



DEPARTMENT OF THE NAVY  
SOUTHWEST DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
1220 PACIFIC HIGHWAY  
SAN DIEGO, CA 92132-5190

5090  
Ser 06CC.DG/119  
February 24, 2000

Mr. Glenn R. Kistner  
U.S. Environmental Protection Agency  
Region IX, (SFD 8-2)  
Hazardous Waste Management Division  
75 Hawthorne Street  
San Francisco, CA 94105-3901

Subj: LIMITED TRENCHING ACTIVITIES AT ANOMALY AREA 3 (AKA MSC R1),  
MARINE CORPS AIR STATION, EL TORO

Dear Mr. Kistner:

The purpose of this letter is to describe some of the findings of the recently completed geophysical survey of Anomaly Area 3, and to provide notification of the planned schedule for limited trenching activities. This area was brought to the specific attention of the BCT during the 25 August, 1999 field visit, and periodic updates have been provided up to the BCT up to this date.

Preliminary Findings of Geophysical Survey

Geophysical surveying activities were conducted during early 2000, and preliminary notes from the surveying activities are provided as enclosures. The survey identified much of Anomaly Area 3 as fill material. Relatively high concentrations of buried metallic debris were identified at three areas. A trench feature, approximately 400 feet long and roughly parallel to Pusan Way, with buried metallic debris was identified as Area A-1 during the survey (see enclosed map). Similar buried metallic debris was identified at Areas A-2 and A-3. Scattered metallic debris was identified at Areas A-4 and A-5.

Tentative Schedule for Field Work

Limited trenching activities at Anomaly Area 3 are planned for the period from 7 through 9 March 2000. Trenching at Areas A-1 and A-2 is the priority due to the identification of a possible trench at A-1, and the relatively high concentration of metallic debris at A-2. Other areas will be investigated as time permits. BRAC Cleanup Team participation in the field work is welcome and encouraged. To coordinate this, please notify myself at (619) 532-0784 in advance of planned site visits.

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Reviewing the material in this letter will help to illustrate the significance of this site. To keep a coordinated, continuous effort applied to this site, I suggest that possible strategies be discussed at our next BCT meeting. In preparation for this meeting, or for any questions in relation to this site, please do not hesitate to call myself, or Ms. Hornecker at (619) 532-0783.

Sincerely,

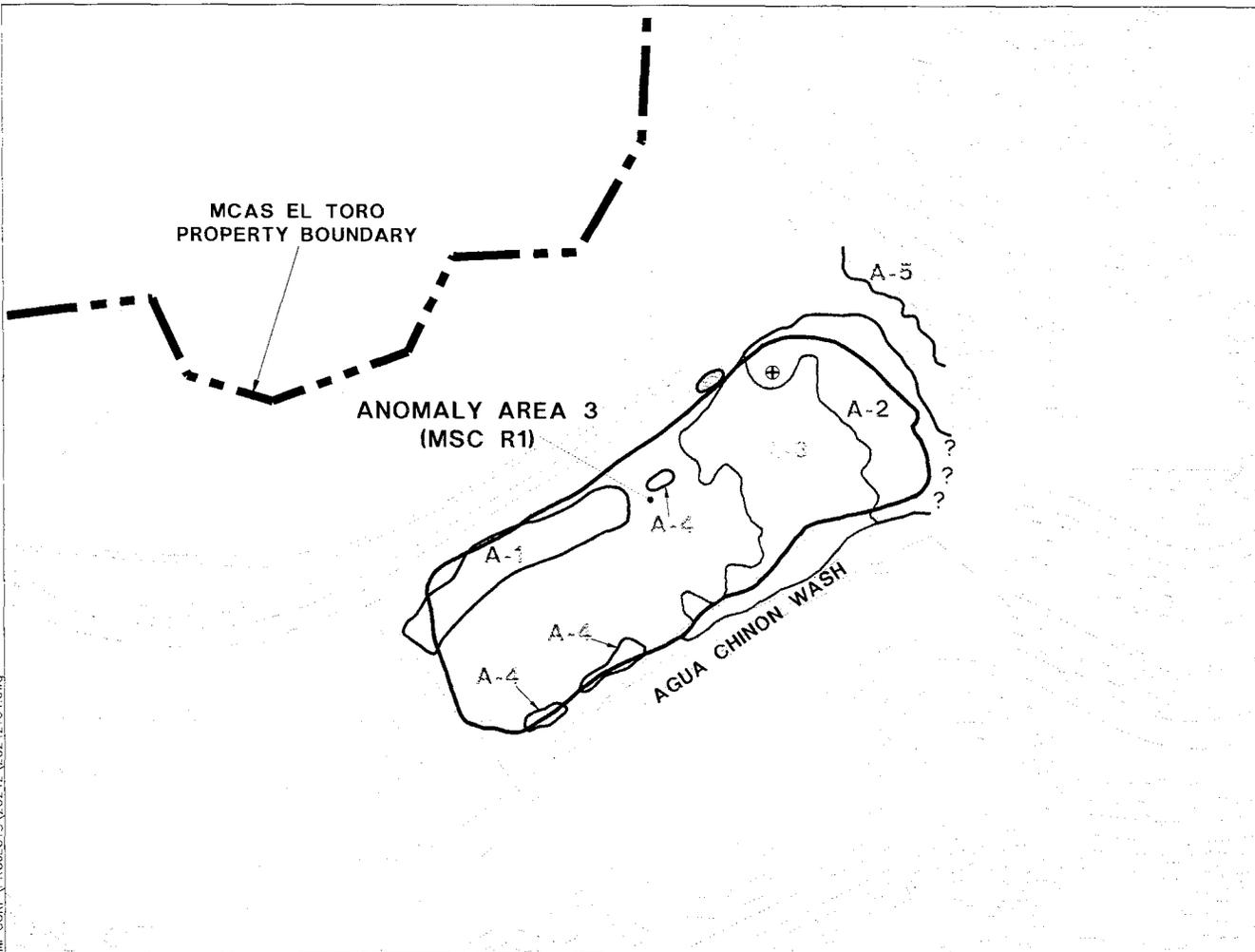
A handwritten signature in cursive script that reads "Dean Gould". The signature is written in black ink and is positioned to the right of the word "Sincerely,".

DEAN GOULD  
Base Realignment and Closure  
Environmental Coordinator  
By direction of the Commander

Enclosure: 1. Preliminary Map, Geophysical Designated Areas (IT/OHM, Feb. 2000)  
2. Preliminary Field Notes (IT/OHM, February 2000)

Copy to: (w/encl)  
Ms. Triss Chesney, DTSC  
Ms. Patricia Hannon, Cal RWQCB, Santa Ana Region

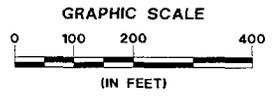
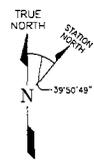
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**EXPLANATION:**

- A-1 LARGE TRENCH CONTAINING METALLIC DEBRIS
- A-2 LARGE AREA CONTAINING HIGH CONCENTRATION OF DEEP BURIED METALLIC DEBRIS.
- A-3 LARGE AREA CONTAINING SCATTERED DEEP BURIED METALLIC DEBRIS (PROBABLY NOT AS MUCH AS AREA A-2 BUT STILL SIGNIFICANT)
- A-4 SUCH AREAS CONTAINING SCATTERED SHALLOW OR DEEP DEBRIS.
- A-5 AREA CONTAINING SCATTERED SURFACE OR SHALLOW DEBRIS.
- AREA OF ELEVATED CONDUCTIVITY PROBABLY INDICATIVE OF FILL SOILS.
- SURFACE OR SHALLOW BURIED LARGE OBJECT FROM EM-31 (FIELD CHECK).
- ⊕ ONLY ANOMALY WITH CHARACTERISTICS OF WELL CASING. HOWEVER, PROBABLY BURIED DEBRIS--SHOULD BE EXCAVATED.

NOTES:  
POINTS SURVEYED WITH GPS FOR DEVELOPING A SITE MAP



REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED
01	97102-MSCR1.DWG BY CALVADA SURVEYING, INC.	11/9/99	

CONTRACT NAME <b>SWDIV</b>		<b>OHM Remediation Services Corp.</b> <small>A Subsidiary of OHM Corporation IRVINE, CA</small>
DRAWN BY <b>R. PIRMORADIAN</b>	DATE <b>2/23/2000</b>	
CHECKED BY	DATE	<b>GEOPHYSICAL DESIGNATED AREAS ANOMALY AREA 3 FEBRUARY 2000</b>
APPROVED BY	DATE	
PROJECT MANAGER	DATE	
AUTOCAD FILE No. <b>20242164.DWG</b>		<b>MARINE CORPS AIR STATION EL TORO, CALIFORNIA</b>
SCALE <b>1"=200'</b>	SHEET <b>1</b> OF <b>1</b>	
DOCUMENT CONTROL No.	OHM PROJECT No. <b>20242</b>	

## **Preliminary Interpretation of Aerial Photo Anomaly 3 Area**

### Geophysical Methods

Magnetic and Geonics EM-31 survey using GPS for horizontal control. The magnetometer has the greatest depth of investigation of the geophysical methods generally used to map buried metallic debris. However, the method has the poorest resolution in that magnetic anomalies from buried metallic (ferrous only) debris have much greater horizontal extent than the source. This method can locate a single 55-gallon drum to depths up to 10 ft. Objects with combined mass of over 1,000 pounds can probably be located to depths approaching 20 ft, if the noise is not too great. The magnetometer was applied to this investigation because a thick soil cover was expected over the debris. The Geonics EM-31 terrain conductivity meter (EM-31) does not have the depth of investigation of the magnetometer. Although the instrument response results from materials in the upper 18 ft, or so, most of the response comes from materials 2-3 ft below ground surface. The EM-31 is not sensitive to very small metallic objects so can help differentiate between magnetic anomalies caused by scattered debris and those caused by large objects. Unlike the magnetometer, which can only locate ferrous debris, the EM-31 can locate any kind of metal. The EM-31 can locate a drum to a maximum depth of about 5 ft and probably will not detect debris any greater than 10 ft. The EM-31 also measures soil conductivity (clays have high conductivity and sands have low conductivity) so has the potential to map pits that have been backfilled with soil having different electrical properties than background materials. The EM-31 was applied to this investigation because of the potential to map fill soils with different composition from native soils.

Other applicable methods not used during this investigation included ground penetrating radar (GPR) and the Geonics EM-61 time domain metal detector. GPR was not used because the debris was expected to be buried at depth and GPR has limited depth of investigation, especially, in fine grained soils. GPR, however, has the best resolution of all the geophysical methods when it can image deep enough. The Geonics EM-61 is a high resolution, deep sensing, digital metal detector. It has a maximum depth of investigation of about 10 feet, but has much better resolution than the magnetometer. The magnetometer was used instead of the EM-61 because the depth of the debris was unknown and we elected depth of investigation over resolution. If better lateral resolution is required than can be provided by the magnetometer, you may want to consider evaluating GPR and the EM-61 to determine if these methods can provide additional valuable data.

### Results

Significant magnetic anomalies indicative of buried metallic debris. The absence of EM-31 response over most of this debris indicates that it is quite deep (i.e. 4+ feet). Some scattered low amplitude EM-31 in-phase anomalies indicative of smaller, shallow debris. One large, negative conductivity and in-phase anomaly along the fence in NW portion of survey area. This anomaly could be large surface of shallow buried metallic object (needs to be field checked). There is a large high conductivity zone encompassing a large

portion of the site as shown on the preliminary interpretation. Most of the magnetic anomalies fall within this zone and it may be indicative of the fill soils placed over the debris. The boundary of this conductive zone is not well defined in the NE portion of the survey area.

Areas with anomalous magnetic data are depicted on the preliminary interpretation map. Anomaly A-1 is a large trench along the NW boundary of the survey area containing buried metallic debris probably deeper than 4 ft. Anomaly A-2 is a large area in the NE portion of the survey area containing significant amounts of deep buried metallic debris. Anomaly A-3 is an area immediately SW of A-2 containing significant amounts of scattered metallic debris. Anomaly A-4 represents small areas with scattered buried debris – the portion of this anomaly NE of A-1 should be investigated due to its proximity to A-1 (it may represent the anomaly caused by a deep buried object/debris). Anomaly A-5 represents an area along the NE boundary of the survey area contained scattered, surface or shallow buried debris – this area needs to be field checks to determine if the anomalies have surface sources. There are also numerous small anomalies caused by small, surface or shallow objects/debris – these are shown as x's. The only anomaly in this area with some characteristics of well casing is a large magnetic anomaly with the A-2 area. The location of this anomaly is shown on the interpretation, however, it is most likely that the anomaly is caused by buried debris (it should be investigated).

## TRANSMITTAL

Date: 29 February 2000

From: Lynn Marie Hornecker  
MCAS El Toro

*LMAH*

To: Diane Silva  
Code 01LS.DS

**Subj: CERCLA Administrative Record Materials**  
Marine Corps Air Station, El Toro

**Installation:** Marine Corps Air Station, El Toro

**UIC Number:** M60050

**Document Title (or subject):** Limited Trenching Activities at Anomaly Area 3  
(AKA MSC R1), MCAS El Toro

**Author:** Dean Gould

**Recipient:** Glenn Kistner, USEPA

**Record Date:** 24 February 2000

**Approximate Number of Pages:** 5

**EPA Category:** 01.1

**Sites:** Anomaly Area 3, MSC R1

**Key Words:** Aerial Photograph Anomaly

**Contract:** N/A

**CTO Number:** N/A