

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 00-122

ADOPTION OF FINAL SITE CLEANUP REQUIREMENTS AND RESCISSION OF  
ORDER NO. 97-115 FOR:

*FAIRCHILD SEMICONDUCTOR CORPORATION AND SCHLUMBERGER TECHNOLOGY  
CORPORATION AND SR PROPERTIES, LLC*

for the property located at

*4300 REDWOOD HIGHWAY  
SAN RAFAEL  
MARIN COUNTY*

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

1. **Site Location:** The former Fairchild Semiconductor Corporation (Fairchild) Discrete Division Facility site (hereinafter the site) is a ten acre parcel located at 4300 Redwood Highway in northern San Rafael. It is bordered by the Northgate Industrial Park on the north and east. The north fork of Gallinas Creek is immediately south of the site. The creek flows eastward, discharging into tidal marshlands of San Pablo Bay about two miles from the site. U.S. Highway 101 and Redwood Highway lie along the site's western border.
2. **Site History:** The site was originally a tidal marsh. It was filled to an elevation of 10 feet above mean sea level for development in the late 1950's before Fairchild occupied the site. Fairchild began leasing the site and constructed an 89,000 square foot facility there in 1960. Subsequent additions were built in 1967 and 1980, increasing the total building square footage to 125,000 square feet. From 1960 to 1988, Fairchild manufactured semiconductor components there. Fairchild ceased operations at the site in March 1988. Stored hazardous materials formerly used in manufacturing were removed from the site by July 1988. The building was demolished in late 1995 and early 1996. The site is currently unoccupied.

Soil and groundwater investigations from 1982 to 1983 found soil and shallow groundwater contaminated with organic solvents and heavy metals. Chemicals detected in the soil and groundwater were believed to have originated from either the acid neutralization system located on the south side of the Fairchild building, from occasional spills and leaks, and/or from imported fill materials that were placed over

the site prior to its development. Based on the measured groundwater concentrations, there are no significant impacts on the adjacent Gallinas Creek's beneficial uses.

3. **Named Dischargers:** Fairchild and Schlumberger Technology Corporation (Schlumberger) are the former and current lessees, respectively, of the property under two long-term leases which expire on April 30, 2003. Fairchild's San Rafael facility has been inactive since 1988. The City of San Rafael General Plan 2000 land use designation for the property is Light Industrial/Office. This designation allows for warehousing, motor vehicle services and specialty retail uses.

Fairchild became a wholly-owned subsidiary of Schlumberger in 1979. In 1987, all issued and outstanding shares of Fairchild stock were sold by Schlumberger to National Semiconductor Corporation (National). Following the sale, Schlumberger continued to lease the site of Fairchild's former San Rafael facility. However, Schlumberger indemnified National against environmental liabilities associated with Fairchild's past activities at the site. Schlumberger is currently managing the cleanup on behalf of Fairchild. Because the existing soil and groundwater pollution was partially or fully caused by spills and leaks from the former Fairchild facility, Fairchild and Schlumberger (hereinafter dischargers) are named as dischargers in this order.

Because of the indemnification agreement between Schlumberger and National and because Fairchild and Schlumberger have always been cooperative and responsive to investigation and remediation requests from the Board, National is not named as a discharger in this order. However, the Board reserves the right to name National as a discharger in the future.

The site consists of two parcels, both of which are owned by SR Properties, LLC, a Delaware limited liability company, as successor-in-interest to the Laurie Ann Lieberman Arthur Avenue Trust, the Nancy Lee Kaplan Arthur Avenue Trust, the Charles E. Frank Arthur Avenue Trust, and the Elaine S. Frank Living Trust. SR Properties, LLC, as the current land owner, is also named as a discharger in this order. SR Properties, LLC will be responsible for compliance only if the Board or the Executive Officer finds that Fairchild and Schlumberger have failed to comply with the requirements of this order.

If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the site where it entered or could have entered waters of the state, the Board will consider adding those parties' names to this order.

4. **Regulatory Status:** This site is subject to the following Board order:

o Site Cleanup Requirements Order No. 97-115 adopted September 17, 1997

The purpose of this order is to update the Site Cleanup Requirements to include tasks necessary to implement the Final Remedial Action Plan.

5. **Site Hydrogeology:** Approximately 7.5 acres of the 10 acre site are covered by pavement and landscaping. The eastern 2.5 acres of the property remain undeveloped. The developed site surface is an average of 10 feet above mean sea level (MSL). A topographic rise to +331 feet MSL occurs approximately one-half mile southeast of the site. An elevation of +407 feet MSL occurs within less than one-third of a mile to the northwest of the site. One-half mile east of the site, the surface elevation of undeveloped land is 0 feet MSL.

Prior to urban and industrial development, the San Rafael site and immediate vicinity consisted of marsh land subject to flooding at high tide. The property was covered with imported fill in the late 1950s. The source of this fill is unknown. Boring logs and regional geology indicate that the Fairchild site is underlain by a layered sequence of imported fill, young bay mud and older bay sediments. Shale bedrock was found in one boring at a depth of 45 feet below the surface.

Groundwater occurs in all soil layers below a depth of about five feet. The young bay muds and older bay sediments are highly impermeable. Overlying fill soils are somewhat more permeable due to higher percentages of coarse grained material and irregular zones of lower compaction density that result in higher porosity. Groundwater beneath the site does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Groundwater elevation measurements from the site yield an inconsistent pattern of groundwater elevations that suggests poor lateral and vertical communication within the groundwater system. Regional groundwater flow for this area is reported to be in the easterly or southeasterly direction. Groundwater beneath the site is saline with high conductivity measurements (an average of over 17,000 mhos for groundwater samples taken from nine monitoring wells in March 1996) and high TDS measurements (between 4,340 and 45,600 mg/l for groundwater samples taken from 14 monitoring wells in 1982). Due to this salinity, high conductivity, and high TDS, local groundwater is not suitable for agricultural, industrial or domestic supplies and pursuant to State Water Resources Control Board Resolution No. 88-63 and the San Francisco Bay Regional Water Quality Control Board Resolution No. 89-39, groundwater beneath the site is not considered a potential source of drinking water.

6. **Remedial Investigation:** Analytical results of soil samples taken from borings indicated the presence of several solvents, principally trichloroethylene, 1,1,1-trichloroethane, toluene, and 1,2-dichloroethylene. Three exploration trenches were

also excavated at the north side of the Fairchild building to further investigate the nature of fill materials in that area. The major portion and concentration of solvents occurred in the imported fill layers. Solvents detected in the underlying silty clay (bay mud) appeared as localized conditions, possibly reflecting cross-contamination during sampling. Vertical migration of solvents was demonstrated to be impeded by the impermeable silty clays.

Since 1982, a total of 27 monitoring wells have been installed and numerous soil borings have been drilled to define the lateral and vertical extent of chemicals at the site. Inconsistent groundwater levels recorded in monitoring wells on-site indicated the absence of a definable groundwater gradient across the site and indicate that there is no significant movement of groundwater on or off the site. Lateral migration of solvents in the groundwater system would occur primarily by the action of diffusion.

Results of the above hydrogeologic and environmental investigations are summarized in the following three reports: (1) "Final Report, Soil and Ground-water Assessment" by Woodward Clyde Consultants (WCC, dated September 13, 1982), (2) "Report, Hydrogeologic Data Update" by Canonie Environmental Services Corporation (Canonie, dated February 1984), and (3) "Final Remedial Action Plan" by Locus Technologies (dated 5 August 2000). These reports documented the existence, magnitude, and areal extent of solvents and heavy metals in the subsurface soils and groundwater.

Up to 1,500 ppm of TCE, 480 ppm of DCE, 60 ppm of chloroform, 21 ppm of vinyl chloride, and 200 ppm of xylenes have been detected in the groundwater beneath the site. Heavy metals have been detected in soil samples from the site at up to 200 ppm for chromium, 670 ppm for copper, 310 ppm for lead, and 740 ppm for nickel. Groundwater samples contained up to 320 ppb of chromium, 70 ppb of cadmium, 140 ppb of copper, 630 ppb of nickel, 60 ppb of silver, 220 ppb of lead, 560 ppb of zinc, and 24 ppb of mercury.

7. **Adjacent Sites:** No other properties located adjacent to the site are known to have on-site sources of groundwater or soil contamination or have cleanup activities taking place.
8. **Interim Remedial Measures:** Canonie prepared a remedial action plan (RAP) for the Fairchild San Rafael site in early 1984. The RAP was approved by the Board on June 13, 1984. The RAP was implemented between 1984 and 1985 with construction of a slurry wall around the entire site to isolate and contain site groundwater. The slurry wall extends through the on-site fill material and New Bay Mud into the Old Bay Muds underlying the site. In addition to the slurry wall, approximately 1500 cubic yards of soil in areas of known hotspots were excavated to construct two groundwater extraction

trenches to the north and south sides of the then existing building. Groundwater recovery/reinjection wells were also installed. The trenches and wells were connected to a ground water treatment system that was constructed as a part of the facilities wastewater treatment system in 1985. A new groundwater treatment system was constructed at the southeast corner of the property in 1989.

Groundwater extraction and treatment began in 1989 and has continued to the present. Groundwater has been continuously collected in two extraction trenches and pumped to the granular activated carbon treatment system prior to discharge, under local permit, to the Las Gallinas Valley Sanitary District (LGVSD) sanitary sewer system. Approximately 400,000 gallons of groundwater are pumped from the site and treated during the wet season, from November 1 through April 15 of each year (the LGVSD permit allows the dischargers to discharge up to 15,000 gallons per day to the sanitary sewer system during the wet season); pumping is also allowed by the LGVSD during the dry season at up to 7,500 gallons per day. As of January 2000, this system has removed approximately 185 pounds of chlorinated solvents. The low permeability soil, the slurry wall, and the groundwater pumping system have effectively prevented pollution (both chlorinated solvents and heavy metals) from migrating off the site.

9. **Feasibility Study:** A Final Remedial Action Plan (FRAP) was submitted by the dischargers on August 5, 2000. The FRAP included a feasibility study that considered several remedial options for the soil and groundwater. The remedial options considered for shallow soils were: no action, soil vapor extraction, shallow soil excavation, and shallow soil drainage. For groundwater and deep soils, the considered remedial options were: no action, institutional controls, continued groundwater extraction and monitoring, natural attenuation, vapor barriers, deep soil excavation, and in-situ chemical oxidation.

The remedial options were first screened based on appropriateness for the site, given the chemicals of concern and the site characteristics. Then the remedial options were grouped together into four alternatives. Alternative 1 was the "no action" alternative, which is required for analysis under applicable regulatory guidance. Alternative 2 included continued groundwater extraction, institutional controls, and groundwater monitoring. Alternative 3 included natural attenuation, institutional controls, and groundwater monitoring. Alternative 4 included natural attenuation, institutional controls, groundwater monitoring, vadose zone excavation and drainage, and vapor barriers. Alternative 4 was selected as the recommended remedial alternative based on its superior short- and long-term effectiveness.

10. **Cleanup Plan:** The cleanup approach chosen is Alternative 4 of the FRAP. Alternative 4 will limit on-site exposures to chemical of concerns and ensure that the risk to human health and the environment are acceptable.

With this alternative, vadose zone soils will be excavated to a depth of approximately 3 feet below final grade in three areas. Soil exceeding 1 mg/kg total VOCs in the vadose zone will be disposed off-site. A gravel drainage layer will be installed in two of the excavated areas, with perforated piping sloped to the south extraction trench. A vapor barrier will be installed beneath the footprints of the future buildings to prevent potential vapor migration.

The groundwater extraction and treatment system will be shut-off but remain in standby mode so that it can be operated if concentrations in the monitoring wells between the slurry wall and Gallinas Creek exceed cleanup standards, or if the groundwater levels will adversely affect site building structures. Additionally, the treatment system may be restarted if significant plume migration toward the south slurry wall is observed.

A groundwater monitoring plan will be followed to determine whether significant plume migration will occur and whether cleanup standards are exceeded.

Natural attenuation processes are expected to reduce chemical concentrations. To evaluate the effectiveness of natural attenuation, a network of wells will be monitored by water quality sampling and water level measurements. Dissolved oxygen, dissolved organic carbon, ferrous and ferric iron, nitrate/nitrite, manganese, sulfate/sulfite, ethene/ethane/methane, oxidation-reduction potential, alkalinity, and pH will be monitored annually in six wells.

A vapor monitoring plan will also be followed. Air samples will be collected from above the liner under each building, above the outdoor excavated areas, and near the site boundaries for analysis by EPA method TO-14.

A Covenant and Environmental Restriction on Property (CERP) will also be recorded on the site. The CERP will restrict the land use to industrial, commercial, or office uses. The CERP will also restrict extraction of groundwater and excavation of soil below four feet. Attached to the CERP will be the Risk Management Plan.

11. **Risk Assessment:** A quantitative health risk assessment was included in the FRAP. The chemicals of concern considered in the risk assessment were trichloroethene, cis-1,2-dichloroethene, vinyl chloride, and xylenes for groundwater. The same chemicals with the addition of 1,1,1-trichloroethane were considered for soil.

The risk assessment was tailored specifically to the most recent development plans that were shown in the FRAP (e.g., commercial/industrial land use only). Risks were calculated for a professional worker. Volatilization from soil and groundwater into the buildings and outdoor air were considered. Based on the proposed development and

implementation of the Risk Management Plan, other exposure pathways are not significant, and could be eliminated from consideration

Risk calculations were performed which corresponded to the four remedial alternatives evaluated in the feasibility study. For Alternative 4, the recommended alternative, the risk assessment indicated an excess cancer risk of  $2.6 \times 10^{-7}$  and a hazard index of 0.012.

For comparison, the Board considers the following risks to be acceptable at the subject site under the imposed land use restrictions and assumed exposure scenarios: a hazard index of 1.0 or less for non-carcinogens, and an excess cancer risk of  $10^{-5}$  or less for carcinogens.

If development plans different from those outlined in the FRAP are identified for the site, the dischargers will be required (1) to incorporate the relevant specific factors associated with the proposed development, (2) to reevaluate the risks to human health and the environment, and (3) address potential concerns as required. Solvent constituents are the only known carcinogens at the site. Concentrations of these constituents do not pose a significant threat to public health or the environment under the current proposed development plan. There are no domestic drinking water wells at the site or in the vicinity that could be affected by the pollution at the site.

Due to risks that will be present at the site pending full remediation, institutional constraints are appropriate to limit on-site exposure to acceptable levels. Institutional constraints include a Covenant and Potential Environmental Restriction on Property (CERP) that notifies future owners and occupants of sub-surface contamination, restricts the extraction of groundwater, prohibits its use as a source of drinking water, and restricts the excavation of soil more than four feet below ground surface.

If the groundwater beneath the site migrates outside the slurry wall, it will represent a potential ecological threat to Gallinas Creek. The Cleanup Plan outlined in Finding 10 will ensure that the beneficial uses of Gallinas Creek will be protected.

## 12. Basis for Cleanup Standards

- a. **General:** State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in

exceedance of applicable water quality objectives. The previously-cited feasibility study confirms the Board's initial conclusion that background levels of water quality cannot be restored. The low permeability of the site soils prevents the use of effective treatment technologies without developing unacceptable chemical exposure at the surface. This order and its requirements are consistent with Resolution No. 68-16.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

- b. **Beneficial Uses:** The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in Title 23, California Code of Regulations, Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the site is saline with ion concentrations and ion ratios very similar to that of seawater. Local groundwater also contains high conductivity measurements (an average of over 17,000 mhos for groundwater samples taken from nine monitoring wells in March 1996) and high TDS measurements (between 4,340 and 45,600 mg/l for groundwater samples taken from 14 monitoring wells in 1982). Due to this salinity, high conductivity, and high TDS measurements, local groundwater is not suitable for agricultural, industrial or domestic supplies. Therefore, groundwater underlying and adjacent to the site does not qualify as a potential source of drinking water. At the present time, there is no known current use of groundwater underlying the site for agricultural, industrial or domestic supplies.

The existing and potential beneficial uses of adjacent Gallinas Creek and San Pablo Bay include:

- o Commercial and sport fishing
- o Estuarine habitat

- o Industrial service supply
  - o Fish migration and spawning
  - o Navigation
  - o Preservation of rare and endangered species
  - o Water contact and non-contact recreation
  - o Shellfish harvesting
  - o Wildlife habitat
- c. **Basis for Groundwater Cleanup Standards:** The groundwater cleanup standards between the slurry wall and Gallinas Creek for the site are based on applicable water quality objectives in the Basin Plan for surface waters with salinities greater than 5 parts per thousand (for the heavy metals). The groundwater cleanup standards for chlorinated solvents between the slurry wall and Gallinas Creek for the site are based on the following: USEPA Ecotox Chronic Criteria, USDOE Chronic Preliminary Remediation Goals, California Toxics Rule, and the California Drinking Water MCL (for Freon 113). Cleanup to these levels will result in acceptable residual risk to humans and to the environment.
- d. **Basis for Soil Cleanup Standards:** The soil cleanup standards between the slurry wall and Gallinas Creek for the site are 1 mg/kg total VOCs and 10 mg/kg total SVOCs. Cleanup levels are based on soil cleanup levels in the Basin Plan and are intended to prevent leaching of contaminants to groundwater and will result in acceptable residual risk to humans and to the environment. The metals soil cleanup standards between the slurry wall and Gallinas Creek for the site should be based on whether heavy metals concentrations in the groundwater exceed groundwater cleanup levels.
13. **Future Changes to Cleanup Standards:** The goal of this remedial action is to protect the beneficial uses of surface water adjacent to the site. Results from other sites suggest that full restoration of beneficial uses to groundwater as a result of active remediation at this site may not be possible. If full restoration of beneficial uses is not technologically nor economically achievable within a reasonable period of time, then the dischargers may request modification to the cleanup standards or establishment of a containment zone, a limited groundwater pollution zone where water quality objectives are exceeded. Conversely, if new technical information indicates that cleanup standards can be surpassed, the Board may decide that further cleanup actions should be taken.
14. **Basis for 13304 Order:** The dischargers have caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.

15. **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 investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.
17. **CEQA:** This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.
18. **Notification:** The Board has notified the dischargers and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.
19. **Public Hearing:** The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

**IT IS HEREBY ORDERED**, pursuant to Section 13304 of the California Water Code, that the dischargers (or their agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

**A. PROHIBITIONS**

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

**B. CLEANUP PLAN AND CLEANUP STANDARDS**

1. **Implement Cleanup Plan:** The dischargers shall implement the cleanup plan described in finding 10.

2. **Groundwater Cleanup Standards:** The following groundwater cleanup standards shall be met in all wells located between the slurry wall and Gallinas Creek:

Constituent	Standard (ug/l)	Basis
Benzene	46	USEPA Ecotox Chronic Criteria (Freshwater/Estuarine)
Chloroform	28	USDOE Chronic Preliminary Remediation Goal (Freshwater/Estuarine)
1,1-Dichloroethylene	3.2	California Toxics Rule (Human Consumption of Aquatic Organisms)
Cis-1,2-Dichloroethylene	590	USDOE Chronic Preliminary Remediation Goal (Freshwater/Estuarine)
Trans-1,2-Dichloroethylene	590	USDOE Chronic Preliminary Remediation Goal (Freshwater/Estuarine)
Ethylbenzene	290	USEPA Ecotox Chronic Criteria (Freshwater/Estuarine)
Freon 113	1200	California Drinking Water MCL
Tetrachloroethylene	8.85	California Toxics Rule (Human Consumption of Aquatic Organisms)
Toluene	130	USEPA Ecotox Chronic Criteria (Freshwater/Estuarine)
1,1,1-Trichloroethane	62	USEPA Ecotox Chronic Criteria (Freshwater/Estuarine)
Trichloroethylene	81	California Toxics Rule (Human Consumption of Aquatic Organisms)
Vinyl Chloride	525	California Toxics Rule (Human Consumption of Aquatic Organisms)
Xylenes	13	USDOE Chronic Preliminary Remediation Goal (Freshwater/Estuarine)

Chromium (VI) (the dischargers may at their option meet this limit as total chromium)	50.0	Basin Plan
Copper	3.1	California Toxics Rule
Lead	5.6	Basin Plan
Nickel	7.1	Basin Plan

**Notes:**

- a. Chronic surface water goals referenced if lower than surface water quality goals for human consumption of aquatic organisms (bioaccumulation) or if the later is not available. Freshwater goals apply to estuarine environments if lower than correlative saltwater goals.
- b. USEPA or USDOE surface water goals referenced if California-specific goals/standards not available.
- c. Surface water quality criteria not available for Freon 113 (1,1,2-trichloro-1,2,2-trifluoroethane). Drinking water standard used as substitute.
- d. Drinking water concerns not addressed (with the exception of Freon 113).

**References:**

- a. California Toxics Rule, 2000, 40 CFR Part 131: Water Quality Standards; Establishment of Numerical Criteria for Priority Toxic Pollutants for the State of California: Federal Register, May 18, 2000
- b. USDOE, 1997, Preliminary Remediation Goals for Ecological Endpoints: U.S. Dept. of Energy, Office of Environmental Management (prepared by R.A. Efrogmson, G.W. Suter II, B.E. Sample and D.S. Jones), August 1997, ES/ER/TM-162/R2.
- c. USEPA, 1996c, Ecotox Thresholds: U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, January, 1996, EPA 540/F-95/038, <http://www.epa.gov/superfund/resources/ecotox/>.

3. **Soil Cleanup Standards:** Soil cleanup standards of 1 mg/kg for total VOCs and 10 mg/kg for SVOCs shall be met in site soils between the slurry wall and Gallinas Creek. The cleanup standard for polluted soils attributable to the

dischargers shall be background concentrations for metals in site soils between the slurry wall and Gallinas Creek.

Alternate soil cleanup standards may be proposed by the dischargers based on site specific data. If higher levels of pollutants to be left in soils are proposed, the dischargers must demonstrate that the aforementioned cleanup standards are not feasible, that the alternate levels will not threaten the quality of waters of the State, and that human health and the environment are protected. Alternate cleanup standards for soils must be acceptable to the Executive Officer.

### C. TASKS

#### 1. IMPLEMENTATION OF FINAL REMEDIAL ACTIONS

COMPLIANCE DATE: 60 days after requested by the Executive Officer

Submit a technical report acceptable to the Executive Officer documenting completion of necessary tasks identified in the FRAP. Proposals for further system expansion or modification may be included in annual reports (see Self-Monitoring Program).

#### 2. PROPOSED INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: February 28, 2001

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the dischargers to prevent or minimize human exposure to soil and groundwater contamination. Such procedures shall include an acceptable deed restriction with an attached Risk Management Plan that will restrict the land use to industrial, commercial, or office uses. The deed restriction shall also restrict extraction of groundwater and excavation of soil below four feet.

#### 3. IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: 60 days after Executive Officer approval

Submit a technical report acceptable to the Executive Officer documenting that the proposed institutional constraints have been implemented.

**4. FIVE-YEAR STATUS REPORT**

**COMPLIANCE DATE:** (December 30, 2005)

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved cleanup plan. The report should include:

- a. A summary of the approved cleanup plan's effectiveness in controlling contaminant migration and protecting human health and the environment
- b. Comparison of contaminant concentration trends with cleanup standards
- c. Evaluation of effectiveness of natural attenuation
- d. Comparison of anticipated versus actual costs of cleanup activities
- e. Cost effectiveness data (e.g. cost per pound of contaminant removed)
- f. Summary of additional investigations (including results) and significant modifications to remediation systems
- g. Additional remedial actions proposed to meet cleanup standards (if applicable) including time schedule

If cleanup standards have not been met and are not projected to be met within a reasonable time, the report should assess the technical practicability of meeting cleanup standards and may propose an alternative cleanup strategy.

**5. IMPLEMENTATION OF CURTAILMENT**

**COMPLIANCE DATE:** February 28, 2001

Submit a technical report acceptable to the Executive Officer documenting completion of the curtailment of the groundwater remediation system as identified in the FRAP.

**6. REACTIVATION OF THE GROUNDWATER TREATMENT SYSTEM**

**COMPLIANCE DATE:** 60 days after reactivation of the groundwater treatment system

If the groundwater remediation system is reactivated because of significant plume migration, submit a technical report acceptable to the Executive Officer documenting reactivation of the groundwater remediation system.

**7. ADDITIONAL RISK ASSESSMENT(S)**

**COMPLIANCE DATE:** 60 days after creation of new development plans or as requested by the Executive Officer

Submit a technical report acceptable to the Executive Officer documenting the results of a quantitative health risk assessment based on new development plans which are identified and approved for the site.

**8. EVALUATION OF NEW HEALTH OR ECOLOGICAL CRITERIA**

**COMPLIANCE DATE:** 90 days after requested by the Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved cleanup plan of revising one or more cleanup standards in response to revision of drinking water standards, maximum contaminant levels, other health-based criteria, or ecological criteria.

**9. EVALUATION OF NEW TECHNICAL INFORMATION**

**COMPLIANCE DATE:** 90 days after requested by the Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating new technical information that bears on the approved cleanup plan and cleanup standards for this site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be requested unless the Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved cleanup plan or cleanup standards.

- 10. Delayed Compliance:** If the dischargers are delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the dischargers shall promptly notify the Executive Officer and the Board may consider revision to this Order.

## D. PROVISIONS

1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).
2. **Good Operation and Maintenance (O&M):** The dischargers shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.
3. **Cost Recovery:** The dischargers shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the dischargers over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.
4. **Access to Site and Records:** In accordance with California Water Code Section 13267(c), the dischargers shall permit the Board or its authorized representative:
  - a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
  - b. Access to copy any records required to be kept under the requirements of this Order.
  - c. Inspection of any monitoring or remediation facilities installed in response to this Order.
  - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the dischargers.
5. **Self-Monitoring Program:** The dischargers shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.

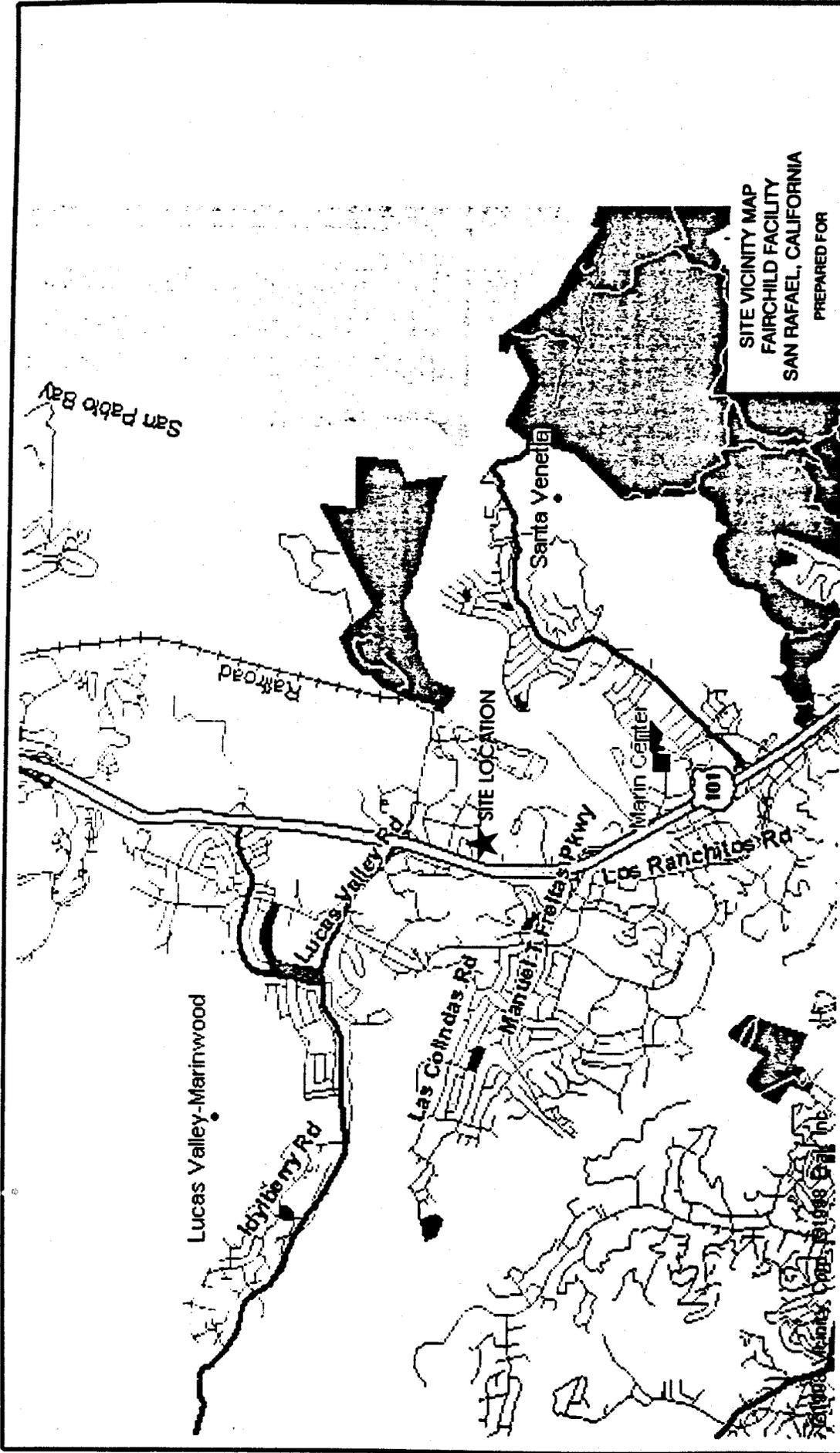
6. **Contractor / Consultant Qualifications:** All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.
7. **Lab Qualifications:** All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).
8. **Document Distribution:** Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies:
  - a. City of San Rafael Fire Department
  - b. Marin County Health Department

The Executive Officer may modify this distribution list as needed.

9. **Reporting of Changed Owner or Operator:** The dischargers shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.
10. **Reporting of Hazardous Substance Release:** If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the dischargers shall report such discharge to the Regional Board by calling (510) 622-2300 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.



SITE VICINITY MAP  
 FAIRCHILD FACILITY  
 SAN RAFAEL, CALIFORNIA  
 PREPARED FOR

**FAIRCHILD**  
 SEMICONDUCTOR CORP.



DRAWING NO. 92-035-A26

FIGURE 1

**LEGEND:**

-  AREA OF ELEVATED GROUNDWATER CONCENTRATION
-  VADOSE SOIL EXCEEDING 1mg/kg TOTAL VOC'S
-  PROPERTY LINE
-  C-28 OBSERVATION WELL
-  R-1 RECOVERY WELL
-  C-20, C-21, C-22 COLLECTION PIT AND VALVE PIT
-  C-23 8" COLLECTION PIPE CLEAN OUT
-  D-25 TRENCH PIEZOMETER
-  SLURRY WALL
-  [ ] LIMITS OF TRENCH EXCAVATION
-  8" PERFORATED PVC RECHARGE/COLLECTION PIPE

**NOTES:**

1. SEE TRENCH ABBREVIATION KEY FOR DESIGNATION OF EXCAVATION TRENCH COMPONENTS.

**TRENCH ABBREVIATION KEY**

- N - NORTH TRENCH
- S - SOUTH TRENCH
- E - EAST SIDE OF TRENCH
- W - WEST SIDE OF TRENCH
- C - CLEANOUT
- P - PIEZOMETER
- CP - COLLECTION PIT
- VP - VALVE PIT

NO.	DATE	REVISION / REVISION	CRS	AS

PROPOSED AREAS FOR ADDITIONAL REMEDIATION  
4300 REDWOOD HIGHWAY  
SAN RAFAEL, CALIFORNIA

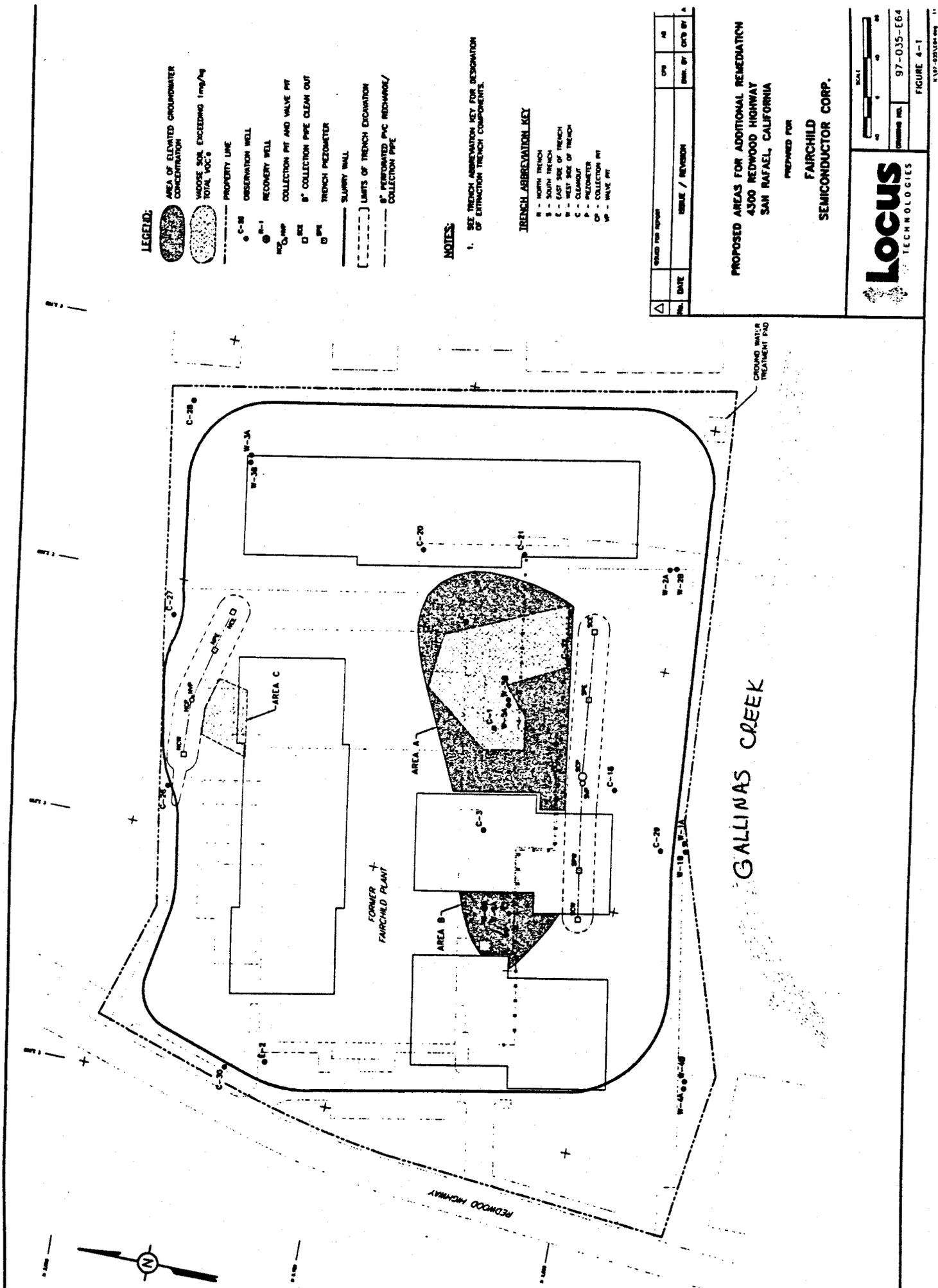
PREPARED FOR  
**FAIRCHILD**  
SEMICONDUCTOR CORP.



PROJECT NO. 97-035-E64

FIGURE 4-1

DATE: 11/17/97



GALLINAS CREEK

REDWOOD HIGHWAY

GROUND WATER TREATMENT PAD

FORMER FAIRCHILD PLANT

AREA C

AREA A

AREA B

- 11. **Secondarily-Responsible Discharger:** Within 60 days after being notified by the Executive Officer that other named dischargers have failed to comply with this order, SR Properties, LLC as property owner shall then be responsible for complying with this order. Task deadlines above will be automatically adjusted to add 60 days.
  
- 12. **Rescission of Existing Order:** This Order supercedes and rescinds Order No. 97-115.
  
- 13. **Periodic Site Cleanup Requirement Review:** The Board will review this Order periodically and may revise it when necessary.

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 November 29, 2000.

  
 Loretta K. Barsamian  
 Executive Officer

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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

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Attachments: Site Maps  
 Self-Monitoring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

*FAIRCHILD SEMICONDUCTOR CORPORATION AND SCHLUMBERGER TECHNOLOGY CORPORATION AND SR PROPERTIES, LLC*

for the property located at

*4300 REDWOOD HIGHWAY  
SAN RAFAEL  
MARIN COUNTY*

1. **Authority and Purpose:** The Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. XX-XXX (site cleanup requirements).
2. **Monitoring:** The dischargers shall measure groundwater elevations semiannually in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following schedule:
  - a. Selected monitoring wells inside the slurry wall: once per year for chromium VI (the dischargers may at their option meet this limit as total chromium), total copper, total lead, total nickel and for solvents (EPA Method 8240, EPA Methods 8010 and 8020, or equivalent). These wells are W-2A, C-18, C-29, E-2, and a well intended to replace W-3A.
  - b. All monitoring wells in the shallow zone outside the slurry wall: once per year for chromium VI (the dischargers may at their option meet this limit as total chromium), total copper, total lead, total nickel, and twice per year for solvents (EPA Method 8240, EPA Methods 8010 and 8020, or equivalent). These wells are W-1A, W-4A, C-30, C-26, and C-27.
  - c. Selected monitoring wells in the deep zone inside and outside the slurry wall: once every two years for chromium VI (the dischargers may at their option meet this limit as total chromium), total copper, total lead, total nickel and for solvents (EPA Method 8240, EPA Methods 8010 and 8020, or equivalent). These wells are W-1B, W-2B, and W-4B.

- d. Selected monitoring wells in the shallow zone inside the slurry wall: once per year for natural attenuation indicators (e.g., dissolved oxygen, dissolved organic carbon, ferrous and ferric iron, nitrate/nitrite, manganese, sulfate/sulfite, ethene/ethane/methane, oxidation-reduction potential, alkalinity, pH) and solvents (EPA Method 8240, EPA Methods 8010 and 8020, or equivalent). These wells are C-1, C-3, C-12, E-1, W-5A, and W-6A.

The dischargers shall sample any new monitoring or extraction wells semiannually and analyze groundwater samples for the same constituents as specified in subparagraph 2.a above. The dischargers may propose changes to the sampling schedule; any proposed changes are subject to Executive Officer approval.

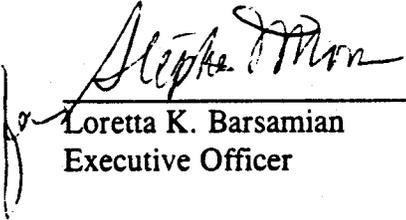
After the site is developed, the dischargers shall collect and analyze representative samples of vapor according to the following schedule:

- a. Vapor monitoring points under buildings above the high density polyethylene liner: quarterly for the first year, then semiannually for the second year, and annually for following years. Samples shall be collected and analyzed for solvents using EPA Method TO-14 or equivalent.
  - b. Vapor monitoring points above outdoor excavated areas in the breathing zone: quarterly for the first year, then semiannually for the second year, and annually for following years. Samples shall be collected and analyzed for solvents using EPA Method TO-14 or equivalent.
  - c. Background vapor monitoring points near U.S. Highway 101, near Gallinas Creek, and near the northeast corner of the site in the breathing zone: quarterly for the first year, then semiannually for the second year, and annually for following years. Samples shall be collected and analyzed for solvents using EPA Method TO-14 or equivalent.
  - d. On days when vapor samples are collected, barometric pressure, ambient air temperature, and wind speed and direction shall be measured on-site or measurements shall be obtained from nearby weather stations.
3. **Monitoring Reports:** The dischargers shall submit semiannual monitoring reports to the Board no later than July 30 and January 31 of each year. The first semiannual monitoring report shall be due on July 30, 2001. The reports shall include:

- a. **Transmittal Letter:** The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the dischargers' principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.
  - b. **Groundwater Elevations:** Groundwater elevation data shall be presented in tabular form. Historical groundwater elevations for previous years shall be included once every five years starting in the January 31, 2004 report.
  - c. **Groundwater Analyses:** Groundwater sampling data shall be presented in tabular form. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results for previous years shall be included once every five years starting in the January 31, 2004 report. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see Paragraph 6, record keeping - below).
  - d. **Vapor Analyses:** Vapor sampling shall be initiated within six months of site development. Vapor sampling data shall be presented in tabular form and a figure showing the locations of vapor sampling shall be included in the monitoring reports. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical vapor sampling results for previous years shall be included once every five years starting in the January 31, 2004 report. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see Paragraph 6, Record Keeping below).
  - e. **Status Report:** The status report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures) and work planned for the following reporting period.
4. **Violation Reports:** If the dischargers violate requirements in the Site Cleanup Requirements, then the dischargers shall notify the Board office by telephone as soon as practicable once the dischargers have knowledge of the violation. Board staff may, depending on violation severity, require the dischargers to submit a separate technical report on the violation within five working days of telephone notification.

5. **Other Reports:** The dischargers shall notify the Board in writing prior to any site activities, such as construction or underground tank removal that have the potential to cause further migration of contaminants or that would provide new opportunities for site investigation.
6. **Record Keeping:** The dischargers or their agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Board upon request.
7. **SMP Revisions:** Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of the dischargers. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Loretta K. Barsamian, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on November 29, 2000.

  
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Loretta K. Barsamian  
Executive Officer