AD NO. _____
DTC PROJECT NO. 8-CO-160-UXO-021
REPORT NO. ATC-8997

STANDARDIZED

UXO TECHNOLOGY DEMONSTRATION SITE

DESERT EXTREME SCORING RECORD NO. 528

SITE LOCATION:
U.S. ARMY YUMA PROVING GROUND

DEMONSTRATOR:
HUMAN FACTORS APPLICATIONS, INC.
8 JAY GOULD COURT, UNIT D
WALDORF, MD 20602

TECHNOLOGY TYPE/PLATFORM:
MAGNETOMETER SCHONSTEDT/HAND HELD

PREPARED BY:
U.S. ARMY ABERDEEN TEST CENTER
ABERDEEN PROVING GROUND, MD 21005-5059

JULY 2005

**20051101 039**

EQT
ARMY
Environmental Quality
Technology Program

DoD EPA DOE **SERDP**
Strategic Environmental Research
and Development Program

ESTCP

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**14. ABSTRACT**
This scoring record documents the efforts of Human Factors Applications, Inc. to detect and discriminate inert unexploded ordnance (UXO) utilizing the YPG Standardized UXO Technology Demonstration Site Desert Extreme. The scoring record was coordinated by Larry Overbay and the Standardized UXO Technology Demonstration Site Scoring Committee. Organizations on the committee include the U.S. Army Corps of Engineers, the Environmental Security Technology Certification Program, the Strategic Environmental Research and Development Program, the Institute for Defense Analysis, the U.S. Army Environmental Center, and the U.S. Army Aberdeen Test Center.

**15. SUBJECT TERMS**
Human Factors Applications, Inc., UXO Standardized Site, YPG, Standardized UXO Technology Demonstration Site Program, Desert Extreme, Magnetometer Schonstedt/Hand Held

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# SECTION 1. GENERAL INFORMATION

## 1.1 BACKGROUND

Technologies under development for the detection and discrimination of unexploded ordnance (UXO) require testing so that their performance can be characterized. To that end, Standardized Test Sites have been developed at Aberdeen Proving Ground (APG), Maryland and U.S. Army Yuma Proving Ground (YPG), Arizona. These test sites provide a diversity of geology, climate, terrain, and weather as well as diversity in ordnance and clutter. Testing at these sites is independently administered and analyzed by the government for the purposes of characterizing technologies, tracking performance with system development, comparing performance of different systems, and comparing performance in different environments.

The Standardized UXO Technology Demonstration Site Program is a multi-agency program spearheaded by the U.S. Army Environmental Center (AEC). The U.S. Army Aberdeen Test Center (ATC) and the U.S. Army Corps of Engineers Engineering Research and Development Center (ERDC) provide programmatic support. The program is being funded and supported by the Environmental Security Technology Certification Program (ESTCP), the Strategic Environmental Research and Development Program (SERDP) and the Army Environmental Quality Technology Program (EQT).

## 1.2 SCORING OBJECTIVES

The objective in the Standardized UXO Technology Demonstration Site Program is to evaluate the detection and discrimination capabilities of a given technology under various field and soil conditions. Inert munitions and clutter items are positioned in various orientations and depths in the ground.

The evaluation objectives are as follows:

a. To determine detection and discrimination effectiveness under realistic scenarios that vary targets, geology, clutter, topography, and vegetation.

b. To determine cost, time, and manpower requirements to operate the technology.

c. To determine demonstrator's ability to analyze survey data in a timely manner and provide prioritized "Target Lists" with associated confidence levels.

d. To provide independent site management to enable the collection of high quality, ground-truth, geo-referenced data for post-demonstration analysis.

### 1.2.1 Scoring Methodology

a. The scoring of the demonstrator's performance is conducted in two stages. These two stages are termed the RESPONSE STAGE and DISCRIMINATION STAGE. For both stages, the probability of detection ($P_d$) and the false alarms are reported as receiver-operating

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characteristic (ROC) curves. False alarms are divided into those anomalies that correspond to emplaced clutter items, measuring the probability of false positive ($P_{fp}$), and those that do not correspond to any known item, termed background alarms.

b. The RESPONSE STAGE scoring evaluates the ability of the system to detect emplaced targets without regard to ability to discriminate ordnance from other anomalies. For the blind grid RESPONSE STAGE, the demonstrator provides the scoring committee with a target response from each and every grid square along with a noise level below which target responses are deemed insufficient to warrant further investigation. This list is generated with minimal processing and, since a value is provided for every grid square, will include signals both above and below the system noise level.

c. The DISCRIMINATION STAGE evaluates the demonstrator's ability to correctly identify ordnance as such and to reject clutter. For the blind grid DISCRIMINATION STAGE, the demonstrator provides the scoring committee with the output of the algorithms applied in the discrimination-stage processing for each grid square. The values in this list are prioritized based on the demonstrator's determination that a grid square is likely to contain ordnance. Thus, higher output values are indicative of higher confidence that an ordnance item is present at the specified location. For digital signal processing, priority ranking is based on algorithm output. For other discrimination approaches, priority ranking is based on human (subjective) judgment. The demonstrator also specifies the threshold in the prioritized ranking that provides optimum performance, (i.e. that is expected to retain all detected ordnance and rejects the maximum amount of clutter).

d. The demonstrator is also scored on EFFICIENCY and REJECTION RATIO, which measures the effectiveness of the discrimination stage processing. The goal of discrimination is to retain the greatest number of ordnance detections from the anomaly list, while rejecting the maximum number of anomalies arising from non-ordnance items. EFFICIENCY measures the fraction of detected ordnance retained after discrimination, while the REJECTION RATIO measures the fraction of false alarms rejected. Both measures are defined relative to performance at the demonstrator-supplied level below which all responses are considered noise, i.e., the maximum ordnance detectable by the sensor and its accompanying false positive rate or background alarm rate.

e. Based on configuration of the ground truth at the standardized sites and the defined scoring methodology, there exists the possibility of having anomalies within overlapping halos and/or multiple anomalies within halos. In these cases, the following scoring logic is implemented:

(1) In situations where multiple anomalies exist within a single $R_{halo}$, the anomaly with the strongest response or highest ranking will be assigned to that particular ground truth item.

(2) For overlapping $R_{halo}$ situations, ordnance has precedence over clutter. The anomaly with the strongest response or highest ranking that is closest to the center of a particular ground truth item gets assigned to that item. Remaining anomalies are retained until all matching is complete.

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(3) Anomalies located within any $R_{halo}$ that do not get associated with a particular ground truth item are thrown out and are not considered in the analysis.

f. All scoring factors are generated utilizing the Standardized UXO Probability and Plot Program, version 3.1.1.

## 1.2.2 <u>Scoring Factors</u>

Factors to be measured and evaluated as part of this demonstration include:

a. Response Stage ROC curves:

(1) Probability of Detection ($P_d^{res}$).

(2) Probability of False Positive ($P_{fp}^{res}$).

(3) Background Alarm Rate ($BAR^{res}$) or Probability of Background Alarm ($P_{BA}^{res}$).

b. Discrimination Stage ROC curves:

(1) Probability of Detection ($P_d^{disc}$).

(2) Probability of False Positive ($P_{fp}^{disc}$).

(3) Background Alarm Rate ($BAR^{disc}$) or Probability of Background Alarm ($P_{BA}^{disc}$).

c. Metrics:

(1) Efficiency (E).

(2) False Positive Rejection Rate ($R_{fp}$).

(3) Background Alarm Rejection Rate ($R_{BA}$).

d. Other:

(1) Probability of Detection by Size and Depth.

(2) Classification by type (i.e., 20-, 40-, 105-mm, etc.).

(3) Location accuracy.

(4) Equipment setup, calibration time and corresponding man-hour requirements.

(5) Survey time and corresponding man-hour requirements.

(6) Reacquisition/resurvey time and man-hour requirements (if any).

(7) Downtime due to system malfunctions and maintenance requirements.

## 1.3  STANDARD AND NONSTANDARD INERT ORDNANCE TARGETS

The standard and nonstandard ordnance items emplaced in the test areas are listed in Table 1. Standardized targets are members of a set of specific ordnance items that have identical properties to all other items in the set (caliber, configuration, size, weight, aspect ratio, material, filler, magnetic remanence, and nomenclature). Nonstandard targets are inert ordnance items having properties that differ from those in the set of standardized targets.

### TABLE 1.  INERT ORDNANCE TARGETS

| Standard Type | Nonstandard (NS) |
|---|---|
| 20-mm Projectile M55 | 20-mm Projectile M55 |
| | 20-mm Projectile M97 |
| 40-mm Grenades M385 | 40-mm Grenades M385 |
| 40-mm Projectile MKII Bodies | 40-mm Projectile M813 |
| BDU-28 Submunition | |
| BLU-26 Submunition | |
| M42 Submunition | |
| 57-mm Projectile APC M86 | |
| 60-mm Mortar M49A3 | 60-mm Mortar (JPG) |
| | 60-mm Mortar M49 |
| 2.75-inch Rocket M230 | 2.75-inch Rocket M230 |
| | 2.75-inch Rocket XM229 |
| MK 118 ROCKEYE | |
| 81-mm Mortar M374 | 81-mm Mortar (JPG) |
| | 81-mm Mortar M374 |
| 105-mm HEAT Rounds M456 | |
| 105-mm Projectile M60 | 105-mm Projectile M60 |
| 155-mm Projectile M483A1 | 155-mm Projectile M483A |
| | 500-lb Bomb |

JPG  = Jefferson Proving Ground
HEAT = high-explosive antitank

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# SECTION 2. DEMONSTRATION

## 2.1 DEMONSTRATOR INFORMATION

### 2.1.1 Demonstrator Point of Contact (POC) and Address

POC:      Scott Hemstreet
          301-705-5044
          shemstreet@hfactors.com

Address:  Human Factors Associates Inc.
          8 Jay Gould Court, Unit D
          Waldorf, MD   20602

### 2.1.2 System Description (provided by demonstrator)

Schonstedt 52Cx ordnance locator (fig. 1). Schonstedt Magnetometers are ferrous metal locators and will only detect "iron" or magnetic materials. The size and orientation of the target and the soil characteristics of the work area limit the depth of detection. The instrument is not capable of classifying the anomaly; it will only indicate the presence or absence of a magnetic anomaly.

Schonstedt Magnetometers do not require calibration. They have a simple battery function test and a "Go"/"No Go" field operational check. The magnetometers will be set in accordance with the manufacturer's handbook to the sensitivity required to detect subsurface anomalies on the project site.



Figure 1.   Demonstrator system, MAG Schonstedt/hand held.

### 2.1.3  Data Processing Description (provided by demonstrator)

The Human Factors Applications (HFA) UXO team will place a plastic pin flag in the ground to record the location of a subsurface anomaly. ATC personnel will survey in the location of this flag to determine the accuracy of the "MAG and Flag" process.

### 2.1.4  Data Submission Format

Data were submitted for scoring in accordance with data submission protocols outlined in the Standardized UXO Technology Demonstration Site Handbook.  These submitted data are not included in this report in order to protect ground truth information.

### 2.1.5  Demonstrator Quality Assurance (QA) and Quality Control (QC) (provided by demonstrator)

Magnetometer(s) will be tested daily before starting UXO operations in the morning.  The UXO Technician III will perform random checks during daily operations to ensure the equipment is operating and being operated properly. If a magnetometer does not pass the daily check, it will be repaired or replaced.

The Master Rated UXO Technician (UXO Technician III) will perform a random QC survey over the entire project site. This random survey will include a 100 percent survey of a 10-foot radius around all sites where ordnance items have been located. If an ordnance item is discovered during the QC survey, 100 percent of the site will be resurveyed

Overview of Quality Assurance (QA): Test site to compare flagged anomaly locations to known locations of test items.

Demonstrator's Field Personnel:  To Be Determined.

Support Equipment Required: ATC survey support.

Frequency and Radio Utilization: None, cell phones or govt. radios for communications.

### 2.1.6  Additional Records

The following record(s) by this vendor can be accessed via the Internet as MicroSoft Word documents at www.uxotestsites.org.  The counterparts to this report are the Blind Grid, Scoring Record No. 238, the Open Field, Scoring Record No. 442.

## 2.2 YPG SITE INFORMATION

### 2.2.1 Location

YPG is located adjacent to the Colorado River in the Sonoran Desert. The UXO Standardized Test Site is located south of Pole Line Road and east of the Countermine Testing and Training Range. The Open Field range, Calibration Grid, Blind Grid, Mogul area, and Desert Extreme area comprise the 350 by 500-meter general test site area. The open field site is the largest of the test sites and measures approximately 200 by 350 meters. To the east of the open field range are the calibration and blind test grids that measure 30 by 40 meters and 40 by 40 meters, respectively. South of the Open Field is the 135- by 80-meter Mogul area consisting of a sequence of man-made depressions. The Desert Extreme area is located southeast of the open field site and has dimensions of 50 by 100 meters. The Desert Extreme area, covered with desert-type vegetation, is used to test the performance of different sensor platforms in a more severe desert conditions/environment.

### 2.2.2 Soil Type

Soil samples were collected at the YPG UXO Standardized Test Site by ERDC to characterize the shallow subsurface (< 3 m). Both surface grab samples and continuous soil borings were acquired. The soils were subjected to several laboratory analyses, including sieve/hydrometer, water content, magnetic susceptibility, dielectric permittivity, X-ray diffraction, and visual description.

There are two soil complexes present within the site, Riverbend-Carrizo and Cristobal-Gunsight. The Riverbend-Carrizo complex is comprised of mixed stream alluvium, whereas the Cristobal-Gunsight complex is derived from fan alluvium. The Cristobal-Gunsight complex covers the majority of the site. Most of the soil samples were classified as either a sandy loam or loamy sand, with most samples containing gravel-size particles. All samples had a measured water content less than 7 percent, except for two that contained 11-percent moisture. The majority of soil samples had water content between 1 to 2 percent. Samples containing more than 3 percent were generally deeper than 1 meter.

An X-ray diffraction analysis on four soil samples indicated a basic mineralogy of quartz, calcite, mica, feldspar, magnetite, and some clay. The presence of magnetite imparted a moderate magnetic susceptibility, with volume susceptibilities generally greater than 100 by 10-5 SI.

For more details concerning the soil properties at the YPG test site, go to www.uxotestsites.org on the web to view the entire soils description report.

## 2.2.3 Test Areas

A description of the test site areas at YPG is included in Table 2.

### TABLE 2. TEST SITE AREAS

| Area | Description |
|---|---|
| Calibration Grid | Contains the 15 standard ordnance items buried in six positions at various angles and depths to allow demonstrator equipment calibration. |
| Blind Grid | Contains 400 grid cells in a 0.16-hectare (0.39-acre) site. The center of each grid cell contains ordnance, clutter, or nothing. |
| Open Field | A 4-hectare (10-acre) site containing open areas, dips, ruts, and obstructions, including vegetation. |
| Desert Extreme | A 1.23-acre area consisting of a sequence of man-made depressions, covered with desert-type vegetation. |

# SECTION 3. FIELD DATA

## 3.1 DATE OF FIELD ACTIVITIES (7, 10, and 11 May 2004)

## 3.2 AREAS TESTED/NUMBER OF HOURS

Areas tested and total number of hours operated at each site are summarized in Table 3.

### TABLE 3. AREAS TESTED AND NUMBER OF HOURS

| Area | Number of Hours |
|---|---|
| Calibration Lanes | 12.75 |
| Desert Extreme | 15.22 |

## 3.3 TEST CONDITIONS

### 3.3.1 Weather Conditions

A YPG weather station located approximately one mile west of the test site was used to record average temperature and precipitation on a half hour basis for each day of operation. The temperatures listed in Table 4 represent the average temperature during field operations from 0700 to 1700 hours while precipitation data represents a daily total amount of rainfall. Hourly weather logs used to generate this summary are provided in Appendix B.

### TABLE 4. TEMPERATURE/PRECIPITATION DATA SUMMARY

| Date, 2004 | Average Temperature, $^{\circ}$C | Total Daily Precipitation, in. |
|---|---|---|
| May 7 | 32.6 | 0.00 |
| May 10 | 32.0 | 0.00 |
| May 11 | 28.2 | 0.00 |

### 3.3.2 Field Conditions

The field was dry and the temperature warm during the HFA survey.

### 3.3.3 Soil Moisture

Three soil probes were placed at various locations within the site to capture soil moisture data: Blind Grid, Calibration, Open Field, and Mogul areas. Measurements were collected in percent moisture and were taken twice daily (morning and afternoon) from five different soil depths (1 to 6 in., 6 to 12 in., 12 to 24 in., 24 to 36 in., and 36 to 48 in.) from each probe. Soil moisture logs are included in Appendix C.

## 3.5 PROCESSING TIME

HFA submitted the raw data from the demonstration activities on the last day of the demonstration, as required. The scoring submittal data was also provided within the required 30-day timeframe.

## 3.6 DEMONSTRATOR'S FIELD PERSONNEL

Bob Dyminski
Scott Hemstreet

## 3.7 DEMONSTRATOR'S FIELD SURVEYING METHOD

HFA set up grids and collected data in a linear fashion. HFA collected their data in a south to north direction.

An ATC team provided surveying support to HFA (which is not included in the overall time breakdown). The HFA team's purpose was to locate and flag all items found.

## 3.8 SUMMARY OF DAILY LOGS

Daily logs capture all field activities during this demonstration and are located in Appendix D. Activities pertinent to this specific demonstration are indicated in highlighted text.

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# SECTION 4.   TECHNICAL PERFORMANCE RESULTS

## 4.1   ROC CURVES USING ALL ORDNANCE CATEGORIES

(Not applicable for this technology)

## 4.2   ROC CURVES USING ORDNANCE LARGER THAN 20 MM

(Not applicable for this technology)

## 4.3   PERFORMANCE SUMMARIES

Results for the Desert Extreme test, broken out by size, depth and nonstandard ordnance, are presented in Tables 5a and 5b (for cost results, see section 5). Results by size and depth include both standard and nonstandard ordnance. The results by size show how well the demonstrator did at detecting/discriminating ordnance of a certain caliber range (see app A for size definitions). The results are relative to the number of ordnances emplaced. Depth is measured from the geometeric center of anomolies.

The RESPONSE STAGE results are derived from the list of anomalies above the demonstrator-provided noise level. The results for the DISCRIMINATION STAGE are derived from the demonstrator's recommended threshold for optimizing UXO field cleanup by minimizing false digs and maximizing ordnance recovery. The lower 90-percent confidence limit on probability of detection and probability of false positive was calculated assuming that the number of detections and false positives are binomially distributed random variables. All results in Tables 5a and 5b have been rounded to protect the ground truth. However, lower confidence limits were calculated using actual results.

The overall ground truth is composed of ferrous and non-ferrous anomalies. Due to limitations of the magnetometer, the non-ferrous items cannot be detected. Therefore, the summary presented in Table 5a exhibits results based on the subset of the ground truth that is solely the ferrous anomalies. Table 5b exhibits results based on the full ground truth. All other tables presented in this section are based on scoring against the ferrous only ground truth. The response stage noise level and recommended discrimination stage threshold values are provided by the demonstrator.

## TABLE 5a. SUMMARY OF DESERT EXTREME RESULTS (FERROUS ONLY)

| Metric | Overall | Standard | Nonstandard | By Size | | | By Depth, m | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Small | Medium | Large | < 0.3 | 0.3 to <1 | >= 1 |
| RESPONSE STAGE | | | | | | | | | |
| $P_d$ | 0.55 | 0.60 | 0.50 | 0.55 | 0.60 | 0.55 | 0.70 | 0.40 | 0.20 |
| $P_d$ Low 90% Conf | 0.50 | 0.51 | 0.42 | 0.44 | 0.49 | 0.38 | 0.60 | 0.29 | 0.02 |
| $P_d$ Upper 90% Conf | 0.63 | 0.68 | 0.63 | 0.64 | 0.71 | 0.72 | 0.76 | 0.52 | 0.58 |
| $P_{fp}$ | 0.85 | - | - | - | - | - | 0.85 | 0.75 | 0.00 |
| $P_{fp}$ Low 90% Conf | 0.80 | - | - | - | - | - | 0.84 | 0.65 | 0.00 |
| $P_{fp}$ Upper 90% Conf | 0.87 | - | - | - | - | - | 0.90 | 0.81 | 0.90 |
| BAR | 0.20 | - | - | - | - | - | - | - | - |
| DISCRIMINATION STAGE | | | | | | | | | |
| $P_d$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Low 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Upper 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_{fp}$ | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_{fp}$ Low 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_{fp}$ Upper 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| BAR | N/A | - | - | - | - | - | - | - | - |

Response Stage Noise Level:  0.00
Recommended Discrimination Stage Threshold:  0.00


## TABLE 5b. SUMMARY OF DESERT EXTREME RESULTS (FULL GROUND TRUTH)

| Metric | Overall | Standard | Nonstandard | By Size | | | By Depth, m | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Small | Medium | Large | < 0.3 | 0.3 to <1 | >= 1 |
| RESPONSE STAGE | | | | | | | | | |
| $P_d$ | 0.50 | 0.50 | 0.50 | 0.40 | 0.60 | 0.55 | 0.55 | 0.35 | 0.20 |
| $P_d$ Low 90% Conf | 0.42 | 0.40 | 0.38 | 0.31 | 0.49 | 0.38 | 0.48 | 0.26 | 0.02 |
| $P_d$ Upper 90% Conf | 0.54 | 0.56 | 0.58 | 0.47 | 0.71 | 0.72 | 0.63 | 0.48 | 0.58 |
| $P_{fp}$ | 0.85 | - | - | - | - | - | 0.85 | 0.75 | 0.00 |
| $P_{fp}$ Low 90% Conf | 0.80 | - | - | - | - | - | 0.84 | 0.65 | 0.00 |
| $P_d$ Upper 90% Conf | 0.87 | - | - | - | - | - | 0.90 | 0.81 | 0.90 |
| BAR | 0.20 | - | - | - | - | - | - | - | - |
| DISCRIMINATION STAGE | | | | | | | | | |
| $P_d$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Low 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Upper 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_{fp}$ | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_{fp}$ Low 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_d$ Upper 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| BAR | N/A | - | - | - | - | - | - | - | - |

Response Stage Noise Level:  0.00
Recommended Discrimination Stage Threshold  0.00

Note:  The recommended discrimination stage threshold values are provided by the demonstrator. No discrimination algorithm was applied.  Therefore, the response and discrimination stage results are exactly the same.

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## 4.4 EFFICIENCY, REJECTION RATES, AND TYPE CLASSIFICATION

Due to technical limitations of the system used for this demonstration, no attempt was made to discriminate. Therefore, the following tables presented in this section are not applicable.

Efficiency and rejection rates are calculated to quantify the discrimination ability at specific points of interest on the ROC curve: (1) at the point where no decrease in $P_d$ is suffered (i.e., the efficiency is by definition equal to one) and (2) at the operator selected threshold. These values are reported in Table 6.

### TABLE 6. EFFICIENCY AND REJECTION RATES

|  | Efficiency (E) | False Positive Rejection Rate | Background Alarm Rejection Rate |
|---|---|---|---|
| At Operating Point | N/A | N/A | N/A |
| With No Loss of $P_d$ | N/A | N/A | N/A |

At the demonstrator's recommended setting, the ordnance items that were detected and correctly discriminated were further scored on whether their correct type could be identified (table 7). Correct type examples include "20-mm projectile, 105-mm HEAT Projectile, and 2.75-inch Rocket". A list of the standard type declaration required for each ordnance item was provided to demonstrators prior to testing. For example, the standard type for the three example items are 20mmP, 105H, and 2.75in, respectively.

### TABLE 7. CORRECT TYPE CLASSIFICATION OF TARGETS CORRECTLY DISCRIMINATED AS UXO

| Size | Percentage Correct |
|---|---|
| Small | N/A |
| Medium | N/A |
| Large | N/A |
| Overall | N/A |

## 4.5 LOCATION ACCURACY

The mean location error and standard deviations appear in Table 8. These calculations are based on average missed depth for ordnance correctly identified in the discrimination stage. Depths are measured from the closest point of the ordnance to the surface. For the Blind Grid, only depth errors are calculated, since (X, Y) positions are known to be the centers of each grid square.

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**TABLE 8.  MEAN LOCATION ERROR AND
STANDARD DEVIATION (M)**

|          | Mean | Standard Deviation |
|----------|------|--------------------|
| Northing | -0.01 | 0.11 |
| Easting  | 0.00 | 0.13 |
| Depth    | N/A  | N/A |

Note:  Demonstrator did not attempt to declare depth of detection.

## SECTION 5.   ON-SITE LABOR COSTS

A standardized estimate for labor costs associated with this effort was calculated as follows:  the first person at the test site was designated "supervisor", the second person was designated "data analyst", and the third and following personnel were considered "field support". Standardized hourly labor rates were charged by title:  supervisor at $95.00/hour, data analyst at $57.00/hour, and field support at $28.50/hour.

Government representatives monitored on-site activity.   All on-site activities were grouped into one of ten categories: initial setup/mobilization, daily setup/stop, calibration, collecting data, downtime due to break/lunch, downtime due to equipment failure, downtime due to equipment/data checks or maintenance, downtime due to weather, downtime due to demonstration site issue, or demobilization.  See Appendix D for the daily activity log.  See section 3.4 for a summary of field activities.

The standardized cost estimate associated with the labor needed to perform the field activities is presented in Table 9.   Note that calibration time includes time spent in the Calibration Lanes as well as field calibrations.  "Site survey time" includes daily setup/stop time, collecting data, breaks/lunch, downtime due to equipment/data checks or maintenance, downtime due to failure, and downtime due to weather.

### TABLE 9.   ON-SITE LABOR COSTS

| | No. People | Hourly Wage | Hours | Cost |
|---|---|---|---|---|
| **Initial Setup** | | | | |
| Supervisor | 1 | $95.00 | 1.33 | $126.35 |
| Data Analyst | 1 | 57.00 | 1.33 | 75.81 |
| Field Support | 0 | 28.50 | 0 | 0.00 |
| SubTotal | | | | **$202.16** |
| **Calibration** | | | | |
| Supervisor | 1 | $95.00 | 12.08 | $1,211.25 |
| Data Analyst | 1 | 57.00 | 12.08 | 726.75 |
| Field Support | 0 | 28.50 | 0 | 0.00 |
| SubTotal | | | | **$1,938.00** |
| **Site Survey** | | | | |
| Supervisor | 1 | $95.00 | 15.55 | $1,445.90 |
| Data Analyst | 1 | 57.00 | 15.55 | 867.54 |
| Field Support | 0 | 28.50 | 0 | 0.00 |
| SubTotal | | | | **$2,313.44** |

See notes at end of table.

TABLE 9 (CONT'D)

|  | No. People | Hourly Wage | Hours | Cost |
|---|---|---|---|---|
| Demobilization | | | | |
| Supervisor | 1 | $95.00 | 4.00 | $380.00 |
| Data Analyst | 1 | 57.00 | 4.00 | 228.00 |
| Field Support | 0 | 28.50 | 0 | 0.00 |
| Subtotal | | | | $608.00 |
| Total | | | | $5,061.60 |

Notes: Calibration time includes time spent in the Calibration Lanes as well as calibration before each data run.

Site Survey time includes daily setup/stop time, collecting data, breaks/lunch, downtime due to system maintenance, failure, and weather.

# SECTION 6.  COMPARISON OF RESULTS TO OPEN FIELD DEMONSTRATION (BASED ON FERROUS ONLY GROUND TRUTH)

## 6.1  SUMMARY OF RESULTS FROM OPEN FIELD DEMONSTRATION

Table 10 shows the results from the Open Field survey conducted prior to surveying the Desert Extreme during the same site visit in April of 2004.  Due to the system utilizing magnetometer type sensors, all results presented in the following section have been based on performance scoring against the ferrous only ground truth anomalies.  For more details on the Open Field survey results reference section 2.1.6.

### TABLE 10.  SUMMARY OF OPEN FIELD RESULTS FOR THE MAG SCHONSTEDT/HAND HELD (FERROUS ONLY)

| Metric | Overall | Standard | Nonstandard | By Size | | | By Depth, m | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Small | Medium | Large | < 0.3 | 0.3 to <1 | >= 1 |
| RESPONSE STAGE | | | | | | | | | |
| $P_d$ | 0.45 | 0.50 | 0.50 | 0.45 | 0.50 | 0.65 | 0.55 | 0.55 | 0.15 |
| $P_d$ Low 90% Conf | 0.44 | 0.48 | 0.45 | 0.41 | 0.45 | 0.57 | 0.50 | 0.49 | 0.08 |
| $P_d$ Upper 90% Conf | 0.50 | 0.56 | 0.54 | 0.50 | 0.56 | 0.71 | 0.59 | 0.60 | 0.25 |
| $P_{fp}$ | 0.25 | - | - | - | - | - | 0.65 | 0.60 | 0.00 |
| $P_{fp}$ Low 90% Conf | 0.22 | - | - | - | - | - | 0.61 | 0.54 | 0.00 |
| $P_{fp}$ Upper 90% Conf | 0.25 | - | - | - | - | - | 0.65 | 0.61 | 0.21 |
| BAR | 0.50 | - | - | - | - | - | - | - | - |
| DISCRIMINATION STAGE | | | | | | | | | |
| $P_d$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Low 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_d$ Upper 90% Conf | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $P_{fp}$ | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_{fp}$ Low 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| $P_{fp}$ Upper 90% Conf | N/A | - | - | - | - | - | N/A | N/A | N/A |
| BAR | N/A | - | - | - | - | - | - | - | - |

## 6.2  COMPARISON OF ROC CURVES USING ALL ORDNANCE CATEGORIES

(Not applicable for this technology)

## 6.3  COMPARISON OF ROC CURVES USING ORDNANCE LARGER THAN 20 MM

(Not applicable for this technology)

## 6.4  STATISTICAL COMPARISONS

Statistical Chi-square significance tests were used to compare results between the Open Field and Desert Extreme scenarios. The intent of the comparison is to determine if the feature introduced in each scenario has a degrading effect on the performance of the sensor system. However, any modifications in the UXO sensor system during the test, like changes in the processing or changes in the selection of the operating threshold, will also contribute to performance differences.

The Chi-square test for comparison between ratios was used at a significance level of 0.05 to compare Open Field to Desert Extreme with regard to $P_d^{res}$, $P_d^{disc}$, $P_{fp}^{res}$ and $P_{fp}^{disc}$, Efficiency and Rejection Rate. These results are presented in Table 11. A detailed explanation and example of the Chi-square application is located in Appendix A.

### TABLE 11.  CHI-SQUARE RESULTS – OPEN FIELD VERSUS DESERT EXTREME

| Metric | Small | Medium | Large | Overall |
|---|---|---|---|---|
| $P_d^{res}$ | Not Significant | Not Significant | Not Significant | Significant |
| $P_d^{disc}$ | N/A | N/A | N/A | N/A |
| $P_{fp}^{res}$ | Not Significant | Not Significant | Not Significant | Not Significant |
| $P_{fp}^{disc}$ | - | - | - | N/A |
| Efficiency | - | - | - | N/A |
| Rejection rate | - | - | - | N/A |

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# SECTION 7. APPENDIXES

## APPENDIX A. TERMS AND DEFINITIONS

GENERAL DEFINITIONS

Anomaly: Location of a system response deemed to warrant further investigation by the demonstrator for consideration as an emplaced ordnance item.

Detection: An anomaly location that is within $R_{halo}$ of an emplaced ordnance item.

Emplaced Ordnance: An ordnance item buried by the government at a specified location in the test site.

Emplaced Clutter: A clutter item (i.e., non-ordnance item) buried by the government at a specified location in the test site.

$R_{halo}$: A pre-determined radius about the periphery of an emplaced item (clutter or ordnance) within which a location identified by the demonstrator as being of interest is considered to be a response from that item. If multiple declarations lie within $R_{halo}$ of any item (clutter or ordnance), the declaration with the highest signal output within the $R_{halo}$ will be utilized. For the purpose of this program, a circular halo 0.5 meters in radius will be placed around the center of the object for all clutter and ordnance items less than 0.6 meters in length. When ordnance items are longer than 0.6 meters, the halo becomes an ellipse where the minor axis remains 1 meter and the major axis is equal to the length of the ordnance plus 1 meter.

Small Ordnance: Caliber of ordnance less than or equal to 40 mm (includes 20-mm projectile, 40-mm projectile, submunitions BLU-26, BLU-63, and M42).

Medium Ordnance: Caliber of ordnance greater than 40 mm and less than or equal to 81 mm (includes 57-mm projectile, 60-mm mortar, 2.75 in. Rocket, MK118 Rockeye, 81-mm mortar).

Large Ordnance: Caliber of ordnance greater than 81 mm (includes 105-mm HEAT, 105-mm projectile, 155-mm projectile, 500-pound bomb).

Shallow: Items buried less than 0.3 meter below ground surface.

Medium: Items buried greater than or equal to 0.3 meter and less than 1 meter below ground surface.

Deep: Items buried greater than or equal to 1 meter below ground surface.

Response Stage Noise Level: The level that represents the point below which anomalies are not considered detectable. Demonstrators are required to provide the recommended noise level for the Blind Grid test area.

Discrimination Stage Threshold: The demonstrator selected threshold level that they believe provides optimum performance of the system by retaining all detectable ordnance and rejecting the maximum amount of clutter. This level defines the subset of anomalies the demonstrator would recommend digging based on discrimination.

Binomially Distributed Random Variable: A random variable of the type which has only two possible outcomes, say success and failure, is repeated for n independent trials with the probability p of success and the probability 1-p of failure being the same for each trial. The number of successes x observed in the n trials is an estimate of p and is considered to be a binomially distributed random variable.

RESPONSE AND DISCRIMINATION STAGE DATA

The scoring of the demonstrator's performance is conducted in two stages. These two stages are termed the RESPONSE STAGE and DISCRIMINATION STAGE. For both stages, the probability of detection ($P_d$) and the false alarms are reported as receiver operating characteristic (ROC) curves. False alarms are divided into those anomalies that correspond to emplaced clutter items, measuring the probability of false positive ($P_{fp}$) and those that do not correspond to any known item, termed background alarms.

The RESPONSE STAGE scoring evaluates the ability of the system to detect emplaced targets without regard to ability to discriminate ordnance from other anomalies. For the RESPONSE STAGE, the demonstrator provides the scoring committee with the location and signal strength of all anomalies that the demonstrator has deemed sufficient to warrant further investigation and/or processing as potential emplaced ordnance items. This list is generated with minimal processing (e.g., this list will include all signals above the system noise threshold). As such, it represents the most inclusive list of anomalies.

The DISCRIMINATION STAGE evaluates the demonstrator's ability to correctly identify ordnance as such, and to reject clutter. For the same locations as in the RESPONSE STAGE anomaly list, the DISCRIMINATION STAGE list contains the output of the algorithms applied in the discrimination-stage processing. This list is prioritized based on the demonstrator's determination that an anomaly location is likely to contain ordnance. Thus, higher output values are indicative of higher confidence that an ordnance item is present at the specified location. For electronic signal processing, priority ranking is based on algorithm output. For other systems, priority ranking is based on human judgment. The demonstrator also selects the threshold that the demonstrator believes will provide "optimum" system performance, (i.e., that retains all the detected ordnance and rejects the maximum amount of clutter).

Note: The two lists provided by the demonstrator contain identical numbers of potential target locations. They differ only in the priority ranking of the declarations.

## RESPONSE STAGE DEFINITIONS

Response Stage Probability of Detection ($P_d^{res}$): $P_d^{res}$ = (No. of response-stage detections)/(No. of emplaced ordnance in the test site).

Response Stage False Positive ($fp^{res}$): An anomaly location that is within $R_{halo}$ of an emplaced clutter item.

Response Stage Probability of False Positive ($P_{fp}^{res}$): $P_{fp}^{res}$ = (No. of response-stage false positives)/(No. of emplaced clutter items).

Response Stage Background Alarm ($ba^{res}$): An anomaly in a blind grid cell that contains neither emplaced ordnance nor an emplaced clutter item. An anomaly location in the open field or scenarios that is outside $R_{halo}$ of any emplaced ordnance or emplaced clutter item.

Response Stage Probability of Background Alarm ($P_{ba}^{res}$): Blind Grid only: $P_{ba}^{res}$ = (No. of response-stage background alarms)/(No. of empty grid locations).

Response Stage Background Alarm Rate ($BAR^{res}$): Open Field only: $BAR^{res}$ = (No. of response-stage background alarms)/(arbitrary constant).

Note that the quantities $P_d^{res}$, $P_{fp}^{res}$, $P_{ba}^{res}$, and $BAR^{res}$ are functions of $t^{res}$, the threshold applied to the response-stage signal strength. These quantities can therefore be written as $P_d^{res}(t^{res})$, $P_{fp}^{res}(t^{res})$, $P_{ba}^{res}(t^{res})$, and $BAR^{res}(t^{res})$.

## DISCRIMINATION STAGE DEFINITIONS

Discrimination: The application of a signal processing algorithm or human judgment to response-stage data that discriminates ordnance from clutter. Discrimination should identify anomalies that the demonstrator has high confidence correspond to ordnance, as well as those that the demonstrator has high confidence correspond to nonordnance or background returns. The former should be ranked with highest priority and the latter with lowest.

Discrimination Stage Probability of Detection ($P_d^{disc}$): $P_d^{disc}$ = (No. of discrimination-stage detections)/(No. of emplaced ordnance in the test site).

Discrimination Stage False Positive ($fp^{disc}$): An anomaly location that is within $R_{halo}$ of an emplaced clutter item.

Discrimination Stage Probability of False Positive ($P_{fp}^{disc}$): $P_{fp}^{disc}$ = (No. of discrimination stage false positives)/(No. of emplaced clutter items).

Discrimination Stage Background Alarm ($ba^{disc}$): An anomaly in a blind grid cell that contains neither emplaced ordnance nor an emplaced clutter item. An anomaly location in the open field or scenarios that is outside $R_{halo}$ of any emplaced ordnance or emplaced clutter item.

Discrimination Stage Probability of Background Alarm ($P_{ba}^{disc}$): $P_{ba}^{disc}$ = (No. of discrimination-stage background alarms)/(No. of empty grid locations).

Discrimination Stage Background Alarm Rate ($BAR^{disc}$): $BAR^{disc}$ = (No. of discrimination-stage background alarms)/(arbitrary constant).

Note that the quantities $P_d^{disc}$, $P_{fp}^{disc}$, $P_{ba}^{disc}$, and $BAR^{disc}$ are functions of $t^{disc}$, the threshold applied to the discrimination-stage signal strength. These quantities can therefore be written as $P_d^{disc}(t^{disc})$, $P_{fp}^{disc}(t^{disc})$, $P_{ba}^{disc}(t^{disc})$, and $BAR^{disc}(t^{disc})$.

## RECEIVER-OPERATING CHARACERISTIC (ROC) CURVES

ROC curves at both the response and discrimination stages can be constructed based on the above definitions. The ROC curves plot the relationship between $P_d$ versus $P_{fp}$ and $P_d$ versus BAR or $P_{ba}$ as the threshold applied to the signal strength is varied from its minimum ($t_{min}$) to its maximum ($t_{max}$) value.[1] Figure A-1 shows how $P_d$ versus $P_{fp}$ and $P_d$ versus BAR are combined into ROC curves. Note that the "res" and "disc" superscripts have been suppressed from all the variables for clarity.
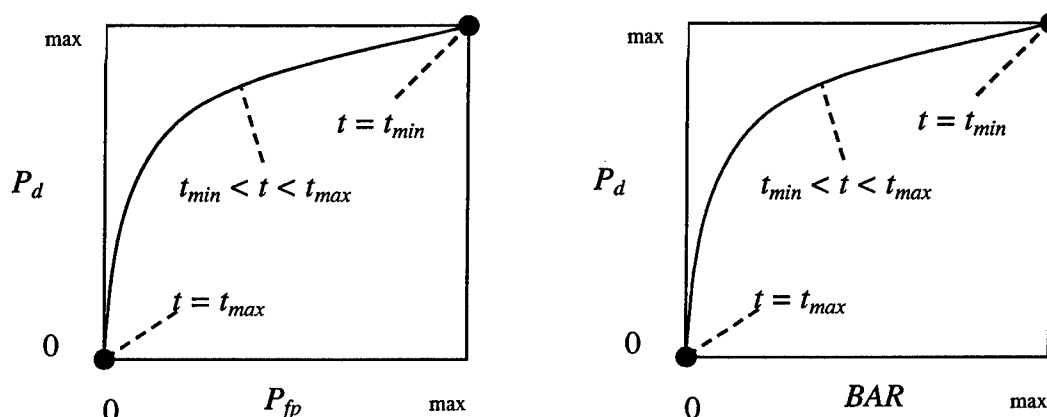


Figure A-1. ROC curves for open field testing. Each curve applies to both the response and discrimination stages.

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[1]Strictly speaking, ROC curves plot the $P_d$ versus $P_{ba}$ over a pre-determined and fixed number of detection opportunities (some of the opportunities are located over ordnance and others are located over clutter or blank spots). In an open field scenario, each system suppresses its signal strength reports until some bare-minimum signal response is received by the system. Consequently, the open field ROC curves do not have information from low signal-output locations, and, furthermore, different contractors report their signals over a different set of locations on the ground. These ROC curves are thus not true to the strict definition of ROC curves as defined in textbooks on detection theory. Note, however, that the ROC curves obtained in the Blind Grid test sites are true ROC curves.

## METRICS TO CHARACTERIZE THE DISCRIMINATION STAGE

The demonstrator is also scored on efficiency and rejection ratio, which measure the effectiveness of the discrimination stage processing. The goal of discrimination is to retain the greatest number of ordnance detections from the anomaly list, while rejecting the maximum number of anomalies arising from nonordnance items. The efficiency measures the amount of detected ordnance retained by the discrimination, while the rejection ratio measures the fraction of false alarms rejected. Both measures are defined relative to the entire response list, i.e., the maximum ordnance detectable by the sensor and its accompanying false positive rate or background alarm rate.

Efficiency (E): $E = P_d^{disc}(t^{disc})/P_d^{res}(t_{min}^{res})$; Measures (at a threshold of interest), the degree to which the maximum theoretical detection performance of the sensor system (as determined by the response stage tmin) is preserved after application of discrimination techniques. Efficiency is a number between 0 and 1. An efficiency of 1 implies that all of the ordnance initially detected in the response stage was retained at the specified threshold in the discrimination stage, $t^{disc}$.

False Positive Rejection Rate ($R_{fp}$): $R_{fp} = 1 - [P_{fp}^{disc}(t^{disc})/P_{fp}^{res}(t_{min}^{res})]$; Measures (at a threshold of interest), the degree to which the sensor system's false positive performance is improved over the maximum false positive performance (as determined by the response stage tmin). The rejection rate is a number between 0 and 1. A rejection rate of 1 implies that all emplaced clutter initially detected in the response stage were correctly rejected at the specified threshold in the discrimination stage.

Background Alarm Rejection Rate ($R_{ba}$):

Blind Grid: $R_{ba} = 1 - [P_{ba}^{disc}(t^{disc})/P_{ba}^{res}(t_{min}^{res})]$.
Open Field: $R_{ba} = 1 - [BAR^{disc}(t^{disc})/BAR^{res}(t_{min}^{res})])$.

Measures the degree to which the discrimination stage correctly rejects background alarms initially detected in the response stage. The rejection rate is a number between 0 and 1. A rejection rate of 1 implies that all background alarms initially detected in the response stage were rejected at the specified threshold in the discrimination stage.

## CHI-SQUARE COMPARISON EXPLANATION:

The Chi-square test for differences in probabilities (or 2 x 2 contingency table) is used to analyze two samples drawn from two different populations to see if both populations have the same or different proportions of elements in a certain category. More specifically, two random samples are drawn, one from each population, to test the null hypothesis that the probability of event A (some specified event) is the same for both populations (ref 3).

A 2 x 2 contingency table is used in the Standardized UXO Technology Demonstration Site Program to determine if there is reason to believe that the proportion of ordnance correctly detected/discriminated by demonstrator X's system is significantly degraded by the more challenging terrain feature introduced. The test statistic of the 2 x 2 contingency table is the

Chi-square distribution with one degree of freedom. Since an association between the more challenging terrain feature and relatively degraded performance is sought, a one-sided test is performed. A significance level of 0.05 is chosen which sets a critical decision limit of 2.71 from the Chi-square distribution with one degree of freedom. It is a critical decision limit because if the test statistic calculated from the data exceeds this value, the two proportions tested will be considered significantly different. If the test statistic calculated from the data is less than this value, the two proportions tested will be considered not significantly different.

An exception must be applied when either a 0 or 100 percent success rate occurs in the sample data. The Chi-square test cannot be used in these instances. Instead, Fischer's test is used and the critical decision limit for one-sided tests is the chosen significance level, which in this case is 0.05.' With Fischer's test, if the test statistic is less than the critical value, the proportions are considered to be significantly different.

Standardized UXO Technology Demonstration Site examples, where blind grid results are compared to those from the open field and open field results are compared to those from one of the scenarios, follow. It should be noted that a significant result does not prove a cause and effect relationship exists between the two populations of interest; however, it does serve as a tool to indicate that one data set has experienced a degradation in system performance at a large enough level than can be accounted for merely by chance or random variation. Note also that a result that is not significant indicates that there is not enough evidence to declare that anything more than chance or random variation within the same population is at work between the two data sets being compared.

Demonstrator X achieves the following overall results after surveying each of the three progressively more difficult areas using the same system (results indicate the number of ordnance detected divided by the number of ordnance emplaced):

|  | Blind Grid | Open Field | Moguls |
|---|---|---|---|
| $P_d^{res}$ | 100/100 = 1.0 | 8/10 = .80 | 20/33 = .61 |
| $P_d^{disc}$ | 80/100 = 0.80 | 6/10 = .60 | 8/33 = .24 |

$P_d^{res}$: BLIND GRID versus OPEN FIELD. Using the example data above to compare probabilities of detection in the response stage, all 100 ordnance out of 100 emplaced ordnance items were detected in the blind grid while 8 ordnance out of 10 emplaced were detected in the open field. Fischer's test must be used since a 100 percent success rate occurs in the data. Fischer's test uses the four input values to calculate a test statistic of 0.0075 that is compared against the critical value of 0.05. Since the test statistic is less than the critical value, the smaller response stage detection rate (0.80) is considered to be significantly less at the 0.05 level of significance. While a significant result does not prove a cause and effect relationship exists between the change in survey area and degradation in performance, it does indicate that the detection ability of demonstrator X's system seems to have been degraded in the open field relative to results from the blind grid using the same system.

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$P_d^{disc}$: BLIND GRID versus OPEN FIELD. Using the example data above to compare probabilities of detection in the discrimination stage, 80 out of 100 emplaced ordnance items were correctly discriminated as ordnance in blind grid testing while 6 ordnance out of 10 emplaced were correctly discriminated as such in open field-testing. Those four values are used to calculate a test statistic of 1.12. Since the test statistic is less than the critical value of 2.71, the two discrimination stage detection rates are considered to be not significantly different at the 0.05 level of significance.

$P_d^{res}$: OPEN FIELD versus MOGULS. Using the example data above to compare probabilities of detection in the response stage, 8 out of 10 and 20 out of 33 are used to calculate a test statistic of 0.56. Since the test statistic is less than the critical value of 2.71, the two response stage detection rates are considered to be not significantly different at the 0.05 level of significance.

$P_d^{disc}$: OPEN FIELD versus MOGULS. Using the example data above to compare probabilities of detection in the discrimination stage, 6 out of 10 and 8 out of 33 are used to calculate a test statistic of 2.98. Since the test statistic is greater than the critical value of 2.71, the smaller discrimination stage detection rate is considered to be significantly less at the 0.05 level of significance. While a significant result does not prove a cause and effect relationship exists between the change in survey area and degradation in performance, it does indicate that the ability of demonstrator X to correctly discriminate seems to have been degraded by the mogul terrain relative to results from the flat open field using the same system.

# APPENDIX B.  DAILY WEATHER LOGS

## TABLE B-1.  WEATHER LOG

| 19 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 13.6 | 33 |
| 8:00 | 16.9 | 41 |
| 9:00 | 18.3 | 35 |
| 10:00 | 20.3 | 30 |
| 11:00 | 21.5 | 28 |
| 12:00 | 22.9 | 20 |
| 13:00 | 25.0 | 13 |
| 14:00 | 25.6 | 12 |
| 15:00 | 26.1 | 12 |
| 16:00 | 26.1 | 12 |
| 17:00 | 26.2 | 12 |

| 20 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 14.9 | 36 |
| 8:00 | 19.0 | 35 |
| 9:00 | 21.0 | 32 |
| 10:00 | 23.0 | 26 |
| 11:00 | 25.3 | 19 |
| 12:00 | 26.3 | 17 |
| 13:00 | 27.1 | 14 |
| 14:00 | 28.2 | 14 |
| 15:00 | 28.5 | 15 |
| 16:00 | 29.3 | 13 |
| 17:00 | 28.8 | 13 |

| 21 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 17.8 | 49 |
| 8:00 | 20.1 | 44 |
| 9:00 | 22.6 | 33 |
| 10:00 | 24.8 | 27 |
| 11:00 | 26.2 | 22 |
| 12:00 | 27.4 | 22 |
| 13:00 | 29.0 | 17 |
| 14:00 | 29.7 | 14 |
| 15:00 | 30.0 | 13 |
| 16:00 | 31.2 | 12 |
| 17:00 | 31.6 | 11 |

| 22 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 18.4 | 44 |
| 8:00 | 20.1 | 41 |
| 9:00 | 22.8 | 28 |
| 10:00 | 24.6 | 19 |
| 11:00 | 26.0 | 15 |
| 12:00 | 26.9 | 13 |
| 13:00 | 27.0 | 12 |
| 14:00 | 27.6 | 11 |
| 15:00 | 27.5 | 8 |
| 16:00 | 27.8 | 7 |
| 17:00 | 27.6 | 5 |

| 23 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 18.2 | 18 |
| 8:00 | 22.4 | 17 |
| 9:00 | 24.2 | 16 |
| 10:00 | 25.2 | 16 |
| 11:00 | 26.1 | 15 |
| 12:00 | 27.2 | 13 |
| 13:00 | 27.3 | 13 |
| 14:00 | 28.0 | 13 |
| 15:00 | 29.5 | 11 |
| 16:00 | 29.7 | 10 |
| 17:00 | 29.6 | 11 |

| 24 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 21.7 | 21 |
| 8:00 | 24.4 | 19 |
| 9:00 | 26.1 | 17 |
| 10:00 | 27.8 | 15 |
| 11:00 | 29.0 | 14 |
| 12:00 | 30.4 | 12 |
| 13:00 | 31.7 | 11 |
| 14:00 | 32.0 | 10 |
| 15:00 | 32.4 | 10 |
| 16:00 | 32.8 | 10 |
| 17:00 | 33.1 | 9 |

| 25 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 20.2 | 19 |
| 8:00 | 25.0 | 15 |
| 9:00 | 27.6 | 13 |
| 10:00 | 30.5 | 11 |
| 11:00 | 32.0 | 9 |
| 12:00 | 33.6 | 8 |
| 13:00 | 34.8 | 7 |
| 14:00 | 35.3 | 7 |
| 15:00 | 35.4 | 7 |
| 16:00 | 35.8 | 7 |
| 17:00 | 35.8 | 6 |

| 26 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.5 | 14 |
| 8:00 | 26.3 | 12 |
| 9:00 | 32.0 | 8 |
| 10:00 | 32.9 | 7 |
| 11:00 | 34.4 | 6 |
| 12:00 | 36.0 | 6 |
| 13:00 | 37.0 | 6 |
| 14:00 | 37.1 | 6 |
| 15:00 | 37.5 | 6 |
| 16:00 | 37.5 | 6 |
| 17:00 | 37.9 | 5 |

| 27 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 28.8 | 9 |
| 8:00 | 30.2 | 9 |
| 9:00 | 31.0 | 10 |
| 10:00 | 32.5 | 10 |
| 11:00 | 32.9 | 9 |
| 12:00 | 33.7 | 11 |
| 13:00 | 34.6 | 10 |
| 14:00 | 36.0 | 9 |
| 15:00 | 37.1 | 9 |
| 16:00 | 37.2 | 9 |
| 17:00 | 37.3 | 8 |

| 28 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.0 | 28 |
| 8:00 | 26.3 | 24 |
| 9:00 | 29.4 | 19 |
| 10:00 | 31.1 | 16 |
| 11:00 | 32.4 | 14 |
| 12:00 | 34.5 | 10 |
| 13:00 | 35.4 | 10 |
| 14:00 | 36.1 | 10 |
| 15:00 | 36.6 | 9 |
| 16:00 | 36.4 | 10 |
| 17:00 | 36.7 | 8 |

| 29 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 19.3 | 40 |
| 8:00 | 20.9 | 35 |
| 9:00 | 23.1 | 31 |
| 10:00 | 25.1 | 21 |
| 11:00 | 26.9 | 11 |
| 12:00 | 28.0 | 9 |
| 13:00 | 28.7 | 8 |
| 14:00 | 29.0 | 8 |
| 15:00 | 30.0 | 7 |
| 16:00 | 30.1 | 8 |
| 17:00 | 29.7 | 7 |

| 30 APRIL 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 20.7 | 16 |
| 8:00 | 22.6 | 14 |
| 9:00 | 23.9 | 12 |
| 10:00 | 25.1 | 11 |
| 11:00 | 25.8 | 10 |
| 12:00 | 26.3 | 10 |
| 13:00 | 27.3 | 9 |
| 14:00 | 28.2 | 11 |
| 15:00 | 28.9 | 12 |
| 16:00 | 29.6 | 11 |
| 17:00 | 30.0 | 11 |

| 1 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 24.0 | 17 |
| 8:00 | 27.1 | 14 |
| 9:00 | 28.1 | 14 |
| 10:00 | 29.8 | 13 |
| 11:00 | 30.2 | 12 |
| 12:00 | 31.8 | 12 |
| 13:00 | 32.8 | 10 |
| 14:00 | 33.7 | 10 |
| 15:00 | 34.5 | 9 |
| 16:00 | 34.6 | 9 |
| 17:00 | 34.7 | 9 |

| 2 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.0 | 15 |
| 8:00 | 28.4 | 12 |
| 9:00 | 30.6 | 11 |
| 10:00 | 32.8 | 9 |
| 11:00 | 34.3 | 8 |
| 12:00 | 35.4 | 8 |
| 13:00 | 36.0 | 8 |
| 14:00 | 36.9 | 7 |
| 15:00 | 37.1 | 7 |
| 16:00 | 37.3 | 6 |
| 17:00 | 37.4 | 6 |

| 3 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 25.8 | 13 |
| 8:00 | 29.9 | 10 |
| 9:00 | 32.1 | 8 |
| 10:00 | 34.3 | 7 |
| 11:00 | 35.6 | 7 |
| 12:00 | 36.8 | 7 |
| 13:00 | 37.3 | 7 |
| 14:00 | 38.0 | 7 |
| 15:00 | 38.9 | 6 |
| 16:00 | 38.8 | 6 |
| 17:00 | 38.6 | 6 |

| 4 MAY 2004 | | |
| --- | --- | --- |
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 24.1 | 13 |
| 8:00 | 27.9 | 11 |
| 9:00 | 31.7 | 10 |
| 10:00 | 34.7 | 9 |
| 11:00 | 35.8 | 8 |
| 12:00 | 37.0 | 8 |
| 13:00 | 38.0 | 7 |
| 14:00 | 38.9 | 6 |
| 15:00 | 39.2 | 6 |
| 16:00 | 39.1 | 5 |
| 17:00 | 38.8 | 5 |

| 5 MAY 2004 | | |
| --- | --- | --- |
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 24.9 | 17 |
| 8:00 | 28.0 | 15 |
| 9:00 | 29.9 | 14 |
| 10:00 | 32.7 | 11 |
| 11:00 | 33.8 | 10 |
| 12:00 | 35.1 | 10 |
| 13:00 | 36.4 | 8 |
| 14:00 | 36.9 | 8 |
| 15:00 | 37.3 | 8 |
| 16:00 | 37.4 | 8 |
| 17:00 | 37.2 | 8 |

| 6 MAY 2004 | | |
| --- | --- | --- |
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 23.8 | 11 |
| 8:00 | 29.1 | 9 |
| 9:00 | 30.0 | 8 |
| 10:00 | 31.8 | 8 |
| 11:00 | 33.4 | 8 |
| 12:00 | 34.5 | 8 |
| 13:00 | 35.1 | 8 |
| 14:00 | 35.8 | 8 |
| 15:00 | 35.8 | 8 |
| 16:00 | 35.9 | 8 |
| 17:00 | 36.0 | 8 |

| 7 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.6 | 19 |
| 8:00 | 27.2 | 17 |
| 9:00 | 30.2 | 13 |
| 10:00 | 31.3 | 11 |
| 11:00 | 33.1 | 11 |
| 12:00 | 34.7 | 10 |
| 13:00 | 35.8 | 10 |
| 14:00 | 35.6 | 10 |
| 15:00 | 36.2 | 10 |
| 16:00 | 35.7 | 10 |
| 17:00 | 35.9 | 9 |

| 8 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 23.5 | 25 |
| 8:00 | 27.6 | 24 |
| 9:00 | 29.0 | 22 |
| 10:00 | 31.4 | 17 |
| 11:00 | 33.1 | 14 |
| 12:00 | 34.4 | 12 |
| 13:00 | 35.9 | 11 |
| 14:00 | 36.8 | 10 |
| 15:00 | 37.5 | 10 |
| 16:00 | 37.7 | 9 |
| 17:00 | 37.5 | 10 |

| 9 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.9 | 29 |
| 8:00 | 27.1 | 21 |
| 9:00 | 29.8 | 17 |
| 10:00 | 31.5 | 13 |
| 11:00 | 32.9 | 12 |
| 12:00 | 34.7 | 10 |
| 13:00 | 35.6 | 10 |
| 14:00 | 36.5 | 10 |
| 15:00 | 36.9 | 10 |
| 16:00 | 37.4 | 9 |
| 17:00 | 36.9 | 9 |

| 10 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 22.5 | 24 |
| 8:00 | 25.2 | 23 |
| 9:00 | 28.5 | 22 |
| 10:00 | 31.1 | 21 |
| 11:00 | 33.0 | 18 |
| 12:00 | 34.5 | 15 |
| 13:00 | 35.4 | 15 |
| 14:00 | 35.5 | 15 |
| 15:00 | 35.9 | 14 |
| 16:00 | 35.4 | 14 |
| 17:00 | 35.0 | 14 |

| 11 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 21.5 | 53 |
| 8:00 | 23.0 | 52 |
| 9:00 | 24.8 | 30 |
| 10:00 | 26.2 | 28 |
| 11:00 | 27.8 | 22 |
| 12:00 | 28.9 | 24 |
| 13:00 | 30.0 | 20 |
| 14:00 | 30.9 | 20 |
| 15:00 | 31.9 | 19 |
| 16:00 | 32.4 | 15 |
| 17:00 | 32.4 | 10 |

| 12 MAY 2004 | | |
|---|---|---|
| TIME | TEMPERATURE °C | RELATIVE HUMIDITY |
| 7:00 | 20.0 | 38 |
| 8:00 | 22.8 | 27 |
| 9:00 | 24.9 | 15 |
| 10:00 | 26.1 | 14 |
| 11:00 | 27.5 | 13 |
| 12:00 | 28.4 | 12 |
| 13:00 | 29.1 | 12 |
| 14:00 | 29.6 | 11 |
| 15:00 | 29.7 | 10 |
| 16:00 | 30.3 | 9 |
| 17:00 | 30.3 | 9 |

# APPENDIX C.  SOIL MOISTURE

Date:  4/19/2004
Times:  0950 hours, 1300 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.0 | 2.0 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.0 | 2.0 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 3.9 | 3.9 |
| | 36 to 48 | 4.1 | 4.1 |

Date:  4/20/2004
Times:  0705 hours, 1300 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.0 | 2.0 |
| | 12 to 24 | 3.6 | 3.6 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/21/2004
Times: 0700 hours, 1250 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.4 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.0 | 2.0 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.5 | 1.5 |
| | 6 to 12 | 2.1 | 2.2 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/22/2004
Times: 0705 hours, 1300 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.9 | 3.9 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/23/2004
Times: 0625 hours, 1300 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.5 | 1.5 |
| | 6 to 12 | 2.2 | 2.2 |
| | 12 to 24 | 3.6 | 3.6 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.0 | 2.0 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/26/2004
Times: 0610 hours, 1230 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.5 | 1.5 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.1 |

Date: 4/27/2004
Times: 0550 hours, 1200 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.2 | 2.2 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.5 | 1.5 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/28/2004
Times: 0550 hours, 1230 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.9 | 3.9 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/29/2004
Times: 0550 hours, 1200 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 4/30/2004
Times: 0600 hours, 1230 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/3/2004
Times: 0555 hours, 1200 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.2 | 2.2 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.5 | 1.5 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/4/2004
Times: 0555 hours, 1230 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/5/2004
Times: 0545 hours, 1130 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/6/2004
Times: 0550 hours, 1145 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.2 | 2.2 |
| | 12 to 24 | 3.9 | 3.9 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/7/2004
Times: 0555 hours, 1130 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.7 | 1.7 |
|  | 6 to 12 | 2.3 | 2.3 |
|  | 12 to 24 | 3.8 | 3.8 |
|  | 24 to 36 | 3.6 | 3.6 |
|  | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
|  | 6 to 12 | 2.1 | 2.1 |
|  | 12 to 24 | 3.7 | 3.7 |
|  | 24 to 36 | 4.0 | 4.0 |
|  | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
|  | 6 to 12 | 2.1 | 2.1 |
|  | 12 to 24 | 3.5 | 3.5 |
|  | 24 to 36 | 4.0 | 4.0 |
|  | 36 to 48 | 4.1 | 4.1 |

Date: 5/10/2004
Times: 0600 hours, 1230 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
|  | 6 to 12 | 2.2 | 2.2 |
|  | 12 to 24 | 3.9 | 3.9 |
|  | 24 to 36 | 3.6 | 3.6 |
|  | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
|  | 6 to 12 | 2.1 | 2.1 |
|  | 12 to 24 | 3.7 | 3.7 |
|  | 24 to 36 | 4.0 | 4.0 |
|  | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
|  | 6 to 12 | 2.1 | 2.1 |
|  | 12 to 24 | 3.5 | 3.5 |
|  | 24 to 36 | 4.0 | 4.0 |
|  | 36 to 48 | 4.1 | 4.1 |

Date: 5/11/2004
Times: 0545 hours, 1130 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/12/2004
Times: 0545 hours, 1130 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.8 | 1.8 |
| | 6 to 12 | 2.3 | 2.3 |
| | 12 to 24 | 3.8 | 3.8 |
| | 24 to 36 | 3.6 | 3.6 |
| | 36 to 48 | 4.0 | 4.0 |
| Mogul Area | 0 to 6 | 1.6 | 1.6 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.7 | 3.7 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.0 | 4.0 |
| Desert Extreme Area | 0 to 6 | 1.7 | 1.7 |
| | 6 to 12 | 2.1 | 2.1 |
| | 12 to 24 | 3.5 | 3.5 |
| | 24 to 36 | 4.0 | 4.0 |
| | 36 to 48 | 4.1 | 4.1 |

Date: 5/13/2004
Times: 0535 hours, 1130 hours

| Probe Location: | Layer, in. | AM Reading, % | PM Reading, % |
|---|---|---|---|
| Calibration Area | 0 to 6 | 1.5 | NA |
| | 6 to 12 | 2.2 | NA |
| | 12 to 24 | 3.9 | NA |
| | 24 to 36 | 3.6 | NA |
| | 36 to 48 | 4.0 | NA |
| Mogul Area | 0 to 6 | 1.6 | NA |
| | 6 to 12 | 2.1 | NA |
| | 12 to 24 | 3.7 | NA |
| | 24 to 36 | 4.0 | NA |
| | 36 to 48 | 4.0 | NA |
| Desert Extreme Area | 0 to 6 | 1.7 | NA |
| | 6 to 12 | 2.1 | NA |
| | 12 to 24 | 3.5 | NA |
| | 24 to 36 | 4.0 | NA |
| | 36 to 48 | 4.1 | NA |

# APPENDIX D. DAILY ACTIVITY LOGS

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status TEAM 2 (152096) | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/21/2004 | 1 | BLIND TEST GRID | 1305 | 1510 | 125 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH TOTAL 469 HITS | NA | CHIP | LINEAR | SUNNY HOT |
| 04/21/2004 | 1 | BLIND TEST GRID | 1510 | 1520 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 0700 | 0850 | 110 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0850 | 0920 | 30 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0920 | 0930 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0930 | 0941 | 11 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0941 | 1115 | 94 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1115 | 1140 | 25 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1140 | 1200 | 20 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1200 | 1255 | 55 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1255 | 1305 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1305 | 1355 | 50 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY HOT WINDY |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/22/2004 | 1 | OPEN FIELD | 1355 | 1402 | 7 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1402 | 1440 | 38 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1440 | 1455 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1455 | 1525 | 30 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1525 | 1535 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT WINDY |
| 04/23/2004 | 1 | OPEN FIELD | 0630 | 0705 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0705 | 0810 | 65 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0810 | 0820 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0820 | 0835 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0835 | 0930 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0930 | 0945 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0945 | 1005 | 20 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/23/2004 | 1 | OPEN FIELD | 1005 | 1118 | 73 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1118 | 1135 | 17 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1135 | 1145 | 10 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1145 | 1245 | 60 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1245 | 1303 | 18 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1303 | 1420 | 77 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1420 | 1432 | 12 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1432 | 1503 | 31 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH B2 258 CHIPS | GPS | NA | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1503 | 1515 | 12 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0610 | 0805 | 115 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0805 | 0815 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/26/2004 | 1 | OPEN FIELD | 0815 | 0924 | 69 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0924 | 0948 | 24 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0948 | 1005 | 17 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 1005 | 1120 | 75 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1120 | 1210 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1210 | 1240 | 30 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1240 | 1325 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1325 | 1340 | 15 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 0600 | 0720 | 80 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D2 | NA | NA | NA | SUNNY | WARM |
| 04/27/2004 | 1 | OPEN FIELD | 0720 | 0845 | 85 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/27/2004 | 1 | OPEN FIELD | 0845 | 0855 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/27/2004 | 1 | OPEN FIELD | 0855 | 0935 | 40 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 0935 | 0946 | 11 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 0946 | 1035 | 49 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D2 | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1035 | 1130 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 TOTAL 256 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1130 | 1220 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1220 | 1254 | 34 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1254 | 1350 | 56 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1350 | 1400 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 0600 | 0624 | 24 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0624 | 0718 | 54 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 | NA | CHIP | LINEAR | SUNNY | WARM |

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| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/28/2004 | 1 | OPEN FIELD | 0718 | 0734 | 16 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0734 | 0835 | 61 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 TOTAL 233 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0835 | 0848 | 13 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 0848 | 0925 | 37 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F2 | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 0925 | 1045 | 80 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID F2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1045 | 1200 | 75 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1200 | 1206 | 6 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F2 | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1206 | 1252 | 46 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F2 TOTAL 165 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1252 | 1305 | 13 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1305 | 1335 | 30 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/28/2004 | 1 | OPEN FIELD | 1335 | 1402 | 27 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1402 | 1415 | 13 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 0605 | 0618 | 13 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0618 | 0657 | 39 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0657 | 0714 | 17 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0714 | 0800 | 46 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 TOTAL 155 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0800 | 0818 | 18 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0818 | 0858 | 40 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID G3 | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/29/2004 | 1 | OPEN FIELD | 0858 | 1011 | 73 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G3 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1011 | 1028 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1028 | 1042 | 14 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G3 | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1042 | 1121 | 39 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G3 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1121 | 1215 | 54 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1215 | 1243 | 28 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F3 | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1243 | 1348 | 65 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F3 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1348 | 1400 | 12 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 04/30/2004 | 1 | OPEN FIELD | 0605 | 0657 | 52 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0657 | 0741 | 44 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F3 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0741 | 0753 | 12 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0753 | 0818 | 25 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0818 | 0928 | 70 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID E3 TOTAL 74 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0928 | 0949 | 21 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0949 | 1008 | 19 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1008 | 1039 | 31 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1039 | 1151 | 72 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D3 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1151 | 1251 | 60 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/30/2004 | 1 | OPEN FIELD | 1251 | 1317 | 25 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1317 | 1330 | 13 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D3 TOTAL 110 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1330 | 1415 | 45 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1415 | 1425 | 10 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0605 | 0623 | 18 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C3 | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0623 | 0814 | 111 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID C3 TOTAL 113 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0814 | 0830 | 16 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0830 | 0905 | 35 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID B3 | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/03/2004 | 1 | OPEN FIELD | 0905 | 1020 | 75 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID B3 TOTAL 105 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1020 | 1050 | 30 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A3 | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1050 | 1150 | 60 | BREAK/ LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1150 | 1313 | 83 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A3 | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1313 | 1327 | 14 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1327 | 1400 | 33 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1400 | 1405 | 5 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0605 | 0645 | 40 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0645 | 0810 | 85 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A4 | NA | CHIP | LINEAR | SUNNY | WARM |

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| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/04/2004 | 1 | OPEN FIELD | 0810 | 0818 | 8 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0818 | 0838 | 20 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A4 TOTAL 153 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0838 | 0855 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0855 | 0940 | 45 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID B4 | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0940 | 0950 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0950 | 1118 | 88 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID B4 TOTAL 108 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1118 | 1218 | 60 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1218 | 1257 | 39 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C4 | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1257 | 1410 | 73 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID C4 TOTAL 90 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1410 | 1415 | 5 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/05/2004 | 1 | OPEN FIELD | 0615 | 0710 | 55 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D4 | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0710 | 0830 | 80 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D4 TOTAL 113 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0830 | 0845 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0845 | 0920 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E4 | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0920 | 1050 | 90 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D4 TOTAL 159 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1050 | 1115 | 25 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1115 | 1150 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F4 | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1150 | 1240 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1240 | 1350 | 70 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F4 TOTAL 101 HITS | NA | CHIP | LINEAR | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/05/2004 | 1 | OPEN FIELD | 1350 | 1400 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 0610 | 0655 | 45 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G4 | NA | NA | NA | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0655 | 0727 | 32 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G4 TOTAL 53 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0727 | 0810 | 43 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F5 | NA | NA | NA | SUNNY | WARM |
| 5/06/2004 | 1 | OPEN FIELD | 0810 | 0825 | 15 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F5 TOTAL 27 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0850 | 0957 | 67 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID H7 TOTAL 17 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/11/2004 | 1 | YUMA EXTREME | 0957 | 1030 | 33 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/11/2004 | 1 | MOGUL | 1030 | 1155 | 85 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID J1 /J2 | NA | NA | NA | SUNNY | HOT |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/11/2004 | 1 | MOGUL | 1155 | 1245 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/11/2004 | 1 | MOGUL | 1245 | 1405 | 80 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA MOGUL | NA | NA | NA | SUNNY | HOT |
| 05/11/2004 | 1 | MOGUL | 1405 | 1410 | 5 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0545 | 0613 | 28 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS J1/J2, ANDJ3 | | | | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0613 | 0737 | 84 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID J1 AND J2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0737 | 0745 | 8 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0745 | 0844 | 59 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRIDS J1/J2, AND J3 TOTAL 181 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0844 | 0905 | 21 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0905 | 0955 | 50 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS I1/I2, ANDI3 | NA | NA | NA | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0955 | 1100 | 65 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/12/2004 | 1 | MOGUL | 1100 | 1304 | 124 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRIDS I1/I2 AND I3 TOTAL 164 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 1304 | 1320 | 16 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/13/2004 | 1 | MOGUL | 0535 | 0623 | 48 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS H1/H2 AND H3 | NA | NA | NA | SUNNY | WARM |
| 05/13/2004 | 1 | MOGUL | 0623 | 0815 | 112 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID H1/H2 AND H3 TOTAL 143 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/13/2004 | 1 | MOGUL | 0815 | 1215 | 240 | DEMOBILIZATION | END OF TEST | NA | NA | NA | SUNNY | HO |
| **TEAM 1 (163666)** | | | | | | | | | | | | |
| 04/19/2004 | 2 | CALIBRATION LANES | 0950 | 1110 | 80 | INTIAL SETUP | SETUP/ MOBILIZATION | NA | NA | NA | SUNNY | COOL |
| 04/19/2004 | 2 | CALIBRATION LANES | 1110 | 1220 | 70 | COLLECT DATA | COLLECT DATA BIDIRECTIONAL EAST TO WEST | NA | FLAG | LINEAR | SUNNY | WARM |
| 04/19/2004 | 2 | CALIBRATION LANES | 1220 | 1320 | 60 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | WARM |
| 04/19/2004 | 2 | CALIBRATION LANES | 1320 | 1420 | 60 | COLLECT DATA | COLLECT DATA BIDIRECTIONAL NORTH TO SOUTH | NA | NA | NA | SUNNY | WARM |
| 04/19/2004 | 2 | CALIBRATION LANES | 1420 | 1430 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/19/2004 | 2 | CALIBRATION LANES | 1430 | 1525 | 55 | COLLECT DATA | COLLECT DATA BIDIRECTIONAL NORTH TO SOUTH | NA | FLAG | LINEAR | SUNNY | WARM |
| 04/19/2004 | 2 | CALIBRATION LANES | 1525 | 1535 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 04/20/2004 | 2 | CALIBRATION LANES | 0705 | 0730 | 25 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION | NA | NA | NA | SUNNY | WARM |
| 04/20/2004 | 2 | CALIBRATION LANES | 0730 | 0835 | 65 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | WARM |
| 04/20/2004 | 2 | CALIBRATION LANES | 0835 | 0845 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/20/2004 | 2 | CALIBRATION LANES | 0845 | 1005 | 80 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | WARM |
| 04/20/2004 | 2 | CALIBRATION LANES | 1005 | 1025 | 20 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1025 | 1205 | 100 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1205 | 1243 | 38 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1243 | 1343 | 60 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1343 | 1405 | 22 | BREAK/LUNCH | LUNCH | NA | FLAG | LINEAR | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1405 | 1447 | 42 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1447 | 1520 | 33 | DOWNTIME DUE TO EQUIP MAIN/CHECK | CHECKING DATA TOTAL FLAG COUNT 571 | NA | NA | NA | SUNNY | HOT |
| 04/20/2004 | 2 | CALIBRATION LANES | 1520 | 1525 | 5 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/21/2004 | 2 | BLIND TEST GRID | 0645 | 0705 | 20 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION | NA | NA | NA | SUNNY | WARM |
| 04/21/2004 | 2 | BLIND TEST GRID | 0705 | 0858 | 113 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | FLAG | LINEAR | SUNNY | WARM |
| 04/21/2004 | 2 | BLIND TEST GRID | 0858 | 0920 | 22 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/21/2004 | 2 | BLIND TEST GRID | 0920 | 1100 | 100 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/21/2004 | 2 | BLIND TEST GRID | 1100 | 1120 | 20 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/21/2004 | 2 | BLIND TEST GRID | 1120 | 1210 | 50 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/21/2004 | 2 | BLIND TEST GRID | 1210 | 1305 | 55 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/21/2004 | 1 | BLIND TEST GRID | 1305 | 1510 | 125 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH TOTAL 469 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/21/2004 | 1 | BLIND TEST GRID | 1510 | 1520 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/22/2004 | 1 | OPEN FIELD | 0700 | 0850 | 110 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0850 | 0920 | 30 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0920 | 0930 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0930 | 0941 | 11 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/22/2004 | 1 | OPEN FIELD | 0941 | 1115 | 94 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/22/2004 | 1 | OPEN FIELD | 1115 | 1140 | 25 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1140 | 1200 | 20 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1200 | 1255 | 55 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1255 | 1305 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | HOT |
| 04/22/2004 | 1 | OPEN FIELD | 1305 | 1355 | 50 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1355 | 1402 | 7 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1402 | 1440 | 38 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1440 | 1455 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1455 | 1525 | 30 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 04/22/2004 | 1 | OPEN FIELD | 1525 | 1535 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT WINDY |
| 04/23/2004 | 1 | OPEN FIELD | 0630 | 0705 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0705 | 0810 | 65 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0810 | 0820 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/23/2004 | 1 | OPEN FIELD | 0820 | 0835 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0835 | 0930 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0930 | 0945 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 0945 | 1005 | 20 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1005 | 1112 | 67 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1112 | 1135 | 23 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1135 | 1145 | 10 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1145 | 1245 | 60 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1245 | 1303 | 18 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1303 | 1420 | 77 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1420 | 1432 | 12 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/23/2004 | 1 | OPEN FIELD | 1432 | 1501 | 29 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH B2 258 CHIPS | GPS | NA | LINEAR | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/23/2004 | 1 | OPEN FIELD | 1501 | 1515 | 14 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0610 | 0805 | 115 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0805 | 0815 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0815 | 0924 | 69 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0924 | 0948 | 24 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 0948 | 1005 | 17 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | WARM |
| 04/26/2004 | 1 | OPEN FIELD | 1005 | 1120 | 75 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1120 | 1210 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1210 | 1240 | 30 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE | NA | NA | NA | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1240 | 1325 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID C2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/26/2004 | 1 | OPEN FIELD | 1325 | 1340 | 15 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/27/2004 | 1 | OPEN FIELD | 0600 | 0720 | 80 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D2 | NA | NA | NA | SUNNY | WARM |
| 04/27/2004 | 1 | OPEN FIELD | 0720 | 0845 | 85 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/27/2004 | 1 | OPEN FIELD | 0845 | 0855 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/27/2004 | 1 | OPEN FIELD | 0855 | 0935 | 40 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 0935 | 0946 | 11 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 0946 | 1035 | 49 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D2 | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1035 | 1130 | 55 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID D2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1130 | 1220 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1220 | 1254 | 34 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1254 | 1333 | 39 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1333 | 1350 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/27/2004 | 1 | OPEN FIELD | 1350 | 1400 | 10 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/28/2004 | 1 | OPEN FIELD | 0600 | 0624 | 24 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0624 | 0718 | 54 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0718 | 0734 | 16 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E2 | NA | NA | NA | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0734 | 0835 | 61 | COLLECT DATA | COLLECT DATA SOUTH TO NORTH GRID E2 TOTAL 233 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/28/2004 | 1 | OPEN FIELD | 0835 | 0848 | 13 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 0848 | 0925 | 37 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F2 | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 0925 | 1045 | 80 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1045 | 1200 | 75 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1200 | 1206 | 6 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F2 | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/28/2004 | 1 | OPEN FIELD | 1206 | 1252 | 46 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F2 TOTAL 165 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1252 | 1305 | 13 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1305 | 1335 | 30 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1335 | 1402 | 27 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/28/2004 | 1 | OPEN FIELD | 1402 | 1415 | 13 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 0605 | 0618 | 13 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0618 | 0657 | 39 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0657 | 0714 | 17 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G2 | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/29/2004 | 1 | OPEN FIELD | 0714 | 0800 | 46 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G2 TOTAL 155 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0800 | 0818 | 18 | BREAK/LUNCH | BREAK | NA | | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0818 | 0858 | 40 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G3 | NA | NA | NA | SUNNY | WARM |
| 04/29/2004 | 1 | OPEN FIELD | 0858 | 1011 | 73 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G3 | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1011 | 1028 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1028 | 1042 | 14 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G3 | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1042 | 1121 | 39 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G3 TOTAL 206 HIT | NA | CHIP | LINEAR | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1121 | 1215 | 54 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1215 | 1243 | 28 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F3 | NA | NA | NA | SUNNY | HOT |
| 04/29/2004 | 1 | OPEN FIELD | 1243 | 1348 | 65 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F3 | NA | CHIP | LINEAR | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/29/2004 | 1 | OPEN FIELD | 1348 | 1400 | 12 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 04/30/2004 | 1 | OPEN FIELD | 0605 | 0657 | 52 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0657 | 0741 | 44 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F3 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0741 | 0753 | 12 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0753 | 0818 | 25 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0818 | 0928 | 70 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID E3 TOTAL 74 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 0928 | 0949 | 21 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/30/2004 | 1 | OPEN FIELD | 0949 | 1008 | 19 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1008 | 1039 | 31 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1039 | 1151 | 72 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D3 | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1151 | 1251 | 60 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1251 | 1317 | 25 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1317 | 1330 | 13 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D3 TOTAL 110 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1330 | 1415 | 45 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C3 | NA | NA | NA | SUNNY | WARM |
| 04/30/2004 | 1 | OPEN FIELD | 1415 | 1425 | 10 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0605 | 0623 | 18 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZAT ION SETTING UP TEST AREA ROPE GRID C3 | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/03/2004 | 1 | OPEN FIELD | 0623 | 0814 | 111 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID C3 TOTAL 113 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0814 | 0830 | 16 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0830 | 0905 | 35 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID B3 | NA | NA | NA | SUNNY | WARM |
| 05/03/2004 | 1 | OPEN FIELD | 0905 | 1020 | 75 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID B3 TOTAL 105 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1020 | 1050 | 30 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A3 | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1050 | 1150 | 60 | BREAK/ LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1150 | 1313 | 83 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A3 TOTAL 105 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1313 | 1327 | 14 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/03/2004 | 1 | OPEN FIELD | 1327 | 1400 | 33 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/03/2004 | 1 | OPEN FIELD | 1400 | 1405 | 5 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0605 | 0645 | 40 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0645 | 0810 | 85 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A4 | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0810 | 0818 | 8 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID A4 | NA | NA | NA | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0818 | 0838 | 20 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A4 TOTAL 153 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/04/2004 | 1 | OPEN FIELD | 0838 | 0855 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0855 | 0940 | 45 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID B4 | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0940 | 0950 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 0950 | 1118 | 88 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID B4 TOTAL 108 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1118 | 1218 | 60 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/04/2004 | 1 | OPEN FIELD | 1218 | 1257 | 39 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C4 | NA | NA | NA | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1257 | 1410 | 73 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID C4 TOTAL 90 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/04/2004 | 1 | OPEN FIELD | 1410 | 1415 | 5 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 0615 | 0710 | 55 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D4 | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0710 | 0830 | 80 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D4 TOTAL 113 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0830 | 0845 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0845 | 0920 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E4 | NA | NA | NA | SUNNY | WARM |
| 05/05/2004 | 1 | OPEN FIELD | 0920 | 1050 | 90 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D4 TOTAL 159 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1050 | 1115 | 25 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/05/2004 | 1 | OPEN FIELD | 1115 | 1150 | 35 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F4 | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1150 | 1240 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1240 | 1350 | 70 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F4 TOTAL 101 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/05/2004 | 1 | OPEN FIELD | 1350 | 1400 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 0610 | 0655 | 45 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G4 | NA | NA | NA | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0655 | 0727 | 32 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G4 TOTAL 53 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0727 | 0810 | 43 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID F5 | NA | NA | NA | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0810 | 0825 | 15 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID F5 TOTAL 27 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0825 | 0837 | 12 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/06/2004 | 1 | OPEN FIELD | 0837 | 0930 | 53 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID E5 | NA | NA | NA | SUNNY | WARM |
| 05/06/2004 | 1 | OPEN FIELD | 0930 | 1025 | 55 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID E5 TOTAL 81 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1025 | 1035 | 10 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1035 | 1105 | 30 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID D5 | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1105 | 1201 | 56 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D5 | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1201 | 1255 | 54 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1255 | 1325 | 30 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID D5 | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1325 | 1354 | 29 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C5 | NA | NA | NA | SUNNY | HOT |
| 05/06/2004 | 1 | OPEN FIELD | 1354 | 1400 | 6 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/07/2004 | 1 | OPEN FIELD | 0610 | 0630 | 20 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID C5 | NA | NA | NA | SUNNY WARM |
| 05/07/2004 | 1 | OPEN FIELD | 0630 | 0800 | 90 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID C5 TOTAL 134 HITS | NA | CHIP | LINEAR | SUNNY WARM |
| 05/07/2004 | 1 | OPEN FIELD | 0800 | 0812 | 12 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY WARM |
| 05/07/2004 | 1 | OPEN FIELD | 0812 | 0835 | 23 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID B5 | NA | NA | NA | SUNNY WARM |
| 05/07/2004 | 1 | OPEN FIELD | 0835 | 0945 | 70 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID B5 | NA | CHIP | LINEAR | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 0945 | 1000 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 1000 | 1035 | 35 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID BH5 TOTAL 151 HITS | NA | CHIP | LINEAR | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 1035 | 1110 | 35 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID A5 | NA | NA | NA | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 1110 | 1200 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 1200 | 1255 | 55 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A5 | NA | CHIP | LINEAR | SUNNY HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/07/2004 | 1 | OPEN FIELD | 1255 | 1310 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY HOT |
| 05/07/2004 | 1 | OPEN FIELD | 1310 | 1332 | 22 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID A5 TOTAL 151 HITS | NA | CHIP | LINEAR | SUNNY HOT |
| 05/07/2004 | 1 | YUMA EXTREME | 1332 | 1350 | 18 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA YUMA EXTREME | NA | NA | NA | SUNNY HOT |
| 05/07/2004 | 1 | YUMA EXTREME | 1350 | 1400 | 10 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY HOT |
| 05/10/2004 | 1 | YUMA EXTREME | 0610 | 0735 | 85 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G7 | NA | NA | NA | SUNNY WARM WINDY |
| 5/10/2004 | 1 | YUMA EXTREME | 0735 | 1005 | 150 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G7 TOTAL 248 HITS | NA | CHIP | LINEAR | SUNNY WARM WINDY |
| 05/10/2004 | 1 | YUMA EXTREME | 1005 | 1020 | 15 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY HOT WINDY |
| 05/10/2004 | 1 | YUMA EXTREME | 1020 | 1130 | 70 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRID G8 | NA | NA | NA | SUNNY HOT WINDY |
| 05/10/2004 | 1 | YUMA EXTREME | 1130 | 1215 | 45 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY HOT WINDY |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/10/2004 | 1 | YUMA EXTREME | 1215 | 1415 | 120 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID G8 TOTAL 174 HITS | NA | CHIP | LINEAR | SUNNY | HOT WINDY |
| 05/10/2004 | 1 | YUMA EXTREME | 1415 | 1430 | 15 | SETUP/DAILY START/STOP/CALIBRATION | END OF DAILY OPERATIONS/EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | HOT WINDY |
| 5/11/2004 | 1 | YUMA EXTREME | 0545 | 0650 | 65 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID H8 | NA | NA | NA | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0650 | 0810 | 80 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID H8 TOTAL 32 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0810 | 0827 | 17 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0827 | 0850 | 23 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID H7 | NA | NA | NA | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0850 | 0957 | 67 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID H7 TOTAL 17 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/11/2004 | 1 | YUMA EXTREME | 0957 | 1030 | 33 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/11/2004 | 1 | MOGUL | 1030 | 1155 | 85 | SETUP/DAILY START/STOP/CALIBRATION | SETUP/MOBILIZATION SETTING UP TEST AREA ROPE GRID J1 AND J2 | NA | NA | NA | SUNNY | WARM |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/11/2004 | 1 | MOGUL | 1155 | 1245 | 50 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | WARM |
| 05/11/2004 | 1 | MOGUL | 1245 | 1405 | 80 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA MOGUL | NA | NA | NA | SUNNY | |
| 05/11/2004 | 1 | MOGUL | 1405 | 1410 | 5 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | NA | NA | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0545 | 0613 | 28 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS J1/J2, ANDJ3 | NA | NA | NA | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0613 | 0737 | 84 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID J1 AND J2 | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0737 | 0745 | 8 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | WARM |
| 05/12/2004 | 1 | MOGUL | 0745 | 0844 | 59 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRIDS J1/J2, AND J3 TOTAL 181 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0844 | 0905 | 21 | BREAK/LUNCH | BREAK | NA | NA | NA | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0905 | 0955 | 50 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS I1/I2, ANDI3 | NA | NA | NA | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 0955 | 1100 | 65 | BREAK/LUNCH | LUNCH | NA | NA | NA | SUNNY | HOT |

| Date | No. of People | Area Tested | Status Start Time | Status Stop Time | Duration, min | Operational Status | Operational Status Comments | Track Method | Track Method =Other Explain | Pattern | Field Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/12/2004 | 1 | MOGUL | 1100 | 1304 | 124 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRIDS I1/I2 ANDI3 TOTAL 164 HITS | NA | CHIP | LINEAR | SUNNY | HOT |
| 05/12/2004 | 1 | MOGUL | 1304 | 1320 | 16 | SETUP/DAILY START/ STOP/CALIBRATION | END OF DAILY OPERATIONS/ EQUIPMENT BREAKDOWN | NA | | NA | SUNNY | HOT |
| 05/13/2004 | 1 | MOGUL | 0535 | 0623 | 48 | SETUP/DAILY START/ STOP/CALIBRATION | SETUP/ MOBILIZATION SETTING UP TEST AREA ROPE GRIDS H1/H2 ANDH3 | NA | | NA | SUNNY | WARM |
| 05/13/2004 | 1 | MOGUL | 0623 | 0815 | 112 | COLLECT DATA | COLLECT DATA BI-DIRECTIONAL SOUTH TO NORTH GRID H1/H2 AND H3 TOTAL 143 HITS | NA | CHIP | LINEAR | SUNNY | WARM |
| 05/13/2004 | 1 | MOGUL | 0815 | 1215 | 240 | DEMOBILIZATION | END OF TEST | NA | | NA | SUNNY | HOT |

Note: Activities pertinent to this specific demonstration are indicated in highlighted text.

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# APPENDIX E.   REFERENCES

1.  Standardized UXO Technology Demonstration Site Handbook, DTC Project No. 8-CO-160-000-473, Report No. ATC-8349, March 2002.

2.  Aberdeen Proving Ground Soil Survey Report, October 1998.

3.  Data Summary, UXO Standardized Test Site:  APG Soils Description, May 2002.

4.  Yuma Proving Ground Soil Survey Report, May 2003.

5.  Practical Nonparametric Statistics, W.J. Conover, John Wiley & Sons, 1980, pages 144 through 151.

# APPENDIX F.  ABBREVIATIONS

AEC    =  U.S. Army Environmental Center
APG    =  Aberdeen Proving Ground
ASCII  =  American Standard Code for Information Interchange.
ATC    =  U.S. Army Aberdeen Test Center
EM     =  electromagnetic
EMI    =  electromagnetic interference
EMIS   =  Electromagnetic Induction Spectroscopy
ERDC   =  U.S. Army Corps of Engineers Engineering Research and Development Center
ESTCP  =  Environmental Security Technology Certification Program
EQT    =  Army Environmental Quality Technology Program
GPS    =  Global Positioning System
HFA    =  Human Factors Applications, Inc.
JPG    =  Jefferson Proving Ground
POC    =  point of contact
QA     =  quality assurance
QC     =  quality control
ROC    =  receiver-operating characteristic
RTK    =  real time kinematic
RTS    =  Robotic Total Station
SERDP  =  Strategic Environmental Research and Development Program
UXO    =  unexploded ordnance
YPG    =  U.S. Army Yuma Proving Ground

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