



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

Maureen F. Gorsen, Director
700 Heinz Avenue
Berkeley, California 94710-2721



Arnold Schwarzenegger
Governor

RESPONSE TO COMMENTS

Corrective Action Final Remedy Selection

**Tyco Electronics Corporation
300 Constitution Drive
Menlo Park, California**

November 28, 2006

The Department of Toxic Substances Control (DTSC) held a 45-day public review and comment period from July 27, 2006 through September 11, 2006 on the proposed remedies for soil and groundwater for Tyco Electronics Corporation in Menlo Park, California.

At the conclusion of the comment period, DTSC received two comment letters (shown below in *italics*). One is from Mr. Dean D. Peterson, Director, County of San Mateo, Department of Environmental Health ("the County"), and the other is from Ms. Arlinda Heineck, Community Development Director, City of Menlo Park. DTSC has prepared the following responses:

I. Letter from the County of San Mateo

Thank you for the opportunity to comment on the proposed soil and groundwater remedies at the Tyco Electronics Corporation (Tyco) site. San Mateo County Health Department staff reviewed the information included with the July 26, 2006 letter submitted by the Department of Toxic Substances Control (DTSC). The proposed remedy for the site appears to include at least 50-years of long-term groundwater monitoring, a deed restriction limiting future use of the entire property to commercial and industrial land uses, and additional restrictions over 0.26 acres including monitoring of an engineered cap over 0.1 acres of the 0.26 acres for the indefinite future.

Comment #1-1

While these measures in general will likely prevent any exposure of the residual contaminants proposed to be left in place at the site, it would be in the best interest of public health to perform corrective actions in the short-term to alleviate any concerns of the long-term existence of residual contaminants at concentrations unacceptable for human health or the environment. In particular, the use and monitoring of engineered

caps have not been proven to be absolutely effective in preventing the direct contact and soil inhalation and ingestion exposure pathways from being completed at some time in the future.

Response #1-1

When evaluating and selecting remedies for this site, DTSC considered both the short-term impact and long-term impact that soil and groundwater remedies may have on human health and the environment. DTSC also used risk assessment studies to help determine the requirements for the cleanup of release of hazardous waste. The risk assessment studies took into consideration the current land use and the reasonably foreseeable future land use of the site. The federal and state laws, regulations and policies governing cleanup or corrective action for hazardous waste release do not mandate that the contaminated sites be cleaned up to non-restricted land use standards. Instead, these laws and regulations authorize DTSC and other oversight agencies to determine, on the basis of any risk assessment studies and other available information, the acceptable cleanup levels to ensure adequate protection of human health and the environment, given the current land use and the reasonably foreseeable future land use of the site. In this case, the current land use and the reasonably foreseeable future land use of the site are for commercial and industrial purposes.

Engineered caps in conjunction with monitoring have been commonly and successfully used on many sites that are contaminated with hazardous waste or substances statewide and nationwide. DTSC and other regulatory agencies such as United States Environmental Protection Agency (USEPA), the Regional Water Quality Control Boards (RWQCBs) all have detailed requirements for designing and constructing engineered caps over the contaminated areas. In addition to the engineering control, DTSC and other agencies also require institutional controls such as imposing land use restrictions by way of a Land Use Covenant (LUC) to preclude exposure to any remaining hazardous waste at the site.

Comment #1-2

The use of engineered caps is highly dependent on effective communication between all relevant parties involved. Unfortunately, key personnel positions in the necessary communication chain such as DTSC staff, City of Menlo Park Building and Planning Department staff, responsible party staff, and future property owners or tenants may change over time which could result in information not properly being conveyed or understood and the unintentional disturbance of the engineered cap and subsequent exposure of residual contaminants. This was most recently demonstrated at the Intel site, another DTSC site, in Santa Clara in November 2005 where an engineered cap was disturbed due to utility repairs by a tenant and exposure pathways of residual contaminants was completed for the construction/utility workers and potentially any members of the public in close proximity to the disturbed cap.

Response #1-2

It is unfortunate that an incident occurred at the former Intel site located at 3935 Freedom Circle, Santa Clara and that the engineering cap was compromised. It was during an annual site certification inspection that Intel's consultant noted the cap disturbance. DTSC was notified by Intel as soon as Intel was aware of the cap disturbance. Intel's consultant collected samples from the stockpiled soil immediately and analyzed the samples for arsenic, lead, and organochlorine pesticides. Laboratory analytical results confirmed that the soil beneath the asphalt cover does not contain arsenic, lead, or organochlorine pesticides at levels hazardous to human health or the environment. All results were well below the USEPA Preliminary Remediation Goals (PRGs) for industrial soil. No hazardous constituent exposure to human health or the environment occurred due to this incident. DTSC believes that the annual inspection and certification process has proven effective in the Intel case.

The LUC required for this site imposes various restrictions and requirements on the use of the property. The area covered by the engineered cap is a relatively small area. The LUC restricts the use of the property to commercial and industrial purposes only, prohibits excavation and other earth-moving activities unless they are pre-approved by DTSC, and specifically prohibits any activity that may disturb or adversely affect the integrity of the engineered cap. The LUC runs with the land and binds all present and future owners in perpetuity. The LUC imposes notification requirements about the presence of hazardous waste and about property transfer. The LUC also requires the present and future owners to conduct annual inspections and submit annual inspection reports to DTSC. For the purpose of implementing and enforcing the LUCs, DTSC continues to track former and operating hazardous waste facilities that underwent corrective action and have LUCs in place as part of the final remedy. In addition, DTSC and Tyco are entering into an Operation and Maintenance Agreement to further ensure that the final remedy for the site is being properly implemented and maintained.

Comment #1-3

This also highlights another shortcoming of the engineered cap which is the voluntary compliance aspect. Someone in the future, not directly involved with the site today, may chose to intentionally violate the conditions applicable to the engineered cap. This may complete the exposure pathway for any construction/utility workers, who may not have had any knowledge of the residual contaminants and have not voluntarily chosen to expose themselves to the residual contaminants, and any members of the public in close proximity to the disturbance. The inspections of the engineered cap by DTSC and the responsible party are listed as occurring annually and unless the inspection of the engineered cap occurred during the time of the disturbance, then the regulatory agency and the responsible party would be unaware of the exposure.

Again, for this particular site, the engineered cap is over residual concentrations of PCBs at concentrations unacceptable for human health or the environment at a depth between 9.5- and 10.5-feet below ground surface in saturated soil, as described in the draft negative declaration. The chances of even an accidental violation of the engineered cap's conditions and subsequent exposure to residual contaminants is even less likely due to the residual contaminants' depth.

Response #1-3

Compliance with the restrictions and requirements of the LUC and the Operation and Maintenance Agreement is not voluntary. The LUC and the Operation and Maintenance Agreement are enforcement tools for DTSC to oversee the implementation and maintenance of the final remedy for the site. DTSC will take enforcement action for any violations of the LUC and the Operation and Maintenance Agreement, and will take other necessary actions to protect human health and the environment. Please also see Response #1-1 regarding the engineered cap.

DTSC agrees with the County's comment that the depth of the most significant residual contamination at the site is greater than 9.5 feet below grade, and the potential for excavation through the engineered cap to the depth of 9.5 feet or more or the exposure of hazardous waste constituents to human health and the environment is very unlikely.

Comment #1-4

However, the use of this type of institutional control highlights a philosophical difference of opinion between San Mateo County and state level environmental regulatory agencies such as the DTSC and Regional Water Quality Control Board. Reliance on engineering controls such as caps and vapor barriers and their long-term oversight is suspect due to the fact compliance is voluntary and self-regulated.

Response #1-4

The federal and state environmental laws, regulations and policies governing hazardous waste management and corrective action process provide for health-risk based cleanup levels and the use of institutional controls such as land use covenants. The institutional controls are requirements of the selected remedy and they are not of a voluntary nature.

When DTSC evaluates and selects corrective measures for a site, DTSC must ensure that these measures (1) are protective of human health and the environment; (2) attain media cleanup standards; (3) control the source of release so as to reduce or eliminate, to the extent practical, further releases that might pose a threat to human health and/or the environment; (4) meet all applicable waste management requirements; (5) achieve short-term and long-term effectiveness; (6) reduce toxicity, mobility, or volume; (7) maintain long-term reliability; (8) are implementable; and (9) are cost-effective. DTSC

applied the foregoing nine criteria when selecting the remedy for this site. In addition, DTSC has determined that the multi-layer engineered cap, additional groundwater monitoring wells, land use covenant, and long term monitoring and inspection will maintain site integrity, monitor residual contaminants behavior, and assure continued protection of human health and the environment.

Comment #1-5

It is noted that in the health risk assessment summary for the eastern and western portions of the site, the construction/utility worker hazard index was at or above unity (of 1.0) in Area B for the current unchanged and future modified site configurations with the current commercial/industrial zoning. It would be better to address the contamination now rather than at some time in the indefinite future. The biggest reason for not dealing with the residual PCBs under the engineered cap appears to be cost.

Response #1-5

The hazard index for the construction/utility worker in Area B of the western portion of the Tyco Menlo Park site is equal to one (1). Pursuant to both DTSC and USEPA risk assessment guidance, only when the hazard index exceeds one, there may be concern for potential health effects. A hazard index equal to one is acceptable or considered protective of human health.

The hazard indices for the current and future construction/utility worker in Area B of the eastern portion of the Tyco Menlo Park site are 2.4 and 2.6, respectively. These values are attributable to inhalation of background concentrations of aluminum. Aluminum concentrations detected in the Eastern Portion of the site, which range from 1,080 milligrams per kilogram (mg/kg) to 35,000 mg/kg, are consistent with background concentrations (ranging from 30,000 to 106,000 mg/kg and an average of 73,000 mg/kg) found in California soils (Bradford, et al. 1996) and may not be indicative of actual contamination. Aluminum was carried through the human health risk assessment because it was difficult to identify Menlo Park or Santa Clara County lithology-specific soil aluminum data for comparison with site-specific aluminum data. Nonetheless, the on-site soil aluminum concentrations are consistent with the range of naturally-occurring concentrations in California soils (Bradford et al., 1996). Therefore, the eastern portion, Area B hazard indices are likely an artifact resulting from an inability to evaluate aluminum using site-specific statistical comparisons as was completed for other inorganic chemicals present at the site.

It should also be noted that for purposes of the human health risk assessment, it was conservatively assumed that aluminum in soil may be re-suspended in dust during construction activities and inhaled by a construction worker/utility worker for 250 days per year for an entire year. It is very unlikely that construction activities in Area B would continue for an entire year or that one individual would be exposed to dust generated

during construction for a year. In addition, much of the eastern portion of the site is currently covered with approximately 18 inches of approved clean imported fill, which prevents exposure to aluminum via the inhalation pathway under current site conditions.

DTSC took into consideration the above-mentioned data and facts, among other factors, in selecting the final remedy for this site, which includes an engineered cap, a LUC and long term groundwater monitoring.

Comment #1-6

To that end, please consider these comments on the alternative analysis table. The designation of low, moderate, and high rankings to each of the four remedial alternatives under each of the nine selection criteria evaluated are always arbitrary which can not be avoided.

Under the short-term and long-term effectiveness, the soil capping may actually be considered low ranking due to the comments stated above. It is noted that the excavation and off-site disposal alternative was given only a moderate ranking for this criteria, possibly for the potential exposure of workers and nearby community to contaminants during excavation.

Response #1-6

DTSC agrees that the application of nine (9) evaluation criteria to rank various remedial alternatives in low, moderate, and high categories is subjective and incorporates site information that is not always explicitly stated. Although not explicitly stated, the soil capping ranking of "moderate" took into account the risk of conducting additional excavation which involved penetration of the bay mud layer currently confining the underlying sandy material recognized for its flow and heaving soil properties. Penetration of bay mud layer is expected to lead to flowing sands and flooding of the excavation. The condition of flowing sands would result in the possible remobilization and redistribution of PCBs and instability and settlement of surrounding soils. In addition, the penetration of the bay mud layer could provide a preferential pathway for PCB migration into the sandy material which is the first recognized aquifer zone. For these reasons, DTSC ranked the soil capping alternative short-term and long-term effectiveness as "moderate", instead of "low" to account for geotechnical issues associated with the sandy material that occurs beneath the bay mud.

Comment #1-7

However, it should also be stated that approximately 5,000 cubic yards of soil have already been excavated and disposed of off-site during various interim remedial measures conducted over the past several years at this site. The extent of residual PCB contamination appears to be 0.26 acres between 9.5 and 10.5 feet below ground

surface which is approximately 423.5 cubic yards. How much more exposure would there be versus the exposure which may have already happened based on the excavation and off-site disposal of 10 times that amount of soil?

Response #1-7

The residual PCB contamination actually extends between 9.5 to 21 feet, not between 9.5 and 10.5 feet below the ground surface; the volume of soil would be more than 423.5 cubic yards.

Interim remedial measures are actions to control or eliminate releases or potential releases of hazardous waste hazardous constituents prior to the implementation of a final remedy. The objective of interim remedial measures is to immediately reduce the mass and toxicity of the hazardous waste and thereby reducing health risks on a near-term basis for existing receptors.

Raychem Corporation, predecessor of Tyco Electronics (formed in 1999 following the merger of Tyco with AMP and Raychem) conducted a series of technical assessments and activities to address the potential soil and groundwater contamination at the site during the 1990s, including a Preliminary Endangerment Assessment study and additional investigations conducted under DTSC's oversight.

Prior to August of 1999, PCBs were only detected in relatively shallow soils at a depth of less than 10 feet below ground surface (bgs) in the area of the former Therminol Fluid Heater (the primary source area for PCBs). It was believed that since the initial sampling during the late 1980s and early 1990s, the PCB contamination was confined to the soil above the bay mud layer at depths from 7 or 8 feet bgs. PCB- contaminated soil was partially removed during the 1980s but further excavation work to remove more of the contaminated soil was hampered by the presence of buried utility lines supporting manufacturing operations and the presence of pipe rack supports and a cooling tower that would be structurally at risk if further excavation took place.

Once contamination was discovered at greater depths in 1999, additional records were searched and it was learned that some penetrations had occurred of the bay mud layer when installing pilings to support footings for a new pipe rack installed in the early 1990s. These penetrations could be providing channels for downward vertical movement of PCBs. Actions were taken immediately to remove the source of the PCB contamination above the bay mud layer during 2000 when several buildings on the site were being demolished, facilitating the excavation activities.

Based on the investigative and assessment work on soils and hydrogeology and the interim remedial measures conducted at the site, DTSC determined that:

- in-situ thermal treatment techniques would only be practical for relatively dry soils at sites with much deeper groundwater than existed at this site;
- penetration of the bay mud layer would lead to rapid flooding of any excavation that penetrated the bay mud layer;
- control of flooding of an excavation into the bay mud layer might not be practical and at a minimum would require extensive sheet piling and slurry wall installation with high ground-water pumping rates from the excavation;
- excavation of contaminated soil above the bay mud (and the semi-confined water-bearing zone below) and removal from the site for disposal at an approved disposal site would be the fastest and probably the most efficient and cost-effective method to remove the contaminated soil; and
- quick removal could minimize the potential for further contamination of deeper soils (below the bay mud layer) with PCBs.

DTSC and USEPA concluded that soil removal above the groundwater level, an engineered cap, long term groundwater monitoring, and institutional controls would be the most effective remedy for this site.

Comment #1-8

The comments stated above could also be applied to a discussion of the long-term reliability and implementability of the soil capping alternatives. Therefore, it appears the soil capping and excavation alternatives appear to be equal in terms of the alternatives evaluation and the only real difference between the two alternatives is the cost of excavation versus indefinite monitoring. Is \$1.617 million worth not having to worry about the residual PCBs over at least the next 50 years? It is also worth mentioning that a large amount of cost associated with the soil excavation alternative most likely relates to the removal of the engineered cap which was placed at the site during one of the several interim remedial excavations.

Response #1-8

The final remedy, including long-term groundwater sampling, will cost approximately \$994,000. As discussed in Response #1-4, the cost is only one of the many factors for selecting the engineered cap, long-term groundwater monitoring and land use covenant as the final remedy for soil and groundwater. In addition to the discussions in the Statement of Basis, penetration of bay mud layer during excavation is expected to lead to flowing sands and flooding of the excavation. The condition of flowing sands would result in the possible remobilization and redistribution of PCBs and instability and settlement of surrounding soils. In addition, the penetration of the bay mud layer could provide a preferential pathway for PCB migration into the sandy material which is the first recognized aquifer zone.

Comment #1-9

Frankly, this larger-scale evaluation should have been done prior to the interim remedial excavations and therefore the true cost of getting the deeper contaminated soil would have been known and may be much more favorable in light of the fact that the top several feet of soil was going to be removed already. In fact, this kind of piece-mealing approach actually violates the CEQA process in terms of development projects and possibly in terms of properly evaluating remedial actions.

Response #1-9

Please see Response #1-7 on Interim remedial measures.

As pointed out in Response # 1-7, the interim remedial measures were necessary to protect existing receptors by immediately removing the major source of contamination to reduce health risks, and they were not considered "piece-mealing" for the purposes of the California Environmental Quality Act (CEQA). DTSC determined that these interim remedial measures were necessary to protect on-site workers and remove the source of additional groundwater contamination. DTSC prepared analysis and documentation pursuant to CEQA for these interim remedial measures and determined that these measures would not have any adverse impact on the environment.

Before DTSC selected the final remedy, DTSC prepared an Initial Study to address the proposed five groundwater monitoring wells, long-term groundwater monitoring and the land use covenant, as well as the interim remedial measures. Based on the analysis contained in the Initial Study, DTSC determined that the proposed project would not result in significant impacts to human health and the environment, and prepared a Negative Declaration.

Comment #1-10

In several places throughout the draft negative declaration, the installation of the five (5) new monitoring wells is described as "required to follow RWQCB standards". The Department of Water Resources (DWR) is the appropriate state agency whose standards should be followed. The DWR has issued the State of California Well Standards bulletin which actually allows local implementing agencies to modify any of the well standards as necessary. Therefore, the draft negative declaration should actually state the DWR and San Mateo County well standards should be followed.

Response #1-10

DTSC agrees that the Initial Study/Environmental Checklist made an incorrect reference regarding the well permit. It should have stated that Tyco must follow the standards of

the State Department of Water Resources (DWR), not the RWQCB. However, this incorrect reference in the Initial Study did not affect DTSC's impact analysis.

DTSC will require Tyco to follow all appropriate local and state standards including but not limited to County of San Mateo, DWR, and RWQCB; and to obtain any necessary approvals or permits from these agencies prior to constructing any groundwater monitoring wells.

Comment #1-11

The draft negative declaration also states that the proposed remedial action at the site will have no effect on housing. While housing typically is addressed in terms of addition units of the proposed action, this proposed action may actually eliminate 80 acres of land for potential future residential use. This may be considered a significant impact in the San Francisco Bay area, particularly in light of the need for affordable housing.

Response #1-11

DTSC disagrees with the County's statement that the proposed remedy may have a significant impact on housing in the Bay Area. Tyco's 80-acre parcel is currently zoned and has been used solely for commercial and industrial use since the 1960s. Housing is not permitted on the property. The LUC does not change the current zoning or land use of the property; neither does it reduce the land available for housing in the Bay Area.

Comment #1-12

This site is not listed in DTSC's EnviroStor database. Therefore, anyone searching the EnviroStor database for any contamination issues associated with Tyco will not be made aware of the significant amount of work conducted in response to the environmental issues at this site. If the DTSC is going to state this database has all sites for which it is the lead oversight agency in terms of contamination issues, then make sure it includes ALL of the sites for which you are the lead agency."

Response #1-12

Currently, the EnviroStor only lists sites or cleanup projects overseen by DTSC's Site Mitigation program and sites that DTSC has referred to the Regional Water Quality Control Boards. DTSC plans to include the corrective action sites overseen by DTSC's Hazardous Waste Management Program in the database in the near future.

II. Letter from the City of Menlo Park

Thank you for forwarding all documents related to the proposed remedies for soil and groundwater contamination at the Tyco Electronics Corporation (Tyco). We appreciate

the opportunity this provides the City of Menlo Park to participate in the review of the proposal.

We have reviewed the documents, including the Fact Sheet, Statement of Basis, Negative Declaration and Initial Study, and Draft Land Use Covenant Implementation and Enforcement Plan. It is the City's understanding that interim remedial measures were taken from May 2000 through November 2004 to either remove and/or contain soil contamination at the Tyco property while long-term solutions were being developed. In addition, we understand that the following measures are necessary to complete remediation at the site:

- Install five new wells near the capped area in the eastern portion of the site;*
- Restrict future use of the site to commercial and/or industrial uses only (land use covenant);*
- Conduct inspections to check on the condition of the site;*
- Inspect the engineered cap; and*
- Sample/monitor the groundwater periodically beneath the site.*

As a part of the City's review, I was able to meet with Leonard Long P.E., Vice President of SCS Engineering, George Reid RG, CHG, CEG, REA, Principle Geologist with GRA Associates, Inc. and Kenneth Finney of Beveridge & Diamond. As active participants in the clean up efforts, they were able to provide a detailed background of the clean-up process to date as well as an explanation of the remaining soil contamination issues. They were also able to answer the City's questions to our satisfaction.

Comment #2-1

We would note that although we were hopeful that a land use covenant would not be necessary, we understand that a future property owner would have the option of pursuing the remediation necessary to request a modification to or termination of the land use covenant.

Response #2-1

It is correct that if there is a change in local zoning or land use, and/or if the current or future property owner wishes to conduct further corrective action at the site, the property owner may request DTSC to consider modifying the remedy, and the property owner may clean up the site to levels acceptable for residential or other land use. The LUC will be modified accordingly or terminated if the site is cleaned up for unrestricted residential use.