

UNITED STATES DISTRICT COURT
DISTRICT OF NEW MEXICO

08 JUN 15 11:09:25

UNITED STATES,

Plaintiff,

vs.

NO. CIV-01-0072 BB/WWD

STATE OF NEW MEXICO ENGINEER, et al.,

Defendants.

**AFFIDAVIT OF ROBERT SCHAFFER IN SUPPORT OF
OBJECTION BY DEFENDANT PAUL PETRANTO TO
PROPOSED BOUNDARY OF THE ZUNI RIVER STREAM SYSTEM**

I, **ROBERT SCHAFFER**, being sworn under oath do hereby state as follows:

1. I have a BS in Biology with a minor in Chemistry from the University of Arizona, 1973. I have a BS in Education from the University of Southwest Louisiana, 1977. I have an MST in Geology from New Mexico Tech, 1983.

2. I was a science teacher at Grants High School from 1977 through 2002, teaching geology, chemistry, biology, physics, the physical sciences and computers. I retired in 2002 after 25 years of teaching.

3. I have lived in the Oso Ridge area since 1977, have studied the geology of the area within the proposed boundaries of the "Zuni River Basin in New Mexico Adjudicated Boundary Map", and have hiked over or driven through much of the area.

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Surface Waters:

4. The map shows the boundaries of the Zuni River Basin aligned to the surface drainage features of the area. However, areas within the eastern, northern and southern portions of the proposed adjudication boundaries do not drain water into the Zuni river system. Instead, the surface water flows into a number of closed basins and forms lakes, never reaching the Zuni River.

5. The Jaralosa Draw and others north of the town of Fence Lake don't flow into the Zuni river until after passing into the state of Arizona.

Underground Waters:

6. If the path of underground water aquifers is to be considered, attention should be focused on the water-bearing layers of rock and sediments. Several water-bearing layers are present in the area covered by the adjudication map. These layers range (north to south) from the deepest Precambrian igneous core of the Zuni mountains to the Permian sandstones and limestones of Oso Ridge to the Triassic and Jurassic sand and claystones of the majority of the area, to the Cretaceous sandstones of the Pine Hill, Candy Kitchen, and Southern Zuni Reservation areas. Since all the layers in the area also have some impermeable claystone layers and shale layers, the water-bearing layers are separated into aquifers of differing depth. The structure of the Zuni Mountains is such that these layers are tilted at various angles all of which slope downhill generally toward the southwest, not west and northwest as the surface flows

do. Since groundwater flows downhill along these water-bearing layers, the groundwater source for the area covered by the map does not necessarily follow the flow pattern of the surface waters. Well logs, which measure the depth of the water-bearing layers, are available to offer exact flow directions and angles of groundwater bearing layers.

7. The groundwater flow patterns cannot be determined by the surface flow patterns. They must be determined for each aquifer in question. Well logs archived by and available from the N.M. State Engineer can offer the information on groundwater flow patterns.

8. The surface waters and the groundwaters of the Adjudication Map do not have the same source areas, nor do they have the same outlets.

9. Some of the aquifers included within the Adjudication map's boundaries, do not exist in the region of the Zuni Indian Reservation.

10. Some of the water-bearing layers of the Ramah Indian Reservation (Pine Hill area) do not exist in the northern and eastern regions of the Adjudication map's boundaries.

Conclusion:

The Zuni River Basin Boundary Map only shows surface water flow patterns. The surface water in the proposed area generally flows to the west and northwest. The surface water in the proposed area does not all flow into the Zuni River in New Mexico.

The map does not show groundwater flows. Generally, the ground water in the proposed area flows to the south and southwest. Geologic evidence tends to indicate that there are separate aquifers in the proposed adjudication area which do not interconnect. For example, individuals who have wells in the El Morro area are drawing from groundwater that is completely separate from groundwater drawn from wells within the boundaries of the Zuni Reservation. Also by example, the aquifers which provide groundwater to the Navajos in the Pine Hill area are separate from the aquifers that provide groundwater to the Zunis.

As there may be two or more surface water systems and two or more groundwater systems within the proposed adjudication area, the map does not accurately reflect the boundaries of the Zuni River Basin. A review of the well logs filed with the State of New Mexico would be helpful in determining sources of water, flow patterns, and drainage areas.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 14, 2003.


ROBERT SCHAFFER

CERTIFICATE OF MAILING

This is to certify that on January 16, 2003 this pleading was served on the following individuals by placing it into envelopes with postage prepaid and addressed as follows:

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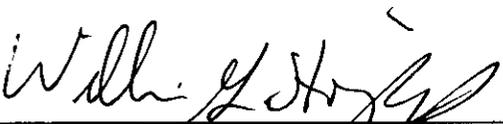
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