DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

8 JUN 1994

377 ABW/EMR
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5659

Ms. Nancy Morlock, Environmental Engineer
RCRA Permits Branch
U.S. EPA Region 6
1445 Ross Ave, Ste 1200
Dallas TX 75202-2733

XIII

Dear Ms. Morlock

We are forwarding the attached proposed additional activities for the McCormick Ranch Phase II Environmental Baseline Survey for your information.

These activities represent extra work being done outside the permit by the using unit, Phillips Laboratory, in their attempt to turn over McCormick Ranch to the State of New Mexico. However, for this to occur, NMED must have certification that no problems exist or cleanup is accomplished, if necessary.

Please contact me at (505) 846-2773/0053 if you have any questions.

Sincerely

CHRISTOPHER B. DeWITT, R.P.G.
Acting Chief, Restoration Br
Environmental Mgmt Division

Attachment:
Additional Activities, McCormich Ranch

cc:
NMED-HRMB (Ms. Hoditschek)
PL/SE (Lt Cochran) (w/o atch)

PHASE II ENVIRONMENTAL BASELINE SURVEY
PROPOSED ADDITIONAL ACTIVITIES
Contract No. F29601-93-C-0219

INTRODUCTION

We recommend three additional activities to the Phase II Environmental Baseline Survey (EBS) at McCormick Ranch, that will add value to the program in a cost effective manner. The additional activities we recommend are:

- Field screening of soil samples for TNT, PETN, nitrate, and semivolatile organic compounds (SVOC's);
- Surface water sampling; and
- Local and regional hydrologic and geomorphologic studies.

We propose performing the above activities in addition to the trenching and soil sampling described in the current Statement of Work. The approximate additional cost for performing each of the proposed activities is attached.

FIELD SCREENING

Field screening of soil samples from the McCormick Ranch site will increase the cost effectiveness of the program and provide greater sample density (i.e., site coverage). Field screening will inexpensively identify soil samples with the highest probability of containing contaminants, and limit the need for more expensive analytical laboratory analyses. Specifically, we recommend screening soil samples for TNT and TNT degradation products, PETN, nitrate, and SVOC's. Proposed field screening methods and the number of analyses recommended are presented in Table 1.

Field screening for TNT and TNT degradation products will be performed with a commercially available immunoassay test kit that provides a quantitative, colorimetric analysis. The test kit conforms to EPA SW846 Method 8515 for quantitative field analysis of TNT, and will detect TNT in soil down to 1 ppm concentration. The method will also detect other nitroaromatic TNT degradation products.

Field screening for PETN is not an established procedure. However, field methods are available to determine if PETN is present in soil samples. We propose performing thin layer chromatography (TLC) to screen for PETN in soil samples. In order to use this screening method, PETN standards must be prepared to determine chromatographic characteristics and method detection limits. Reference standards for PETN can be prepared from Standard Analytical Reference Materials (SARM) obtained from the U.S. Army Environmental Center (USAEC). Once the characteristics and detection limits are established, field screening will determine if PETN is present in concentrations exceeding the detection limit. This field screening procedure is qualitative and will determine if PETN is present, but not the type or concentration of all contaminants of concern in the sample. When contaminants are identified in the TLC analysis, selected samples will be sent to the laboratory for a quantitative analysis for contaminants of concern (see Table 1). To provide quality assurance and quality control (QA/QC), PETN standards (matrix spikes) will be analyzed at the beginning and end of each day in which field screening for PETN is performed.

The nitrate concentration in soil samples will be analyzed using a commercially available test kit, the N-Trak from HACH. This method provides the nitrate concentration of soil samples from approximately 1 to 30 mg/kg. Standards will be tested at the beginning and end of each day for QA/QC purposes.

The current Statement of Work for McCormick Ranch calls for 45 soil samples to be analyzed for explosive compounds and nitrates (plus five duplicate samples). We

recommend collecting a total of 300 samples and screening them for TNT and TNT degradation products, PETN, and nitrate. From these samples, 45 samples plus 5 field duplicate samples will be sent to the analytical laboratory and quantitatively analyzed for explosives (Method SW8330; SW8330-ADD-1 (nitroglycerine); SW 8330-ADD-2 (PETN)) and nitrate plus nitrite (Method E353.2). In this manner, we will increase the probability of finding any explosive residues that may be present in the soil.

To determine if SVOC's are present in the soil samples, we also propose using the TLC method. When used to screen for SVOC's, this method will be qualitative and non-specific. The analysis will indicate whether hydrocarbons are present in the samples, but not contaminant type or concentration. Samples testing positive (i.e., hydrocarbons present) will be sent to the analytical laboratory and analyzed for contaminants of concern (e.g., SVOC's). We propose screening 100 samples for hydrocarbons (Table 1). From these, 23 samples (plus 3 duplicate samples) will be sent to the analytical laboratory for quantitative analysis.

We estimate that the cost of performing the field screening described above will be approximately $105,608. This estimate includes additional labor associated with field analysis, additional sample collection, and mapping and reporting requirements. The cost for this effort are presented for labor and other direct costs (ODC's) on the attached spread-sheet. The relationship between cost and number of samples is approximately linear for each specific method proposed. However, a major reduction in the number of samples screened (i.e., >50%) will result in an overall higher cost per sample due to certain fixed costs regardless of number of samples.

Table 1: Proposed Field Screening Methods and number of Samples

ANALYTE	FIELD SCREENING METHOD	LABORATORY METHOD	NUMBER OF SAMPLES
TNT	IMMUNOASSAY	SW8330*	300
PETN	THIN LAYER CHROMATOGRAHY	SW8330-ADD-2	300
NITRATE	N-TRAK (HACH KIT)	E353.2**	300
SVOC's (HYDROCARBONS)	THIN LAYER CHROMATOGRAPHY	SW3550/SW8270	100

*SW = EPA, 1986, Test Method for Evaluating Solid Waste Laboratory Manual Physical/Chemical Methods, SW-346, Third Edition

**E = EPA, 1983, Methods for Chemical Analysis of Water and Wastes, EPA-6001, 4-79-020

WATER SAMPLING

Surface Water Sampling

If a precipitation event creates sufficient surface runoff to allow samples to be collected then up to four surface water samples will be taken from upgradient (upstream) of the site and onsite. Likely locations of ponded water will be determined from geomorphologic study.

Up to four surface water samples will be collected using either a collection bottle or a peristaltic pump. An equipment blank will be collected if a pump is used. The surface water samples will be analyzed for the constituents and methods listed in Table 2. All QA/QC procedures (duplicate samples, blanks, reporting requirements) used for groundwater samples will be followed for the surface water samples. If no surface water can be collected after six intense rainfall events then sample collection attempts will be stopped.

We estimate the cost for the collection and analysis of groundwater and surface water samples to be $14,350. This estimate includes all labor, sample collection and analysis, and reporting requirements. The costs for this effort are presented for labor and ODC's on the attached spreadsheet.

Table 2: Analytical Methods

Analyte	Matrix	Method
ARSENIC	WATER	SW7060
LEAD	WATER	SW7421
MERCURY	WATER	SW7470
SELENIUM	WATER	SW7740
CYANIDE	WATER	SW9010A
ICP METALS	WATER	SW6010
SEMI-VOC'S	WATER	SW8270
EXPLOSIVES	WATER	SW8330
EXPLOSIVES	WATER	SW8330 ADD 1 & 2
NITRATE & NITRITE	WATER	E353.2

Method number preceded by E is from: Methods for Chemical Analysis of water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983 - with additions)

Method numbers precede by SW are from: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 33rd Edition (USEPA, 1986a)

LOCAL AND REGIONAL HYDROLOGIC AND GEOMORPHOLOGIC STUDIES

A study of the surface and subsurface hydrologic system is important in assessing the potential for contaminant migration from the McCormick Ranch site. A geomorphologic study of the site and vicinity using available maps, references,. and aerial photographs will be conducted to determine the predominant drainage patterns in the region. A site field study will be conducted to characterize soils. Recommendations will be made from this study on appropriate locations for field screening and surface water sample collection. The results of the study will be included as part of the Phase II EBS report.

The regional hydrology of the Kirtland AFB is presently being studied under several investigations. Sandia National Laboratories/New Mexico (SNL/NM) is conducting a Sitewide Hydrogeologic Study of the Kirtland AFB. This study includes the collection and interpretation of lithologic and geophysical logs of all the wells on and in the vicinity of the base, drilling of new wells where information is lacking, and unsaturated and saturated zone characterization studies such as pumping and infiltration tests. The Environmental Restoration Program for SNL/NM is also performing site specific hydrogeologic investigations at their various facilities. The closest locations to the McCormick Ranch site are in Tech Area 3 where the Chemical Waste Landfill and Mixed Waste Landfill are undergoing RCRA or HSWA investigations. Additionally, a basewide groundwater surveillance program required by DOE Order 5400.1 includes monthly water level measurements of 34 wells and 3 springs on Kirtland AFB and quarterly sampling of 16 wells. The USGS under contract to the U.S. Air Force Center for Environmental Excellence has conducted a RCRA Facility Investigation (RFI) for 18 sites on the base. The investigation included the McCormick Ranch site. Five wells were installed around the perimeter of the active explosives testing area. Soil samples were also collected adjacent to the well locations. Only total chromium was detected above the quantitation limit at two of the wells.

A detailed evaluation of pertinent data from the investigations described will be used to evaluate risks associated with potential contaminant migration in the unsaturated zone and groundwater aquifer. Preliminary estimates of travel times through the unsaturated zone for the contaminants of interest will be performed, if appropriate, using a two-dimensional computer code or analytical solutions. These estimates will only be qualitative due to the amount of information available at the site and the scope of effort. The results of the proposed Phase II EBS soil and groundwater sampling and the completion of a hydrologic study will be used to evaluate the need for any additional hydrogeologic studies.

A portion of the McCormick Ranch site is situated on what has been identified on the USGS topographic map as a dry playa. (Playa is a term generally used for the low-lying area of a desert basin where water collects after a rain and subsequently evaporates. Depending on the suspended and dissolved constituents in the water, sediments in playas will typically consist of muds and evaporites, such as gypsum and calcite). The 'playa' at McCormick Ranch probably contains a higher clay content than in the surrounding soils but very little to no evaporites. During intense precipitation, surface runoff from the east may flow to this low-lying area and, perhaps, continue draining offsite to the west. Runoff from other areas of McCormick Ranch has the potential for carrying contaminants along with sediments into the playa and concentrating these contaminants. Additionally, low-lying areas tend to contain fine-grained sediments such as clays and silts which can adsorb high concentrations of metals and organics. Other areas on McCormick Ranch may also collect rainfall runoff. The geomorphology study, including a surface water study from precipitation events will evaluate drainage patterns at the site.

A geomorphologic study of the site and vicinity using available maps, references,. and aerial photographs will be conducted to determine the predominant drainage patterns in the region. A site field study will be conducted to characterize soils. Recommendations will be made from this study on appropriate locations for field screening and surface water sample collection.

We estimate the cost for the hydrologic and geomorphologic study to be $12,024. This estimate includes all labor, sample collection and analysis, and reporting requirements. The costs for this effort are presented for labor and ODC's on the attached spreadsheet.

6/7/94 ADDITIONAL COSTS FOR FIELD SCREENING AT McCORMICK RANCH

Field Screening Cost

Labor:

Task	Cost
Preparation	$8,474
Field Sampling	
Analysis	$22,910
Sample Collection	$21,440
Interpretation and Report	$25,641

TOTAL LABOR: $78,465.05

Other Direct Costs:

Item	Price/Sample	Sample No.	Cost
Laboratory Testing			
TNT Test Kit	$24.79	300	$7,436
PETN Test (TLC)	$12.39	300	$3,718
Nitrate (HACH N-TRAK)	$24.79	300	$7,436
semiVOC's (TLC)	$12.39	100	$1,239
Misc. ODCs	Price/Unit	Days	Cost
Addl' Surveying	$619.70	2	$1,239
Rental Vehicle	$74.36	15	$1,115
Misc. Lab Supplies	NA	NA	$1,239
Addl' Explosive Expert Hours	$743.64	5	$3,718

ODC's $27,143

Total Costs $105,608

*DAY = 10 HRS - FIELD; 8 HRS -

6/7/94 ADDITIONAL COSTS FOR FIELD SCREENING AT McCORMICK RANCH

Surface Water Sampling Cost

Labor:

Task	Cost
Preparation	$400.00
Field Sampling	$2,034.00
Interpretation and Report	$600.00

TOTAL LABOR: **$3,034.00**

Other Direct Costs:

ITEM	PRICE/SAMPLE	NUMBER	COST
Laboratory Testing			
Laboratory Analyses*	$1,363.34	8	$10,907
Misc. ODCs	Price/Unit	Days	Cost
Mileage	NA	NA	$99
Sampling Equipment	NA	NA	$310

*includes costs of QA/QC samples (total of 4 samples; 4 QA/QC)

ODC's **$11,316**

Total Costs **$14,350**

*DAY = 10 HRS - FIELD; 8 HRS - OFFICE

6/7/94 ADDITIONAL COSTS FOR FIELD SCREENING AT McCORMICK RANCH

Hydrology/Geomorphology Task

Labor:

Task	Cost
Analysis, Field, and Report	$11,726.00

TOTAL LABOR: $11,726.00

Other Direct Costs:

Misc. ODCs	Price/Unit	Days	Cost
Mileage	NA		
Sampling Equipment	NA	NA	$99
		NA	$198

*includes costs of QA/QC samples (total of 4 samples; 4 QA/QC)

ODC's $298

Total Costs $12,024

*DAY = 10 HRS - FIELD; 8 HRS - OFFICE

105,608
14,350
12,024
131,982