CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 97-144

RESCINDING CLEANUP AND ABATEMENT ORDER NO. 88-1 FOR:

ALZA CORPORATION AND

STANFORD UNIVERSITY

for the property located at

1454 PAGE MILL ROAD
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location**: The site is located at 1454 Page Mill Road, Palo Alto, Santa Clara County. The property covers about 3.6 acres and is situated in the Stanford Research Park.

2. **Site History**: Leland Stanford Jr. University (Stanford) owns the property. Stanford has leased the property to several businesses since 1961. In 1972, Dynapol Corporation, a subsidiary of Alza Corporation, began sub-leasing the site from Page Mill Partnership which was leasing the property from Stanford. Alza took over the lease from Page Mill Partnership in April 1975 and continued to sub-lease the property to Dynapol until 1983.

   In February 1981, DNAX Corporation sub-leased a portion of the property from Alza and began operating a research and development (R & D) facility in the fields of genetic chemistry and cell biology. The chemicals used by DNAX include chloroform (up to 11 gallons per year) and carbon tetrachloride (up to 4 gallons per year). Alza sub-leased the other portion of the property to Beckman Corporation (Beckman) from July 1982 to January 1986. Beckman apparently conducted R & D at the site. Beckman stored its chemicals inside its laboratories, but no information was available on the amount of chemicals used or stored on-site.

On November 1986, Neurex (a subsidiary of Neuroscience Tech. Corp.) took over the sub-lease from DNAX, and shared the site with Alza. Neurex performed research in the areas of neuropeptides, animal tissues, and new molecular configurations. Neurex reportedly did not store any hazardous materials at the site. Neurex vacated the facilities in March 1987 leaving Alza as the sole occupant of the site.

Currently, Alza is the sole occupant at the site. The two main buildings on the site, Buildings N and R, are used to house Alza's R & D operations. A combination of biological and clinical researches currently occur in Building R. Building N houses Alza's chemical laboratories, plant engineering, and veterinary research departments. Chemicals used by Alza include: acetone, aquassure (pseudocumene 50%, surfactants 50%), chloroform, ethanol, heptane, isopropyl alcohol, methanol, methylene chloride and toluene.

Volatile organic compounds (VOCs), mainly chloroform and carbon tetrachloride, were detected both in soil and groundwater at the site in February 1987. These VOCs were first discovered when Alza voluntarily installed a monitoring well near a former chemical storage area near Building R. Alza further conducted site assessment and remedial investigations in 1987. The study indicated the presence of a contaminant source near the former chemical storage area, where previous tenants used to store drums containing solvents and other chemicals. Based on the analytical data, the VOCs detected at the site were most likely released by previous tenants, particularly DNAX. Alza reported that it has never stored chemicals in the former chemical storage area. However, as a ground lessee, Alza took over the responsibility to investigate and remediate the site.

3. **Regulatory Status**: The Board's Executive Officer issued Cleanup and Abatement Order No. 88-1 for the site on January 12, 1988. The order required Alza and Stanford to conduct remedial investigation, to implement interim remedial measures for soil and groundwater, and to perform groundwater monitoring at the site.

4. **Site Hydrogeology**: The site is located in the city of Palo Alto, California, east of the foothills of the Santa Cruz mountains. The geologic setting in the vicinity of the site consists of interbedded layers and lenses of clay, silt, sand, and gravel. Deeper subsurface soils in the vicinity of the site are composed of alternating layers of sand, clay, and gravel. Two shallow aquifers were identified underneath the site. The first shallow aquifer was encountered at a depth between 27 to 50 feet below ground surface (bgs), and the second shallow aquifer occurs at a depth between 70 to 90 feet bgs. Water from these two shallow aquifers is not currently used for any beneficial purposes. Potable groundwater occurs in a confined aquifer at a depth of about 210 feet bgs. The potable aquifer is separated from the overlying shallow aquifers by a thick clay aquitard.

The regional groundwater flow of the two shallow aquifers is towards the north-northeast, towards the San Francisco Bay. Based on the groundwater monitoring data obtained since 1988, VOC distributions were limited to the first shallow aquifer.

5. **Remedial Investigation**: Alza performed soil and groundwater investigation at the site in late 1980s.

   Soil: Alza conducted soil investigation in the vicinity of the former chemical storage area near Building R in 1987. Soil samples contained 0.520 mg/kg chloroform, 0.250 mg/kg carbon tetrachloride, and 0.130 mg/kg 1,1-dichloroethene. Alza reported that it has not stored these chemicals in the area. In 1988, Alza conducted soil vapor survey and installed two soil vapor extraction wells (SVE). It also installed four additional SVE wells to expand its SVE system in 1989. Alza conducted additional soil testing in November 1994 to assess the progress of soil remediation. At this time, the total VOC concentrations were less than 0.006 mg/kg, which is below the allowable cleanup level of 1 mg/kg.

   Groundwater: Alza initiated groundwater investigation in 1987. Alza conducted three phases of subsurface investigation to determine the lateral and vertical extent of VOCs at the site between 1987 and 1989. It installed eight monitoring wells, five wells located in the first shallow aquifer and three in the second shallow aquifer. Alza also installed two extraction wells in the first shallow aquifer. Groundwater data indicated presence of elevated concentrations of chloroform up to 6700 ppb and carbon tetrachloride up to 290 ppb near the former chemical storage area. Low levels of TCE and DCE were also detected in two monitoring wells located northwest of the site, where the source of these two chemicals was unknown.

6. **Adjacent Sites**: There are several active sites cross- and down-gradient of the site.

   Hewlett-Packard 1501 Page Mill Road: This site is a cross- and up-gradient of the Alza site. VOCs discovered at the HP site mainly include TCE and its break-down products and BTEX. The lateral and vertical extent of VOCs at the site is determined, and the VOC plume originated at the site has not commingled with Alza's plume. HP is conducting soil and groundwater remediations pursuant to the Board's site cleanup requirements adopted in August 1994.

   HP and Varian Sites: The HP 640 Page Mill Road and Varian 601 California Avenue sites are downgradient of the Alza site. VOCs discovered at the sites include chlorinated alkenes including TCE and its break-down products. HP and Varian have completed remedial investigations and are conducting remediations pursuant to the Board's site cleanup requirements adopted in September 1994. Based on the groundwater monitoring

data, the VOC plume originated at the Alza site has not migrated off-site or has not commingled with downgradient VOC plumes.

7. **Interim Remedial Measures**:

Soil Vapor Extraction: Alza conducted SVE system using six wells from April 1988 to November 1994. The system had effectively extracted about 23 pounds of chloroform and carbon tetrachloride, the two indicator compounds at the site. Alza operated the SVE system in cyclical mode to enhance the extraction process before it was permanently closed in 1995. The system was permanently closed for the following reasons: (i) VOC concentrations in soil had significantly declined and reached asymptotic levels, (ii) VOC mass removal rates reached asymptotic levels, and (iii) confirmatory soil testing results from two borings near the source area showed less than 0.006 mg/kg of total VOCs, which is below the allowable cleanup level of 1 mg/kg.

Groundwater Extraction: Groundwater extraction has been conducted at the site since April 1989. Originally, there were two extraction wells (X-5 and E-1). Well X-5 was pumped from April 1989 to May 1990, and was discontinued due to low water level. Well E-1 has been pumping since October 1989 to the present. Well E-1 was modified in December 1990, and groundwater extraction was resumed in February 1991 at an increased pumping rate. Well E-1 is currently pumping at a rate of approximately 0.6 gallon per minute. The system has been effective in reducing VOC concentrations and containing off-site migration of the plume. VOC concentrations in groundwater have dramatically declined to below MCLs and have reached asymptotic levels since remediation began at the site. VOC removal rates have also reached asymptotic levels.

8. **Remedial Actions:** In January 1990, Alza submitted a report labeled "Proposed Final Cleanup Objectives and Actions" (RAP) for the site. The report evaluated the interim remedial measures for soil and groundwater, evaluated cleanup alternatives and proposed cleanup goals for the contaminants of concern. The report recommended the soil and groundwater interim remedial measures as final remedies to meet the cleanup goals. To date, the projected activities proposed in the RAP are completed. Alza's SVE system was closed in mid-1995. Shortly, Alza requested closure of the groundwater extraction system in October 1995. The groundwater extraction system was not closed at that time because chloroform and carbon tetrachloride concentrations were not stable, and more time was required to observe the trend of the monitoring data.

9. **Basis for No Further Action:** The groundwater extraction and treatment system has been operating for over eight years and has succeeded in significantly reducing groundwater pollution. VOC concentrations are below maximum contaminant levels (MCLs) or laboratory detection levels in every monitoring well except in well E-1, where concentrations have been either non-detect or slightly above MCLs. However, the

average VOC concentrations are below MCLs in all monitoring wells. Therefore, closure of the groundwater remediation system and monitoring program is appropriate at this time for the following reasons:

- For the last two years, the average VOC concentrations in groundwater has been below MCLs.
- The second shallow aquifer has never been impacted by the contamination at the site.
- The first and second shallow aquifers are not currently used as drinking water sources, and it is unlikely that these aquifers will be used as drinking water sources in future.
- Groundwater in the two shallow aquifers does not immediately discharge into any creeks or other surface water bodies in the vicinity.
- The source of the contamination was a former chemical storage area that was closed prior to 1988. Since then, there was no reported additional VOC release at the site. The site had been fully characterized, and the lateral and vertical extent of the groundwater plume was defined prior to undertaking cleanup operations in 1988. Based on the effectiveness evaluation of the interim remedial measures, the soil vapor extraction and groundwater extraction systems were effective in reducing VOC concentrations to below MCLs and preventing migration of the plume.

For the above reasons, further groundwater remediation or monitoring at the site is neither necessary nor cost-effective.

10. **Cost Recovery**: Pursuant to California Water Code Section 13304, the dischargers are hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to oversee site closure activities as required by this Order.

11. **CEQA**: This action, to rescind Cleanup and Abatement Order, is categorically exempted from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.

12. **Notification**: The Board has notified the dischargers and all interested agencies and persons of its intent under California Water Code Section 13304 to rescind the Cleanup and Abatement Order for the site, and has provided them with an opportunity to submit their written comments.

13. **Public Hearing**: The Board, at a public meeting, heard and considered all comments pertaining to the rescission of the Cleanup and Abatement Order for the site.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that Cleanup and Abatement Order No. 88-1 is rescinded.

IT IS FURTHER ORDERED, that the dischargers are required to properly close all the existing extraction and monitoring wells at the site following methods and procedures consistent with the Santa Clara Valley Water District's Ordinance No. 90-1. The dischargers are also required to dismantle and remove all remediation equipment and piping at the site within 120 days after this Order is adopted.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on December 17, 1997.

Loretta K. Barsamian
Executive Officer

FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY SUBJECT YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO: IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

Attachments: Site Map

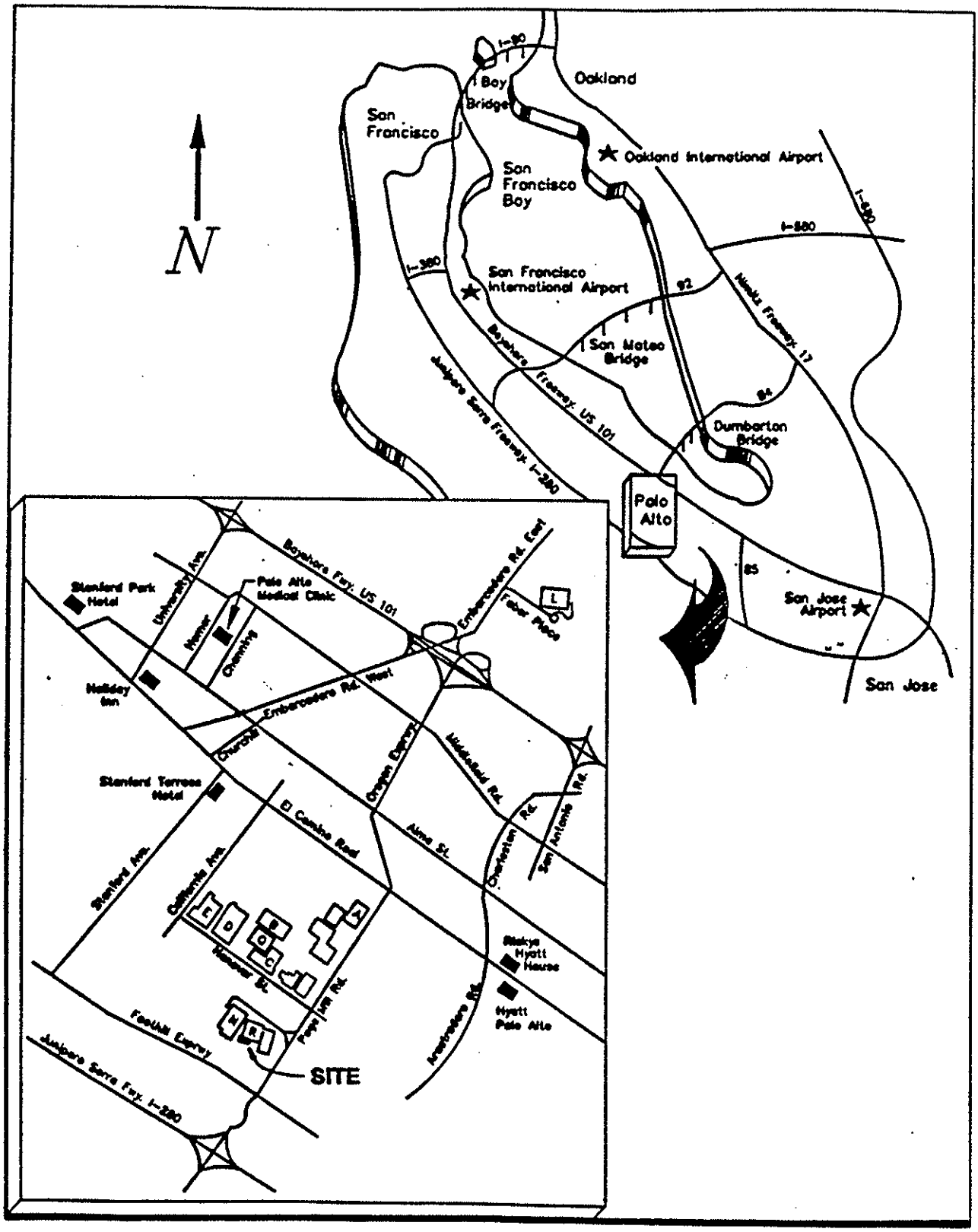

Figure 1. LOCATION MAP
1454 Page Mill Road, Palo Alto, California