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SUBJECT: Trip rept of 940228-0304 to Chihuahua, Chihuahua, Mexico to qualify clearing of level +00 portion & to expand permanent sample location of grid on level +00 re field research at Pena Blanca Natural Analog Site.

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TRIP REPORT

SUBJECT: Field Research at the Peña Blanca Natural Analog Site
(20-5704-063)

DATE: February 28, 1994 - March 4, 1994

PLACE: Chihuahua, Chihuahua, Mexico

AUTHORS: English C. Percy, James D. Prikryl, and Ronald T. Green

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TRIP REPORT

SUBJECT: Field research at the Peña Blanca natural analog site
(20-5704-063)

DATE: February 28, 1994 through March 4, 1994

PLACE: Chihuahua, Chihuahua, Mexico

PARTICIPANTS: English C. Percy, James D. Prikryl, and Ronald T. Green (CNWRA)
Ignacio Reyes, *Universidad Autonoma de Chihuahua* (UACH)

AUTHORS: English C. Percy, James D. Prikryl, and Ronald T. Green

BACKGROUND AND PURPOSE OF TRIP:

This trip comprised the most recent field research conducted under Task 3 of the Geochemical Natural Analog Research Project. CNWRA natural analog research within the Peña Blanca uranium district is focused on the Nopal I deposit. Ongoing field research at Nopal I includes physical clearing of previously mined horizontal surfaces spanning the uranium mineralization (Levels +00 and +10); mapping of faults and fractures within and around the deposit which may be related to uranium transport; mapping of uranium distributions within and around the deposit; and sampling of rocks and waters associated with the deposit.

The purposes of this trip were to qualify clearing of a portion of Level +00 of the Nopal I deposit, to conduct and review geologic mapping of the newly cleared portion of Level +00, to expand the permanent sample location grid on Level +00, to conduct a contact gamma survey of the newly cleared portion of Level +00, to collect mineral and rock samples from the newly cleared portion of Level +00, to collect additional samples of Nopal Formation tuff for hydrologic characterization and for use in IWPE experiments, to collect additional samples of vein filling minerals from the East-West fracture at 13.5 m North on Level +10, to collect additional samples from Level +10 to identify areas of recent uranium mobility, and to conduct an electromagnetic survey of the entire Nopal cuesta for evidence of perched water tables that may have interacted with the Nopal I uranium deposit.

SUMMARY OF PERTINENT POINTS:

The clearing of a portion of Level +00 was found to be complete and to meet the requirements of the subcontract. Geologic mapping of the recently cleared portions of Levels +10 and +00 was determined to be well done. The 1 m by 1 m sampling grid on Level +00 was expanded to include the newly cleared area. A contact gamma survey was conducted on the newly cleared portion of Level +00 and rock and mineral samples were collected. Samples of unaltered Nopal Formation tuff were collected for use in IWPE experiments. Additional samples of vein-filling minerals were collected from the East-West fracture at 13.5 m North on Level +10, and several sets of samples were collected from elsewhere on Level +10 to identify patterns of recent (i.e., within the last 1 Ma) uranium mobility.

A set of electromagnetic measurements was completed spanning the entire Nopal cuesta. These measurements were conducted using an EM-47 time domain electromagnetic system with a 160 m perimeter transmitter loop; upon reduction of the data, perched water zones (or other conductors) may be detected at depths of up to 150 to 200 m.

SUMMARY OF ACTIVITIES:

Monday, February 28, 1994

Travel from San Antonio to Chihuahua City and on to the Nopal I mine camp. To maximize our working time at the site, we set up camp in disused cabins at the former Nopal I miners' camp about 1 km from the deposit as we have done on earlier trips.

Tuesday, March 1, 1994: Peña Blanca Analog Site

The electromagnetic system and associated equipment were transported to the highest point on the Nopal cuesta, assembled, and tested. A set of traverses was devised to allow measurement of essentially the entire Nopal cuesta. Measurements consisting of individual soundings will follow the dip slope of the cuesta, so the background conductivity of the volcanic stratigraphy should be approximately constant for the entire survey. Measurements were completed at five locations on the first day. Measurement locations were marked by plastic stakes, survey flagging, and painted rock cairns so that the sites can be accurately re-measured at the end of the wet season (e.g., September 1994). These measurements are designed to detect postulated perched water zones within the Nopal cuesta. Water moving seasonally within such perched zones may have interacted with the uranium deposit and may constitute a significant portion of such interaction during the last 10^4 to 10^6 years.

Initial observations of the newly cleared portion of Level +00 were made. The new clearing exposes the outcrop of the altered Nopal Formation vitrophyre as it is juxtaposed with the uranium deposit on Level +00. The 1 m by 1 m grid on Level +00 was extended to cover the newly cleared area. The portion of the grid constructed earlier (7/93) on Level +00 was repaired. A contact gamma survey of the newly cleared area was conducted.

Wednesday, March 2, 1994: Peña Blanca Analog Site

The EM survey of the Nopal cuesta continued; measurements were completed at 10 locations. Samples were collected on the newly cleared portions of Level +00. Three sets of traverse samples were collected, each extending from within the deposit out across the newly cleared area: two across the altered

vitrophyre, and one across heavily weathered Nopal tuff. Additionally, samples were collected within the altered vitrophyre of material chosen to be exemplary of the range of alteration minerals. Specifically, zeolite minerals have been reported by earlier workers; samples were collected from areas that may contain zeolites.

The sample location grid on Level +10 was repaired. A set of samples of Nopal tuff was collected along a North-South traverse across the northern margin of the Level +10 exposure of the deposit. These samples follow a trend of uranium-enriched tuff exterior to the deposit and were collected to search for disequilibria among uranium decay series isotopes. Such disequilibria would indicate uranium mobility during the last 1 Ma.

Thursday, March 3, 1994

The conductivity survey of the Nopal cuesta continued; measurements were completed at two locations. These final measurements included one set on Level +10 over and adjacent to the uranium deposit.

Samples were collected to extend traverses collected (9/1/92) perpendicular to the EW fracture at about 13.5 m N on Level +10. One dimensional fracture density counts were made perpendicular to the EW fracture at eight locations. These detailed observations will support interpretations of uranium transport out of the EW fracture into the enclosing highly fractured tuff along complex networks of microfractures too small to be mapped otherwise.

Samples were collected along a major NS fracture that extends on Level +10 from the deposit to the vertical face rising to Level +20. These samples will be analyzed for uranium decay series disequilibria. Samples of unaltered Nopal Formation tuff were collected for use in IWPE experiments.

Possible hydrologic infiltration tests were discussed with I. Reyes. Four distinct zones for initial tests were identified on Level +10, and corresponding locations were examined beneath Level +10 in the Level +00 adit. Likely geometries and sequences were considered.

Samples and field gear packed for return to San Antonio. Travel from Nopal Mine camp to Chihuahua City.

Friday, March 4, 1994

Travel from Chihuahua City to San Antonio.

CONCLUSIONS:

None

PROBLEMS ENCOUNTERED:

None.

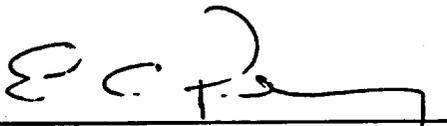
PENDING ACTIONS:

Analysis of the samples collected and interpretation of the data will determine future field research requirements. Planning for anticipated hydrologic infiltration tests will continue and will be coordinated with I. Reyes.

RECOMMENDATIONS:

None.

SIGNATURES:


English C. Pearcy
Senior Research Scientist

3/10/94
Date

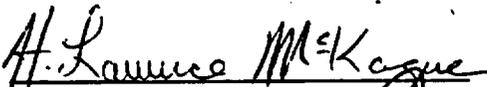

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