

JUL 22 1985

3426.1/B7372/MG/85/07/22

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WM 3426.1 s/f FIN B7372

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WM Project 10  
Docket No.

PDR ✓  
LPDR ✓ (b)

Dr. Roy E. Williams  
Williams & Associates Inc.  
P.O. Box 48  
Viola, ID 83872

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Dear Dr. Williams:

(Return to WM, 623 SS)

We have reviewed the 2nd draft of the statistical evaluation of hydrochemical data from the Hanford site. Neil Coleman has provided me with the following additional comments which we would like resolved in the final draft:

On pages 15 & 16 of the report is a discussion of the possible effects of temperature variation on concentrations of various ions in collected water samples. These effects were evaluated by plotting the following variables vs. depth BLS: pH, in situ temperature,  $Mg^{2+}$ ,  $K^{+}$ , and  $F^{-}$ . These plots are shown in Appendix C. It was concluded, based on the high correlation between depth and in situ temperature, that there was no apparent relationship of ion concentrations or pH to temperature.

An inspection of the diagrams shown in Appendix C shows that a reasonably high correlation may exist between sample depth and concentration of F. This apparent spatial correlation with depth may actually be caused by a correlation between  $F^{-}$  concentrations and in situ temperatures.

Overall, the plots in Appendix C are interesting and partially address the question of possible temperature effects. It is recommended that four additional figures be included that plot the following 5 variables versus depth for the given wells: boron<sup>+3</sup>,  $Na^{+}$ ,  $Cl^{-}$ ,  $SO_4^{-2}$ , and in situ temperature.

It appears that this suite of variables may be more sensitive to sampling depth than the variable set used in Appendix C. As noted on page 22 of the report, calculated correlation coefficients suggest an association between four of these parameters. Two of these parameters were identified in the Stepwise MANOVA analyses as discriminators.

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The action taken by this letter is considered to be within the scope of the current contract NRC-02-82-044. No changes to cost or delivery of contracted services and products are authorized. Please notify me immediately if you believe that this letter would result in changes to cost or delivery of contracted products.

Sincerely,

**Original Signed By**

Matthew Gordon  
Hydrology Section  
Geotechnical Branch  
Division of Waste Management

DFC : WMGT kd	:	:	:	:	:	:	:
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