CONSTRUCTION PLAN
- a) Drilling method (mud rotary, hollow-stem auger, etc.) cable tool
- b) Borehole diameters: 8" 9 inches from 0 feet to 20 feet
5" inches from 20 feet to 210 feet
_____ inches from _____ feet to _____ feet
- c) Casing materials (PVC steel, stainless steel, etc.):
material steel diameter 6" inches from 0 feet to 20 feet
material PVC diameter 4" inches from 0 feet to 200 feet
material _____ diameter _____ inches from _____ feet to _____ feet
- d) Method of sealing at reductions _____
- e) Annular seal materials (cement, grout, etc.) and method of placement (tremied, circulated):
material cement method _____ from 0 feet to 20 feet
material _____ method _____ from _____ feet to _____ feet
material _____ method _____ from _____ feet to _____ feet
- f) Gravel packs (state material, and whether natural or artificial):
material _____ from _____ feet to _____ feet
material _____ from _____ feet to _____ feet
- g) Perforations (if pre-manufactured, please give specs of perforations or screens):
type well screen slot opening .012" from 200 feet to 210 feet
type _____ from _____ feet to _____ feet
- h) Method of well development (bail, air lift, surge) _____
- i) Will surface or conductor casing extending above grade be used to protect the aquifer from additional surface contaminants during drilling and construction? Yes
16. Include detailed construction diagram, if available.
17. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials? Yes No X
If yes, a request for a variance must accompany this application pursuant to R12-15-820.

CONDITIONS

- I. Construction and abandonment standards for all wells shall be in accordance with DWR rules R12-15-811 and R12-15-816.
- II. Drilling of the well shall be completed within one (1) year after the date of Notice.
- III. A Well Driller Report, DWR-55-6-5/83, is required within 30 days of completion of drilling. A Completion Report, DWR-55-7-3/83, is required to be filed with the Department within 10 days after installation of pump equipment for monitor wells.
- IV. Pump equipment may not be installed on a well drilled for piezometer purposes. If a monitor well is pumped, pumping is limited to the minimum amount required for monitor purposes, but in no case may exceed 35 gallons per minute and an annual amount of 10 acre feet total.
- V. Special construction standards required pursuant to R12-15-821: _____

Administrative Agreements



United States Department of the Interior

NATIONAL PARK SERVICE
Pipe Spring National Monument
HC 65 Box 5
406 N. Pipe Spring Road
Fredonia, AZ 86022-9600



L54 (PISP)

Ms. Kathy Wilson
MS 420
Bureau of Indian Affairs Regional Office
P.O. Box 10
Phoenix, AZ 85001

Dear Ms. Wilson:

Thank you for the opportunity to meet with you and the Kaibab Band of Paiute Indians yesterday to make further headway on framing a new cooperative agreement regarding the National Park Service (NPS) operated and maintained water system on the Kaibab Paiute Reservation.

I have rewritten paragraph 8 of the draft agreement as follows:

Each party shall have independent metering responsibilities. Each party is encouraged to install adequate metering devices to regularly track water use and consequently, better enable the location of leaks on the system, and the most efficient conservation of the water resource.

The Service agrees to maintain a meter that will measure water production at the well, and install and maintain meters at other locations to measure total water use at the joint NPS-Kaibab Band visitor center complex, total NPS use on the Monument, and Monument residential use as a portion of total NPS use.

The Tribe agrees to install and maintain a meter that will measure total regular tribal use from the system, maintain the meter on the North Calf Pasture line referenced in paragraph 13, and install and maintain a meter that will measure emergency deliveries to Kaibab and Juniper Villages. Furthermore, the Tribe is encouraged to install and maintain meters at other use locations, such as Red Hills Village, the tribal headquarters building, and the tribal service station, to enable the aforementioned maintenance and conservation goals.

Each party shall make available to the other, upon request, a map and description of meters and metering locations on the system. Each party shall allow access to its meters related to the system to the other party.

Each party agrees to read and record water use data from the meters on the system in its area of responsibility on a quarterly or more frequent basis, and to provide a report containing this data to the other party at the end of each calendar year.

I believe this rewrite captures what we discussed in the meeting.



I have also reviewed NPS policy regarding delegated authority for signature of such agreements. As Superintendent of the Monument, I have general signature authority for the agreement. As the agreement involves the regular transfer of funds from the NPS to the Tribe, and the possibility of transfer of funds from the Tribe to the NPS, the cooperative agreement will also require the signature of our Contracting Officer, Malinda Flatray, at Zion National Park. Consequently, please add an additional signature line labeled as follows:

NATIONAL PARK SERVICE
ZION NATIONAL PARK

By: _____ Date: _____
Malinda Flatray, Contracting Officer

We look forward to seeing the water rate appraisal and your revised final draft as soon as possible. At that time, I will forward the final draft to our Solicitor, Kevin Jones, for additional review and a memorandum indicating approval from his office. With his approval and no need for additional changes, and concurrence regarding the rate to be charged the NPS, we will be ready to execute the agreement.

Thank you for your participation in the formulation of this important continuing agreement between the NPS and the Tribe.

Sincerely,



John W. Hiscock
Superintendent

cc:
Carmen Bradley, Chairperson, Kaibab Band of Paiute Indians
Kevin Jones, DOI Solicitor
Malinda Flatray, Contracting Officer, ZION





National Park Service
U.S. Department of the Interior

Pipe Spring
National Monument

HC 65 Box 5
406 North Pipe Spring Road
Fredonia, Arizona 86022

928-643-7105 phone
928-643-7583 fax

Pipe Spring National Monument

To: Chuck Patton
Fax number: 970-225-9965
From: John Hiscase
Date: 9/23/04
Pages to follow: 4
Subject: BIA Appraisal of NPS Well Water Value

Comments:

Under 1972 agreement w/ Tribe we pay
\$33/acre ft. for NPS use.

We of course pay all costs of
production (elect, maint, operations, treatment
& BIA appraisal does not appear to
take this into account.

What might you have on pure
value of water in west?

Thanks!

EXPERIENCE YOUR AMERICA™

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

TELEFAX

BUREAU OF INDIAN AFFAIRS
WESTERN REGIONAL OFFICE
Branch of Land and Water Resources, MS 420/430
P.O. Box 10
Phoenix, AZ 85001

TELEPHONE NO.: (602) 379-6789 * FAX NO.: (602) 379-6835

DATE: 8/6/04

Number of Pages (Including Cover Sheet): 4

TO: John Hescock

LOCATION: _____

FAX NO.: _____

FROM: Charles

TITLE: _____

DEPARTMENT: _____

TELEPHONE NO.: _____

MESSAGE: The Appraisal Report

Thanks for your para. & language.

IRRIGATION

WATER RIGHTS

SAFETY OF DAMS*

LAND

PHOENIX AREA OFFICE

KAIBAB INDIAN RESERVATION

MARKET ANALYSIS

EVALUATION OF THE WELL HEAD RATE FOR WELL WATER WATER DELIVERED BY THE PAIUTE TRIBE TO NATIONAL PARK SERVICE PIPE SPRINGS NATIONAL MONUMENT

PURPOSE:

To determine if the rate of \$33 per acre foot of well water, that has been paid in the past by the National Park Service, is current Fair Market rent. The water is delivered from well B(40-4) Scdd about 2 miles North of Pipe Spring National Monument. This report has been prepared at the request of the Phoenix Area Office Area Director. Anyone else is an unintended user of this report.

SCOPE:

The Evaluation is used for in-house exchanges of information and meets the minimum standards for a Market Analysis under Standards 4 and 5 of the Uniform Standards of Professional Appraisal Practice (USPAP). This Evaluation is an investigation of the well water market in an attempt to determine an indicated well head rate (value of water at the well site). The rate expressed here is based on local and regional market conditions. The Evaluation is appropriate since information is available as to the cost of domestic or culinary water (water that can be used for human consumption) at the well site. Two different rental rates will be indicated in the conclusion. It is not known which party is responsible for the payment of electricity charges, if the tribe is responsible an additional \$35 to \$50 should be added on to the rental value of the well site. If the National Park Service is paying for the electricity the electric charges should not be added to the per acre foot charges (see conclusion).

LOCATION OF THE WELL SITE:

The well is located 2 miles north of the Pipe Spring National Monument on the Kaibab Indian Reservation in Northern Arizona or 18 miles West of Fredonia, Arizona. Colorado City which is located on the line between Utah and Arizona is located about 14 miles to the Northwest. The well site is reached by taking paved Highway 389 approximately 15 miles west from Highway Alt. 89 at Fredonia. At Pipe Spring Monument go North towards Moccasin two miles to the subject well.

DATE OF INSPECTION:

Due to road conditions the subject was not physically inspected. Location was determined by information received from Tribal Administrator Angelita Bullets of the Kaibab Band of Paiute Indians Tribal office at Pipe Springs, Arizona.

MARKET DESCRIPTION:

The lessee, National Park Service, uses the water from this well for supplying it's Pipe Springs National Monument visitors center with culinary water. The National Park Service under agreement with the Paiute Tribe originally drilled this well back in 1972. Water is delivered by buried pipe to the visitors station at Pipe Springs National Monument.

EXTENT OF THE EVALUATION PROCESS:

The PAO Appraisal staff has contacted various water sources including City Engineers, Irrigation Districts and water bottlers to assist in evaluating the cost of an acre foot of water. The evaluation consisted of determining what the cost of the water would be delivered at the well head.

THIS EVALUATION IS BASED ON RECENT DATA AND SUPPORTING MATERIAL ON FILE IN THE PHOENIX AREA OFFICE (PAO), APPRAISAL SECTION.

EVALUATION:

A market search for comparable companies who deliver water at well sites was made. The previous lease was based on a per acre foot of delivered water and this report will use the same basis of comparison. An acre foot of water as defined in the second edition of THE DICTIONARY OF REAL ESTATE APPRAISAL states "A VOLUME OF WATER EQUAL TO THE AMOUNT REQUIRED TO COVER ONE ACRE OF LAND TO A DEPTH OF ONE FOOT; EQUAL TO 325,850 GALLONS OR 43,560 CUBIC FEET OF WATER". Three of the sources of information, namely the City of Kanab public works manager Mr. Keith McCalister and Cloyd Chamberlin at Kaneco Products in Kanab, Utah were interviewed January 7 and 8, 1998 and Chris Sanquigi of Arctic Ice and Water, a privately owned company, in Apache Junction, Arizona was interviewed on February 12, 1998. The balance of the information was obtained from files located in the Phoenix Area Office. Even though this information is older the information still remains consistent with the newer information developed in January and February 1998.

Water King in Parker, Arizona, a privately owned business, in 1992 purchased water from the city at \$0.0003 ~~cents~~ per gallon for the first 5,000 gallons and \$0.0001 ~~cents~~ per gallon for any amount over 5,000 gallons. This breaks down to \$32.58 to \$97.74 ~~cents~~ acre foot. After purchasing the water they purified the water by reverse osmosis and sell it retail for \$0.25 ~~cents~~ per gallon.

→ \$ 33.59/AF if use their
rate structure

Arctic Ice and water, a privately owned company, located in Mesa, Arizona pumps water from a 900' deep well, with water being pulled from 700'. The raw product cost at the well head is ~~2000~~ ²⁰⁰⁰ ~~cents~~ per gallon or \$65.16 per acre foot (this includes \$2.50 per acre foot payable to the state for . The withdrawing of a natural asset). The water is then sold 2000 gallon tanks at ~~10 cents~~ per gallon. This information was obtained from Chris Sanguigi on February 12, 1998 in Apache Junction, Arizona. \$ 0.001

On January 7, 1998 I interviewed Cloyd Chamberlin of Kaneco Products in Kanab, Utah. Mr. Chamberlin (telephone numbers 435-644-2977 or 435-644-2371) is the Manager of the Kaibab Irrigation Water District. For one acre foot of irrigation water an individual must purchase 2 shares at \$200 per share or a total of \$400.00. This would give him the right to receive 1 acre foot of irrigation water per year. After the initial year his cost would be \$14.50 per share or \$29.00 per 1 acre foot of water. The \$29.00 is for maintenance and upkeep of equipment.

On January 8, 1998 I interviewed Mr. Keith McCalister who is the Public Works Manager of the City of Kanab, Utah. He said that the raw water cost per 1,000 gallons was about \$0.12 ~~cents~~. This indicates about per \$39.12 per acre foot.

CONCLUSION:

In reviewing and analyzing the above information, it is concluded that an appropriate rental, per acre foot, should be in the range of \$45 to \$60 if the National Park Service is paying for the electricity to the well. If the tribe is paying for the electricity the annual rent should reflect this fact and the overall rental rate should be \$75 to \$110 (See Scope of Appraisal page #1).

RECOMMENDED THAT \$45 TO \$60 PER ACRE FOOT, WOULD BE SUFFICIENT COMPENSATION FOR WATER USE, IF THE NATIONAL PARK SERVICE IS PAYING ELECTRIC CHARGES. IF THE TRIBE IS PAYING THE ELECTRIC CHARGES A FAIR ANNUAL RENT WOULD BE \$75 TO \$110 PER ACRE FOOT.

February 23, 1998
DATE

4/7/98
APPROVED

Patrick J. Murphy
Patrick J. Murphy, Appraiser

Gabriel D. Sneezy
Gabriel D. Sneezy, MSA, MFLA
Area Chief Appraiser
Certified General Appraiser
Arizona #30482

THIS IS NOT AN APPRAISAL REPORT. IT DOES NOT CONTAIN THE DOCUMENTATION REQUIRED IN AN APPROVED APPRAISAL REPORT.

Author: John Hiscock at NP-PISP
Date: 09/16/1999 10:21 AM
Priority: Normal
TO: Ron Everhart at NP-DENVER
CC: Don Falvey at NP-ZION, Chuck Pettee at NP-WASO-WR, Dan Kimball at NP-WASO-WR
Subject: Kaibab Paiute Water Agreement

Ron:

Did get to speak with Don this morning on letter to the Tribe.
I'm attaching, just FYI the copy finally sent to Tribe.

It was a conversation with Tribal Chair Carmen Bradley, the other day that motivated this. I asked her the status of the Tribe's review of the now, 2.5 yr. old draft replacement agreement. She informed me that the draft was now with the Tribe's new attorneys and she wasn't sure when they would be done reviewing and advising on it. I told her that we needed some sort of concurrence in continuing to operate (and spend govt. funds) under the provisions of the old agreement in the interim. She suggested an indeterminate interim extension as opposed to the three month extensions we have been trying to keep in place. Given our poor negotiating position there is no problem with extensions while we wait (extensions may actually be some of the better news we could receive).

One other important bit of news that came from our conversation. She said that the Tribe's new attorneys are proposing to look into the bigger water picture at PISP. Not only looking at water agreement with its exchange of NPS utility system maint. for use of the Tribe's 1/3 of spring flow, but looking at the underlying basis of NPS and tribal water rights. This proposition, of course, opens a pandora's box of complicated and unclear issues. (I get the definite impression that this is the attorneys proposal, and not necessarily at the Tribe's request, however the Tribe is acquiescing in the path the attorneys are following.)

John

Forward Header

Subject: Kaibab Paiute Water Agreement
Author: John Hiscock at NP-PISP
Date: 9/15/1999 4:42 PM

If at all possible, I need your immediate review of the attached letter. I've promised such a letter to Chairperson Bradley by 9:00 am Thursday morning. If I don't hear from you I will proceed with the attached, or slightly modified version, BUT, I'd love to have your input, or concurrence.

John

L54 (PISP)

September 15, 1999

Ms. Carmen M. Bradley
Chairwoman
Kaibab Band of Paiute Indians
Tribal Affairs Building
HC 65 Box 2
Pipe Spring, Arizona 86022

Dear Ms. Bradley:

We hereby request the Tribe's concurrence in an updated interim extension of the water agreement of April 13, 1972, and supplementary amendment of March 1996 (copies attached). As you are aware, the National Park Service (NPS) and the Tribe have concurred in previous interim extensions of the agreement, since its expiration on April 13, 1997, while the Tribe and its advisors are reviewing a mutually rewritten, suggested replacement agreement (copy attached). The previous interim extensions have been for three months at a time. We are amenable to another three month extension, or agreement to an indeterminate extension subject to end automatically upon adoption of a new, replacement, agreement between the NPS and Kaibab Paiute Tribe.

The NPS must have formal concurrence in an ongoing extension in the provisions of the old agreement, or a new agreement, in place, in order to: (1) legitimize the expenditure of National Park Service funds on the joint water system outside of Pipe

Spring National Monument; and (2) allow the continued use of the Tribe's Calf Pasture water line across Pipe Spring National Monument, which was only authorized pursuant to the existence of the old agreement. The investment which the National Park Service makes on a both a routine and as needed basis to the water system that benefits the Tribe and the Monument, was detailed in our former letter of July 15, 1997 (copy attached).

We would certainly prefer adoption of a new agreement - as previously suggested, or modified by mutual consent. We request and encourage the Tribe to expedite its associates' ongoing review of the suggested agreement. Again, however, in the interim, we request the Tribe's concurrence in an extension of the terms of the old agreement.

John W. Hiscock
Superintendent

PIPE SPRING NATIONAL MONUMENT
AQUIFER TEST
MONITOR WELL NO. 1

by Richard Inglis, Hydrologist
Water Operations Branch
Water Resources Division
December, 1989

SW 1/4, NE 1/4, NE 1/4, Sec. 17, T. 40 N., R. 4 W.
Mohave County, Arizona

An aquifer test for Monitor Well No. 1 was conducted as a portion of the investigation to determine the decline of springflows in Pipe Spring NM (PISP). This report presents all data collected during the drilling and testing of Monitor Well No. 1, as well as interpretative analyses. Further information about groundwater near PISP is available in a report by Inglis (in press). The well is located on lands managed by the Kaibab-Paiute Indian Nation and is registered with the State of Arizona, #55-526126 by the U.S. Dept. of Interior c/o National Park Service.

DRILLING BACKGROUND: The construction of a new monitoring well was first proposed by Barrett and Williams (1986), but was not recommended for implementation at that time. Monitor Well No. 1 was constructed to reveal information about the aquifer supplying the springs in the monument. Monitor Well No. 1 is identified as Site #1 on Figure 1. There are no other wells in the immediate vicinity.

This site was selected because of the presence of the most eastern outcrop of sandstone layers that are continuous with the east slope of Winsor Point which has been identified as Navajo Sandstone by Hemphill (1956). Evidence of the Sevier Fault, a major structural feature controlling groundwater movement, has been located very near the wellsite.

Contract specifications for three monitoring wells for PISP were prepared by the Water Resource Division. Due to budget limitations, only one of the three wells was awarded under contract (No. PX-1200-9-C835) by the Rocky Mountain Region to Ballard Drilling CO. of Hurricane, UT. A permit application to drill a monitoring well was sent to the State of Arizona and was approved with modifications. Arrangements were made to commence drilling during the second week of October.

Drilling using cable tool started October 10, 1989 and was completed November 2, 1989. The well is located in Navajo Sandstone on a hillside immediately west of the Sevier Fault about 1/2 mile north of the monument. The land surface elevation is about 5080 ft as determined from the Fredonia, AZ 15 minute USGS topographic map and the well is located in Navajo Sandstone adjacent to the fault.

The contractor drilled a 9-inch borehole to 20 ft, and installed a steel, 6-inch surface casing with a grout seal. Total depth of well is 200 ft. Samples of cuttings every 5 ft were taken during drilling to allow the preparation of a geologic log of the strata, used to confirm that the well was drilled west of the Sevier Fault. The driller reported that water was first encountered in the well at 105 ft below land surface datum and rose in the well to 82.9 ft indicating that the aquifer is artesian at this site i.e. under piezometric pressure of about 22 ft. The driller also stated that the aquifer is about 15 ft thick and red clay was encountered at 155 ft which is indicative of the Kayenta Formation. See Table 1 for lithologic information from the Well Driller Report filed with the State of Arizona (File No. B(40-4)17aac). One hundred and ninety ft of 4-inch, PVC casing was installed with 10 ft of continuous slot, PVC well screen placed from 115 to 125 ft below land surface. A one foot long steel extension was welded to the top of the steel casing after completion of the aquifer test. An instrument shelter was constructed over the well by cementing a 2 ft diameter concrete pipe section to the exposed bedrock at the surface. The pipe section is covered with a lockable steel plate. See Figure 2 for a diagram of the well as constructed.

AQUIFER TEST METHODS: The well was pumped before the installation of the casing using a submersible pump supplied by the driller set at 150 ft below land surface. The measuring point was the top of the steel casing which was level with the ground surface. Water levels were measured with a Druck 10-psi pressure transducer with a theoretical range of 23 ft (accuracy of one tenth of one percent) set at 110 ft below land surface datum. Static water level before pumping was 82.9 ft. Discharge data was obtained by measuring water levels in a flume with Druck 1-psi pressure transducers (range of 2.3 ft).

Both pressure transducers were scanned and recorded in one minute intervals by an Omnidata Easylogger Field Unit with a 16 kilobytes Data Storage Pack. Pumped water from the well was conveyed by a 2-inch pipe approximately 25 ft to a 1-inch Baski cutthroat flume (with a range of 1 to 120 gpm and an accuracy of approximately 10 percent) and discharged down a short hill slope into a dry wash. Discharge water flowed in the wash several hundred yards before soaking into the stream bed. Recirculating discharge water into the well is not suspected. Water levels measured by the transducer in the flume were recorded simultaneously with water levels in the well (see Figure 3 and 4). A hard copy of the recorded data is available from the Water Resources Division in Fort Collins. Discharge was verified using a 5 gallon container and a stopwatch. Static water levels were verified with a 500-ft Olympic Well Probe. Water quality of the well discharge was not analyzed.

RESULTS: Monitor Well No. 1 was tested by pumping at 60 gpm for 19 hrs, 5 min (started 16:13 10/30/89, ended 11:18 11/1/89) and resulted in a water level drawdown of 2.2 ft. The rate of discharge variation is within + or - 5 gpm throughout the test (Figure 3). Recovery of water level in the well was recorded for a duration of 27 hrs, 19 min at which time water levels were 0.2 ft below static water level. Analysis of the aquifer test data using the Modified Jacob's method on the recovery curve (see Figure 5) indicates a transmissibility of 113,000 gallons per day per foot. This value is high for published values for the Navajo Sandstone, but the proximity of the Sevier Fault and increased pathways along fracture zones may explain the difference in transmissibility. The slight water level variation during the final hours of recovery curve seen on both Figure 4 and 5 may be explained as barometric effects on artesian wells that would typically occur during the afternoons in the PISP area. The drawdown curve analysis (Figure 6) indicates very high transmissibility values which were rejected based on violations of the assumptions of the Theis equation, e.g., homogeneous aquifer.

Figure 7 depicts data of the first two attempts to pump the well at approximately 20 gpm on October 20, 1989. Pump failure caused ending the test prematurely. Very rapid recovery was partially due to the lack of a check valve which allowed drainage of the discharge pipe into the well. Analysis of this data set was not done.

The well screen, casing and construction of the instrument shelter was inspected and approved by park personnel. To complete the well as a monitoring station, a datalogger and pressure transducer must be installed in the finished well and the elevation of a reference point at the well must be established.

CONCLUSIONS Monitor Well No. 1 appears to be suitable to observe the water level in the aquifer supplying the springs at PISP. Drilling and pumping the well has revealed that the aquifer is artesian and has a very high transmissibility. Also revealed, is the 15 ft thickness of the water producing zone and that red clay, believed to be of the Kayenta Formation, was encountered at 155 ft below the ground surface. This information will be essential in understanding the groundwater system in the PISP area.

LITERATURE CITED

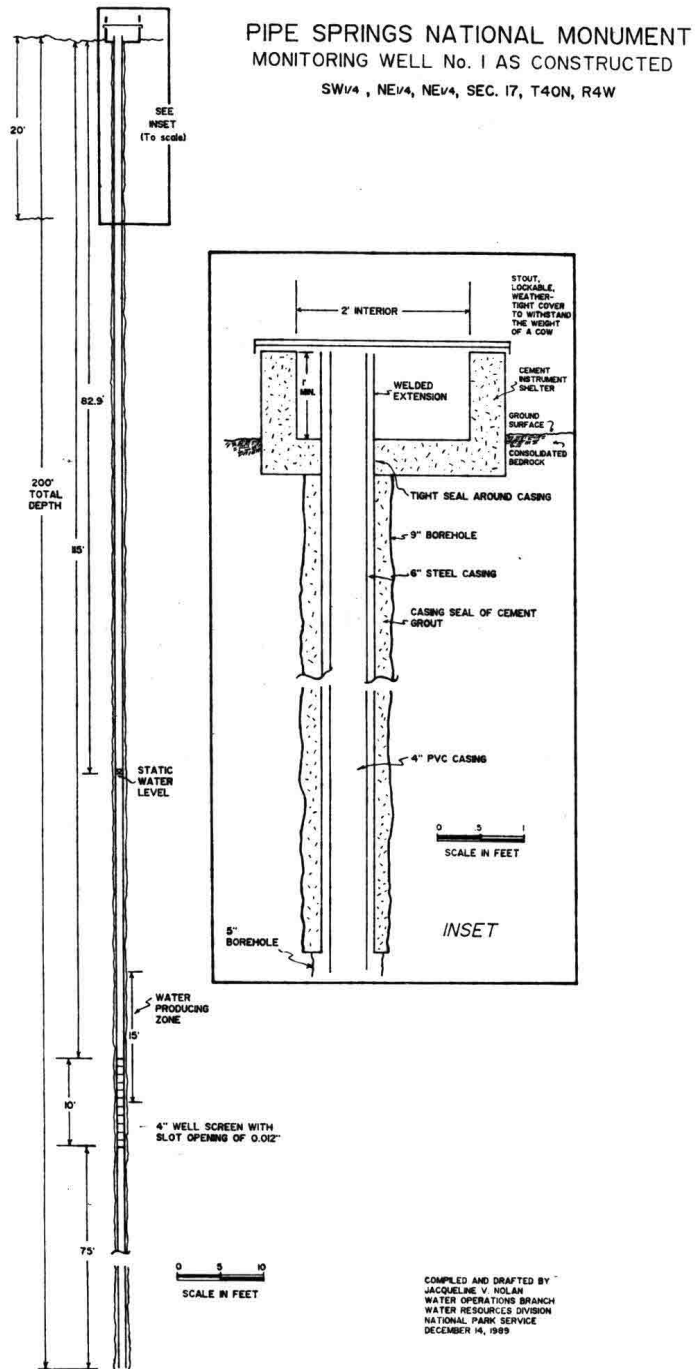
Inglis, Richard, in press. Water Resources Data of the Pipe Spring National Monument Area, Arizona, 1977-1989. Ft. Collins, CO, National Park Service, 22 pp.

Hemphill, W. R., 1956. Photogeologic Map of the Fredonia NW Quadrangle Mohave County, Arizona. Washington, DC, USGS Miscellaneous Geologic Investigations Map I-133.

Barrett, D. C., and Williams, O. R., 1986. An Evaluation of the Decline in Spring Flow at Pipe Spring NM. Ft. Collins, CO, National Park Service, 13 p.

Table 1 - Log of Well

From (ft)	To (ft)	Description of Formation Material
0	5	White Navajo Sandstone
5	10	Red Navajo Sandstone
10	15	Red Navajo Sandstone
15	20	Red Navajo Sandstone
20	25	Red Navajo Sandstone
25	30	Red Navajo Sandstone
30	35	Red Navajo Sandstone
35	40	Red Navajo Sandstone
40	45	Red Navajo Sandstone
45	55	Red Navajo Sandstone
55	65	Red Navajo Sandstone
65	75	Red Navajo Sandstone
75	85	Red Navajo Sandstone
85	95	Red Navajo Sandstone
95	105	Water at 105 ft, water raised in hole 22 ft up to 83 ft
105	115	Red Navajo Sandstone
115	125	Red Navajo Sandstone
125	135	Red shale
135	145	Red sandy shale
145	155	Red sandy shale
155	165	Red clay
165	175	Red clay
175	185	
185	200	Red clay



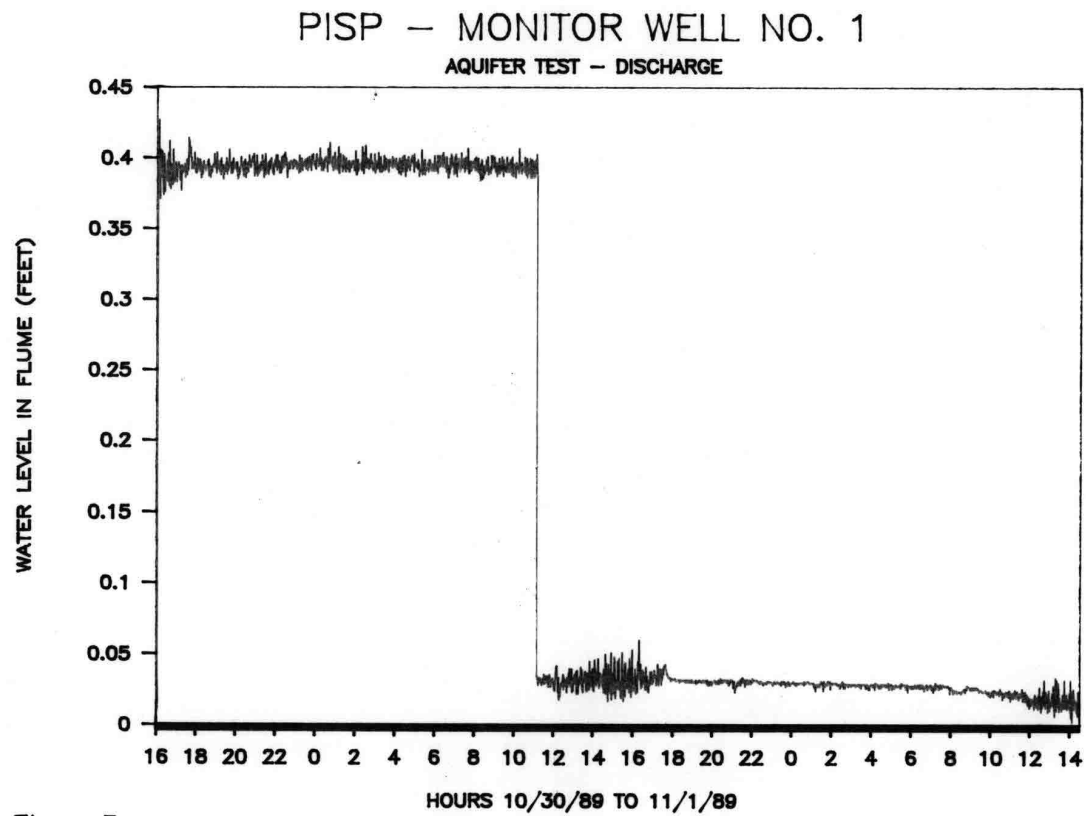


Figure 3.

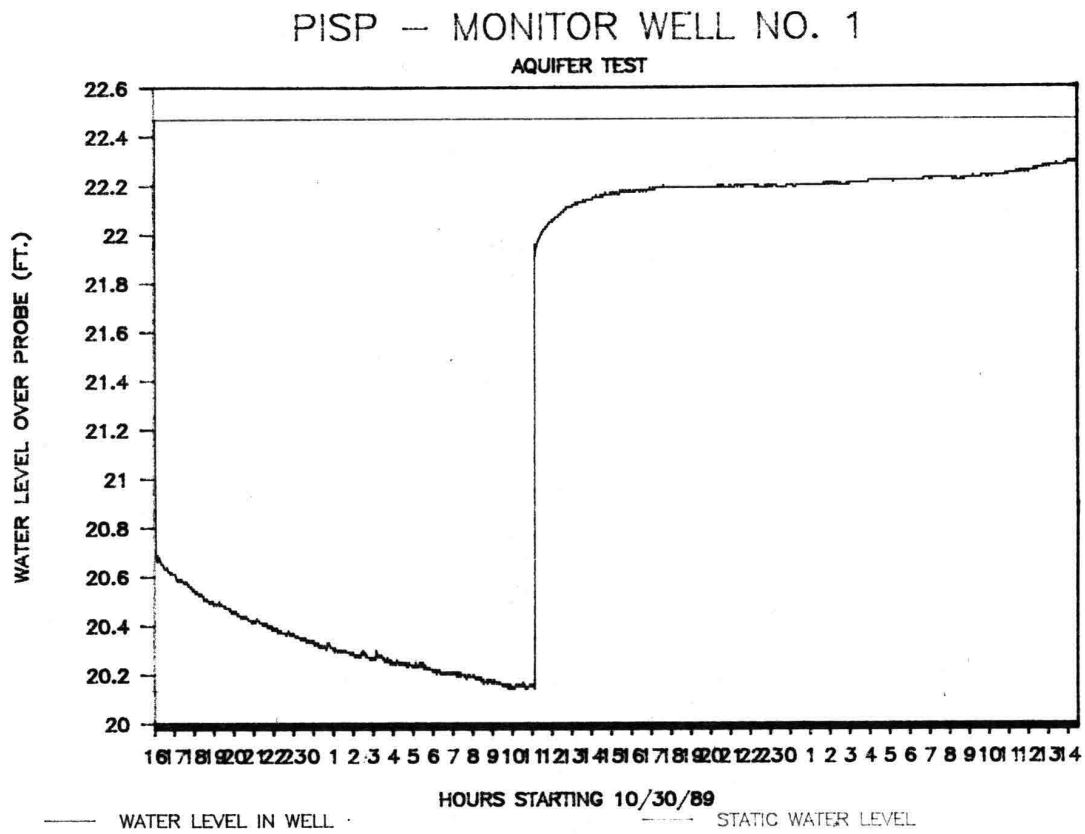


Figure 4.

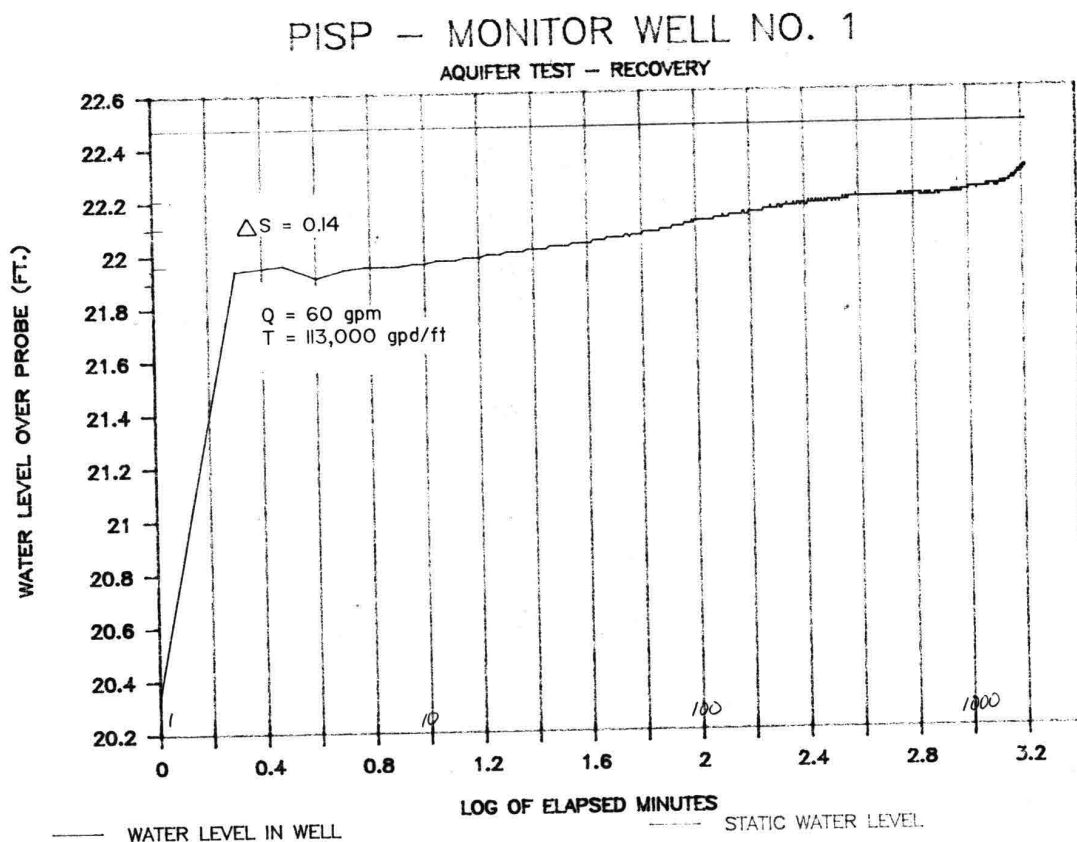


Figure 5.

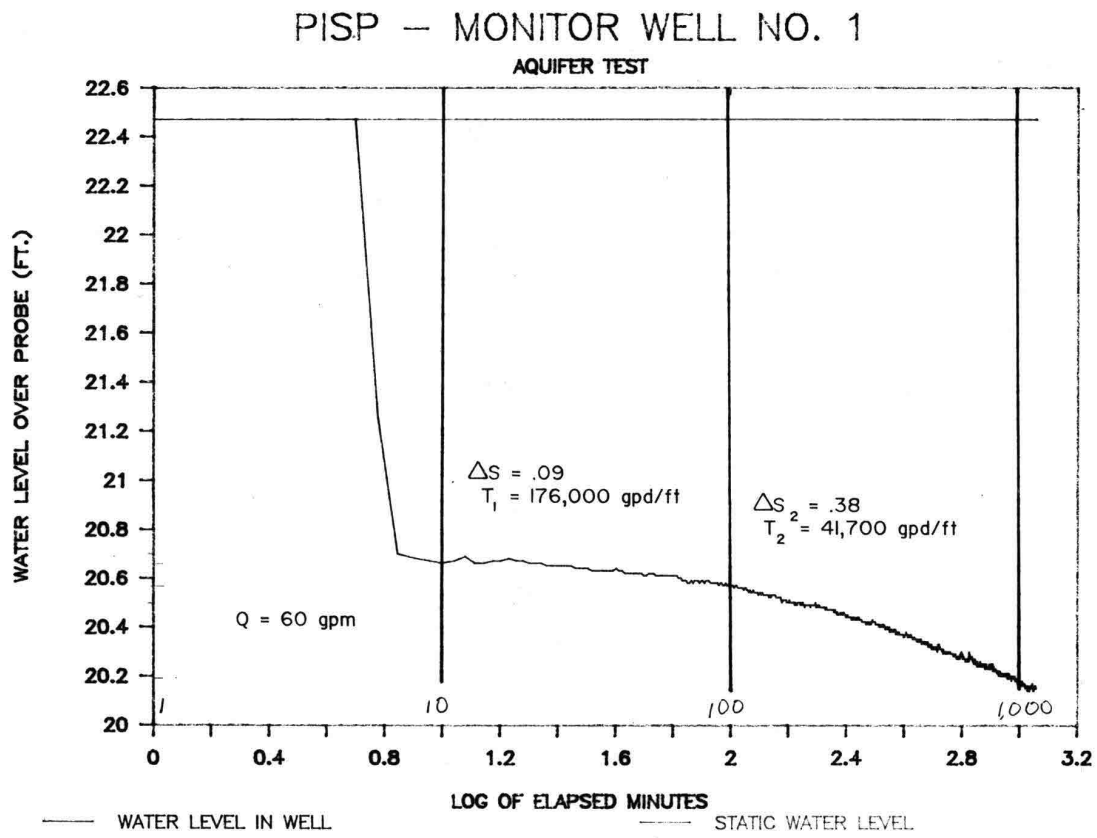


Figure 6.

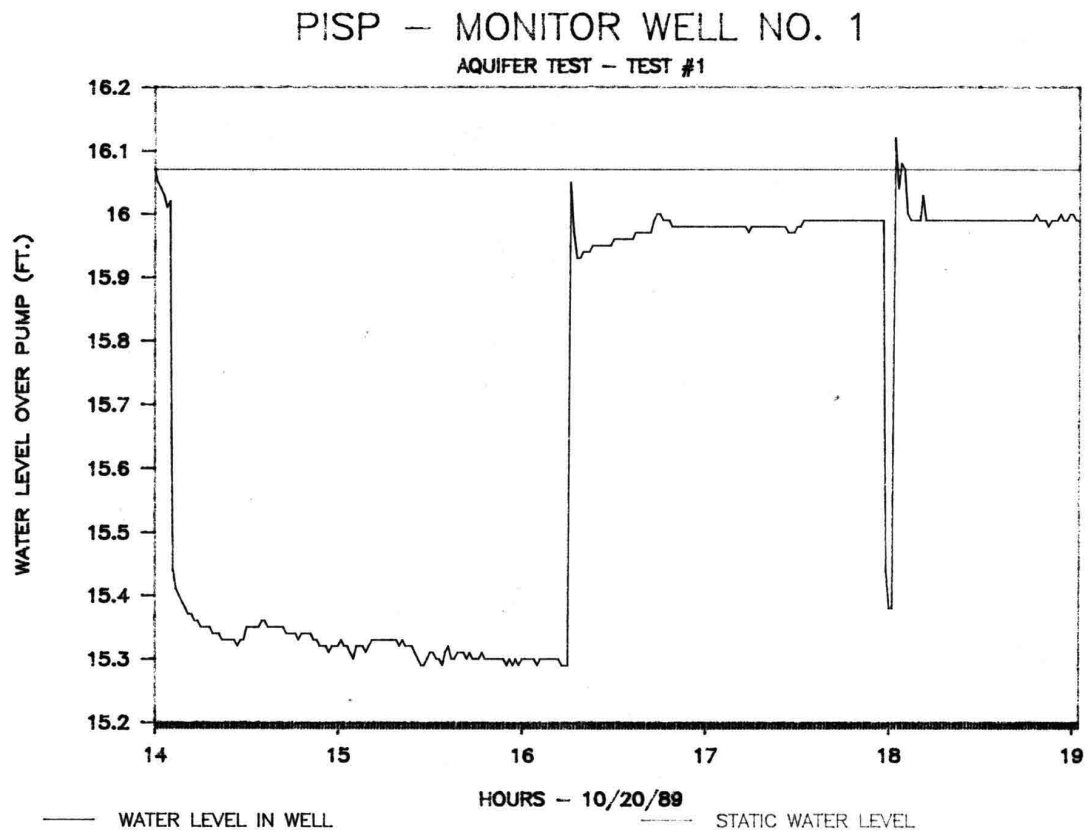


Figure 7.

October 22, 1999

John,
~~Terry~~,
Rick,

Chuck, FYI

I plotted up the data I could find for the "USGS" Monitor Well and the "NPS Monitor Well. The USGS well is about a mile north of the culinary wells and 2 miles south of the Tribal irrigation wells. The NPS well is about a mile south of the culinary wells and about $\frac{3}{4}$ mile north of Pipe Spring.

Water level in the USGS well has gradually declined about 5 feet over the past 25 years. Water level in the NPS monitor well really hasn't changed much, especially during the period from mid-1992 into 1997. Any additional data you might have for either of these wells would be greatly appreciated.

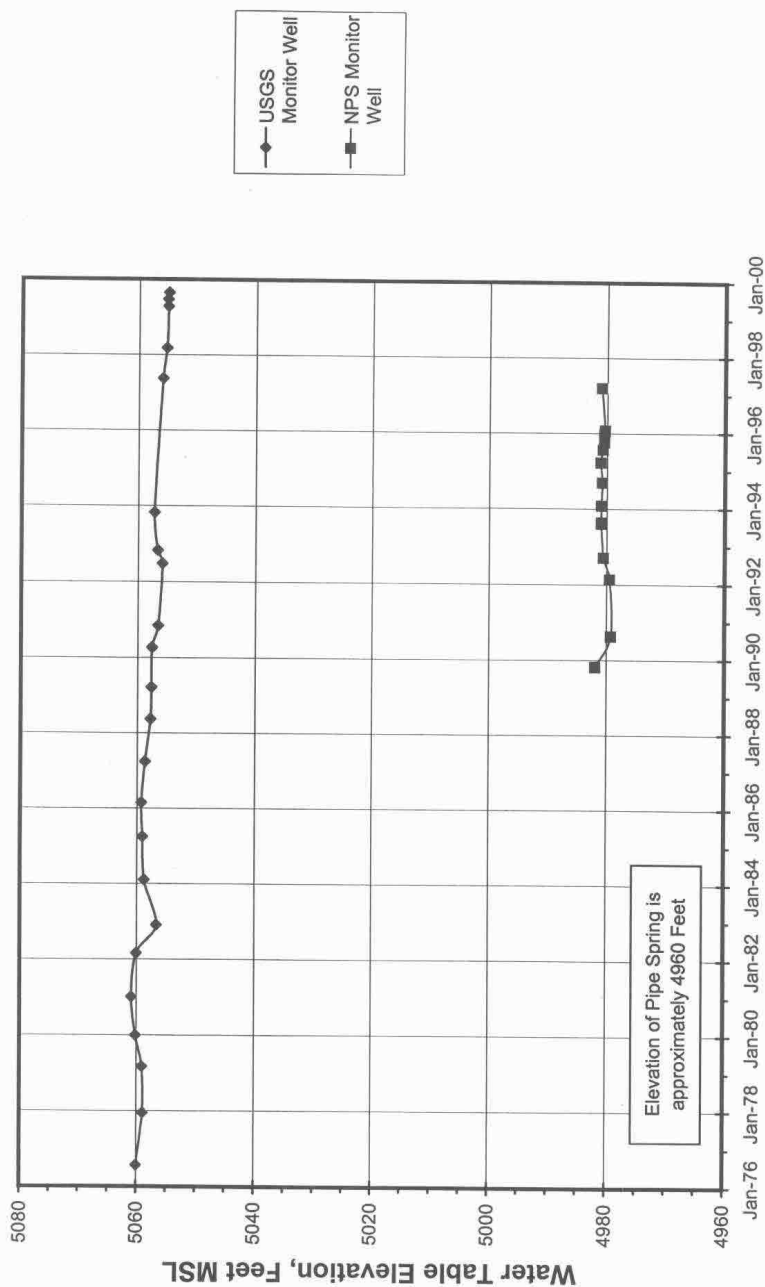
I did not try to incorporate the data from the datalogger on the NPS well during the period from 8/90 to 3/95. I only used the data from manual measurements during that period. Working through the data from the datalogger is a project for another day.

I don't see anything in these records that would indicate any lowering of the water table throughout the region. That, along with continued flow of West Cabin Spring, increased flow from Tunnel Spring, and the perceived increase in the seep area below West Cabin Spring leads me to conclude that the flow decrease at the castle is a very localized phenomena. It will be interesting to see what interpretation of the geophysical data might tell us.

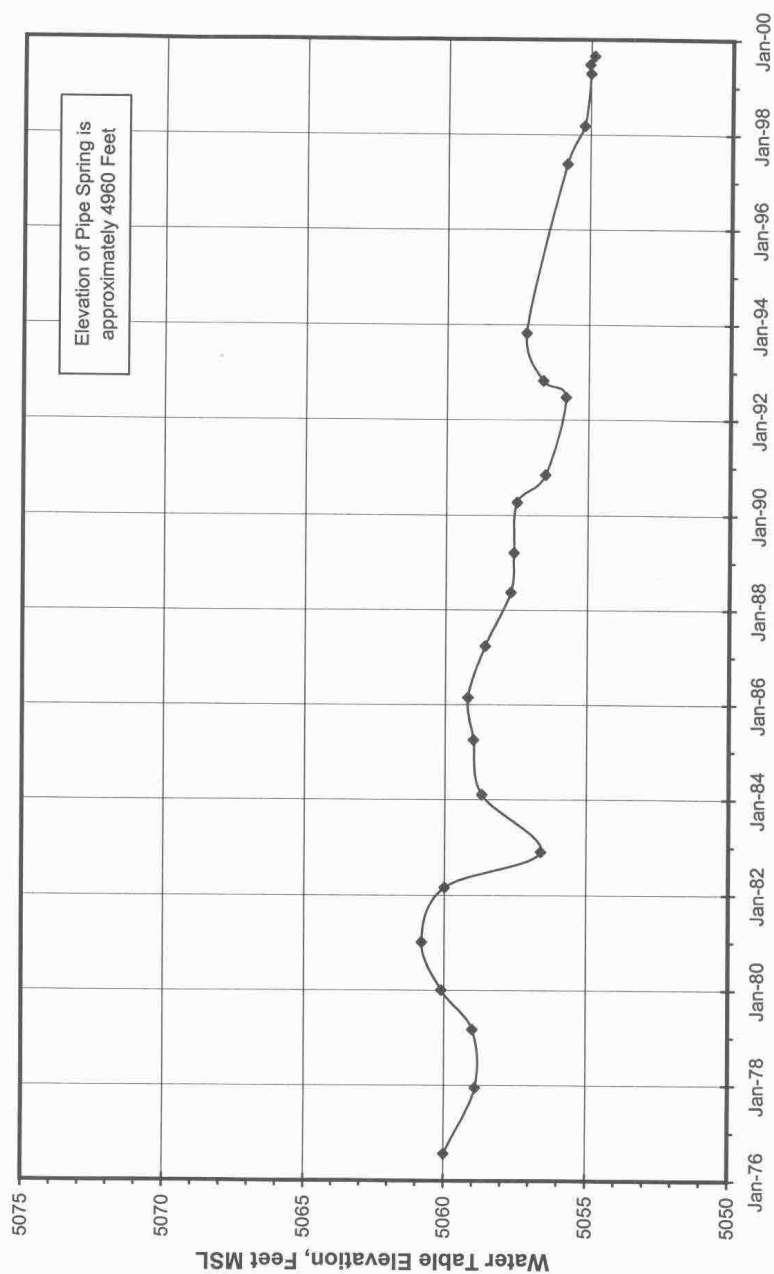
That's all for now!

Larry

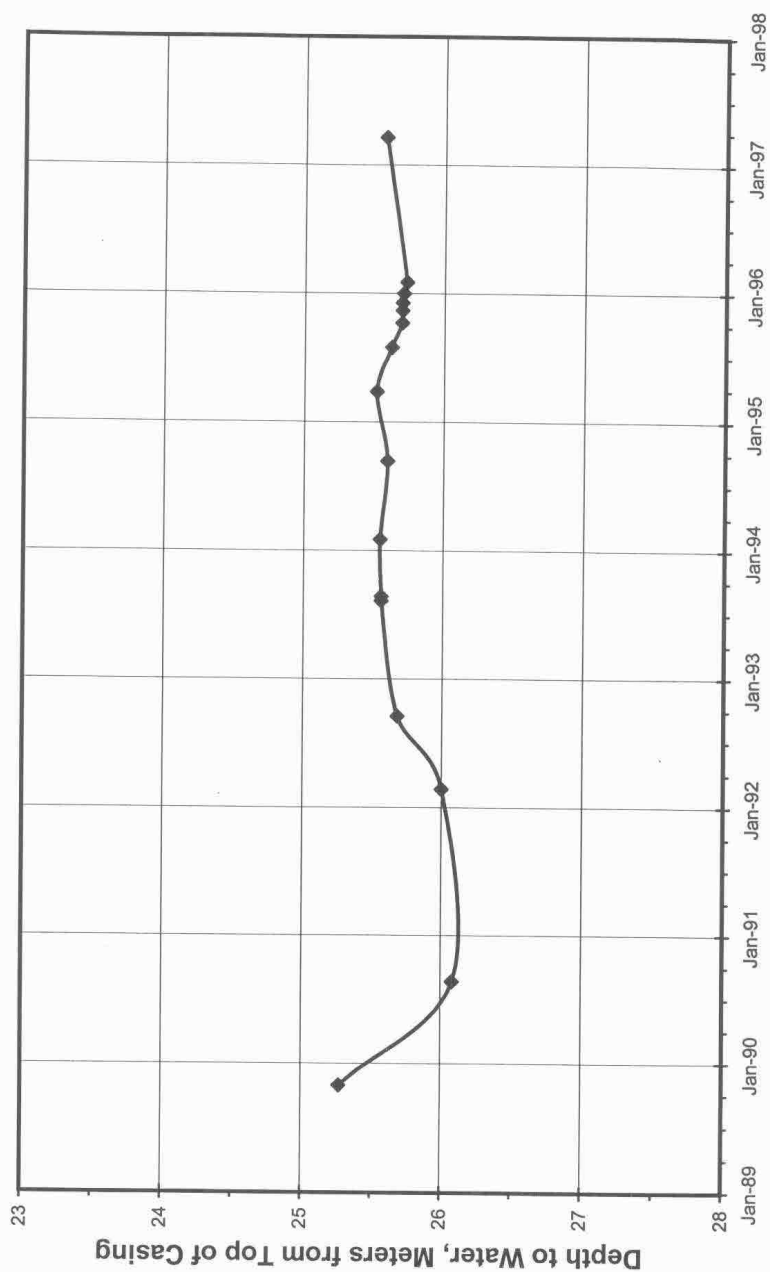
Monitor Wells North of Pipe Spring National Monument



USGS Monitor Well



NPS Monitor Well





IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Pipe Spring National Monument
Moccasin, Arizona 86022

Received JUN 5 1989
Water Rights Branch

L54 (PISP-S)

June 2, 1989

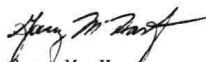
Memorandum

To: Chief, Water Rights Branch
Attention: W.S.B. Hydrologist, (Inglis)

From: Superintendent, Pipe Spring National Monument

Subject: Kaibab-Paiute Tribal Approval

Please see the enclosed approval resolution K-24-89, from the Kaibab Paiute Indians, giving the N.P.S. permission to drill through test wells.


Gary M. Hasty,
Superintendent

Chuck.

*Ask Bill Werrell about
the status of this. I just doesn't
match my recollection - not to
say my recollection is perfect.*

6 June 89 0

Kaibab-Paiute Tribe

[602] 643-7245

Tribal Affairs Building
PIPE SPRING, AZ. 86022

June 1, 1989

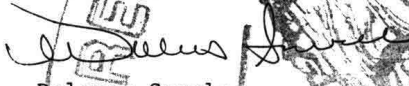
Mr. Gary Hastings,
Superintendent
National Park Service
Pipe Springs, AZ 86022

Mr. Hastings:

Please find enclosed Resolution #24 giving permission to the National Park Service to drill three (3) test wells on the Kaibab Paiute Reservation to monitor the water table, for a period not to exceed five (5) years.

If you have any questions/comments, please call.

Sincerely,


Dolores Savala,
Chairperson



Kaibab-Paiute Tribe

[602] 643-7245

Tribal Affairs Building
PIPE SPRING, AZ. 86022

RESOLUTION OF THE
KAIBAB BAND OF PAIUTE INDIANS
K-24-89

WHEREAS, the Kaibab Paiute Tribe has received reports that the flow from the spring at Pipe Springs has decreased; and

WHEREAS, the National Park Service has indicated a willingness to furnish funding and personnel for a study to be conducted; and

WHEREAS, an Archeology Study was completed that showed that test wells could be drilled without disturbing any cultural sites; and

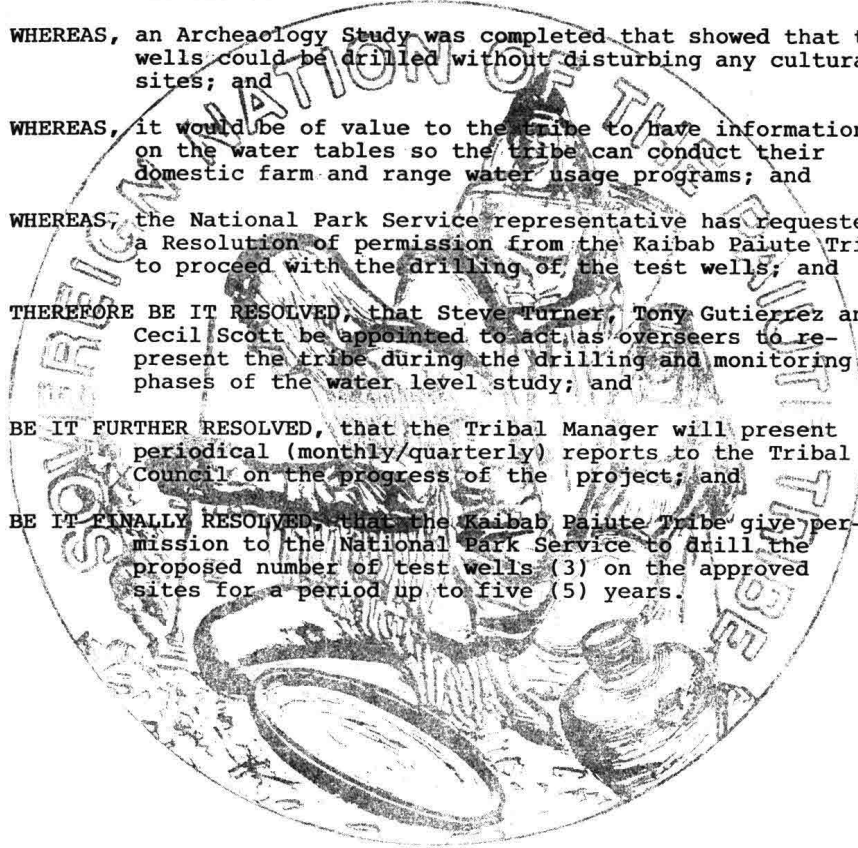
WHEREAS, it would be of value to the tribe to have information on the water tables so the tribe can conduct their domestic farm and range water usage programs; and

WHEREAS, the National Park Service representative has requested a Resolution of permission from the Kaibab Paiute Tribe to proceed with the drilling of the test wells; and

THEREFORE BE IT RESOLVED, that Steve Turner, Tony Gutierrez and Cecil Scott be appointed to act as overseers to represent the tribe during the drilling and monitoring phases of the water level study; and

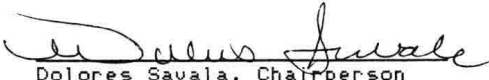
BE IT FURTHER RESOLVED, that the Tribal Manager will present periodical (monthly/quarterly) reports to the Tribal Council on the progress of the project; and

BE IT FINALLY RESOLVED, that the Kaibab Paiute Tribe give permission to the National Park Service to drill the proposed number of test wells (3) on the approved sites for a period up to five (5) years.

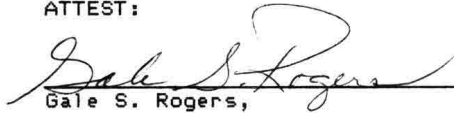


C E R T I F I C A T I O N

I hereby certify that the foregoing Resolution was regularly adopted by the Kaibab Paiute Tribal Council at a Regular Council Meeting on May 25, 1989 at which a quorum was present with a vote of 4 in favor 0 opposed 1 absent 1 excused, pursuant to authority vested in the Kaibab Paiute Tribal Council by Article VI Section 1 (a) (c) & (d) of the Constitution of the Kaibab Band of Paiute Indians. Ratified by the Tribe on June 20, 1987 and approved by the Assistant Secretary of the Interior on July 14, 1987 pursuant to Section 16 of the Act of June 18, 1934.


Dolores Savala, Chairperson

ATTEST:


Gale S. Rogers,
Tribal Council Secretary

Docket Information

Number of Documents in Docket 31
Documents Dated from 6/1/1989 to 9/23/2004
Docket Compiled: 4/4/2012