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ENVIRON / SAFETY / QA

MR. STEPHEN WILSON
CROWLEY MARINE SERVICES, INC.
2401 FOURTH AVENUE
SEATTLE, WASHINGTON 98111

**RE: ENVIRONMENTAL INVESTIGATION AND REMEDIATION AT
PACIFIC DRY DOCKS YARDS I AND II**

Dear Mr. Wilson:

At your request, The Gauntlett Group (Gauntlett) has completed a review of the environmental investigation and remediation activities completed at Pacific Dry Dock Yards I and II between 1989 and 1997. The purpose of the review was to address the adequacy of the investigation and remediation activities completed at the Yards relative to comments provided by Geomatrix Consultants, Inc (Geomatrix). The Geomatrix comments were appended to the Port of Oakland's April 10, 1997, letter to Crowley Marine Services (Crowley).

The documentation that Gauntlett reviewed indicates that a series of phased investigation programs were conducted at both Yards between 1989 and 1996. Aerial photographs, site observations, and site history information were used to select suspect areas for the initial environmental investigations. Many of the initial fill, soil, and water samples collected from the Yards between 1989 and 1992 were tested for broad ranges of priority pollutants such as chlorinated and aromatic volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals (Title 22 metals), and petroleum hydrocarbons. The initial testing results were used to focus areas for additional investigation or remediation and focus sample testing requirements. The phased investigation approach that was used is similar to current American Society for Testing and Materials (ASTM) standards for initiating environmental investigations.

The site characterization and remediation activities completed by Crowley at the Yards are summarized in Attachment 1. Responses to Geomatrix recommendations for additional soil or groundwater sampling at the Yards are also included in the attachment. Gauntlett responses to the recommendations are given in the order that they were listed by Geomatrix.

Geomatrix appears to be recommending a screening level sampling program for priority pollutant compound analyses at both of the Yards. The data that Gauntlett reviewed



MR. STEPHEN WILSON

MAY 28, 1997

Page 2


indicates that Crowley has completed screening level evaluations, follow-up investigations, and remediation at the Yards. The site investigation work was performed under the oversight of local or state regulatory agencies. Requisite permits have been obtained for the environmental investigation and remediation work completed. Regulatory agency concurrence as to the adequacy of specific investigation or remediation activities has also been obtained. Given this information, the significant additional investigations recommended by Geomatrix are not warranted.

Thank you for the opportunity to provide the requested services on this project. Please call if you have any questions.

Very truly yours,

THE GAUNTLETT GROUP, LLC


PATRICK LACEY
FIELD SERVICES MANAGER


DOUGLAS A. LIDDIE
PRESIDENT

Attachments: Responses to comments appended to the Port of Oakland's April 10, 1997, letter

ATTACHMENT 1

Responses to Comments Appended to the Port of Oakland's April 10, 1997 Letter

GENERAL

Investigation and remediation activities completed at each of the Yards are briefly summarized below. Specific responses to the Port of Oakland's April 10, 1997, letter comments regarding the adequacy of the investigation activities conducted are also provided.

The Yard I facility at 1441 Embarcadero is located on about 1.5 acres. Intertidal and offshore sediment testing was completed between 1989 and 1994. Over 100 borings were drilled and sampled at this Yard between 1989 and 1996. Fill and soil testing has been completed at over 150 locations. More than 20 grab groundwater samples were collected and tested during the course of the investigations. Six groundwater monitoring wells were installed and routinely sampled to document water quality beneath the Yard. The analytical data were used to identify constituents of potential concern and areas at the yard where remediation was performed. The constituents of potential concern identified during these investigations was generally limited to petroleum hydrocarbons and spent sandblast grit. Remediation of targeted areas at the Yard has been completed as described below:

- An underground fuel storage tank in the northwestern portion of the site was removed during September 1991.
- An underground fuel storage tank in the northeast corner of the site was removed during February 1994.
- Approximately 40 tons of fill material were excavated from two areas in the eastern section of the site during June and July 1995.
- Approximately 4000 tons of spent sandblast grit and debris were removed from the supra- and intertidal areas at the Yard during March 1997.

The Yard II facility at 321 Embarcadero is located on about 3.5 acres. Intertidal and offshore sediment testing was also completed at this Yard between 1989 and 1994. Sixty-seven borings were drilled and sampled at this Yard between 1989 and 1995. Fill and soil testing has been completed at 93 locations. Eleven grab groundwater samples have been collected and tested. Seven groundwater monitoring wells were installed and tested once each quarter for a year. Constituents of potential concern at Yard II include heavy petroleum hydrocarbons, lighter petroleum hydrocarbons in the northeastern portion of the site, and spent sandblast grit. Requisite remediation at this Yard has been completed as described below:

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• still ASTs present

- An underground fuel storage tank was removed from the north-central portion of the site during September 1994.
- The aboveground diesel fuel storage tanks near the powerhouse were removed during March 1996.
- Approximately 500 tons of spent sandblast grit were removed from the supra- and intertidal areas at the Yard during March 1997.

RESPONSES TO GEOMATRIX COMMENTS

Offshore Sediment Area - Both Yards

Work conducted to evaluate the offshore sediment areas at both Yards has been approved by the San Francisco Regional Water Quality Control Board (SFRWQCB). The data collected during the 1991 and 1994 studies suggest that the constituents detected in the sediments have been contributed by sources other than the Yards or by Crowley's predecessor at Yard II, the U.S. Navy (Versar, October 1992 and PTI Environmental, June 1994). At Yard I, the highest PAH concentrations were found in sediments collected furthest from the facility. At Yard II, the highest PAH concentrations were found near decaying marine structures and pilings. These creosote oil-treated pilings were installed by the Navy during 1945.

Offshore sediment sampling and analysis programs were completed during 1991 and 1994. The 1994 program included chemical and aquatic toxicity testing of sediment samples. The analytical data indicated that there is a low overall potential for aquatic toxicity from the constituents in the offshore sediments and that the short-term bioavailability of the chemicals is low. The one area at Yard I that had a moderate potential for chronic toxicity (affected the growth of the juvenile polychaete worms) was near the storm water outfall in the eastern section of the site. This location also had the highest lead and zinc concentrations of any sediment tested during 1994. Gauntlett understands that the City of Oakland traced this storm drain after the 1994 study was completed. Continuous discharge from this outfall of what appeared to be sanitary sewage was observed during the March 1997 grit removal program.

The 1994 data indicated that visual evidence of high grit concentrations at Yard II was limited to one transect. Intertidal grit in this area was removed during March 1997. No grit was observed in the 1994 offshore sediment samples collected from Yard I.

In March 1996, the SFRWQCB acknowledged that data from the 1994 study and the 1995-1996 Bay Protection and Toxic Cleanup Program screening study indicated that the sediment in the subtidal areas on and near the Yards do not represent a significant threat to aquatic life or human health.

Yard I - Western Portion

Initial fill, soil, and groundwater testing at Yard I - western portion was completed between 1989 and 1992. Seventy-two borings were augered and tested during these initial investigations (Versar, October 1990; Versar, May 1992; and Versar, September 1992). Grab groundwater samples from 14 locations were also tested during these investigations. The general strategy during the initial investigations was to test samples from suspect areas such as the waste oil tank for a broad range of chemical constituents (VOCs, SVOCs, metals, and petroleum hydrocarbons). Subsequent rounds of testing were generally focused on parameters of potential concern that were identified in the additional samples. Available site history information and site observations were also used to develop initial and subsequent testing requirements.

Fill and soil samples from borings BH9, BH10, BH11, and BH13 were analyzed for VOCs and samples from borings BH1, BH2, BH3, BH5, BH9, BH10, BH11, and BH13 were analyzed for SVOCs during the 1991-1992 investigation. Two soil samples were analyzed for VOCs, SVOCs, organochlorine pesticides, and PCBs during the 1993 well installation program (Versar, October 1993). Except for pyrene at the laboratory reporting limit in a 1990 sample, these constituents have not been detected in fill and soil samples from the western portion.

A soil sample from the boring immediately adjacent to the waste oil tank (BH9) was tested for chlorinated VOCs, SVOCs, and metals in addition to petroleum hydrocarbons. A grab groundwater ^{sample} was also collected from the BH9 boring and analyzed for chlorinated VOCs and SVOCs. Organic constituents other than petroleum hydrocarbons were not detected in the soil and water samples tested indicating that characterization of this area is complete. No additional testing in this area is necessary.

Concentrations of metals reported in the five soil samples tested (BH9, BH11, BH13, MW-1, and MW-3) are within background ranges for California soils (Background Concentrations of Trace and Major Elements in California Soils, Kearney Foundation Special Report, March 1996). No additional metals testing is indicated by the initial metals data.

PCBs were not detected in the soil samples from wells MW1 and MW3. Gauntlett understands that there were no PCB-oil transformers located at the Yard. There are no records indicating a release of PCB-containing fluids at Yard I or PCB-containing machinery in the former machine shop. The sole detection of PCB (at a concentration of 0.26 milligram per kilogram) in a Yard I sample was in a composite intertidal and offshore sediment sample collected during the 1989-1990 investigation. Any residual PCBs that may have been contained in the intertidal sediments for this area were removed during the March 1997 grit removal program.

Yard I - Eastern Portion

Title 22 metals testing at Yard I, eastern portion was completed during March 1992 (Versar, July 1992). The metals testing referenced in the Port of Oakland's April 10, 1997, letter was completed during August 1992 as a follow-up to the March 1992 investigation. Thirteen soil borings were sampled for Title 22 metals during the March 1992 investigation. Indicator metals selected after reviewing the March 1992 results were lead, mercury, and copper based on frequencies and levels of detection.

Title 22 metal and VOC testing of soil samples collected during 1989 and 1990 was also completed. VOCs were not detected in the initial samples (PDDI-4 and PDDI-8). PDDI-8 was located between the paint storage area and dry dock. No additional VOC testing was indicated by the initial investigation results.

SVOCs have been detected in eastern portion soil and grab groundwater samples. Gauntlett understands that the significance of these constituents is being evaluated in a risk assessment for the Yard.

Gauntlett is not aware of any PCB-containing machinery being located in the former gear house. PCB testing of soils beneath the gear house is not warranted.

Yard I - Overall

Sufficient analyses for constituents of potential concern has been completed at Yard I. Site wide sampling for Title 22 metals, VOCs (other than BTEX), and SVOCs has been completed during the phased investigation programs completed at the Yard. A new screening investigation of the site is not warranted based on the available data. Surficial soil samples have been collected and analyzed where appropriate. Note that the majority of the yard is underlain by fill, not soil. The heterogeneity of lead distribution in the eastern portion of Yard I is most likely related to the quality of the fill placed in this area prior to 1919 and not site use. Lead concentrations in fill samples collected during July 1995 exhibited no apparent correlation with sampling depth or sampling location (Versar, May 1996).

Yard I - Groundwater Monitoring Well Network

Grab groundwater samples have been analyzed for the parameters recommended by Geomatrix during site characterization activities. VOCs and SVOCs have not been detected in the western portion samples. Two SVOCs were detected in the August 1992 grab groundwater samples from borings BH20E-W and BH32E-W. Bis(2-ethylhexyl) phthalate is a common laboratory contaminant in environmental samples. The fluorene concentration in the BH20E-W sample was only slightly above the laboratory reporting limit. Dissolved lead, which is the indicator metal

for the Yard due to frequencies and levels of detection, has not been detected in any of the groundwater monitoring well samples collected. The groundwater monitoring network has been routinely tested for the parameters requested by the ACHCS. Sampling of the existing groundwater monitoring well network at the site for the additional parameters suggested is not necessary.

Yard I - Downgradient Boundary

Monitoring well MW-6, installed during February 1996 along the southeastern perimeter of the site was most recently tested during March 1997 (The Gauntlett Group, April 1997). Petroleum hydrocarbons, BTEX, and dissolved lead were not detected in the sample indicating that no discharge of constituents related to site operations is occurring. No additional site characterization work along the downgradient boundary is indicated by the available data.

Yard II - Area 1: Near Former Chemical Storage Area

Gauntlett understands that materials stored in this area by Crowley were limited to paint, caustic soda, and sandblast grit. The lateral extent of metals, especially lead, in a surficial fill material collected from the supratidal area along the edge of area 1 (sample PDDII-1) was established by borings BH1, PDDII-11, CH13, CH14, PDDII-9, and PDDII-10 (Versar, October 1990 and Versar, March 1996). The vertical extent of metals in this area was established by boring BH21. Complete Title 22 metal analyses of samples from PDDII-1 and BH-1 established lead, copper, and mercury as the elements of potential concern for this area. The elevated concentrations of metals detected in the surficial fill samples from the supratidal zone of area 1 were excavated during the March 1997 grit removal program.

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The type of hydrocarbons in area 1 was established by soil samples from borings BH1, CH13, and CH14 and grab groundwater samples from TGSP1 and TGSP2. These data indicate that the petroleum hydrocarbon present in this area is a long-chain petroleum hydrocarbon. BTEX has not been detected in these samples. Based on the data already obtained, there appears to be no need to test additional samples for VOCs or SVOCs. Gauntlett does not understand the reference to the TCA detections in area 1 samples; TCA has not been detected in any samples from Yard II based on the data that has been reviewed.

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Yard II - Area 2: Former UST and AST and existing UST

Sample PDDII-3, collected in December 1989, was analyzed for VOCs, SVOCs, Title 22 metals, and petroleum hydrocarbons. Lead was the only element detected at potentially elevated concentrations. BTEX has not been detected in soil and water samples from this area indicating that a long-chain petroleum hydrocarbon compound is present in the soils tested. Except for tetrachloroethene (PCE) and bis(2-ethylhexyl) phthalate, VOCs and SVOCs have not been detected in soil and grab groundwater samples from this area. PCE has not been detected in any

need to verify.

other soil or groundwater samples from the Yard indicating that the single detection in a 1989 soil sample is anomalous. VOCs including PCE were not detected in grab groundwater samples from TGSP3 and TGSP6. The phthalate ester compound reported in sample PDDII-3 is a common laboratory contaminant.

Gauntlett understands that the power pack shop, not the machine shop as indicated in the Port of Oakland's April 10, 1997, Letter, was located next to area 2. Gauntlett also understands that chemical use in the power pack shop was generally limited to caustic soda for parts cleaning and degreasing and that chlorinated solvents were not used for parts degreasing.

Available data indicate that the underground storage tank presently located in area 2 was installed by Crowley's predecessor at Yard II. The concrete pad above this storage tank appears to be present in an April 14, 1950 aerial photograph of the Yard. Gauntlett understands that Crowley did not use the underground storage tank while it occupied the Yard.

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Yard II - Area 3: Former AST concrete containment area: existing underground vault

Two samples for metals sufficiently characterized this approximately 10 by 20 foot area. The concentrations of metals detected were within background ranges indicating that no additional testing was necessary. Since BTEX was not detected in a soil sample from BH9, a long-chained petroleum hydrocarbon compound is indicated. SVOCs were not detected in a soil sample from BH11 indicating that additional SVOC testing is not necessary. Testing for VOCs other than BTEX in this relatively small area is not indicated by the available data.

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PCBs were not detected in a Yard II composite intertidal and offshore sediment sample collected during the 1989-1990 investigation. The only known potential source of PCBs at Yard II was a transformer in the powerhouse. This transformer area was tested for PCBs during 1992. Testing results were transmitted to the Port of Oakland in a May 21, 1993, letter from Crowley. PCBs were not detected in a concrete wipe sample from beneath the transformer and a wipe sample from the exterior of the transformer indicating that no PCB releases occurred. Since there are no additional known PCB sources at the site other than light ballasts inside the buildings, testing of additional soil or water samples for PCBs is not warranted.

Yard II - Area 4: No known environmental feature

Since petroleum hydrocarbons have not been detected in well MW-3 and VOCs were not detected in the grab groundwater sample from TGSP6, the hydrocarbon present in the surficial fill material in this area appears to be a long-chain, relatively immobile petroleum hydrocarbon. SVOCs were not detected in a soil sample from BH16. Characterization of this area is complete; additional testing for BTEX or SVOCs is not warranted by the available data.

Yard II - Area 5: Northeastern portion of site

The concentrations of Title 22 metals detected in a soil sample from BH19 were within the range of background values indicating that additional testing was not necessary. Metal concentrations in soil samples from borings MW4, MW6, and MW7 were also within background ranges. SVOCs were not detected in the one sample collected from this area.

Yard II - Area 6: Former ASTs and existing UST containing oil

The levels of Title 22 metals detected in PDDII-6 soil sample were within background ranges. No additional metals testing is indicated by this initial result. The type of hydrocarbon present in the surficial fill in this area appears to be diesel based on the data obtained from borings BH13, BH14, CH5, CH6, CH7, CH8, and CH9. Since BTEX has been detected at trace levels in the groundwater samples from well MW1, there appears to be little value in analyzing fill or soil samples for BTEX. SVOCs were not detected in a soil sample from BH14. Since the data indicate that the type of hydrocarbon in this area is diesel, additional SVOC testing is not necessary. PCB testing of fill, soil, or water samples in this area is also not necessary for the reasons presented above.

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Available data indicate that the underground storage tank presently located in area 6 was installed by Crowley's predecessor at Yard II. The concrete pad above this storage tank appears to be present in a 1950 aerial photograph of the Yard. The completion report for the site development project completed at Yard II by the US Navy indicates that fuel oil-fired boilers were installed in the powerhouse on or about 1945 (Completion Report, Hurley Marine Works, 1945). The source for the fuel oil used to fire these boilers is presumed to be the underground storage tank in question. Gauntlett understands that Crowley did not use this underground storage tank while it occupied the Yard.

Yard II - Other Environmental Features

The open trenches discussed in the Port of Oakland's letter are concrete-lined steam and electrical utility trenches that were covered with trench plates when the Yard was operating. Since hazardous materials were not conveyed in these trenches, there appears to be little need to sample this site feature. Gauntlett understands that the pipes on the northwestern perimeter of the Yard discharged stormwater from the building roofs. Sampling at this site feature is not indicated based on its previous use. Sampling beneath the machine shop, sandblast grit storage area, and power house does not appear to be necessary because these features are underlain by concrete or asphalt and environmental testing in the vicinity of these features has been completed. Gauntlett understands that the cooling tower was installed by Crowley's predecessor at the Yard and that Crowley assumes no responsibility for routine operation of this site feature while it occupied the Yard.

Yard II - Other Site Areas

Sufficient analyses for constituents of potential concern has been completed at Yard II. Site wide sampling for Title 22 metals, VOCs (other than BTEX), and SVOCs has been completed during the phased investigation programs completed at the Yard. A new screening investigation of the site is not warranted based on the extensive data that is available. Surficial soil samples have been collected and analyzed where appropriate. Note that the majority of the yard is underlain by fill, not soil. The fill was placed by the U.S. Navy during site development in the 1940s. Data heterogeneity may be a function of the fill at this Yard and not site use.

GROUNDWATER

Yard II - Area 1: Near Former Chemical Storage Area

The grab groundwater samples were analyzed for constituents of potential concern that were detected in the shallow soil samples. Sampling for VOCs and SVOCs is not necessary given the reported chemical uses and storage practices in this area. The elevated metals that were detected in the surficial fill samples were removed during the 1997 grit removal program. Because metals mobility is generally restricted in the environment, sampling of groundwater is not warranted. Gauntlett does not understand the reference to TCA detections in soil in this area. There were no TCA detections in the data that was reviewed.

Yard II - Area 2: Former UST and AST and existing UST

Several groundwater samples have been collected in this area. Grab groundwater samples collected from TGSP3 and TGSP6 were analyzed for petroleum hydrocarbons and VOCs. These constituents were not detected. SVOCs were not detected in a soil sample from BH11 which was collected beneath the water table. VOCs were not detected in a soil sample from BH22 which was also collected beneath the water table. Title 22 metal concentrations in this BH22 sample were within background ranges. Characterization of the area 2 groundwater has been completed.

Yard II - Other Areas

Monitoring of groundwater at these other areas is not necessary for the reasons presented above. Gauntlett understands that the underground collection system referred to in the Port of Oakland's letter is actually a concrete-lined vault that was used as a grease trap. No piping or discharge features are associated with this vault. Gauntlett understands that parts degreasing was achieved using caustic soda, not chlorinated solvents. Note that the groundwater beneath the power house is monitored by well MW1. VOCs and SVOCs were not detected in soil samples from beneath the water table in BH13 and BH14. Groundwater beneath the former sandblast grit storage area is monitored by well MW4. Metals, petroleum hydrocarbons, and VOC testing of groundwater in this well has been completed.

Yard II - Downgradient boundaries

Wells MW4 and MW6 monitor the prevailing downgradient boundaries although groundwater flow is tidally influenced. Routine testing of these wells has been completed.

Yard II - Groundwater Monitoring Network

Grab groundwater samples have been analyzed for the parameters recommended by Geomatrix during site characterization activities. The groundwater monitoring network has been routinely tested for appropriate parameters. Sampling of the existing groundwater monitoring well network at the site for the additional parameters suggested is not necessary.

REFERENCES

Kearney Foundation of Soil Science. March 1996. Background Concentrations of Trace and Major Elements in California Soils.

PTI Environmental Services. June 1994. Supplemental Inshore Sediment Impairment Study, Crowley Marine Services, Inc., Pacific Dry Docks Yards I and II.

The Gauntlett Group. April 1997. Self Monitoring Report, Former Pacific Dry Dock and Repair Company Yard I, 1441 Embarcadero, Oakland, California.

U.S. Navy. 1945. Completion Report, Contract Nobs-723 (Amendment #4), Increase of Ship Repair Facilities and Installation for Floating Dry Dock, Hurley Marine Works, Foot of Fifth Avenue, Oakland, California.

Versar, Inc.-Sacramento. October 2, 1990. Site Assessment Report for the Pacific Dry Dock and Repair Yards 1 and 2, Oakland, California.

Versar, Inc.-Sacramento. May 6, 1992. Preliminary Investigation and Evaluation Report (PIER), Pacific Dry Dock and Repair Yard I, Western Section, Oakland, California.

Versar, Inc.-Sacramento. July 24, 1992. Preliminary Investigation and Evaluation Report (PIER), Pacific Dry Dock and Repair Yard I, Eastern Section, Oakland, California.

Versar, Inc.-Sacramento. September 18, 1992. Addendum to Phase II Site Investigation Work Plan, Pacific Dry Dock Yard I, Oakland, California.

Versar, Inc.-Sacramento. October 30, 1992. Revised Inshore Sediment Impairment Study, Pacific Dry Dock and Repair Yard I, Oakland, California.

Versar, Inc.-Sacramento. October 30, 1992. Revised Inshore Sediment Impairment Study, Pacific Dry Dock and Repair Yard II, Oakland, California.

Versar, Inc.-Sacramento. October 26, 1993. Quarterly Groundwater Monitoring Report, Pacific Dry Dock Yard I, Oakland, California.

Versar, Inc.-Sacramento. March 20, 1996. Preliminary Investigation and Evaluation Report, Former Pacific Dry Dock and Repair Company Yard II Facility, Oakland, California.

Versar, Inc.-Sacramento. May 6, 1996. Site Assessment Report, Former Pacific Dry Dock and Repair Company Yard I Facility, Oakland, California.