STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1800 HARRISON STREET, SUITE 700
OAKLAND, CA 94612

Phone: Area Code 415
464-1255

September 7, 1990
File No. 2189.8152 (AJM)

Mr. James J. DeLong
Director, Legal Affairs
Applied Materials, Inc.
P. O. Box 58039
Santa Clara, CA 95052

Subject: Additional Comments Prepared by Weiss Associates Concerning Proposed Revised Tentative Order, Amending Order No. 89-167 for the Building 1 Facility at 3050 Bowers Avenue in Santa Clara

Dear Mr. DeLong:

This will acknowledge receipt of your Fax Letter of September 6, 1990, concerning the subject matter. We have accepted the submitted suggestions and incorporated all of them into the Revised Tentative Order. Because these comments apply to the monitoring program, the Self-Monitoring Program for the site also requires revision.

Due to the nature of written comments from Applied Materials and verbal comments from the EPA, it seems less confusing to prepare a revised Order than to propose numerous amendments. You will receive a thicker package for the proposed final Order than you received previously for the Order initially proposed last month.

If you have subsequent comments, please submit them verbally to A. J. Mancini at (415) 464-0825 as soon as possible.

Sincerely,

Steve Morse

Steve Morse, Chief
South Bay Toxics Division

cc: Jerry Schoening
Applied Materials

Patti Collins
EPA Region IX (H-3-6)

Lindee Glick
Weiss Associates

APPLIED MATERIALS

September 6, 1990

Mr. Anthony J. Mancini
Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, CA 94612

Dear Tony:

I am forwarding a letter which Lindee Glick of Weiss Associates wrote to Jerry Schoening dated August 28, 1990. Applied Materials endorses Lindee's comments and requests that you accept these suggestions for revisions to the Applied Materials Building 1 proposed Order.

Sincerely,

James J. DeLong
Director, Legal Affairs

Enclosure

cc: Lindee L. Glick
Weiss.Associates

Kip Edwards
Orrick, Herrington & Sutcliffe

Jerry Schoening

149JD.90

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WEISS ASSOCIATES
Geologic and Environmental Services
Fax: 415-547-5043 Phone: 415-547-5420
5500 Shellmound Street, Emeryville, CA 94608

August 28, 1990

Mr. Jerry Shoening, Corporate Manager
Safety and Health
Applied Materials, Inc.
3050 Bowers Avenue
Santa Clara, CA 95054

Re: Revisions to Applied Materials
Building 1 Site Cleanup Order

Dear Mr. Shoening:

This letter provides Weiss Associates suggestions for revisions to the Applied Materials Building 1 Facility Order dated September 21, 1989 and amended by the Notice of Tentative Order dated August 1, 1990 issued by the California Regional Water Quality Control Board - San Francisco Bay Region (WQCB).

In the order dated September 21, 1989, Provision 6 states that a quarterly report will be submitted every three months beginning on February 15 (subsequent dates being May 15, August 15, November 15, and February 15 of each year). It is also stated that the first quarterly report for each calendar year shall provide a cross section or geologic map describing the hydrogeologic setting. Provision 7 states that an annual report be submitted on February 15 evaluating the progress of cleanup measures.

As has occurred in the past, quarterly monitoring reports are submitted on a different schedule than outlined above, also the annual report including fourth quarter results, has been accepted as a substitute for the fourth quarter technical monitoring report. We propose a new schedule for report submittal that will reflect the most current data available. Because ground water is sampled triannually, we propose triannual reports based on this data. Ground water sampling occurs in January, May, and September, and accordingly, reports could be submitted to the WQCB on March 15, July 15, and November 15 of each calendar year. It is also proposed that the March 15 report will be the annual report detailing: 1) all of the data from the previous calendar year, 2) data collected from the January ground water sampling, and 3) all requirements listed in Provision 7 of the site cleanup order. The geologic map and/or cross

section will be included in this annual report.

The Notice of Tentative Order dated August 1, 1990 amends Provision 6 with the requirement of isoconcentration maps of 1,1,1-TCA, 1,1-DCA, and 1,1-DCE in each technical monitoring report showing an isoconcentration contour of the cleanup goal. Due to the small number of data points, and the present concentrations of 1,1-DCA and 1,1-DCE generally greater that 10 μg/L, there are not enough constraints to realistically plot the cleanup goal isocontour between the 10 μg/L contour and nondetectable VOCs. The isoconcentration maps will be provided in each monitoring report as proposed in the Notice of Tentative Order, but the isoconcentration contour for the cleanup goal should not necessarily be required, but instead we select isoconcentration contours that most accurately depict the data. When concentrations reach levels where we can reasonably define the cleanup goal contour, this will be included in the map.

In addition, Provision 2: Tasks 6 and 7, require a soil cleanup evaluation report and soil cleanup proposal report, respectively. These two tasks overlap in content and would be more appropriately combined into one report. We request that the combined report is submitted by January 15, 1991. At the suggestion of the WQCB, a letter report presenting the borings logs and analytical soil data from additional borings at Applied Materials Building 1 will be submitted by November 2, 1990.

We hope you find these suggestions beneficial. If you have any questions please call me or Richard Weiss.

Sincerely,
Weiss Associates

Lindee L. Glick

Lindee L. Glick
Project Geologist

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STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
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August 28, 1990
File No. 2189.8152 (AJM)

Mr. Jerry Schoening
Corporate Manager, Safety and Health
Applied Materials, Inc.
P. O. Box 58039
Santa Clara, CA 95052

Subject: Response to Applied Materials' Comments Regarding the Proposed Tentative Order and Staff Report: Your Fax Letter Dated August 7, 1990

Dear Mr. Schoening:

Copies of your letter were made available to Members of the Regional Board for the regular Board Meeting of August 15, but without any response by Board staff. Copies of this letter will be provided to the Board preparatory to the Board Meeting scheduled for September 19, 1990. Our responses are made in the sequence of the comments in your letter.

1. We acknowledge previous correspondence in which the term "proactive manner" is used. We don't know what is meant by that term; a previous letter suggested proposed language <u>if</u> Finding 6 were to be amended, and also for Finding 2. We did not then propose amending either Finding 2 or 6. However, inasmuch as you have requested a revision in your letter of 08/07/90, we reviewed both Findings for possible revision. The suggested language is not appropriate for Finding 2: this Finding dates the initial discovery of VOCs in groundwater at the site, identifies the pollutants detected, and gives analytical results measured in 1989.

   Finding 6 includes a brief history of cleanup activities, which is amenable to slight revision. We propose amending Finding 6 by adding, at the beginning, the following new first paragraph:

   6. <u>Interim Actions.</u> On its own volition, AM in November 1983 installed a monitoring well downgradient of a nest of three underground tanks on the west side of Building 1. When VOCs were detected in groundwater by this well AM voluntarily began an investigative program and has conducted site investigations and remedial actions, in cooperation with the Regional Board, since that time.

   The remainder of the Finding is unchanged other than the original first paragraph becoming the second paragraph, and the rest being in sequence after this paragraph.

2. Finding 5 in the Amended Order (AO) will be revised to read as follows:

   5. Tasks 6 and 7 related to soil cleanup evaluation and soil cleanup proposal have not been completed as required by the current Order. Because Task 5 showed that additional soil investigation was required, Task 5 was not completed until approximately ten weeks after its due date, and therefore Task 6 could not be completed by its due date of February 28, 1990. Board staff concurred in delays for completion of Tasks 5 and 6 in order to allow time for a more complete assessment required by Task 5 and provide better information for use in the completion of Task 6.

      The completion of Task 7, with an original due date of March 16, 1990, is sequential following Task 6. Since Task 6 is delayed, Task 7 is also delayed and therefore has not been completed. Board staff concurred in a delay for completion of Task 7. A soil remediation system most likely will not be constructed and/or implemented as required in Task 8 and the dates for completion of other Tasks probably will not be met. Completion dates, with Board staff concurrence, are changed as shown herein.

3. Your comments shown as "Finding 8, page 2" are wide-ranging in scope; we will address part of this comment by revising Finding 7 (AO), by adding at the end, a new sentence which reads:

   The discharger states that the cleanup time for extraction alone may or may not be improved by some excavation of the source materials.

   In Finding 8 we will revise the portion within the parentheses to read:

   (50 years, length for Alternative 4, pump-and-treat, estimated for purposes of comparison by AM)

   Your comments show that AM and Board staff still are not in complete agreement concerning soil remediation. We agree that the linear model is not dependably accurate. The model originally told you that groundwater cleanup in the source area could be accomplished in about 12 years (for TCA); now it tells you that cleanup of TCA may take as long as 20 years and cleanup of all VOCs may take much longer. According to what the EPA has determined, the time actually required to achieve cleanup goals is greater than the time extrapolated from a linear model, and may be considerably greater because the rate at which VOCs are removed by pump-and-treat declines over time, and pumping becomes less efficient; increasing the rate of groundwater pumping does not necessarily produce a similar increase in VOCs removed. Other extraction techniques that may be implemented will increase the time required to reach cleanup goals. If your linear model shows that cleanup goals might be reached in 53 years, Board staff intuitively reasons that the time required to attain this goal will be longer than 53 years.

As stated in your letter, the model output did include a range of possible times and not just a maximum time of 50 years. The report that you submitted to the Board uses the high end of the range when it compares alternatives, because (according to the report) it is suspected that it will take a significant amount of time for VOCs to reach cleanup goals. We agree that pump-and-treat alone will take a significant amount of time to reach cleanup goals.

Your comment touches on another facet of this subject: VOC adsorption by soils throughout the length of the plume. You state that soils that have adsorbed VOCs exist throughout the length of the plume and not only at the source. The soil surveys completed by AM have been limited in areal extent, in and near the source area. The results of these surveys cannot be used to describe the full length of the plume without additional documentation. The report of 07/25/90 uses the history of extraction at Well 5E to illustrate that there is a difference between the source area and the downgradient area, and the model predicts a 30 % reduction in the time for VOC cleanup to MCLs if the source is removed, based on extraction at Well 5E. The recently submitted report does not indicate or imply that VOC adsorption throughout the plume is a significant factor to be considered.

Staff does not agree that the best solution is to continue pump-and-treat for an indefinite period while more data are being collected for the linear model. We propose to monitor the extraction process closely and evaluate the potential for accelerating groundwater remediation through practical methods such as source soil removal if an opportunity to do so arises. In the interim it appears that AM has an opportunity to develop another model and/or collect additional information to support a new or modified approach if AM desires to do so.

4. Page 4, first paragraph: the report of 07/25/90 puts more credance in the high end of the range and we agree. As referred to elsewhere in this letter, EPA's review of historical records of pump-and-treat projects shows that the time actually required to achieve cleanup goals (MCLs) in most cases is greater than the time predicted by a linear model such as the one developed by AM.

5. Page 4, part b. second paragraph: There is a "typo" in the Tentative Order - this should be part c. Staff believes that 50 years may not be adequate because the time extrapolated from the linear model, based on EPA's study, is less than the time actually required to achieve MCL cleanup goals. This statement will be rewritten to read:

   > Board staff believes that, without some soil removal, even a period of 50 years may not be adequate for extraction alone to achieve cleanup goals.

6. Staff Report (Appendix B), page 9, second paragraph: Board staff has not been provided with information that shows VOCs to be distributed in the fine-grained sediments adjacent to the A-zone throughout the length of the plume. As stated earlier in this letter, we agree with the tentative

approach taken in the report submitted by AM which points out the difference in pollution in the source area from that in downgradient areas.

7. Staff Report "Conclusion" (stated as a belief): Staff believes that soil removal combined with groundwater extraction will reasonably accelerate VOC removal at reasonable costs. This appears logical to us, especially if current operations at Building 1 are phased out in the near future.

If you have any questions about this letter please contact A.J. Mancini at (415) 464-0825.

Sincerely,

Steve Morse, Chief
South Bay Toxics Division

cc: Patti Collins, EPA IX
Tom Iwamura, SCVWD
Howard Hatayama, DHS/TSCD
Lee Esquibel, SCCHD

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TO:
Tony Mancini (415) 464-1380
Kip Lowanns (415) 773-5759
Jim Delong 727-2222

(PLEASE PRINT)

TEXT:

SENDER: Jerry Schoening

DATE: 8/7/90 FAX LOG # BY: JG

August 7, 1990

California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, CA 94612

Attention: Mr. A. Mancini

Dear Mr. Mancini:

This letter is to provide Applied Materials comments regarding the Notice of Tentative Order dated August 1, 1990 and the attached appendices to that order.

In previous correspondence from our attorney in May regarding this order revision, we requested a revision to findings 2 and 6 to reflect the proactive manner in which Applied Materials has handled the site since its discovery by Applied. The proposed order revision does not include any of this language. Please make the revisions as requested.

APPENDIX A

Finding 5 should be changed to provide a brief explanation of the reasons for the items that "have not been completed as required." The board staff concurrence with the non-completion under the circumstances should also be noted.

Finding 8, page 2: the time estimated to obtain complete cleanup to the MCLs was based on a model that is not dependably accurate due to the short time that data has been taken for input to the model. The model output also included a range of possible times not just the maximum time you stated as 50 years. The cleanup time for extraction alone may or may not be improved by some excavation of the source materials. It is likely that the time improvement, if any, would be minimal because the soils that have adsorbed VOCs in fine-grained sediments exist throughout the length of the plume not only at the source. Because of this situation and the limited data that

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exists, the best solution is to continue extraction and monitoring of the site until sufficient data is obtained to more accurately determine the time to cleanup for the extraction-only alternative. At such time as the data is more conclusive, the next opportunity to do excavation will be taken if the analysis indicates that excavation will be effective.

Page 4, first paragraph: there is no evidence to support the statement that "within a reasonable period of time cannot be determined with exactness but appears minimal;" The range of time developed in the model all have the same probability of happening based on any factual data - it is only a judgement that the time may be at the long or short end of the range. It would be more accurate to state the ranges found.

Page 4, part b. second paragraph: The last sentence again states that "without some soil removal, even a period of 50 years may not be adequate for extraction alone to achieve cleanup goals." The same argument applies - we have insufficient data to draw any conclusion at this time, therefore a statement like this should not be made.

APPENDIX B

Page 9, second paragraph: This paragraph and the following one on conclusions both ignore that the remaining VOCs are distributed in the fine-grained sediments adjacent to the A zone throughout the length of the plume, and that excavation of the source soils may or may not have any significant effect on the cleanup time.

The conclusion that excavation will "reasonably accelerate VOC removal at reasonable costs" is an opinion, not a logically drawn conclusion based on any factual data. This should be pointed out and a statement should be made regarding the need for ongoing data collection and analysis prior to making any such conclusion.

Thank you for your attention to these comments. This submittal to the board should be as accurate as possible so they are properly informed of all the uncertainties of the site and also of our intention to continue to analyze data and pursue cleanup in the most effective ways.

Sincerely Yours,

J. Schoening

Jerry Schoening
Corporate Manager, Safety and Health