



Department of Energy

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

MAY 20 1985

WM Record File 101.2

WM Project 10
Docket No.
PDR
LPDR

Dr. Robert J. Wright
Repository Projects Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Distribution:
IBRAHIM
Kennedy
(Return to WM/623-SS) 73

Dear Dr. Wright:

RESPONSE TO REQUEST FOR SEISMIC SURVEY DATA BY NUCLEAR REGULATORY COMMISSION

The enclosed letter was written by our contractor, Rockwell Hanford Operations (Rockwell) in response to your request for additional information regarding the reprocessing of seismic reflection data, as discussed with Buck Ibrahim during a December 28, 1984 telephone conversation with Rockwell and subcontract personnel. This letter has not, for some reason, been transmitted to you, although this subject has been subsequently discussed in person and by telephone by NRC, DOE, and Rockwell scientists.

From recent conversations with Mr. Ibrahim, there appears to be some misinterpretation of how the subcontractor, Mr. Berkman, used synthetic seismograms in data processing. We hope it will be possible in the near future to arrange a meeting between Mr. Berkman and other BWIP personnel and Mr. Ibrahim to facilitate a better understanding of this data and its reprocessing. For any additional discussion of this subject, please contact J. E. Mecca (FTS 444-5038) or B. W. Hurley (FTS 444-7059) of my staff.

Thank you for your time and attention.

Very truly yours,

[Handwritten signature of O. L. Olson]

O. L. Olson, Project Manager
Basalt Waste Isolation Project Office

BWI:BWH

Enclosure

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Rockwell Hanford Operations  
Energy Systems Group  
P.O. Box 800  
Richland, WA 99352



Rockwell  
International

March 1, 1985

In reply, refer to letter 26695

Mr. O. L. Olson, Project Manager  
Basalt Waste Isolation Project Office  
Department of Energy  
Richland Operations Office  
Richland, Washington 99352

Dear Mr. Olson:

REQUEST FOR SEISMIC SURVEY DATA BY NUCLEAR REGULATORY COMMISSION  
(Contract DC-AC06-77RLO1030)

This letter addresses a request for synthetic seismograms used in the interpretations presented in "Reprocessing and Interpretation of Seismic Reflection Data, Hanford Site, Pasco Basin, South Central Washington" (Berkman, 1984). The specific data requested is not available and all synthetic seismograms used in the interpretation are included in the document.

Mr. Berkman, consultant to the Basalt Waste Isolation Project, misunderstood Mr. Ibrahim's request for synthetic seismograms used to identify multiples under the top of the basalt at 0.6 seconds during the December 28, 1984 telephone conversation. Synthetic seismograms were used to identify the primary reflectors, not to identify multiples. Synthetic seismograms can be calculated for multiple inclusion, however, the following discussion is presented to clarify the point that events approximately 0.600 seconds on the original Seismograph Services Corporation (SSC) processing are neither true reflectors or multiples.

Figure 21 (Berkman, 1984) demonstrates the character correlation utilized to identify the primary reflectors. Figures 22 through 31 are additional synthetic seismograms calculated for geologically plausible layering situations, and were evaluated in identifying the primary reflectors. Section VI.C. discusses the synthetic seismogram procedures. Multiples and transmission losses were not treated.

The question of the significance of the events at approximately 0.600 seconds on the original SSC processing was directly referred to on page 30, and alluded to in much of the discussion of sections IV and V. It is believed that the automatic gain control (AGC) utilized by SSC amplified fictitious low amplitude data and produced the events under discussion.



Rockwell  
International

Mr. O. L. Olson  
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Numerous factors relate to the discussion of multiples. If the stacking velocity was the multiple velocity it could cause multiples to be aligned and add "in-phase" while causing true reflection events to be misaligned and add "out-of phase". This is opposed to the normal situation of utilizing a stacking velocity related to the real earth where true reflection events should align and multiples should misalign. The purpose of the above discussion is to lead up to the observation that if the events under discussion were multiples, they would have to be second order multiples and if this were the case, then the first and third order multiples should be observable in addition. Since this is not the case a strong argument is presented for them not to be multiples.

To reiterate, since no reflection in this time zone is shown on the Vertical Seismic Profile and all multiples are not seen in the seismic data, then the events at approximately 0.600 seconds on the original SSC processing are not valid events. They are felt to be fictitious random events which were enhanced in error by the original SSC processing. The processing step where this most likely occurred is in the application of a short window AGC, but may be the result of numerous suboptimum sequences as discussed in sections IV and V.

In order to more fully address the Nuclear Regulatory Commission (NRC) questions, it is suggested that arrangements be made for Dr. Ibrahim, NRC geophysicist, to visit the Hanford Site to go over the seismic reflection data with members of my staff and our consultant, Mr. Berkman. We would also like to use this opportunity to take Dr. Ibrahim to the field to familiarize him with the geologic environment of the study area.

If there are any questions regarding this response or the proposed visit by Dr. Ibrahim, please contact G. S. Hunt of my staff.

Very truly yours,

E. B. Ash, Director  
Basalt Waste Isolation Project

EBA/AMT/jah

cc: J. H. Antonnen - DOE-RL  
P. E. Rasmussen - DOE-RL  
J. J. Sutey - DOE-RL

(I/AC DOE-RL 1011)

FROM <b>DOE</b>		DATE OF DOCUMENT <b>5/20/85</b>	DATE RECEIVED <b>5/28/85</b>	NO <b>WM-85470</b>
TO <b>RJWright</b>		LTR <b>XX</b>	MEMO	ORT
		ORIG.	CC <b>XX</b>	OTHER <i>Wright Date: 6/9/85</i>
CLASSIF		ACTION NECESSARY <input type="checkbox"/>	CONCURRENCE <input type="checkbox"/>	DATE ANSWERED <b>6/11</b>
POST OFFICE		NO ACTION NECESSARY <input checked="" type="checkbox"/>	COMMENT	BY
REG. NO.		FILE CODE: <b>101.2</b>		
DESCRIPTION (Must Be Unclassified) <b>Response to Request for Seismic Survey Data by Nuclear Reg Com</b>		REFERRED TO <b>HMiller</b>	DATE <b>5/28</b>	RECEIVED BY
ENCLOSURES		<b>RJWright</b>		
REMARKS				

*Handwritten notes:*  
 A note to [unclear]  
 5/31  
 I, [unclear], Berkman + [unclear] discussed the matter with [unclear], Westbrook et al at the seismic survey meeting in Silver Spring 5/23.  
 Wright