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LETTER REGARDING U S GEOLOGICAL SURVEY REVIEW AND PENDING
RECOMMENDATIONS ON INTERIM MEASURES PHASE 1 ACTIVITIES EVALUATION
ADDENDUM AT SITE 11 NSB KINGS BAY GA
4/11/1996
U S GEOLOGICAL SURVEY



United States Department of the Interior

GEOLOGICAL SURVEY
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2155 Eagle Drive
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Dear Anthony,

This letter summarizes our review of the revised version of Interim Measure Phase I Activities: Evaluation and Recommendations Report Addendum, Site 11, Old Camden County Landfill, Naval Submarine Base, Kings Bay, Georgia. This revised version of the report is dated March, 1996. It was prepared by ABB Environmental Services, Inc., for the Navy, SouthDiv, who asked the USGS to review it.

This revision is a substantial improvement over the original version we reviewed. Most of the discussion of the various analyses has been clarified and substantiated through presentation of appropriate data. There is still material in the report that we at the USGS feel could be improved, and our opinions on these matters were stated in my letter to you dated March 1, 1996 (amended March 19, 1996).

Also, in the March 1 letter I stated, "the margin notes in the manuscript and on the figures are technically substantive, and should be given attention." As a matter of convenience, only the letter, without a copy of the annotated manuscript, was sent forward to Navy SouthDiv, and on to GA-EPD. Our original annotated manuscript of the report version dated February, 1996, was sent to ABB-ES. On reviewing this latest version, we feel that many of these margin comments were not adequately addressed. Rather than repeating each margin comment, I have underlined each passage of text associated with an unaddressed margin note, and have written in the margin of this manuscript 'See original manuscript' and the original page number of the February 1996 version. As before, the margin notes in this revised document are substantive and we feel should be addressed in some manner. To ensure that the substantive commentary given in the margins of this and the previous version of the manuscript are duly noted copies of the two annotated manuscripts also are enclosed with this letter; we will retain the original annotated manuscripts of all future reports we review.

Comments (by section and page):

Executive Summary

p. i. Again, there was no Executive Summary in our version (blank page).

2.0 Data Assessment

Generally, this report is an evaluation of past interim-measure activities at Site 11, and a forum for recommending future direction of site remediation based on the information presented herein. It is not necessary to discuss specific planned future activities by either ABB-ES or USGS in this document. These plans will be thoroughly discussed later, in the CAP document, and in future documents from both ABB-ES and USGS offices. We recommend removal or revision (see manuscript) of this discussion on pp. 2-1 (1st and 2nd para.), 2-12 (near bottom), 2-16 (1st para.).

p. 2-31a. Firstly, the discussion of Drawdown Correction (pp. 2-20 - 2-36) is greatly improved from the previous version. The new well annotated figures help to make each of the discussional points clear and credible. This discussion reflects a studious analysis of the available data, which is more than adequate for the purposes of this report. However, as is often the case, a better understanding of the available data begs answers to new questions, which, in turn, provide the building blocks for future data collection and analysis. Three points arising from this discussion which we may want to consider as we move ahead are:

(1). It is possible the 'leveling' trend that is noted beginning at about 19,000 minutes (figs 2-16 to 2-18) is not a true indication of the length of time necessary to achieve steady-state conditions. Most of the drawdown due to stage 3 pumping occurs within the first few hundred minutes from the beginning of the period. Subsequent water-level decline, from about 13,000 minutes to about 22,000 minutes, occurs during a period of no rainfall, and may be attributable only to natural recession. The recession constants determined for this report are based on a period during which there were four rainfall events. If there were no rainfall events in that period, it is reasonable to assume that the resulting recession constant would be larger. A larger recession constant would probably account for the water-level decline observed in the dry period between 13,000 and 22,000 minutes.

(2). The difference between the response of water levels in the shallow unit and the response in the other two units is not adequately explained by any of our present notions of the groundwater flow system at Site 11. Further careful examination of continuous water-level records at pair or cluster sites containing a shallow-zone well is warranted to verify this phenomenon and may help to understand this apparent anomaly.

(3). What causes the numerous spikes in the corrected drawdown in the period from about 22,000 minutes to about 80,000 minutes? They do not appear to be well correlated to rainfall events. Were the pumps turned off and on for any reason during this period.

p. 2-31b. There are no distance-drawdown plots presented in Appendix B in the report version we reviewed. Also, there is still inadequate discussion of how such plots were used to 'facilitate the interpretation of the contours in figure 2-19. (See comment on p. 2-19b in letter of March 1.)

p. 2-36. There is still insufficient discussion of the uncertainty associated with each of the components used to construct figure 2-21. The procedures and analyses having inherent uncertainty and for which a discussion of uncertainty is lacking include: (1) location of the contour lines in relation to measured water levels on the unstressed (April 4, 1994) potentiometric surface map (fig. 2-10); (2) distance-drawdown plots and their application in the construction of figure 2-19 (see also comment on p. 2-31b, above); (3) correction of drawdown values used in figure 2-19; (4) location of the contour lines on figure 2-21 in

relation to artificial interpreted values on figure 2-20; and (5) the flow-net analysis on figure 2-21. It is the compounded uncertainty of each of these estimation procedures that prompted us to recommend elimination and eventual replacement of this analysis in our letter of March 1. The compounded potential errors resulting from each of these estimations probably negates any analytical detail that is gained through the superimposition procedure.

p. 2-41. It is understandable that the corrected water level for well KBA-11-12 might not fit the contours in figure 2-21, because no water level data from the well was used in the construction of the unstressed (April 4, 1994) potentiometric surface map (fig. 2-10). The estimation error at that point is probably attributable to an error in the location of the contours on figure 2-10 in that area. However, it is difficult to understand how the corrected water level for well KBA-11-16 could not fit the contours in figure 2-21, considering that water-level data for that well was used in the construction of both figures 2-10 and 2-19. Thus, the lack of fit at KBA-11-16 in figure 2-21 can only be attributed to errors in the superimposition procedure. This shortcoming of the procedure is particularly troublesome because data from this location is critical to determine whether the GWE system allows ground water to slip through at this point.

I hope this review has been constructive. If you have any questions, please feel free to call me at (770) 903-9189.

Sincerely,



L. Elliott Jones
Hydrologist

Enclosures: Copies of annotated manuscripts (without appendices) of February 1996 and March 1996 versions of subject report.

Copies (without enclosures) to:

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David W. Hicks, U.S. Geological Survey, Atlanta, Georgia
Richard E. Krause, U.S. Geological Survey, Atlanta, Georgia