

# WILLIAMS & ASSOCIATES, INC.

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Environmental Resources Waste Management • Geological Engineering • Mine Hydrology

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February 5, 1986  
Contract No. NRC-02-85-008  
Fin No. D-1020  
Communication No. 28

Mr. Jeff Pohle  
Division of Waste Management  
Mail Stop 623-SS  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

RE: Monthly Report--January 1986

Dear Jeff:

This document constitutes the fourth monthly (January 1-31, 1986) progress report as required by Contract No. NRC-02-85-008. Williams and Associates, Inc. reviewed several documents this month for the Nevada Test Site, the BWIP site, and for the Palo Duro Basin. These document reviews are in draft and final forms. We are continuing our efforts on the required list of tasks outlined in the SOW. Details about our efforts on this contract are outlined based on Task and Subtask numbers.

WM-RES  
WM Record File  
D-1020  
W9A

WM Project 10,11,16  
Docket No. \_\_\_\_\_  
PDR   
LPDR  (B,N,S)

Distribution:

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## TASK 1

The following work was conducted under Task 1.

### Subtask 1.1

We reviewed the issue hierarchy approach developed for NNWSI; our comments on the issue hierarchy approach were forwarded to you as Communication No. 25. This subtask has been completed.

### Subtask 1.2

Several reports related to the development of potential conceptual models of the saturated and unsaturated zones were reviewed during the month of January, 1986. A written review of the document entitled "Sources and mechanisms of Recharge for Ground Water in the West-Central Amargosa Desert, Nevada--A Geochemical Interpretation" by H.C. Claassen was prepared. This document is considered to be particularly significant with respect to the development of a conceptual model of regional ground water flow in the vicinity of the NTS.

Final drafts of the documents reviewed in December were sent. These were:

1. Kerrisk, J.F., 1983, Reaction-Path Calculations of Ground Water Chemistry and Mineral Formation at Rainer Mesa, Nevada: Los Alamos National Laboratory, Los Alamos, New Mexico, LA-9912-MS, 41 p.
2. Ogard, A.E., and Kerrisk, J.F., 1984, Ground Water Chemistry Along Flow Paths Between a Proposed Repository Site in the Accessible Environment: Los Alamos National Laboratory, Los Alamos, New Mexico, LA-10188-MS, 48 p.
3. Travis, B.J., 1985, TRACR3D: A Model of Flow and Transport in Porous/Fractured Media: Los Alamos National Laboratory, Los Alamos, New Mexico

### Subtask 1.3

Williams and Associates, Inc. is continuing to work on the conceptual model evaluation for NNWSI. A letter report that

describes potential conceptual models for the saturated and unsaturated zones in the vicinity of Yucca Mountain will be prepared during February, 1986.

## TASK 2

The following work was conducted under Task 2.

### Subtask 2.1

We reviewed the issue hierarchy approach developed for NNWSI; our comments on the issue hierarchy approach were forwarded to you as Communication No. 25. This subtask is completed.

### Subtask 2.2

We reviewed the test plan, a two volume set, entitled "Exploratory Shaft Test Plan, Volume I: Exploratory Shaft Test Program" and "Exploratory Shaft Test Plan, Volume II: Preliminary Test Description." We reviewed all sections of these lengthy documents with respect to possible hydrogeologic implications of the described test plans. We completed our review as Communication No. 23.

We reviewed a copy of the document entitled "HEADCO: A Program for Converting Observed Water Levels and Pressure Measurements to Formation Pressure and Standard Hydraulic Head" by F. Spane, Jr., and R. Mercer. The review is in draft form at this time.

We are reviewing the head data that is currently available. We are reviewing the changes in gradient and direction of groundwater flow at the BWIP site per instructions received from the NRC. We will have a written response completed in the near future. We are looking at the variable fluid density approach cited by Rockwell (Luszczynski, 1961).

### Subtask 2.3

Williams and Associates, Inc. is continuing the preliminary phase of conceptual model evaluation. We are considering the existing concepts regarding groundwater flow at the BWIP site; these concepts are being evaluated based upon the water level data collected in the multi-piezometer clusters (DC-19, DC-20, and DC-22). Our concepts of ground water flow are being revised based on the additional water level data presented during the DOE/NRC consultation meeting held December 1985. The water level perturbations created by pulling the bridge plugs at borehole

RRL-14 and by drilling borehole DC-23W provide additional insight into the conceptual model(s) of groundwater flow.

Reference Cited:

Luszczynski, N.J., 1961, Head and Flow of Ground Water of Variable Density: Journal of Geophysical Research, vol. 66, no. 12, pp. 4247-4256.

### TASK 3

The following work was conducted under Task 3.

#### Subtask 3.1

Work continued in January collecting background data and related information to enhance understanding of salt repository sites. As part of this effort several key documents were requested from the NRC Project Officer. These documents were received and in addition numerous other documents were received during this month. The process of cataloging and evaluating these documents for review has begun.

The issues for the three salt sites were reviewed. Our comments were submitted to the NRC as Communication #22. An updated list of documents was included; the list contains all references in our files for the Palo Duro Basin, the Paradox Basin, the salt domes (Vacherie, Richton, and Cypress Creek), and a generic category for relevant documents not site related.

We reviewed the issue hierarchy approach developed for NNWSI; our comments on the issue hierarchy approach were forwarded to you as Communication #25. This subtask is completed.

#### Subtask 3.2

During the month of January three documents were reviewed and these reviews have been forwarded to the NRC. In addition review work has begun on several more documents which should be finished within the next month. The reports reviewed are:

1. Kaiser, W.R., 1985, Cross-formational Flow in the Palo Duro Basin, Texas Panhandle: Texas Bureau of Economic Geology, Austin, Texas, OF-WTWI-1985-33.
2. Orr, E.E., and Senger, R.K., 1984, Vertical Hydraulic Conductivity, Flux and Flow in the Deep-Basin Brine Aquifer, Palo Duro Basin, Texas: Texas Bureau of Economic Geology, Austin, Texas, OF-WTWI-1984-44, 19 p.
3. Senger, Rainer K., 1984, Hydrodynamic Development of the Palo Duro Basin and Other Mechanisms Creating Possible Transient Flow Conditions: Texas Bureau of Economic Geology, Austin, Texas, OF-WTWI-1984-54.

Subtask 3.3

Consideration of conceptual models and model alternatives has begun as part of the site familiarization process. Documents specifically relating to the definition of the hydrogeologic framework are being collected as potential source material for review of conceptual models. Refamiliarization with possible conceptual models, as outlined in contract exhibits, is underway also.

TASK 4

(not initiated)

TASK 5

Williams and Associates, Inc. submitted Communication No. 2 (in October) to the NRC requesting further consideration of a proposal initially submitted under the previous contract. This request presents additional information pertaining to the determination of effective porosity from field data. Effective porosity is a parameter required for calculating ground water velocities and travel times. This request is pending further discussions.

Dr. Bloomsburg attended the Unsaturated Rock/Contaminated Transport Workshop #3, sponsored by the University of Arizona, Nuclear Regulatory Commission and Sandia National Laboratory on January 6-9, 1986. A trip report was forwarded to the NRC as Communication No. 20. There are no meetings scheduled in February.

Contractual Problems

No contractual problems have arisen.

Current Expenditures

A breakdown of individual hours and charges is shown on the attached table. Cumulative costs and projected costs are shown on the second table. The attached figure illustrates projected and current cumulative costs.

Sincerely,

*Roy E. Williams*

Roy E. Williams

**INDIVIDUAL HOURS AND CHARGES**

	This Month (hours)	Cumulative (hours)	Cumulative (amount)
Roy Williams	72	256	\$ 12,800
Gerry Winter	173.3	693.2	13,172.3
Jeff Brown	39.5	163.5	5,722.5
Jim Osiensky	116	464	8,816
Dale Ralston	4	72	3,168
Kirk Steinhorst	-	-	-
Terry Eckwright	22	34	516
Jack Sharp	-	-	-
Charles Smith	-	-	-
George Bloomsburg	43	62	2,480
Terry Howard	-	-	-
Stanley Miller	13	29	1,015

**CURRENT AND CUMULATIVE PROJECT COSTS**

Task	Current Month	Cumulative to Date*		Total to Date*
		FY 86	FY 87	
1	\$ 9,414	\$ 27,223	\$-----	\$ 27,223
2	5,793	30,779	-----	30,779
3	7,966	24,219	-----	24,219
4	-----	-----	-----	-----
5	966	12,157	-----	12,157
<b>Total</b>	<b>24,139</b>			

Percentage billed to total funds allocated = 23%.

\* Cumulative and total corrected (error in November table)

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Viola, Idaho 83872  
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