



WATER-RIGHT DOCKET

Pecos National Historical Park

Docket No: 1

HEADQUARTERS WELL

State Water Rights Documentation

07-18-1978: declaration of owner of underground water right: declaration no. up-500

Revised December 1975

75934

IMPORTANT — READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM.

Declaration of Owner of Underground Water Right

Upper Pecos Basin
BASIN NAME

Declaration No. UP-500 Date received July 18, 1978

STATEMENT

1. Name of Declarant United States of America (Pecos National Monument)
Mailing Address P.O. Box 728, Santa Fe, New Mexico 87501
County of Santa Fe, State of New Mexico

2. Source of water supply 322 ft. well from top of casing
(artesian or shallow water aquifer)

3. Describe well location under one of the following subheadings:
a. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 8 Twp. 15N Rge. 12 E. N.M.P.M., in
San Miguel County.
b. Tract No. _____ of Map No. _____ of the _____
c. X = _____ feet, Y = _____ feet, N. M. Coordinate System _____ Zone _____
in the _____ Grant.
On land owned by United States of America
Prior to 7 December 1941

4. Description of well: date drilled December 1941 driller Barney Isbell depth 322 feet.
outside diameter of casing 6 inches; original capacity unknown gal. per min.; present capacity 30 gpm @ 65'
equivalent intermittent pumping 1 day
gal. per min.; pumping lift 115 feet; static water level 156 feet (xxxx (below) land surface) Sept. 14, 1977
make and type of pump Jacuzzi Submersible, 1 1/2 HP - 33 stages
make, type, horsepower, etc., of power plant commercial power
Fractional or percentage interest claimed in well 100%
claimed

5. Quantity of water appropriated and beneficial use: 20 (acre feet per acre) (acre feet per annum) 3 purposes.
for municipal
Municipal use on area

6. xxxxxx located and described as follows (describe only lands actually irrigated):

Subdivision	Sec.	Twp.	Range	Acres Irrigated	Owner
<u>See attached map NPS # 430/80015</u>					
<u>Well was drilled prior to February 24, 1972</u>					
<u>Pecos National Monument established by Act of Congress dated June 28, 1965</u> <u>(79 Stat. 195)</u>					

(Note: location of well and acreage actually irrigated must be shown on plot on reverse side.)

7. Water was first applied to beneficial use prior to December 7, 1941 and since that time
has been used continuously on the above described lands for municipal purposes
Existing well was drilled for the State Historical Monument prior to
7 Dec. 1941 to a depth of 100 ft. In 1951 while still in state ownership the well
was deepened to present depth as the quality of water for the 100 ft. well was
suspected of causing the resident custodian to be ill.

8. Additional statements or explanations:
This notice is given as a matter of comity, cooperation and information. It does
not consent to the jurisdiction of the State in regard to the rights of the United
States to the use of water described in this notice. This notice is not intended
to affect previously vested rights under either Federal or State law to the use
of this or any other water.

I, John E. Cook being first duly sworn upon my oath,
depose and say that the above is a full and complete statement prepared in accordance with the instructions on the re-
verse side of this form and submitted in evidence of ownership of a valid underground water right, that I have carefully
read each and all of the items contained therein and that the same are true to the best of my knowledge and belief.

United States of America
by: John E. Cook declarant.

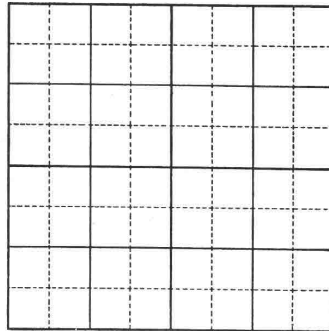
Subscribed and sworn to before me this 18 day of July, A.D. 1978
7-25-80
My commission expires _____
Notary Public

FILED
NEW MEXICO LAW A DECLARATION IS ONLY A STATEMENT OF DECLARANT'S CLAIM
EVIDENCE FOR FILING DOES NOT CONSTITUTE APPROVAL OR REJECTION OF THE CLAIM

Locate well and areas actually irrigated as accurately as possible on following plat:

Section (s) _____, Township _____, Range _____, N. T. R. T.

(See attached map
NPS #430/80015)



INSTRUCTIONS

Declaration shall be executed (preferably typewritten) in triplicate and must be accompanied by a \$1.00 filing fee. Each of triplicate copies must be properly signed and attested.

A separate declaration must be filed for each well in use.

All blanks shall be filled out fully. Required information which cannot be sworn to by declarant shall be supplied by affidavit of person or persons familiar with the facts and shall be submitted herewith.

Secs. 1-3. Complete all blanks.

Sec. 4. Fill out all blanks applicable as fully as possible.

Sec. 5. Irrigation use shall be stated in acre feet of water per acre per year applied on the land. If used for domestic, municipal, or other purposes, state total quantity in acre feet used annually.

Sec. 6. Describe only the acreage actually irrigated. When necessary to clearly define irrigated acreages, describe to nearest 2½ acre subdivision. If located on unsurveyed lands, describe by legal subdivision "as projected" from the nearest government survey corners, or describe by metes and bounds and tie survey to some permanent, easily-located natural object.

Sec. 7. Explain and give dates as nearly as possible of any years when all or part of acreage claimed was not irrigated.

Sec. 8. If well irrigates or supplies supplemental water to any other land than that described above, or if land is also irrigated from any other source, explain under this section. Give any other data necessary to fully describe water right.

If additional space is necessary, use a separate sheet or sheets and attach securely hereto.

Revised August 1967

IMPORTANT-READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM

APPLICATION FOR PERMIT

explore by drilling

To ~~appropriate~~ the Underground Waters of the State of New Mexico

- Date Received August 14, 1978 File No. UP-500-X
1. Name of applicant United States of America (Pecos National Monument)
 Mailing address P.O. Box 728
 City and State Santa Fe, New Mexico 87501
2. Source of water supply _____, located in _____
 (artesian or shallow water aquifer) (name of underground basin)
3. The well is to be located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 5 Township 16N
 Range 12W N.M.P.M., or Tract No. _____ of Map No. _____ of the _____ District,
 on land owned by _____
4. Description of well: name of driller _____
 Outside Diameter of casing 6" inches; Approximate depth to be drilled 600 feet;
5. Quantity of water to be ~~expended~~ diverted and beneficially used 7 (estimated) acre feet,
 (consumptive use, diversion)
 for municipal purposes.
6. Acreage to be irrigated or place of use N/A acres.

Subdivision	Section	Township	Range	Acres	Owner
See attached NPS Map #430/80,015					STATE ENGINEER OFFICE DIVISION I ROBERT L. HARRIS

7. Additional statements or explanations This application does not request a new appropriation for groundwaters. This application is for a new diversion for waters claimed in "Declaration of Owner of Underground Water Right" filed with the State Engineer's Office on July 18, 1978 in Santa Fe, New Mexico.

It is estimated that 7 AF of water/year of the declared ownership to 20 AF of water/year by the above Declaration will be diverted from this well for municipal purposes after the construction of a visitor center/office building complex which is being designed. Date for construction of this new facility, while still uncertain, is anticipated to begin in the not to distant future.

The test well will be drilled to intercept groundwaters in the Sangre de Cristo formation. Drill cutting samples will be collected and analyzed at 10 foot intervals. Aquifer testing is planned and the water produced during the testing will be returned to surface drainage.

This notice is given as a matter of comity, cooperation and information. It does not consent to the jurisdiction of the State in regard to the rights of the United States to the use of water described in this notice. This notice is not intended to affect previously vested rights under either Federal or State law to the use of this or any other water.

I, John E. Cook, affirm that the foregoing statements are true to the best of my knowledge and belief and that development shall not commence until approval of the permit has been obtained.

United States of America
(Pecos National Monument), Permittee,

By: John E. Cook, Regional Director

Subscribed and sworn to before me this 1st day of August, A.D., 1978

My commission expires June 3rd, 1981

Notary Public

Number of this permit UP-500-X

ACTION OF STATE ENGINEER

After notice pursuant to statute and by authority vested in me, this application is approved provided it is not exercised to the detriment of any others having existing rights; further provided that all rules and regulations of the State Engineer pertaining to the drilling of _____ wells be complied with; and further subject to the following conditions:

1. Depth of well shall in no event exceed depth of valley fill above the red bed or other underlying formation.
2. Diameter of well not to exceed 6 inches.
3. Except for one test period of 24 hours the well shall not be pumped or equipped without first obtaining a valid permit to use said well.
4. Application approved for exploratory purposes only and application to be cancelled when water is located on or before August 31, 1979.
5. Well driller shall submit logs of all holes drilled and all holes to be filled.
6. At the end of the test period pump shall be removed and well shall be capped until a valid permit to use such well is obtained.
7. Well to be drilled by a driller licensed as a water well driller in the State of New Mexico.

Well record due August 31, 1979

Proof of completion of well shall be filed on or before _____, 19____

Proof of application of water to beneficial use shall be filed on or before _____, 19____

Witness my hand and seal this 23rd day of August, A.D., 19 78

S. E. Reynolds, State Engineer

By: Fred H. Hennighausen
Fred H. Hennighausen
 District Supervisor

INSTRUCTIONS

This form shall be executed, preferably typewritten, in triplicate and shall be accompanied by a filing fee of \$5.00. Each of triplicate copies must be properly signed and attested.

A separate application for permit must be filed for each well used.

Secs. 1-4—Fill out all blanks fully and accurately.

Sec. 5—Irrigation use shall be stated in acre feet of water per acre per annum to be applied on the land. If for municipal or other purposes, state total quantity in acre feet to be used annually.

Sec. 6—Describe only the lands to be irrigated or where water will be used. If on unsurveyed lands describe by legal subdivision "as projected" from the nearest government survey corners, or describe by metes and bounds and tie survey to some permanent, easily located natural object.

Sec. 7—If lands are irrigated from any other source, explain in this section. Give any other data necessary to fully describe water right sought.

IMPORTANT—READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM

APPLICATION FOR PERMIT

explore by drilling

To ~~Appropriate~~ the Underground Waters of the State of New Mexico

- Date Received August 14, 1978 File No. UP-500-X-2
1. Name of applicant United States of America (Pecos National Monument)
 Mailing address P.O. Box 728
 City and State Santa Fe, New Mexico 87501
2. Source of water supply _____, located in _____
 (artesian or shallow water aquifer) (name of underground basin)
3. The well is to be located in the NE 1/4 NW 1/4 Section 8 Township 16N
 Range 12W N.M.P.M., or Tract No. _____ of Map No. _____ of the _____ District,
 on land owned by United States of America (Pecos National Monument)
4. Description of well: name of driller _____
 Outside Diameter of casing 6 inches; Approximate depth to be drilled 600 feet;
5. Quantity of water to be ~~diverted~~ and beneficially used 7 (estimated) acre feet,
 (consumptive use, diversion) _____
 for _____ purposes.
6. Acreage to be irrigated or place of use N/A acres.

Subdivision	Section	Township	Range	Acres	Owner
See attached NPS Map #430/60,013					

7. Additional statements or explanations This application does not request a new appropriation for groundwaters. This application is for a new diversion for waters claimed in "Declaration of Owner of Underground Water Right" filed with the State Engineer's Office on July 18, 1978 in Santa Fe, New Mexico.

It is estimated that 7 AF of water/year of the declared ownership to 20 AF of water/year by the above Declaration will be diverted from this well for municipal purposes after the construction of a visitor center/office building complex which is being designed. Date for construction of this new facility, while still uncertain, is anticipated to begin in the not to distant future.

The test well will be drilled to intercept groundwaters in the Sangre de Cristo Formation. Drill cutting samples will be collected and analyzed at 10 foot intervals. Aquifer testing is planned and the water produced during the testing will be returned to surface drainage.

This notice is given as a matter of comity, cooperation and information. It does not consent to the jurisdiction of the State in regard to the rights of the United States to the use of water described in this notice. This notice is not intended to affect previously vested rights under either Federal or State law to the use of this or any other water.

I, John E. Cook, affirm that the foregoing statements are true to the best of my knowledge and belief and that development shall not commence until approval of the permit has been obtained.

United States of America
(Pecos National Monument), Permittee,

By: John E. Cook, Regional Director

Subscribed and sworn to before me this 1st day of August, A.D., 1978

My commission expires June 3rd, 1981

Christopher E. Cook
 Notary Public

Number of this permit UP-500-X-2

ACTION OF STATE ENGINEER

After notice pursuant to statute and by authority vested in me, this application is approved provided it is not exercised to the detriment of any others having existing rights; further provided that all rules and regulations of the State Engineer pertaining to the drilling of _____ wells be complied with; and further subject to the following conditions:

1. Depth of well shall in no event exceed depth of valley fill above the red bed or other underlying formation.
2. Diameter of well not to exceed 6 inches.
3. Except for one test period of 24 hours the well shall not be pumped or equipped without first obtaining a valid permit to use said well.
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Sec. 7—If lands are irrigated from any other source, explain in this section. Give any other data necessary to fully describe water right sought.

Land History

10-559
v. 1958

U. S. DEPARTMENT OF THE INTERIOR - NATIONAL PARK SERVICE

FIXED PROPERTY RECORD

DESCRIPTION OF PROPERTY (Include reference to the location within the Park; how the asset was acquired, name of contractor, etc.)

Add, JV 930-129, 10/30/68 , 1" water line extension to the Priest's garden. This is a plastic line with hydrants.(2). Length of extension 390'.

DATE	REFERENCE		QUANTITY			COST		
	Journal Vou.	Other	Unit	No. of Units	Accumulated Total	Direct Costs	Indirect Costs	Accumulated Costs
10/30/68	930-129	RR				390.00		390.00

L. Acct.	General Classification	Sub-Classification	Region	State	Park or Office
220.7	WATER SYSTEM	Water System	SW	New Mexico	Pecos

Other Supporting Information

WATER RESOURCES

REPORT NO. 80-4

HYDROGEOLOGY OF THE PECOS NATIONAL MONUMENT

WELL NO. 2

Paul K. Christensen
National Park Service
Southwest Region
November 1979



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HYDROGEOLOGY OF THE PECOS NATIONAL MONUMENT WELL NO. 2

by

Paul K. Christensen

ABSTRACT

Pecos National Monument is located in north central New Mexico. Pecos National Monument well no. 2 has a total depth of 350 feet and penetrates two upper Paleozoic formations: the Pennsylvanian Madera limestone and the Pennsylvanian-Permian Sangre de Cristo formation.

The Sangre de Cristo formation comprises the upper 200 foot section of the hole. Well cuttings show that the formation is comprised of 150 feet of reddish-brown to light brown shale and siltstone which rests on 50 feet of sandstone. A minor perched water zone occurs in a sandy portion of the siltstone unit at approximately 60 feet BSL.

The Madera limestone which comprises the remainder of the hole appears as limestone interbedded with gray and reddish-brown shales. The producing water zone occurs in a fractured limestone with solution cavities in the interval between 315 to 340 feet BSL. Another water producing zone was encountered between 500 to 560 feet BSL.

Originally, the hole was drilled to a depth of 560 feet BSL. Water-swelling shale zones encountered in the hole from the surface to total depth required casing from the surface to the screen and sealing off of the hole at 350 BSL. The screen was emplaced in the interval of 330 to 340 feet BSL.

The producing water zone is an artesian perched reservoir. Static water level is 120 feet BSL (195 feet above the reservoir). The aquifer test revealed a coefficient of transmissibility of 216 gpd/ft with a drawdown of 75.8 feet in 24 hours at a discharge of 42.8 gpm. No stabilization occurred. The specific capacity is 0.57 gpm/ft drawdown. A recovery of 80 per cent occurred 110 minutes after pumping ceased.

Water quality testing shows the water to be safe for human consumption. Aesthetically, the water is pleasing.

INTRODUCTION

This report describes the hydrogeology of the Pecos National Monument well no. 2 and is intended to summarize the stratigraphy and groundwater hydrology of the rocks penetrated by the well. Pecos National Monument is located in north central New Mexico, about 25 miles west of Santa Fe, New Mexico. See figure 1 for locations.

The methodology behind this report is three-fold:

- 1) a microscopic analysis of the well cuttings taken at 10 foot intervals,
- 2) an aquifer test dated August 9 and 10, 1979, and 3) literature research.

The written sources consulted are Geology and Ground-Water Resources of San Miguel County, New Mexico (1951), by R.L. Griggs and G.E. Henderickson, the New Mexico Bureau of Mines and Mineral Resources Ground-Water Report 2, and Pecos National Monument New Mexico: Its Geological Setting (1969) by Ross B. Johnson, U.S. Geological Survey Bulletin 1271-E.

STRATIGRAPHY

Pecos National Monument well no. 2 penetrates two formations, the Sangre de Cristo formation, and the Madera limestone of the Magdalena group. The Sangre de Cristo formation which is Pennsylvanian-Permian in age has a thickness of 600-1000 feet in San Miguel County and consists of alternating dark-maroon shale and coarse pink feldspathic sandstone. A mantle of thick red soil covers much of the formation on the monument and is derived from the formation itself. The contact between the Sangre de Cristo formation and the older Madera limestone appears conformable or gradational regionally but may be disconformable locally. The Madera limestone, Pennsylvanian in age, consists of two limestone members. The upper member may be 1000 feet thick and consists of medium

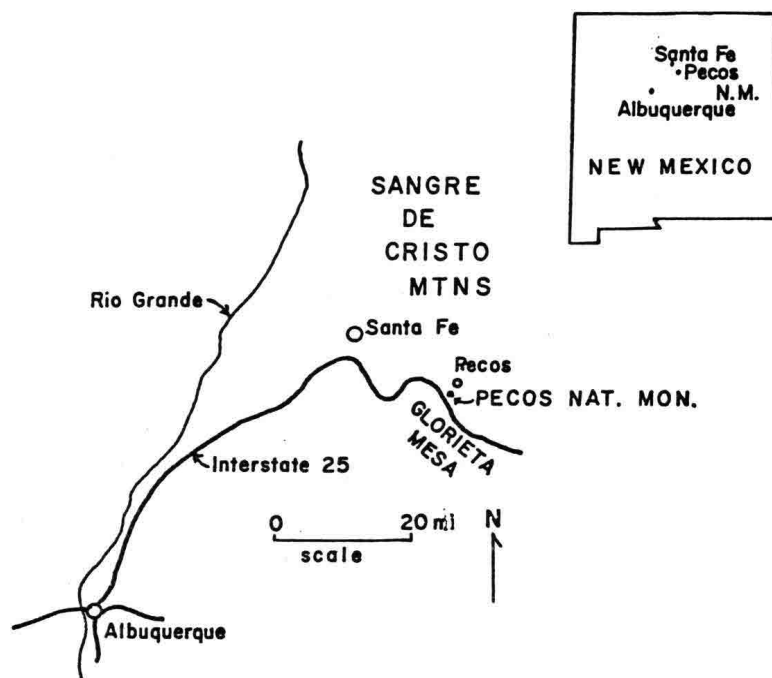


FIGURE 1. Location map for Pecos National Monument, north-central New Mexico

to coarsely crystalline light-gray commonly feldspathic limestone interbedded with coarse feldspathic sandstone. Near the top of the member, in places, some maroon shale is present. The lower member may be as much as 800 feet thick and consists of tan to light-gray to dark-gray fine-grained cherty limestone interbedded with dark-gray to black shale.

Pecos National Monument well no. 2 was drilled by the air rotary method to a depth of 560 feet below land surface. The generalized lithologic descriptions of the well cuttings which follow are from the microscopic analysis of the samples. The analysis is presented in Appendix I.

The upper 200 foot section of the hole stands in the lower portion of the Sangre de Cristo formation. The cuttings show that this section consists of 150 feet of reddish-brown to light brown shale and siltstone which rests on 50 feet of sandstone. The sandstone is light-brown, friable to soft, feldspathic, and poorly sorted with a clay and silt matrix. In part, it is coarse-grained and contains pebble gravel. This basal sandstone of the Sangre de Cristo formation becomes muddier near the contact with the Madera limestone.

The lower 360 foot section of the hole stands in the upper member of the Madera limestone. In the interval between 200 and 280 feet, the samples consist of a white to gray very fine- to fine-grained limestone interbedded with gray shale. The interval between 280 and 330 feet consists of very fine- to coarse-grained quartz limestone. Calcite is very common, which suggests fracture and cavity filling. The lower 350 to 560 foot interval consists of light gray to light brown very fine- to coarse-grained feldspathic limestone and gray to reddish-brown shales.

No coarse feldspathic sands were found in the samples of the interval between 200 and 560 feet. The reddish-brown shales that are found in places in the upper member of the Madera limestone are present. The hole does not penetrate the lower member of the Madera limestone.

GROUND WATER HYDROLOGY

Ground water withdrawn by the Pecos National Monument well no. 2 is derived from the upper member of the Madera limestone. In the upper member, ground water occurs in fractures and solution cavities. Large calcite crystals in the cuttings from interval 280 to 340 suggest that along zones of fracturing, circulating ground water has dissolved large openings in the limestone and redeposited the calcium carbonate in other zones of fracturing and previously open cavities.

A perched water table was encountered in the siltstone interval between 40 and 70 feet at approximately 60 feet BSL. This zone produced little water. The main ground water reservoir lies about 315 feet BSL at Pecos National Monument well no. 2. After tapping the reservoir, the water table rose to a level of 122.0 feet BTC (120.0 BSL). Confined ground water conditions exist. The main ground water reservoir is capped by a layer of limestone in which the fractures and cavities have been filled by calcite deposition, restricting upward movement. The reservoir is bound beneath by a shale unit which separates the reservoir tapped by the well from ground water beneath this water-producing zone. Some leakage from the artesian aquifer probably occurs.

From the water reservoir encountered between 315 and 340 feet, a discharge of approximately 35 to 40 gpm of water occurred during air rotary drilling. Flow steadily increased through this interval. No further increase in flow was observed until final interval, 500 to 560, when discharge out of the hole increased to 40-65 gpm. The water was muddy in the interval 315-350 and became gray when water from the lower interval 500-560 was tapped. The color was derived from shales encountered in drilling. The change in color and the increase in flow of the interval 500-560 further suggest that the tapped aquifer is confined on both lower and upper surfaces.

Between the intervals 0-280 and 340-560, the shales are water swelling. The hole was partially filled by the caving of these shales. To avoid the problem the hole was backfilled to 350 feet and sealed and casing was emplaced to 330 feet. The screen sits in the interval between 330 340 upon 10 more feet of casing. The casing and screen have an outer diameter of $5\frac{1}{2}$ inches. During the pump test performed August 9 and 10 after completion, water was slightly muddy initially but soon became clear and tasted good.

The pump test performed without an observation well, August 9 and 10, 1979, showed a drawdown of 75.8 feet in 24 hours at an average discharge of 42.8 gpm with no stabilization. Appendix II contained the data from the aquifer test and the time-drawdown, residual-drawdown, and calculated time-recovery curves. Specific capacity was 0.57 gpm/ft drawdown. A recovery of 65.0 feet (80% of total drawdown) occurred 110 minutes after pumping ceased. From the residual drawdown curve, the approximate calculated coefficient of transmissibility is 216 gpd/ft.

Pumping records on two wells at Rowe and Pecos which also withdraw water from the upper member of the Madera limestone show specific capacities of 4.5 and 2.0 gpm/ft drawdown, respectively. Drilling logs indicate the water comes from the arkosic sandstone beds, which were not penetrated or are absent at the Pecos National Monument well no. 2.

Water Chemistry

Table 1 compares the maximum permissible concentration limits of certain constituents as set by health criteria with well water from the Pecos well. Water from the well is clear and bears a good taste. The water contains no inorganic constituents in any harmful amount.

SUMMARY

Groundwater at Pecos National Monument well no. 2 is withdrawn from an artesian perched reservoir in the upper member of the Madera limestone. The water producing unit consists of a limestone, whose porosity and permeability is due to fractures and solution cavities. The coefficient of transmissibility is 216 gpd/ft. A drawdown of 75.8 feet was observed after 24 hours of pumping from a static water level of 122.0 feet BTC at an average pumping rate of 42.8 gpm. Specific capacity is 0.57 gpm/ft drawdown. A recovery of 80 per cent occurred 110 minutes after pumping ceased. Water from the well is clear, bears a good taste, and is fit for human use.

Table 1. Pecos well chemistry and EPA health standards

<u>Constituent</u>	<u>Maximum permissible Concentration (mg/l)</u>	<u>Pecos well water (mg/l)</u>
Arsenic	0.05	<0.01
Barium	1.0	0.1
Cadmium	0.01	<0.001
Chromium +6	0.05	<0.01
Fluoride	1.4-2.4	1.7
Lead	0.05	0.001
Mercury	0.002	<0.0004
Nitrogen Nitrate	45	1.1
Selenium	0.01	0.01
Silver	0.05	0.01

APPENDIX I

Sample analysis of Pecos National Monument Well no. 2 cuttings

<u>Interval</u>	<u>Sample Description</u>
SANGRE DE CRISTO FORMATION	
0-10	SHALE - Light reddish-brown, earthy, hard, calcareous, micaceous, water swelling, blocky.
10-20	SHALE - Light brown, earthy, moderately hard, non-calcareous, micaceous, water swelling, blocky.
20-30	SHALE - Light reddish-brown, a/a.
30-40	SHALE - Light gray, earth, moderately hard, calcareous, micaceous, water swelling, blocky, silty.
40-50	SILTSTONE - Light brown, waxy, hard, slightly calcareous, very micaceous, flaky.
50-60	SILTSTONE - Light brown, earthy, soft, calcareous, slightly sandy, water swelling, blocky.
60-70	SILTSTONE - Light brown, earthy, moderately hard to hard, micaceous, very sandy, clayey, water swelling, blocky, calcareous.
70-80	SHALE - Light brown, earthy, moderately hard to hard, noncalcareous, micaceous, water swelling, blocky, occasional clasts of mud and limestone, sand grains of quartz and lithic composition.
80-90	SHALE - Light brown, calcareous, a/a.
90-100	SHALE - Light brown, very calcareous, a/a.
110-120	SHALE - Light brown, calcareous, a/a.
120-150	SHALE - Light brown, mottled with gray, earthy,

150-70	SANDSTONE - Moderately hard, calcareous, micaceous, water swelling, flaky to blocky, occasional limestone and mud clasts.
150-70	SANDSTONE - Light brown, very fine- to medium-grained, angular to subrounded, friable to soft, grain composition - feldspar, quartz, lithic, muddy calcareous matriz.
170-80	SANDSTONE - a/a, occasional coarse grains and pebble gravel.
180-200	SANDSTONE - a/a, matrix becoming very muddy.
	MADERA LIMESTONE
200-10	LIMESTONE - Light brown, very fine to fine-grained, very hard, slightly silty, dolomitic, white calcite fill, with some medium- to dark gray very micaceous calcareous moderately hard shale.
210-30	LIMESTONE - Light gray, a/a.
230-40	LIMESTONE - Light to medium gray, a/a, with some medium to dark gray carbonaceous calcareous micaceous shale.
240-50	SHALE - Light to medium gray, earthy, hard, calcareous, slightly carbonaceous, nonswelling, blocky.
250-60	LIMESTONE - Light to medium gray, reddish gray, micro- crystalline to very fine-grained, dolomitic, very hard. Reddish-gray limestone, muddy.

260-70	SHALE - Medium gray, earthy, moderately hard, calcareous, water swelling, micaceous, block, with some limestone, a/a.
270-80	SHALE - Medium gray, a/a, with some limestone, a/a.
280-300	LIMESTONE - Light brown, light gray, very fine to fine grained, very hard, abundant white calcite fill, dolomitic.
300-10	LIMESTONE - White, very fine-grained, dolomitic, very hard, clear quartz grains common, abundant white calcite fill.
310-20	LIMESTONE - White, a/a, with abundant white calcite fill.
320-30	LIMESTONE - Light gray, coarse-grained, dolomitic, very hard, sandy, white calcite fill common, some coarse-grained dolomitic rhombs.
330-40	LIMESTONE - White. a/a, with abundant white calcite fill and some glauconite, and SANDSTONE - Dark gray, fine- to coarse-grained, angular, soft to moderately hard, poor sorting, slightly micaceous carbonaceous slightly calcareous muddy matrix, very limely in parts.
340-50	SHALE - Dark reddish-brown, earthy, slightly calcareous, silty, micaceous, water swelling, blocky.
350-60	SHALE - Dark reddish-brown, a/a, sandy in parts, and LIMESTONE - Light brown, light gray, very fine- to fine-grained, coarser grained in parts, oolitic in parts, very hard, dolomitic.

360-70	LIMESTONE - Light brown, light gray, a/a.
370-80	LIMESTONE - Light gray. light brown, dark gray, very fine- to medium-grained, very hard, micaceous, muddy, dolomitic, some pyrite.
380-90	SHALE - Medium to dark reddish-gray, earthy, moderately hard to hard, micaceous, water swelling, blocky.
390-410	LIMESTONE - Light brown, light gray, very fine- to fine- grained, occasionally coarsely grained, dolomitic, very hard, pyritic, micaceous.
410-20	LIMESTONE - Light brown, very fine-to fine-grained, white calcite fill, muddy, orange feldspar common, dolomitic, very hard.
420-40	SHALE - Medium gray, earthy, hard, micaceous, carbonaceous, slightly calcareous, blocky, nonswelling, some pyrite.
440-50	SHALE - Medium gray, earthy, moderately hard, micaceous, blocky, water swelling, calcareous, orange feldspar common.
450-60	SHALE - Medium gray, light reddish brown, a/a.
460-80	SHALE - Light gray, earthy, hard, very micaceous, orange feldspar common, nonswelling, calcareous with some light brown to light gray limestone.
480-90	LIMESTONE - Light brown, light gray, very fine to fine- grained, very hard, dolomitic, micaceous,

muddy with medium gray calcareous nonswelling shale.

490-500 SHALE - Medium gray, earthy, moderately hard to hard, micaceous, calcareous, blocky, nonswelling.

500-10 SHALE - Light reddish-brown, earthy, moderately hard, micaceous, occasional mud clust, blocky, calcareous, water swelling.

510-40 LIMESTONE - Light brown, light gray, a/a, interbedded with SHALE - Light reddish-brown, a/a.

540-50 SHALE - Medium to dark gray, earthy, calcareous, moderately hard to hard, micaceous, water swelling, blocky.

550-60 LIMESTONE - Dark gray, very fine to fine grained very hard, dolomitic, blocky.

APPENDIX II

RECOVERY DATA

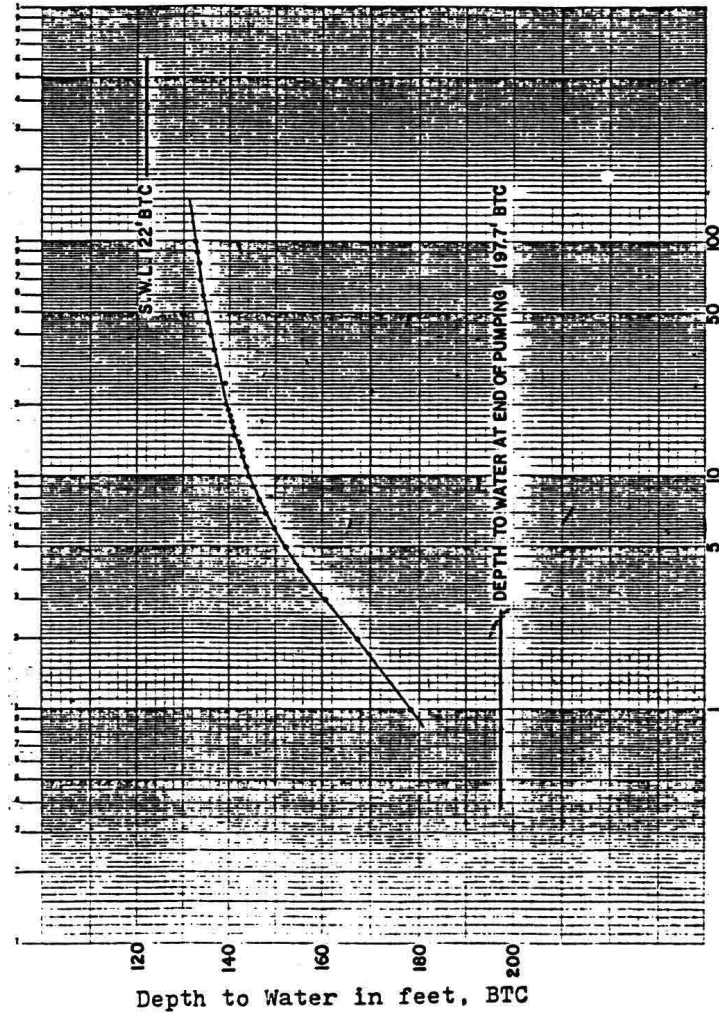
Clock Time (hour)	Time, Pump Start (t, min)	Time, Pump Stop (t', min)	Ratio (t/t')	Water Level (BTC, ft.)	Drawdown from Pumping Curve	Calculated Recovery
10 August 1979						
0935	1444	0	-	197.70	197.70	0
		1.0	1445	177.98	197.70	19.73
		2.0	723	167.39	197.70	30.31
		3.0	482	160.22	197.69	37.47
		4.0	362	155.69	197.69	42.00
		5.0	290	152.47	197.69	45.22
		6.0	240	150.10	197.69	47.59
		7.0	207	148.00	197.68	49.68
		8.0	182	146.80	197.68	50.88
		9.0	161	145.60	197.68	52.08
0945	1454	10.0	145	144.90	197.68	52.78
		11.0	132	144.05	197.68	53.68
		12.0	121	143.40	197.68	54.28
		13.0	112	142.84	197.67	54.83
		14.0	104	142.14	197.67	55.53
		15.0	97.3	141.60	197.67	56.07
		16.0	91.3	141.23	197.67	56.44
		17.0	85.9	140.80	197.67	56.87
		18.0	81.2	140.50	197.67	57.17
		19.0	77.0	140.21	197.66	57.45
0955	1464	20.0	73.2	139.81	197.66	57.85
		25.0	58.8	139.65	197.65	58.00
		30.0	49.1	137.75	197.65	59.90
		35.0	42.3	136.95	197.64	60.69
		40.0	37.1	136.20	197.63	61.43
		45.0	33.1	135.68	197.62	62.37
		50.0	29.9	135.25	197.61	62.36
1035	1504	60.0	25.1	134.55	197.59	63.04
1045	1514	70.0	21.6	133.90	197.57	63.67
1055	1524	80.0	19.1	133.53	197.56	64.03
1105	1534	90.0	17.0	132.92	197.54	64.62
1115	1544	100.0	15.4	132.54	197.52	64.98

Park: Visitor Center Well #2, Pecos National Monument
 Elevation: 6890 ft. MSL
 Date: August 9 and 10, 1979
 Observers: Alan Bengtson, Paul Christensen, Garland Moore

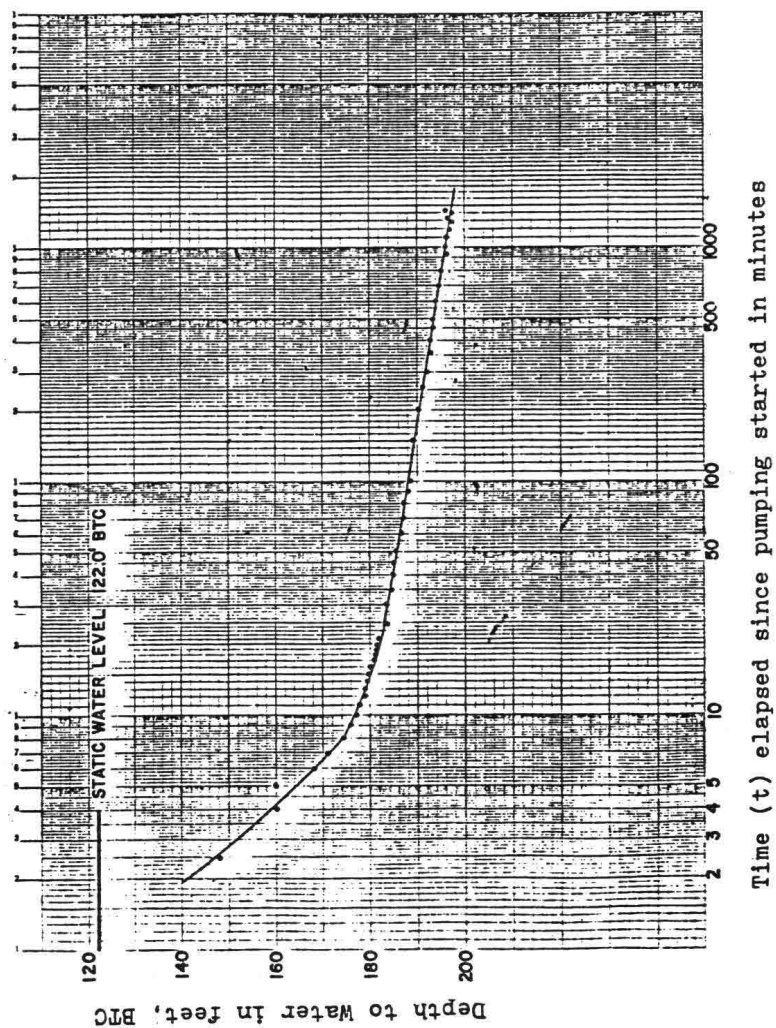
DRAWDOWN DATA

Clock Time (hour)	Pumping Time (min)	Water Level BTC (feet)	Drawdown (feet)	Specific Capacity	Remarks
9 August 1979					
0931	0	121.95	0		SWL
	2.5	148.10	26.15	1.91	5 gal/6 sec Q=50gpm
	4.0	160.18	38.23	1.31	
	5.0	160.13	38.18	1.31	
	6.0	168.35	46.40	1.08	
	7.0	171.02	49.07	1.02	
	8.0	174.87	52.92	.94	
	9.0	176.11	54.16	.92	
	10.0	177.15	55.20	.91	
	11.0	177.90	55.95	.89	
	12.0	178.78	56.83	.88	
	13.0	179.15	57.20	.87	
0945	14.0	179.64	57.69	.87	
	15.0	180.08	58.03	.86	
	16.0	180.60	58.65	.85	
	17.0	181.04	59.09	.85	
	18.0	181.41	59.46	.84	
	19.0	181.78	59.83	.84	
	20.0	182.02	61.07	.83	
	21.0	182.25	61.30	.82	
0956	25.0	183.60	61.65	.81	
	30.0	183.89	61.94	.81	
	35.0	184.60	62.65	.80	
	40.0	185.10	63.15	.79	

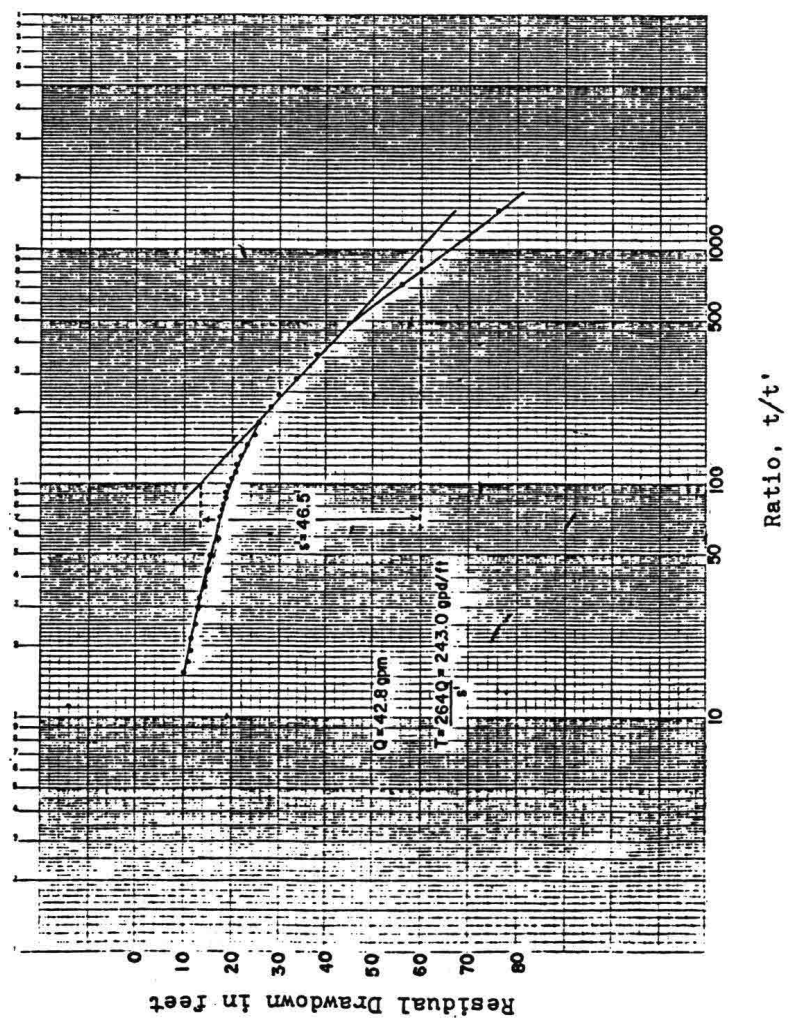
1016	45.0	185.28	63.33	.79	
	50.5	186.02	64.07	.78	
1031	60.0	186.70	64.75	.77	
	70.0	187.20	65.25	.77	
	80.0	187.55	65.60	.76	
1101	90.0	188.11	66.16	.76	5 gal/6 sec Q=50gpm
	100.0	188.62	66.67	.75	5 gal/6 sec Q=42.8gpm
	150.0	189.16	67.21	.64	(throughout rest of test)
	200.0	190.25	68.30	.63	
1348	257.0	191.30	69.35	.61	
	300.0	192.15	70.20	.61	
1526	355.0	192.75	70.80	.60	
1611	400.0	192.90	70.95	.60	
1701	450.0	193.18	71.23	.60	
1751	500.0	193.50	71.55	.60	580 mhos @ 12°C
1931	600.0	194.10	72.15	.59	
2111	700.0	194.80	72.85	.59	
2251	800.0	195.40	73.45	.58	
10 August 1979					
0101	930.0	196.20	74.25	.58	
0211	1000.0	196.40	74.45	.57	
0351	1100.0	196.80	74.85	.57	
0541	1210.0	197.25	75.30	.57	
0711	1300.0	197.42	75.47	.57	
0740	1329.0	197.20	75.25		Engine sputtered due to change of fuel tanks
0851	1400.0	197.49	75.54	.57	Pump off; adjusted value from graph: measured value 196.61 ft. BTC to water
0935	1444.0	197.70	75.75	.57	level not valid because of measurement taken just seconds after pump was turned off, allowing recovery.



TIME-RECOVERY CURVE, Pecos National Monument well #2
August 8 and 9, 1979



TIME-DRAWDOWN CURVE, Pecos National Monument well #2
August 8 and 9, 1979



RESIDUAL DRAWDOWN CURVE, Pecos National Monument well #2

OEC 10 1979

N2215(SWR)OM

State Engineer's Office
State of New Mexico
Attention: Mr. E. B. Collins Jr., Basin Supervisor
P.O. Box 1717
Roswell, New Mexico 88201

Gentlemen:

In response to your letter of August 22, 1978, concerning Permit No. UP-500-X, Application for Permit to explore by drilling the underground waters of Pecos River Basin, enclosed are the results of the drilling activity as you have requested. As instructed, the well has not been placed in production as yet.

If you have any questions about this report or feel that additional information that is available might clarify certain points, please do not hesitate to call on us.

Sincerely yours,



Associate Regional Director,
Park Operations

Enclosures

cc:
Supt., Pecos NM
Manager, DSC (Atten: Bob Budz) (with enclosures
Chief, Air & Water Division, WASO 492 (Atten: Vic Berte') to all)
bcc:
Moore, OM, SWR

In accordance with the planned development plan for Pecos National Monument, New Mexico, a test well was converted to a production well design for the proposed development.

Initial drilling with an air rotary drilling rig was completed by Lujan Drilling Company of Roy, New Mexico. Test drilling was completed from surface to 560 feet in depth. Drill cutting samples were collected at 10 foot intervals and analyzed. See Appendix I. Follow-up activities were performed by Thompson Drilling of Espanola and Red Top Drilling of Las Vegas, New Mexico. Water zones were encountered at 58, 160, and from 315 to 340 feet below surface. Surface casing was installed from 1.63' above surface to 210 feet below surface and grouted in place. Initial blow out volumes were measured from the 315 to 340 feet zone at a measured rate of 40 gpm.

Swelling clays which occur throughout the borehole closed the hole to 295 feet from 560 feet. A preliminary aquifer test was performed. Static water level measured was 120.96 feet below top of casing. The pump withdrew an average of 9 gpm for 21 hours. The maximum drawdown was measured at 16.79 feet below static water level (137.75 feet below top of casing). Recovery data was collected for 4 hours during which time 91.5% of the total drawdown had recovered.

In order to prevent further swelling from the clays and to straighten the hole, a 5½" liner was installed from 1.63 feet above surface to 330 feet in depth - a 10 foot section of Johnson stainless #10, Type 304 was installed from 330 to 340 feet, on an additional 10 feet of 5½" blank water well casing.

On August 9 and 10, 1979, a final aquifer test was performed for 24 hours, during which the drawdown was measured at 75.75 feet below static water level at an average withdrawal rate of 50 gpm. Static water level was measured at 121.95 feet below top of casing. Recovery data collected for 100 minutes showed a recovery of 64.98 feet (85.8%) of the drawdown.

Aquifer performance test data on both events are shown in Appendix II and III respectively.

Limited chemical analysis are shown in Appendix IV.

APPENDIX I

Sample analysis of Pecos National Monument Well no. 2 cuttings

<u>Interval</u>	<u>Sample Description</u>
	SANGRE DE CRISTO FORMATION
0-10	SHALE - Light reddish-brown, earthy, hard, calcareous, micaceous, water swelling, blocky.
10-20	SHALE - Light brown, earthy, moderately hard, non-calcareous, micaceous, water swelling, blocky.
20-30	SHALE - Light reddish-brown, a/a.
30-40	SHALE - Light gray, earthy, moderately hard, calcareous, micaceous, water swelling, blocky, silty.
40-50	SILTSTONE - Light brown, waxy, hard, slightly calcareous, very micaceous, flaky.
50-60	SILTSTONE - Light brown, earthy, soft, calcareous, slightly sandy, water swelling, blocky.
60-70	SILTSTONE - Light brown, earthy, moderately hard to hard, micaceous, very sandy, clayey, water swelling, blocky, calcareous.
70-80	SHALE - Light brown, earthy, moderately hard to hard, noncalcareous, micaceous, water swelling, blocky, occasional clasts of mud and limestone, sand grains of quartz and lithic composition.
80-90	SHALE - Light brown, calcareous, a/a.
90-100	SHALE - Light brown, very calcareous, a/a.
110-120	SHALE - Light brown, calcareous, a/a.
120-150	SHALE - Light brown, mottled with gray, earthy,

150-70	SANDSTONE - moderately hard, calcareous, micaceous, water swelling, flaky to blocky, occasional limestone and mud clasts.
150-70	SANDSTONE - Light brown, very fine- to medium-grained, angular to subrounded, friable to soft, grain composition - feldspar, quartz, lithic, muddy calcareous matriz.
170-80	SANDSTONE - a/a, occasional coarse grains and pebble gravel.
180-200	SANDSTONE - a/a, matrix becoming very muddy.
MADERA LIMESTONE	
200-10	LIMESTONE - Light brown, very fine to fine-grained, very hard, slightly silty, dolomitic, white calcite fill, with some medium- to dark-gray very micaceous calcareous moderately hard shale.
210-30	LIMESTONE - Light gray, a/a.
230-40	LIMESTONE - Light to medium gray, a/a, with some medium to dark gray carbonaceous calcareous micaceous shale.
240-50	SHALE - Light to medium gray, earthy, hard, calcareous, slightly carbonaceous, nonswelling, blocky.
250-60	LIMESTONE - Light to medium gray, reddish gray, micro- crystalline to very fine-grained, dolomitic, very hard. Reddish-gray limestone, muddy.

260-70	SHALE - Medium gray, earthy, moderately hard, calcareous, water swelling, micaceous, blocky, with some limestone, a/a.
270-80	SHALE - Medium gray, a/a, with some limestone, a/a.
280-300	LIMESTONE - Light brown, light gray, very fine to fine grained, very hard, abundant white calcite fill, dolomitic.
300-10	LIMESTONE - White, very fine-grained, dolomitic, very hard, clear quartz grains common, abundant white calcite fill.
310-20	LIMESTONE - White, a/a, with abundant white calcite fill.
320-30	LIMESTONE - Light gray, coarse-grained, dolomitic, very hard, sandy, white calcite fill common, some coarse-grained dolomitic rhombs.
330-40	LIMESTONE - White, a/a, with abundant white calcite fill and some glauconite, and SANDSTONE - Dark gray, fine- to coarse-grained, angular, soft to moderately hard, poor sorting, slightly micaceous carbonaceous slightly calcareous muddy matrix, very limey in parts.
340-50	SHALE - Dark reddish-brown, earthy, slightly calcareous, silty, micaceous, water swelling, blocky.
350-60	SHALE - Dark reddish-brown, a/a, sandy in parts, and LIMESTONE - Light brown, light gray, very fine- to fine-grained, coarser grained in parts, oolitic in parts, very hard, dolomitic.

360-70	LIMESTONE - Light brown, light gray, a/a.
370-80	LIMESTONE - Light gray, light brown, dark gray, very fine- to medium-grained, very hard, micaceous, muddy, dolomitic, some pyrite.
380-90	SHALE - Medium to dark reddish-gray, earthy, moderately hard to hard, micaceous, water swelling, blocky.
390-410	LIMESTONE - Light brown, light gray, very fine- to fine- grained, occasionally coarsely grained, dolomitic, very hard, pyritic, micaceous.
410-20	LIMESTONE - Light brown, very fine- to fine-grained, white calcite fill, muddy, orange feldspar common, dolomitic, very hard.
420-40	SHALE - Medium gray, earthy, hard, micaceous, carbonaceous, slightly calcareous, blocky, nonswelling, some pyrite.
440-50	SHALE - Medium gray, earthy, moderately hard, micaceous, blocky, water swelling, calcareous, orange feldspar common.
450-60	SHALE - Medium gray, light reddish brown, a/a.
460-80	SHALE - Light gray, earthy, hard, very micaceous, orange feldspar common, nonswelling, calcareous with some light brown to light gray limestone.
480-90	LIMESTONE - Light brown, light gray, very fine to fine- grained, very hard, dolomitic, micaceous,

muddy with medium gray calcareous nonswelling shale.

490-500 SHALE - Medium gray, earthy, moderately hard to hard, micaceous, calcareous, blocky, nonswelling.

500-10 SHALE - Light reddish-brown, earthy, moderately hard, micaceous, occasional mud clust, blocky, calcareous, water swelling.

510-40 LIMESTONE - Light brown, light gray, a/a, interbedded with SHALE - Light reddish-brown, a/a.

540-50 SHALE - Medium to dark gray, earthy, calcareous, moderately hard to hard, micaceous, water swelling, blocky.

550-60 LIMESTONE - Dark gray, very fine to fine grained very hard, dolomitic, blocky.

FORM 10-131
(APRIL 1964)

PURCHASE ORDER

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHWEST REGION
P.O. Box 728
Santa Fe, New MEXICO 87501
(ISSUING OFFICE)

REQUISITION NO.

OM (Alan)

DATE OF ORDER

9/14/78

THIS NUMBER MUST APPEAR ON ALL
PACKAGES AND PAPERS
RELATING TO THIS ORDER

ORDER NO. AMENDMENT #1

PX7029-8-0736

ACCOUNTING CLASSIFICATION

INCREASE OBLIGATION BY:

7500-1001-417 N 2600 \$1,080.00 11

VENDOR'S NAME AND ADDRESS

Lujan Drilling Company
Box 216
Roy, New Mexico 87745

SHIP TO: (Consignee and Address)

Pecos National Monument
2 miles Southeof
Pecos, New Mexico 87552

CONTRACT NO.

DISCOUNT TERMS

SHIP VIA

DELIVERY: F.O.B.

TIME FOR DELIVERY

GOVT. B/L NO.

SHIPPING POINT

ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
	This amendment is issued to increase l.f. by 180 l.f.				
	Furnish and install 6" nominal diameter casing for well. Casing shall be new and round, weighing 19# per linear foot.	180	ft.	6.00	1,080.00
	This casing to be furnished and installed in conjunction with order No. EA7029-8-0013 and shall amend order no. PX7029-8-0736. Unstable Geological Formations require one well to be cased and grouted to a depth of 200'.				

THE ARTICLES OR SERVICES LISTED WERE RECEIVED ON

TOTAL

1,080.00

SIGNATURE

(DATE)

AND ACCEPTED ON

(DATE)

RECEIVING REPORT NO:

NAME AND TITLE

Delmar D. Scharn, Supervisory
Contract Specialist

SIGNATURE:

PURCHASING OFFICER

2A. RECEIVING REPORT

FORM 10-131
(APRIL 1964)

PURCHASE ORDER

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHWEST REGION
P.O. Box 728
Santa Fe, New MEXICO 87501
(ISSUING OFFICE)

REQUISITION NO.

OM (Alan)

THIS NUMBER MUST APPEAR ON ALL
PACKAGES AND PAPERS
RELATING TO THIS ORDER

DATE OF ORDER

9/14/78

ORDER NO. AMENDMENT #1

PX7029-8-0736

ACCOUNTING CLASSIFICATION

INCREASE OBLIGATION BY:

7500-1001-417 N 2600 \$1,080.00 11

VENDOR'S NAME AND ADDRESS

Lujan Drilling Company
Box 216
Roy, New Mexico 87745

SHIP TO: (Consignee and Address)

Pecos National Monument
2 miles Southeof
Pecos, New Mexico 87552

CONTRACT NO.

DISCOUNT TERMS

SHIP VIA

DELIVERY: F.O.B.

TIME FOR DELIVERY

GOVT. B/L NO.

SHIPPING POINT

ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
	This amendment is issued to increase l.f. by 180 l.f. Furnish and install 6" nominal diameter casing for well. Casing shall be new and round, weighing 19# per linear foot. This casing to be furnished and installed in conjunction with order No. EA7029-8-0013 and shall amend order no. PX7029-8-0736. Unstable Geological Formations require one well to be cased and grouted to a depth of 200'.	180	ft.	6.00	1,080.00
TOTAL					1,080.00
SIGNATURE					
NAME AND TITLE		Delmar D. Scharn, Supervisory Contract Specialist PURCHASING OFFICER			
5. MEMORANDUM COPY					

AMEND. #2
increase by
20'

FORM 10-131
(APRIL 1964)

PURCHASE ORDER

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

SOUTHWEST REGION

P. O. Box 728

~~Santa Fe, New Mexico 87501~~
(ISSUING OFFICE)

REQUISITION NO.

OM

THIS NUMBER MUST APPEAR ON ALL
PACKAGES AND PAPERS
RELATING TO THIS ORDER

DATE OF ORDER

9/8/78

ORDER NO.

PX7029-8-0790

ACCOUNTING CLASSIFICATION

7500-1001-417 N 2500 \$1,860.00 10

VENDOR'S NAME AND ADDRESS

Tom Thompson
Rt. 1, Box 413B
Española, New Mexico 87532

SHIP TO: (Consignee and Address)

Pecos National Monument
2 mi. S. of
Pecos, NM 87552

DEPOS

CONTRACT NO.

O.M.

DISCOUNT TERMS

Net

SHIP VIA

DELIVERY: F.O.B.

Destination

TIME FOR DELIVERY

GOVT. B/L NO.

N/A

SHIPPING POINT

ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
1.	Standby Time.	24	hrs.	40.00	\$960.00
2.	Generator Use (120v - 240v).	2	days	100.00	200.00
3.	Set up, pump installation, and removal.	2	ea.	350.00	700.00

THE ARTICLES OR SERVICES LISTED WERE RECEIVED ON

TOTAL \$1,860.00

(DATE) AND ACCEPTED ON (DATE)

RECEIVING REPORT NO:

SIGNATURE:

SIGNATURE

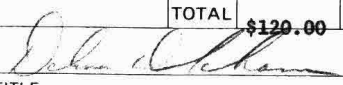
NAME AND TITLE

J. I. Carpenter, Regional
Chief, Division of Contracting & Property
Management
PURCHASING OFFICER

2A. RECEIVING REPORT

FORM 10-131
(APRIL 1964)

PURCHASE ORDER

UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE SOUTHWEST REGION P. O. Box 728 Santa Fe, New Mexico 87501 (ISSUING OFFICE)		REQUISITION NO.		THIS NUMBER MUST APPEAR ON ALL PACKAGES AND PAPER RELATING TO THIS ORDER	
		OM - Bengtson			
		DATE OF ORDER		ORDER NO.	
		September 22, 1978		AMENDMENT #2 PX7029-8-0736	
		ACCOUNTING CLASSIFICATION			
		INCREASE OBLIGATION BY:			
		7500-1001-417 N 2600 \$120.00 11			
VENDOR'S NAME AND ADDRESS		SHIP TO: (Consignee and Address)			
Lujan Drilling Company Box 216 Roy, NM 87745		Pecos National Monument 2 mi. South of Becos, NM 87552			
CONTRACT NO.	DISCOUNT TERMS	SHIP VIA			
DELIVERY: F.O.B.	TIME FOR DELIVERY	GOVT. B/L NO.			
SHIPPING POINT					
ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
1.	This amendment is issued to increase l.f. by 20 l.f. Furnish and install 6" nominal diameter casing for well. Casing shall be new and round, weighing 19# per linear foot. This casing to be furnished and installed in conjunction with Order No. EA 7029-8-0013 and shall amend order No. PX7029-8-0736. Unstable formation requires well to be cased to 210' + as opposed to 200' which was stated on Amendment #1	20	lf	6.00	\$120.00
THE ARTICLES OR SERVICES LISTED WERE RECEIVED ON		TOTAL		\$120.00	
(DATE) AND ACCEPTED ON (DATE)		SIGNATURE 			
RECEIVING REPORT NO:		NAME AND TITLE Delmar D. Scharn Supervisory Contract Specialist PURCHASING OFFICER			
SIGNATURE:		2A. RECEIVING REPORT			

MARK ALL PACKAGES AND PAPERS WITH CONTRACT AND/OR ORDER NUMBERS						
1. DATE OF ORDER 9/6/79	2. CONTRACT NO. (if any) O.H.	3. ORDER NO. PX7029-9-0698	PAGE 1 OF			
4. ISSUING OFFICE National Park Service, Southwest Region, P.O. Box 728, Santa Fe, NM 87501						
5. ACCOUNTING AND APPROPRIATION DATA 7075-0001-182 N 2600 \$310.00 10N						
6. SHIP TO (Consignee and Address, ZIP Code) Same as #4					VIA Your Option	
7. TO: CONTRACTOR (Name, Address, ZIP Code) Controls for Environmental Pollution 1925 Rosina Santa Fe, NM 87501					8. TYPE OF ORDER ☐ (a) Purchase Reference your _____ Please furnish the following on the terms specified on both sides of this order and on the attached sheets, if any, including delivery as indicated. This purchase is negotiated under authority of _____ ☐ (b) Delivery Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.	
9. REQUISITION OFFICE QM - Moore					10. REQUISITION NO./PURCHASE AUTHORITY	
11. F.O.B. POINT Destination		12. GOVERNMENT B/L NO. n/a		13. DELIVERY TO F.O.B. POINT ON OR BEFORE September 18, 1979		14. DISCOUNT TERMS Net
15. SCHEDULE See reverse for projections						
Item No. (a)	Supplies or Services (b)	Quantity Ordered (c)	Unit (d)	Unit Price (e)	Amount (f)	Quantity Accepted (g)
1.	Analyze Pecos Water Well #2 for Arsenic, Barium, Cadmium, Chromium (Hexavalent), Lead, Mercury, Nitrate-Nitrogen, Selenium, Silver, Fluoride, Turbidity.	11	ea.	10.00	\$110.00	
2.	Castolon (Big Bend) Well. In addition to the above, also analyze for the following: Ca, Cu, Fe, Mg, Mn, Na, SO ₄ , Zn, Alkalinity, Specific Conductance, Total Hardness, pH, Surfactants, TDS	1	ea.		200.00	
16. CLASSIFICATION: ☐ SMALL BUSINESS ☐ OTHER THAN SMALL BUSINESS ☐ MINORITY BUSINESS ENTERPRISE						15. (h) Total from continuation pages
17. SHIPPING POINT		18. GROSS SHIPPING WEIGHT		19. INVOICE NO.		15. (i) GRAND TOTAL
20. MAIL INVOICE TO (Include ZIP Code) Same as #4						
21. UNITED STATES OF AMERICA BY (Signature)				22. NAME (Typed) Mabel E. Jaramillo		\$310.00
ORDER FOR SUPPLIES OR SERVICES 147-107 STANDARD FORM 147 (REV. 2-77) Prescribed by GSA, FPR (41 CFR) 1-3.605						

MARK ALL PACKAGES AND PAPERS WITH CONTRACT AND/OR ORDER NUMBERS						
1. DATE OF ORDER 9/6/79	2. CONTRACT NO. (if any) O.M.	3. ORDER NO. FX7029-9-0698	PAGE 1 OF			
4. ISSUING OFFICE National Park Service, Southwest Region, P.O. Box 728, Santa Fe, NM 87501						
5. ACCOUNTING AND APPROPRIATION DATA 7075-0001-182 N 2600 \$310.00 10M						
6. SHIP TO (Consignee and Address, ZIP Code) Same as #4					VIA Your Option	
7. TO: CONTRACTOR (Name, Address, ZIP Code) Controls for Environmental Pollution 1925 Rosina Santa Fe, NM 87501				8. TYPE OF ORDER ☐ (a) Purchase Reference your _____ Please furnish the following on the terms specified on both sides of this order and on the attached sheets, if any, including delivery as indicated. This purchase is negotiated under authority of _____ ☐ (b) Delivery Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.		
9. REQUISITION OFFICE CM - Moore				10. REQUISITION NO./PURCHASE AUTHORITY		
11. F.O.B. POINT Destination		12. GOVERNMENT B/L NO. n/a		13. DELIVERY TO F.O.B. POINT ON OR BEFORE September 18, 1979		14. DISCOUNT TERMS
15. SCHEDULE See reverse for Rejections						
Item No. (a)	Supplies or Services (b)	Quantity Ordered (c)	Unit (d)	Unit Price (e)	Amount (f)	Quantity Accepted (g)
1.	Analyze Pecos Water Well #2 for Arsenic, Barium, Cadmium, Chromium (Hexavalent), Lead, Mercury, Nitrate-Nitrogen, Selenium, Silver, Fluoride, Turbidity.	11	ea.	10.00	\$110.00	
2.	Castolon (Big Bend) Well. In addition to the above, also analyze for the following: Ca, Cu, Fe, Mg, Mn, Na, SO ₄ , Zn, Alkalinity, Specific Conductance, Total Hardness, pH, Surfactants, TDS	1	ea.		200.00	
16. CLASSIFICATION: ☐ SMALL BUSINESS ☐ OTHER THAN SMALL BUSINESS ☐ MINORITY BUSINESS ENTERPRISE						15. (h) Total from continuation pages
17. SHIPPING POINT		18. GROSS SHIPPING WEIGHT		19. INVOICE NO.		15. (i) GRAND TOTAL
20. MAIL INVOICE TO (Include ZIP Code) SAME AS #4				\$310.00		
21. UNITED STATES OF AMERICA BY (Signature)				22. NAME (Typed) Mabel F. Jaramillo TITLE: CONTRACTING/ORDERING OFFICER		

ORDER FOR SUPPLIES OR SERVICES

147-107

STANDARD FORM 147 (REV. 2-77)
Prescribed by GSA, FPR (41 CFR) 1-3.605



STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ROSWELL

S. E. REYNOLDS
STATE ENGINEER

August 31, 1978

RECEIVED	
NPS SOUTHWEST REGIONAL OFFICE	
ADDRESS CORRESPONDENCE TO:	
P.O. BOX 717	
ROSWELL, NEW MEXICO	
88201	
PS	
PA	
MC	
PE	
PB	
File	

mtg

20/9

Files: UP-500-X and UP-500-X-2

United States of America
(Pecos National Monument)
P. O. Box 728
Santa Fe, New Mexico 87501

Attention: Mr. John E. Cook, Regional Director

Dear Mr. Cook:

On August 23, 1978 two Applications for Permit to Explore by Drilling the Underground Waters of the State of New Mexico under File Nos. UP-500-X and UP-500-X-2 were approved.

The permits stated the well locations to be in Township 16 North, Range 12 West. The correct location for the wells should be Township 15 North, Range 12 East.

Please change your copies of both permits UP-500-X and UP-500-X-2 to show Township 15 North, Range 12 East.

Yours truly,

R. B. Collins, Jr.
R. B. Collins, Jr.
Basin Supervisor

jb
cc: Santa Fe

L54
Peco

FORM 10-131
(APRIL 1964)

PURCHASE ORDER

UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE SOUTHWEST REGION P. O. Box 728 <u>Santa Fe, New Mexico 87501</u> (ISSUING OFFICE)		REQUISITION NO. OM-Moore PECO DATE OF ORDER August 29, 1978 ACCOUNTING CLASSIFICATION 7500-1001-417 N 2600 \$240.00 11		THIS NUMBER MUST APPEAR ON ALL PACKAGES AND PAPERS RELATING TO THIS ORDER ORDER NO. PX7029-8-0736	
VENDOR'S NAME AND ADDRESS Lujan Drilling Co. Box 216 Roy, NM 87745		SHIP TO: (Consignee and Address) Pecos National Monument 2 mi. S of Pecos, NM 87552			
CONTRACT NO. O.M.		DISCOUNT TERMS Net		SHIP VIA Your option	
DELIVERY: F.O.B. Destination		TIME FOR DELIVERY September 1978		GOVT. B/L NO. n/a	
SHIPPING POINT September 1978					
ITEM NO.	ARTICLES OR SERVICES	QUANTITY ORDERED	UNIT	UNIT PRICE	AMOUNT
1.	Furnish and install 6" nominal diameter casing for two wells, approximately 20 l.f. per well. Casing shall be new and round, weighing 19# per linear foot. This casing to be furnished and installed in conjunction with Order No. EA7029-8-0013 to drill two exploratory wells at Pecos National Monument. Further instructions on the well drilling will be furnished by Gary Moore of this office.	40	l.f.	6.00	\$240.00
THE ARTICLES OR SERVICES LISTED WERE RECEIVED ON _____ (DATE) AND ACCEPTED ON _____ (DATE)		SIGNATURE		TOTAL \$240.00	
RECEIVING REPORT NO: _____		NAME AND TITLE		Delmar D. Scharn Supervisory Contract Specialist PURCHASING OFFICER	
SIGNATURE: _____		2A. RECEIVING REPORT			

L54
PELO



STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ROSWELL

S. E. REYNOLDS
STATE ENGINEER

August 17, 1978

RECEIVED			
NWS SOUTHWEST REGIONAL OFFICE			
AUG 18 1978			
From	To	Date	
ADDRESS CORRESPONDENCE TO:			
P. O. BOX 1717			
ROSWELL, NEW MEXICO			
88201			
1	2	3	4
622421			
MC			
BS			
PB			
2 dm			

File: UP-500

United States of America
Pecos National Monument
P. O. Box 728
Santa Fe, New Mexico 87501

Attention: Mr. John E. Cook
Regional Director

Dear Mr. Cook:

The two applications to explore by drilling the underground waters of the State of New Mexico have been forwarded to this office. The Pecos National Monument is located in what has been designated as the Upper Pecos Ground Water Basin. Please address all future correspondence to this office.

The declaration referred to in the two applications has not been processed primarily because the location was given as Range 12 West and it is the belief of this office that it should be Range 12 East.

By letter of August 1, 1978 addressed to Mr. Garland Moore, a request was made for the pump test of the well and what we believe as an error was pointed out. A request was made that with his permission we would change the west to east. A copy of this letter is enclosed. We will hold all action on the declaration and applications until the location is verified. If this is actually Range 12 West the ground water jurisdiction would probably be in Albuquerque in the Rio Grande Basin. Please advise.

Yours very truly,

R. B. Collins, Jr.
Basin Supervisor

RBC*jb
encl.
cc: Santa Fe

L54
PECO



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

ROSWELL

August 1, 1978

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO:

P. O. BOX 1717
ROSWELL, NEW MEXICO
88201

File: UP-500

Mr. Garland Moore
National Park Service
Box 728
Santa Fe, New Mexico 87501

Dear Mr. Moore:

The Declaration of Owner of Underground Water Right as filed on behalf of the United States of America, Pecos National Monument has been forwarded to this office for processing. Along with the declaration was a note that you have some test pump data on the well that is being declared. Please forward that information to this office so that our files will be more complete.

Upon receipt of the test pump data, we will process the declaration and return your copy.

Under Item 3 of the declaration you state the well as being located in the NW~~1~~⁴NE~~1~~⁴ of Section 8, Township 16 North, Range 12 West. I believe the correct location should be Range 12 East. With your permission we will correct the description.

Yours truly,

R. B. Collins, Jr.
Basin Supervisor

REC*jb
cc: Santa Fe

AUG 17 1978

L54(SWR)OM

Your reference:
UP-500

Mr. R. B. Collins, Jr.
Basin Supervisor
State Engineer's Office
State of New Mexico
P.O. Box 1717
Roswell, New Mexico 88201

Dear Mr. Collins:

In response to your request by letter dated August 1, 1978, to Mr. Garland Moore of this office, enclosed is the test pump data requested for the well described in Declaration #UP-500.

We have no objections to the correction to the legal description for the location of the well as described in your letter.

Sincerely yours,


~~Noting~~
Regional Director
Southwest Region

Enclosure

cc:
Chief, Division of Natural Resources, WASO (Atten: Vic Berte') 550
w/copy of enclosure and incoming memorandum
Supt., Pecos w/copy of enclosure and incoming memorandum
State Engineer's Office, Bataan Memorial Bldg., Santa Fe, NM 87503
w/copy of enclosure and incoming memorandum
Moore, OM, SWR w/copy of enclosure and incoming memorandum

GMoore/og 8/16/78



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

ROSWELL

August 1, 1978

S. E. REYNOLDS
STATE ENGINEER

RECEIVED	
NPS SOUTHWEST REGIONAL OFFICE	
AUG 2 1978	
ADDRESS CORRESPONDENCE TO:	
P. O. BOX 1717	
ROSWELL, NEW MEXICO	
88201	
CB 8/2	
JRM	
File:	

File: UP-500

Mr. Garland Moore
National Park Service
Box 728
Santa Fe, New Mexico 87501

Dear Mr. Moore:

The Declaration of Owner of Underground Water Right as filed on behalf of the United States of America, Pecos National Monument has been forwarded to this office for processing. Along with the declaration was a note that you have some test pump data on the well that is being declared. Please forward that information to this office so that our files will be more complete.

Upon receipt of the test pump data, we will process the declaration and return your copy.

Under Item 3 of the declaration you state the well as being located in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 8, Township 16 North, Range 12 West. I believe the correct location should be Range 12 East. With your permission we will correct the description.

Yours truly,

A handwritten signature in cursive script, appearing to read "R. B. Collins, Jr."

R. B. Collins, Jr.
Basin Supervisor

RBC*jb
cc: Santa Fe



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

ROSWELL

S. E. REYNOLDS
STATE ENGINEER

June 18, 1979

ADDRESS CORRESPONDENCE TO:

P. O. BOX 1717
ROSWELL, NEW MEXICO
88201

File: UP-500

United States of America
Pecos National Monument
P. O. Box 728
Santa Fe, New Mexico 87501

Gentlemen:

Enclosed is your copy of Declaration of Owner of Underground Water Right as numbered above, which has been filed for record in the office of the State Engineer.

Please refer to this number in all future correspondence concerning this declaration.

Also enclosed is a copy of an "Investigative Report" prepared for use by the State Engineer Office in conjunction with the Declaration of Owner of Underground Water Right.

If you have any questions about this report or feel that you have additional information available which might clarify certain points, please contact the writer.

The filing of this declaration does not indicate affirmation or rejection of the statements contained therein.

Yours truly,

A handwritten signature in cursive script, appearing to read "R. B. Collins, Jr.".

R. B. Collins, Jr.
Basin Supervisor

RBC*jb
encl.
cc: Santa Fe

INVESTIGATIVE REPORT

FILE: UP-500 DATE: June 15, 1979
TO: Fred H. Hennighausen, District II Supervisor
FROM: R. B. Collins, Jr., Basin Supervisor
SUBJECT: Declaration of Owner of Underground Water Right No. UP-500
DECLARANT: U.S.A. Pecos National Monument

WELL: UP-500 SUBDIVISION SECTION TOWNSHIP RANGE
NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ 8 15 N. 12 E.

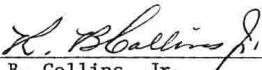
CONSIDERATIONS: Declaration was filed July 20, 1978 claiming a priority prior to December 7, 1941 for the use of 20 acre-feet per annum in the operation of Pecos National Monument.

Field investigation of August 8, 1978 found approximately .2 acre in lawn and garden, two occupied trailer homes, from the Park Log approximately 65,000 visitors per year, water used for bread baking and adobe manufacturing for repair work. The diversion of water for the items listed would amount to the following:

1. .2 acre of lawn and garden at 2.3 acre-feet per acre per annum duty = .46 acre-feet.
 2. Two trailers, assuming 4 people each at 60 gallons per day per person = .54 acre-feet per annum.
 3. 65,000 visitors (drinking and comfort stations - 6 gallons per person) = 1.2 acre-feet per annum.
 4. Assume 3 acre-feet for baking Indian bread, cleaning up and adobe manufacturing for repairs on the Ruins. 3 acre-feet
- The total of the above uses is 5.2 acre-feet.

CONCLUSIONS: From the declared capacity of the well of 30 gpm assuming 60% pumping time, the well would produce approximately 29 acre-feet per annum. The declared 20 acre-feet was well within the capacity of the well.

REC'd
entl.
cc: Santa Fe

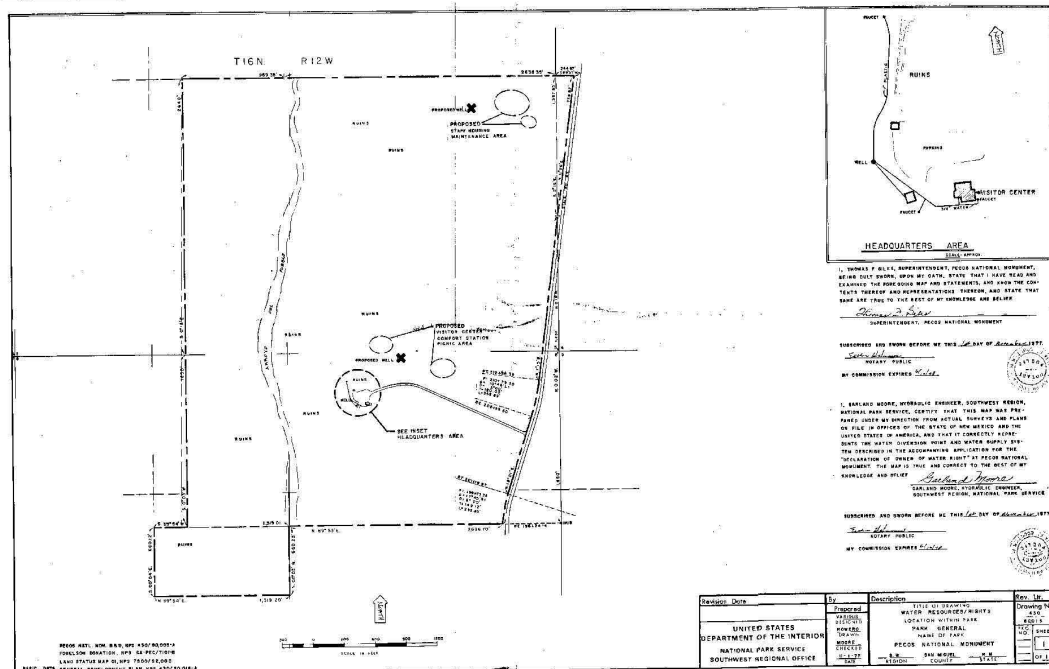

R. B. Collins, Jr.
Basin Supervisor

MARK ALL PACKAGES AND PAPERS WITH CONTRACT AND/OR ORDER NUMBERS						
1. DATE OF ORDER 6/14/79		2. CONTRACT NO. (if any) O.M.		3. ORDER NO. PX7029-9-0505		PAGE 1 OF
4. ISSUING OFFICE National Park Service, Southwest Regional Office P.O. Box 728, Santa Fe, New Mexico 87501						
5. ACCOUNTING AND APPROPRIATION DATA 7075-7011-585 W 2600 \$650.00 1001						
6. SHIP TO (Consignee and Address, ZIP Code) National Park Service, Southwest Regional Office P.O. Box 728, Santa Fe, New Mexico 87501				VIA Your Option		
7. TO: CONTRACTOR (Name, Address, ZIP Code) Tommy Thompson Route 1, Box 413B Española, New Mexico 87532				8. TYPE OF ORDER ☐ (a) Purchase Reference your _____ Please furnish the following on the terms specified on both sides of this order and on the attached sheets, if any, including delivery as indicated. This purchase is negotiated under authority of _____ ☐ (b) Delivery Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.		
9. REQUISITION OFFICE OM (Bengtson)				10. REQUISITION NO./PURCHASE AUTHORITY		
11. F.O.B. POINT Destination		12. GOVERNMENT B/L NO. N/A		13. DELIVERY TO F.O.B. POINT ON OR BEFORE ASAP-ARO		14. DISCOUNT TERMS Net
15. SCHEDULE *See reverse for rejections						
Item No. (a)	Supplies or Services (b)	Quantity Ordered (c)	Unit (d)	Unit Price (e)	Amount (f)	Quantity Accepted (g)
1.	Mobilization (incl. mileage)	1	job		100.00	
2.	Generator Use (120-240v.)	2	day	100.00	200.00	
3.	Set up, pump installation, and removal	1	job		350.00	
16. CLASSIFICATION: ☐ SMALL BUSINESS ☐ OTHER THAN SMALL BUSINESS ☐ MINORITY BUSINESS ENTERPRISE 17. SHIPPING POINT 18. GROSS SHIPPING WEIGHT 19. INVOICE NO. 20. MAIL INVOICE TO (Include ZIP Code) 21. UNITED STATES OF AMERICA BY (Signature) SALES AS #4 22. NAME (Typed) Delmar D. Scharn Supervisory Contract Specialist 650.00						
15. (i) GRAND TOTAL						15. (h) Total from continuation pages

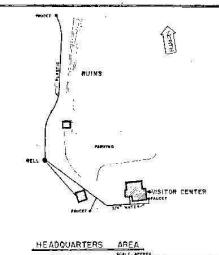
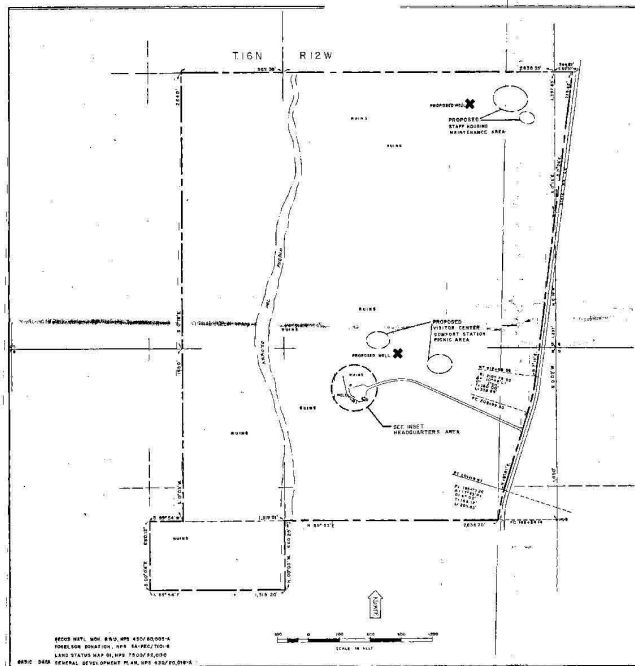
ORDER FOR SUPPLIES OR SERVICES 147-107 STANDARD FORM 147 (REV. 2-77)
Prescribed by GSA, FPR (41 CFR) 1-3.605

MARK ALL PACKAGES AND PAPERS WITH CONTRACT AND/OR ORDER NUMBERS						
1. DATE OF ORDER 6/14/79	2. CONTRACT NO. (if any) O.M.	3. ORDER NO. PX7029-9-0505	PAGE 1 OF			
4. ISSUING OFFICE National Park Service, Southwest Regional Office P.O. Box 728, Santa Fe, New Mexico 87501						
5. ACCOUNTING AND APPROPRIATION DATA 7075-7011-585 N 2600 \$650.00 14C2						
6. SHIP TO (Consignee and Address, ZIP Code) National Park Service, Southwest Regional Office P.O. Box 728, Santa Fe, New Mexico 87501					VIA Your Option	
7. TO: CONTRACTOR (Name, Address, ZIP Code) Tommy Thompson Route 1, Box 413B Española, New Mexico 87532					8. TYPE OF ORDER ☐ (a) Purchase Reference your _____ Please furnish the following on the terms specified on both sides of this order and on the attached sheets, if any, including delivery as indicated. This purchase is negotiated under authority of _____ ☐ (b) Delivery Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.	
9. REQUISITION OFFICE OM (Bengtson)					10. REQUISITION NO./PURCHASE AUTHORITY	
11. F.O.B. POINT Destination		12. GOVERNMENT B/L NO. N/A		13. DELIVERY TO F.O.B. POINT ON OR BEFORE ASAP-ARO		14. DISCOUNT TERMS Net
15. SCHEDULE *See reverse for rejections						
Item No. (a)	Supplies or Services (b)	Quantity Ordered (c)	Unit (d)	Unit Price (e)	Amount (f)	Quantity Accepted (g)
1.	Mobilization (incl. mileage)	1	job		100.00	
2.	Generator Use (120-240v.)	2	day	100.00	200.00	
3.	Set up, pump installation, and removal	1	job		350.00	
16. CLASSIFICATION: ☐ SMALL BUSINESS ☐ OTHER THAN SMALL BUSINESS ☐ MINORITY BUSINESS ENTERPRISE						15. (h) Total from continuation pages
SEE BILLING INSTRUCTIONS ON REVERSE		17. SHIPPING POINT		18. GROSS SHIPPING WEIGHT		19. INVOICE NO.
20. MAIL INVOICE TO (Include ZIP Code) SAME AS #4						15. (i) GRAND TOTAL 650.00
21. UNITED STATES OF AMERICA BY (Signature)				22. NAME (Typed) Delmar D. Scharn Supervisory Contract Specialist TITLE: CONTRACTING/ORDERING OFFICER		
ORDER FOR SUPPLIES OR SERVICES 147-107						
STANDARD FORM 147 (REV. 2-77) Prescribed by GSA, FPR (41 CFR) 1-3.605						

Maps and Miscellaneous Information



716 AUG 14 PM 1 36
STATE ENGINEER OFFICE
SANTA FE, N.M. 87501



I, THOMAS F. BAKER, SUPERINTENDENT, SANTA FE NATIONAL MONUMENT, SANTA FE, NEW MEXICO, STATE THAT I HAVE READ AND EXAMINED THE FOREGOING MAP AND STATEMENTS AND AM AWARE OF THE CONTENTS HEREOF AND HEREBY CERTIFY THAT THE SAME ARE TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

THOMAS F. BAKER
SUPERINTENDENT, SANTA FE NATIONAL MONUMENT

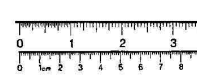
FORWARDED AND TRULY VERIFIED BY THIS DEPUTY AT SANTA FE, N.M. 87501
DEPUTY PUBLIC
MY COMMISSION EXPIRES 1978

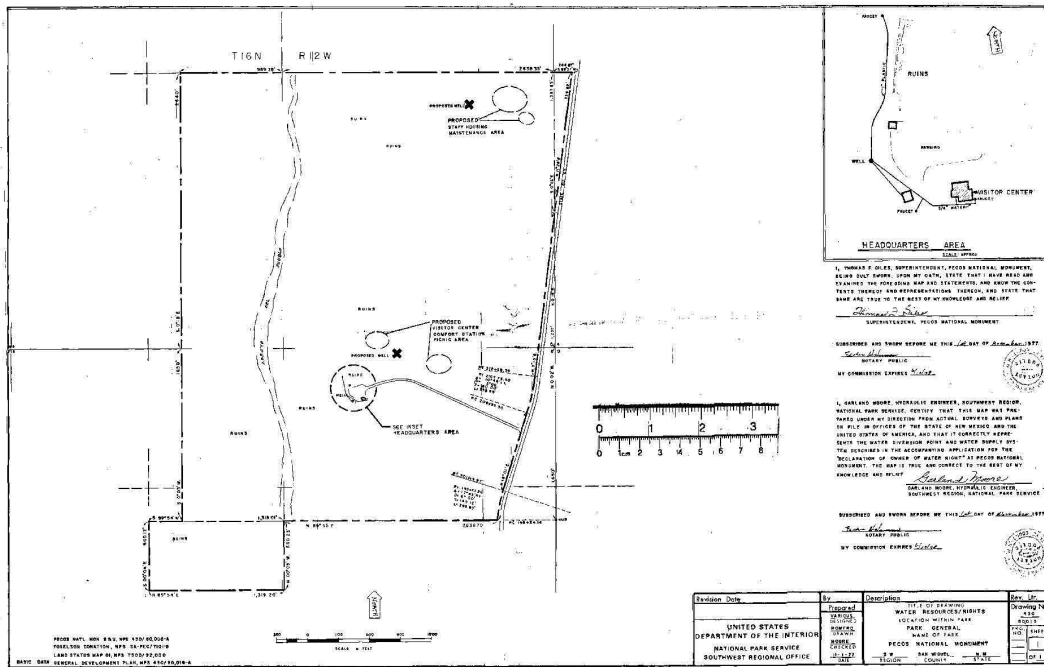
I, BARBARA M. BAKER, HYDRAULIC ENGINEER, DISTRICT ENGINEER, NATIONAL PARK SERVICE, CERTIFY THAT THIS MAP WAS PREPARED UNDER MY SUPERVISION, DIRECTED AND MADE BY ME OR UNDER THE SUPERVISION OF THE STATE OF NEW MEXICO AND THE UNITED STATES OF AMERICA, AND THAT IT CORRECTLY REPRESENTS THE WATER RESOURCES AND WATER SUPPLY OF THE FOREGOING AREA IN THE VICINITY OF THE HEADQUARTERS AREA OF THE SANTA FE NATIONAL MONUMENT. I AM AWARE OF THE CONTENTS OF THIS MAP AND OF THE INFORMATION AND BELIEF.

BARBARA M. BAKER
DISTRICT ENGINEER, NATIONAL PARK SERVICE

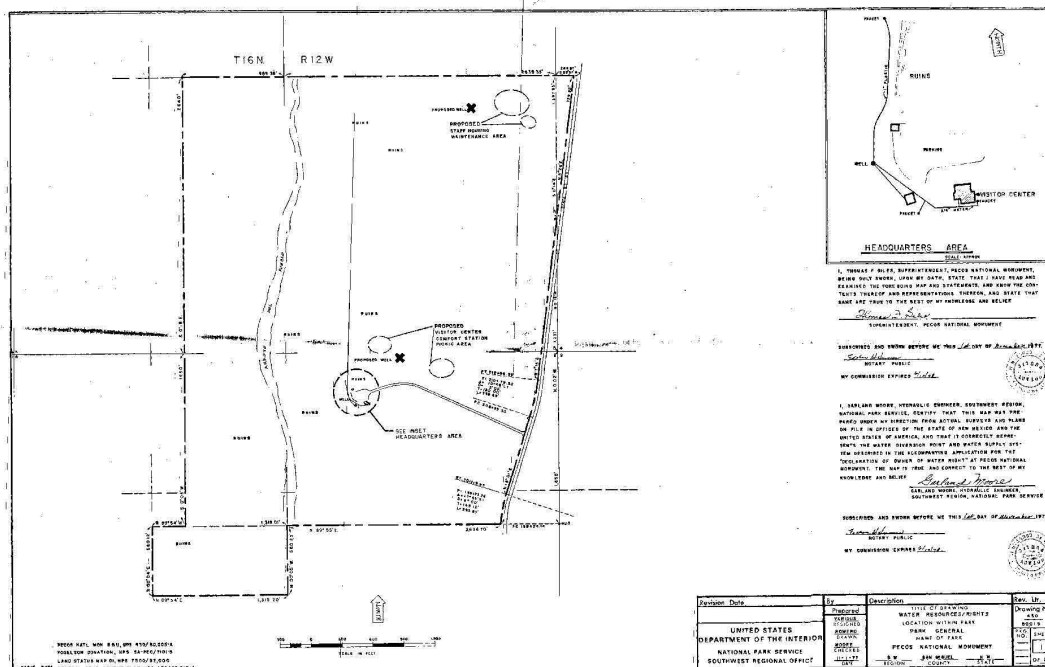
FORWARDED AND TRULY VERIFIED BY THIS DEPUTY AT SANTA FE, N.M. 87501
DEPUTY PUBLIC
MY COMMISSION EXPIRES 1978

Project Name	By	Description	Scale
UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE SOUTHWEST REGIONAL OFFICE	PAUL BANKS BANKS BANKS BANKS BANKS	WATER RESOURCES RIGHTS LOCATION WITHIN PARK PARK GENERAL NAME OF PARK FEDERAL NATIONAL MONUMENT STATE COUNTY TOWNSHIP RANGE SECTION	Drawing No. S.F. S.F. S.F. S.F. S.F.





728 AUG 14 PM 1 35

STATE ENGINEER OFFICE
SANTA FE, N.M. 87501

*10 AUG 14 PM 1 37

STATE ENGINEER OFFICE
SANTA FE, N.M. 87501

