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Agency

Office of
Emergency and
Remedial Response

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June 1991

EPA

Superfund Record of Decision:

South Bay Asbestos Area (Amendment), CA

50272-101

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South Bay Asbestos Area, CA
First Remedial Action (Amendment)

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14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 550-acre South Bay Asbestos Area site consists of a ring levee in Alviso, San Jose, California. Land use in the area is mixed residential, commercial, light industrial, and agricultural. A 300-acre wetlands area is located adjacent to the site and is partially covered by the levee. The ring levee was constructed by the City of San Jose as an emergency measure during a flood in March 1983, but a number of subsequent EPA investigations determined that the levee soil was comprised of 40 percent asbestos. In 1986 and 1987, EPA conducted several emergency response actions to reduce asbestos exposure around the site including the removal of an asbestos pile, paving and covering local roads and lots, and spraying the levee with a dust-suppressing polymer. A 1988 Record of Decision (ROD) provided for installation of a vegetated soil cover over the levee. A subsequent 1989 ROD addressed the remediation of portions of the site not previously addressed and provided for paving of contaminated truck yards, monthly wet sweeping of streets, removal of asbestos waste debris, cover requirements, inspections, deed restrictions on landfills, and site maintenance and monitoring. This ROD amends the 1988 ROD for the asbestos-contaminated soil in the ring levee and surrounding area. The primary contaminant of concern affecting the soil is asbestos, an inorganic.

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - South Bay Asbestos Area, CA
First Remedial Action (Amendment)
Contaminated Medium: soil
Key Contaminants: inorganics (asbestos)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 32
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(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

The selected remedial action for this site includes excavating and disposing offsite 25,000 cubic yards of asbestos-contaminated levee soil; restoring any wetlands areas located under the levee, or which were disturbed by the excavation; and conducting soil sampling. The estimated present worth cost for this remedial action is $2,100,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: The chemical-specific soil cleanup goal for asbestos is based on health-based criteria, and is 1 area percent.

RECORD OF DECISION AMENDMENT

RING LEVEE OPERABLE UNIT

SOUTH BAY ASBESTOS AREA

ALVISO DISTRICT, SAN JOSE, CALIFORNIA

June 1991

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RECORD OF DECISION AMENDMENT

DECLARATION

Site Name

Alviso Ring Levee
Operable Unit
South Bay Asbestos Area

Site Location

Community of Alviso
San Jose, California

Statement of Basis and Purpose

This document amends the selected remedial action for the Ring Levee Operable Unit of the South Bay Asbestos Area, located in the community of Alviso in the City of San Jose, California. This document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. Section 9601 et. seq., and the revised National Contingency Plan, 55 Fed. Reg. 8666 et. seq. (March 8, 1990) to be codified at 40 C.F.R. Part 300. This decision is based on the administrative record for this site. The attached Administrative Record Index (Exhibit 1) identifies the documents on which the selection of the remedial action is based.

Assessment of the Site

Actual or threatened releases of asbestos from the Ring Levee, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

Description of the Selected Remedy

This Record of Decision amends the previous Record of Decision for the Alviso Ring Levee Operable Unit (# RO9-88/026) dated September 29, 1988. The overall remedy for the rest of the South Bay Asbestos Area site was selected in a separate Record of Decision (# RO9/89/044) dated September 29, 1989. The previous ROD for the ring levee selected a soil cover remedy consisting of 12 inches of compacted soil base, and 6 inches of topsoil planted with native vegetation to control erosion. The ROD further provided for environmental mitigation required under Section 404

of the Clean Water Act, 33 U.S.C. Section 1344, for impacts of the soil cover, and for deed restrictions to prevent disturbance of the soil cover.

EPA is now amending the Record of Decision to select the removal alternative. This remedy, although favored by many members of the community and the potentially responsible parties, was not originally selected due to several implementation problems. EPA was concerned about the loss of flood protection once the levee was removed, the potential for increased asbestos exposure during levee excavation, loading and transport, and also the projected high cost for landfill disposal of the levee material. Acceptable solutions to these problems have since been proposed; complete removal of the levee is now EPA's preferred alternative.

The new selected remedy includes:

- Removal of the entire levee, after flood control improvements on the Coyote Creek are completed. (Completion is currently expected in 1994.) Post-removal sampling shall be conducted to confirm that the levee has been completely removed;

- Continued polymer spraying of the levee for dust control, semiannually or as needed, until the levee is removed;

- Use of stringent dust control measures during levee removal;

- Off-site disposal of levee material in compliance with federal and state laws and regulations;

- Restoration of the previously existing wetlands underlying the levee.

The estimated costs associated with levee removal are approximately $ 2.1 million. Once the levee is removed, no long term monitoring and maintenance will be required, as this source of contamination will no longer be present in the Alviso community.

The State has no technical objections to the selected remedy.

Statutory Determinations

The removal remedy for the Ring Levee Operable Unit of the South Bay Asbestos Area meets the remedy selection standards in CERCLA Section 121, 42 U.S.C. Section 9621, and the National Contingency Plan, 40 CFR Part 300. The selected remedy is protective of human health and the environment. The selected remedy attains the Federal and State requirements that are legally applicable or relevant and appropriate under the circumstances of

the release or threatened release, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable; however, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element.

Since the revised selected remedy calls for the complete removal of the Ring Levee, EPA currently anticipates that five-year reviews will not be required specifically for the Ring Levee Operable Unit, following completion of the remedial action. However, in accordance with CERCLA Section 121(c), 42 U.S.C. Section 9621(c), a review may be conducted if the remedial action has not been completed within five years of its initiation. In addition, because hazardous substances will remain elsewhere at the South Bay Asbestos Area site, EPA will conduct five year reviews for the overall site, as set forth in the Record of Decision dated September 29, 1989. Any reviews of the ring levee remedial action required by CERCLA Section 121(c), the NCP and any applicable EPA guidance may be conducted in conjunction with the reviews for the overall site.

Daniel W. McGovern

6.26.91

Daniel W. McGovern
Regional Administrator, EPA Region 9

Date

RECORD OF DECISION AMENDMENT
SUMMARY

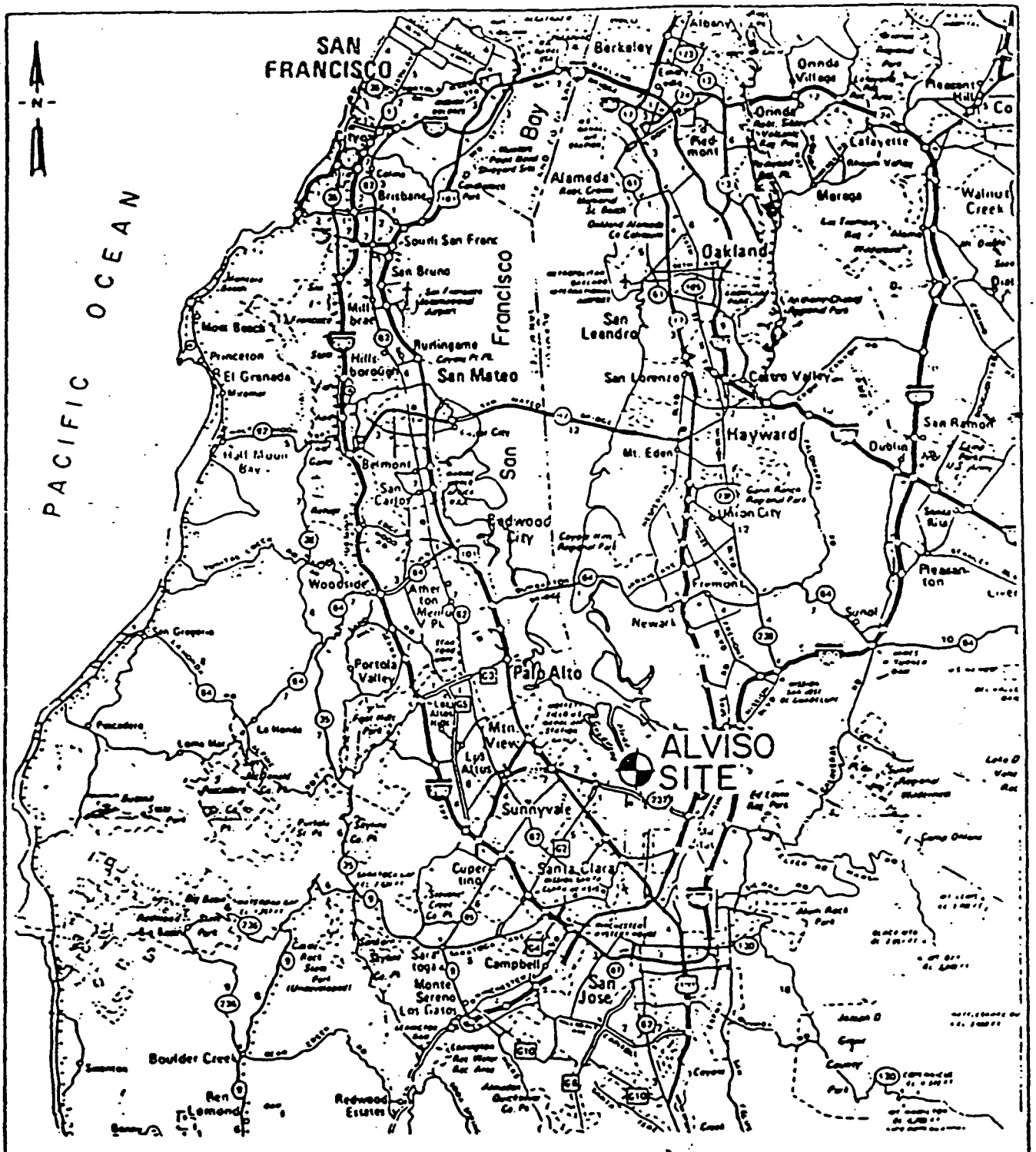
I. Site Name, Location, and Description

The South Bay Asbestos site is located at the northern end of the Santa Clara Valley and at the southernmost extent of San Francisco Bay. The site, which encompasses the community of Alviso, is a mix of residential, commercial, light industrial and agricultural land uses, comprising an area of about 550 acres (Figure 1). Approximately 1700 residents live in Alviso. The town is located in a quiet section of the Silicon Valley between Highway 237 to the south, rapidly growing Santa Clara to the west and south and expanding office development to the east and north-east.

Alviso is highly susceptible to flooding, due to its low elevation and proximity to the Bay. Flood-producing storms occur within the region every few years. Two major streams, the Guadalupe River and Coyote Creek enter the Bay to the west and north-east of Alviso, respectively. These rivers do not provide natural local drainage since they are leveed to prevent overbank flooding. The Guadalupe River was channelized in 1963 by the Santa Clara Valley Water District (SCVWD) to provide for greater flood flow capacity. The streams are under tidal influence and therefore, discharge to the Bay is impeded during high tides. Numerous salt evaporation ponds are present between Alviso and the Bay, further impeding natural drainage into the Bay.

The development of agriculture in the region was facilitated by widespread ground water withdrawal from irrigations wells. Between 1934 and 1967, aquifer compaction due to overpumping caused the ground surface of the Santa Clara Valley to subside four to six feet, to an elevation below sea level, significantly increasing the potential for flooding. The land surrounding Alviso has been artificially raised with soil and debris fill, some containing asbestos, to offset the effects of subsidence.

The community of Alviso is adjacent to Bay wetlands. Over the last century, most of the tidal flats and marshlands which surround San Francisco Bay have been filled or altered. Near Alviso, a fragment of wetlands survives as the New Chicago Marsh, a National Wildlife Refuge covering approximately 300 acres. The ring levee was partially constructed in wetlands; approximately 2.82 acres of wetlands were buried under the levee.



Source: Operating Unit Feasibility Study, Alviso Area; Project WC85-192; Figure 1. Canonie Engineers, February, 1987.

Project No. 288-ER2	South Bay Asbestos Site Camp Dresser & McKee Inc.	REGIONAL LOCATION MAP	Figure 1

The wetlands adjacent to Alviso are a significant wildlife habitat because they provide an interface between fresh and saltwater environments. The wetlands support several endangered or threatened species, including the Salt Marsh Harvest Mouse (Reithrodontomys raviventris), California Clapper Rail (Rallus longirostris obsoletus), Golden Eagle (Aquila chrysaetos), and Peregrine Falcon (Falco peregrinus). Small mammals and a great number of birds and waterfowl species use the wetlands and surrounding upland habitats (i.e., land elevated above the water level of the marsh).

Description of the Levee

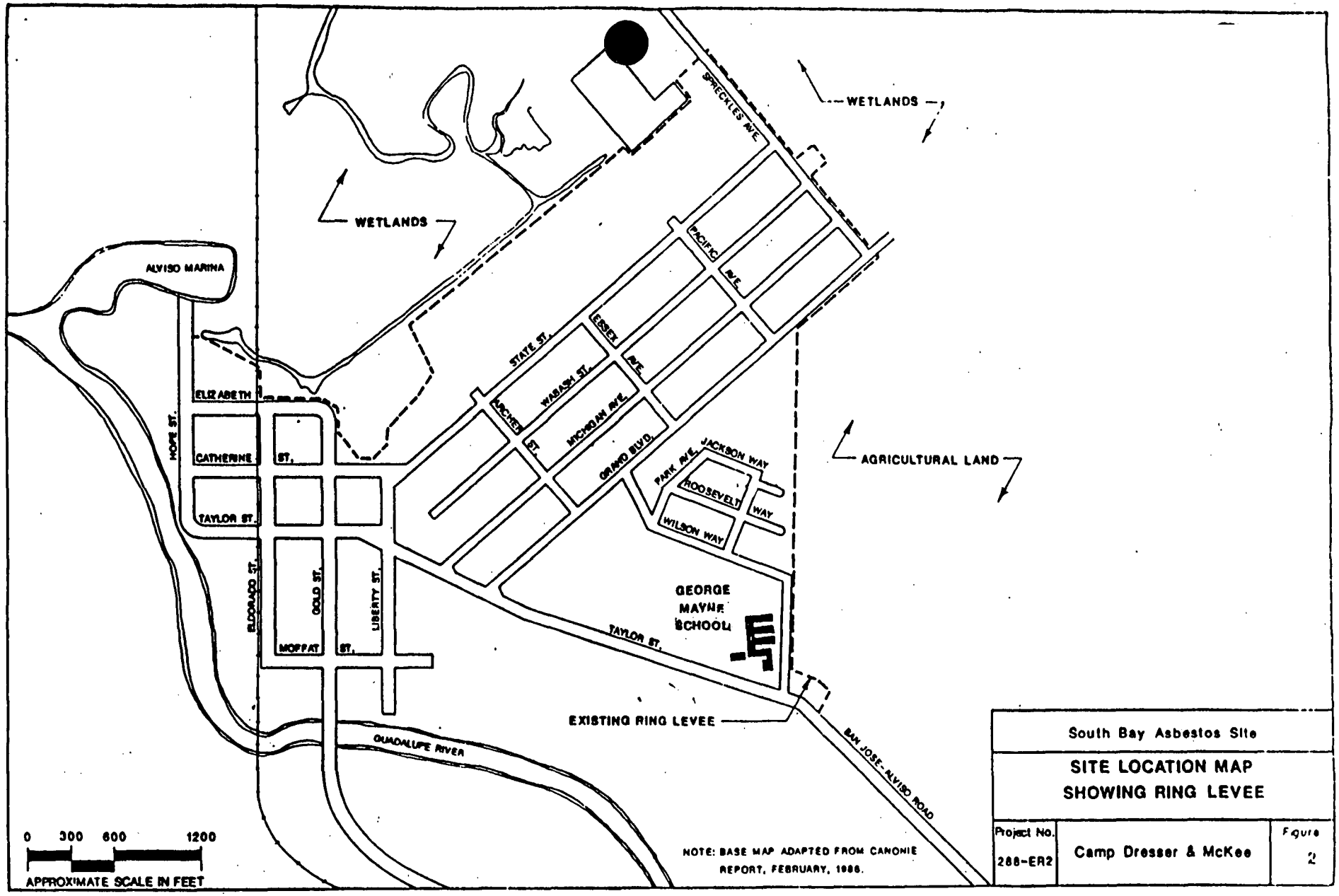
The ring levee, which extends around the community of Alviso on the east, north, and northwest (Figure 2), was constructed of approximately 25,000 cubic yards of material and is approximately four to six feet in height, two miles in length, and has a trapezoidal shape. The levee has side slopes generally steeper than 2:1, and covers an area of approximately eight acres. A narrow, approximately two-foot wide path exists along the crest.

The ring levee immediately adjoins School Street, the homes on the eastern side of Alviso (the O'Neil Tract), and continues along Grand Blvd. and Spreckles Ave. The levee is isolated from public streets along the northwest, where it continues behind the commercial trucking operations along State Street. The steep outboard or bayward side of the levee abuts wetlands areas along Spreckles Avenue and along the commercial truckyard operations. At its western end, the levee borders two private homes. One home owner has fenced the levee to prevent foot traffic. The levee terminates at the northwestern end of town.

The levee immediately adjacent to streets and homes is used heavily as a pedestrian walkway. Residents, and particularly children, have been seen walking and jogging along the berm, playing on the slopes, picnicking or riding bicycles on or adjacent to the levee. The levee in these areas is barren of vegetation. In addition, it appears that motor vehicles may also drive over the levee. Areas removed from public access tend to be well-vegetated with grasses and weeds.

II. Site History

The City of San Jose constructed the ring levee as an emergency measure during a flood in March 1983, which caused the evacuation of the entire town for sixteen days as flood waters overtopped the Coyote Creek channels and existing levees. The ring levee was constructed in an attempt to divert existing and possible future flood waters from the community. Because of the urgency of the situation, San Jose did not obtain the necessary permits from the Army Corps of Engineers (COE), who has jurisdiction over such construction, and did not consult with other



South Bay Asbestos Site

SITE LOCATION MAP SHOWING RING LEVEE

Project No.		Figure
288-ER2	Camp Dresser & McKee	2

federal and state agencies. San Jose planned to obtain an "after the fact permit" from the COE; however, no permit was ever issued for the levee. The levee was constructed with serpentine soil and rock from Azevedo Quarry, which was later found to contain up to 40% asbestos.

The South Bay Asbestos Area site was proposed for inclusion on the National Priorities List in June of 1984, and was listed on the NPL in October 1984, with a score of 44.68. After assuming the lead role from the state in 1986, EPA conducted several emergency measures to reduce asbestos exposure around the town, including paving a lot adjacent to the George Mayne School, paving an unpaved section of Spreckles Avenue, and removing an asbestos debris pile and chip sealing the road and parking lot at the Environmental Education Center, located within the New Chicago Marsh, to the east of Alviso. EPA also sprayed the ring levee with a dust suppressing polymer in 1986 and again in 1987. In April 1988, the City of San Jose signed a Consent Agreement with EPA which required the City to maintain the levee by periodically applying the sealant and to conduct operation and maintenance activities at the Environmental Education Center. The City sprayed the levee in July of 1988 and again in October of 1989.

In April 1988, EPA released the Operable Unit Feasibility Study (OUFS) for the ring levee, and signed a Record of Decision selecting a vegetated soil cover for the levee in September 1988. Although the cover proposal received a generally favorable review, the Potentially Responsible Parties (PRPs) and many of the community members preferred the complete removal of the asbestos-contaminated levee. The ROD noted that the PRPs had indicated an interest in pursuing complete removal of the levee, an option that EPA did not select due to its high cost, the proportionally greater potential for asbestos releases during removal operation, the institutional, regulatory, and technical problems associated with replacing the levee's flood protection function, and the difficulties associated with disposing of the removed material. The 1988 ROD noted that complete removal of the levee, assuming it could be accomplished in a safe manner, would be at least as protective as the selected soil cover remedy and would be a permanent solution. The ROD further stated that if the PRPs formally proposed to remove the levee, and could identify acceptable solutions to the problems associated with this option, EPA would consider amending the Record of Decision to select the removal alternative.

EPA has identivied two potentially responsible parties, the City of San Jose and A.J. Raisch Paving Company. San Jose constructed the levee and A.J Raisch Paving Company was the supplier of the material. EPA sent general notice letters to San Jose in July 1987, and to Raisch in February 1988. Special Notice letters pursuant to CERCLA Section 122 were sent in August 1988.

The Remedial Investigation/Feasibility Study for the South Bay Asbestos Area Site was released for public comment in February 1989, and in September 1989, EPA signed a second Record of Decision for the overall South Bay Asbestos Area site, to address those portions of the site that were not included in the Ring Levee Operable Unit. The overall remedy includes: paving contaminated truck and industrial yards with asphalt or other suitable resurfacing material; control of street dust emissions through monthly wet sweeping; removal of asbestos waste debris; cover requirements, inspections, and deed restrictions on landfills; and routine maintenance and monitoring.

A more complete history of EPA and interagency site investigations and response actions may be found in the previous RODs for this site.

III. Community Participation

All requirements for public participation as specified in Section 113(k)(2)(B)(i-v) and Section 117 of CERCLA and the NCP have been satisfied. The new proposed plan was mailed to residents and interested members of the public, and copies were made available in the information repository at the San Jose Public Library (Alviso Branch) and in the administrative record file on review at the EPA Region 9 Docket Room. A public comment period on the new proposed plan was held February 26 - March 27, 1990. Notice of the new proposed plan and public comment period were published in both English and Spanish on February 20, 1990 in the San Jose Mercury News and Milpitas Post. No comments on the new proposed plan were submitted during the public comment period. However, responses to comments concerning the levee that were made during the February 15, 1989 public meeting on the Proposed Plan for the remediation of the overall South Bay Asbestos Area Site are provided in the Responsiveness Summary, Attachment A of this ROD.

IV. Risk Assessment

Asbestos is the contaminant of concern at this site. The ring levee has been identified as one of the primary sources of asbestos within the community. Concentrations of asbestos in the levee range from non-detect to 40% by area using polarized light microscopy.

Asbestos is a generic term referring to two groups of naturally-occurring hydrated silicate materials having a fibrous crystalline structure. Chrysotile fibers belong to the serpentine group; actinolite, amosite, anthophyllite, cummingtonite, crocidolite, and tremolite belong to the amphibole group. Asbestos fibers have been widely used because of their high tensile strength an flexibility and their noncombustible, nonconducting

and chemical-resistant properties. The fibers have been used in insulation, brake linings, cement pipe, paper products, textiles and building products.

Asbestos is a known human carcinogen and has been the subject of numerous epidemiological studies. There is no threshold level of exposure below which there is no risk. The primary diseases that have been associated with asbestos exposure are asbestosis, lung cancer, and mesothelioma; others include cancers of the larynx, pharynx, gastrointestinal tract, kidney, and ovary as well as respiratory diseases such as pneumonia.

Lung cancer is currently responsible for the largest number of deaths from exposure to asbestos. It has been associated with exposure to all principal commercial asbestos fiber types. Excessive lung cancer rates have been documented in groups of workers involved with the mining and milling of asbestos and the manufacture and use of asbestos products. Studies in which the extent of exposure can be approximated provide evidence that lung cancer increases linearly with both level and duration of exposure.

Human studies have also shown that exposure to asbestos can cause mesothelioma, a cancer that occurs as thick diffuse masses in the serous membranes (mesothelia) that line body cavities. Mesothelioma occurs in the pleura (the membrane that surrounds the lungs and lines the lung cavity) and the peritoneum (which surrounds the abdominal cavity). Epidemiological studies suggest that the incidence of mesothelioma is related to dose and time from first exposure.

Asbestosis, which involves fibrosis of lung and pleural tissues, is another serious chronic disease associated with high levels of exposure to asbestos. A full discussion of the health effects of asbestos is found in the EPA document Airborne Asbestos Health Assessment Update, EPA 600/8-84-003F, June 1986.

To evaluate the risks posed by the ring levee under worst case scenarios, two separate experiments were conducted by California DHS in 1985 on the levee itself. The experiments were designed to simulate actual exposures based on observations of adults and children walking, bicycling, crawling, and playing on the levee. The first experiment consisted of raking and shoveling loose levee soil directly upwind of a sampler. An electric fan was positioned to simulate wind and blow the disturbed soil into the sampler. The second experiment consisted of shoveling the soil on the levee and collecting air samples in an adult's breathing zone; a toy truck was then used to simulated play, while air samples were collected downwind in a child's breathing zone, without a fan.

The results from the first experiment exceeded the Occupational Safety and Health Act (OSHA) Permissible Exposure Limit (PEL) of 0.2 fibers ber cubic centimeter by two orders of mag-

nitude. The results from the second experiment exceeded the OSHA PEL by one order of magnitude. Although the simulations represented an extreme asbestos exposure scenario, the exceedences of OSHA standards in a residential setting indicated that uncontrolled levee dust posed a significant health threat to the community. Since this time, a dust suppressant polymer has been periodically applied to the levee to control the release of dust, until a more permanent remedy is implemented.

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g. 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site. When preliminary risk calculations were made using the air concentrations from the DHS experiments and worst case exposure scenarios, the risks greatly exceeded the EPA's acceptable risk range of 10^{-4} to 10^{-6}.

V. Applicable or Relevant and Appropriate Requirements

Under Section 121(d) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 42 U.S.C. Section 121 (d), remedial actions must attain a degree of clean-up which assures protection of human health and the environment. Additionally, remedial actions that leave any hazardous substance, pollutant, or contaminant on-site must meet a level or standard of control that at least attains federal and more stringent state standards, requirements, criteria, or limitations that are "applicable or relevant and appropriate" under the circumstances of the release. These requirements, known as "ARARs", may be waived in certain instances. Additionally, only substantive (in contrast to administrative) federal and state requirements need to be followed.

"Applicable" or "relevant and appropriate" requirements are further defined in the revised National Contingency Plan (NCP), 55 Fed. Reg. 8666 (March 8, 1990), 40 C.F.R. part 300. "Applicable" requirements are those clean-up standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal environmental or state environmental or facility siting law that specifically address a hazardous substance, pollutant or contaminant, remedial action, location or other circumstance at a CERCLA site. "Relevant and appropriate" requirements are those clean-up standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting law that, while not directly "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to

those encountered at the CERCLA site such that their use is well-suited to the particular site. For example, requirements may be relevant and appropriate if they would be "applicable" but for jurisdictional restrictions associated with the requirement. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be ARARs.

The determination of which requirements are "relevant and appropriate" is somewhat flexible. EPA and the State may consider the type of remedial actions contemplated, the hazardous substances present, the waste characteristics, the physical characteristics of the site, and other appropriate factors in identifying ARARs. It is possible for only part of a requirement to be considered relevant and appropriate.

There are three types of ARARs. The first type includes "chemical-specific" (i.e. contaminant specific) requirements. These ARARs are usually health- or risk-based numerical values or methodologies that set limits on concentrations of specific hazardous substances, pollutants, and contaminants in the environment. A second type of ARAR includes location-specific requirements which set restrictions on certain types of activities based on site characteristics, for example, restrictions on activities in wetlands, floodplains, and historic sites. The third type of ARAR includes action-specific requirements. These are technology- or activity-based restrictions which are triggered by the type of action under consideration. As described in the NCP, ARARs must be met during the implementation of the remedial action as well as at its completion.

ARARs must be identified on a site-specific basis from information about specific chemicals at the site, specific features on the site, and actions that are being considered as remedies.

Most of the ARARs listed below were identified as ARARs for the soil cover remedy in the previous Record of Decision for the Ring Levee Operable Unit. Differences for the new remedy are noted. Also, some additional ARARs described in the 1989 overall ROD are also included, along with some additional explanation and citations.

In addition to ARARs, EPA or the State may, as appropriate, identify other advisories, criteria or guidance, not necessarily promulgated requirements, to be considered for a particular release. The "to be considered" (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, or other federal or state agencies that may be useful in developing CERCLA remedies.

Contaminant-Specific ARARs

The following ARARs, while specific to asbestos, address techniques relating to the implementation of the selected remedial action, rather than health- or risk-based numerical standards or methods. Thus, they might also be considered "action-specific" ARARs.

1. Clean Air Act, National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations (40 C.F.R. Sections 61.151, 61.152, 61.153)

NESHAPS, and similar BAAQMD regulations, require "no visible emissions", specified cover requirements, dust suppression, wetting methods or alternative approved control and dust suppression methods for disposal and handling of asbestos-containing waste material. The NESHAPs requirements for emissions control and dust suppression is an ARAR for implementation of this remedy. However, the specified cover requirements, while relevant and appropriate for the original soil cover remedy, are not ARARs for the removal remedy, since the levee will be removed rather than covered.

In the previous ROD selecting the soil cover, the California Bay Area Air Quality Management District (BAAQMD) regulations (Reg. 11, rule 2, 305.3.1) were listed as an ARAR. However, as a point of clarification, the BAAQMD wetting and dust suppression requirements do not come under the NCP's definition of more stringent state ARARs, because they are virtually identical to the NESHAPs requirements.

2. Toxic Substances Control Act (TSCA) and Asbestos Hazard Emergency Response Act (AHERA) regulations, 40 C.F.R. 763.

EPA has promulgated regulations under TSCA and AHERA (Subchapter II of TSCA) related to the inspection and management of asbestos-containing material in schools. These regulations utilize polarized light microscopy (PLM) as a measurement technique for detecting asbestos; the use of this measurement technique for asbestos is relevant and appropriate to the removal of the Alviso ring levee. (See Appendix I for an explanation of the use of PLM in determining the cleanup standard for asbestos at the South Bay Asbestos Area site.)

Location-Specific ARARs

3. The Endangered Species Act of 1973 and regulations (16 U.S.C. Section 1531 et seq.; 40 C.F.R. Section 6.302(h); 50 C.F.R. Parts 17 and 402.

Section 7 of the Endangered Species Act, 16 U.S.C. Section 1536, requires Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of any endangered species or cause adverse modifications of critical habitat. Endangered species (including Salt Marsh Harvest Mouse and

California Clapper Rail) have been identified in the New Chicago Marsh which abuts the site. Section 7 and related regulatory requirements are therefore ARARs. 40 C.F.R. Section 6.302 (h) describes the applicability of the Endangered Species Act to EPA actions.

4. Clean Water Act, Section 404 (33 U.S.C. Section 1344) and regulations, 40 C.F.R. 230 et.seq.; Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands), May 24, 1977; 40 C.F.R. 6.302 (a) and (b) and 40 C.F.R. Part 6, Appendix A.

These requirements address wetlands protection and floodplain management. The site is located in a floodplain and in and adjacent to wetlands. Federal agencies are required to avoid, to the extent possible, adverse impacts from destruction of wetlands, and avoid support of new constructions in wetlands if a practicable alternative exists. Section 404 and regulations mandate that dredged or fill material should not be discharged into aquatic ecosystems (in this case wetlands) unnecessarily, and also set forth mitigation requirements.

5. National Historic Preservation Act, 16 U.S.C. Section 470f; Historic Sites Act, 16 U.S.C. Section 461 et seq.; Archaeological and Historic Preservation Act, 16 U.S.C. Sections 469 et. seq.; Executive Order (E.O.) 11593 (Protection and Enhancement of the Cultural Environment, May 13, 1971); 40 C.F.R. Section 6.301; and 36 C.F.R. Part 800.

Federal agencies are required to consider the effects of their actions upon designated or potential historic, architectural, archaeological, and cultural sites and natural landmarks. The western portion of the levee borders on the older section of Alviso, which is listed in the National Register of Historic Places. To the extent that levee removal may impact this section of town, the substantive requirements of these statutes, orders and regulations are ARARs.

6. McAteer-Petris Act and regulations (California Government Code, Title 7.2, Section 66600 et. seq.; California Administrative Code (CAC) Title 14, Div. 5, Sec. 10110 et. seq.); Coastal Zone Management Act, 16 U.S.C. Sec. 1451 et. seq.

The McAteer-Petris Act established the San Francisco Bay Conservation and Development Commission (BCDC), which regulates activities adjacent to the Bay through the San Francisco Bay Plan document and permit requirements. Although remedial activities conducted on-site are exempted from permits (CERCLA Section 121 (e)(1), 42 U.S.C. Section 9621(e)(1)), the substantive requirements of the Bay Plan are ARARs, to the extent that a BCDC permit would otherwise be required.

The Bay Plan also serves as the coastal zone management plan for the San Francisco Bay, pursuant to the Coastal Zone Management Act (CZMA), 16 U.S.C. Sec. 1451 et. seq.. Section 307(c)(1) of the Coastal Zone Management Act (CZMA) requires that Federal agencies conducting or supporting activities directly affecting the coastal zone conduct or support those activities in a manner that is consistent with approved State coastal zone management programs.

Action Specific ARARs

7. Occupational Safety and Health Act (OSHA) regulations, 29 C.F.R. 1910.1000 and 1910.1001; 29 C.F.R. 1926.58.

OSHA has set a Permissible Exposure Limit (PEL) for asbestos fibers at .2 fibers per cubic centimeter of air (f/cc) for occupationally exposed workers, as a eight-hour time-weighted average, and an Excursion Limit of 1.0 f/cc averaged over a thirty (30) minute period. OSHA regulations also specify protective measures to ensure that worker exposures do not exceed these limits. These requirements are ARARs for the implementation of the remedy as levee removal has the potential to generate significant amounts of dust during excavation and loading activities.

To Be Considered (TBCs):

1. U. S. Fish and Wildlife Service Mitigation Policy, 46 Fed. Reg. 7644-7663 (Jan. 23, 1981).

This policy, identified as an ARAR in the previous ROD, is more accurately a TBC. It defines four resource categories of impacted habitats, and establishes mitigation goals and guidelines for each category. According to USFWS, the mitigation goal for any losses of habitat values for the wetlands near Alviso is no net loss of in-kind habitat values. Portions of the levee were constructed in wetlands; removal of the levee will allow for restoration of the wetlands underlying the levee.

2. Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act (CWA) Section 404(b)(1) Guidelines, February 6, 1990.

This Memorandum of Agreement sets forth the policy and procedures to be used in the determination of the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines, 40 C.F.R. Section 230 et. seq. (listed above as a location-specific ARAR).

VI. Description and Comparison of Alternatives

As described in section II above, the original 1988 Record of Decision selecting the soil cover alternative, stated that EPA did not select the alternative of complete removal of the levee due to its high cost, the proportionally greater potential for asbestos releases during removal operation, the problems associated with replacing the levee's flood protection function, and the difficulties associated with disposing of the removed material. This section sets forth a comparison of the two alternatives, and also describes how the problems associated with the removal alternative have been and will be addressed. A description of the other proposed remedies evaluated in the Operable Unit Feasibility Study (OUFS) may be found in the September 1988 Record of Decision.

1. Soil Cover.

The Soil Cover Alternative involved stripping and rough grading the existing levee, placing a minimum of 12 inches of compacted soil over the levee, placing 6 inches of top soil over the compacted soil, and revegetating the levee and side slopes. Native vegetation would be selected for the levee which would provide erosion protection and provide cover for the Salt Marsh Harvest Mouse. A temporary irrigation system would be installed until vegetation was re-established. Previously existing wetlands would remain buried under the levee, because the levee would be left permanently in place. In addition, the cover would further expand the encroachment of the levee into the New Chicago Marsh. Therefore, section 404 of the Clean Water Act would require creation, enhancement or restoration of wetland areas elsewhere to compensate for, at a minimum, the additional loss of wetlands due to installation of the cover. The soil cover alternative would also include deed restrictions on the levee to prevent future disturbance of the cover.

2. Levee Removal

The levee removal alternative consists of excavating the levee material down to pre-existing grade and transporting the material to an approved off-site disposal site. Following the removal, the underlying exposed soil will be sampled to verify that the removal is complete. (See Section VIII for a description of the cleanup criteria.) Once the levee removal has been completed, wetland and adjacent upland areas, including areas that were buried under the ring levee and its appurtenant structures and areas disturbed by remedial action activities will be restored. Restoration shall include any necessary excavation and grading, and replanting the areas with native vegetation.

The levee removal alternative was referred to in the OUFS and the September 1988 ROD as the "off-site RCRA landfill alternative". As stated in the OUFS, this was the only alternative evaluated that would have eliminated all risks at the site

due to asbestos in the ring levee. As originally proposed, this alternative provided for excavation and off-site disposal of the levee material at a landfill meeting the requirements of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Sec. 6901 et. seq. However, following the initial screening of remedial action alternatives in the OUFS, EPA screened out and eliminated levee removal from further consideration on the basis of cost and other factors; the estimated capital costs to remove and dispose of the levee material in an off-site RCRA landfill were three to seven times higher than the containment and cover alternatives.

EPA has subsequently determined that, since asbestos is not classified as a hazardous waste under the federal Resource Conservation and Recovery Act, disposal in a RCRA (Class I) landfill will not be required. This makes levee removal a more cost-effective alternative than originally calculated. Under California law, however, asbestos is classified as a non-RCRA hazardous waste. Therefore, the levee material must either be disposed of in an appropriate landfill qualified to accept such material, or safely re-used in a manner that permanently encapsulates the material and that is protective of public health and the environment. Such disposal or reuse must comply with all applicable federal and state laws and regulations and must be approved by EPA.

One option being considered is to use the levee material as a paving sub-base for an off-site roadway. Once buried under permanent pavement, asbestos emissions would be effectively controlled. If the material is removed, transported and reused safely, and if all federal and state requirements are met, this option would be protective. Landfill disposal costs would not be incurred under this option.

The original purpose of the Alviso ring levee was to provide temporary flood protection for the Alviso community. The loss of flood protection following levee removal was one consideration which led to EPA's initial rejection of the removal alternative. The U.S. Army Corps of Engineers, in conjunction with the Santa Clara Valley Water District, is currently constructing a fresh-water flood control project on the Coyote Creek and Guadalupe River. Once the flood control project is completed, the ring levee will no longer be needed for flood protection and can be safely removed. The ring levee will not be removed until after completion of the flood control project, which is currently expected to occur in 1994.

As the excavation of material may generate a significant amount of dust, dust suppression techniques will be required. Examples of dust suppression techniques which could be used include, but are not limited to, wetting the material with water, using a chemical dust suppressent, or installing a tent over portions of the levee as it is removed. The specific dust suppression measures to be used will be included in the Remedial

Design/Remedial Action (RD/RA) workplan, which must be approved by EPA. As levee removal will not take place until permanent flood control improvements are in place, in the interim, the levee will be resprayed with a dust suppressing polymer, semiannually or as needed.

VII. Summary of the Comparative Analysis of Alternatives

This section presents a comparison of alternatives using nine component criteria. These criteria, listed below, are set forth in the National Contingency Plan and are derived from requirements in CERCLA Section 121(a) and (b).

1. Overall protection of human health and the environment.
2. Compliance with ARARs
3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility, or volume through treatment.
5. Short-term effectiveness.
6. Implementability.
7. Cost.
8. State Acceptance.
9. Community Acceptance.

1. Overall Protection of Human Health and the Environment

The soil cover alternative was designed to control the release of asbestos fibers by providing a physical barrier between the contaminant and the potential receptors. The cover would be planted with native vegetation to control erosion, and with maintenance, would provide a high degree of long-term public health protection.

Removal of the levee will provide even more effective long term protection, as the source of contamination will no longer remain in the community. The removal alternative was the only alternative evaluated in the OUFS that would eliminate all risks at the site due to asbestos in the Ring Levee. Removal of the levee would provide the maximum possible protection for the community since asbestos in the levee will be removed from Alviso. However, effective dust control measures will be necessary to ensure adequate protection of human health and the environment as the levee is being removed. Also, periodic application of a dust suppressant to the levee will be necessary to ensure protection

of public health and the environment until the levee can be removed, following completion of the Coyote Creek flood control project.

2. Compliance with ARARs

The ARARs pertinent to the removal remedy are described in Section V above. With the use of stringent dust control measures during implementation, the levee removal remedy will comply with all ARARs. The soil cover remedy would also have complied with all ARARs identified for that remedy in the 1988 ROD.

A notable difference between the soil cover and removal remedies pertains to wetlands mitigation ARARs. Constructing a soil cover over the levee would have resulted in additional loss of wetlands. Consequently, wetlands mitigation would have been required in order for the soil cover alternative to comply with ARARs. However, removal of the levee can be accomplished with no additional filling of wetlands, and will also allow the wetland areas originally lost under the levee to be restored.

3. Long-Term Effectiveness and Permanence

With adequate long-term maintenance, the cover alternative would effectively control asbestos releases from the levee. Conceivably, the soil cover could require major repairs in the event of flooding or seismic activity. Lack of maintenance and corresponding erosion could also negatively affect the long-term effectiveness and permanence of the soil cover remedy. Because the soil cover would result in asbestos remaining at the site, a five year review would be required.

Removing the levee would provide a more permanent, highly effective remedy, which would permanently eliminate asbestos emissions in Alviso without the need for long-term maintenance or repairs. Removal of the levee material would eliminate long-term risks at the site due to the Ring Levee. After removal of the levee, future use of the area would be unrestricted. Because the asbestos-contaminated levee will be completely removed, EPA currently anticipates that five-year reviews will not be required specifically for the Ring Levee Operable Unit. However, institutional controls may be necessary to ensure the continued permanent encapsulation of the material at its off-site location.

4. Reduction of Toxicity, Volume or Mobility Through Treatment.

Because there is presently no feasible and reliable treatment technology for asbestos to reduce its toxicity, mobility or volume, no remedial alternative for this site utilizes treatment. Therefore, both the soil cover alternative and the selected alternative are consistent with the statutory preference for selecting remedies that utilize a treatment technology which per-

manently and significantly reduces the toxicity, mobility, or volume of the hazardous substances, to the extent that such technologies exist.

5. Short-Term Effectiveness

Installation of the soil cover would provide short-term public health protection. However, to control dust generated by construction activities, dust control measures would need to be implemented during the construction operation. It is estimated that it would take four to five months to complete the soil cover remedy following the initiation of remedial activities.

The removal alternative could potentially create significant amounts of dust during excavation, loading and transport of material which could be greater than the amount of dust generated under the soil cover alternative. Therefore, it will be necessary to employ strict dust control measures during the short period of time that the removal is taking place, in order to ensure adequate short-term public health protection. In the short term, until the levee is removed following completion of the alternative flood control project, periodic polymer spraying of the levee would protect against asbestos emissions. Removal of the levee could be completed within 2 to 3 weeks of mobilization.

6. Implementability

Both the soil cover and removal alternatives are approximately equally implementable; both remedies may be accomplished easily using conventional equipment. Approximately 29 different private, public and commercial landowners own property along the levee; easements or access rights must be obtained prior to implementation of either remedy. However, one difference is that, since no long-term maintenance will be required after the levee has been removed, long-term or permanent easements would not be necessary under the levee removal alternative.

7. Cost.

The cost of the soil cover alternative, including maintenance costs, was estimated to be $2.4 million. The estimated costs for levee removal, adjusted for inflation over five years, and assuming the material will be re-used offsite at minimal cost, is $2.1 million. Since no long-term maintenance will be required, there would be no maintenance costs associated with levee removal. If the levee material can be used as a paving sub-base for a roadway, minimal transportation and disposal costs are anticipated. Disposal in a landfill would increase the cost of this alternative, but would likely be significantly less than the original estimated cost for disposal in a RCRA landfill.

8. State Acceptance.

The California Department of Health Services (DHS) has no technical objection to either the soil cover or removal alternatives. As asbestos is a California-regulated hazardous waste, DHS has expressed concern over the selection of a non-landfill disposal or re-use site. EPA will consult with DHS prior to approval of any disposal site to ensure that such disposal or reuse complies with state laws and regulations.

9. Community Acceptance

During the public comment period held on the original proposed plan for the Ring Levee Operable Unit, held April 12 - May 11, 1988, the removal alternative was supported by the community, provided that the levee would be replaced by alternative flood protection. The Coyote Creek flood control improvements currently under construction will provide permanent flood protection for Alviso. No public comments were received during the February 26 - March 27, 1990 comment period. The few levee-related comments that were received during the February 15, 1989 public meeting on the Proposed Plan for the overall South Bay Asbestos Area are addressed in the Responsiveness Summary, Attachment A of this ROD.

VIII. The New Selected Remedy

As discussed above, the new selected remedy for the Ring Levee Operable Unit includes removal of the entire levee down to pre-existing grade, as soon as practicable after completion of the Coyote Creek flood control project. Prior to removal, the levee will continue to be sprayed with a dust suppressing polymer, semiannually or as needed. Effective dust control measures will be used during the removal of the levee; the levee material will be re-used or disposed off-site in a safe manner, as approved by EPA, and will be consistent with federal, state and local laws and regulations. Once the levee removal has been completed, wetland and adjacent upland areas, including areas that were buried under the ring levee and its appurtenant structures and areas disturbed by remedial action activities will be restored.

As described in Appendix I, the cleanup goal of one area percent as analyzed by polarized light microscopy will be used to evaluate the thoroughness of the cleanup. Problems with asbestos analytical techniques make establishing health-based clean up goals difficult. The PLM method is used to measure asbestos levels in bulk insulation samples pursuant to EPA regulations promulgated under the Toxic Substances Control Act (TSCA) and Asbestos Hazard Emergency Response Act (AHERA). EPA has selected the one area percent clean up level for the South Bay Asbestos Area site because one area percent is the generally accepted detection limit for asbestos in soil using PLM. One area percent by PLM has also been used in the past as an action level in emergency response situations, and as a cleanup goal for remedial ac-

tions at other Superfund sites. Following the removal of the levee to pre-existing grade, the underlying soil will be sampled to ensure that the removal is complete.

Once the levee has been removed, the public will no longer be exposed to the asbestos hazards associated with the levee, and the health and environmental risks associated with the levee will be eliminated.

The capital cost for removing the levee is estimated to be $2.1 million. This estimate is based on costs for excavating, loading and hauling 25,000 cubic yards of material at a unit cost of $22 per cubic yard, and includes 8 polymer applications at a cost of $70,000 per application. Landfill disposal costs were not included in this cost estimate, which assumes that the material will be disposed or reused offsite at minimal cost. However, in the event that such disposal or reuse is unable to meet Federal and State requirements, additional costs may be incurred for disposal in an appropriate landfill. Once the levee is removed, no additional monitoring or maintenance will be required, as this source of contamination will no longer be present in the Alviso community.

It is possible that some changes may be made to the remedy as a result of the remedial design and construction processes. Such changes, in general, would reflect modifications resulting from the engineering design process.

IX. Statutory Determinations.

The selected remedy will comply with the statutory requirements of Section 121 of CERCLA.

Protection of Human Health and the Environment:

The selected remedy will achieve permanent long-term protection of human health and the environment through removal of the source of contamination from the Alviso community. The levee material will be safely disposed of off-site, in a manner that permanently encapsulates the material and that is protective of public health and the environment, or in an appropriate landfill. Implementation of the remedy will not pose unacceptable short term risks, as long as dust control measures are properly utilized.

Compliance with Applicable or Relevant and Appropriate Requirements:

The selected remedy will comply with all ARARs identified and described in Section V.

Cost Effectiveness:

The selected remedy is cost-effective, because it has been determined to provide overall effectiveness proportional to its costs. The estimated cost of the selected remedy is $2.1 million. The costs for the soil cover remedy previously selected were estimated to be $2.4 million.

Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable:

The selected remedy is in compliance with the statutory mandate to utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. As explained below, no alternative treatment technologies are currently practicable for asbestos. Recovery of asbestos from soils is not appropriate for technological and practical reasons; because of reduced commercial use, asbestos has limited recovery or financial value. However, removal of the ring levee will provide a permanent solution to the extent that the asbestos-containing ring levee material will be removed from the community of Alviso, and that permanent encapsulation or landfill disposal of the levee material off-site will prevent the emission of asbestos fibers.

Preference for Treatment as a Principal Element:

The selected remedy does not satisfy the statutory preference for selecting remedies that permanently and significantly reduce the toxicity, mobility or volume of the hazardous substances through treatment as a principal element, because treatment technologies that result in permanent destruction or alteration of asbestos are not currently practicable. Asbestos is a natural fibrous mineral that receives its toxicity due to the form of the fiber. Permanent encapsulation or landfill disposal of the levee material off-site will protect public health by preventing the emission of asbestos fibers, but the form of the fiber will not be altered. Reduction in toxicity or mobility can only be achieved through destruction or alteration of the fibers, or by stabilization or solidification of the fibers. These treatment technologies are not currently practicable and would be extremely costly.

APPENDIX I

I. Asbestos Analytical Techniques

There are three commonly accepted analytical techniques used to measure asbestos. They are:

1) Phase Contrast Microscopy ("PCM") : An optical technique useful in examining minute dust particles.

2) Polarized Light Microscopy ("PLM"): An optical technique that uses polarized light to identify minerals.

3) Transmission Electron Microscopy ("TEM"): A technique using an electron microscope to achieve extremely high resolution of asbestos fibers too small to be resolved using optical methods.

A brief description, including the advantages and disadvantages of each technique, is presented below.

A. Phase Contrast Microscopy

Phase contrast microscopy ("PCM") is a optical microscopy technique that is commonly used to analyze air samples collected in the work place (e.g. in enclosed spaces). PCM translates differences in the phase of light transmitted or reflected by the object into differences of intensity in the image. Most of the available medical studies of asbestos diseases have measured asbestos using PCM. This is because PCM was the only technique available when most of the occupational studies were done. The method is better suited to analysis of work place air than ambient air because in the work place one may expect a higher fraction of asbestos fibers to total particulates.

The PCM technique has three major limitations concerning its use in the ambient environment. The technique cannot detect fibers with diameters of less than 0.2 micrometers. Many fibers in the environment are much smaller than this. Also, PCM can not distinguish between asbestos fibers and other types of fibers. Therefore, in the environment, the PCM fiber count may be completely unrelated to the asbestos fiber content. For these reasons, it is widely accepted that the PCM method is totally unsuitable for measurement of asbestos fibers in ambient atmospheres.

B. Polarized Light Microscopy

Polarized Light Microscopy ("PLM") is the EPA-approved technique for analysis for bulk insulation samples. The PLM technique is relatively quick (1/2 hour/sample) and can be used to: (1) identify all asbestos types, (2) distinguish between asbestos and other fibrous and non-fibrous minerals and (3) identify most non-asbestos components of samples. The resolution capacity of PLM is 200x to 400x magnification. Another advantage of PLM is that it can be performed for a relatively low cost.

There are two counting procedures for PLM analysis, the point counting method and the field comparison method. The point counting method uses a superimposed grid with 100 points. The operator counts the points where asbestos is present. The point count method involves the preparation of eight slides, each of which can be viewed at 100 possible points, to establish the presence or absence of asbestos at 50 points on each slide. The result is recorded and reported as area percent based on the number of positive points. The following format is used for determination:

Area percent = a/n (100)
where:
a = number of points with asbestos fibers present
n = number of non-empty points counted.

The field comparison method also called "visual estimation" or the 2-minute method with the stereobinocular light microscope, is used to quantify a large sample (e.g., 1 ounce) using the micro- scope at 30-40x. The operator estimates the homogeneity of the mixture and estimates the percentage of each individual fibrous component.

The disadvantages associated with PLM include:

o Asbestos content determination done by visual estimate (field comparison) or point counting is qualitative or at best, semi-quantitive; concentration is expressed as the ratio of asbestos to non-asbestos particles or percent by area.

o Small fiber identification is difficult because certain optical properties (birefringence and the angle of extinction) are hard to determine in small fibers.

o The thinnest fibers that can be observed are approximately 0.4 micrometers in diameter; fibers this small, cannot usually be identified by mineral type. Sample preparation methods (grinding) may reduce size of structures.

- o Highly skilled analysts are required, particularly in view of the subjective nature of the determinations.

- o The "quantitative" limit of detection is 1 area percent. samples may still contain asbestos in quantities below the PLM detection limit.

- o No standardized sample preparation method currently exists, which may cause widely varying analytical results between laboratories.

Using PLM to identify asbestos in soils can be difficult because soils are subjected to erosion and weathering; asbestos bundles become separated and broken into smaller, possibly sub-optical sizes much more quickly than fiber bundles in relatively undisturbed insulating materials. Asbestos fibers may also be dispersed by wind and by seasonal flooding. Therefore, a sizable fraction of the asbestos fibers in soil could be below optical resolution. The EPA method for analysis of bulk insulation has been used as the de facto method for analyzing asbestos in soils, as no other approved method exists.

C. Transmission Electron Microscopy

Transmission electron microscopy ("TEM") is the most powerful analytical method available for measuring asbestos. TEM has been used for air, water, or soil analysis. It is the preferred instrumental technique for measuring asbestos in ambient atmosphere since it incorporates the most powerful combinations of identification methods. TEM analysis uses electron microscopy, at magnifications of 10,000 to 50,000 times, to detect asbestos structures as thin as 0.2 nanometers in diameter. This is sufficient to identify the thinnest asbestos fibrils under most circumstances. The transmission electron microscope allows the operator to locate very small fibers. Two mineral identification tools, Selected Area Electron Diffraction ("SAED") and Energy Dispersive X-ray Analyzer ("EDXA") can then be utilized to identify the mineral type from a single point on the specimen.

The disadvantages associated with TEM include the following:

- o No widely accepted TEM method is available for the analysis of asbestos in soils, making it difficult to correlate inter-laboratory data. Sample preparation methods are not standard among workers, making the comparison of results between sites or laboratories very difficult or meaningless.

- o Analysis requires a minimum of 6 to 8 hours over 2 to 3

days. Highly skilled analysts are required and large differences in results can occur due to operator variance.

o TEM analysis is extremely expensive, over 20 times the per sample cost of optical methods.

o TEM analysis is performed on much smaller sample than PLM so that obtaining homogeneity during sample preparation is more critical.

o Typically, total structures are counted. Sample preparation (i.e., grinding) destroys the structure size distribution.

Both PLM and TEM sample preparation alters the soil matrix. This is significant because the sample is dispersed into very fine particles before it is put onto a filter for analysis. Since asbestos occurs in clusters and bundles as well as fibers, the sample preparation process (in the case of soil) can destroy the structure of those forms and produce a very large number of individual fibers of small size. Although total fibers are counted as part of the TEM analysis, these results must be converted to weight percent, using data on length, width, and density. This conversion to mass is necessary due to the sample preparation grinding process, which artificially increases the fiber count. How the TEM weight percent compares with air emissions and risk tables has not been standardized by government or industry. Therefore, interpretation of soil data results relative to air samples and/or risk charts is very difficult, at best.

II. Problems With Using Asbestos Data in Quantifying Risk

Although the role of asbestos as a cause of cancer is clear, the ways in which fibers cause disease are not well understood, and this has complicated efforts to measure asbestos successfully. Asbestos researchers have not agreed upon which attributes of asbestos are important to measure to assess risk, including size and shape of individual fibers, number of fibers, total mass of fibers, inclusion of asbestos bundles, clusters, and matrix debris in the fiber count, and asbestos mineralogical type. For example, most researchers think that longer, thinner asbestos fibers, (those longer than 5 microns in length with an aspect ratio greater than 3 to 1) are more carcinogenic, i.e., the "Stanton Hypothesis". However, other researchers question this approach, suggesting that both long and short fibers may be biologically active. In addition to fiber dimension, surface chemistry of the asbestos fiber may play a role in causing disease. Further, there is disagreement whether mineral type is a factor in disease causation. Some would argue that chrysotile

asbestos may partially dissolve in weakly acidic environments, facilitating fiber clearance from the lung. However, EPA's view is that all asbestos mineral types are equally carcinogenic.

To compound the problem, analysis of ambient samples for asbestos is much more difficult than occupational or work place samples, because the concentration of asbestos in the environment may be much lower. Asbestos fibers found in ambient air may be too short and thin to be detected by conventional microscopes, and may be agglomerated with other particulate matter so that they are masked or hidden. Further, although EPA has attempted to standardize asbestos analytical techniques, differences in sample handling, preparation, instrument capabilities, operator proficiency, and counting procedures make it extremely difficult to compare results from different laboratories. In short, accurate measurement of asbestos is impeded by many factors, greatly complicating any estimates of environmental risk. For this reason clean up levels have been established using the best available analytical methods. The following discussion summarizes the rationale behind choosing the one area percent by PLM clean up level.

III. Clean Up Goals for the South Bay Asbestos Area Site

Problems with asbestos analytical techniques make establishing health-based clean up levels very difficult. As mentioned above, the clean up level of one area percent by PLM has been chosen because it is the best available analytical technique. This is further evidenced by the fact that EPA chose this method (PLM) for use in the Asbestos Hazard Emergency Response Act ("AHERA"). AHERA specifies that the EPA approved PLM method be used to measure asbestos levels in bulk insulation samples. EPA has promulgated the one area percent clean up level for the South Bay Asbestos Area site because one area percent is the generally accepted detection limit for asbestos in soil using PLM. One area percent by PLM has also been used in the past as an action level in emergency response situations.

Responses to Ring Levee Comments
from the
February 15, 1989 Public Meeting

A few comments concerning the ring levee were made at the February 15, 1989 Public Meeting on the Proposed Plan for addressing asbestos contamination in the remainder of the community. The meeting transcript may be found in Appendix A of the Responsiveness Summary for the Remedial Investigation/Feasibility Study and the Proposed Plan, dated September 25, 1989. The ring levee comments are addressed below:

1. Comment:

One community member asked why EPA had planned to cap the levee if the prevailing winds were not the cause of asbestos releases. (meeting transcript, p. 28)

Response:

EPA originally proposed remediation for the ring levee because children and adults frequently walk, ride bicycles, picnic and play on the levee, and they may be exposed to asbestos.

2. Comment:

One community member commented that levee removal would create more flooding problems if the levee is not replaced. Another commented that the community did want a levee, but not an asbestos levee. (meeting transcript, pp. 80, 90)

Response:

According to the City of San Jose, a flood control study of the ring levee conducted by the City in 1988 concluded that the levee provides only short term flood protection. The Santa Clara Valley Water District, under a grant from the U.S. Army Corps of Engineers, is currently constructing levees on the Coyote Creek, which will provide permanent flood protection for Alviso. The ring levee will not be completed until after the Coyote Creek project is completed.

3. Comment:

One community member asked if EPA will be on site when the levee is removed to ensure that dust requirements are met. (meeting transcript p. 84)

Response:

The City of San Jose and Raisch Company will be required to submit plans for dust control during the removal activities, which must be approved by EPA. EPA will oversee the removal activities to ensure that dust suppression techniques are carried out properly.

4. Comment:

One community member was concerned with liability issues in the event of flooding after the levee is removed; asked if EPA's agreement with the City covered flood liability, and asked if there would be legal recourse against the City of San Jose or EPA if flooding occurred after removal of the levee. (meeting transcript p. 84)

Response:

The Santa Clara Valley Water District is the agency responsible for flood control in this region. The City of San Jose has informed EPA that the City's flood control study conducted in 1988 showed that the ring levee would be ineffective in preventing a major flood, but the Coyote Creek improvements currently under construction will be far more effective in controlling future flooding. To ensure continual flood protection for Alviso, the amended Record of Decision and EPA's agreement with the City and Raisch will provide that the ring levee will not be removed until after the Coyote Creek improvements have been completed.