

CLOSURE PLAN FOR MITIGATING
AGRICULTURAL CHEMICAL HAZARDS
SUNNYSIDE NURSERY
ALAMEDA COUNTY, CALIFORNIA
June, 1989
PROJECT 4454/2

FOR

THE PLYMOUTH GROUP
2047 OLD MIDDLEFIELD WAY
MOUNTAIN VIEW, CALIFORNIA 94043

BY

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FIGURE 1 - Site Plan

FIGURE 2 - Development Plan



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INTRODUCTION

This Closure Plan describes the proposed activities for mitigating the toxic hazards of residual agricultural chemicals at the Sunnyside Nursery (see Figure 1). A residential development, consisting of 137 homes, is currently planned for the property (see Figure 2). The Sunnyside Nursery is located at the intersection of Mohr and Laguna Avenues in Alameda County, California. The nursery is a family-owned business which has been in operation for 34 years, growing ornamental plants.

As a supplemental document to this Closure Plan, Environmental Risk Sciences (an experienced toxicological specialty firm) is preparing a Risk Assessment. In addition to discussing the health issues of potential pesticide exposure, this Risk Assessment will direct particular attention to addressing Endosulfan, the most prevalent EPA Priority Pollutant pesticide we have found at the Sunnyside Nursery.

An underground storage tank closure plan will be submitted to the Alameda County Environmental Health Department when the two on-site fuel tanks are scheduled to be removed.

WORK PERFORMED TO DATE

The following work has been performed to date at the Sunnyside Nursery by Terratech, Inc.:

1. Preliminary hazardous/toxic investigation of surface soils in greenhouses, drainage ditches, Laguna yard, shop area, and under pesticide storage room (see Project 4454 report dated February 8, 1989 and letter dated February 22, 1989).
2. Preliminary hazardous/toxic investigation of the soil and ground water conditions adjacent to the two underground fuel tanks (see Project 4454 report dated February 8, 1989).
3. Geotechnical investigation involving five exploration drill holes (see Project 4454/1 report dated March 9, 1989). [NOTE: The geotechnical logs are included in the February 8th toxics report.]
4. Supplemental sampling and analysis of surface soils in for selected greenhouses Endrin and soluble Priority pesticides in response to comments from the Hayward Fire Department (see Project 4454/2 Table 1 dated May 3, 1989 and Sequoia Laboratory reports dated April 23 and May 12, 1989).



SITE HISTORY

The subject property was purchased by the Yoshida family in 1949. Prior to that, the site was apparently used for row crop cultivation; specifically, sugar beets and tomatoes. Construction of the Sunnyside Nursery was completed in 1955. There were never any greenhouses on the Laguna parcel or any other locations beside those presently occupied. Historic pesticide storage has always been in the room which is presently used. The only type of crop grown at the nursery has been ornamental plants, primarily violets.

SITE DESCRIPTION

Figure 1 is a Site Plan of the existing improvements on the property.

The small ("Laguna") parcel along the north side of Laguna Avenue contains three single-family residences with detached garages, an employee parking lot, and a yard area where old plants, plant containers and other assorted debris have historically been discarded. No chemical containers were observed in this debris. A conservative estimate of the area of this unpaved yard is 35,000 square feet.

The main ("Nursery") parcel along the east side of Mohr Avenue contains four single-family residences (two with detached garages), a large office/shipping/warehouse building, a building used for public wholesale of plants, a boiler and shop building, several other maintenance and storage buildings, numerous greenhouses, and two underground fuel tanks.

The typical ground cover beneath the greenhouses is a combination of concrete slab walkways and bare soil. All of the other buildings have slab-on-grade floors. Most of the "yard" areas and driveways/walkways are paved; either by asphalt concrete or Portland cement concrete. Excess water from sprinkling operations drains into the on-site drainage system. This system consists of earthen and lined ditches, piping and subgrade concrete-lined settling/holding tank directly northeast of the diesel fuel tank. The collected water is recycled into the irrigation system.

Our estimate of the total area on the main parcel where direct, pesticide to soil contact is likely to have occurred (greenhouses and earthen drainage/runoff ditches) is 400,000 square feet.

SITE GEOLOGY

The native surface soils, to a depth of about four feet, consist of dark brown to black SANDY CLAY. Below the dark surface clay, layers of interbedded brown SANDY CLAY, CLAY and CLAYEY SAND were encountered to the bottom of all borings except DH-5. Boring DH-5 encountered a WELL GRADED SAND with clay and gravel within its 26 to 31 foot depth interval. Our drill hole logs are presented in Appendix A of the February 8, 1989 report.



Ground water was first encountered in the seven borings at depths ranging from about 11 to 16 feet below the ground surface. The piezometric level of the water table appears to be about 11 to 12.5 feet below the ground surface. The shallow ground water appears to be locally confined.

We would expect the 10+ feet of clayey soils above the water table to have a low vertical permeability, particularly with regard to the transport of agricultural chemicals. Further discussion of pesticide migration in soils will be presented in the Risk Assessment.

CHEMICAL USAGE

In addition to the typical fertilizer and soil amendment compounds, the nursery uses insecticide and fungicide chemicals. The primary category of agricultural chemicals that have historically been used are known as carbamates. Organophosphate, organochloride and zinc-containing compounds have also been used. According to the Yoshida's, no chlorinated herbicides have ever been used. Some of the pesticides are in a liquid solution of aromatic hydrocarbons such as xylenes. Chemicals have been used under the supervision of the Alameda County Agriculture Department.

The levels of toxicity vary between and within the various pesticide categories, dependent on the specific chemical. However, the chlorinated compounds are widely recognized as the most persistent. The only group of pesticides on the EPA Priority Pollutant List (the Method 8080 group) and Title 22 TTLC/STLC list are part of the organochloride category.

Chemicals that are being used are stored in the central room where HS-1 and HS-2 were collected. Chemical spraying of the plants is done by hand using a wand fed by a portable (trailer-mounted) tank and compressor. Only water is used as mixing/diluting agent. Specific spraying frequency varies by season and crop, but on the average is monthly.

GENERAL CLOSURE DISCUSSION

A site Health and Safety Plan will be submitted to the Alameda County Environmental Health Department for approval prior to any closure work. The primary contents of this plan will be a description of the anticipated hazards and the recommended responses to them; from personal protective equipment to emergency actions. Our environmental personnel have completed at least 40 hours of OSHA-SARA training for working with hazardous wastes.

Recognizing that 1) toxic chemicals have been routinely used on-site, 2) the intended residential land-use represents an exposure risk, and 3) any amount of additional sampling would only provide a statistical indication of "clean" and "dirty", the planned agricultural chemical mitigation measures are broad and conservative.

We plan to work closely with the County Environmental Health Department to assure compliance with their expectations.



CLOSURE OF LAGUNA YARD

The first phase of the planned residential development is to occur on the Laguna Avenue parcel. Accordingly, this will be the first area of closure.

Removal of Debris

All debris is planned to be removed and disposed of off-site. A member of Terratech's environmental staff will be present during the removal to observe for the presence of chemical containers and at the completion of the work to verify its adequacy. It will be the responsibility of the removal contractor to properly (and legally) dispose the debris. We expect the debris removal work would be part of a full site preparation contract including the demolition of the existing buildings on the parcel.

Excavation of Surface Soils

The upper 18 inches of soil in the yard where debris was historically present (estimated 35,000 square feet) is planned to be excavated. The 18 inch depth was selected based on a combination of 1) our experience with the typical vertical profile of pesticide concentrations (as supported by various case studies and research projects - see Risk Assessment), and 2) our opinion on a reasonable maximum depth for typical excavations; ex. building foundations, landscape plants and fence posts.

A member of Terratech's environmental staff will direct the earthwork contractor and verify the horizontal and vertical compliance with this Closure Plan. Fencing will be used to restrict access to contaminated soil anytime the work schedule requires temporary stockpiling.

Verification Sampling and Testing

One verification soil sample is planned to be collected for each proposed residence having yard space coinciding with the excavation. At this time this appears to translate into 5 to 8 samples. The samples will be collected in steam-cleaned brass liners at the 6-12" interval below the excavation bottom. Upon retrieval, each end of the liner will be covered with aluminum foil and then capped, taped and labeled. The sample will then be placed in an individual ziplock bag and into a field cooler containing blue ice. Sampling personnel will wear a fresh pair of disposable gloves for each sampling event. A chain-of-custody record will be completed to document the collection, handling and analysis requests.

Samples are planned to be submitted to a State certified laboratory and individually analyzed for organochloride pesticides (EPA Method 8080) and carbamate pesticides (EPA Method 632). The chlorinated pesticides were selected due to their persistence and presence on the EPA Priority Pollutant and Title 22 TTLC/STLC lists. The carbamates pesticides were selected due to their dominate use at this nursery.



Testing for categories of pesticides other than the two described above is not planned due to the relatively low application rate and short persistence of these chemicals. Testing for zinc and other toxic metals is not planned due to the relatively low application rate and the absence of indications of a metals problem in our Phase I investigation. Testing for aromatic hydrocarbons is not planned due to the relatively short persistence of these chemicals and the expectation that the extensive grading work will significantly dissipate whatever residual concentrations are present.

In addition to the laboratory's normal quality assurance/quality control procedures, we plan to submit one "field blank" liner of Monterey sand to be analyzed along with the verification samples.

If detectable amounts of pesticides are found in a verification sample, a decision on continuing the excavation deeper would be made based on the Risk Assessment and Title 22 criteria. Soil with contamination exceeding Title 22 Total Threshold Limit Concentrations (TTLIC's) or comparable limits established by ERS for chemicals not included in Title 22 would be excavated.

Isolation/Disposal of Excavated Soil

The proposed development on the Laguna parcel involves limited roadway construction. It is therefore planned to use a combination of isolation under streets and off-site disposal for the estimated 2,000 to 2,500 cubic yards of excavated soil.

The maximum burial depth under the streets would be limited to six feet, leaving a minimum of five feet of native clayey soil between the fill and the water table. A member of Terratech's environmental staff will monitor this earthwork to verify compliance. To provide premium protection against surface water infiltration, a full-depth asphalt concrete pavement section is planned.

At this time it does not appear that the site soil would be classified as hazardous waste requiring disposal at a Class I landfill. Accordingly, we anticipate utilizing Class III (or Class II) landfill disposal. The testing needed to sufficiently verify this for the regulatory agencies would be performed during the period between the debris removal and soil excavation activities.

Backfilling of Excavation

It is planned to use a combination of the material set aside from the subexcavation of the streets and import to backfill the excavation. The source of any import to be used will be evaluated for potential toxic concerns prior to hauling. Some degree of verification analysis by a State certified laboratory is anticipated. All backfilling would be subject to geotechnical observation and testing.



Contingency for Utility Excavations

As previously mentioned, it does not appear that the "contaminated" soil would be classified as hazardous waste or represent a significant health hazard from a single exposure. However, as a precaution the following mitigation steps are planned for utility excavations: 1) notify workers of the potential hazards and provide copies of the Health and Safety Plan; 2) perform work in an incremental manner so that backfilling proceeds promptly after excavating; 3) restrict access to stockpiled soil by plastic covering or perimeter fencing; and 4) characterize and properly dispose of all excess soil.

CLOSURE OF NURSERY

It is currently anticipated that the Sunnyside Nursery will continue operations through the Spring of 1990. At that time we will be re-evaluating site conditions as well as the developments in mitigation practices and regulations. It is likely that an updated Closure Plan will be submitted to the Alameda County Environmental Health Department (and City of Hayward) at that time for review and comment.

Removal of Chemicals

All agricultural chemicals and their containers are planned for removal prior to site preparation/demolition work. We understand that the nursery owners have another operation in the Salinas area where most, if not all, of the chemicals will be transported for use. All chemicals left behind will be manifested and removed by a licensed hazardous waste company.

Demolition of Greenhouses

It is anticipated that the greenhouse demolition will be part of the site wide demolition contract. All building materials, irrigation piping, tables and floor slabs will be removed. Some residual planting soil will likely be left behind, on the ground. A member of Terratech's staff will be present to observe this work and verify its adequacy. It will be the responsibility of the demolition contractor to properly (and legally) dispose of all debris.

Excavation of Surface Soils

The upper 18 inches of soil in the greenhouse and earthen ditch areas (estimated 400,000 square feet) is planned to be excavated. The rationale, monitoring and soil access restrictions are the same as those described in the Laguna Yard Closure Plan.

Verification Sampling and Testing

One verification soil sample is planned to be collected for each proposed residence having yard space coinciding with the excavation. At this time this appears to translate into approximately 88 samples. Sampling and



analysis procedures will be the same as those described in the Laguna Yard Closure Plan. All samples will be individually analyzed. In addition to the laboratory's normal quality assurance/quality control procedures, we plan to submit one "field blank" liner of Monterey sand to be analyzed for each day that verification samples are collected.

If detectable amounts of pesticides are found in a verification sample, a decision on continuing the excavation deeper would be made based on the Risk Assessment and Title 22 criteria. Soil with contamination exceeding Title 22 Total Threshold Limit Concentrations (TTLC's) or comparable limits established by ERS for chemicals not included in Title 22 would be excavated.

Isolation of Excavated Soil

According to the project Civil Engineer, Mr. Ted Cannis, the proposed development will have about 183,000 square feet of roadway coverage. We plan to subexcavate this roadway area to a maximum depth of six feet and use the contaminated soil as replacement backfill. This maximum depth would leave at least five feet of native clayey soil between the base of the fill and first ground water. A member of Terratech's environmental staff will monitor this earthwork to verify compliance. To provide premium protection against surface water infiltration, a full-depth asphalt concrete pavement section is planned.

Backfilling of Excavation

It is planned to use a combination of the material set aside from the subexcavation of the streets and import to backfill the excavation. The source of any import to be used will be evaluated for potential toxic concerns prior to hauling. Some degree of verification analysis by a State certified laboratory is anticipated. All backfilling would be subject to geotechnical observation and testing.

Contingency for Utility Excavations

The planned precaution steps for utility excavations will be the same as those described in the Laguna Yard Closure Plan.

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