N60028_000818
TREASURE ISLAND
SSIC NO. 5090.3.A

Cal/EPA

Department of
Toxic Substances
Control

700 Heinz Avenue,
Bldg. F, Suite 200
Berkeley, CA
94710

January 20, 1998

Pete Wilson
Governor

Peter M. Rooney
Secretary for
Environmental
Protection

Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
Attn: Mr. Ernesto Galang
900 Commodore Drive
San Bruno, California 94066-2402

DRAFT FINAL ONSHORE REMEDIAL INVESTIGATION REPORT, NAVAL STATION TREASURE ISLAND (SEPTEMBER, 1997)

Dear Mr. Galang:

Please find enclosed additional comments from Dr. Calvin C. Willhite of the Department of Toxic Substances Control, Human and Ecological Risk Division. The enclosed comments only cover Volume IV of the Remedial Investigation Report and are in addition to comments that were previously submitted in letters dated December 19, 1997, and January 8, 1998.

If you have any questions regarding this letter, please contact me at (510) 540-3763.

Sincerely,

David Rist

David Rist
Hazardous Substances Scientist
Office of Military Facilities

Enclosure

cc: See next page.

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cc: Mr. David Leland
San Francisco Bay
Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

James A. Ricks, Jr. (SFD-8-2)
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Mr. James B. Sullivan
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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY PETE WILSON, Governor

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MEMORANDUM

TO: Mary Rose Cassa
Office of Military Facilities
Northern California
700 Heinz Street, Suite 200
Berkeley, California 95812

FROM: Calvin C. Willhite, Ph.D.
Human and Ecological Risk Division
400 P Street, 4th Floor
Sacramento, California 95812-0806

DATE: January 13, 1998

SUBJECT: Naval Station Treasure Island (NAVSTA TI)
San Francisco, California
Volume IV, Onshore Remedial Investigation Report

PCA:14740 Site-WP: 200231-47

The Department of Toxic Substances Office of Military Facilities requested on October 8, 1997 that the Human and Ecological Risk Division (HERD) review and provide written comment on the five volume set: "Onshore Remedial Investigation Report. Naval Station Treasure Island. San Francisco, California" (Comprehensive Long-Term Environmental Action Navy[CLEAN I] Contract Task Order No. 0199)", dated September, 1997. These documents were produced by PRC Environmental Management, Inc. on behalf of the Department of the Navy, Naval Facilities Engineering Command, San Bruno, California. This memorandum covers only Volume IV of the five volume set, with Volume V to follow; Volume I, Volume II and Volume III reviews were dated November 21, 1997, December 16, 1997 and January 7, 1998, respectively.

BACKGROUND

These reports present the findings by study area of the remedial investigations conducted at NAVSTA TI in San Francisco Bay. The remedial investigation was conducted by the Navy to determine the nature and extent of contamination from past military activities and to determine the risks to human health and the environment. The investigation was performed under the Navy's Installation Restoration Program in accord with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Federal Facility Site Remediation Agreement (September 29. 1992).; signatories to that agreement include the U.S. Navy, the DTSC and the California Regional Water

Quality Control Board. The City of San Francisco and the U.S. EPA are also represented on the Base Realignment and Closure (BRAC) Cleanup Team. NAVSTA TI was designated for closure in 1993 and on September 30, 1997, NAVSTA TI was closed as an operational naval facility.

There are 29 total areas of concern identified at NAVSTA TI:

1. Medical Clinic (spilled X-ray developer)
2. eliminated
3. PCB Equipment Storage
4. eliminated
5. Old Boiler Plant (fuel lines, demolition debris)
6. eliminated
7/10. Pesticide Storage Area/Paint Shop (PAH, oil/fuels/metals, heptachlor)
8. Sludge Disposal (wastewater treatment plant sludge)
9. Foundary (paint shop/forge)
11. YBI Landfill (oil/fuels, metals)
12. Old Bunker Area (lead, PAH, metals)
13. eliminated
14. eliminated
15. eliminated
16. eliminated
17. Tanks 103/104 (PAH, oil, fuels, metals)
18. eliminated
19. eliminated
20. eliminated
21. Vessel Waste Oil Recovery (oil/fuel)
22. eliminated
23. eliminated
24. Fifth Street Fuel Release (abandoned fuel lines/dry cleaners)
25. eliminated
26. eliminated
27. eliminated
28. West Side on/off Ramp (lead)
29. East Side on/off Ramp (lead)

Specific Comments

1. Appendix F. A discussion of off-site reference ("background") metals concentrations in TI and YBI groundwater should be added to the documentation.
2. Appendix F. A contrast and comparison of YBI and TI ambient ("bakcground" or "off-site reference") metals concentrations in soil and rock [preferably by lithologic source] to the range of same in East Bay hills, San Francisco and other Bay Area locations (e.g., areas of fill material in Emeryville, Alameda, Mare Island) should be added (attachments). Are the values at YBI and TI consistent with, greater than or less than those found in other areas around the Bay?

3. Appendix F. Discussion of world, U.S. and other such citations to soil metals concentrations (which by necessity include mines, ore deposits and unspecified/unrelated lithology) are largely irrelevant in the present context. Should the authors wish to include such bibliographic citations, appropriate qualifications with sufficient detail must be added in the text to explain the source of those data.
4. Page F-1. Section 1.1. Please cite the applicable sections of EPA/540/1-89/002 in discussing the necessity of obtaining background concentrations for both naturally occurring (Section 5.7.3) and ubiquitous anthropogenic (Section 5.7.4) materials.
5. Page F-3. Please insert a discussion of the date of TI infilling, the source(s) of the fill material and references to substantiate those claims. Please indicate where, when and the nature and source of the fill material at Site 11.
6. Page F-5. Identify the materials which potentially confound/contribute to "source of contamination at Sites 28 and 29" here and throughout the text; please gives the names of each site at each point in the text where the site number is mentioned.

Why were sites 8, 16, 28 and 29 "assumed to be geologically similar"? Are not borings data sufficient to establish whether these areas of colluvium/marine sand are the same or similar lithology?
7. Page F-5. Please list and identify the "13 background locations" and describe how 21 borings (why not 13 borings?) (why not 21 locations with 21 borings?) are adequate to charactrize adequately the site? The description as presented in the text is not clear. Was bedrock sampled?
8. Pages F-6, F-8. Why were iron, magnesium etc. excluded from the background measurements? Other military (e.g, Presidio) sites have not used the rationale for exclusion from background measurements based on nutrition. Should the DTSC approve elimination of background determinations for arsenic because of the data on its essentiality in nutrition [arsenic has been shown to be an essential element in at least four mammalian species, National academy of Sciences, Drinking Water and Health, Vol. V, 1983)? It would appear that a toxicologic rationale would have no bearing on an element from a geologic point of view; some explanation of the basis for such an approach should be added to explain the approach taken.
9. Pages F-7, F-8. Cite references for all statements relating to fill source: "The fill material for TI was obtained primarily (were there secondary sources and, if so, what were those sources and where were those materials placed when constructing the island?) from San Francisco Bay sediments."
10. Page F-8. It would assist the reader if relative source contribution data (e.g., as percentage of total 'major pollutant sources') were given. For instance, East Bay oil refineries (whose citations for selenium and other discharge to the Bay have been well publicized in Bay Area newspapers) are not mentioned.
11. Page F-9. What is "current practice in the environmental industry'?
12. Page F-9. Cite published DTSC and U.S. EPA guidance documents at each point that statements like, "DTSC recommends to use the 80th percent lower confidence limit on the 95th percentile..." are made in the text.
13. Page F-9. It is not clear why a 1/2 LOD is used to substitute an "ND" in a background metals study; the 1/2 LOD default is certainly applicable to a analysis of a groundwater plume of solvent, fuel or other waste material, but the relevance of such an approach is not readily apparent here.
14. Page F-10. Since the YBI data set is admittedly "small" (N=21), it becomes even more important to discuss the values in contrast to far more robust local background determinations (points # 1 and 2. above) (e.g., Lawrence Berkeley National Laboratory N=498 background samples), and helps place into context the analytical difficulties described in Section 4.1.

15. Section 4.2. Please compare and contrast the "outliers" eliminated using statistical justifications to the concentration range of naturally occurring metals in Bay Area soil and rock prior to making conclusions or arriving at artifically "conservative" (i.e., 'low') estimates of ambient levels".
16. Section 4.3. Please compare YBI antimony, lead and zinc concentrations to a) the range and mean of antimony concentrations in East and West Bay background studies and b) compare the YBI soil antimony, lead and zinc concentrations by the same/similar lithology to the corresponding values in North, East, West and South Bay as available in DTSC Region II site characterization files and in the published literature; the same comparisons should be carried out for TI as well.
17. Page F-14, Tables F-1 and F-2. Please include the results of summary comparisons with East and West Bay soil background metals concentrations.
18. Page G-1, line 6 from bottom. Are not YBI and TI background metals values analyses found in Appendix F and not in Appendix K?
19. Page G-3. Please define what constitutes a 'cursory review'?
20. Page G-4, Section 3.0. As this section is written, it tells the reader very little except to see Section 3.7. It would assist the reader if a reasonably complete discussion of the exposure scenarios used (e.g., construction/utility worker, resident, commercial/industrial, recreational) was given here and the rationale behind the assumptions around the selected exposure parameters (e.g., child soil ingestion, relevance of pica child exposure, etc.) - including but not limited to exclusion of domestic use of YBI/TI groundwater, the risk and exposure parameters for non-domestic use of YBI/TI groundwater and other details was provided.
21. Page G-5. As written, it is not clear how the parameters listed here actually relate to YBI/TI: for example, do TI residents actually live on-base for 30 years as stated? What, in fact, is the average length of residency among the people now living on TI? What is the longest recorded residential occupancy on TI or YBI? What is the measured soil organic carbon content at TI and YBI? Since organic carbon content is a necessary parameter for site-specific quantitative environmental fate and transport analyses, why is the only value given limited to default CAPCOA parameters? Would one not obtain more accurate results from the environmental fate and transport calculations if actual site conditions were used in those calculations? How does the 150 days/year recreational duration assumption actually compare to the current actual use patterns at TI and YBI? What kind(s) of activities do those visitors perform at YBI and TI? How does the 150 days/year assumption fit with the City of San Francisco reuse plan - surely one would not ordinarily visit an amusement park 3 days/week or every day of the year for 30 years? Please describe the basis of the 4.5 year commercial/industrial exposure scenario - is this the assumed duration of an amusement park construction project?
22. Page G-9. It is not clear why a "whole product" approach (methods supplied previously to the authors) to evaluation of the toxicology of petroleum hydrocarbons was not also included in the present risk assessment? Since the indicator chemical (e.g., BTEX) approach is often not useful as the light aromatics were either not present in heavy fuels or have volatilized away or leached into groundwater and dissipated many years ago due to weathering of the parent materials, or are otherwise degraded leaving behind the heavier fractions, how was the toxicology of the materials actually present in TI soil assessed?
23. Page G-10, Section 4.4. A brief discussion of the source, relevance and regulatory application of the 10 microgram/dL blood Pb value is in order here. As written, it appears as though the value is

interpreted by the authors as though the concentration were a legally binding limit. For purposes of comparison, it is appropriate to reference the values listed in 8 CCR 5216 amd 8 CCR 1532.1.
24. Page G-10. Please indicate the source(s) of TI and YBI drinking water here. Please also indicate whether any private or community produce gardens exist at TI/YBI and if so, whether any such activities actually occur at any of the problem areas evaluated in the 5 volume Onshore Remedial Investigation Report.
25. Page G-16, Section 6.2. The text as written is diffuse; the reader can gain no insight or understand the degree of confidence one can place in the results of the ecologic or human health risk analysis based on the approach, rationale and discussion presented here.
26. Tables G-1 to G-3. For each footnote listed as "see text for derivation", please provide which section of the 5 volume submission to which the phrase refers.
27. Table G-5. While the values listed appear to be default assumptions, a discussion of the basis of these values particularly for the fuels, should be addressed. It is simply not physiologically possible that percutaneous uptake of topical gasoline (ABS=0.1) is identical to that for aheavy motor oil (ABS=0.1); what are the data which support such assumptions? For all petroleum fractions, metals, PAH and pesticides listed, do the ABS numbers refer to neat compound or to compound as present in a soil matrix? As an example, please consider the numerous PAH (e.g., fluorene =0.15; benzo(a)pyrene-0.15); based on the data of Yang et al. (*Toxicol. Ind. Health* **2**: 409-415, 1986; **Ibid 2**: 79-84, 1986) and of Wester et al. (*Fund. Appl. Toxicol.* **15:** 510-516, 1990), it would appear that the percutaneous absorption of PAH from a soil matrix is 0.02, not the 0.15 value used in the present report. Please provide a clear rationale for each value selected; default regulatory values may have little rrelevance in the present context.
28. Attachment G-1. This section is terrible. For each chemical listed in this section, please add U.S. EPA soil (residential and industrial) and ambient air PRG values; for each VOC listed, please add the most recent published BAAQMD ambient air background concentrations and indicate the value for the closest BAAQMD monitoring station to YBI/TI. Please list here also the applicable 8 CCR 5155 and 5216 PEL. For each toxicity summary here, please cite at the appropriate location in the text the applicable ATSDR summary along with all published references listed in the bibliography.

As written, the text is alarmist; for example, on page G-1-4, "An acute oral dose of dieldrin {from soil?) causes salivation and convulsions..." "...increases cleft palate, open eye and webbed foot" and "...increase in postnatal death" (in humans?)" "Workers experienced headache, dizziness, hyperirritability, general malaise, nausea, vomiting, anorexia, muscle twitching and myoclonic jerking "(!). There is no explanation of a) dose, b) route of exposure, or whether any of the multitude of toxicologic consequences have anything whatsoever to do with the occurrence of residual concentrations of aldrin or diedrin (likely used at TI/YBI to control structural termites under perfectly legal applications) in soil at TI. The entire toxicity summary section needs to be revisited and the salient points about magnitude and duration of exposure (dose) and the margin of exposure at TI/YBI in relation to that associated with the stated toxicologic consequence should be defined. For substances like the chlorinated pesticides, metals and PAH which are ubiquitous environmental chemicals, at a minimum the ATSDR summary of occurrence should be spelled out here. For chemicals like acetone where the results of controlled human inhalation trials have been published, the results of those studies should be summarized and included. For substances like aluminum dust where objective clinical consequence of human exposure is well known, provide the details of the magnitude and duration of human exposure required to develop this conditions and the information on the

physical nature and forms of the metals (does pulmonary fibrosis occur after residing next to sites with aluminum in the soil?) involved. Indications of whether the materials were neat or as present in soil, preferably at regulated hazardous waste sites, and other salient details should be added here. For materials like benzene, the magnitude and nature of the exposures (e.g., *Blood* **4**: 837-841, 1974; *Acta Haematol.* **55**: 65-72, 1976; *Environ. Res.* **23**: 181-190, 1ForF980; *Am. J. Ind. Med.* **7**: 395-402, 1985; *Br. J. Ind. Med.* **44:** 124-128, 1987; *N. Engl. J. Med.* **316**(17): 1044-1050, 1987) and it is important to distinguish between exposures to a single material in fuel (e.g., *Br. J. Ind. Med.* **50**: 561-569, 1993; **Ibid 50**: 549-560, 1993) as contrast to exposures to the pure material and mixed exposures (*J. Occup. Med.* **25**: 685-692, 1983; **Ibid 24**: 203-212, 1982; **Ibid 21**: 167-174, 1979; **Ibid 21**: 367-370, 1979; *Am. J. Epidemiol.* **118**: 526-542, 1983; *Br. J. Cancer* **43**: 77-84, 1981; *Occup. Environ. Med.* **52**: 380-384, 1995). For all materials discussed in the toxicology profiles (e.g., benzene), the magnitude and nature of the exposure and the exact disease (e.g., acute myelogenous leukemia) should be specified.

29. Page G-1-59. It is this reviewer's understanding that PCDD were present in the older formulations of PCB oils (ATSDR TP-92/16). It would be most helpful here to discuss all potential source material of PCDD and to provide specifics (e.g., chloracne) of known clinical consequence of PCDD/PCDF exposure in humans. Where major review articles and books, including discussions of environmental fate and transport (e.g., extent of soil adsorption by lithology), which have bearing on the toxicology of these and other chemicals with Navy toxicity summaries, please include that information here.

30. Page G-1-62. Please indicate that no epidemiologic studies of individual PAH are available, as such are always present in mixtures (e.g., coal tar pitch). For all toxicity summaries, please indicate whether the referenced health consequence is due to controlled application (e.g., skin painting, dietary feeding, inhalation bioassay) of neat material or material as present in a soil matrix. Please expand discussions, with references to published studies, of the influence of soil adsorption on bioavailability and associated toxicologic consequence. For all chemicals discussed, please include structural formula, chemical structures and discussion of salient physical properties (e.g., vapor pressure) as relates to the toxicology of the material. For all substances with bibliographic citation appearing in volume IV, please cite the applicable reviews in the body of the profile. Where statements like "Confidence in each of the RfDs is low", please indicate who has made this conclusion (the Navy? U.S. EPA? DTSC?) and what such judgment means for the site assessment made here.

31. Page G-1-68. For all abbreviations (e.g., TCDF, 2,4,5-T, 2,4,5-TP), please spell out the complete name and, for even very short entries, please include citation to available major published review articles on the chemical of interest.

32 .Page G-1-73; G-1-75. Please add a discussion of petroleum weathering and cited applicable ATSDR references in the body of the text. Please delete the extraneous entries made on page G-1-75.

For PCE and TCE, please add a diagram (e.g., *Appl. Environ. Microbiol.* **49**(5): 1080-1083, 1985) of environmental reductive dehalogenation and a complete discussion of the conditions under which this occurs. Toxicologic summaries of the decomposition products (again, citing ATSDR review documents as available) should be included (e.g., 1,1-DCE, 1,2-DCE, VC). While the authors list the IARC and ATSDR documents on pages G-1-82 to G-1-86, no mention of same is given in the applicable sections of the main text.

33. Attachment G-2. Tables G-2-1 to Table G-2-20, Table G-4-21, Table G-4-22. For each of the calculation tables, provide rationale in an accompanying brief text the justification [and reference(s) as applicable] for the input parameters selected. For example, in Table G-2-1, why was a drinking water Pb concentration of 6.3 ppb used? How was the lead soil concentration of 11.7 ppm selected? What are the source data for airborne dust, lead in dust, references/data on soil ingestion rates, soil contact, water and food ingestion rates? How was the 9.7 ppb inorganic Pb in the diet derived? Footnotes to each of the tables should be added to make the tables self-explanatory. Details of the "depth interval" should be provided along with an explanation of the significance - and the confidence the reader can place - in the "output" parameters (e.g., What does the" 50% percentile" mean? What is a 'typical' child and who defines that parameter? Why is soil ingestion 0.05 and 0.65 for children?) should be supplied.

34. Attachments G-3 and G-4. For each entry listed "NE", a footnote or explanation should be added to explain the reasons for lack of evaluation. Why is inorganic Pb listed in this section? Since this is redundant, cannot inorganic Pb be handled in a general preface explanation to Attachment G-3?

On page G-3-xiii, please provide explanations for the terms "central tendency exposure" and "reasonable maximum exposure" - what do these terms mean to the lay reader?

35. Attachment G-4. A preface and ex planation should be added here to amplify a) why the section was prepared and submitted, b) the underlying assumptions and how the calculations were performed and c) how the results compare to those for other Bay Area metals background values. Since one of the primary determinants of metals toxicity is the physical form of the material (dictating the oral, dermal and inhalation toxicity), what data are used here to account for TI-specific metals bioavailability?

36. Table G-4-21; Table G-4-22. What significance should be attached to the blood Pb values (e.g., 10.7, 12.4, 13.6 micrograms/dL) calculated for the pica child under "ambient" levels at YBU and TI? Reference to applicable sections of the body of the text, footnote, preface or an overall summary section should be added to explain the relevance of the adult, "typical" and "pica" child assumptions, relevance and significance for benefit of the site risk manager, the restoration advisory board and the public.

Attachments

Reviewed by: S.M. DiZio, Ph.. D.
Senior Toxicologist