DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, WEST
NAVAL FACILITIES ENGINEERING COMMAND
900 COMMODORE DRIVE
SAN BRUNO, CALIFORNIA 94066-2402

IN REPLY REFER TO:

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09ER1WM/L5002
25 Oct 1994

From: Commanding Officer, Engineering Field Activity West
To: Distribution

Subj: DRAFT FINAL TANK FARM CONSTRUCTION SUMMARY REPORT, HUNTERS POINT ANNEX, SAN FRANCISCO, CA

Encl: (1) Draft Final Tank Farm Construction Summary Report, Engineering Field Activity West, Naval Facilities Engineering Command,San Bruno, CA

1. Enclosure (1) provides the Draft Final Tank Farm Construction Summary Report at Hunters Point Annex. Please find enclosed the response to EPA and DTSC comments in Appendix J, and a cover letter detailing the revision to Draft Tank Farm Construction Summary Report.

2. If you have any questions regarding this matter, please contact Mr. William McAvoy, Code 09ER1WM at (415) 244-2554.

RICHARD POWELL
By direction

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DRAFT
CONSTRUCTION SUMMARY REPORT
TANK FARM REMOVAL ACTION

DATED 22 OCTOBER 1993

October 3, 1994

DRAFT FINAL
CONTRUCTION SUMMARY REPORT
TANK FARM REMOVAL ACTION
ENGINEERING FIELD ACTIVITIES WEST
NAVAL FACILITIES ENGINEERING COMMAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

VOLUME I: TEXT, TABLES, PLATES, APPENDICES

DEPARTMENT OF THE NAVY
WESTERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND
SAN BRUNO, CALIFORNIA 94066-0727

INSTRUCTIONS FOR MODIFICATION INSERTS

- Replace the front and side panel cover sheets for the Draft report with the front and side title panels for the Draft Final title report. See enclosed example.
- Replace the title page, certification statement page, Table of Contents, text, and tables of Draft with Draft Final.
- Add HDPP Warranty Information after the compaction test results in Appendix I.
- Insert new Appendix J, "Response to Agency Comments".
- Replace Distribution Sheet with the new Distribution Sheet.

A Report Prepared for

Department of the Navy
Installation Restoration Branch Code 1811
Western Division
Naval Facilities Engineering Command
900 Commodore Drive, Building 101
San Bruno, California 94066-0720

DRAFT FINAL
CONSTRUCTION SUMMARY REPORT
TANK FARM REMOVAL ACTION
NAVAL STATION TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

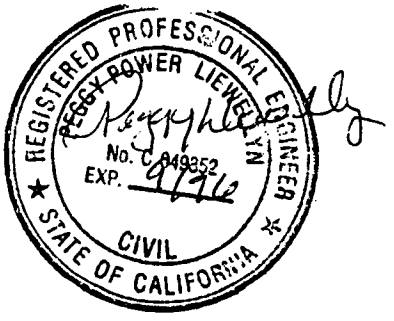
Contract No. N62474-88-D-5086

HLA Project No. 11400 0706

by

Katherine G.S. Carretti
Project Engineer

Peggy Llewellyn, P.E., No. 49352
Senior Engineer



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Under Contract to
PRC Environmental Management Inc.
135 Main Street, Suite 1800
San Francisco, California 94105

October 3, 1994

ENGINEER'S CERTIFICATION

The undersigned certifies that, to the best of its knowledge, the completed construction is in substantial conformance with the permitted plans and specifications for this project dated August 19, 1992. This certification is based upon the undersigned's regular, but not exhaustive, observation of construction activities and upon observation of certain testing procedures conducted by others; it is not based upon the undersigned's inspection or supervision of the contractor's operations or performance. This certification is subject to deviations from the plans and specifications which are presented in Section 3.0 of this report and those deemed not critical to the permitting requirements. This certification shall not be deemed to modify or limit the construction contractor's duties and responsibilities.

HARDING LAWSON ASSOCIATES

Dated: 10/3/94

By: Peggy L Llewellyn

Peggy Llewellyn, P.E.

Senior Engineer

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1.0 INTRODUCTION

This Construction Summary Report (CSR) has been prepared by Harding Lawson Associates (HLA) to document the removal actions taken at the Tank Farm, Hunters Point Annex (HPA), San Francisco, California (Drawing T1). The Tank Farm originally consisted of 18 aboveground fuel and lubrication (lube) oil tanks, piping, pump houses, and associated equipment. This report was prepared under contract to PRC Environmental Management, Inc. (PRC) for the Department of the Navy (Navy), Western Division, Naval Facilities Engineering Command (WESTDIV), under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract N62474-88-D-5086, Contract Task Order 172.

This CSR presents information required for the final Pollution Report (POLREP) required under *Superfund Removal Procedures* (OSWER Directive 9360.0-03B; *EPA, 1988*).

Removal actions at the Tank Farm were performed in accordance with the *Removal Action for Tank Farm (IR-6), Volume I-Work Plan* (*HLA, 1990b*) (Work Plan) and *Removal Action, Tank Farm* (*Navy, 1992*) (Plans and Specifications). Responses to agency comments on the Draft CSR are presented in Appendix J.

1.1 Tank Farm Physical Description

The Tank Farm lies between Lockwood and Robinson streets in the northern portion of HPA (Drawing T1). The tanks were in four separate bermed areas, identified as Areas 1 through 4 on Drawing C1. The ground surface is mostly flat and paved with asphalt and concrete. Robinson Street is approximately 20 feet higher in elevation than the flat portion of the Tank Farm. The steep slope between Robinson Street and the flat portion of the Tank Farm is densely covered with ground cover and shrubs. The slope

from Robinson Street formed the south side of the berms for Areas 1, 3, and 4. Imported soil and concrete walls formed the remaining portions of the berms.

The lube oil storage and distribution system was located in Areas 1 and 2. Area 1 contained eight 12,000-gallon horizontal lube oil tanks, which were removed prior to 1986. The tank saddles, interconnecting product, steam, and sludge drain pipelines (both above and underground), and a sludge drain inlet vault were removed as part of this removal action. Area 2 contained one 12,000-gallon vertical lube oil tank (designated as Tank 9), a sump, and several underground distribution lines. The Lube Oil Pump House (Building 111), a sump, and aboveground distribution pipelines were located between Areas 1 and 2.

The diesel fuel storage and distribution system was located in Areas 3 and 4. Area 3 contained eight 12,000-gallon vertical diesel fuel storage tanks with cone-shaped bottoms (designated as Tanks 1 through 8), interconnecting product and sludge drain (both above- and underground) pipelines, and four sludge drain inlet vaults. Each tank in Area 3 was mounted on a 4-foot-high concrete pier. Area 4 contained one 210,000-gallon diesel storage tank (designated as Tank 10), a sump, and several underground distribution lines. The Diesel Fuel Pump House (Building 112), sumps, and underground distribution lines were located between Areas 3 and 4.

Surface water in the bermed areas drained to manually opened plug drains, which were connected to the storm drain system. Plug drains were typically used in the 1940s and 1950s when inspection of the runoff was required before its discharge to the storm drain system.

Directly north of Building 112 is a truck washout ramp, which still remains in place. Steam line trenches containing fuel distribution and steam lines from Buildings 111 and 112 to the fueling berths north of the Tank Farm still remain in place.

1.2 Tank Farm History

The Tank Farm was constructed in 1942 as a diesel fuel and oil storage facility, and was used by the Navy until 1974 (*WESTEC, 1984*). Diesel oil reportedly spilled from an unknown ruptured vertical tank in Area 3 in the early 1940s, and apparently the contents overflowed the berm surrounding the tanks. The spilled oil was removed to the Oil Reclamation Ponds at the south end of the HPA facility (Drawing T1).

Triple A Machine Shop (Triple A) leased most of the HPA facility and reportedly used the Tank Farm from 1976 until the firm vacated the site in June 1986. Stoddard solvent may have been stored in two of the vertical tanks (Drawing C2) during this period. Triple A refused the Navy's request to vacate when the lease expired. The Navy began legal proceedings to retake possession, and, following actions taken by the San Francisco District Attorney's Office (DA), Triple A vacated the facility in mid 1986. The DA charged Triple A with illegally disposing of hazardous waste at about 20 locations throughout HPA, including the Tank Farm (*DA, 1986*). These sites are included in the Navy's Installation Restoration (IR) program.

EMCON Associates (EMCON), performing a preliminary assessment at HPA, identified sites that required both time-critical and non-time-critical removal actions (*EMCON, 1987a*). The Tank Farm was identified as a candidate for a non-time-critical removal action. In 1988, HLA sampled the contents of the tanks at the Tank Farm (*HLA, 1988*), and in 1989, performed an assessment of the Tank Farm (*HLA, 1990a*). The assessment concluded that the tanks at the Tank Farm posed a potential threat to public health and that a non-time-critical removal action was necessary.

In 1990, HLA prepared the work plan (*HLA, 1990b*), which included an Engineering Evaluation Cost Analysis (EE/CA) as required by OSWER Directive 9360.0-03B (*EPA, 1988*). Comments from the U.S. Environmental Protection Agency (EPA) and California Department of Toxic Substances Control (DTSC) (formerly

Department of Health Services) were received and incorporated into the final work plan. Plans and specifications for implementing the work plan were prepared and the plans were issued for bid in June 1992 (*Navy, 1992*).

PRC sampled the contents of the tanks in April 1992 (*PRC, 1992*); the results are summarized in Table 1. The following observations were made at the time PRC performed the sampling:

- Tank 1 had approximately 50 gallons of rust-colored liquid
- Tank 2 had approximately 300 gallons of colorless liquid
- Tank 3 had approximately 20 gallons of rust-colored liquid
- Tank 4 had approximately 20 gallons of sludge and rust scale
- Tank 5 had approximately 30 gallons of sludge and rust scale
- Tank 6 had approximately 50 gallons of brown-colored liquid
- Tank 7 had approximately 700 to 800 gallons of yellow-brown liquid
- Tank 8 had approximately 50 gallons of colorless liquid with rust scale
- Tank 9 was empty
- Tank 10 had approximately 50 gallons of liquid in puddles at the bottom of the tank.

2.0 PROJECT ORGANIZATION

The Tank Farm Removal Action was a coordinated effort among Navy agencies, the designer, and the contractor. WESTDIV, serving as the project owner, provided funding and was primarily responsible for interaction with regulatory agencies, including the EPA and the DTSC. As the designer, HLA provided guidance to WESTDIV. The Resident Officer in Charge of Construction (ROICC) served as the contracting officer in charge of the contractor, DECON Environmental Services Inc. (DECON), Hayward, California. Under contract to PRC, HLA provided field observation services to the ROICC. DECON used the following subcontractors: P.W. Stephens Contractors, Inc. (Stephens), Hayward, California, asbestos abatement; Northwest Envirocon Inc., asbestos air monitoring; Superior Precision Analytical (SPA), San Francisco, waste characterization analysis; Hydrochem Services, Inc., BDC Services, Inc., and CKC, Inc., transportation of hazardous waste from the site; Smith-Emery Co., soil compaction testing; and R & B Construction, owner and operator of the hydraulic shear used to demolish the tanks. Plate 1 shows the reporting relationships among the organizations and primary personnel associated with the Tank Farm Removal Action.

3.0 OVERVIEW OF REMOVAL ACTION

As presented in the Work Plan (*HLA, 1990b*), the removal action consisted of the following activities:

- Removal of asbestos-containing materials (ACM) from piping, pumps, and tanks.
- Removal of tank and piping contents; petroleum fuel and solvents remaining in the tanks and the Building 112 sump were removed and disposed.
- Removal of tanks and tank piping; tanks and piping were removed, decontaminated, and dismantled, and the tank, piping, and decontamination rinsate was recycled.
- Removal of the foundations for the nine vertical tanks and the eight previously removed horizontal lube oil tanks; foundations were decontaminated, removed, and disposed.
- Implementation of controls to minimize the impact of stormwater infiltration within the berms.

Although not originally proposed in the Work Plan, the following was performed as part of the Tank Farm Removal Action:

- Demolition of the two pump houses (Buildings 111 and 112); piping was removed and decontaminated, and the buildings were decontaminated and demolished.

The following variances were issued to the Tank Farm Removal Action plans and specifications:

- A 2-foot-high 40-foot-square secondary containment unit lined with high-density polyethylene (HDPE) was constructed for storage tank containment, instead of the specified asphalt-bermed paved area.
- The existing truck washout ramp area was cleaned, covered with HDPE, and used as a decontamination area, rather than using the secondary containment unit.
- A 20-mil high-density polypropylene (HDPP) liner was used instead of the specified clay cap because soil remediation is planned within 2 years. With the shorter cap life, the HDPP liner is more cost effective. The Contractor and manufacturer provided 5- and 15-year warranties, respectively, for the cover, and the contractor is responsible for annual inspection and maintenance of the cover. Warranty information is presented in Appendix I.

- The rinsate was recycled at a petroleum recycling facility rather than treated because of the high concentrations of TPH.
- The catch basin designs were modified slightly to be compatible with the HDPP cap.
- One catch basin was installed in Area 3 rather than the two basins planned, and the design grades were changed so that the site drained into one basin.
- Catch basin excavations were lined with 20-mil HDPE because of the presence of oil-saturated soil in Area 3.
- Compaction requirements for Area 3 were waived because of the presence of oil-saturated soil.

Variances requested by the contractor were addressed to the ROICC. The ROICC would contact WESTDIV who would consult with HLA and PRC to determine whether the variance required agency approval or notification and to assess the impact on costs and the schedule. If a variance specifically affected a design element of the Work Plan or involved a state or federal regulation, the agencies were contacted. Variances involving slight modifications to the design or improvements to a design element were generally approved by the ROICC.

4.0 CONSTRUCTION ACTIVITIES

The contract for the Tank Farm Removal Action was awarded November 13, 1992. The contract specified the work would be completed by June 26, 1993. The actual construction schedule is shown on Plate 2.

The tank contents were sampled for polychlorinated biphenyls (PCBs) on November 20, 1992, before preparation of the preconstruction submittals, because analytical results could affect some of the submittals. The contractor submitted the first set of submittals on December 3, 1992; the final preconstruction submittal was approved February 12, 1993. The contractor began mobilization on February 23, 1993, and site preparation and mobilization were completed by March 4, 1993. The contractor then began exposing piping to remove the asbestos pipe lagging insulation. In the next phases of work, asbestos was removed, the lines and tanks were purged and cleaned, and the piping and tanks were removed. These activities were completed by April 8, 1993. Catch basins replacing the plug drain boxes were installed between April 1 and 27, 1993. Demolition of Buildings 111 and 112 began April 21 and was completed by May 6, 1993. Site grading and liner placement began April 13, 1993, and were completed on May 13, 1993. DECON demobilized the field office on May 11, 1993. Waste characterization and disposal continued after demobilization; the final waste was removed from the site on June 18, 1993. These activities are discussed in the following sections.

The final site walkthrough occurred June 23, 1993. Items identified for further action on the walkthrough were completed by June 30, 1993. Variance negotiations between the contractor and the ROICC are currently underway, and the contractor is completing the phase-out submittals.

Weekly reports filed by HLA's senior engineer provide a summary of weekly activities as presented in Appendix A. Appendix B is a photo summary of the project.

4.1 Tank Contents Sampling for PCBs

On November 20, 1992, DECON collected samples of the tank contents for analysis for PCBs. The sample from each tank was placed in a 1-liter amber glass jar. A sample could not be drawn from Tank 9 (the lube oil tank) at that time because it was empty. The samples were transported in a chilled container with the chain of custody record to SPA in San Francisco. PCBs were not detected in any of the samples.

One sample was collected from the outflow line of Tank 9 on March 12, 1993. Aroclor 1260 was detected at 0.54 milligrams per liter (mg/l), below the California action level of 2.0 mg/l. Analytical results are presented in Table 2.

4.2 Submittal Preparation and Review

Submittals were grouped into three categories: preconstruction submittals, recurring submittals, and phase-out submittals. Preconstruction submittals had to be reviewed by HLA and approved by the ROICC before mobilization onto the site. Preconstruction submittals include such items as work plans, training certificates, medical monitoring records, and administrative documents. Recurring submittals were submitted routinely throughout the course of the project; they include such items as daily and weekly reports and monthly schedules. Phase-out submittals are used to verify that the work was completed in accordance with the specifications. Laboratory reports, as-built drawings, and waste manifests are examples of phase-out submittals. Table 3 summarizes contractor submittals.

The following submittals were not required because PCBs were not found in the tank contents above the California action level of 2.0 mg/l:

- Wipe Sample Testing
- Certification of Destruction of PCB Materials.

The variances to the specifications discussed in Section 3.0 negated the need for the following submittals:

- All Section 02510 Bituminous Hot Pavement Submittals
- Clay Cap Backfill
- Filter Fabric
- Permeability Tests.

Pertinent submittals are presented in the following appendices:

Appendix C:	Project Personnel and Medical Monitoring Records
Appendix D:	Permits and Notifications
Appendix E:	OSHA "Injury-Illness" Records
Appendix F:	Contractor Daily Logs
Appendix G:	Waste Manifests
Appendix H:	Laboratory Chemical Data Sheets
Appendix I:	Compaction Test Results.

4.3 Mobilization and Access

Mobilization took place between February 23 and March 4, 1993. An office trailer, a storage trailer, two backhoes, four 6,500-gallon rinsate tanks and three 16- to 20-yard rolloff bins were delivered. The five existing IR-6 monitoring wells within the area of activity were sealed with 6-mil polyethylene sheeting and duct tape for the project duration. Approximately 2,500 gallons of standing rainwater was impounded, sampled, and analyzed; after approval was received from the POTW, the water was pumped into the sanitary sewer. Vegetation was cleared at ground surface from the work areas and disposed of as demolition debris in a Class III landfill. The personnel decontamination facility and the secondary containment unit were constructed. Electricity was hooked up March 2, and water was established March 3. The berm of the secondary containment unit was raised to the specified height of 2 feet on March 3.

The support zone, contamination reduction zone (CRZ), and exclusion zone were delineated. The boundary between the support zone and the CRZ was delineated with yellow caution tape. The boundary between the CRZ and the exclusion zone was delineated by red hazard tape.

On March 2, DECON excavated 30 yards of berm soil to gain access to Area 3. Soil was excavated with a backhoe and placed in rolloff bins. Additionally, 20 yards of berm soil was excavated on March 4 and placed in rolloff bins to be used to reestablish the berms. The contractor was able to access Areas 1 and 2 without excavating the berms. Berm removal was performed in Level C protection. Personnel in the exclusion zone wore white Tyvek and half-face respirators with HEPA cartridges, hard hats, safety glasses, gloves, and steel-toed boots. Drawing C1 indicates site access and safety aspects involved with mobilization.

4.4 Exposing Piping

The majority of the underground piping was in Areas 1 and 3 (Drawings C2 and C3) and was less than 4 feet below ground surface. These areas each had piping that had connected eight storage tanks to the nearby pump house. Areas 2 and 4 each had a single tank; two product pipes were associated with each of these tanks. Hand-excavation to expose product piping and asbestos-insulated steam piping in Area 1 began March 2, 1993, and continued through March 4, 1993. The contractor had difficulty hand-excavating the soil because serpentine rock was encountered at the eastern and southern boundaries of Area 1. The contractor temporarily halted excavation activities until a backhoe could facilitate access. Excavation of the product piping in Area 1 began again on March 23, once the concrete tank foundations were removed. A backhoe excavated along the side of the piping, using a 12-inch bucket to facilitate hand-excavation to the required depth. Trenching to expose underground piping was

completed March 25, 1993. The trenches were lined with 6-mil polyethylene sheeting in preparation for purging and to protect the clean backfill soil from potential petroleum hydrocarbon contamination. Trench excavations were generally up to 4 feet deep and 18 inches wide.

Area 3 underground piping was exposed by hand-excavation between March 5 and 10, 1993. The trenches were lined with 6-mil polyethylene sheeting in preparation for purging the pipes and to protect clean backfill soil from potential petroleum hydrocarbon contamination. Underground piping in Areas 2 and 4 was not excavated until after the tanks were demolished. This piping was excavated on April 7 and 8, 1993, in conjunction with excavation of the concrete valve box associated with each tank.

The approximately 140 cubic yards of soil excavated to expose piping and was placed in rolloff bins. This soil was disposed at Chemical Waste Management Inc.'s Class I disposal facility in Kettleman Hills, California.

Workers wore Level C personal protective equipment for all piping excavation activities. This included poly-coated Tyvek to protect against liquid spills, half-face respirators with HEPA cartridges, hard hat, safety glasses, gloves, and steel-toed boots.

4.5 Asbestos Removal

Removable of friable asbestos insulation from exposed piping in Area 1 and piping adjacent to Building 111 occurred on March 29 and 30, 1993. A total of 150 feet of pipe insulation was removed by Stephens using glovebag techniques. Stephens is licensed by the California State Contractors License Board and registered with the Division of Occupational Safety and Health (DOSH Regulation No. 9) to perform asbestos abatement. Seven yards of asbestos waste were generated during this phase of work.

Asbestos workers wore Type C respirators (supplied air) and full-body coveralls with attached shoe covers. The respiratory protection was downgraded to half-face respirators with safety goggles by Steven Shapiro, HLA's project monitor, after he reviewed air monitoring results by Northwest Envirocon, Inc., that demonstrated the 8-hour time-weighted average (TWA) fiber concentration was less than 2.0 fibers/cubic centimeter. Table 4 summarizes the asbestos air monitoring results.

Nonfriable asbestos was present in the gaskets between flanges in piping in Area 3 and Buildings 111 and 112, and in the transite pipe in Area 1 that contained electrical conduit. The gasketed flanges in Area 3 were removed and double-wrapped in 6-mil polyethylene sheeting between March 15 and 22, 1993; the transite pipe in Area 1 was removed and double-wrapped in 6-mil polyethylene sheeting on April 1, 1993; and the gasketed flanges in Buildings 111 and 112 were removed and double-wrapped in 6-mil polyethylene sheeting between April 21 and 29, 1993. Ten yards of material containing nonfriable asbestos were removed from the site. Drawings C2 and C3 show the areas on site where asbestos removal took place.

Workers were in Level C protection for this phase of work.

4.7 Piping and Tank Purging, Cleaning, and Demolition

Piping and tank purging, cleaning, and demolition occurred between March 9 and April 8, 1993. Between March 9 and 11, DECON used the manifold system in Building 112 to remove the residual product from the piping in Area 3 by applying a vacuum to the manifold and vacuuming the product into a vacuum truck. Approximately 700 gallons of residual product were removed from the tank fill and discharge piping in Area 3 and the manifold and filtering system in Building 112.

The contractor then pressurized the lines with compressed air to test for leaks in preparation for pipe rinsing. Leaks were detected in the piping due to deterioration.

The contractor requested approval to cut and remove the pipes in 10-foot sections and pressure wash them in the decontamination station that was set up in truck washout area.

The contractor began cutting piping in Area 3 into 10-foot sections with a reciprocating band saw on March 15. The 10-foot sections of pipe were stockpiled in the truck washout area decontamination station. Flanges were double-wrapped in 6-mil polyethylene sheeting because of nonfriable asbestos in the flange gaskets. Pipe cutting in Area 3 was completed March 22.

Because PCBs were not detected above state or federal action levels, wipe sampling was not required. However, all piping was triple rinsed, once with water, once with a hot water:penetone mix, and then using pressure washing. After triple rinsing all piping was inspected by HLA's field engineer for visible petroleum residue on the pipe walls or rinsate liquids. If the piping and rinsate were free of visible petroleum residue or sheen, the piping was stockpiled for transportation to the scrap yard. If petroleum residue was found, the piping was triple rinsed again until no petroleum residue was visible.

Between March 11 and 19, the nine 12,000-gallon tanks in Areas 2 and 3 were cleaned from outside, through the top manhole on the tanks. The tanks were triple-rinsed in the same manner as the piping. The tank walls showed no visible petroleum residue after using this process; the cone-shaped bottoms of the eight vertical storage tanks from Area 3 had an oily residue that required additional cleaning.

Between March 22 and 26, R & B Construction demolished the tanks using a hydraulic shear to cut the metal into manageable pieces for scrap. Tank 9 was removed and demolished March 22. Additional cleaning of Tank 9 was not required. Tanks 1 through 8 were removed and demolished March 24 and 25. The cone-shaped tank bottoms were cut off to allow the contractor to gain access for cleaning. Between

March 24 and March 26, DECON cleaned the tank bottoms with rags soaked with the 7:1 water:penetone mixture, until no visible petroleum residue remained.

The 210,000-gallon diesel storage tank was cleaned from inside on March 23 and demolished March 24. A confined space entry permit was prepared and confined space procedures were followed during tank entry. The tank was triple-rinsed. Once HLA inspected the tank and found no visible petroleum residue, the hydraulic shear demolished the tank in place.

The piping in Area 1 was removed between April 1 and 5 and triple-rinsed and inspected on April 6 and 7. Piping in Areas 2 and 4 was removed April 7 and 8 and triple-rinsed and inspected on April 8, 1993.

Worker protection for pipe purging, pipe removal, and pipe and initial tank cleaning was Level C: half-face respirators with HEPA cartridges, hard hats, safety glasses, gloves, and steel-toed boots. The poly-coated Tyvek was worn when there was potential exposure to liquids. Worker protection was downgraded to modified Level C (no respirator) for recleaning the tank bottoms. Drawings C2 and C3 show the locations of the piping and tanks removed.

4.8 Storm Drain Catch Basins Installation

The plug drain in Area 4 (Drawing C3) was removed on April 1, 1993. Plug drains in Areas 1, 2, and 3 were removed on April 15. Several drain lines no longer required as a result of a reconfiguration of the surface drainage collection system were also removed. The new catch basins were installed between April 19 and 27, 1993. Excavations ranged from 8 to 10 feet deep and up to 6 feet wide.

Free product on the groundwater surface was discovered while excavating for the new catch basin in Area 3. To keep the product and groundwater from entering the storm drain system, a layer of gravel was placed in the bottom of the excavation to

provide a stable base for installation of a double layer of 20-mil polyethylene sheeting around the catch basin. In all areas, the concrete catch basin grade rings were placed on top of a 12-inch layer of gravel in the bottom of each excavation. The existing vitrified clay pipe (VCP) storm drain lines were joined to the new catch basins with mortar 12 inches above the bottom of each catch basin. After checking for leaks, the contractor attached the top section of each catch basin and backfilled the excavations to grade. A detail showing a typical catch basin is shown on Drawing C5.

Workers wore Level C protection when placing the gravel and lining the Area 3 excavation but otherwise were in Level D protection for storm drain catch basin replacement.

4.9 Cleaning and Demolishing Buildings 111 and 112

Cleaning and demolishing Buildings 111 and 112 started April 21, 1993, and was completed May 6, 1993. Piping was removed between April 21 and 29. The contractor used a reciprocating band saw to cut the piping into 10-foot sections. Sections of piping were stockpiled in the truck washout area decontamination station and were subsequently pressure washed between April 30 and May 5. Pipe sections containing nonfriable asbestos flange gaskets were double-wrapped in 6-mil polyethylene sheeting.

Building 111 was partially demolished with a backhoe on May 3. The east and south walls act as retaining walls for the hill that abuts the south side and were not removed. A 7-foot portion of the floor on the south side that connects to the south and east walls of the Building 111 still remains (Drawing C4).

Building 112 was partially demolished April 29 and 30 with the breaker hammer of the backhoe. Only the east wall, which is part of the Area 3 berm, remains. Rubble and debris were removed between May 3 and 6, 1993.

A metal storage shed east of Area 3 was demolished on May 3, 1993.

Demolition debris was disposed of at Hillsdale Solid Waste Disposal facility, a Class III landfill in Colma, California.

4.10 Backfill, Compaction, and Liner Placement

Backfill, compaction, and liner placement took place between April 13 and May 13, 1993. Area 4 was backfilled on April 13, graded on April 21, and compacted on April 29 and 30. The liner was placed and anchored with soil between May 6 and 11. Area 1 was backfilled on April 23, and graded and compacted on April 29 and 30. The Area 1 liner was placed on May 11 and 12. Area 2 was backfilled on April 26 and graded and compacted on April 29. The Area 2 liner was placed May 6 and anchored with soil May 10 and 11. Area 3 was backfilled April 27, and graded April 29, May 3, and May 5. Compaction testing performed by Smith-Emery (Appendix I) indicated that Areas 1, 2, and 4 were backfilled and compacted to 90 percent relative compaction in accordance with the specifications. The frequency of compaction testing exceeded the specification requirement of one sample per 50 linear feet of trench.

The contractor attempted to compact Area 3 on May 5, but the presence of free product in the soil, predominantly at the east end of the area, prevented adequate compaction. The ROICC waived the compaction requirements for Area 3, and the area was regraded on May 12 for liner placement. No compaction tests were performed in Area 3. The Area 3 liner placement was completed on May 13.

Worker protection for backfill compaction and liner placement was Level D.

Drawing C4 shows the final grades of the four working areas, and Drawing C5 shows detail sections.

4.11 Waste Disposal

Waste generated during the project included a combination of hazardous and nonhazardous wastes. The following waste types were generated during the course of the project:

- Surface water collected from within the work areas
- Tank and pipe contents as a mixture of diesel fuel, lube oil, and Stoddard solvent
- Rinsate from the tank and piping cleaning operation
- Soil excavated to expose piping and install catch basins and PPE
- Pipe insulation (ACM)
- Flange gaskets (ACM)
- Building and vegetative debris.

Waste characterization samples were collected of the soil, surface water, rinsate, tank contents, and pipe lagging to evaluate disposal options. Other than sampling paint chips for asbestos, the vegetative and building debris was not sampled or analyzed prior to disposal. The flange gaskets had been previously analyzed and found to contain nonfriable ACM; no additional sampling was required.

Surface water runoff collected from the site and stored in the 6,500-gallon tanks was sampled and analyzed for the following parameters as required by the Department of Public Works (DPW), City and County of San Francisco, for batch wastewater discharges:

Chemical or Property	Analytical Method: Wastewater Methods 16th Ed.	Analytical Method: EPA Test Method
pH	423	
Dissolved sulfides (mg/l)	427C	
Oil and Grease (mg/l)	503A	
Hydrocarbon Oil and Grease (mg/l)	503E	
Total Suspended Solids (mg/l)	209D	

Chemical or Property	Analytical Method: Wastewater Methods 16th Ed.	Analytical Method: EPA Test Method
Chemical Oxygen Demand (mg/l)	508A	
Flashpoint (°F or °C)		1010 or 1020
Cyanide-Total (mg/l)	412D	
Phenols-Total (mg/l)	510B, 510C or 501D	
Arsenic-Total (mg/l)	303E or 304	7060
Barium--Total (mg/l)		6010
Beryllium--Total (mg/l)		6010
Cadmium-Total (mg/l)	303A, 303B or 304	6010
Chromium-Total (mg/l)	303A, 303B or 304	6010
Cobalt-Total (mg/l)		6010
Copper-Total (mg/l)	303A, 303B or 304	6010
Lead-Total (mg/l)	303A, 303B or 304	6010
Molybdenum-Total (mg/l)		6010
Mercury-Total (mg/l)	303F	7470
Nickel - Total (mg/l)	303A, 303B or 304	6010
Silver-Total (mg/l)	303A, 303B or 304	6010
Selenium-Total (mg/l)		7740
Thallium-Total (mg/l)		7840
Vanadium-Total (mg/l)		6010
Zinc-Total (mg/l)	303A, 303B or 304	6010
Purgeables (μg/l)		8240
Base/Neutrals and Acids (μg/l)		8270
Polychlorinated biphenyls (mg/l)		8080

The results of the chemical analyses of samples of two separate batches of the collected water are presented in Table 5. A permit was granted from the DPW to discharge the collected surface water into the sanitary sewer; a copy of the permit is presented in Appendix D. The collected surface water was discharged to the sanitary sewer in two batches of approximately 2,500 gallons on March 4, and June 13 and 14, 1993.

Composite samples were collected of the tank and pipe contents rinsate and excavated soil. The samples were collected in appropriate containers and stored in a chilled container for shipment to SPA with the chain of custody record for the following waste characterization analyses, as required by the specifications:

Chemical or property	EPA Test Method
Arsenic-Total (mg/l)	7060
Barium-Total (mg/l)	6010
Beryllium-Total (mg/l)	6010
Cadmium-Total (mg/l)	6010
Chemical or property	EPA Test Method
Chromium-Total (mg/l)	6010
Cobalt-Total (mg/l)	6010
Copper-Total (mg/l)	6010
Lead-Total (mg/l)	6010
Molybdenum-Total (mg/l)	6010
Mercury-Total (mg/l)	7470
Nickel - Total (mg/l)	6010
Silver-Total (mg/l)	6010
Selenium-Total (mg/l)	7740
Thallium-Total (mg/l)	7840
Vanadium-Total (mg/l)	6010
Zinc-Total (mg/l)	6010
Purgeables (μg/l)	8240
Base/Neutrals and Acids (μg/l)	8270
Polychlorinated biphenyls (mg/l)	8080

All the rinsate was sampled for petroleum hydrocarbons, and was found to contain over 10,000 ppm; DECON requested sending the rinsate offsite for treatment. The rinsate was accepted under the same profile as the tank contents. The results are presented in Table 5. Laboratory data sheets are presented in Appendix H.

The pipe and tank contents were taken to Petroleum Recycling Corporation, Patterson, California, for recycling, on March 19, 1993. The rinsate was taken to Petroleum Recycling Corporation on June 16 and 17, 1993. The petroleum products in the rinsate were recycled and the water was treated offsite at Petroleum Recycling Corporation.

In the composite soil sample from Areas 1 and 2, the following metals were detected: lead at 250 milligrams per kilogram (mg/kg), chromium at 220 mg/kg, nickel at 330 mg/kg, zinc at 210 mg/kg, and barium at 97 mg/kg; cobalt, copper, and vanadium were detected at concentrations less than 50 mg/kg. In the composite soil sample from Areas 3 and 4, the following metals were detected: lead at 1,200 mg/kg,

nickel and zinc at 170 mg/kg, chromium at 150 mg/kg, and barium at 58 mg/kg; cobalt, copper, and vanadium were detected at less than 50 mg/kg. PCB concentrations were less than 2 mg/kg.

Lead concentrations in soil from Areas 3 and 4 exceeded the California total threshold limit concentration (TTLC) for lead of 1,000 mg/kg. The soil was disposed of at a Class I landfill. Several Class II and III landfills were contacted concerning the soil from Areas 1 and 2. After reviewing the analytical data, these landfills would not accept the soil from Areas 1 and 2 because lead levels were over 200 mg/kg and PCBs were detected. Therefore, this soil was also disposed of at a Class I landfill. Between June 10 and 14, 1993, the soil was transported to the Chemical Waste Management Class I landfill in Kettleman Hills, California, for disposal.

Pipe insulation, flange gaskets, and building paint were analyzed for asbestos. The results of the analysis are presented in Table 5. The pipe insulation contained friable asbestos and was disposed of at the California Asbestos Monofil, Copperopolis, California. The pipe sections with flange gaskets contained nonfriable asbestos and were disposed of at Redwood Landfill, a Class III landfill in Novato, California. Because samples from the building paint and debris pile did not contain asbestos, the building debris and waste piles were disposed of at Hillside Solid Waste Disposal facility, a Class III landfill in Colma, California.

Hazardous wastes were transported under a Uniform Hazardous Waste Manifest (DHS 8022A/EPA 8700-22) and nonhazardous waste was transported under Nonhazardous Waste Manifest (12-BLS-C5). Copies of the manifests are in Appendix G. A summary of waste tracking is presented in Table 6.

5.0 CONSTRUCTION COST SUMMARY

The contract was a lump sum bid for the majority of the work, plus a unit price for transportation and disposal of hazardous and nonhazardous tank contents, rinsate, and soil. The lump sum portion of the bid was $229,791 and was not altered. The unit price based on estimated quantities of various waste types was $84,721. After adjusting for the actual quantities of wastes handled, the unit price portion of the contract was $111,463, for a total contract price of $341,259. The contract base price was $314,512. Variances such as the secondary containment berm and polypropylene liner were value-engineered and the Navy expected a credit to the lump sum bid. The cost of demolishing the buildings was $43,749. The ROICC and DECON are still in the process of negotiating the value-engineered items. The construction cost of the entire project is estimated to be between $375,000 and $385,000.

6.0 CURRENT CONDITION OF TANK FARM

All the tasks specified in the plans and specifications were performed as specified or amended. Additional tasks performed were the decontamination and demolition of Buildings 111 and 112 and a metal storage shed. All tanks, tank and pipe contents, steel piping, and asbestos within the bermed areas have been removed. The following pre-existing conditions still remain at Tank Farm:

- The truck washout ramp has been cleaned but remains intact.
- The sumps have been cleaned but remain intact.
- Storm drain lines inside and outside the bermed areas remain intact.
- The retaining walls for Buildings 111 and 112 remain intact.
- Product lines outside the bermed areas, including the steam trench, remain intact.

The following conditions were previously unknown and discovered during the removal action:

- Extensive visible petroleum contamination of soil in Area 3, extends to the water table.
- Floating petroleum product less than 1/8-inch thick was identified on the surface of the groundwater while excavating for the storm drain replacement in Area 3.
- Minimal visible petroleum contamination of soil in Areas 1, 2, and 4. Contamination extended to approximately 3 feet below ground surface in areas excavated for piping and drain plug removal.

Approximately 140 cubic yards (cy) (120 cy from Areas 1 and 2; 20 cy from Areas 3 and 4) of soil within the bermed areas around the piping and drain valve boxes was excavated, placed in rolloff bins, sampled, transported and disposed of at the Chemical Waste Management Class I disposal facility in Kettleman Hills, California.

The ground surface within the bermed areas is covered with a 20-mil polypropylene cover.

7.0 SUMMARY AND CONCLUSIONS

The Tank Farm Removal Action was completed on schedule and within budget. The overall cost of the project will be between $375,000 and $385,000; however, final negotiations are still underway. Because PCBs were not detected in the tank and pipe contents above action levels, stringent PCB decontamination verification was not required. Several field variances were requested because of potential cost savings or changes in field conditions. The overall cost of the field variances was $38,000.

All of the tanks, piping and steel at the Tank Farm were decontaminated and salvaged. The tank and pipe contents and rinsate water were recycled and/or treated. Approximately 7 cubic yards of friable asbestos and 10 cubic yards of nonfriable asbestos were generated and landfilled during the removal action. Approximately 140 cubic yards of soil were excavated to remove underground piping. This soil had metals concentrations above the TTLCs and was disposed of as hazardous waste in a Class I landfill, along with used PPE. Approximately 140 cubic yards of vegetation, concrete, and building debris was disposed of at a Class III landfill.

All storm drain lines and other underground piping outside the berm remain in place. Sumps were cleaned and backfilled with soil. Floating petroleum product was found on the groundwater when excavating to install a new catch basin in Area 3. Visible petroleum contamination was observed in the catch basin and pipe removal excavations. In Areas 1, 2, and 4, the visible contamination extended to a depth of approximately 3 to 4 feet; in Area 3, the visible contamination extended to the bottom of the catch basin excavation, which was approximately 8 feet deep.

After removal of the tanks and piping and installation of the new catch basins, the site was graded to drain, the berms were reestablished, and an HDPP liner was placed over the bermed areas to prevent surface water infiltration. The HDPP liner was installed instead of the clay specified to cap the site because remediation of the soil at the Tank Farm is expected to occur within the next 2 years.

8.0 REFERENCES

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TABLES

Table 1. Results of Tank Contents Sampling and Analysis Performed by PRC - April 1992
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California

Sample Number:	WS-6/1-R	WS-04-R	WS-03-R
Location:	Tanks 1 & 6	Tank 2	Tank 7
Sample Type:	Composite	Discrete	Discrete
Date:	4/22/92	4/17/92	4/17/92
PHYSICAL PROPERTIES			
Heat of Combustion (BTU/lb)	19,166	19,502	19,626
Flash Point °F (COC)	300°F	305°F	220°F
API Gravity (@60°F)	9.7/31.1*	31.4	31
% Water	99/0.6*	0.5	1
Total Organic Halogens	ND	ND	ND
Kinematic Viscosity	47.1 (SUS)	47.1 (SUS)	45.6 (SUS)
Saponifiable Fat	Negative	Negative	Negative
Sulfur	3250 ppm	3060 ppm	107 ppm
Appearance	*2 Phases - Water and Oil	Oily liquid	2 Phases - Water and Oil
FIELD NOTES			
Previous Usage	Diesel fuel storage	Diesel fuel storage	Stoddard solvent storage
Estimated Volume of Contents	Tank 1: < 50 gallons Tank 6: < 50 gallons	Approx 300 gallons of liquid	Approx 700 - 800 gallons
Visual Observations	Contents mixed w/a rust scale giving liquids a brownish color	Contents consisted of a colorless liquid	Two phases present: Yellow liquid w/brown particles below, viscous yellow liquid above
PID	Tank 1: >75 ppm Tank 6: 50 ppm	> 100 ppm	> 90 ppm
Sampling Comments	Tanks 1 & 6 contents composited. Both contained small quantities and could be disposed together	One liquid sample (approx 1 gallon) collected from Tank 2	One liquid sample (approx 1 gallon) collected from Tank 7

Table 1. Results of Tank Contents Sampling and Analysis Performed by PRC - April 1992
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	WS-08-R	WS-08-D	WS-01-R	WS-02-R
Location:	Tank 8	Tank 8	Truck ramp	Bermed area
Sample Type:	Discrete	Discrete	Discrete	Discrete
Date:	4/22/92	4/22/92	4/17/92	4/17/92
PHYSICAL PROPERTIES				
Heat of Combustion (BTU/lb)	NA	19,512	NA	NA
Flash Point °F (COC)	>100°F	305°F	>100°F	>100°F
API Gravity (@60°F)	10	9.6/31.1*	10	10
% Water	98	98/0.3	100	100
Total Organic Halogens	ND	ND	ND	ND
Kinematic Viscosity	NA	48.1 (SUS)	NA	NA
Saponifiable Fat	NA	Negative	NA	NA
Sulfur	NA	3350 ppm	NA	NA
Appearance	Water w/sediment	*2 Phases - Water and Oil	Water, clear	Water, clear
FIELD NOTES				
Previous Usage	Stoddard solvent storage		Truck ramp used for loading and unloading	Bermed area surrounds Tanks 1-8
Estimated Volume of Contents	< 50 gallons			
Visual Observations	Tank contains product - mainly a colorless liquid w/rust scaling at bottom		Muddy water w/a light sheen present	Muddy water present
PID	65 ppm		No reading above background	No reading above background
Sampling Comments	One real sample (approx 1 gallon) collected from Tank 8	One duplicate sample (1g) for quality control purposes collected from Tank 8	One water sample collected	One water sample collected

Table 1. Results of Tank Contents Sampling and Analysis Performed by PRC - April 1992
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	WS-6/1-R	WS-04-R	WS-03-R	WS-08-R	WS-08-D	WS-01-R	WS-02-R
Location:	Tanks 1 & 6	Tank 2	Tank 7	Tank 8	Tank 8	Truck ramp	Bermed area
Sample Type:	Composite	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Date:	4/22/92	4/17/92	4/17/92	4/22/92	4/22/92	4/17/92	4/17/92
CHEMICAL ANALYSES							
CLP VOCs							
Acetone	810 µg/l	7,600 µg/kg	59,000 µg/kg	500 µg/kg	730 µg/kg		
2-Butanone		7,600 µg/kg			940 µg/kg		
Benzene			2,100 µg/kg				
Xylenes			3,200 µg/kg				
Toluene					150 µg/kg		
CLP SOCs							
Pyrene	8,900 µg/l		14,000 µg/kg	91,000 µg/kg		2.5 µg/l	
Bis(2ethylhexyl)phthalate	12,900 µg/l			12,000 µg/kg	4,400 µg/kg	5.0 µg/l	
Di-n-octylphthalate	5,200 µg/l			8,400 µg/kg	4,400 µg/kg		
Phenanthrene	520,000 µg/l						
2-Methylnaphthalene		140,000 µg/kg	71,000 µg/kg				
Naphthalene			130,000 µg/kg				
Fluoranthene				28,000 µg/kg			
Chrysene				5,600 µg/kg			
Halogenated Volatiles							
Methylene Chloride	0.35 mg/l	0.9 mg/kg	0.5 mg/kg	0.50 mg/kg	0.37 mg/kg		
Freon 113		0.02 mg/kg	0.02 mg/kg				
1,1,1-Trichloroethane		0.04 mg/kg	0.03 mg/kg				
1,4,-Dichloroethane		0.04 mg/kg	0.02 mg/kg				
Trichloroethene							0.08 mg/l
Aromatic Volatiles							
TPH		6,600 µg/kg	9000 mg/kg			13 mg/l	73 mg/l
Toluene						0.14 µg/l	0.22 µg/l
p-Xylene						0.06 µg/l	
Xylenes (total)						0.06 µg/l	

Table 1. Results of Tank Contents Sampling and Analysis Performed by PRC - April 1992
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	WS-6/1-R	WS-04-R	WS-03-R	WS-08-R	WS-08-D	WS-01-R	WS-02-R
Location:	Tanks 1 & 6	Tank 2	Tank 7	Tank 8	Tank 8	Truck ramp	Bermed area
Sample Type:	Composite	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Date:	4/22/92	4/17/92	4/17/92	4/22/92	4/22/92	4/17/92	4/17/92
1,4-Dichlorobenzene						0.24 µg/l	
Benzene							0.06 µg/l
TPH Extractables							
TPH as Diesel	14,000 mg/kg	480,000 mg/kg	540000 mg/kg	4,900 mg/kg	430 mg/kg		
Unknown HC as diesel						2,300 mg/l	
TRPH							
TRPH (by IR)	730,000 mg/kg	1,200,000 mg/kg	1,200,000 mg/kg	1,200,000 mg/kg	740 mg/kg	4.9 mg/l	
Pesticide Organics							
Aldrin	320 µg/kg			800 µg/l			
Endosulfan I	140 µg/kg			260 µg/l			
Metals							
Zinc	29.8 mg/kg				4 mg/kg	0.29 mg/l	0.19 mg/l
Lead		0.54 mg/kg				0.25 mg/l	
Copper				3.0 mg/kg	2.6 mg/kg	0.057 mg/l	
Iron					70.2 mg/kg	6 mg/l	1.2 mg/l
Manganese					2.9 mg/kg	0.32 mg/l	0.39 mg/l
Aluminum						0.54 mg/l	
Calcium						31.5 mg/l	
Chromium						0.012 mg/l	0.015 mg/l
Sodium						14.2 mg/l	7.3 mg/l
Arsenc							0.021 mg/l
Magnesium							5.7 mg/l

Note: Values only given in table for detected analytes.

COC - Cleveland Open Cup

SUS - Sabolt Universal Seconds

Table 2. Results of Tank Contents Sampling for PCBs
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California

	Tank:	1	2	3	4	5	6	7	8	10	9
	Sample Number:	111892-1	111892-2	111892-3	111892-4	111892-5	111892-6	111892-7	111892-8	111892-9	924-081
	Date:	11/20/92	11/20/92	11/20/92	11/20/92	11/20/92	11/20/92	11/20/92	11/20/92	11/20/92	3/10/93
PCB ANALYSES	**Units**										
Aroclor-1016	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54 mg/l

Notes: ND - Below method detection limits

Table 4. Asbestos Abatement Air Monitoring Results
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California

Sample Number:	1	2	3	4	5	6	7	8	9	10	11
Sample Type*:	AP	AP	AD	AD	STE	P	P	B	B	P	STE
Location:	Center of Work Area	NE side of Work Area	Center of Work Area	NE side of Work Area	Cirilo X.	Cirilo X.	Jorge A.	-	-	Jorge A.	Jorge A.
Date Sampled:	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/30/93	3/30/93
NIOSH Method:	7400	7400	7400	7400	7400	7400	7400	7400	7400	7400	7400
Total Minutes Sampled:	213	213	86	87	30	37	70	-	-	155	30
Average Flow Rate: (liters per minute)	10.09	10.09	10.09	10.09	2.03	2.03	2.03	-	-	2.03	2.03
Volume: (liters)	2149.17	2149.17	867.74	877 - 831	60.9	75.11	142	-	-	314.65	60.90
Date Analyzed:	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/29/93	3/30/93	3/30/93
Fibers/Square mm:	44.59	47.13	22.93	21.66	11.46	12.74	20.38	-	-	19.11	6.37
Fibers/cc:	< 0.011	< 0.011	< 0.015	< 0.014	< LOQ	0.065	0.055	-	-	0.023	< LOQ
8 Hr TWA:	-	-	-	-	0.0053	0.0053	0.0080	-	-	0.015	0.015

*Sample Types:

AP: Air Sample prior to Abatement

AD: Area Sample during Abatement

C: Clearance Sample

AC: Aggressive Clearance Sample

P: Personal Breathing Zone Sample

B: Blank Sample

NAE: Negative Air Exhaust

CR: Clean Room Sample

STE: Short Term Exposure

LOQ: Limit of Quantitation

TWA: Time Weighted Average

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California

Sample Number:	Rainwater	924-080	924-229,109,220,244,237,196	924-236	924-238	924-241	924-243	924-245	924-312-1,2,3,4,6,8	924-312-5,7,9
Date Sampled:	12/16/92	3/8/93	4/8/93	3/5/93	3/5/93	3/5/93	3/5/93	3/5/93	3/12/93	3/12/93
Date Analyzed:	12/23/92	3/13/93	4/14/93	3/13/93	3/13/93	3/13/93	3/10-13/93	3/13/93	3/16-17/93	3/16-17/93
Matrix:	Rainwater runoff	Sub-surface Piping Insulation	Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Rainwater	Rainwater
Asbestos Analyses										
Chrysotile	-	40%	-	ND	-	-	-	-	-	-
Amosite	-	ND	-	ND	-	-	-	-	-	-
Crocidolite	-	-	-	ND	-	-	-	-	-	-
EPA 8240 - Volatile Organics										
Chloromethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Bromomethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Vinyl Chloride	ND	-	ND	ND	ND	ND	ND	ND	-	-
Chloroethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Methylene Chloride	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Acetone	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Carbon Disulfide	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Trichlorofluoromethane	ND	-	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,1-Dichloroethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
trans-1,2-Dichloroethene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Chloroform	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,2-Dichloroethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
2-Butanone	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,1,1-Trichloroethane	ND	-	ND	ND	ND	ND	ND	ND	-	-
Carbon Tetrachloride	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Vinyl Acetate	ND	-	ND	ND	ND	ND	ND	ND	-	-
Bromodichloromethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,2-Dichloropropane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Cis-1,3-Dichloropropene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Trichloroethene	ND	-	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,1,2-Trichloroethane	ND	-	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	Rainwater	924-080	924-229,109,220,244,237,196	924-236	924-238	924-241	924-243	924-245	924-312-1,2,3,4,6,8	924-312-5,7,9
Date Sampled:	12/16/92	3/8/93	4/8/93	3/5/93	3/5/93	3/5/93	3/5/93	3/5/93	3/12/93	3/12/93
Date Analyzed:	12/23/92	3/13/93	4/14/93	3/13/93	3/13/93	3/13/93	3/10-13/93	3/13/93	3/16-17/93	3/16-17/93
Matrix:	Rainwater runoff	Sub-surface Piping Insulation	Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Rainwater	Rainwater
Trans-1,3-Dichloropropene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
2-Chloroethyl vinyl ether	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Bromoform	ND	-	ND	ND	ND	ND	ND	ND	ND	-
4-Methyl-2-pentanone	ND	-	ND	ND	ND	ND	ND	ND	ND	-
2-Hexanone	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Tetrachloroethene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,1,2,2-Tetrachloroethane	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Toluene	ND	-	ND	ND	ND	ND	ND	ND	-	-
Chlorobenzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Styrene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
Total Xylenes	ND	-	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichlorobenzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,4-Dichlorobenzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
1,2-Dichlorobenzene	ND	-	ND	ND	ND	ND	ND	ND	ND	-
PCB ANALYSES										
Aroclor-1016	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254	ND	-	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	ND	-	21 µg/kg	600 µg/kg	17 µg/kg	250 µg/kg	8 µg/kg	22 µg/kg	ND	ND
EPA 8270										
Acid Extractables										
4-Chloro-3-methylphenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	Rainwater	924-080	924-229,109,220,244,237,196	924-236	924-238	924-241	924-243	924-245	924-312-1,2,3,4,6,8	924-312-5,7,9
Date Sampled:	12/16/92	3/8/93	4/8/93	3/5/93	3/5/93	3/5/93	3/5/93	3/5/93	3/12/93	3/12/93
Date Analyzed:	12/23/92	3/13/93	4/14/93	3/13/93	3/13/93	3/13/93	3/10-13/93	3/13/93	3/16-17/93	3/16-17/93
Matrix:	Rainwater runoff	Sub-surface Piping Insulation	Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Rainwater	Rainwater
2,4-Dinitrophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Methyl-4,6-dinitrophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Base Neutral Extractables										
Acenaphthene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benoic Acid	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a) anthracene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b) fluoranthene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k) fluoranthene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (ghi) perylene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl Alcolhol	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl butyl phthalate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-chloroethoxy) methane	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-chloroethyl) ether	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-chloroisopropyl) ether	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-ethlyhexyl) phthalate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-chlorophenyl phenyl ether	-	-	ND	ND	ND	ND	ND	ND	ND	ND

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	Rainwater	924-080	924-229,109,220,244,237,196	924-236	924-238	924-241	924-243	924-245	924-312-1,2,3,4,6,8	924-312-5,7,9
Date Sampled:	12/16/92	3/8/93	4/8/93	3/5/93	3/5/93	3/5/93	3/5/93	3/5/93	3/12/93	3/12/93
Date Analyzed:	12/23/92	3/13/93	4/14/93	3/13/93	3/13/93	3/13/93	3/10-13/93	3/13/93	3/16-17/93	3/16-17/93
Matrix:	Rainwater runoff	Sub-surface Piping Insulation	Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Rainwater	Rainwater
Chrysene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,g) anthracene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthatate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Diethyphthalate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Methyl naphthalene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	-	-	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	-	-	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	-	-	ND	ND	ND	ND	ND	ND	ND	ND

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	Rainwater	924-080	924-229,109,220,244,237,196	924-236	924-238	924-241	924-243	924-245	924-312-1,2,3,4,6,8	924-312-5,7,9
Date Sampled:	12/16/92	3/8/93	4/8/93	3/5/93	3/5/93	3/5/93	3/5/93	3/5/93	3/12/93	3/12/93
Date Analyzed:	12/23/92	3/13/93	4/14/93	3/13/93	3/13/93	3/13/93	3/10-13/93	3/13/93	3/16-17/93	3/16-17/93
Matrix:	Rainwater runoff	Sub-surface Piping Insulation	Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Berm Soil	Rainwater	Rainwater
1,2,4-Trichlorobenzene	-	-	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Hydrocarbons (C9-C15/C22)	-	-	-	-	-	-	-	-	1,000,000 mg/kg	1,000,000 mg/kg
Metals										
Antimony	-	-	ND	-	-	-	-	-	ND	ND
Arsenic	-	-	2	-	-	-	-	-	ND	ND
Barium	-	-	97	-	-	-	-	-	ND	ND
Beryllium	-	-	ND	-	-	-	-	-	ND	ND
Cadmium	-	-	ND	-	-	-	-	-	ND	ND
Chromium	-	-	220	-	-	-	-	-	ND	ND
Cobalt	-	-	23	-	-	-	-	-	ND	ND
Copper	-	-	46	-	-	-	-	-	ND	ND
Lead	-	-	250	-	-	-	-	-	ND	ND
Mercury	-	-	ND	-	-	-	-	-	ND	ND
Molybdenum	-	-	ND	-	-	-	-	-	ND	ND
Nickel	-	-	330	-	-	-	-	-	ND	ND
Selenium	-	-	ND	-	-	-	-	-	ND	ND
Silver	-	-	ND	-	-	-	-	-	ND	ND
Thallium	-	-	ND	-	-	-	-	-	ND	ND
Vanadium	-	-	45	-	-	-	-	-	ND	ND
Zinc	-	-	210	-	-	-	-	-	ND	ND
THP										
Total Oil and grease	ND	-	-	-	-	-	-	-	-	-
TPH-Diesel	-	-	-	-	-	-	-	-	-	-
EPA 160.2 - Total Suspended Solids										
Total Suspended Solids	-	-	-	-	-	-	-	-	-	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	924-312-10,11,12,13,15,17	924-312-10,14,16,18,19	924-323	924-406	924-505	924-519-1	924-519-2	924-RS7
Date Sampled:	3/12/93		3/8/93	4/6/93	5/5/93	5/19/93	5/19/93	4/8/93
Date Analyzed:	3/16-17/93	3/16-17/93	3/13/93	4/13/93	5/7/93	5/20/93	5/20/93	4/16/93
Matrix:	Tank Contents	Surface Water	Paint Chips	Surface Water	Soil	Rinsate	Rinsate	Soil
Asbestos Analyses								
Chrysotile	-	-	ND	-	-	-	-	-
Amosite	-	-	ND	-	-	-	-	-
Crocidolite	-	-	ND	-	-	-	-	-
EPA 8240 - Volatile Organics								
Chloromethane	ND	-	-	ND	-	-	-	-
Bromomethane	ND	-	-	ND	-	-	-	-
Vinyl Chloride	-	-	-	ND	-	-	-	-
Chloroethane	ND	-	-	ND	-	-	-	-
Methylene Chloride	ND	-	-	ND	-	-	-	-
Acetone	ND	-	-	21 µg/l	-	-	-	-
Carbon Disulfide	ND	-	-	ND	-	-	-	-
Trichlorofluoromethane	-	-	-	ND	-	-	-	-
1,1-Dichloroethene	ND	-	-	ND	-	-	-	-
1,1-Dichloroethane	ND	-	-	ND	-	-	-	-
trans-1,2-Dichloroethene	ND	-	-	ND	-	-	-	-
Chloroform	ND	-	-	ND	-	-	-	-
1,2-Dichloroethane	ND	-	-	ND	-	-	-	-
2-Butanone	ND	-	-	ND	-	-	-	-
1,1,1-Trichloroethane	-	-	-	ND	-	-	-	-
Carbon Tetrachloride	ND	-	-	ND	-	-	-	-
Vinyl Acetate	-	-	-	ND	-	-	-	-
Bromodichloromethane	ND	-	-	ND	-	-	-	-
1,2-Dichloropropane	ND	-	-	ND	-	-	-	-
cis-1,2-Dichloroethene	ND	-	-	ND	-	-	-	-
Cis-1,3-Dichloropropene	ND	-	-	ND	-	-	-	-
Trichloroethene	-	-	-	ND	-	-	-	-
Dibromochloromethane	ND	-	-	ND	-	-	-	-
1,1,2-Trichloroethane	-	-	-	ND	-	-	-	-
Benzene	ND	-	-	ND	-	-	-	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	924-312-10,11,12,13,15,17	924-312-10,14,16,18,19	924-323	924-406	924-505	924-519-1	924-519-2	924-RS7
Date Sampled:	3/12/93		3/8/93	4/6/93	5/5/93	5/19/93	5/19/93	4/8/93
Date Analyzed:	3/16-17/93	3/16-17/93	3/13/93	4/13/93	5/7/93	5/20/93	5/20/93	4/16/93
Matrix:	Tank Contents	Surface Water	Paint Chips	Surface Water	Soil	Rinsate	Rinsate	Soil
Trans-1,3-Dichloropropene	ND	-	-	ND	-	-	-	-
2-Chloroethyl vinyl ether	ND	-	-	ND	-	-	-	-
Bromoform	ND	-	-	ND	-	-	-	-
4-Methyl-2-pentanone	ND	-	-	ND	-	-	-	-
2-Hexanone	ND	-	-	ND	-	-	-	-
Tetrachloroethene	ND	-	-	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	-	ND	-	-	-	-
Toluene	-	-	-	ND	-	-	-	-
Chlorobenzene	ND	-	-	ND	-	-	-	-
Ethylbenzene	ND	-	-	ND	-	-	-	-
Styrene	ND	-	-	ND	-	-	-	-
Total Xylenes	-	-	-	ND	-	-	-	-
1,3-Dichlorobenzene	ND	-	-	ND	-	-	-	-
1,4-Dichlorobenzene	ND	-	-	ND	-	-	-	-
1,2-Dichlorobenzene	ND	-	-	ND	-	-	-	-
PCB ANALYSES								
Aroclor-1016	ND	ND	-	ND	-	-	-	ND
Aroclor-1221	ND	ND	-	ND	-	-	-	ND
Aroclor-1232	ND	ND	-	ND	-	-	-	ND
Aroclor-1242	ND	ND	-	ND	-	-	-	ND
Aroclor-1248	ND	ND	-	ND	-	-	-	ND
Aroclor-1254	ND	ND	-	ND	-	-	-	ND
Aroclor-1260	ND	ND	-	0.7 µg/l	-	-	-	280 µg/kg
EPA 8270								
Acid Extractables								
4-Chloro-3-methylphenol	ND	ND	-	ND	-	-	-	-
2-Chlorophenol	ND	ND	-	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	-	ND	-	-	-	-
2,4-Dimethylphenol	ND	ND	-	19 µg/l	-	-	-	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	924-312-10,11,12,13,15,17	924-312-10,14,16,18,19	924-323	924-406	924-505	924-519-1	924-519-2	924-RS7
Date Sampled:	3/12/93		3/8/93	4/6/93	5/5/93	5/19/93	5/19/93	4/8/93
Date Analyzed:	3/16-17/93	3/16-17/93	3/13/93	4/13/93	5/7/93	5/20/93	5/20/93	4/16/93
Matrix:	Tank Contents	Surface Water	Paint Chips	Surface Water	Soil	Rinsate	Rinsate	Soil
2,4-Dinitrophenol	ND	ND	-	ND	-	-	-	-
2-Methyl-4,6-dinitrophenol	ND	ND	-	ND	-	-	-	-
2-Methylphenol	ND	ND	-	ND	-	-	-	-
4-Methylphenol	ND	ND	-	ND	-	-	-	-
2-Nitrophenol	ND	ND	-	ND	-	-	-	-
4-Nitrophenol	ND	ND	-	ND	-	-	-	-
Pentachlorophenol	ND	ND	-	ND	-	-	-	-
Phenol	ND	ND	-	ND	-	-	-	-
2,4,5-Trichlorophenol	ND	ND	-	ND	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	-	ND	-	-	-	-
Base Neutral Extractables								
Acenaphthene	ND	ND	-	ND	-	-	-	-
Acenaphthylene	ND	ND	-	ND	-	-	-	-
Anthracene	ND	ND	-	ND	-	-	-	-
Benzidine	ND	ND	-	ND	-	-	-	-
Benoic Acid	ND	ND	-	ND	-	-	-	-
Benzo(a) anthracene	ND	ND	-	ND	-	-	-	-
Benzo(b) fluoranthene	ND	ND	-	ND	-	-	-	-
Benzo(k) fluoranthene	ND	ND	-	ND	-	-	-	-
Benzo (ghi) perylene	ND	ND	-	ND	-	-	-	-
Benzo (a) pyrene	ND	ND	-	ND	-	-	-	-
Benzyl Alcolhol	ND	ND	-	ND	-	-	-	-
Benzyl butyl phthalate	ND	ND	-	ND	-	-	-	-
Bis (2-chloroethoxy) methane	ND	ND	-	ND	-	-	-	-
Bis (2-chloroethyl) ether	ND	ND	-	ND	-	-	-	-
Bis (2-chloroisopropyl) ether	ND	ND	-	ND	-	-	-	-
Bis (2-ethlyhexyl) phthalate	ND	ND	-	20 µg/l	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	-	ND	-	-	-	-
4-Chloroaniline	ND	ND	-	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	-	ND	-	-	-	-
4-chlorophenyl phenyl ether	ND	ND	-	ND	-	-	-	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	924-312-10,11,12,13,15,17	924-312-10,14,16,18,19	924-323	924-406	924-505	924-519-1	924-519-2	924-RS7
Date Sampled:	3/12/93		3/8/93	4/6/93	5/5/93	5/19/93	5/19/93	4/8/93
Date Analyzed:	3/16-17/93	3/16-17/93	3/13/93	4/13/93	5/7/93	5/20/93	5/20/93	4/16/93
Matrix:	Tank Contents	Surface Water	Paint Chips	Surface Water	Soil	Rinsate	Rinsate	Soil
Chrysene	ND	ND	-	ND	-	-	-	-
Dibenzo (a,g) anthracene	ND	ND	-	ND	-	-	-	-
Dibenzofuran	ND	ND	-	ND	-	-	-	-
Di-n-butylphthatate	ND	ND	-	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	-	ND	-	-	-	-
1,3-Dichlorobenzene	ND	ND	-	ND	-	-	-	-
1,4-Dichlorobenzene	ND	ND	-	ND	-	-	-	-
3,3'-Dichlorobenzidine	ND	ND	-	ND	-	-	-	-
Diethyphthalate	ND	ND	-	ND	-	-	-	-
Dimethylphthalate	ND	ND	-	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	-	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	-	ND	-	-	-	-
Di-n-octylphthalate	ND	ND	-	ND	-	-	-	-
Fluoranthene	ND	ND	-	ND	-	-	-	-
Fluorene	ND	ND	-	ND	-	-	-	-
Hexachlorobenzene	ND	ND	-	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	-	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	-	ND	-	-	-	-
Hexachloroethane	ND	ND	-	ND	-	-	-	-
Indeno (1,2,3-cd) pyrene	ND	ND	-	ND	-	-	-	-
Isophorone	ND	ND	-	ND	-	-	-	-
2-Methyl naphthalene	ND	ND	-	ND	-	-	-	-
Naphthalene	ND	ND	-	ND	-	-	-	-
2-Nitroaniline	ND	ND	-	ND	-	-	-	-
3-Nitroaniline	ND	ND	-	ND	-	-	-	-
4-Nitroaniline	ND	ND	-	ND	-	-	-	-
Nitrobenzene	ND	ND	-	ND	-	-	-	-
N-Nitrosodiphenylamine	ND	ND	-	ND	-	-	-	-
N-Nitrosodi-n-propylamine	ND	ND	-	ND	-	-	-	-
Phenanthrene	ND	ND	-	ND	-	-	-	-
Pyrene	ND	ND	-	ND	-	-	-	-

Table 5. Waste Characterization Analysis
Construction Summary Report
Tank Farm Removal Action
Hunters Point Annex
San Francisco, California
(Continued)

Sample Number:	924-312-10,11,12,13,15,17	924-312-10,14,16,18,19	924-323	924-406	924-505	924-519-1	924-519-2	924-RS7
Date Sampled:	3/12/93		3/8/93	4/6/93	5/5/93	5/19/93	5/19/93	4/8/93
Date Analyzed:	3/16-17/93	3/16-17/93	3/13/93	4/13/93	5/7/93	5/20/93	5/20/93	4/16/93
Matrix:	Tank Contents	Surface Water	Paint Chips	Surface Water	Soil	Rinsate	Rinsate	Soil
1,2,4-Trichlorobenzene	ND	ND	-	ND	-	-	-	-
4-Nitroaniline	ND	ND	-	ND	-	-	-	-
Hydrocarbons (C9-C15 or C22)	1,000,000 mg/kg	1,000,000 mg/kg	-	-	-	-	-	-
Metals								
Antimony	ND	ND	-	ND	-	-	-	ND
Arsenic	ND	ND	-	ND	-	-	-	ND
Barium	ND	ND	-	0.13 mg/l	-	-	-	58 mg/kg
Beryllium	ND	ND	-	ND	-	-	-	ND
Cadmium	ND	ND	-	ND	-	-	-	ND
Chromium	ND	ND	-	0.14 mg/l	-	-	-	150 mg/kg
Cobalt	ND	ND	-	ND	-	-	-	14 mg/kg
Copper	ND	ND	-	0.1 mg/l	-	-	-	40 mg/kg
Lead	ND	ND	-	1.0 mg/l	-	-	-	1200 mg/kg
Mercury	ND	ND	-	ND	-	-	-	ND
Molybdenum	ND	ND	-	ND	-	-	-	170 mg/kg
Nickel	ND	ND	-	0.3 mg/l	-	-	-	ND
Selenium	ND	ND	-	ND	-	-	-	ND
Silver	ND	ND	-	ND	-	-	-	ND
Thallium	ND	ND	-	ND	-	-	-	ND
Vanadium	ND	ND	-	ND	-	-	-	34 mg/kg
Zinc	ND	ND	-	0.52 mg/l	-	-	-	170 mg/kg
THP								
Total Oil and grease	-	-	-	-	ND	-	-	-
TPH-Diesel	-	-	-	-	-	22,000 mg/l	13,000 mg/l	
EPA 160.2 - Total Suspended Solids								
Total Suspended Solids	-	-	-	-	120 mg/l	-	-	-

Amigo bag and lining co.
Formerly McCoy Supply Co.

September 7, 1994

Decon Environmental Services
Attn.: Sean Anderson
23490 Connecticut St.
Hayward, CA 94545
Fax:: 510-782-8584
Phone: 510-732-6444

Re: 20 Mil, MDPE, Estimated Lifetime

Dear Sean:

Amigo bag and lining co. will warranty that the 20 Mil medium density polyethylene that was sold to Decon Environmental Services and delivered to Hunters Point Naval Shipyard, will last 5 years in direct sunlight, assuming no physical stresses like wind or vehicle traffic.

Please call with any questions.
Sincerely,

Mark R. Howe, President

1220 47th Avenue • Oakland, California 94601 • 510/535-2455 • FAX 510/535-0312
800/995-7714

APPENDIX J

RESPONSES TO AGENCY COMMENTS

NAVY RESPONSES TO COMMENTS ON DRAFT CONSTRUCTION SUMMARY REPORT TANK FARM REMOVAL ACTION

The following presents the Navy's responses to the U.S. Environmental Protective Agency (EPA) comments on the Draft Construction Summary Report, Tank Farm Removal Action, dated October 22, 1993, as presented in a letter dated March 24, 1994. Comments are reproduced exactly as submitted to the Navy. The California EPA Department of Toxic Substance Control (DTSC) will not be submitting comments on this report.

GENERAL COMMENTS

Comment 1: **A signed certification statement from the site engineer should be provided to verify compliance with the removal action work plan and specifications.**

Response: A certification statement has been included after the cover page.

SPECIFIC COMMENTS

Comment 1: **Page 4, Section 1.2, 2nd para.: Reference is made to Table 1 for sample analysis of 10 tanks. It would be helpful if Table 1 included a key to identify which sample number belongs to which tank and whether or not the sample is a composite sample. This is not clear for some of the samples, especially on pages 3 and 4. The Navy should also state reasons, or reference specifications, for the basis on which the chemical parameters and methods were limited to those shown in Table 1.**

Response: Table 1 has been amended to identify sample locations and which samples are composites. Chemical test methods and analytes were presented in the Tank Farm Work Plan dated September 13, 1990 which was approved by the EPA. The analytes were selected based on the predisposal/treatment requirements from the treatment, storage, and disposal facilities.

Comment 2: **Page 9, Section 4.1, third sentence: "A sample could not be drawn from tank 9...because it was empty...Analytical results...in Table 2." Is sample number 111892-9 on Table 2 from tank number 9 or is it from tank number 10? ND cannot be reported for tank 9 as it was empty. Table 2 should indicated which sample are from which tank. The Navy should also state the reason, or provide a specification reference, for PCB analysis.**

Response: PCB analysis was required as part of the waste characterization specifications (Section 02085, paragraph 3.6.4) for the Tank Farm Removal Action. The contractor analyzed the contents of each tank separately for PCBs, so that if designated levels of PCBs (greater than 2 ppm) were found, the contents of that tank could be handled separately. The contractor performed this

sampling in November 1992, significantly before construction activities began, to coordinate the treatment of the PCB-contaminated waste, if necessary. The second paragraph of Section 4.0 (page 8-R) has been modified in response to this comment. Tank 9 could not be sampled in November 1992, however, in March 1993, when construction began, a liquid residue was found in the drain line of Tank 9 and was sampled, as stated in the added second paragraph of Section 4.1. See page 9.

Comment 3: **Page 10, Section 4.3, fourth sentence: "Standing surface water was pumped to the storm drain..." The Navy should state the approximate volume and location of water. Also state how it was determined to be clean and whether pumping to the storm drain was within the permit requirements.**

Response: Standing rainwater (surface water runoff) was pumped into the storage tanks, sampled, and analyzed for volatile organic compounds (EPA Method 8240), PCBs, and total oil and grease. No analytes were detected. After receipt of approval from the Publically Owned Treatment Works (POTW), the water was discharged to the City and County of San Francisco sanitary sewer system. Approximately 2,500 gallons of collected runoff was discharged to the sanitary sewer prior to mobilization, and an additional 2,500 gallons of collected runoff was discharged to the sanitary sewer during the course of the removal action. The chemical analysis results for the initial water sample have been added to Table 5. Sections 4.3 and 4.11 have been revised in response to this comment. Note that no water was discharged to the storm drain.

Comment 4: **Page 11, Section 4.4: The Navy should indicate approximate ranges for depths and widths of each category of trench excavations (deep and shallow excavations). This information could be helpful during future remedial activities.**

Response: In general, underground distribution piping was less than 4 feet below ground surface. Shallow trenches were excavated to remove the distribution piping. These excavations generally involved removing a 6- to 8-inch diameter steam line, and were typically 18 inches wide and 4 feet deep. Deep excavations to remove or replace plug drains and drain lines were 8 to 10 feet deep and 6 feet wide. The text of Sections 4.4 and 4.8 has been modified in response to this comment.

Comment 5: **Page 12, Section 4.5, top of page: Summary of the air monitoring data for asbestos in Table 4. Units are not provided for some of the rows in Table 4: Air flow rates and volume. The Navy should provide these units.**

Response: Table 4 has been modified to include units for air flow rates and sample volume.

Comment 6: **Page 17, Section 4.10, bottom of first para.: "...Areas 1, 2, and 4 were backfilled and compacted to 90 percent..." Some of the density test results in**

Appendix I show compaction results below 90 percent; were these areas re-compacted to 90% and retested? Also, did the test frequency comply with the QA/QC requirements specified?

Response: Appendix I presents the results of 14 tests; Tests 12, 13 and 14 were the retests of failed tests 2, 6 and 8 after the areas had been reworked. The specification required 1 test per 50 linear feet of trench. A total of 385 linear feet of trenching from Areas 1, 2, and 4 were excavated and backfilled; therefore the 11 tests taken exceeded the 8 tests required by the specification Section 02226, paragraph 3.7.1.

Comment 7: **Page 20, Section 4.1, top of page.: Rinsate...found to contain over 10,000 ppm, DECON requested sending the rinsate offsite for treatment." Was the request granted and was the rinsate actually sent to offsite treatment? Which treatment facility? What happened with the rinsate showing below 10,000 ppm? Why was the rinsate tested for petroleum hydrocarbons only? What about metals? State reasons of reference specifications for the treatment/disposal criteria and revise the report, as necessary.**

Response: The specifications required the contractor to treat the rinsate onsite using Granular Activated Carbon (GAC) and discharge the treated rinsate to the sanitary sewer. The contractor, in an attempt to reduce costs, minimized the amount of rinsate generated by using steam and degreasing agents. Therefore, the rinsate contained high concentrations of petroleum hydrocarbons; in fact there was a layer of floating petroleum product on the rinsate surface. The contractor requested a variance from the specifications, because they believed it was more cost effective to treat the rinsate offsite by recycling than to treat it using a GAC system. They sampled all the rinsate and it contained TPH over 10,000 ppm. The Navy granted the variance because of these high concentrations. The rinsate was tested for petroleum hydrocarbons initially to evaluate and discuss treatment options. When it was determined that the rinsate could be recycled in the same manner as the tank contents and was generated from cleaning the same tanks, it was accepted by the same treatment facility that treated the pipe and tank contents, as part of the same waste stream. See page 20.

Comment 8: **Page 23, Section 6, bottom of page: "The ground surface...is covered with a 20-mil polypropylene cover." How is the cover anchored and protected against the elements? Are there any regular inspection/maintenance activities scheduled to upkeep the cover integrity? How long is the cover scheduled to function, 2 or 5 years? Who is responsible for future inspection/maintenance, if any? The Navy should revise the report to address these questions.**

Response: As part of granting the variance to the contractor to use a polyethylene cover instead of the clay cap over the bermed areas, the Navy required that the contractor warranty the cover. Therefore, the contractor is responsible for annual inspection and maintenance of the cover for 5 years. The contractor provided a 5-year warranty with the cover and the manufacturer provided a 15-year warranty on the materials. These warranties are included in Appendix I, and are referenced in Section 3.0 of the text.

DISTRIBUTION

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CONSTRUCTION SUMMARY REPORT
TANK FARM REMOVAL ACTION
NAVAL STATION TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA
October 3, 1994

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QUALITY CONTROL REVIEWER

David F. Leland by Patrick Hale

David F. Leland, P.E.
Principal Engineer