

CNWRA *A center of excellence in earth sciences and engineering*

A Division of Southwest Research Institute™
6220 Culebra Road • San Antonio, Texas, U.S.A. 78228-5166
(210) 522-5160 • Fax (210) 522-5155

July 24, 2001
Contract No. NRC-02-97-009
Account No. 20.01402.471

U.S. Nuclear Regulatory Commission
ATTN: Mrs. Deborah A. DeMarco
Office of Nuclear Material Safety and Safeguards
Mail Stop 8 A23
Washington, DC 20555-0001

Subject: Submittal of Abstract—Pre Late-Miocene Sedimentary Record of Basin and Range Extension in Southwestern Nevada and Eastern California

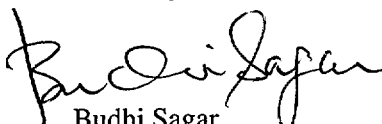
Dear Mrs. DeMarco:

The purpose of this letter is to transmit the subject abstract for programmatic review to the NRC. The paper will be presented at the annual meeting of the Geological Society of America (GSA) to be held in Boston in November of 2001. The GSA does not require a full paper.

This abstract documents a study of middle Tertiary Sediments. These sediments were found in the Nye County's Early Warning Drilling Program wells. This abstract discusses their origin.

Should you have any questions regarding this, please contact Dr. John Stamatakos at (210) 522-5247 or Dr. Lawrence McKague at (210) 522-5183.

Sincerely,


Budhi Sagar
Technical Director

rae

Attachment

| | | | | | |
|-----|------------|------------|------------|--------------------------|---------------|
| cc: | J. Linehan | B. Meehan | S. Wastler | W. Patrick | J. Stamatakos |
| | W. Reamer | J. Greeves | T. Essig | CNWRA Dirs/EMs | D. Murray |
| | B. Leslie | J. Piccone | P. Justus | T. Nagy (SwRI Contracts) | |
| | E. Whitt | | | | |

D:\GLGP Group\letters\sds\abs-07-24-2001.wpd



Washington Office • Twinbrook Metro Plaza #210
12300 Twinbrook Parkway • Rockville, Maryland 20852-1606

PRE LATE-MIOCENE SEDIMENTARY RECORD OF BASIN AND RANGE EXTENSION IN
SOUTHWESTERN NEVADA AND EASTERN CALIFORNIA

MURRAY, D.A, and RIDGWAY, K.D., Dept. of Earth & Atmospheric Sciences, Purdue
University, West Lafayette, IN 47907-1397, murrayda@purdue.edu; STAMATAKOS,
J.A., CNWRA, Southwest Research Institute, San Antonio, TX 78238; GRAY, M.B.,
Dept. of Geology, Bucknell University, Lewisburg, PA 17837

Oligocene to middle Miocene fluvial, lacustrine and volcanic strata are well exposed in southcentral Nevada and southeastern California and record an early phase of extensional deformation in the Basin and Range province. These strata are approximately 2,000 m thick and predominantly mapped as the Horse Spring Formation and Rocks of Pavits Spring. Stratigraphic and sedimentologic data show that the stratigraphy of these combined deposits consists of three main units. The lower unit consists of a few hundred meters of gastropod and ostracod-rich limestones. This lower unit is overlain by several hundred meters (possibly up to 1000 m) of pebble-cobble conglomerate, coarse sandstone, and red siltstone. Individual conglomerate beds can be greater than 30 m thick. Above the conglomerate-rich unit is a thick section (over 1000 m) of volcanoclastic sandstone, bedded tuff and airfall tuff. This three-unit stratigraphy can be correlated in outcrop from the Funeral Mountains of eastern California east to the Frenchman Flat area of the Nevada Test Site. Analysis of cuttings from several of the wells drilled by Nye County south of the Yucca Mountain area also show a similar three-unit subsurface stratigraphy. We interpret the lower limestone-rich unit to represent initiation of extension that resulted in the ponding of existing fluvial drainages along the axes of the newly developed extensional basins. The middle conglomerate-rich unit is interpreted to represent active extension and the development of regional through-going fluvial drainage systems. The upper volcanic-rich unit is interpreted to represent the late phase of extension when attenuation of the crust resulted in widespread regional volcanism to the north of this area.

Our stratigraphic analyses coupled with those of regional structure and geophysics can be used to test various hypotheses of early Basin and Range extension, including the proposed 90 degree rotation of extension (north-south to east-west), detachment faulting, and Walker Lane strike-slip displacements.

Work supported by the US NRC (Contract NRC-02-97-009). The work is an independent product of the CNWRA and does not necessarily reflect the views or regulatory position of the NRC.