

D1020

PDR-1  
LPDR- Wm-10 (2)  
Wm-11 (2)  
Wm-16 (2)

# WILLIAMS & ASSOCIATES, INC.

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Hydrogeology • Mineral Resources Waste Management Engineering • Mine Hydrology  
WM DOCKET CONTROL CENTER

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August 4, 1987  
Contract No. NRC-02-85-008  
Fin No. D-1020  
Communication No. 139

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

RE: Monthly Report--July 1987

Dear Jeff:

This document constitutes the twenty-second monthly (July 1-31, 1987) progress report as required by Contract No. NRC-02-85-008. Williams and Associates, Inc. reviewed several documents this month on the subject of groundwater travel time and treatment of uncertainty. These document reviews were completed and forwarded to the NRC. 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.

We are continuing our efforts on the topical reports on uncertainty.

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PDR WMRES EECWILA  
D-1020 PDR

87237958  
WM Project: WM-10,11,16  
PDR w/encl  
(Return to WM, 623-SS)

WM Record File: D1020  
LPDR w/encl

Wm-RES  
WM Record File  
D1020  
W&A

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

Distribution:  
Pohle \_\_\_\_\_ Joan-ticket \_\_\_\_\_  
(Return to WM, 623-SS)

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TASK 1

The following work was conducted under Task 1.

Subtask 1.1

This subtask has been completed.

Subtask 1.2

Williams and Associates, Inc. is conducting an informal review of general documents pertaining to our task of evaluating "Groundwater Testing Methodologies Applicable to Unsaturated Fractured Rock."

Subtask 1.3

Williams and Associates, Inc. is continuing to review the literature pertaining to potential conceptual models for NNWSI.

Subtask 1.4

Williams and Associates, Inc. is continuing our informal review of the Draft SCP for NNWSI.

## TASK 2

The following work was conducted under Task 2.

### Subtask 2.1

This subtask has been completed.

### Subtask 2.2

Williams and Associates, Inc. plan to prepare a brief report on the two-dimensional cross-sectional model study of the hydraulic gradients indicated by the cluster piezometer sites (DC-19, -20, and -22). This effort has been conducted on a limited basis because of the need to maintain timely responses on higher priority items. The purpose of this effort is to investigate the relationship of vertical hydraulic conductivity to horizontal hydraulic conductivity.

### Subtask 2.3

Williams and Associates, Inc. is continuing to review the literature pertaining to potential conceptual models for BWIP. We will update our existing conceptual models per requirements in the SOW.

Williams and Associates, Inc. is continuing to work on the statistical analysis of off-site and on-site hydrochemical data. The on-site data set from our 1985 report has been retrieved; editing of the on-site data set is continuing.

### Subtask 2.4

The draft chapter 3 of the Site Characterization Plan (SCP) has been received. We are reviewing this draft chapter for our information. We are preparing to have an internal meeting on the most significant aspects of this draft chapter. Formal comments have not been requested.

### TASK 3

The following work was conducted under Task 3.

#### Subtask 3.1

This subtask has been completed.

#### Subtask 3.2

Williams and Associates, Inc. has completed initial reviews of most of the documents that describe hydrogeologic testing at the WIPP site. We anticipate receiving additional documents that describe hydrogeologic testing conducted at the WIPP site; these additional documents will be reviewed. Written reviews will not be prepared for each document. A topical report will be prepared that covers the hydrogeologic testing described in all the reports.

#### Subtask 3.3

Williams and Associates, Inc. completed the initial requirement under this subtask with the submission of our conceptual model letter report. We will continue to update our evaluation of existing conceptual models.

TASK 4

This task has not been initiated. We are accumulating relevant documents during the course of our other activities under Tasks 1, 2, and 3.

TASK 5

Williams and Associates, Inc. prepared a draft of the outline for Topical Report #2 on reducing and quantifying uncertainty. The outline was forwarded in June as Communication #134. We were unable to forward a copy of the outline to Nuclear Waste Consultants early enough in the process to receive their comments prior to the June 26 target date. Nuclear Waste Consultants has received a copy of the outline. They anticipate forwarding comments to us after the scheduled July 14th meeting in Silver Spring.

Williams and Associates, Inc. reviewed and discussed the topics of discussion selected for the July meeting in Silver Spring. Dr. Williams and Dr. Sharp attended this meeting held July 14 and 15. The meeting was held to discuss definitions of pre-waste-emplacement, path of likely radionuclide travel, and groundwater velocity.

Williams and Associates, Inc. reviewed two documents on the subject of treatment of uncertainty. The documents reviewed are:

1. Massman, Joel and Freeze, R. Alan, 1987, Groundwater Contamination from Waste Management Sites: The Interaction Between Risk-Based Engineering Design and Regulatory Policy, 1. Methodology, 2. Results. Water Resources Research, vol. 23, no. 2, p. 351-67.
2. Hofer, E. and Hoffman, F.O., 1987, Selected Examples of Practical Approaches for the Assessment of Model Reliability - Parameter Uncertainty Analysis. OECD/NEA Workshop on Uncertainty Analysis for Systems Performance Assessments, Seattle, Feb.

The reviews were forwarded as Communication #138.

Williams and Associates, Inc. is continuing our evaluation of "Groundwater Testing Methodologies Applicable to Unsaturated Fractured Rock." Several different methodologies are being evaluated with respect to their potential applicability to Yucca Mountain. A report written jointly by Williams and Associates, Inc. and Water, Waste, and Land, Inc. will be forwarded to the NRC during August, 1987.

Williams and Associates, Inc. is continuing work on our proposed task entitled "Mathematical Simulation of Unsaturated Flow in Yucca Mountain."

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 pl*  
Roy E. Williams

**INDIVIDUAL HOURS AND CHARGES**

	This Month (hours)	Cumulative (hours)	Cumulative (amount)
Roy Williams	120	1,744	\$ 89,580
Gerry Winter	173.3	3,112.6	74,087.9
Jeff Brown	-	358	12,530
Jim Osiensky	173.3	2,666.6	50,832.28
Dale Ralston	10	322	14,506.8
Kirk Steinhorst	3.25	108.25	4,153.26
Terry Eckwright	0	109	1,641
John Sharp	33	117.5	4,789
Charles Smith	-	-	-
George Bloomsburg	20	501	20,450
Terry Howard	-	-	-
Stanley Miller	7	323	11,548.26
Noel Krothe	-	7.6	380
Richard Parizek	0	67.75	3,387.5
Barbara Williams	20	313.5	6,307.06
John Riley	19.5	194	3,104

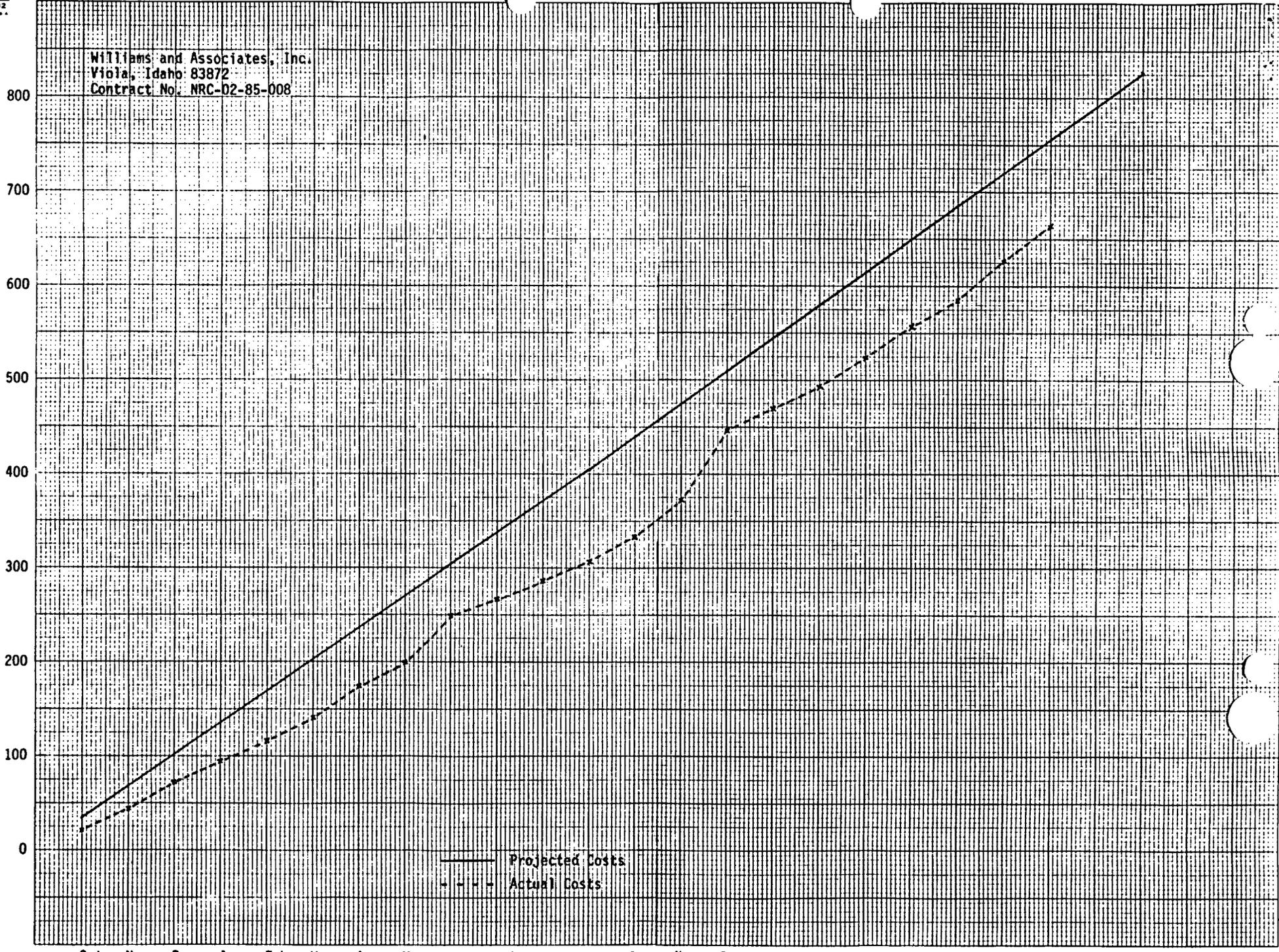
**CURRENT AND CUMULATIVE PROJECT COSTS**

Task	Current Month	Cumulative to Date		Total to Date
		FY 86	FY 87	
1	\$ 11,745	\$ 92,077	\$106,909	\$198,986
2	9,374	76,862	82,949	159,811
3	4,639	86,177	42,710	128,887
4	-----	-----	-----	-----
5	11,409	51,580	124,877	176,457
Total	37,167			

Percentage billed to total funds allocated = 80%.

Williams and Associates, Inc.  
Viola, Idaho 83872  
Contract No. NRC-02-85-008

Cost in Dollars x 100



— Projected Costs  
- - - Actual Costs