TERRATECH

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January 11, 1991
Project 4454/3

Mr. Hugh Murphy
Hayward Fire Department
22300 Hayward Boulevard
Hayward, California 94541

Subject: Contingency Plan, Endosulfan Chemistry
and Sampling Protocol
Sunnyside Commons II
Hayward, California

Dear Mr. Murphy:

The following letter addresses the three issues raised by you at today's meeting concerning the trace pesticide impact to the shallow ground water beneath Sunnyside Commons II in Hayward. Specifically, these issues are: (1) formal documentation of the Plymouth Group's Remediation Contingency Plan for the unexpected scenario that pesticide concentrations in the ground water rise above acceptable levels; (2) documentation on the physical properties of the pesticide involved - Endosulfan; and (3) justification of sampling protocol based on Endosulfan's physical interaction with ground water.

GROUND WATER REMEDIATION CONTINGENCY PLAN

The findings from our investigations of the ground water beneath the subject site have demonstrated that the pesticide impact is both minor and localized to the area around a former open well. The three rounds of ground water testing performed to date at MW-3, the well closest to the former open well, indicates a declining concentration of total Endosulfan - from 0.70 parts per billion (ppb) to 0.11 ppb. As discussed in our December 4th report we are performing quarterly monitoring and fully expect the Endosulfan concentration to rapidly dissipate/degrade below quantifiable thresholds. Monitoring will continue until both wells show no detectable pesticide residues for four consecutive quarters.

If, for some unexpected reason, the Endosulfan (or other EPA 8080 pesticide) residuals rise above drinking water standards (or other regulatory mandated quality threshold) we recommend initiating a "pump and treat" cleanup process utilizing the existing well(s). Extracted ground water would be pumped through activated carbon, a demonstrated technique of removing pesticides, then either discharged to the storm sewer under a RWQCB permit or utilized on-site for dust control or landscape irrigation. Specific design and permitting would conform to the regulatory requirements at the time of implementation. Post-cleanup monitoring would also conform to the applicable requirements.

As previously mentioned, we see no technical reason that the public process steps of tentative and final map review/approval, permit issuance, grading,

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construction and even habitation cannot proceed simultaneously to this unobtrusive cleanup process.

ENDOSULFAN CHEMISTRY

Endosulfan is a organo-chloride insecticide primarily manufactured by FMC Corp. under the trade name of Thiodan. According to the 1989 Farm Chemicals Handbook, the relative density of Endosulfan (a crystalline solid) is 1.745 (i.e. heavier than water). Appendix A of Environmental Risk Sciences' (ERS) project Health Risk Assessment report dated June 22, 1989 contains a detailed discussion of Endosulfan's common uses, physical properties, environmental fate, toxicity and health effects.

According to the ERS research, the solubility of the two Endosulfan isomers (I and II) has been found to be 0.53 and 0.28 mg/l, respectively. Since the highest concentration of Endosulfan we have found in the ground water (~0.005 mg/l) is well below these solubility limits, we would anticipate no sinking precipitate. Further, given the high soil affinity of the chemical and the clayey nature of the shallow project soils, including the water bearing zones, aquifer, we would suspect little, if any, vertical migration.

SAMPLING PROTOCOL

The principle monitoring wells being utilized to assess the ground water impact (MW-3 and MW-4) are completed to the same depth (24-25 feet) of the former open well suspected of allowing the pesticide overspray into the ground water. Purging activities prior to actual sampling draw fresh representative ground water into the wells. Ground water samples for this project have been collected with discreet Teflon bailers from the upper third of the post-purge water columns within the wells. Since little to no stratification of the trace amount of dissolved Endosulfan would be expected, particularly after purging, it is our opinion that the samples collected conform to accepted protocols and expectations of validity.

We would be glad to discuss any further questions you may have.

Sincerely,

TERRATECH, INC.

E. R. Lautenbach

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cc: Laura Rice, The Plymouth Group
Rich Hiett, Regional Water Quality Control Board
Pam Evans, Alameda County Health Agency