

JACOBS ENGINEERING GROUP INC.

MEMORANDUM

TO: Andy Piszkin - Code 1812.AP **DATE:** 6 August 1993

FROM: John Dolegowski - CH2M HILL/SCO
Harry Ohlendorf - CH2M HILL/SAC
Susan Keydel - CH2M HILL/SFO

SUBJECT: MCAS El Toro RI/FS
Phase II; Ecological Issues
CLE-C01-01F145-G2-0164

This memo summarizes the preliminary ecological risk assessment conducted as part of the Phase I Remedial Investigation (RI) Technical Memorandum (7 May 1993) identifies tasks currently being conducted to refine the list of chemicals of potential ecological concern (COPEC) by site, and identifies some general data needs for the Phase II field work. Site specific data needs will be developed separately.

Preliminary Ecological Risk Assessment

A preliminary ecological risk assessment was prepared for the Phase I RI Draft Technical Memorandum (7 May 1993) for the Marine Corps Air Station (MCAS) El Toro facility. This ecological risk assessment was a conservative screening intended to identify COPEC and areas or sites where habitat or receptors could be affected. Surface soil, sediment, and surface water data from the Phase I investigation were used in this effort. For the preliminary ecological risk assessment, surface soil data were not screened against background values because the methodology for comparison had not yet been agreed to by the Navy and agencies. The following methodology was used for evaluating surface soil, sediment, and surface water:

- **Surface soil evaluation.** Chemical concentrations in near-surface soil (0 to 4 feet below ground surface) were used to evaluate potential threats to terrestrial mammals, invertebrates, and plants. To evaluate risks to terrestrial mammals, exposure doses were derived and compared to literature toxicity values such as reported no observable adverse effect levels (NOAELs), if available, or lowest observable adverse effect levels (LOAELs) in the tested animal. The rat was considered to be a representative terrestrial mammal, and literature values for the rat were used when ever available. To evaluate potential for plant and invertebrate effects, Phase I reported soil concentrations were compared to literature reported effect levels for various species. Concentrations exceeding either the derived acceptable dose (for terrestrial mammals), or plant or invertebrate criteria were identified as presenting a potential threat to the habitat or species present.

- **Surface water evaluation.** Maximum concentrations detected in surface runoff samples for Sites 2, 3, and 18 were compared to chronic ambient water quality criteria for the protection of aquatic life. This approach was conservative in two ways. First, the maximum concentrations detected in San Diego Creek were compared to chronic criteria; because chronic criteria are more appropriately compared to an average concentration, using the maximum concentration detected resulted in a conservative evaluation. Second, the dry washes contain water infrequently and when surface water is present, an acute exposure is more likely; therefore, using chronic water quality criteria instead of acute criteria resulted in a conservative evaluation of the washes.
- **Sediment evaluation.** Deposits sampled at Sites 2, 3, 4, 6, 12, 14, and 18 were evaluated for those exceeding sediment criteria; this included dry runoff deposits in the catch basins, perennially wet sediments in San Diego Creek, and deposits in the four dry washes (Borrego Canyon, Agua Chinon, Bee Canyon, and Marshburn Channel). For each site, the maximum value detected for each chemical was compared to sediment criteria. Criteria for organic compounds were derived from ambient water quality criteria; criteria for inorganic compounds were lowest effect levels (LELs). Chemicals exceeding criteria were identified as chemicals of potential ecological concern (COPEC) for sediment.

The results from this preliminary risk assessment were used to identify sites where ecological receptors could be affected and the chemicals of potential ecological concern corresponding to that site.

Pre-Phase II Work Plan Tasks

Since the RI Technical Memorandum was submitted, several activities have been conducted to refine the lists of COPEC and re-evaluate sites identified as needing further investigation. These activities include:

- Screening surface soil data against background data
- Conducting a reconnaissance survey to better characterize habitat at sites recommended for additional investigation in the Preliminary Ecological Risk Assessment in order to better focus Phase II efforts.
- Re-evaluating chemicals found in stormwater runoff in the dry washes using acute criteria instead of chronic criteria
- Re-evaluating deposits in dry catchbasins and dry washes using terrestrial criteria instead of sediment criteria
- Developing a revised list of COPEC for the Phase II Work Plan based on the results of the above four tasks

Each of these activities is described in greater detail below.

Comparison to Background Data

Since the Technical Memorandum was submitted in May 1993, statistical methodology for evaluating background soil data was agreed to by the Navy and agencies (Jacobs Engineering Group Inc. 1993. MCAS El Toro Phase I RI/FS, Data Quality Objectives Position Paper, Background Concentrations in Surface Soils: Metals, Pesticides, and Herbicides, Document Control #CLE-C01-01F145-G2-0162. July 6.). Background soil values for inorganic chemicals were developed using site specific MCAS El Toro data according to the agreed upon statistical methodology. These values were then used to evaluate surface soil data for each site at the MCAS El Toro. For each inorganic chemical detected at a site, the maximum concentration detected was compared to the 99th percentile value of the background data. Only those inorganic chemicals having maximum values exceeding the background criteria were considered further in the re-evaluation of COPEC. All organic chemicals were retained.

Reconnaissance Survey

Ecological habitat at each of the MCAS El Toro sites was briefly characterized during the spring of 1992. Information from this visit and from literature and regulatory agencies was used to:

- Generate a list of expected species at the MCAS El Toro (presented in Appendix H4 of the Technical Memorandum)
- Identify areas of potential ecological concern based on having both COPEC present and ecological receptors on or near the individual sites

Follow-up reconnaissance surveys of particular sites will be conducted during August or September 1993. This effort is intended to provide additional information on areas having special status (or other) species present or areas of concern based on the Phase I Preliminary Ecological Risk Assessment. In addition, the September reconnaissance will provide insight into differences in habitat uses in Spring versus Fall. Sites 1 through 9, 13, 14, 16, 17, 18, 20, and 21 were identified as potentially having occurrences of ecological receptors. However, only sites 1, 2, 6, 17, and 18 have had special status species identified there. The follow-up reconnaissance will better distinguish areas of ecological concern from those providing little or no habitat. Areas to be evaluated in the site reconnaissance are identified in Table 1.

Re-evaluation of Surface Water

A secondary, less conservative screening of surface water COPEC has been performed. Chemicals detected in storm water runoff samples from the dry washes were re-evaluated using acute criteria. This applies to samples collected in Borrego Canyon, Agua Chinon, Bee Canyon, and Marshburn Channel. San Diego Creek was not re-evaluated using acute criteria because it contains water a majority of the year and aquatic receptors could potentially be chronically exposed.

Re-evaluation of Dry Wash and Catchbasin Deposits

Deposits in catchbasins and dry washes were initially evaluated as sediments in the Phase I Ecological Risk Assessment. These areas do not represent aquatic environments and using sediment criteria derived from Ambient Water Quality Criteria is somewhat erroneous. These dry deposits are more appropriately evaluated assuming potential exposure by terrestrial animals. Therefore, terrestrial criteria have been used to re-evaluate the deposits previously identified as aquatic sediments. This approach is consistent with the approach used in the MCB Camp Pendleton ecological risk evaluation.

Specifically, samples collected from the dry washes (labelled as 18_AC, 18_BE, 18_MC, 18_BO, 02_WF, 02_EF, 02_MM and 03_AC) were evaluated using terrestrial exposure criteria; similarly, deposits from the catch basins (labelled 04_CBAC, 06_CBAC, 12_CBBE, 14_CBBE, 20_CB and 21_CB) were re-evaluated for potential terrestrial exposure. Data from the dry washes were evaluated separately from the catchbasin data to provide a more refined level of characterization. COPEC for each of these areas will be used in preparing the Phase II Work Plan.

Revised list of COPEC for the Phase II Work Plan

Based on the results of the above four tasks, a revised list was developed for sites needing further characterization during Phase II. COPECs (for soil, catch basin deposits, dry washes, sediments, and surface water) for each site are presented in Table 1. A revised list of sites needing further evaluation (based on potential ecological concerns) will be developed following the site reconnaissance to be conducted in September.

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cc:	C. Mitchell - MCAS El Toro	File - PMO
	J. Hamill - U.S. EPA, Region 9	File - CTO Notebook/PMO
	S. Tindall - Bechtel	File - CH2M HILL
	J. Zarnock - Cal-EPA/DTSC	
	J. Broderick - CRWQCB, Santa Ana	

Table 1
Chemicals of Potential Ecological Concern
Based on Exceeding Background Soil Values (a) and Ecological Criteria
for Phase II Investigation
MCAS El Toro

Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
1	SSS/Other	none	none	none	NA	NA	none
2	SSS/Other	Soil- Mercury	Soil- none	Soil- Mercury	NA	Borrego Canyon- (acute criteria) Aluminum Cadmium Copper Selenium Zinc	Soil- Mercury Surface Water - Aluminum Cadmium Copper Selenium Zinc
		Dry Wash (Borrego Canyon) none	Dry Wash (Borrego Canyon) none	Dry Wash (Borrego Canyon) none			
3	Other	Soil - 4,4'-DDE Lead Mercury	Soil - Lead	Soil - Lead Mercury	NA	Agua Chinon - (acute criteria) gamma Chlordane Aluminum Cadmium Copper Selenium Zinc	Soil - 4,4'-DDE Lead Mercury Surface Water - gamma Chlordane Aluminum Cadmium Copper Selenium Zinc
		Dry Wash (Agua Chinon) none	Dry Wash (Agua Chinon) none	Dry Wash (Agua Chinon) none			

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Chemicals of Potential Ecological Concern
Based on Exceeding Background Soil Values (a) and Ecological Criteria
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MCAS EI Toro

Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
4	Other	Soil - Aluminum Lead Mercury	Soil - Aluminum Lead	Soil - Benzo(a)pyrene Aluminum Lead Mercury Zinc	NA	NA	Soil - Benzo(a)pyrene Aluminum Lead Mercury Zinc Catch basin (Agua Chinon) Lead
		Catch basin (Agua Chinon) Lead	Catch basin (Agua Chinon) Lead	Catch basin (Agua Chinon) Lead			
5	no further action	Soil - Lead	Soil - Lead	Soil - Lead	NA	NA	none
6	SSS/Other	Soil - Barium Chromium Lead Zinc	Soil - Chromium Lead	Soil - Antimony Chromium Lead Zinc	NA	NA	Soil - Antimony Barium Chromium Lead Zinc Catch basin (Agua Chinon) Lead
		Catch basin (Agua Chinon) Lead	Catch basin (Agua Chinon) Lead	Catch basin (Agua Chinon) Lead			

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		Mammals	Inverts	Plants			
7	Other	Soil - 4,4'-DDE Benzo(a)anthracene Barium Cobalt Lead Mercury	Soil - Lead	Soil - Benzo(a)pyrene Cobalt Lead Mercury	NA	NA	Soil - 4,4'-DDE Benzo(a)anthracene Barium Cobalt Lead Mercury
8	Other	Soil - 4,4'-DDE alpha Chlordane Dieldrin Aluminum Barium Cadmium Copper Lead Mercury Zinc	Soil - Aluminum Cadmium Copper Lead Mercury Zinc	Soil - Benzo(a)pyrene PCB 1254 Aluminum Cadmium Copper Lead Mercury Zinc	NA	NA	Soil - 4,4'-DDE alpha Chlordane Benzo(a)pyrene Dieldrin PCB 1254 Aluminum Barium Cadmium Copper Lead Mercury Zinc
9	Other	Soil - Barium Lead	Soil - Lead	Soil - Lead	NA	NA	Soil - Barium Lead
10	no further action	Soil - Benzo(a)anthracene	Soil - none	Soil - Benzo(a)anthracene	NA	NA	none
11	no further action	none	none	none	NA	NA	none

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		Mammals	Inverts	Plants			
12	no further action	Soil - 4,4'-DDD 4,4'-DDE 4,4'-DDT Benzo(a)anthracene Dieldrin Aluminum Barium Lead Mercury Vanadium Zinc	Soil - 4,4'-DDT Aluminum Lead Vanadium	Soil - Benzo(a)pyrene PCB 1254 Aluminum Lead Mercury Vanadium Zinc	NA	NA	none
		Catch basin (Bee Canyon) 4,4'-DDE Barium Lead Mercury	Catch basin (Bee Canyon) Lead	Catch basin (Bee Canyon) Lead Mercury			
13	Other	Soil - Lead Mercury	Soil - Lead	Soil - Benzo(a)pyrene Lead Mercury	NA	NA	Soil - Benzo(a)pyrene Lead Mercury

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		Mammals	Inverts	Plants			
14	Other	Soil - Benzo(a)anthracene Barium Lead	Soil - Lead	Soil - Benzo(a)pyrene Lead Zinc	NA	NA	Soil - Benzo(a)anthracene Benzo(a)pyrene Barium Lead Zinc Catch basin (Bee Canyon) Mercury
		Catch basin (Bee Canyon) Mercury	Catch basin (Bee Canyon) none	Catch basin (Bee Canyon) Mercury			
15	no further action	Soil - Lead	Soil - Lead	Soil - Lead	NA	NA	none
16	other	Soil - Lead Zinc	Soil - Lead	Soil - Lead Zinc	NA	NA	Soil - Lead Zinc
17	SSS/Other	Soil - Benzo(a)anthracene Chromium Lead Zinc	Soil - Chromium Lead	Soil - Benzo(a)pyrene Chromium Lead Zinc	NA	NA	Soil - Benzo(a)anthracene Benzo(a)pyrene Chromium Lead Zinc
18 - Borrego Canyon dry wash - downstream	SSS/Other	none	none	none	NA	(acute criteria) Aluminum Cadmium Copper Zinc	Surface Water - Aluminum Cadmium Copper Zinc

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Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
18 - Agua Chinon dry wash upstream	SSS/Other	none	none	none	NA	(Acute criteria) Aluminum Copper	Surface Water - Aluminum Copper
18 - Agua Chinon dry wash downstream	SSS/Other	none	none	none	NA	(Acute criteria) Aluminum Cadmium Copper	Surface Water - Aluminum Cadmium Copper
18 - Bee Canyon dry wash upstream	SSS/Other	none	none	none	NA	(Acute criteria) Aluminum Cadmium Copper Zinc	Surface Water - Aluminum Cadmium Copper Zinc
18 - Bee Canyon dry wash downstream	SSS/Other	none	none	none	NA	(Acute criteria) Aluminum Cadmium Copper Zinc	Surface Water - Aluminum Cadmium Copper Zinc
18 - Marshburn Channel dry wash upstream	SSS/Other	none	none	none	NA	(Acute criteria) Aluminum Copper Zinc	Surface Water - Aluminum Copper Zinc

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		Mammals	Inverts	Plants			
18 - Marshburn Channel dry wash downstream	SSS/Other	Soil - Mercury Dry wash (Marshburn Channel) none	Soil - none Dry wash (Marshburn Channel) none	Soil - none Dry wash (Marshburn Channel) Mercury	NA	(Acute criteria) Aluminum Copper Cyanide	Soil - Mercury Surface Water - Aluminum Copper Cyanide
18 - San Diego Creek upstream	SSS/Other	NA	NA	NA	none	(Chronic criteria) Aluminum Cadmium Copper Lead Mercury	Surface Water - Aluminum Cadmium Copper Lead Mercury
18 - San Diego Creek - Agua Chinon	SSS/Other	NA	NA	NA	none	(Chronic criteria) Aluminum Beryllium Cadmium Copper Lead Zinc	Surface Water - Aluminum Beryllium Cadmium Copper Lead Zinc

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Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
18 - San Diego Creek - Bee Canyon	SSS/Other	NA	NA	NA	none	(Chronic criteria) gamma Chlordane Aluminum Cadmium Copper Lead	Surface Water - gamma Chlordane Aluminum Cadmium Copper Lead
18 - San Diego Creek - Marshburn Channel	SSS/Other	NA	NA	NA	none	(Chronic criteria) Aluminum Cadmium Copper Lead Silver Zinc	Surface Water - Aluminum Cadmium Copper Lead Silver Zinc
19	no further action	Soil - Benzo(a)anthracene Cobalt	Soil - none	Soil - Benzo(a)pyrene Cobalt	NA	NA	none

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Chemicals of Potential Ecological Concern
Based on Exceeding Background Soil Values (a) and Ecological Criteria
for Phase II Investigation
MCAS EI Toro

Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
20	Other	Soil - 4,4'-DDE Cobalt Lead Mercury Zinc	Soil - Cobalt Lead Zinc	Soil - Benzo(a)pyrene Cobalt Lead Mercury Zinc	NA	NA	Soil - 4,4'-DDE Benzo(a)pyrene Cobalt Lead Mercury Zinc Catch basin - Antimony Barium Copper Lead Zinc
		Catch basin - Barium Copper Lead Zinc	Catch basin - Copper Lead Zinc	Catch basin - Antimony Copper Lead Zinc			
21	Other	Soil - none	Soil - none	Soil - none	NA	NA	Soil - none Catch basin - 4,4'-DDE 4,4'-DDT Benzo(a)anthracene Benzo(a)pyrene Lead Mercury Zinc
		Catch basin- 4,4'-DDE 4,4'-DDT Benzo(a)anthracene Lead Mercury Zinc	Catch basin- Lead	Catch basin- Benzo(a)pyrene Lead Mercury Zinc			

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for Phase II Investigation
MCAS El Toro

Site	Ecological Habitat Evaluation (b)	Terrestrial			Sediment	Surface Runoff (a)	Media Specific COPEC
		Mammals	Inverts	Plants			
22	no further action	Soil - Benzo(a)anthracene Lead	Soil - Lead	Soil - Benzo(a)pyrene Lead	NA	NA	none

- (a) Not screened against background soil criteria. All soil, dry wash deposits, catch basin deposits, and sediments were screened against background surface soil values.
- (b) Ecological Habitat Evaluation is based on the Spring 1992 reconnaissance. This table will be revised, if needed, following the Fall 1993 reconnaissance.
- SSS Special Status Species have been observed at this site.
- Other Habitat is present and will be further evaluated during the Fall 1993 reconnaissance. SSS were not observed during the first reconnaissance.