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SEP 11 1995

MEMORANDUM

TO: Benito J. Garcia, Chief, HRMB

FROM: Steve Yanicak, NMED DOE Oversight Bureau, POC LANL

DATE: 7 September, 1995

SUBJECT: Response to RFI Report for Field Unit 1, SWMU 3-010(a), April 28, 1995

The DOE Oversight Bureau (DOE OB) has reviewed the subject document. The following comments are provided for the purpose of communicating the results of the DOE OB review. These comments are not provided or intended for the purpose of representing the regulatory position of the New Mexico Environment Department.

SPECIFIC

1. Page 4, 1.3, VCA Activities

   General Statement: The statements "BTEX analysis revealed the unexpected presence of volatile organic compounds (VOCs) other than BTEX" and "Because the extent of VOC contamination was not known" appear to be incorrect due to the fact that solvents were detected at the SWMU in 1992 from a surface sample.

   General Question: Why were solvents not placed on the contaminants-of-concern (COCs) list knowing that they existed prior to Phase I characterization, and why was only a BTEX analysis requested after the VCA activities?

2. Page 9, 2.3.3, Water Encountered in Phase II Boreholes

   General Comment: An altered and/or weathered unit crops out down-gradient from the SWMU; thus, this weathered unit may be laterally connected to the perched zone.

3. Page 9, 2.3.4, Existence and Significance of Seep

   General Statements: The statement "In RFI Work Plan (RFIW) for Operable Unit (OU) 1114, a seep was identified in the bottom of the drainage downgradient from SWMU 3-010(a) (Fig. 2-2) (LANL 1993, 1090)" is incorrect because Figure 2.2 is missing in the 1993 RFIW for OU 1114; therefore, the presence of the seep is not documented in that RFIW report. DOE OB staff notified ESH-18 during April, 1994 concerning the presense of the referenced seep.

   More evidence needs to be submitted before making statements such as the first paragraph of Section 2.3.4.

It is very apparent that the perched aquifer may be leaking via fracture flow, and if fracture flow does exist then flow paths may not be parallel to that of the normal head gradient (flow direction) of the perched zone. That is, partial discharge of the perched aquifer may be occurring through fracture transport, and may not emanate from an appropriate or "calculated" elevation from its possible source (perched zone). It may be appropriate to perform a tracer test between B1 and the seep.

4. Page 12, 2.3.5, Hydrologic Model for SWMU 3-010(a)

General Statements: The statement, "the presence of a major perched zone is unlikely" is questionable considering the fact that structural (fracture zones, faults, etc.) and rock properties (weathered units, surge deposits, etc.) may change laterally and vertically in this area. Physical evidence that supports the significance of the perched zone at SWMU 3-010 (a) is the fact that a seep/spring discharges from the tuff approximately 3,000 ft due east at an elevation of approximately 7,320 ft. The referenced zone continuously discharges approximately 30 gpm or 43,200 gpd. Various other perched zones exist on the western edge of the laboratory boundary {e.g., Homestead, Charlie's and Starmer's Springs (LANL, Expedited Cleanup Plan for SWMU 9-013, FU 5, Tech Area 9)}. It is our experience that perched zones within the tuff are hydrologically complex, and the adequacy of assumptions concerning these zones will be questioned until aquifer characterization is performed.

It should be noted that on April 11, 1995, DOE OB staff observed exposed tuff along the road (jogging path) in the bottom of the channel below the SWMU, and water was not flowing at the interface between the alluvium and the tuff; however, the seep/spring downgradient was flowing at approximately 2 gpm. The road was subsequently covered with soil during the Phase II activities. The above indicates that flow along the tuff/alluvium interface may not be occurring.

The presence of ground water in borehole B1 is probably not ephemeral as stated in the last paragraph.

General Question: Do other tributaries at or near Tech Area 3 contain seeps or springs similar to the tributary downgradient of the SWMU?

5. Page 46, 4.5.1, Soil-Vapor Probe Survey

General Statements: Soil-vapor survey data, and all subsequent borehole data, are very questionable because the COCs (solvents) were probably being masked by highly variable concentrations of non-solvent (possibly background) constituents during the soil-vapor survey. It appears that the "background" concentrations, which one would interpret from data points across the drainage, vary from 1.4 ppm (ID# 03-2616) to as much as 121 ppm (ID# 03-2646). The above supports the assumption that the solvent concentrations were probably being masked. Note that the highest detectable concentration was approximately 100 ft from the center of the excavation pit. Interpretation of this data is clearly ambiguous. We question the validity of the soil-vapor survey data.

It is DOE OB's understanding that the majority of soil-vapor data were obtained using a PID with 10.6 eV bulb. It appears that the referenced bulb is not capable of detecting the major solvent constituents that are of concern such as 1,1 DCA, 1,2 DCA, 1,1,1 TCA, and carbon tetrachloride.

The first paragraph states that the soil-vapor data would guide the selection of borehole locations. Nowhere in this section is it explained how the soil-vapor data were interpreted and/or analyzed in order to fulfill the above objective. The interpretation of the soil-vapor data appears difficult and/or impossible. The soil-vapor data may represent a non-applicable constituent (i.e., biological entity).

It appears that the statement "PID readings from these locations indicated that the site has naturally occurring background VOC concentrations of 15 to 25 ppm" is incorrect due to the fact that detectable concentrations across the drainage vary from 1.3 ppm to 121 ppm, with an average value of 41 ppm.

General Question: It was DOE OB's understanding that two (2) Tedlar™ bag samples were to be taken during the soil-vapor survey. What was the reasoning for taking just one Tedlar™ bag sample?

6. Page 51, 4.5.2.1 and 4.5.2.2, Borehole Locations and Monitor Well Construction and Sampling

General Statement: We question the validity of the data used to characterize the subsurface contamination due to the fact that the boreholes were placed in accordance with the interpretation of the soil-vapor survey data. All ground-water sample data are questionable because the sampling procedures were inadequately performed. That is, the ground-water samples were not taken in accordance with any Federal or State Guidance protocol. Sampling protocols are very critical when used to define or assess the extent of volatile contamination in ground waters, especially in the dissolved phase. On 1 February, 1995, DOE OB personnel observed that B1 did not have a protective cover and concrete pad, and had been damaged, probably by a snow-plow blade. Therefore, we question the integrity of the monitoring well. On 2 February, 1995, DOE OB personnel collected a split-sample with LANL and observed that a protective cover and concrete pad had been installed; however, we question the integrity of the protective cover and concrete due to freezing conditions the previous night (i.e, the concrete may not have cured adequately).

7. Page 61, 4.6.1.1, Phase II Water Samples

General Statement: The usefulness of comparing VOC values obtained from ground-water samples with respect to drinking water standards, SALs, risk assessment, concentration terms, etc., is questioned due to the inadequacy of the ground-water sampling procedures. Subsequently, reported values could possibly vary by orders of magnitude, given the physical properties of the contaminant.

8. Page 67, 4.6.1.4, Phase II Borehole Soil Data

General Comment: Borehole soil data may not represent the actual concentration of VOCs in the subsurface due to the fact that downhole soil-vapor results (total VOCs) are considerably higher (see Figures 1 through 3) and show a larger suit of analytes than the borehole soil results. Note the large discrepancies in the 1,1 DCE results (Figure 4). An unknown portion of the VOCs may have been stripped (volatilized) from the soil/tuff during core retrieval, handling, sample preparation, etc. The elevated downhole soil-vapor results may be indicating that

the majority of the VOCs are concentrated along fractures.

9. Page 90, 5.0, Conclusions and Recommendations

General Comments: It should be noted that solvents were detected at the SWMU prior to the Phase I assessment.

Data and risk assessment results based on Phase II data are questionable due to the probable inadequacy of the soil-vapor probe survey and downhole soil-vapor survey data which were based on soil-vapor probe survey data.

Risk, exposure and toxicity assessments should be performed using the downhole soil-vapor data, and compared to assessment results using the borehole soil data.

DOE OB's interpretation of the 3-010(a) release site is that the majority of the solvent contamination (vapor, dissolution in water and single-phase) is probably concentrated along fractures and within the permeable zone (perched aquifer) that was encountered in B1 and any other anomalously high permeability/porosity zones. It appears obvious to us that the solvents may have been transported (via vapor phase and ground water) both laterally and vertically an unknown distance; hence, further characterization and delineation of the contaminated vadose zone and ground water should be implemented.

DOE OB recommends that LANL evaluate the possibility of adverse health effects from the exposure to carcinogenic compounds (solvents) on the workers that were performing the excavation activities at the SWMU.

General Question: How was ecological screening assessment performed and what methods were used? Which LANL staff members or group performed the assessment? Is the report available for our review?

Please feel free to contact Michael Dale at 672-0449 if you have any questions concerning this matter.

Reviewed by: M. Dale MD
S. Yanicak SY

attachments
cc: Ivan Trujillo, DOE POC/LAAO, MS A316
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TOTAL VOLATILE CONCENTRATION VS DEPTH

BOREHOLE B2

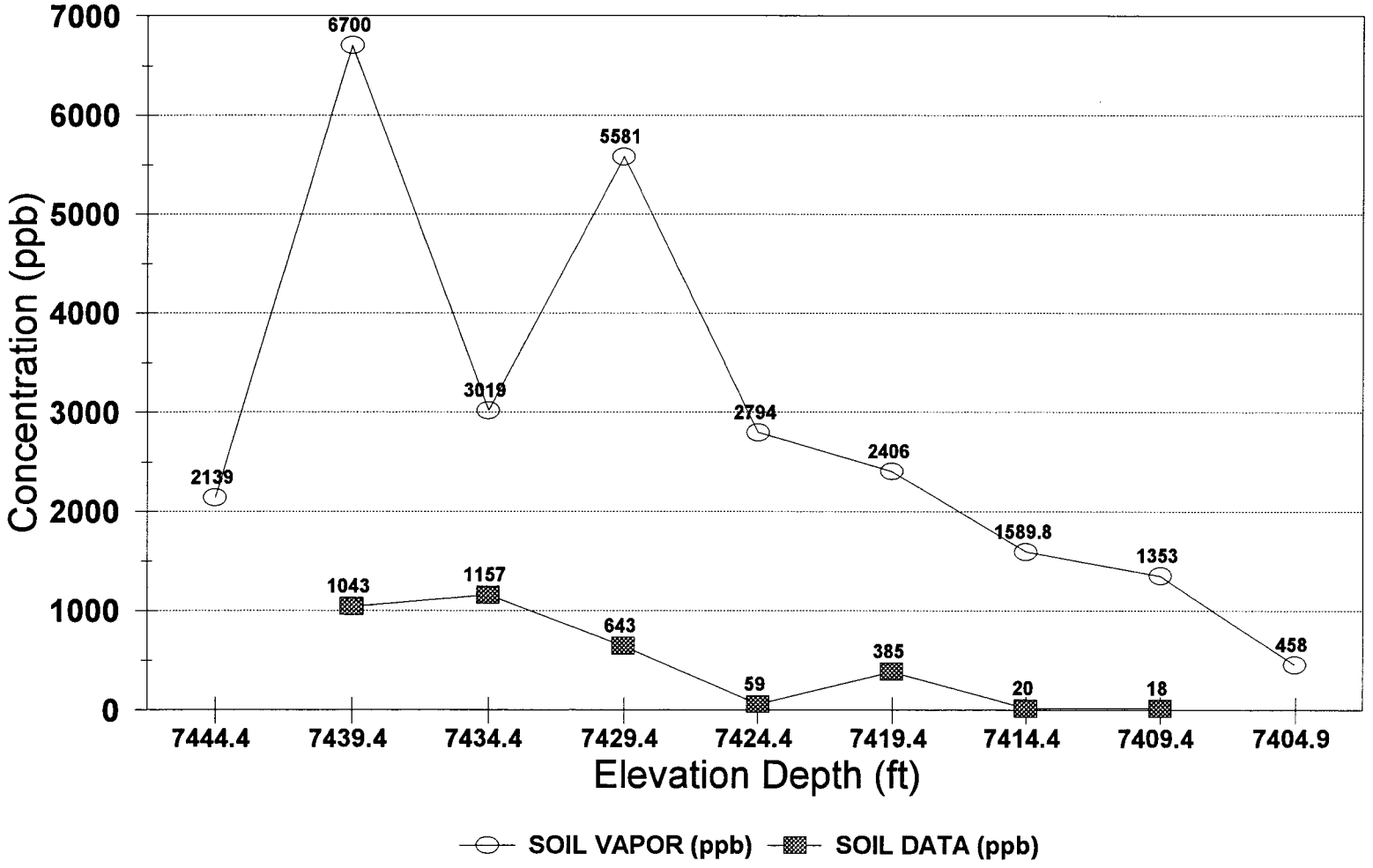

Figure 1 - Comparison of downhole soil-vapor and borehole soil results (total volatile concentration), SWMU 3-010(a), Borehole B2 (data from LANL RFI Report, SWMU 3-010(a), April 28, 1995)

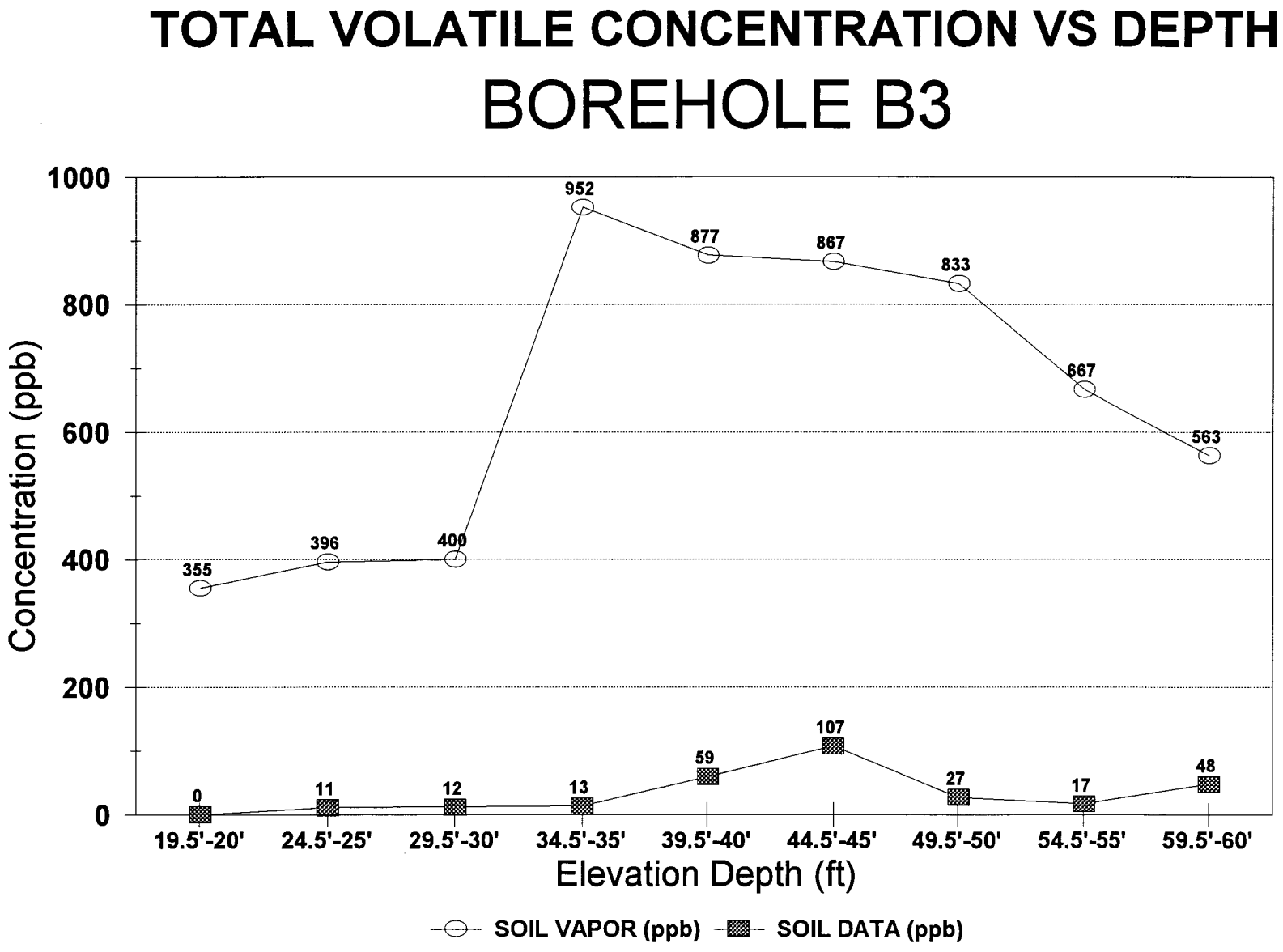

Figure 2 - Comparison of downhole soil-vapor and borehole soil results (total volatile concentration), SWMU 3-010(a), Borehole B3 (data from LANL RFI Report, SWMU 3-010(a), April 28, 1995)

TOTAL VOLATILE CONCENTRATION VS DEPTH

BOREHOLE B6

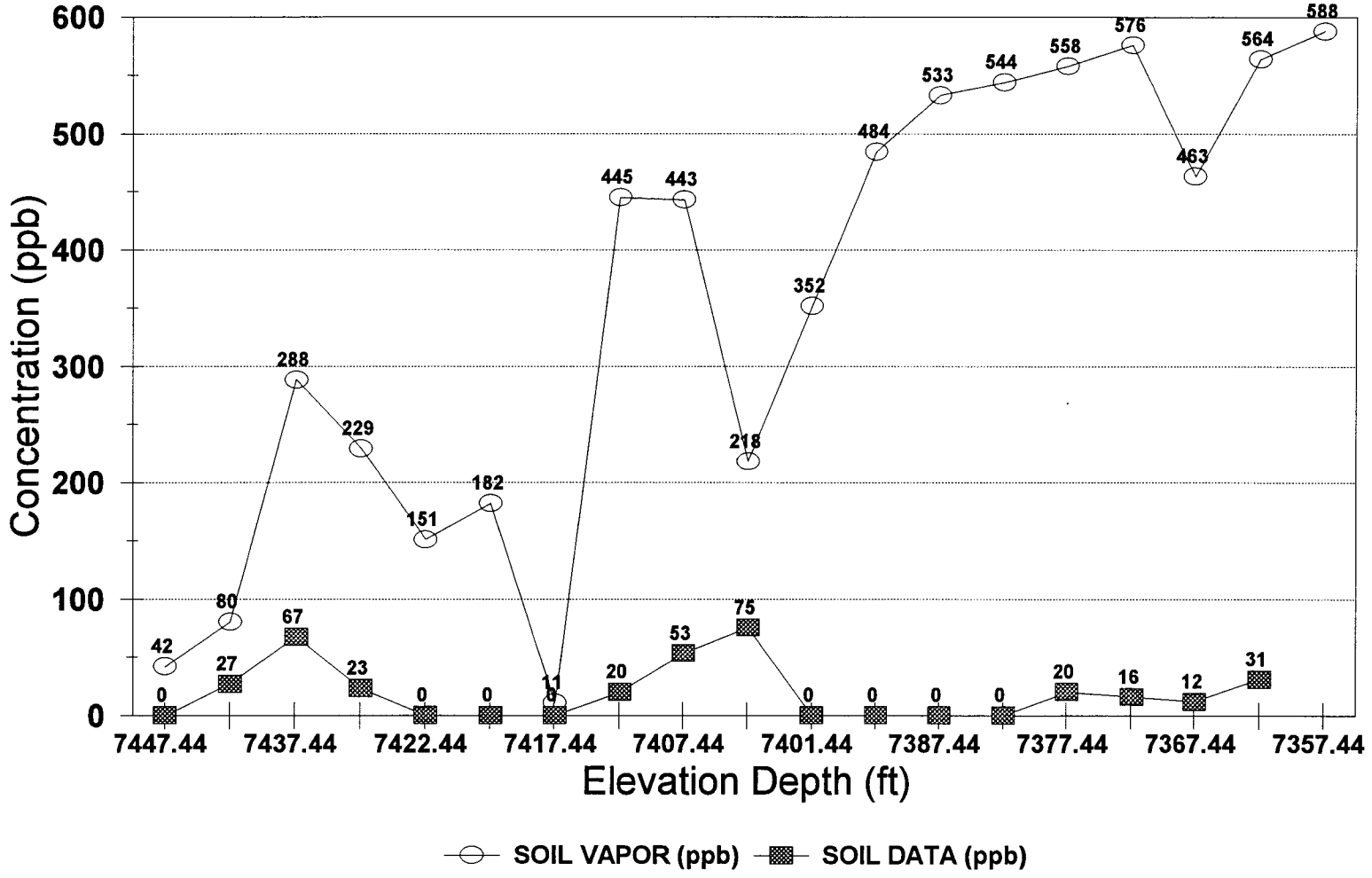

Figure 3 - Comparison of downhole soil-vapor and borehole soil results (total volatile concentration), SWMU 3-010(a), Borehole B6 (data from LANL RFI Report, SWMU 3-010(a), April 28, 1995)

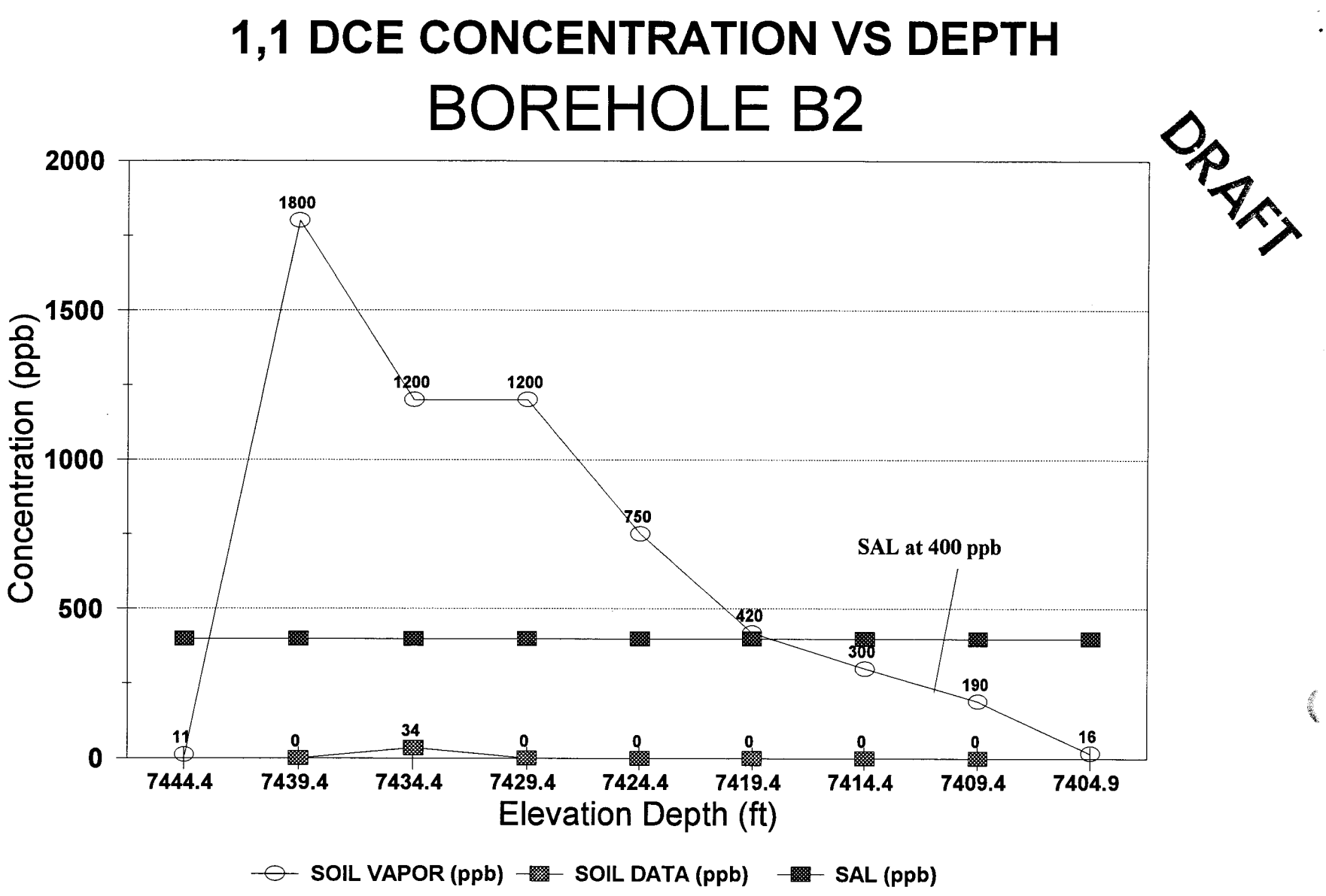

Figure 4 - Comparison of downhole soil-vapor and borehole soil results (1,1 DCE), SWMU 3-010(a), Borehole B2 (data from LANL RFI Report, SWMU 3-010(a), April 28, 1995)