TETRA TECH FW, INC.

November 2, 2004
FWHN-FTMC-04-0180

Mr. Ron Shell
Alabama Department of Environmental Management
Land Division
Government Hazardous Waste Branch
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2059

Subject: Investigation Report, Segments 55, 56, 62, and 63, ADEM Emergency Administrative Order No. 04-086-EHW, Ordnance and Explosives Response, Contract Number DACA87-99-D-0010

Dear Mr. Shell:

Transmitted herewith is the Investigation Report for Segments 55, 56, 62, and 63 at Fort McClellan, Alabama, in accordance with ADEM's Emergency Administrative Order No. 04-086-EHW.

Feel free to contact me at (256) 820-7904 if you require additional information.

Sincerely,

Arthur Holcomb, P.E.
Project Manager

Enclosure as stated

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Investigation Report
For Segments 55, 56, 62 and 63 at Fort McClellan, AL

Emergency Administrative Order No. 04-086-EHW

Prepared by:

TETRA TECH FW, INC.
Fort McClellan, Alabama

November 2004

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

Investigation Report
For Segments 55, 56, 62 and 63 at Fort McClellan, AL

1.0 INTRODUCTION

This report is prepared in connection with the work performed to satisfy the requirements of Section A.1 of the Emergency Administrative Order No. 04-086-EHW (the "Order") issued by the Alabama Department of Environmental Management (ADEM) on July 30, 2004 to the U.S. Army Garrison (USAG), the U.S. Army Corps of Engineers (USACE), Tetra Tech FW, Inc. (TtFW), and the U.S. Fish and Wildlife Service (FWS). All efforts described in this report have been performed under the terms of Contract DACA87-99-D-0010, Ordnance and Explosives Response at Fort McClellan, Alabama. The report documents activities conducted to reinvestigate segments 55, 56, 62 and 63 in accordance with investigation plans submitted to and approved by ADEM. (See APPENDICES 1-3) The objective of this report is to document the actions taken and the attendant results for the above mentioned segments.

2.0 DESCRIPTION OF SITE

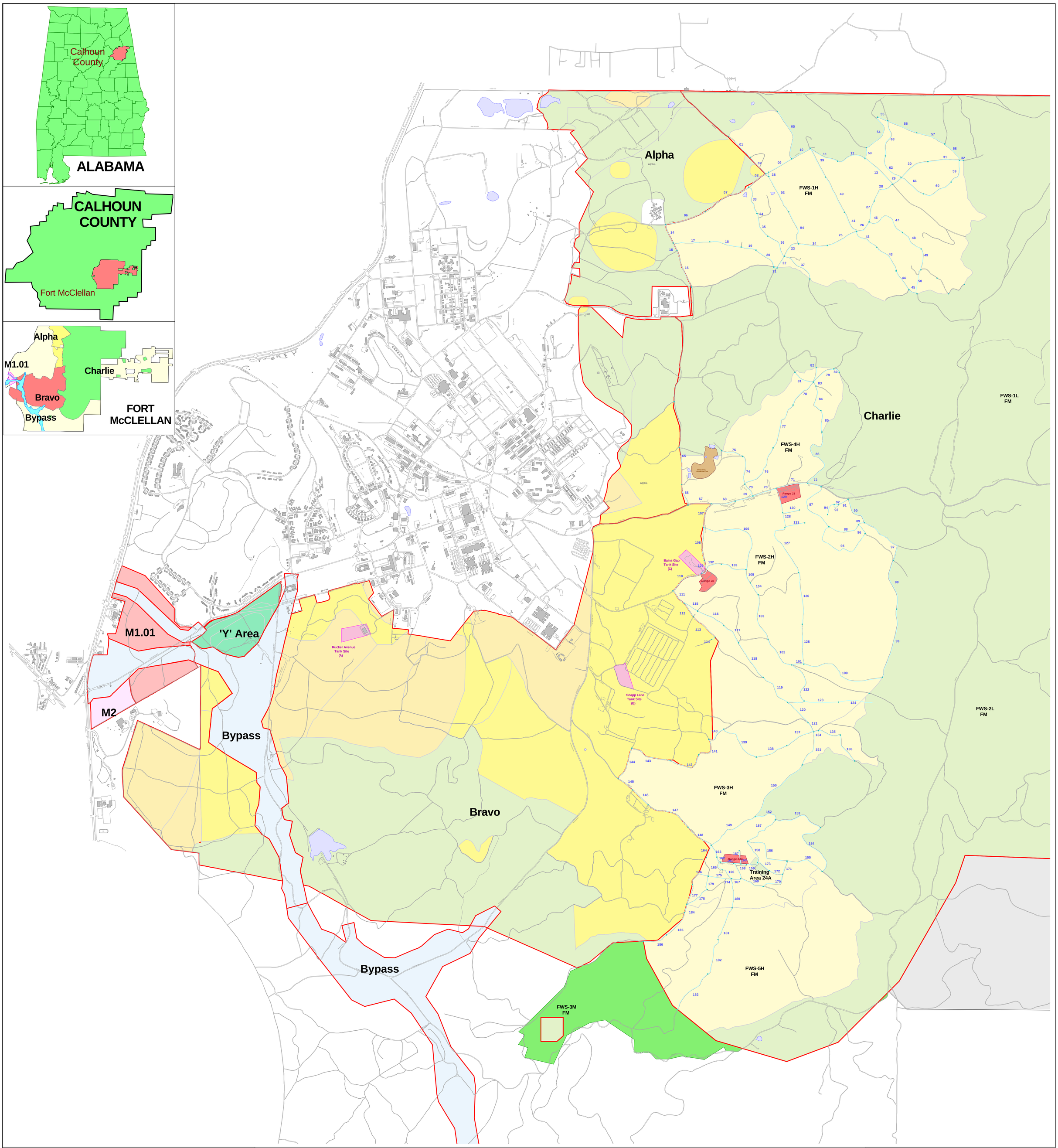
Segments 55, 56, 62 and 63 lie within the Task Order 20 Charlie Area, which is currently under the ownership of the FWS. The area was previously part of Fort McClellan and was investigated as the Charlie Area (later designated the Fish and Wildlife Land Transfer). See Figure 1.

2.1 GENERAL SITE DESCRIPTION -

Fort McClellan occupied 18,929 acres of land located northeast of the City of Anniston, Calhoun County, Alabama. To the west of the former Fort McClellan are the areas known as Weaver and Blue Mountain. To the north is the City of Jacksonville. The Talladega Forest is located east of the former Fort McClellan. The portion of the former Fort McClellan, which contains segments 55, 56, 62 and 63, has been designated the Charlie Area, and lies in the eastern portion of the site, east of the main cantonment area and the Alpha and Bravo areas (redevelopment area). The Charlie Area is comprised of portions of the Choccolocco Mountains and the Choccolocco Corridor to the east of the mountains. The segments discussed in this report are portions of the roads and firebreaks designated by FWS for clearance to allow firefighters access to areas contaminated with munitions and explosives of concern (MEC) during both prescribed burns and wildfires.

2.2 THE INVESTIGATION

To meet the requirements of Section A.1. of the Order, TtFW developed plans for re-investigating segments 55, 56, 62, and 63, which were reviewed, commented on, and ultimately approved by the USAG, USACE, and ADEM. The reinvestigation of segment 56 was performed on August 5 to 11, 2004, and of segments 55, 62 and 63 on August 30 to September 2, 2004. ADEM personnel were on site at all times to observe the conduct of the investigation and to provide comments and feedback it deemed appropriate. Following the investigation of these four segments, it was determined that only segments 56 and 63 contained moved MEC items.



TETRA TECH FW, INC.

Legend

- Firebreak Road Segment Intersections
- Firebreak Roads
- WaterTank Sites
- High Use Areas
- Landfill

Study AreaSectors by ClearanceType

- Surface
- Clearance to 1ft
- Clearance to Depth
- No Further Action

- Study Area Sectors
- Study Area Boundaries
- M1.01 Study Area
- M2 Parcel
- 'Y' Removal Area
- Bypass ROWArea

- Public Access Area
- USFWS Management Area
- Roads
- Buildings
- Lakes/Ponds

Figure 1
Overview

**Fort McClellan,
Calhoun County,
Alabama
September 2004**

The objective of this task was to find 100% of all moved items in these four segments. The task proved especially difficult because the area searched is a known impact area and is littered with items that were fired into this area. Locating items fired into this area was not the objective of this task, but rather only items that were moved were to be identified. Subjective criteria, as agreed to by ADEM, were applied in determining which items were to be marked as "moved items". For example, determining criteria included carefully observing the color of dirt on an item, and / or whether partially covered items appeared to have been recently placed as opposed to clearly impacted.

In an effort to locate all moved items, a deliberate approach was employed after the initial investigation of segment 56 proved more difficult than anticipated. The road segments were divided into lots. Each lot consisted of grids, with the grids marked into lanes (5 feet wide). In segment 56, each grid measured 100 feet x 100 feet, while in segments 55, 62 and 63 each grid was 100 feet x 50 feet. The last grid on each side was slightly longer than 100 feet due to the gains/losses in elevation along the road segments. This break down allowed for a more detailed product quality control (QC) and made the segments easier to manage. Product QC was performed using the Military Standard (MIL-STD) 1916 sampling procedure. (SEE APPENDIX 4) The detailed QC documentation is provided in the appendices.

Prior to heading into the area each day, the team tested each hand held instrument on the appropriate instrument test site, located just outside the compound. The designated team leader supervised the instrument test. The segment to be swept was prepared for the approach by marking the grids and lanes. Lanes were laid out using cord or rope to mark the area to be investigated. As each grid was worked, the rope or cording used for marking was then moved to the next grid to be investigated. Once the team arrived on site, they began their search of the area in the marked location.

The designated team leader observed the team members to ensure proper clearance techniques were employed. The teams moved leaves, if present, on every detected anomaly and marked all items that met the agreed upon failure criteria. The team used hand held instruments to assist in locating any MEC items that were moved into the area. Each team member worked within their assigned lane and covered the entire length and width before moving to the next lane. Each MEC item that was lying on or protruding from the surface was marked to assist the QC process. By marking all located items, TtFW helped ensure that no MEC items were overlooked.

3.0 METHODS EMPLOYED FOR THE INVESTIGATION

A three-step process was used for the investigation. The first step was to search the area and locate and mark all MEC in accordance with the approved plans. In the second step, a determination was made, in conjunction with ADEM, as to which of the items located were actually moved from another location. The final step was the disposal of the moved items. An instrument-assisted search was performed 100 feet on both the north and south side of segment 56 and 50 feet on segments 55, 62 and 63. Each MEC item discovered was marked and the required data was recorded (location-GPS, type, moved, or previous, etc.). Once the search was complete and a determination was made on which items were moved, demolition was performed

using appropriate sandbag mitigation techniques on the moved items. Methods employed are described in more detail in Section 4 below.

3.1 WASTE REMOVAL/REMEDIATION AND TRANSPORTATION METHODS EMPLOYED

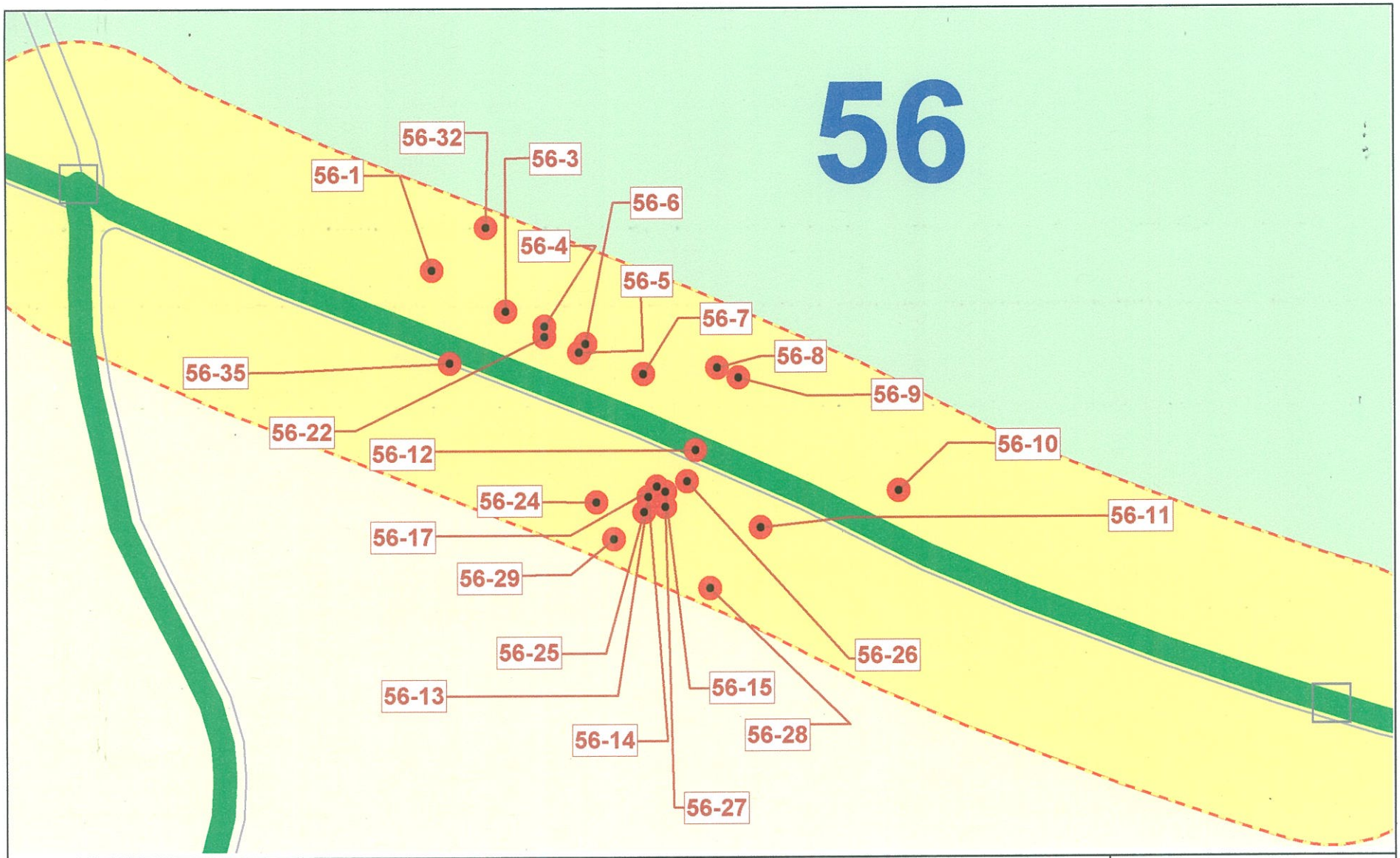
The detailed description of the removal actions is contained in the daily field logs. (APPENDIX 5) A summary of the activities of each segment is provided below.

3.1.1 Segment 56

The initial plan for segment 56 was reviewed and approved by the USAG, USACE and ADEM on August 4, 2004, with a team going to the field on August 5th. The initial plan called for a team to conduct an instrument assisted sweep of each side of the segment 56 road bed out to 100 feet. This initial sweep was completed on August 6th with 22 items located that had been moved. While cleaning up after demolition activities on August 6th, another item was discovered that had the appearance of being a moved item. After discussions with the ADEM and USACE, it was decided that the area would be re-swept looking for additional items. The second sweep was conducted in the same manner as the first with the exception that the team would sweep 90 degrees from the initial direction of the sweep. While this second sweep was in process, USACE determined that they should conduct a Quality Assurance (QA) sweep to ensure the sweep was successful. During this QA sweep, another item was located that appeared to have been moved. This lead to further discussion and it was determined that the initial sweep operations were not effective and that a more rigorous investigation needed to be performed that included full QC and QA. On August 11th, the third and final sweep was started. This sweep included the use of lanes and the use of a MIL-STD 1916 type of product QC. No items were located during this final sweep or during follow on QC or QA inspections. The total number of moved MEC items located in segment 56 was 24, (See Figure 2) and the details of those items are located in Table 1 below.

3.1.2 Segments 55, 62 and 63

The plan for investigating segments 55, 62 and 63 was submitted to ADEM on August 20, 2004 and approved by ADEM on August 26. These segments were swept on August 30 to September 2, 2004. Segment 63 was the only segment of the three that contained a moved MEC item. These three segments were swept in the same manner as the final sweep of segment 56. They were swept, and QC and QA was performed. The item found on segment 63 (See Figure 3) was located on September 1st and had demolition performed the same day. No other items were located on the sweep or in subsequent QC or QA inspections.



N
W E
S
0 50 100 150 200
1" = 100'

TETRA TECH FW, INC.

Legend

- Segment 56 Finds
- Firebreak Road Intersections
- Firebreak Roads
- Segment 56, 100ft. Buffer Zone

CharlieSectors by ClearanceType

- No Further Action
- Surface

Figure 2

Segment 56

Fort McClellan,
Calhoun County,
Alabama
November 2004

TABLE 1 ALL MEC ITEMS RECOVERED DURING THE INVESTIGATION

Anomaly ID*	Database ID Number**	ITEM (See Appendix 6 For Photos)	NORTHING	WESTING	Distance from Cleared Area
56-1	0000-01	81mm Practice Mortar, Not Fuzed	33.74636	85.74307	28’
56-3	0000-03	81mm Practice Mortar, Not Fuzed	33.74628	85.74290	38’5”
56-4	0000-04	81mm Practice Mortar, Not Fuzed	33.74625	85.74281	37’5”
56-5	0000-05	81mm Practice Mortar, Not Fuzed	33.74620	85.74273	30’9”
56-6	0000-06	81mm Practice Mortar, Not Fuzed	33.74622	85.74271	37’5”
56-7	0000-07	81mm Practice Mortar, Not Fuzed	33.74240	85.74249	33’
56-8	0000-08	81mm Practice Mortar, Not Fuzed	33.74617	85.74241	47’7”
56-9	0000-09	81mm Practice Mortar, Not Fuzed	33.74615	85.74236	47’7”
56-10	0000-10	81mm Practice Mortar, Not Fuzed	33.74593	85.74199	34’
56-11	0000-11	81mm Practice Mortar, Fuzed	33.74586	85.74231	22’8”
56-12	0000-12	81mm Practice Mortar, Not Fuzed	33.74601	85.74246	13’
56-13	0000-13	81mm Practice Mortar, Not Fuzed	33.74592	85.74257	30’9”
56-14	0000-14	81mm Practice Mortar, Fuzed	33.74592	85.74257	21’5”
56-15	0000-15	81mm Practice Mortar, Fuzed	33.74593	85.74253	28’8”
56-17	0000-17	81mm Practice Mortar, Not Fuzed	33.74594	85.74255	10’
56-22	0000-22	81mm Mortar, Fuzed	33.74623	85.74281	18’5”
56-24[1]	0000-24	81mm Mortar, Partial Fuzed	33.74591	85.74269	26’6”
56-25[1]	0000-25	81mm Mortar, Partial Fuzed	33.74589	85.74258	10’8”
56-26[1]	0000-26	81mm Mortar, Fuze Sheared Off	33.74595	85.74248	10’8”
56-27[1]	0000-27	81mm Mortar, Fuzed	33.74590	85.74253	10’8”
56-28[1]	0000-28	81mm Mortar, Fuzed	33.74574	85.74243	36’4”
56-29	0000-29	81mm Practice Mortar, Not Fuzed	33.74577	85.74275	20’
56-32	0000-32	81mm Practice Mortar, Not Fuzed	33.74657	85.74290	31’3”
56-35	0000-35	81mm Practice Mortar, Fuzed	33.74618	85.74303	31’3”
63-1	0000-01	81mm Practice Mortar, Fuzed	33.74448	85.74402	30’0”

Note: ** Within Segment 56 each MEC item discovered was marked and numbered. The numbers listed above are the items that had been moved and does not include the MEC items that were not moved*

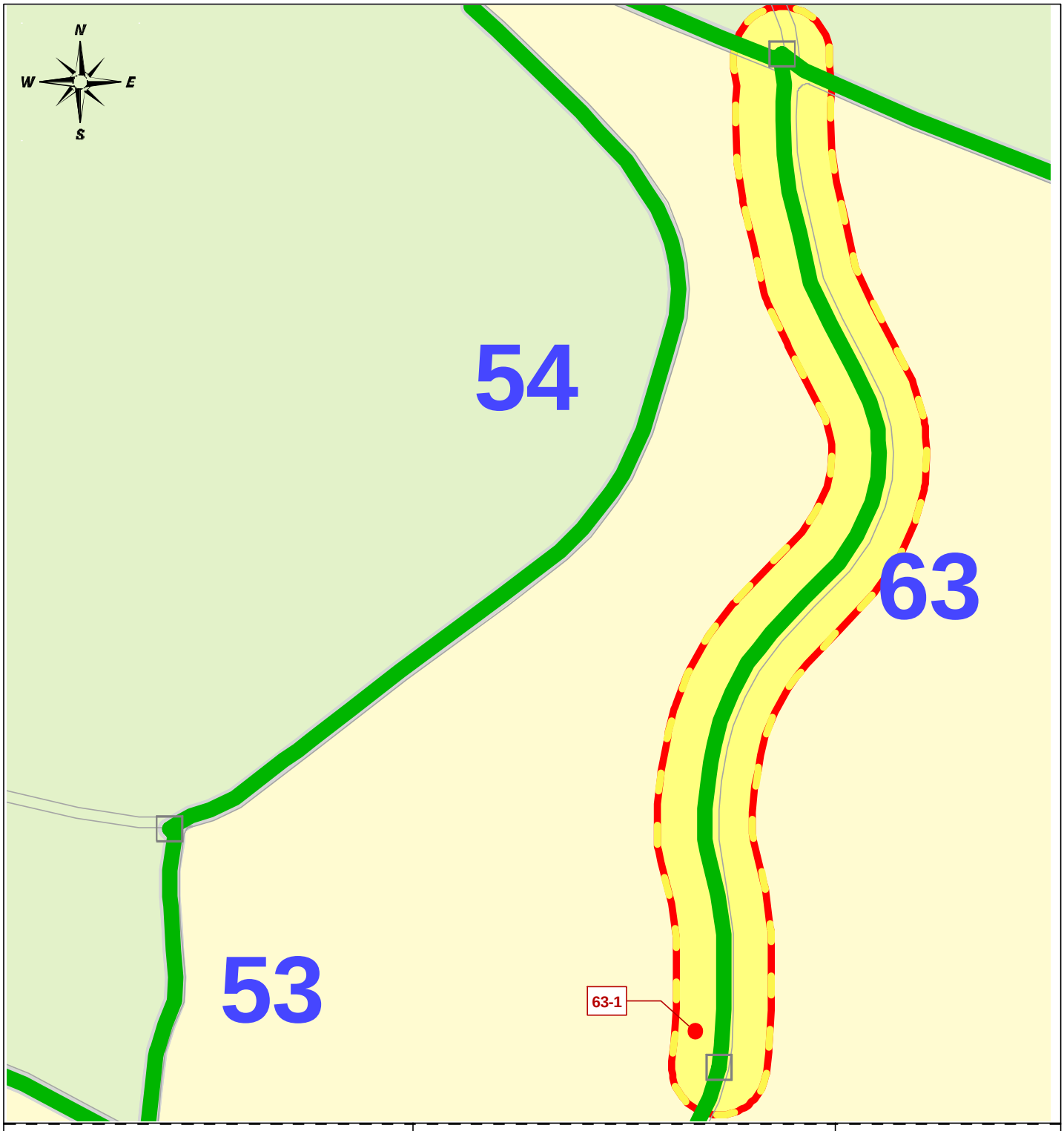
*** The database ID number starts with number one (00000-01) for each segment or grid.*

[1] *The digital photos for these items were lost when the server crashed..*

3.2 DESCRIPTION OF METHODS EMPLOYED TO DEMONSTRATE PERFORMANCE STANDARDS

3.2.1 Process Quality Control

During the investigations, the UXO QC Specialist conducted regular Preparatory, Initial and Follow-up Surveillance Inspections on the process. Details of the Process QC conducted are contained within the Daily Quality Control Reports. (APPENDIX 7)



0 75 150 225 300

1" = 150'

TETRA TECH FW, INC.

Legend

- 81mm Mortar rounds (Inert, Practice)
- Firebreak Road Intersection Points
- Firebreak Roads
- Segment 63, 50ft. Buffer Zone

CharlieSectors by ClearanceType

- No Further Action
- Surface

Figure 3

Segment 63

Fort McClellan
Calhoun County
Alabama

November 2004

3.2.2 Product Quality Control - Acceptance Inspection

When work was completed on grids, unit sized lanes (5 feet x 100 feet) were combined into lots that underwent acceptance sampling following the requirements of MIL STD 1916. The methodology used applies the sampling plan to areas completed, to determine the nature of the anomaly and then compare against the Acceptance Criteria discussed below. Upon successful completion of the Acceptance Inspection, the lots were turned over to the USACE for acceptance.

3.2.3 Determination of the Sampling Plan

The sampling protocol followed was Verification Level (VL) III, Code Letter (CL) A, Inspection by Attributes, and Inspection by Lots. Normal Inspection protocol requires a sample size of 32 units per Lot.

3.2.4 Lot Size

A unit for a single Schondstedt sweep consisted of a 5 feet x 100 feet lane. Selection of lot size was the responsibility of the Project Manager and the UXO QC Specialist. The lot size in segment 56 was 100 unit-sized lanes. For segment 55, it was 120 lanes, and for segments 62 and 63, the lot size was 10 grids or 200 lanes.

3.2.5 Acceptance Criteria

The criteria for both QC and QA acceptance within segment 56 was: "no MEC item that is on the surface or protruding from the surface that was not marked or investigated, whether the item was moved or previously fired". The QA pass/failure criteria in segments 55, 62 and 63 was: "no MEC item on the surface or protruding from the surface that was not marked or investigated, and no ferrous metal item on the surface larger than 3 inches in any dimension that was not removed."

3.2.6 Quality Assurance

Government QA was carried out by the onsite USACE Safety Specialist. The QA effort consisted of a random 10% inspection throughout the segments.

4.0 DESCRIPTION OF WASTE DISPOSITION

4.1 ONSITE ACTIVITIES

When the items listed in Table 1 were located, they were marked and data was collected on the items. This data consisted of identification of the items, determining if the item was fuzed, if the item was safe to move, if there was an explosive hazard, and a photograph was taken. The next step in the process was to perform demolition to remove any possible explosive hazard on items that could not be positively identified as free of explosive hazards. Demolition was performed on each item that either had a fuze or that could not be identified as 100% free of explosive filler. For the items that did not contain a fuze, the field team moved these items to an area and performed demolition operations to determine if the items were explosively configured. Items that were fuzed, were left in place and demolition performed. For the items that were left in

place, a determination had to be made concerning the exclusion zone requirements. For the items which were located in areas that the exclusion zone remained within areas secured by existing land use controls, demolition was performed using standard operating procedures. For the items located on segment 56, the exclusion zone went beyond the boundary of the former Fort McClellan and outside the area protected by existing land use controls. This required the use of engineering controls to reduce the exclusion zone. Sand bag mitigation was used to reduce the exclusion zone from 1080 feet to 200 feet. The sand bag mitigation was constructed in accordance with USACE document HNC-ED-CS-S-98-7, which governs the design and use of sand bag mitigation to reduce fragmentation hazards associated with high order detonations. Basically it requires sand bags to be piled around and over the item to be detonated in a way that is proven to reduce fragmentation hazards. Photographs of the sand bag mitigation are included.

4.2 DEMILITARIZATION

The demilitarization process started during field activities when demolition was performed as described above in paragraph 4.1. When needed, the moved items were blown in place (BIP) to ensure no explosive hazard remained. This is an explosive procedure conducted at the location where the item was found. In this procedure, a controlled donor explosive charge or shape charge perforator is used to initiate a detonation of any residual explosive materials in the item or to prove the item did not contain energetic material. These operations are conducted by trained UXO Technicians, with special equipment and under special access and control procedures to assure that no one is placed at risk from the detonation. Items which were safe to move were consolidated in the scrap storage facility for processing at a later date. All items that could not be moved had demolition performed on site. These items were then taken to the scrap storage facility also. All items in the scrap storage facility have had an initial field inspection by a qualified UXO technician. The items received a second and final inspection in the scrap yard and were demilitarized along with all other MEC related scrap contained in the scrap yard. The items were demilitarized to allow for shipment to an authorized facility.

The demilitarization process requires the items to be deformed in a way that the items could not be mistaken for explosively configured items. This requires the items to be permanently deformed or cavities opened so that the items are easily verified as free of explosives. The guidance document for demilitarization of MEC scrap is Department of Defense Demilitarization Publication DoD 4160.21-M-1.

4.3 CERTIFICATION AND VERIFICATION

TtFW ensured that MEC scrap metal generated from this investigation was properly inspected in accordance with the procedures in Section 4.2 above. Only qualified UXO personnel performed these inspections. The Senior UXO Supervisor certified and the USACE's OE Safety Specialist verified that the MEC scrap was free of explosive hazards.

Once all the scrap in the scrap storage facility has been inspected and certified free of explosives the scrap is placed in DOT approved shipping containers and sealed with a numerical seal. The containers are closed and clearly labeled on the outside with the following information: USACE/Ft. McClellan/Tetra Tech FW, Inc. and with the seal's unique identification. The containers are closed in such a manner that a seal must be broken in order to open the container.

A documented description of the container is provided by TtFW with the following information for each container; contents and weight of container; location where OE scrap was obtained;

TtFW's name, names of certifying and verifying individuals; unique container identification; and seal identification.

DD form 1348-1A are used as certification/verification documentation. All DD 1348-1A must clearly show the typed or printed names of TtFW's Senior UXO Supervisor and the USACE's OE Safety Specialist, organization, signature, and TtFW's home office and field office phone number(s) of the persons certifying and verifying the scrap metal.

In addition to the data elements required and any locally agreed to directives, the DD 1348-1A clearly indicates the following for scrap metal:

- Basic material content (Type of metal; e.g., steel or mixed);
- Estimated weight;
- Unique identification of each of the containers and seals stated as being turned over; and
- Seal identification, if different from the unique identification of the sealed container.

The following certification/verification are entered on each DD 1348-1A for turn over of scrap and signed by the Senior UXO Supervisor and the USACE OE Safety Specialist.

> "This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, are free of explosive hazards, engine fluids, illuminating dials and other visible liquid HTWR materials."

4.4 MAINTAINING THE CHAIN OF CUSTODY AND FINAL DISPOSITION

The USACE will arrange for maintaining the chain of custody and final disposition of the certified and verified materials. The certified and verified material will only be released to an organization that will:

- Upon receiving the unopened labeled containers each with its unique identified and unbroken seal ensuring a continued chained of custody, and after reviewing and concurring with all the provided supporting documentation, sign for having received and agreeing with the provided documentation that the sealed containers contained no explosive hazards when received. This will be signed on company letterhead and state that the contents of these sealed containers will not be sold, traded or otherwise given to another party until the contents have been smelted, shredded, or flashed and are only identifiable by their basic content.

Send notification and supporting documentation to the sealed container-generating contractor documenting the contents of the sealed containers have been smelted and are now only identifiable by their basic content.

4.5 OFFSITE LOCATIONS

All MEC scrap that was collected under the Order will be sent to Hawthorne Army Depot for disposal. All the MEC scrap that is sent to Hawthorne is certified free of explosives as described in 4.3.6 above. Hawthorne Army Depot will provide a signed letter that ensures the scrap is properly treated before release to the public.

Certification

I certify that the information contained in or accompanying this submittal is true, accurate and complete. As to those portions of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted.

Arthur B. Holcomb 11/2/2004

Tetra Tech FW, Inc. (Signature) Name (print) Date
Arthur B. Holcomb, P.E.
Program Manager

C. DAVID DOUTHAT 2NOV04

U.S. Army Corps of Engineers (Signature) Name (print) Date
C. David Douthat, P.E.
Ordnance and Explosive Directorate

GARY E HARVEY 2NOV 2004

Gary E. Harvey (Signature) Name (print) Date
Site Manager
Ft. McClellan, AL

APPENDIX 1
FWS SEGMENT 56 LAND TRANSFER AREA

Approach
Segment 56
FWS Land Transfer Area

1. We propose to use a 3 step process to adhere to the Administrative Order issued by ADEM. The first step will be to search the area (see attached figure). Locate and mark all munitions. The second step will be to determine which of the items located were actually moved from another location and then the final step will be to dispose of the items.

2. We propose to do an instrument assisted search 100 feet on both the north and south side of segment 56. We will mark each MEC item discovered, record the required data (location(GPS), type, moved or previous, etc.) Once the search is completed we will decide which items were moved and then demolition will be performed using appropriate sandbag mitigation techniques on the moved items.

3. Pending ADEM agreement work will commence at 0800 on August 5, 2004. Personnel from Tetra Tech FW, Inc. and the Army team will meet at building 215 to undergo safety and operational briefs at 0600. The team members will consist of:

Grady Bendel	- SUXOS
Nate Martin	- UXOSO
David Crossley	- Team Leader
Todd Steelman	- Team Member

(2) USACE Safety Representatives – UXO Escorts

4. Per the attached letter designated members of the ADEM and Army team will be escorted within the exclusion zone to observe the work.

RESPONSE TO COMMENTS ON APPROACH TO SEGMENT 56

What instrument(s) will be used to search the area and identify MEC items? **Schondstedt Model GA-52 hand held magnetic locator will be used to assist in finding items and a Etrex Legend hand held GPS for will be used to determine the GPS coordinates of the items.**

What distinguishing criteria will be used to determine the items that are recently placed versus the items that are considered to be in-situ?

Considerations for determining if a MEC item has been moved will include:
1) Color/consistency of soil adhering to the MEC item in comparison to the surrounding soil.
2) Visible disturbance of leaves and soil surrounding the MEC item.
3) MEC items protruding from a freshly dug location, even if partially buried.

What distinguishing criteria will be used to determine the items that are recently reburied versus the items that are considered to be in-situ?

Since there are no standards for making this determination we will rely on the above considerations and the best judgment of the SUXOS, UXOQC and the USACE Safety Specialist.

Please explain the process Fort McClellan will use to ensure that the entire area is cleared of recently placed items within Segment 56.

We will do the surface recon out to 100 feet. Based on the interviews of the team that admitted to moving the items, they only moved the items 30 - 40 feet from the road. We believe that 100 feet will provide enough coverage to ensure we recover all the moved items. A tape measure will be used to measure the 100 feet out from the road and pin flags will used to mark this 100 foot barrier.

How will the army record and document its findings?

An electronic field log book will be used to document the effort. This info will be transferred to the existing database which contains the information for the removal action on the FWS roads. This will allow the information to be inserted into the removal report (Both the ADEM and USACE reports) for this area.

How will the army record and document the location of items that the Army does not intend to recover at this time?

Per the conference call of August 3, 2004 and as stated by Stephen Cobb with ADEM, the intent of the AO was to address relocated/disposed MEC items. All of the items addressed by the AO will be recovered. Items not addressed by the AO will not be addressed at this time. The recovering of the relocated items and the evaluation of the other areas where MEC removal has been accomplished will traverse impact areas. It is anticipated that numerouos

MEC items will be encountered that were not relocated or disposed improperly. Since these areas containing MEC items are included within areas currently proposed for removal actions, the Army does not intend to track, locate or dispose of MEC items that were not relocated or disposed improperly. Best management practices dictate that it will be more appropriate to conduct a full investigation and removal action IAW all relevant explosive safety requirements in the future.

Please provide a photograph of each find (each MEC item), including any remnants of fragmentation

We wish to fully comply with ADEM's request, however, in accordance with the ADEM Administrative Order (AO) 04-086-EHW USAG, "…shall locate and properly manage all disposed and/or land filled munitions in the general vicinity…". There is no reference to fragmentation that we are aware of in the AO therefore we do not intend to track, locate, or photograph fragmentation as part of compliance with the order to correct the AO. Since the recon will traverse an impact area the amount of fragmentation and MEC items anticipated to be encountered will be numerous. The MEC items not relocated and fragmentation will be addressed in the actions taken following the completion of the EE/CA and action memorandum.

Please describe the Army's plan for describing and characterizing its finds to the Department (e.g., fuzed items, practice items, potentially explosively configured items, etc.)

The following information will be collected (if available) for each item located:

- **Anomaly ID (a unique number identifier)**
- **Type (Mortar, Projectile, etc)**
- **Description (Practice, HE, HEAT, etc.)**
- **Model (Mk or MOD if known, M69, MkII, etc.)**
- **Size (37mm, 81mm, 2.36in, etc.)**
- **Fuzed (Yes,No, Partially)**
- **Demolition Required (Yes or No)**
- **Team Leader Comments (text)**

After demolition is performed on any item, the above information is then verified to be correct (if an item cannot be verified as practice by the field team, they will call it HE, after demo if the item is positively identified as practice, then the Model is changed from HE to Practice)

A waste determination IAW ADEM Admin. Code R. 335-14-3-.01(2) should be conducted on waste from the treatment of recovered MEC items and the waste should be managed appropriately based on that determination.

A response to this comment will be provided in a separate submittal.

Once the work is completed, a final report should be expeditiously submitted to ADEM.

A report will be submitted IAW the requirements of the AO and ADEM Administrative Code R 335-14-5-.07(6).

In addition, please revise the plan to extract language referring to "in consultation with ADEM representatives" as ADEM staff will not be on site for field consultations or approvals, but rather only to observe cleanup actions and protocols. ADEM will thoroughly review the Army's findings and provide written comments on the report submitted to the Department.

We will remove the verbiage from the text of the document.

Regarding the list of ADEM personnel authorized to be in the exclusion zone during OE operations, please expand the list to include Mr. Jim Grassiano and Ms. Shana Decker.

An approval for the ADEM personnel to enter the exclusion zone as observers has been provided by The US Army Engineering Support Center, Huntsville.

APPENDIX 2
PROPOSED REVISED PLAN FOR ROAD SEGMENT 056

PROPOSED REVISED PLAN FOR ROAD SEGMENT 056

1. The objective of this task is to find 100% of all moved items. This is a difficult task in that the area is a known impact area littered with items that were fired into this area. The items fired into this area are not the objective of this task, only items that were moved. Of necessity, subjective criteria will be applied in determining which are "moved items": for example, color of dirt on the item, whether partially covered items appear to have been recently placed as apposed to clearly impacted, etc.

2. In order to reduce the number of items that could be overlooked a more deliberative approach will be employed. We will divide both the north and south sides of this road segment into 4 lots. Each lot will consist of 5 grids and each grid will have 20 lanes (5 feet wide). The grids will each be, 100 feet x 100 feet with the last grid on each side being slightly longer than 100 feet x 100 feet. This will allow for a more detailed product QC and will make the segment easier to manage. We will implement a product QC that will use a MIL-STD 1916 sampling procedure.

3. The site will be prepared for this new approach by marking the grids and lanes that will be used. Lanes will be laid out as each grid is worked and then moved to the next grid and will consist of cord or rope to mark the area that needs to be investigated. Prior to the teams heading into the area each day, the team will test each hand held instrument on the hand held instrument test site. This site is located just outside the gate of the compound and the test will be supervised by the team leader. Once the team arrives on site, the team begins their search of the area, the team leader will observe the team to ensure proper technique is followed. The teams will move leaves on every anomaly that is detected if present and mark all items that meet the failure criteria discussed in paragraph 4. The team will use the hand held instruments to assist them in finding any MEC items that were moved into this area. Each team member will work within their assigned lane and will cover the entire length and width before moving to the next lane. Each MEC item that is on or protruding from the surface will be marked to help with the QC process by ensuring no MEC items were overlooked.

4. Quality Control

<u>Process Quality Control</u>

The UXO Quality Control Specialist will conduct regular, Preparatory, Initial and Follow-up Surveillance Inspections on the process. Details of the Process Quality Control conducted will be contained within the Daily Quality Control Reports.

<u>Product Quality Control - Acceptance Inspection</u>.

When work is completed on a the full set of grids that compose one lot, it will under go acceptance sampling following the requirements of MIL STD 1916. The methodology used will apply the sampling plan to these lots, using the same type (Schonstedt, Vallon, etc.) equipment as the field teams. Any anomalies detected will be evaluated to

determine the nature of the anomaly and then compare it against the Acceptance Criteria contained below. Because of the nature of this impact area, we will evaluate the lanes identified randomly and may add an additional targeted 10% sampling within certain areas of the heaviest contamination. Upon successful completion of the Acceptance Sampling, the lots will be turned over to the client for Acceptance.

Determination of the Sampling Plan

Verification Level (VL) III, Code Letter (CL) A, Inspection by Attributes, Inspection by Lots, will be the sampling protocol followed. This protocol requires a sample size of 32 units per Lot or 32 lanes per 100 lanes in a given lot.

Lot Size

The lot size will be 100 unit-sized lanes. A unit for a single Schonstedt sweep consists of a 5 foot x 100 foot lane. Selection of lot size is the responsibility of the Project Manager and the UXO Quality Control Specialist. There are 5 grids per lot, each divided into 20 lanes numbered 1 through 100.

Acceptance Criteria

The acceptance criteria for lots that have undergone Acceptance Sampling are, “no MEC item on the surface or protruding from the surface that was not marked or investigated, whether the item was moved or previously fired into the area.”

5. Government QA will be carried out by the onsite USACE Safety Specialist. The QA failure is: “no MEC item that is on the surface or protruding from the surface that was not marked or investigated, whether the item was moved or previously fired”

6. Any MEC discovered that is determined to meet the criteria of a “moved item” will be disposed of in accordance with established procedures. Those items determined to not meet the criteria of a moved item will be left in place for disposal under a follow on removal action when the Charlie Area is scheduled for additional removal actions.

Lane Selection Table: MIL-STD 1916 (VL-III) – CL (A)

Lots	***1***	***2***	***3***	***4***
LANES				
1	2	7	1	6
2	6	8	16	7
3	7	9	19	8
4	9	15	21	11
5	10	19	22	12
6	11	21	28	17
7	13	25	32	18
8	26	27	35	20
9	33	34	39	23
10	35	35	40	27
11	38	36	41	30
12	39	42	42	32
13	41	43	43	33
14	43	44	44	39
15	45	46	45	41
16	50	62	49	44
17	51	63	51	45
18	52	64	54	53
19	60	65	55	60
20	61	66	56	61
21	67	67	64	63
22	70	70	65	64
23	71	74	66	67
24	78	77	70	69
25	80	78	71	71
26	81	79	72	73
27	86	80	76	77
28	88	81	77	85
29	89	85	88	87
30	94	86	91	88
31	96	87	94	95
32	99	97	96	96

APPENDIX 3
PROPOSED PLAN FOR ROAD SEGMENTS 55, 62 AND 63

PROPOSED PLAN FOR ROAD SEGMENTS 55, 62 AND 63

1. The objective of this task is to find 100% of any items that may have been moved from either of these segments. This is a difficult task in that the segments are within a known impact area that has not yet been cleared and is littered with items that were fired into the area and that are not the objective of this task. Of necessity, subjective criteria will be applied in determining which items, if any, are "moved items": for example, color of dirt on the item, whether partially covered items appear to have been recently placed as opposed to clearly impacted, etc. There is no definitive proof at this time that any items were moved from either of these segments.

2. Both the east and west sides of these road segments will be divided into grids and then into lots. The length of segment 55 is 325 feet while segment 62/63 is approximately 2000 feet. Segment 55 will consist of 6 grids (3 on each side). These 6 grids will make 1 lot. In segment 62/63 each lot will consist of 10 grids and each grid will have 20 lanes (5 feet wide). The grids will each be, 100 feet. The last grid on each side of this segment (62/63) may be slightly longer than 100 feet due to elevation gain and loss over the length of the segment. The additional length will be included in the last lot on each end of the segment. Setting out grids will allow for a detailed product QC and will make the segments easier to manage. Product QC will be implemented by using the sampling procedures derived from MIL-STD 1916.

3. These segments will be prepared by marking the grids and lanes that will be used. Lanes, which will be laid out for each grid to be worked will consist of cord or rope to mark the area that needs to be investigated. Prior to the teams heading into the area each day, the team will test each hand held instrument at the hand held instrument test site. The test site is located just outside the gate of the compound and the test will be supervised by the team leader. Once the team arrives at the search area, the team will begin their search of the area with the team leader observing the team to ensure proper technique is followed. The team will use the hand held instruments to assist them in finding any MEC item that may have been moved into the area. Each team member will work within their assigned lane and will cover the entire length and width before moving to the next lane. Each MEC item that is on or protruding from the surface will be marked to help with the QC process by ensuring no MEC items were overlooked. The teams will remove all ferrous metal larger than 3 inches in any direction with the exception of MEC items. MEC items that are deemed to have been moved will be properly handled by TtFWI. MEC items that are deemed to have not been moved will be left in place for disposal under a follow on removal action.

4. Quality Control

<u>Process Quality Control</u>

The UXO Quality Control Specialist will conduct regular, Preparatory, Initial and Follow-up Surveillance Inspections on the process. Details of the Process Quality Control inspections that are conducted will be included in the Daily Quality Control Reports.

Product Quality Control - Acceptance Inspection.

When work is completed in an area on a full set of grids that compose one lot, the lot will undergo acceptance sampling following the requirements of MIL STD 1916. The methodology to be used is to apply an appropriate sampling plan to these lots, using the same type (Schonstedt, Vallon, White, etc.) equipment as the field teams. Any anomalies detected will be evaluated to determine the nature of the anomaly and then compared against the Acceptance Criteria contained below. Because of the nature of this impact area, lanes will be randomly identified and may be adjusted by adding an additional targeted 10% sampling within certain areas of the heaviest contamination. Upon successful completion of the Acceptance Sampling, the lots will be turned over to the U.S. Army Corps of Engineers for Quality Assurance.

Determination of the Sampling Plan

Verification Level (VL) III, Code Letter (CL) A, Inspection by Attributes, Inspection by Lots, will be the sampling protocol followed. This protocol requires a sample size of 32 units per Lot or 32 lanes per given lot. In segment 55 this will mean 32 lanes within 6 grids (120 lanes), in segment 62/63 this will 32 lanes per lot (10 grids or 200 lanes). The segment is approximately 2000 feet long which equates to 20 grids on each side of the road way. This will equate to 4 lots of 10 grids each. The final lot will contain any additional sampling area to reach the end of the segment based on distance gained due to the elevation changes of the segment.

Lot Size

The lot size will be based on a number of units that are called lanes. A unit for a single Schonstedt sweep consists of a 5 foot x 50 foot lane. Lot size will be 6 grids or 120 lanes in segment 55 and 10 grids or 200 lanes in segment 62/63.

QC Acceptance/Rejection Criteria

The acceptance/rejection criteria for lots that have undergone Acceptance/Rejection Sampling are, “no MEC item on the surface or protruding from the surface that was not marked or investigated, and no ferrous metal item on the surface larger than 3 inches in any dimension that was not removed.”

5. Government QA will be carried out by the onsite USACE Safety Specialist. The QA pass/failure criteria is: “no MEC item on the surface or protruding from the surface that was not marked or investigated, and no ferrous metal item on the surface larger than 3 inches in any dimension that was not removed.”

6. Any MEC discovered that is determined to meet the criteria of a “moved item” will be disposed of in accordance with established procedures. Those items determined to not meet the criteria of a moved item will be left in place for disposal under a follow on removal action when the area containing these segments is scheduled for additional removal actions.

APPENDIX 4
MILITARY STANDARD (MIL-STD) 1916 SAMPLING PROCEDURE

NOT MEASUREMENT SENSITIVE

MIL-STD-1916
1 April 1996

DEPARTMENT OF DEFENSE TEST METHOD STANDARD

DOD PREFERRED METHODS FOR ACCEPTANCE OF PRODUCT

AMSC N/A

AREA QCIC

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F O R E W O R D

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense (DoD).

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Armament Research, Development and Engineering Center, ATTN: AMSTA-AR-EDE-S, Picatinny Arsenal, NJ 07806-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

3. DoD procurement practices encourage industry innovation and provide flexibility to achieve the benefits of continuous improvement.

4. There is an evolving industrial product quality philosophy that recognizes the need for quality policy changes that will provide defense contractors with opportunities and incentives toward improvement of product quality and cooperative relationships between the contractor and the Government.

5. Process controls and statistical control methods are the preferable means of preventing nonconformances, controlling quality, and generating information for improvement. An effective process control system may also be used to provide information to assess the quality of deliverables submitted for acceptance. Suppliers are encouraged to use process control and statistical control procedures for their internal control and to submit effective process control procedures in lieu of prescribed sampling requirements to the Government for approval.

6. Sampling inspection by itself is an inefficient industrial practice for demonstrating conformance to the requirements of a contract and its technical data package. The application of sampling plans for acceptance involves both consumer and producer risks; and increased sampling is one way of reducing these risks, but it also increases costs. Suppliers can reduce risks by employing efficient processes with appropriate process controls. To the extent that such practices are employed and are effective, risk is controlled and, consequently, inspection and testing can be reduced.

7. The following points provide the basis for this standard:

a. Contractors are required to submit deliverables that conform to requirements and to generate and maintain sufficient evidence of conformance.

b. Contractors are responsible for establishing their own manufacturing and process controls to produce results in accordance with requirements.

c. Contractors are expected to use recognized prevention practices such as process controls and statistical techniques.

8. This standard also provides a set of sampling plans and procedures for planning and conducting inspections to assess quality and conformance to contract requirements. This standard complies with the DoD policy of eliminating acceptable quality levels (AQL's) and associated practices within specifications.

CONTENTS

C O N T E N T S

C O N T E N T S

MIL-STD-1916

1. SCOPE

1.1 Scope. The purpose of this standard is to encourage defense contractors and other commercial organizations supplying goods and services to the U.S. Government to submit efficient and effective process control (prevention) procedures in place of prescribed sampling requirements. The goal is to support the movement away from an AQL-based inspection (detection) strategy to implementation of an effective prevention-based strategy including a comprehensive quality system, continuous improvement and a partnership with the Government. The underlying theme is a partnership between DoD and the defense supplier, with the requisite competence of both parties, and a clear mutual benefit from processes capable of consistently high quality products and services. The objective is to create an atmosphere where every noncompliance is an opportunity for corrective action and improvement rather than one where acceptable quality levels are the contractually sufficient goals.

1.2 Applicability. This standard, when referenced in the contract, specification, or purchase order, is applicable to the prime contractor, and should be extended to subcontractors or vendor facilities. The quality plans are to be applied as specified in the contract documents, and deliverables may be submitted for acceptance if the requirements of this standard have been met.

1.3 Applications. Quality plans and procedures in this standard may be used when appropriate to assess conformance to requirements of the following:

a. End items
b. Components or basic materials
c. Operations or services
d. Materials in process
e. Supplies in storage
f. Maintenance operations
g. Data or records
h. Administrative procedures

Note, use of the word "product" throughout this standard also refers to services and other deliverables.

1.4 Product requirements. The contractor is required to submit product that meets all contract and specification requirements. The application of the quality plans or procedures of this standard does not relieve the contractor of responsibility for meeting all contract product requirements. The contractor’s quality system, including manufacturing processes and quality control measures, will be established and operated to consistently produce products that meet all requirements. Absence of any inspection or process control requirement in the contract does not

relieve the contractor of responsibility for assuring that all products or supplies submitted to the Government for acceptance conform to all requirements of the contract.

1.5 Limitations. The sampling plans and procedures of this standard are not intended for use with destructive tests or where product screening is not feasible or desirable. In such cases, the sampling plans to be used will be specified in the contract or product specifications.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, and 5 of this standard, whether or not they are listed.

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE/AMERICAN SOCIETY FOR QUALITY CONTROL (ANSI/ASQC)

ANSI Z1.1/ASQC B1	-	Guide for Quality Control Charts.
ANSI Z1.2/ASQC B2	-	Control Chart Methods of Analyzing Data.
ANSI Z1.3/ASQC B3	-	Control Chart Method of Controlling Quality During Production.
ANSI/ASQC Q9000	-	Quality Management and Quality Assurance Standards Guidelines for Selection and Use.
ANSI/ASQC Q9004	-	Quality Management and Quality System Elements Guidelines.

INTERNATIONAL ORGANIZATION OF STANDARDS (ISO)

ISO 8402	-	Quality - Vocabulary.
ISO 9000	-	Quality Management and Quality Assurance Standards - Guidelines for Selection and Use.
ISO 9004	-	Quality Management and Quality System Elements - Guidelines.

(Copies of DoD adopted non-Government Standards are available to Military activities through the DoD Single Stock Point, Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. Military activities may obtain copies of non-DoD adopted documents from the sponsoring Industry Association. Non-military activities may obtain copies of non-Government standards and publications from the American Society for Quality Control, PO Box 3066, Milwaukee, WI 53201-3066 and the American National Standards Institute, 1430 Broadway, New York, NY 10018, as appropriate.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows

a. ACO - Administrative Contracting Officer.
b. ANSI - American National Standards Institute.
c. AQL - Acceptable Quality Level.
d. ASQC - American Society for Quality Control.
e. CL - Code Letter.
f. DFARS - DoD Federal Acquisitions Regulation Supplement.
g. DoD - Department of Defense.
h. DoDISS - DoD Index of Specifications and Standards.
i. DoDSSP - DoD Single Stock Point.
j. FAR - Federal Acquisitions Regulation.
k. FMEA - Failure Modes and Effects Analysis.
l. ISO - International Organization for Standardization.
m. PCO - Procurement Contracting Officer.
n. PDCA - Plan-Do-Check-Act.
o. QAR - Quality Assurance Representative.
p. SPC - Statistical Process Control.
q. VL - Verification Level.

3.2 Acceptance. The act of an authorized representative of the Government by which the Government, for itself or as agent of another, assumes ownership of existing identified supplies tendered or approves specific services rendered as partial or complete performance of the contract. (FAR 46.101)

3.3 Contract quality requirements. The technical requirements in the contract relating to the quality of the product or service and those contract clauses prescribing inspection, and other quality controls incumbent on the contractor, to assure that the product or service conforms to the contractual requirements. (FAR 46.101)

3.4 Critical characteristic. A characteristic that judgment and experience indicate must be met to avoid hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product; or that judgment and experience indicate must be met to assure performance of the tactical function of a major item such as a ship, aircraft, tank, missile, or space vehicle.

3.5 Critical nonconforming unit. A unit of product that fails to conform to specified requirements for one or more critical characteristics.

3.6 Government contract quality assurance. The various functions, including inspection, performed by the Government to determine whether a contractor has fulfilled the contract obligations pertaining to quality and quantity. (FAR 46.101)

3.7 Inspection. Examining and testing supplies or services (including, when appropriate, raw materials, components, and intermediate assemblies) to determine whether they conform to contract requirements. (FAR 46.101)

3.8 Major characteristic. A characteristic, other than critical, that must be met to avoid failure or material reduction of usability of the unit of product for intended purpose.

3.9 Major nonconforming unit. A unit of product that fails to conform to specified requirements for one or more major characteristics, but conforms to all critical characteristics.

3.10 Minor characteristic. A characteristic, other than critical or major, whose departure from its specification requirement is not likely to reduce materially the usability of the unit of product for its intended purpose or whose departure from established standards has little bearing on the effective use or operation of the unit.

3.11 Minor nonconforming unit. A unit of product that fails to conform to specified requirements of one or more minor characteristics, but conforms to all critical and major characteristics.

3.12 Nonconformance. A departure from a specified requirement for any characteristic.

3.13 Nonconforming unit. A unit of product that has one or more nonconformances.

3.14 Production interval. A period of production under continuous sampling assumed to consist of essentially homogeneous quality. It is normally a single shift. It can be a day if it is reasonably certain that shift changes do not affect quality of product, but shall not be longer than a day.

3.15 Quality. The composite of material attributes including performance features and characteristics of a product or service to satisfy a given need. (DFARS 46.101)

3.16 Quality assurance. A planned and systematic pattern of all actions necessary to provide adequate confidence that adequate technical requirements are established; products and services conform to established technical requirements; and satisfactory performance is achieved. (DFARS 46.101)

3.17 Quality audit. A systematic examination of the acts and decisions with respect to quality in order to independently verify or evaluate the operational requirements of the quality program or the specification or contract requirements of the product or service. (DFARS 46.101)

3.18 Quality program. A program which is developed, planned, and managed to carry out cost effectively all efforts to effect the quality of materials and services from concept

through validation, full-scale development, production, deployment, and disposal. (DFARS 46.101)

3.19 Screening inspection. An inspection process whereby every unit is checked and all nonconforming units are removed; also referred to as 100 percent inspection.

3.20 Traceability. The ability to trace the history, application or location of an item or activity, or similar items or activities, by means of recorded identification. (ISO 8402)

3.21 Verification level (VL). Prescribes the level of significance or utility of a characteristic to the user. The amount of effort to assure conformance can be allocated on the basis of importance to the user. (Major characteristics will require more verification effort than minor characteristics.) VL-VII requires the highest level of effort, and the effort decreases as the VL decreases to the lowest level, VL-I.

4. GENERAL REQUIREMENTS

4.1 Acceptance by contractor-proposed provisions.

4.1.1 General.

a. This standard, when referenced in the contract or product specifications, requires the contractor to perform sampling inspection in accordance with paragraph 4.2 and the product specification. However, it is recognized that sampling inspection alone does not control or improve quality. Product quality comes from proper product and process design and process control activities. When such activities are effective, sampling inspection is a redundant effort and an unnecessary cost. Contractors that have an acceptable quality system and proven process controls on specific processes are encouraged to consider submitting alternate acceptance methods for one or more contractually specified characteristics. In addition, contractors that have a successful quality system and a history of successful process controls relevant to the products/services being procured in this contract, are encouraged to consider submitting a systemic alternate acceptance method for all the contractual sampling inspection requirements associated with paragraph 4.2.

b. Submissions shall describe the alternate acceptance methods, the sampling inspection provision to be replaced, and an evaluation of the protection provided by the alternate methods as compared with the inspection requirement to be replaced. The alternate acceptance method shall include evidence of process control and capability during production together with adequate criteria, measurement, and evaluation procedures to maintain control of the process. The acceptability of the alternate acceptance methods is dependent upon the existence of a quality system, the demonstration of its process focus, and the availability of objective evidence of effectiveness.

4.1.2 Requirements and procedures.

a. Contractors currently operating quality systems in accordance with such models as MIL-Q-9858 enhanced with Statistical Process Controls (SPC), ANSI/ASQC Q9004, or others that are deemed satisfactory to the Government representative are qualified to apply for alternate acceptance methods if demonstration of process focus and objective evidence of effectiveness exists.

b. The contractor shall include in his request for approval of an alternate acceptance method an assessment plan to periodically verify process stability, capability, and other conditions under which the alternate acceptance method was developed. The current minimum values of process capability are equivalent to a C_{pk} of 2.00 for critical characteristics, 1.33 for major characteristics, and 1.00 for minor

characteristics. Upon approval of the assessment plan, the contractor may reduce or eliminate inspection sampling when the plan criteria are met or exceeded.

4.1.3 Submission and incorporation.

4.1.3.1 Submission. There are two ways of submitting alternate acceptance methods:

a. Submission of individual alternate acceptance methods for one or more contractually specified sampling inspection requirements through the Government quality assurance representative (QAR) to the procuring contracting officer (PCO) for approval at any time during the contract period of performance.

b. Submission of a systemic alternate acceptance method to the PCO prior to contract being awarded. This pre-approval allows the contractor to adopt alternate acceptance methods throughout the length of the contract. After contract award, submissions of a systemic alternate acceptance method should be made through the administrative contracting officer (ACO) to the PCO.

4.1.3.2 Incorporation. All approved alternate acceptance methods shall be incorporated into the contractor's manufacturing and quality program plans or other vehicles acceptable to the contracting agency, as applicable.

4.1.4 Withdrawal of approval of alternates. The Government reserves the right to withdraw approval of alternate acceptance methods that are determined to provide less assurance of quality than the inspection requirements originally specified or when the inability to maintain process stability and capability over time becomes apparent.

4.2 Acceptance by tables.

4.2.1 Preferred sampling plans. This standard establishes three sets of matched sampling plans for the sampling inspection of product submitted to the Government for acceptance. These sampling plans provide for inspecting the samples from lots or batches by attributes or variables measurement and for continuous sampling by attributes measurement. The three sets of matched sampling plans are indexed by seven specified verification levels (VL) and five code letters (CL), which are determined by the lot or production interval size. The sampling plans are matched between corresponding VL and CL combinations to result in essentially similar protection. The contractor has the option to utilize the type of plan, at the same verification level, that best complements the production process.

4.2.2 Formation and identification of lots or batches. The product shall be assembled into identifiable lots, sublots, or batches, or in such other manner as may be prescribed. Each lot or batch shall, as far as practicable, consist of units of product of a single type, grade, class, size, and composition, manufactured under essentially the same conditions, and at essentially the same time. The lots or batches shall be identified by the contractor and shall be kept intact in

adequate and suitable storage space. Although lot or batch size is not used to select a continuous sampling plan, the formation of lots or batches may remain desirable for reasons of homogeneity, shipping convenience, and facilitation of payment.

4.2.3 Determination of sampling plan. A sampling plan is determined by:

a. Verification level (VL) as specified.
b. Type of sampling (attributes, variables, or continuous).
c. Lot or production interval size code letter (CL) from Table I.
d. Switching procedure (normal, tightened, reduced).

For lot acceptance situations (attributes or variables), the occurrence of one or more nonconformances shall result in withholding acceptance of the product submitted and initiation of corrective action. When continuous sampling is in effect, the occurrence of a nonconforming unit while in a sampling phase results in withholding acceptance of that unit, a return to screening, and initiation of corrective action. If a nonconforming unit is found while in a screening phase, acceptance is withheld for that unit and screening is continued until the requirements of paragraph 5.2.2.3.2 are satisfied.

4.2.4 Sampling of lots or batches.

4.2.4.1 Selection of units. Units of product drawn from a lot for a sample shall be selected at random from the lot without regard to their quality. Random sampling requires that each unit in the lot, batch, or production interval has the same probability of being selected for the sample.

4.2.4.2 Representative (stratified) sampling. When appropriate, the number of units in the sample shall be selected in proportion to the size of sublots or subbatches, or parts of the lot or batch, identified by some rational criterion. When representative sampling is used, the units from each sublot, subbatch, or part shall be selected at random.

4.2.4.3 Process of sampling. A sample may be drawn after all units comprising the lot or batch have been assembled, or sample units may be drawn during assembly of the lot or batch, in which case the size of the lot or batch shall be determined before samples are drawn. When the lot or batch passes the sampling plan, such lots or batches are acceptable and may be submitted to the Government.

4.2.4.4 Non-conforming product. When sample units are drawn during lot or batch assembly and nonconforming units are found, the contractor shall withhold from acceptance that portion of the lot completed and all additional production occurring prior to the initiation and verification of corrective action. For lots or batches withheld from acceptance, the contractor shall take the following actions:

a. Screen the lots or batches and dispose of all nonconforming units in accordance with paragraph 4.3.

b. Determine the cause of the nonconformances and implement appropriate process changes.

c. Initiate the switching requirements of paragraph 5.2.1.3.

d. Advise the Government representative of actions taken and resubmit the screened lot or batches to the Government for evaluation/consideration.

4.3 Disposition of nonconforming product. All units of product found to be nonconforming by the contractor shall be removed and kept apart from the flow of production or otherwise identified or segregated to preclude submission to the Government. The contractor may rework or repair these units unless the contract excludes such activities. Corrected product shall be screened by the contractor and resubmitted to the Government apart from the regular flow of the product.

4.4 Critical characteristics. Unless otherwise specified in the contract or product specifications, the contractor is required for each critical characteristic to implement an automated screening or a fail safe manufacturing operation and apply sampling plan VL-VII to verify the performance of the screening operation. The occurrence of one or more critical nonconformances requires corrective action as specified in paragraph 4.5.

4.5 Special reservations for critical nonconformance. When a critical nonconformance is discovered at any phase of production or during any inspection, the following immediate actions are required:

a. Prevent delivery of critical nonconforming units to the Government.

b. **N**otify the Government representative.

c. Identify the cause.

d. Take corrective action.

e. Screen all available units

Records of corrective actions shall be maintained and made available to the Government representative.

5. DETAILED REQUIREMENTS

5.1 Acceptance by contractor-proposed provisions. In order for an alternate acceptance method to be considered, the contractor shall establish and implement an internal prevention-based quality system as a means of ensuring that all products conform to requirements specified by the contract and associated specifications and standards. The acceptability of the quality system as part of the request for alternate acceptance method(s) is dependent on its compliance with an industry-accepted quality system model, demonstration of its process focus, and the availability of objective evidence of its implementation and effectiveness.

5.1.1 Quality system plan. The quality system shall be documented and shall be subject to on-site Government review throughout the contract. It shall include, at a minimum, a description of the organizational structure, responsibilities, procedures, processes, and resources. Such documentation is hereinafter called the quality system plan. The contractor shall maintain, disseminate, update, and improve the quality system plan in order to ensure its continued use and accuracy. The design and documentation of the quality system plan shall allow for ease of use, review, and audit by internal as well as Government personnel.

5.1.2 Prevention-based quality system. The quality system shall be prevention-based. Common quality system models that reflect this philosophy include the ISO 9000 series, MIL-Q-9858 enhanced with SPC, and many industry specific total quality standards and programs. The quality system shall also reflect additional needs in accordance with the requirements of this standard. Regardless of the model chosen, the quality system shall demonstrate its prevention-based outlook by meeting the following objectives throughout all areas of contract performance:

a. The quality system is understood and executed by all personnel having any influence on product or process quality.

b. Products and services meet or exceed customer requirements.

c. Quality is deliberately and economically controlled.

d. Emphasis is on the prevention of process discrepancies and product nonconformances.

e. Discrepancies and nonconformances that do occur are readily detected, and root cause corrective actions are taken and verified.

f. Sound problem solving and statistical methods are employed to continuously reduce process variability and, in turn, improve process capability and product quality.

g. Records are maintained and indicate implementation of the quality plan and effectiveness of the control procedures.

5.1.3 Process focus of quality system. To demonstrate a process focus, the contractor shall demonstrate that the manufacturing process and its related processes have been studied and are understood, controlled, and documented to show that they are:

a. Consistently producing conforming product.

b. Controlled as far upstream as possible.

c. Robust to variation in equipment, raw materials, and other process inputs, and designed to yield a quality product.

d. Operated with the intent to constantly strive to reduce process/product variability.

e. Designed to utilize manufacturing equipment with objectives of minimum variability around targeted values.

f. Managed for continuous improvement.

g. Designed and controlled using a combination of manufacturing practices and statistical methods in order to ensure defect prevention and process improvement.

5.1.4 Objective evidence of quality system implementation and effectiveness.

5.1.4.1 Examples of evidence regarding process improvement.

a. Process flow charts showing the key control points where action is taken to prevent the production of defective product.

b. Identification of process improvement techniques and tools used, e.g., Plan-Do-Check-Act (PDCA) cycle, Failure Modes and Effects Analysis (FMEA), Pareto Analysis, and Cause and Effect Analysis.

c. Identification of the measures used, e.g., trend analysis, cost of quality, cycle time reduction, defect rates, 6-sigma capability.

d. Results of the improvements from the use of these process improvement tools.

e. Results of properly planned experiments that led to reduced common cause variability of a process and improved productivity

5.1.4.2 Examples of evidence regarding process control.

a. Identification of the scope of use of process control techniques, e.g., SPC, automation, gages, set-up verification, preventative maintenance, visual inspection.

b. Process control plans, including the improvement goals and statements of management commitment to SPC.

c. Approaches and supporting data used to determine if suppliers have adequate controls to assure defective product is not produced and delivered.

d. Descriptions of the required training in SPC and/or continuous improvement, i.e., the number of courses and their content, courses required for personnel at each organizational level and function associated with the quality plan, the qualifications of the instructors or trainers for SPC classes, support by management to attend such courses, and information demonstrating the effectiveness of the training.

e. Identification and definition of the interrelations of all departments (e.g., production, engineering, purchasing, marketing, administration, etc.) involved in SPC and quality improvement, their responsibilities, and the use of teams.

f. When applying control charts, the reasoning behind establishing rational subgroups and sampling frequency; the procedures for determining and updating control limits; and the criteria for determining out-of-control conditions.

g. Identification of key parameters used in lieu of one or more specified characteristics, verification of the correlation of such parameters to those characteristics, and description of the manufacturing process steps responsible for these parameters.

h. Identification of personnel responsible for process-related corrective action.

i. Proper gage measurement studies showing measurement variations relative to the total variation.

j. Traceability of the product and process corrective action(s) taken when the process went out of statistical control, showing how the root cause was identified and eliminated.

5.1.4.3 Examples of evidence regarding product conformance.

a. Control charts showing the process in statistical control in accordance with the criteria asked for in paragraph 5.1.4.2.f.

b. Records of product and process corrective action(s) taken when nonconformances occur.

c. Process capability studies consisting of the correct calculation and interpretation of indices, such as C_p and C_{pk}.

d. History of product inspection results reinforced by statistical data and analysis.

e. Results from in-process control methods, such as 100 percent automated assembly and/or inspection.

5.2 Acceptance by tables.

5.2.1 Sampling inspection. When acceptance is to be accomplished using the sampling tables provided in this document, the following considerations apply.

5.2.1.1 Verification level specification. The VL's are specified in the contract or product specifications. A VL may be specified for individual characteristics, for a group of characteristics, or for subgroups of characteristics within the group. The VL and code letter (CL) from Table I determine the sampling plan required to assess product compliance to contract and specification requirements. Contractors are expected to produce and submit product in full conformance to all requirements. Lots, batches, or production intervals of product that consistently meet or exceed all requirements will be accepted by the sampling plans of this standard and will result in qualifying for reduced sampling levels.

TABLE I. Code letters (CL) for entry into the sampling tables

Lot or production interval size	Verification levels						
	VII	VI	V	IV	III	II	I
2–170	A	A	A	A	A	A	A
171–288	A	A	A	A	A	A	B
289–544	A	A	A	A	A	B	C
545–960	A	A	A	A	B	C	D
961–1632	A	A	A	B	C	D	E
1633–3072	A	A	B	C	D	E	E
3073–5440	A	B	C	D	E	E	E
5441–9216	B	C	D	E	E	E	E
9217–17408	C	D	E	E	E	E	E
17409–30720	D	E	E	E	E	E	E
30721 and larger	E	E	E	E	E	E	E

5.2.1.2 Sampling procedures. Sampling is performed at one of three stages called normal, tightened, and reduced. Unless otherwise specified, the VL stated in the contract shall be considered the normal stage of inspection and shall be used at the start of inspection. The tightened and the reduced stages are then defined as the stages to the immediate left and right, respectively, of the initial stage. The sampling inspection stage in effect shall continue unchanged for each group of characteristics or individual characteristic except where the switching procedures given in paragraph 5.2.1.3 require change. The switching procedures shall be applied to each group of characteristics or to individual characteristics.

5.2.1.3 Switching procedures. The procedures for switching among normal, tightened, and reduced inspection are given as Note (2) in Tables II, III, and IV.

The switching procedures are independent of the results of any remedial action, such as screening, additional samples, etc., resulting from the occurrence of sample nonconformances and withholding of acceptance.

Some Table IV switching criteria depend upon a corresponding Table II entry. These entries have been denoted by $n_a(N)$ and $n_a(T)$ in the descriptions that follow. $n_a(N)$ represents the Table II sample size used for normal sampling at the VL and CL currently in effect. Likewise, $n_a(T)$ represents the tightened sample size.

5.2.1.3.1 Normal to tightened**.** When normal inspection is in effect, tightened inspection shall be instituted when one of the following conditions occurs, depending on the type of sampling plan being used:

Lot or batch sampling (Tables II and III):

2 lots or batches have been withheld from acceptance within the last 5 or fewer lots or batches.

Continuous sampling (Table IV):

2 nonconforming units are found within a period of inspections (whether on sampling or screening) totaling no more than 5 times n_a(N).

5.2.1.3.2 Tightened to normal. When tightened inspection is in effect, normal inspection may be instituted when the following conditions are both satisfied:

a. The cause for producing the nonconformances is corrected.

b. Lot or batch sampling (Tables II and III):

5 consecutive lots/batches are accepted.

Continuous sampling (Table IV):

No nonconforming units have been found within a period of inspections (whether on sampling or screening) totaling at least 5 times n_a(T) units.

5.2.1.3.3 Normal to reduced. When normal inspection is in effect, reduced inspection may be instituted when the following conditions are all satisfied:

a. Lot or batch sampling (Tables II and III):

10 consecutive lots/batches are accepted while on normal inspection.

Continuous sampling (Table IV):

No nonconforming units have been found within a period of inspections (whether on sampling or screening) totaling at least 10 times n_a(N) units .

b. Production is at a steady rate.

c. The contractor's quality system is considered satisfactory by the Government.

d. Reduced inspection is considered desirable by the Government.

5.2.1.3.4 Reduced to normal. When reduced inspection is in effect, normal inspection shall be instituted when one of the following conditions occur.

a. Lot or batch sampling (Tables II and III):

A lot/batch is withheld from acceptance.

Continuous sampling (Table IV):

A nonconforming unit is found.

b. Production becomes irregular or delayed.

c. The contractor's quality system is unsatisfactory.

d. Other conditions warrant that normal inspection be re-instituted.

5.2.1.4 Discontinuation of acceptance. If sampling inspection of lots or batches remains in tightened inspection due to discovery of nonconformances or when, on continuous sampling

plans, there are long periods of screening due to discovery of nonconformances, the Government reserves the right to discontinue acceptance of the product until the causes of nonconformances are eliminated or other means acceptable to the procuring agency have been instituted. When sampling inspection is restarted after discontinuation of acceptance, it shall be at the tightened inspection stage.

5.2.2 Preferred sampling inspection tables. See the Appendix for methods of computing sampling results, using switching rules, and determining compliance with requirements using the attributes, variables, and continuous sampling plans contained in this section.

5.2.2.1 Attributes sampling plans for lot or batch inspection. The preferred attributes sampling plans for lots or batches are described in Table II for normal, tightened, and reduced inspection.

5.2.2.1.1 Acceptability criterion. The lot or batch shall be considered acceptable only if no nonconforming units are found upon inspection of the random sample of the size listed in Table II.

TABLE II. Attributes sampling plans

Code letter	Verification levels								
	T	VII	VI	V	IV	III	II	I	R
	Sample size (n_a)								
A	3072	1280	512	192	80	32	12	5	3
B	4096	1536	640	256	96	40	16	6	3
C	5120	2048	768	320	128	48	20	8	3
D	6144	2560	1024	384	160	64	24	10	4
E	8192	3072	1280	512	192	80	32	12	5

NOTES:

(1) When the lot size is less than or equal to the sample size, 100 percent attributes inspection is required.

(2) One verification level (VL) to the left/right of the specified normal VL is the respective tightened/reduced plan. Tightened inspection of VL-VII is T, reduced inspection of VL-I is R.

5.2.2.2 Variables sampling plans for lot or batch inspection. The preferred variables sampling plans for lots or batches are described in Table III for normal, tightened, and reduced inspection.

5.2.2.2.1 Limitations on use. Variables sampling is not to be used indiscriminately. Its use shall depend upon evidence, provided by graphical or statistical analyses, that the assumptions of independence and normality are being met. Attribute sampling shall be used whenever the evidence fails to warrant use of variables sampling.

5.2.2.2.2 Nonconforming unit. For the purposes of variables sampling, a unit of product shall be considered nonconforming if its variables measurement is outside the specified tolerance.

5.2.2.2.3 Acceptability criteria. The lot or batch shall be considered acceptable if its sample contains no nonconforming units and the applicable "k" and "F" criteria (see Table III) are met. If the sample contains any nonconforming unit, or if the sample does not meet the "k" criterion, or if the sample does not meet the "F" criterion (when applicable), the lot does not meet the acceptability criteria.

a. k criterion, single-sided specification. For a single-sided specification the quantity $\frac{|(\bar{x} - spec\ limit)|}{s}$ shall be greater than or equal to the k value specified in Table III in order to meet the "k" criterion.

b. k criterion, double-sided specification. For a double-sided specification, each of the quantities $\frac{(\bar{x} - L)}{s}$ and $\frac{(U - \bar{x})}{s}$ must be greater than or equal to the k value specified in Table III in order to meet the "k" criterion.

c. F criterion (only applicable in double-sided specifications). For a double-sided specification the quantity $\frac{s}{(U - L)}$ must be less than or equal to the specified F value in Table III in order to meet the "F" criterion.

Note: $\bar{x}$ = sample mean, s = sample standard deviation,
U = upper specification limit, L = lower specification limit.

TABLE III. Variables sampling plans

Code letter	T	Verification levels							R
		VII	VI	V	IV	III	II	I	
	Sample size (n_V)								
A	113	87	64	44	29	18	9	4	2
B	122	92	69	49	32	20	11	5	2
C	129	100	74	54	37	23	13	7	2
D	136	107	81	58	41	26	15	8	3
E	145	113	87	64	44	29	18	9	4
	k values (one- or two-sided)								
A	3.51	3.27	3.00	2.69	2.40	2.05	1.64	1.21	1.20
B	3.58	3.32	3.07	2.79	2.46	2.14	1.77	1.33	1.20
C	3.64	3.40	3.12	2.86	2.56	2.21	1.86	1.45	1.20
D	3.69	3.46	3.21	2.91	2.63	2.32	1.93	1.56	1.20
E	3.76	3.51	3.27	3.00	2.69	2.40	2.05	1.64	1.21
	F values (two-sided)								
A	.136	.145	.157	.174	.193	.222	.271	.370	.707
B	.134	.143	.154	.168	.188	.214	.253	.333	.707
C	.132	.140	.152	.165	.182	.208	.242	.301	.707
D	.130	.138	.148	.162	.177	.199	.233	.283	.435
E	.128	.136	.145	.157	.174	.193	.222	.271	.370

NOTES:

(1) When the lot size is less than or equal to the sample size, 100 percent attributes inspection is required.

(2) One verification level (VL) to the left/right of the specified normal VL is the respective tightened/reduced plan. Tightened inspection of VL-VII is T, reduced inspection of VL-I is R.

5.2.2.3 Continuous attributes sampling inspection plans. The preferred continuous sampling plans for inspection by attributes are described in Table IV for normal, tightened, and reduced inspection.

TABLE IV. Continuous sampling plans

Code letter	T	Verification levels							R
		VII	VI	V	IV	III	II	I	
	Screening phase: clearance numbers (i)								
A	3867	2207	1134	527	264	125	55	27	*NA*
B	7061	3402	1754	842	372	180	83	36	*NA*
C	11337	5609	2524	1237	572	246	116	53	*NA*
D	16827	8411	3957	1714	815	368	155	73	*NA*
E	26912	11868	5709	2605	1101	513	228	96	*NA*
	Sampling phase: frequencies (f)								
A	1/3	4/17	1/6	2/17	1/12	1/17	1/24	1/34	1/48
B	4/17	1/6	2/17	1/12	1/17	1/24	1/34	1/48	1/68
C	1/6	2/17	1/12	1/17	1/24	1/34	1/48	1/68	1/96
D	2/17	1/12	1/17	1/24	1/34	1/48	1/68	1/96	1/136
E	1/12	1/17	1/24	1/34	1/48	1/68	1/96	1/136	1/192

NOTES:

(1) Use of other i and f combinations are permitted provided they are computed in accordance with Appendix, paragraph 30.5.

(2) During the screening phase, one verification level (VL) to the left of the specified normal VL is the tightened plan. Tightened inspection of VL VII is T. There is no reduced plan while in the screening phase.

During the sampling phase, one verification level (VL) to the left/right of the specified normal VL is the respective tightened/reduced plan. Tightened inspection of VL-VII is T, reduced inspection of VL-I is R.

(3) Sample units shall be chosen with frequency (f) so as to give each unit of product an equal chance of being inspected. The inspector should allow the interval between sample units to vary somewhat rather than draw sample units according to a rigid pattern.

5.2.2.3.1 Conditions for continuous sampling procedures. The following conditions must exist before the continuous attributes sampling procedures of this section may be used for inspection.

a. Moving product.

b. Ample space, equipment, and manpower at or near the inspection station to permit 100 percent inspection when required.

c. A process that is producing or is capable of producing material whose quality is stable.

5.2.2.3.2 Continuous sampling inspection procedure. At the start of production, all units are inspected. Sampling inspection may be initiated at frequency "f" when the following conditions are satisfied:

a. All units of product are of the same configuration and produced under stable conditions.

b. At least "i" consecutive units inspected are free of nonconformances.

Sampling inspection shall be terminated and 100 percent inspection resumed if either of the following conditions occur:

a. The production process is interrupted for more than three operating days.

b. The requirement that all units of product are of the same configuration and produced under stable conditions is not satisfied.

c. A unit having any nonconformance is found during sampling.

5.2.2.3.3 Acceptability criterion. In continuous sampling, units of product are determined to be acceptable or not on essentially an individual basis. While 100 percent inspection is being performed, each unit is individually inspected and categorized as a conforming or a nonconforming unit and accepted or not accepted accordingly. While inspection is being performed on a sampling basis, each unit that is inspected is categorized as acceptable or not acceptable depending on whether it is found to be conforming or nonconforming and each unit not inspected is considered to be conforming and hence accepted. (See "Special reservation for critical nonconforming unit", paragraph 5.2.2.3.3.1.)

5.2.2.3.3.1 Special reservation for critical nonconforming unit. In addition to the provisions of paragraph 4.5, if a critical nonconforming unit is found while on sample inspection, all product since the last conforming unit was found shall be inspected.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory).

6.1 Intended use. This document is intended for use in contracts in place of AQL-based sampling documents.

6.2 Issue of DoDISS. When this standard is used in acquisition, the applicable issue of the DoDISS must be cited in the solicitation (see 2.2).

6.3 Supersession data. The following military standards are planned to be canceled when this standard is approved:

a. MIL-STD-414 - Sampling Procedures and Tables for Inspection by Variables for Percent Defective

b. MIL-STD-1235 - Single-and Multi-Level Continuous Sampling Procedures and Tables for Inspection by Attributes

6.4 Subject term (keyword listing).

Attributes
Continuous
Control
Process
Sampling
Statistical
Variables
Verification

APPENDIX

EXAMPLES OF SAMPLING PLAN USE

10. SCOPE

10.1 General. This Appendix is not a mandatory part of the standard. The information contained herein is intended for guidance only.

10.2 Purpose. This Appendix illustrates how to implement the three types of sampling plans described in paragraphs 4 and 5 of this standard. The examples explain how to use the four tables, how to apply the switching rules, and how to do some of the requisite calculations. In addition, this Appendix explains how the contractor can modify Table IV to some extent by calculating and using other "i" and "f" values.

20. APPLICABLE DOCUMENTS. This section is not applicable to this Appendix.

30. EXAMPLES

30.1 Attributes sampling. Wing nuts are to be inspected for missing thread. A verification level IV (VL-IV) has been specified. The producer chooses to use attributes

Lot #	Lot Size	Code Letter	Sample Size	Non-conform-ances	Lot Disposition	Stage T/N/R	Action
1	5000	D	160	2	Withhold Acceptance	N	Begin with normal sampling, VL-IV.
2	900	A	80	0	Accept	N	
3	3000	C	128	1	Withhold Acceptance	N	2 lots out of 5 fail to pass. Switch to tightened VL-IV. Check process.
4	1000	B	256	0	Accept	T	
5	1000	B	256	0	Accept	T	
6	900	A	192	0	Accept	T	
7	2000	C	320	0	Accept	T	
8	2500	C	320	0	Accept	T	Process corrected and 5 consecutive lots accepted. Switch to normal VL-IV.
9	3000	C	128	0	Accept	N	
10	5000	D	160	0	Accept	N	

FIGURE 1. Attributes sampling inspection log.

sampling plans from Table II. Lot sizes may vary as a result of production decisions. A segment of the producer's experience is shown in figure 1.

30.2 Variables sampling (single-sided specification limit case). The maximum temperature of operation for a certain device is specified as 209 (measured in degrees F). Verification level I (VL-I) has been specified. A lot of 40 items is submitted for inspection in accordance with variables sampling. Table III requires a sample size of $n_V = 4$ for code letter A. Suppose the measurements obtained are as follows: 197, 188, 184, and 205; and compliance

Line	Information Needed	Symbol	Formula	Result	Explanation
1	Sample size	n_v		4	See Table III
2	Sum of measurements		$\sum x$	774	
3	Sum of squared measurements		$\sum x^2$	150034	
4	Correction factor	CF	$(\sum x)^2 / n_v$	149769	$(774)^2 / 4$
5	Corrected sum of squares	SS	$\sum x^2 - CF$	265	150034-149769
6	Sample variance	V	$SS / (n_v - 1)$	88.333	265/3
7	Sample standard deviation	s	$\sqrt{V}$	9.399	$\sqrt{88.333}$
8	Sample mean	$\overline{x}$	$\sum x / n_v$	193.500	774/4
9	Lower specification limit Upper specification limit	L U		Not applicable 209	
10	Lower quality index Upper quality index Quality Index	Q_L Q_U Q	$(\overline{x} - L) / s$ $(U - \overline{x}) / s$ $min(Q_L, Q_U)$	Not applicable 1.649 1.649	 (209-193.5)/9.399
11	Sample F value	$\hat{F}$	$s / (U - L)$	Not applicable	
12	Number of nonconformances k value F value	C k F		0 1.210 Not applicable	 See Table III See Table III
13	C acceptability criterion k acceptability criterion F acceptability criterion		$C = 0$? $Q \geq k$? $\hat{F} \leq F$?	Yes Yes Not applicable	 1.649 ≥ 1.21
NOTES: The k value is the minimum allowable value for the quality index, Q. The F value is the maximum allowable value for the sample F value, $\hat{F}$.					

FIGURE 2. Computations for single specification limit case.

with the acceptability criteria is to be determined. Computations are shown in figure 2. The lot is accepted since it meets all applicable acceptability criteria.

30.3 Variables sampling (double-sided specification limit case). The minimum temperature of operation for a certain device is specified as 180 (measured in degrees F). The maximum is 209. Verification level I (VL-I) has been specified. A lot of 40 items is submitted for inspection in accordance with variables sampling. Table III requires a sample of size $n_V = 4$ for code letter A (CL-A). Suppose the measurements obtained are as follows: 197, 188, 184 and 205; and compliance with the acceptability criteria is to be determined. Computations are shown in figure 3. The lot is accepted since it meets all applicable acceptability criteria.

Line	Information Needed	Symbol	Formula	Result	Explanation
1	Sample size	n_v		4	See Table III
2	Sum of measurements		$\sum x$	774	
3	Sum of squared measurements		$\sum x^2$	150034	
4	Correction factor	CF	$(\sum x)^2 / n_v$	149769	$(774)^2 / 4$
5	Corrected sum of squares	SS	$\sum x^2 - CF$	265	150034-149769
6	Sample variance	V	$SS / (n_v - 1)$	88.333	265/3
7	Sample standard deviation	s	$\sqrt{V}$	9.399	$\sqrt{88.333}$
8	Sample mean	$\overline{x}$	$\sum x / n_v$	193.500	774/4
9	Lower specification limit Upper specification limit	L U		180 209	
10	Lower quality index Upper quality index Quality Index	Q_L Q_U Q	$(\overline{x} - L) / s$ $(U - \overline{x}) / s$ $min(Q_L, Q_U)$	1.436 1.649 1.436	(193.5-180)/9.399 (209-193.5)/9.399
11	Sample F value	$\hat{F}$	$s / (U - L)$	0.324	9.399/(209-180)
12	Number of nonconformances k value F value	C k F		0 1.210 0.370	 See Table III See Table III
13	C acceptability criterion k acceptability criterion F acceptability criterion		$C = 0$? $Q \geq k$? $\hat{F} \leq F$?	Yes Yes Yes	 $1.436 \geq 1.210$ $0.324 \leq 0.370$
NOTES: The k value is the minimum allowable value for the quality index, Q. The F value is the maximum allowable value for the sample F value, $\hat{F}$.					

FIGURE 3. Computations for double specification limit case.

30.4 Continuous sampling. A visual inspection of stamped metal parts for the presence of a spot weld will be performed immediately after units pass through a spot welding station. Verification level II (VL-II) has been specified. The product will be submitted for continuous attributes sampling inspection. The production interval size is an 8-hour shift, which initially will consist of between 700 to 800 welded parts. With VL-II and code letter C (CL-C) from Table I, the "i" and "f" values (Table IV) are found to be 116 and 1/48, respectively. A segment of sampling experience is shown in figure 4.

Product Item Number	Code Letter	Frequency or 100%	Stage T/N/R	Event/Action
1	C	100%	N	Start production: Begin screening phase with i = 116.
8	C	100%	N	Find a defective unit: Reset counter.
124	C	100%	N	i =116 consecutive conforming units cleared: Begin sampling phase with f = 1/48.
170	C	1/48	N	First random sample selected: Found it to conform.
9697	C	1/48	N	200 consecutive conforming sampled units observed: Switch to reduced inspection with f = 1/68. Here, 200 equals 10 times the Table II sample size entry for CL-C and VL-II.
9769	C	1/68	R	Next sample randomly selected with f = 1/68.
13982	C	1/68	R	Production interval size tripled (2100 to 2400 units): End CL-C and begin CL-E sampling phase, f = 1/136, since VL-II and reduced sampling inspection are in effect.
14121	E	1/136	R	First random sample taken with new f = 1/136: Found it to conform. Continue random sampling.
16290	E	1/136	R	A nonconforming unit observed: Switch to normal inspection. Initiate screening phase with i = 228, since CL-E and VL-II are in effect.
16518	E	100%	N	i = 228 consecutive conforming units cleared: Begin sampling phase with f = 1/96.

FIGURE 4. Continuous sampling inspection log.

30.5 Continuous sampling - plan tailoring. The producer may opt to use another continuous sampling plan instead of the one specified in Table IV. The only restrictions are that such a change is not allowed while inside a screening sequence and that the new plan be derived in accordance with the procedure described below.

Certain circumstances make such choices desirable. Sometimes the selection of a clearance number or frequency is application dependent, e.g., if it matters that i or 1/f be a

multiple of pallet size. Availability and capability of screening and sampling crews are yet further considerations.

The plan cited in Table IV consists of the largest i number and the smallest f number combination. Plans whose i is larger than the tabulated i, or whose f is smaller than the tabulated f, are not permitted. Producers willing to sample at rates larger than f can reduce i substantially.

The procedure that allows choice is presented by way of the preceding continuous sampling example situation as initially described, subject to one modification: the producer prefers to start with a plan having an i of 50 instead of the 116 specified. The procedure to determine a valid f is as shown in figure 5.

Line	Information Needed	Symbol	Formula	Result	Explanation
1	Clearance number	i		116	Table IV
2	Target i number	i_t	$i_t < i$?	Yes	50 < 116
3	Attribute sample size	n_a		20	Table II, same VL, CL
4	Compute f_0:				
	Step 1	S_1	$(n_a+1)(1+1/n_a)^{n_a}$	55.7193	
	Step 2	S_2	$(i_t+1)(1+1/i_t)^{i_t}$	137.2710	
	Step 3	S_3	$[S_1/(S_1-1)]^{i_t}$	2.4732	
	Step 4	f_0	$(S_1-1)/[(S_2)(S_3)]$	0.1612	
5	Valid f		*Any* $f > f_0$	1/6	1/6 > 0.1612

FIGURE 5. Procedure to determine a valid f.

Therefore, an i of 50 may be used in lieu of 116 if f is increased from 1/48 to 1/6.

If it is f that is preselected, the corresponding i may be found by trial and error, that is, by iterative implementation of the procedure described.

The printed numerical results have been rounded to 4-decimal accuracy. However, use of the procedure requires that all calculations be performed with at least 6-digit precision. Evidence supporting the validity of numerical results shall be maintained and be available for review upon request. Proper execution of the procedure ensures Tables IV and II are comparable with respect to the average fraction inspected and the average outgoing quality limit.

CONCLUDING MATERIAL

Custodians:
Army - AR
Navy - OS
Air Force - 05
DLA - DH

Preparing activity:
Army - AR

Review activities:
Army - AT, AV, CR, EA, GL, ME, MI, MR
Navy - AP, AS, CH, EC, NM, NW, SA, SH, YD-1
Air Force - 10, 11, 13, 17, 19, 70, 71, 80, 82, 84
DLA - ES

(Project QCIC -0146)

APPENDIX 5
DAILY FIELD LOGS

CONTRACTOR PRODUCTION REPORT				***Date***
				8/2/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			001
Contractor		***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.		G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Sunny/Clear	Sunny/Clear	93 °F	71 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0520 Arrived
0600 Briefing with Todd Biggs in reference to ADEM Notice
0630 Commence administrative duties
1103 Interviewed with David Keller
1300 Lunch
1330 Returned to office
1630 Went to segment 056 with Todd Biggs to flag and mag
1740 Returned to office
1800 End of day

Site SUXOS/Superintendent — **8/2/2004** Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/3/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			002
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Sunny/Clear	Sunny/Clear	95 °F	70 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0530 Arrived at work
0600 Morning Safety Briefing
0630 Returned to office, performed administration
1000 Went to check on field work
1030 Returned to office
1230 Lunch
1300 Returned to Office
1330 Gave tour to John Defise and Frank Jones of TO-20 segment 056
1445 Returned to office
1730 End of Day

8/3/2004

Site SUXOS/Superintendent — Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/4/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			003
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Sunny / Clear	Sunny / Clear	95 °F	70 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0530 Arrived at work
0600 Morning Safety Briefing
0630 Returned to office, performed administration
1000 Went and did Weekly Explosive Inventory
1130 Returned to Office
1200 Sent non-essential personnel home
1230 Lunch
1300 Returned to Office
1330 Worked on Incident Report for TO-20 area
1730 End of day

Site SUXOS/Superintendent

8/4/2004
Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/5/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			004
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Clear/Sunny	Clear/Sunny	89 °F	70 °F	0
For work performed see attached personnel breakdown sheet.				

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Held Daily Safety meetings
0630 Prepatory was held for field operation
0730 Went and loadout sand bags
0830 Had Site Safety give general safety briefing to ADEM personnel
0900 Checked out RFD device
0948 Return to office
1120 Lunch
1200 Received permission to start work in 056
1210 Set EZ
1218 Briefed personnel
1230 Went to work
1410 Lightning hold
1430 Return to work
1700 Lightning hold
1720 Return to work
1755 Completed north side of road
1825 Changed locks on gates
1830 Returned compound loaded trucks and trailers with sand bags
1910 End of day

Site SUXOS/Superintendent — **8/5/2004** Date

CONTRACTOR PRODUCTION REPORT			***Date***
			8/6/2004
Contract Number	***Location***		***Report Number***
DACA 87-99-D-0010	Fort McClellan Project		005
Contractor	***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.	G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Clear/Sunny	Clear/Sunny	88 °F	67 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily SUXOS briefing
0615 Administration at office
0653 Changed locks and set EZ
0730 Fueled vehicle
0755 Return to 1-Hotel area to observe operations
0943 Completed Area Surface sweeping
1038 Move 15 items to the intersection of segments 028, 029 and 013 for venting
1145 Returned to compound to setup for demolition
1215 Lunch
1245 Return to work
1300 Issued Demolition, (see demolition log)
1650 Found 1 more item
1713 Went to draw demolition for last Item (see demolition log)
1748 Demolition is all clear
1800 Took all items to scrapyard and store in container placed seal #1671681820 Return to office
1900 End of day

Site SUXOS/Superintendent — **8/6/2004** Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/9/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			006
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Sunny	Sunny	87 °F	65 °F	0
For work performed see attached personnel breakdown sheet.				

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily briefing
0625 Went to set EZ
0715 Notified Team EZ is set
0810 Return to compound
0900 Went to segments 056
0930 Return to Office faxed TF Base of field operations
1000 Returned to field to look at items
1100 ADEM had called a stop work to make inquiries
1300 Team returned to work
1336 Picked up demolition vehicle
1450 Notified TF Base of demolition operations
1456 Issued demolition Donor explosives
1515 Demolition briefing (see demolition log)
1636 Secured from demolition operation, notified TF Base
1645 Changed locks on EZ gates
1700 Took 2 items to scrapyard and secured in ADEM drum switched seal to #167129
1730 Return to office
1800 End of Day

8/9/2004

Site SUXOS/Superintendent — Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/10/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			007
Contractor		***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.		G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Clear and Sunny	Clear and Sunny	88 °F	67 °F	0
For work performed see attached personnel breakdown sheet.				

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0800 Morning briefing and Safety
0815 Administration in office
1115 Lunch
1145 Went to field to observe teams setting up grids and lanes
1300 Went togate to escort TF Base personnel and ADEM representative
1533 Completed grid setup and sent personnel to break down gear and clean vehicles and equipment
1555 Changed locks and notified TF Base all personnel are in from field work
1600 Return to office
1700 End of day

Site SUXOS/Superintendent — **8/10/2004** Date

CONTRACTOR PRODUCTION REPORT			***Date***
			8/11/2004
Contract Number	***Location***		***Report Number***
DACA 87-99-D-0010	Fort McClellan Project		008
Contractor	***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.	G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Clear and Sunny	Partly Cloudy	85 °F	65 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Morning briefing and Safety briefing
0615 Administration
0645 Held prepatory for sweep team
0705 Team leader took team to test instruments 0715 Departed for the 1-Hotel area
0737 All Blue Locks are changed, EZ is set, notified Team Leader Dave Crossley
0744 Arrived at 1-Hotel
0825 Observed Initial for field operations
0833 Sweep Team started sweeping
0914 Returned to compound to get additional white locators
0940 Tested Whites #9285 0260 186 and #9285 0260 1871020 Went and got water for field team
1100 Return to office
1230 Return to field witk lunch for field team
1300 Observed field operations, Sweep Team, QC and QA
1535 Changed locks, unsecured EZ, notified TF Base all personnel returned from field work
1600 Return to office
1700 End of day

Site SUXOS/Superintendent — **8/11/2004** Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/12/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			009
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Partly Cloudy	Cloudy	84 °F	62 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily briefing / Safety briefing
0617 Went to change locks
0635 Changed locks and set EZ,notified Team Leader
0715 Went to check area for intruder
0745 Nothing found
0810 Fueled vehicle
0820 Did Weekly Explosives Inventory
0830 Return to office
0931 Arrived at 1-Hotel area to measure in found items in segment 056 area
1055 Went to compound
1200 Returned to 1-Hotel area
1230 Lunch
1300 Escorted ADEM representative out
1335 Return to office
1530 QC completed QC of Segment 056 area and turned over to QA
1600 QA completed in Segment 056 area
1700 End of Day

Site SUXOS/Superintendent

8/12/2004
Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/30/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			010
Contractor		***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.		G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Cloudy	Partly Cloudy	87 °F	66 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily Briefing
0620 Faxed daily work sheet to TF Base Security
0645 Prepatory for Field Personnel
0750 Set Blue locks on EZ
0911 Went to field to observe Item found by Team and observe field work
1058 Took Charles Dumars to the field to join field to team
1215 took Lunch to Field personnel
1245 Observed Field work
1600 Unlocked blue locked EZ
1605 Notified TF Base Field work secured for the day
1730 End of day

Site SUXOS/Superintendent — **8/30/2004** Date

CONTRACTOR PRODUCTION REPORT				***Date***
				8/31/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			011
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Clear/Sunny	Clear/Sunny	87 °F	68 °F	0
For work performed see attached personnel breakdown sheet.				

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily Briefing
0620 Faxed daily work sheet to TF Base Security
0630 Set Blue locks on EZ
0812 Took ADEM Represtivive Shanna field to observe field work
1045 Returned to office to do phone meeting with company lawyer.
1200 Took Lunch to Field personnel
1245 Observed Field work
1445 Returned Bo Reeves to compound
1505 Returned to segment 62/63 and observed team
1600 Unlocked blue locked EZ
1605 Notified TF Base Field work secured for the day
1630 End of day

Site SUXOS/Superintendent — **8/31/2004** Date

CONTRACTOR PRODUCTION REPORT				***Date***
				9/1/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			012
Contractor	***Site SUXOS/Superintendent***			
Tetra Tech FW, Inc.	G. Bendel			
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Cloudy	Cloudy	87 °F	70 °F	0
For work performed see attached personnel breakdown sheet.				

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

0600 Daily Briefing
0620 Faxed daily work sheet to TF Base Security
0640 Set Blue locks on EZ
0700 Weekly Explosive Inventory
0730 Went to field to observe field work in 62/63
1100 Took Lunch to Field personnel
1130 Observed Field work
1400 Returned to compound to set up for demolition ops
1505 Returned to firing point and observed demolition operation
1600 Unlocked blue locked EZ, took items to scrap yard and place in container with seal #167130
1605 Notified TF Base Field work secured for the day
1730 End of day

Site SUXOS/Superintendent

9/1/2004
Date

CONTRACTOR PRODUCTION REPORT				***Date***
				9/2/2004
Contract Number	***Location***			***Report Number***
DACA 87-99-D-0010	Fort McClellan Project			013
Contractor		***Site SUXOS/Superintendent***		
Tetra Tech FW, Inc.		G. Bendel		
AM Weather	***PM Weather***	***Max Temp***	***Min Temp***	***Precip***
Cloudy	Cloudy	86 °F	72 °F	0

For work performed see attached personnel breakdown sheet.

Job Safety		
	Was Job Safety meetings held this date? (If yes attach copy of minutes)	Yes, see daily health and safety report
	Were there any lost time accidents this date? (If yes attach copy of OSHA report)	No
	Was trenching/scaffold/HV electrical work done? (If yes attach statements or checklist showing inspection performed)	No
	Was hazardous Material/Waste released into the environment? (If yes attach description of incident and proposed action)	No

List of Actions taken today/safety inspections conducted

Safety brief and site observations

Equipment/material received today to be incorporated in job

See Material Receiving Report

Equipment on job site today, including number of hours used today

See Equipment Usage Report

Site SUXOS Comments

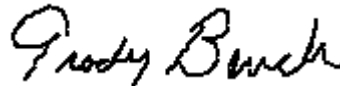
0600 Daily Briefing
0615 Faxed TF Base Daily operations
0630 Went to change locks on EZ
0645 EZ Set notified Team Leader
0733 Observe field team working in Segment 62/63
0906 Took all scrap to scrap yard and set it apart from other scrap.
0930 Returned to office.
1200 Lunch
1230 Reurned to office
1600 End of Day

Site SUXOS/Superintendent

9/2/2004

Date

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
8/5/2004	Surface Sweep2	Crossley	Steelman	Reeves	Welch	0600 Morning meeting and safety brief 0630 Prepatory for field operation 0730 Loadout sand bags 1120 Lunch 1140 Received permission to start work in 056 1218 Tailgate safety brief 1230 Went to work 1410 Lightning hold 1430 Return to work 1700 Lightning hold 1720 Return to work 1755 Completed Sweep of north side of road 1830 Returned to compound loaded trucks and trailers with sand bags 1910 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
8/5/2004	SUXOS	Bendel	Crossley	Martin	Steelman	0600 Morning meeting and safety brief 0630 Prepatory was held for field operation 0730 Went and loadout sand bags 0830 Had Site Safety give general safety briefing to ADEM personnel 0900 Checked out RFD device 0948 Return to office 1120 Lunch 1140 Received permission to start work in 056 1200 Set EZ 1218 Briefed personnel 1230 Went to work 1410 Lightning hold 1430 Return to work 1700 Lightning hold 1720 Return to work 1755 Completed north side of road 1825 Changed locks on gates 1830 Returned compound loaded trucks and trailers with sand bags 1910 End of day	
8/6/2004	Surface Sweep2	Crossley	Steelman	Reeves	Welch	0600 Morning meeting and safety brief 0630 Team to field 0700 Tailgate safety brief 0715 Team to work 0940 Complete surface sweep 1000 Comence demo ops see demo log 1630 Return to compound 1930 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
8/6/2004	SUXOS	Crossley	Welch	Steelman	N/A	0600 Morning meeting and safety brief 0615 Administration at office 0653 Changed locks and set EZ 0730 Fueled vehicle 0755 Return to 1H area to observe operations 0943 Completed Area Surface sweeping 1038 Move 15 items to the intersection of segments 028, 029 and 013 for venting 1145 Returned to compound to setup for demolition 1215 Lunch 1245 Return to work 1300 Issued Demolition, (see demolition log) 1650 Found 1 more item 1713 Went to draw demolition for last Item (see demolition log) 1748 Demolition is all clear 1800 Took all items to scrap yard and store in container placed seal #167168 1820 Return to office 1900 End of day	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
8/9/2004	SUXOS	Crossley	Crozier	N/A	N/A	0600 Morning meeting and safety brief 0625 Went to set EZ 0715 Notified Team EZ is set 0810 Return to compound 0900 Went to segments 056 0930 Return to Office faxed TF Base of field operations 1000 Returned to field to look at items 1100 ADEM had called astop work to make inquiries 1300 Team returned to work 1336 Picked up demolition vehicle 1450 Notified TF Base of demolition operations 1456 Issued demolition Donor explosives 1515 Demolition briefing (see demolition log) 1636 Secured from demolition operation, notified TF Base 1645 Changed locks on EZ gates 1700 Took 2 items to scrapyard and secured in ADEM drum switched seal to #167129 1730 Return to office 1800 End of Day	
8/10/2004	Surface Sweep2	Crossley	Crozier, Saveal	Steelman, Soth	Reeves	0800 Morning meeting and safety brief 0830 Move to field 0900 Tailgate safety brief 0910 Commence grid layout for sweep lines 1530 Complete layout return to compound clean up stow gear 1730 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/10/2004	SUXOS	Bendel	Crossley	Martin	N/A	0800 Morning meeting and safety brief 0815 Administration in office 1115 Lunch 1145 Went to field to observe teams setting up grids and lanes 1300 Went togate to escort TF Base personnel and ADEM representative 1533 Completed grid setup and sent personnel to break down gear and clean vehicles and equipment 1555 Changed locks and notified TF Base all personnel are in from field work 1600 Return to office 1700 End of day	

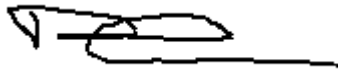
Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/11/2004	Surface Sweep2	Crossley	Crozier, Saveal	Steelman, Soth	Reeves, Munge	0600 Morning meeting and safety brief 0620 Team load out 0645 QC prepetory inspection 0700 Schonstedt instrument 0720 Move to work area 0740 Arive at work site 0830 QC on site perform intial inspection on sweep team, tailgate safety brief 0840 Team to work in grid 1-S 1000 Complete grid 1s.10 minute break 1010 Start grid 2-s 1050 Complete grid 2-s.10 minute break 1100 Start grid 3-s 1130 Complete grid 3-s. 10 minute break 1145 Start grid 4-s 1215 Complete grid 4-s, break for lunch 1250 Start grid 5-s 1315 Start grid 6-s 1335 Complete 5-s 1355 Complete 6-s, 10 minute break 1405 Start grid 7-s 1430 Start grid 8-s 1445 Complete grid 7-s 1500 Complete grid 8-s, 10 minute break 1510 Start grid 9-s. Frank Bynum off site 1540 Complete grid 9-s, start grid10-11-s 1610 Complete grid 10-11-s, return to shop 1630 Secured	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/11/2004	SUXOS	Bendel	Crossley	Martin	N/A	0600 Morning meeting and safety brief 0615 Administration 0645 Held prepatory for sweep team 0705 Team leader took team to test instruments 0715 Departed for the 1H area 0737 All Blue Locks are changed, EZ is set, notified Team Leader Dave Crossley 0744 Arrived at 1H 0825 Observed Initial for field operations 0833 Sweep Team started sweeping 0914 Returned to compound to get additional white locators 0940 Tested Whites #9285 0260 186 and #9285 0260 187 1020 Went and got water for field team 1100 Return to office 1230 Return to field witk lunch for field team 1300 Observed field operations, Sweep Team, QC and QA 1535 Changed locks, unsecured EZ, notified TF Base all personnel returned from field work 1600 Return to office 1700 End of day	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/12/2004	Surface Sweep2	Crossley	Crozier, Saveal	Steelman, Soth	Reeves, Munge	0600 Morning meeting and safety brief 0615 Pack up 0645 Check all schonstedts, all OK. Move to field 0705 Tailgate Safety brief 0715 Start grid 1-n Lay tapes commence sweep 0755 Start grid 2-n 0805 Complete grid 1-n 0820 Complete grid 2-n,10 minute break 0835 Start grid 3-n 0900 Start grid 4-n 0930 Complete grid 4-n, 10 minute break 0945 Start grid 5-n 1005 Start grid 6-n. Complete grid 5-n 1035 Complete grid 6-n, 10 minute break 1055 Start grid 7-n 1125 Complete grid 7-n start grid 8-n 1200 Complete grid 8-n. Break for lunch 1240 Start grid 9-n 1325 Complete grid 9n, start 10-11-n 1315 Start grid 10-11-n 1400 Complete sweep 1410 Pack up return from field 1439 Clean vehicles, stow equipment 1630 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/12/2004	SUXOS	Bendel	Crossley	Crozier, Saveall	Steelman, Soth	0600 Morning meeting and safety brief 0617 Went to change locks 0635 Changed locks and set EZ, notified Team Leader 0715 Went to check area for intruder 0745 Nothing found 0810 Fueled vehicle 0820 Did Weekly Explosives Inventory 0830 Return to office 0931 Arrived at 1H area to measure find area 1055 Went to compound 1200 Returned to 1H area 1230 Lunch 1300 Escorted ADEM representative out 1335 Return to office	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
3/30/2004	SC1	Crossley	Crozier, Adams	Steelman, Soth	Reeves	0600 Morning meeting and safety brief 0615 Team packup loadout 0645 Prepatory inspection 0710 Team to test grid, each sweep member checked shonstedt for proper function 0740 Team to field 0800 Tailgate safety brief 0805 Initial layout of grids 0900Commence surface sweep 1005 Complete grid 7 10 minute break 1020 Start grid 6 1040 Dumars joined team/ tailgate safety brief 1100 Complete grid 6 start grid 5 1135 Complete grid 5 start grid 4b 1210 Complete grid 4b break for lunch 1245 Resume sweep in gri d 4a 1315 Start grid 3 1345 Complete grid 3 start grid 2 1400 Complete grid 2 team break 1415 Resume sweep in grid 1 1500 Complete grid one andall of lot 55 1505 Start lot 63 grid 1 1525 Complete grid 1 start grid 2 1550 Complete grid 2 continued pulling lanes for grid 3 1600 Return to office 1615 Clean trucks log time 1630 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
8/31/2004	SC1	Crossley	Crozier, Adams	Steelman, Soth	Reeves	0600 Morning meeting and safety brief 0615 Loadout 0630 Team at test grid op tested all shonstedts all in good working order 0640 Depart to work area 0655 Arrive at work area 0705 Tailgate safety brief 0710 Start sweep 0940 15 minute break 1000 Back to work 1200 Break for chow 1230 Back to work in grid 15 1400 15 minute break 1415 Team to work in grid 63/21 1545 Depart from field 1610 Back at office complete timesheets,paperwork 1630 Secure	
9/1/2004	SC1	Crossley	Crozier, Adams	Steelman, Soth	Reeves	0600 Morning meeting and safety brief 0615 Team prep for mob to field 0630 To test grid check all shonstedts 0640 Mob to field 0655 Tailgate safety brief 0705 Team to work in grid 25 0800 Chuck stungby bees 0815 Break 0830 Back to work 0915 Jason bee stung several times 1100 Found moved 81mm sweep grid 34, 35, 36 to 100ft 1120 Break for lunch 1150 Back to work 1210 Steelman bee stung many times went home 1510 Start demo ops 1600 Complete demo ops,return to base 1630 Secure	

Date	Team	UXO Sup	Member #1	Member #2	Member #3	Comment	Signature
9/2/2004	SC1	Crossley	Crozier, Adams	Steelman, Soth	Reeves	0600 Morning meeting and safety brief 0640 Team at test grid test schonstedts 0705 Tailgate safety brief 0715 Start grid 40 0735 Complete grid 40, police area 0810 depart area, return to office 0830 Fill out logs complete time sheets 1000 Secure	

APPENDIX 6
PHOTOS


56-1


56-3
07/22/2002


56-4


56-5


56-6


SB-8


SB-9


56-10


56-11


54-12


56-13


56-17


56-22


56-14


56-15


56-29


56-32


56-35


09/01/2004

APPENDIX 7
THE DAILY QUALITY CONTROL REPORTS

QC Daily Logbooks

Date

8/5/2004

QC Supervisor

Nate Martin

Comments

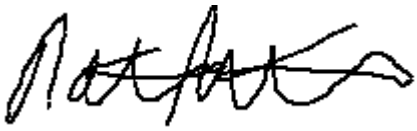
0600 Conducted site safety briefing
0630 Conducted preparatory surveillance to insure all personnel are aware of required tasks, safety precautions, and unusual circumstances involved with this operation.
0800 Gave compulsory site safety brief to ADEM representatives Shana Decker and Phillip Stroud.
0820 Waiting for Permission to proceed with clean-up operation to begin.
1213 Arrived at area 1H to start op.
1240 WBGT=73, no work/rest required. Temp=88, NWB=90, humidity =74%. Shady area. I can hear thunder, monitoring lightning meter.
1333 Temp=85, humidity=75%, NWB=82, GT=85, WBGT=68.9. No work/rest required.
1410 On hold due to lightning.
1424 Lightning ceased, returning to work.
1830 Returned to office to close shop.
1900 End Of Day.

Date

8/6/2004

QC Supervisor

Nate Martin



Comments

0600 Safety Brief, Heat stress/WBGT
0630 Gave compulsory site safety brief to David Bush (ADEM).
0710 At area 1H to begin clearance ops on right side of road, left side was completed yesterday.
1020 The team has comleted sweeping and now the are setting up sandbag mitigating "dog houses". I have just returned from dropping off Todd Steelman at the office per his request.
1122 After Corps Safety informed us that we could reduce the thickness of our doghouse walls to 12" insstead of 24", we have completed staging sandbags and are returning to the office to get explosive invetory documents for withdrawal of explosives.
1300 notfied TFBase of demo op.
1320 Issued the following explosives: 300'xNONEL, 40'xdet cord, 21xperfs, and 7xdetonators.
1336 departed ESB
1345 attended safety brief
1355 set up shot
1458 5 min warning
1504 1min warning
1519 fired 1st shot
1525 shot clear
1540 setting up next shot
1554 5 min warning
1557 1 min warning
1600 fired shot
1604 all clear
1605 cleaning up shot site.
1630 while cleaning up the first shot, Don Welch found another 81mm mortar that had been improperly moved and requires demolition. SUXOS & Demo Supervisor have departed the site to retrieve sufficient explosives to demil this item.
1730 set up shot
1738 5 min warning
1743 1 min warning
1744 fired shot
1748 all clear
1800 returning to office to clean equipment and complete time sheets & reports.
1900 end of day.

QC SURVEILLANCE REPORT
DACA87-99-D-0010
Former Ft. McClellan

1 – Activity

☐ Project Management	☐ Geophysical Data Collection	☐ Data Management	☐ Brush Cutting/Clearing
☐ Intrusive Investigation	☐ Geophysical Data Processing	☐ Demolition	☐ UXO Avoidance/Escort
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ UXO Avoidance	☐ Transect Activity
☐ Survey	☐ Scrap Processing	☒ Other:	**QA at segment 56 in Area 1H**

2 – Phase

☐ Preparatory	☐ Initial	☐ Follow up

3 – References

Site Specific Work Plan DACA87-99-D-0010 TO #20

4 - Observed Condition/Activities:

Quality control procedures in accordance with MIL-STD-1916 was performed in Area 1H at segment 56. The attached table provides the grid number and the randomly selected lanes that were inspected using a White's metal detector. No discrepancies were noted in any of the areas selected for inspection. This area has been turned over to the US Army Corps of Engineers for Quality Assurance and final disposition. No further action is required.

Personnel Present: Nate Martin (UXOQC), Grady Bendel (Site Manager/SUXOS), David Crossley (Team Leader/UXO III)

Conducted By:	Signature:	Date:
Nathaniel W. Martin II		12 August 2004

5- Site UXO QC Specialist Review

Comments: no discrepancies noted.

☒ Acceptable	Deficiency Report #:
☐ Unacceptable	Non-Conformance Report #:

Name:	Signature:	Date:
Nathaniel W. Martin II		12 August 2004

QC SURVEILLANCE REPORT
DACA87-99-D-0010
Former Ft. McClellan
Random Number Table. MIL STD 1916 VL(III) - CL(A). N32 Normal. Lot Size = 100 lanes

	Lot #1		Lot #2		Lot #3		Lot #4	
sample #	grid #	Lane #	grid #	Lane #	grid #	Lane #	grid #	Lane #
1	grid S-1	2-10	grid S-6	7-35	grid N-1	1-5	grid N-6	6-30
2	grid S-1	6-30	grid S-6	8-40	grid N-1	16-80	grid N-6	7-35
3	grid S-1	7-35	grid S-6	9-45	grid N-1	19-95	grid N-6	8-40
4	grid S-1	9-45	grid S-6	15-75	grid N-2	1-5	grid N-6	11-55
5	grid S-1	10-50	grid S-6	19-95	grid N-2	2-10	grid N-6	12-60
6	grid S-1	11-55	grid S-7	1-5	grid N-2	8-40	grid N-6	17-85
7	grid S-1	13-65	grid S-7	5-25	grid N-2	12-60	grid N-6	18-90
8	grid S-2	6-30	grid S-7	7-35	grid N-2	15-75	grid N-6	20-100
9	grid S-2	13-65	grid S-7	14-70	grid N-2	19-95	grid N-7	3-15
10	grid S-2	15-75	grid S-7	15-75	grid N-2	20-100	grid N-7	7-35
11	grid S-2	18-90	grid S-7	16-80	grid N-3	1-5	grid N-7	10-50
12	grid S-2	19-95	grid S-8	2-10	grid N-3	2-10	grid N-7	12-60
13	grid S-3	1-5	grid S-8	3-15	grid N-3	3-15	grid N-7	13-65
14	grid S-3	3-15	grid S-8	4-20	grid N-3	4-20	grid N-7	19-95
15	grid S-3	5-25	grid S-8	6-30	grid N-3	5-25	grid N-8	1-5
16	grid S-3	10-50	grid S-9	1-10	grid N-3	9-45	grid N-8	4-20
17	grid S-3	11-55	grid S-9	3-15	grid N-3	11-55	grid N-8	5-25
18	grid S-3	12-60	grid S-9	4-20	grid N-3	14-70	grid N-8	15-65
19	grid S-3	20-100	grid S-9	5-25	grid N-3	15-75	grid N-8	20-100
20	grid S-4	1-5	grid S-9	6-30	grid N-3	16-80	grid N-9	1-5
21	grid S-4	7-35	grid S-9	7-35	grid N-4	4-20	grid N-9	3-15
22	grid S-4	10-50	grid S-9	20-50	grid N-4	5-25	grid N-9	4-20
23	grid S-4	11-55	grid S-9	24-70	grid N-4	6-30	grid N-9	7-35
24	grid S-4	18-90	grid S-9	27-85	grid N-4	10-50	grid N-9	9-45
25	grid S-4	20-100	grid S-9	28-90	grid N-4	11-55	grid N-9	11-55
26	grid S-5	1-5	grid S-9	29-95	grid N-4	12-60	grid N-9	13-65
27	grid S-5	6-30	grid S-9	20-100	grid N-4	16-80	grid N-9	17-85
28	grid S-5	8-40	grid S-10	1-5	grid N-4	17-85	grid N-10	5-25
29	grid S-5	9-45	grid S-10	5-25	grid N-5	8-40	grid N-10	7-35
30	grid S-5	14-70	grid S-10	6-30	grid N-5	11-55	grid N-10	8-40
31	grid S-5	16-80	grid S-10	7-35	grid N-5	14-70	grid N-10	15-75
32	grid S-5	19-95	grid S-10	17-85	grid N-5	16-80	grid N-10	16-80

QC SURVEILLANCE REPORT
DACA87-99-D-0010
Former Ft. McClellan

1 – Activity

☐ Project Management	☐ Geophysical Data Collection	☐ Data Management	☐ Brush Cutting/Clearing
☐ Intrusive Investigation	☐ Geophysical Data Processing	☐ Demolition	☐ UXO Avoidance/Escort
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ UXO Avoidance	☐ Transect Activity
☐ Survey	☐ Scrap Processing	☒ Other: QA failure at segment 56	

2 – Phase

☐ Preparatory ☐ Initial ☐ Follow up

3 – References

Site Specific Work Plan DACA87-99-D-0010 TO #20

4 - Observed Condition/Activities:

A CEHNC Form 948 was issued by Walt Zange for the 100' boundary around segment 56. This section did not pass QA and was returned to TtFW for further action. The failure resulted when an 81mm TP mortar was found on the surface while conducting the QA sweep.

Personnel Present: Nate Martin (UXOQC), Grady Bendel (Site Manager/SUXOS), Walt Zange (ACOE Safety Rep.)

Conducted By:	Signature:	Date:
Nathaniel W. Martin II		10 August 2004

5- Site UXO QC Specialist Review

Previous sweeps have been walked perpendicular to the adjoining road. The area will be swept again this time walking parallel to the road. The change in direction will cause different readings on the Schonstedt locators and will allow the sweep team to intercept items whose magnetic signature is stronger when read from a different direction.

☐ Acceptable	Deficiency Report #:
☒ Unacceptable	Non-Conformance Report #:

Name:	Signature:	Date:
Nathaniel W. Martin II		10 August 2004

QC SURVEILLANCE REPORT
DACA87-99-D-0010
Former Ft. McClellan

1 – Activity

☐ Project Management	☐ Geophysical Data Collection	☐ Data Management	☐ Brush Cutting/Clearing
☐ Intrusive Investigation	☐ Geophysical Data Processing	☐ Demolition	☐ UXO Avoidance/Escort
☐ Surface Clearance	☐ Anomaly Reacquisition	☐ UXO Avoidance	☐ Transect Activity
☐ Survey	☐ Scrap Processing	☒ Other:	**QA at segment 56 in Area 1H**

2 – Phase

☐ Preparatory	☐ Initial	☐ Follow up

3 – References

Site specific Work Plan DACA87-99-D-0010 TO #20

4 - Observed Condition/Activities:

A CEHNC Form 948 was issued by Walt Zange for the 100' boundary around segment 56 in Area 1H. This area passed QA.

Personnel Present: Nate Martin (UXOQC), Grady Bendel (Site Manager/SUXOS), Walt Zange (ACOE Safety Rep.)

Conducted By:	Signature:	Date:
Nathaniel W. Martin II		12 August 2004

5- Site UXO QC Specialist Review

Comments: no discrepancies noted.

☒ Acceptable	Deficiency Report #:
☐ Unacceptable	Non-Conformance Report #:

Name:	Signature:	Date:
Nathaniel W. Martin II		12 August 2004

Lane Assignment Table - MIL STD 1916 VL(III), CL(A)

LOT Seg. 55, lot 1
Date

Random Letter S4

Lot Size 100

1	2	3	4	5	6
	Grid	**Unit**	**Lane**	**Feet from Grid Corner**	**Grid**
1	1	1	1	5	1
2	2	2	8	40	1
3	3	3	11	55	1
4	4	4	12	60	1
5	5	5	13	65	1
6	6	6	4	20	2
7	7	7	5	25	2
8		8	7	35	2
9		9	8	40	2
10		10	9	45	2
11		11	11	55	2
12		12	12	60	2
13		13	14	70	2
14		14	3	15	3
15		15	5	25	3
16		16	7	35	3
17		17	12	60	3
18		18	13	65	3
19		19	15	75	3
20		20	4	20	4
21		21	7	35	4
22		22	3	15	5
23		23	15	75	5
24		24	2	10	6
25		25	4	20	6
		26	5	25	6
		27	7	35	6
		28	10	50	6
		29	13	65	6
		30	1	5	7
		31	6	30	7
		32	7	35	7

Lot Size:	7 Grids
Grid Size:	50'x100'
Lane Size(Ft): based on sensor sweep	5
Lanes per Grid:	20
Lanes Per Lot Size:	100
Sample Size(n)	32

Lane Assignment Table - MIL STD 1916 VL(III), CL(A)

LOT Seg. 62, Lot 1
Date

Random Letter S65

Lot Size 100

1	2	3	4	5	6
	Grid	**Unit**	**Lane**	**Feet from Grid Corner**	**Grid**
1	1	1	3	15	1
2	2	2	5	25	1
3	3	3	7	35	1
4	4	4	8	40	1
5	5	5	5	25	2
6	6	6	6	30	2
7	7	7	10	50	2
8	8	8	1	5	3
9	9	9	2	10	3
10	10	10	4	20	3
11		11	5	25	3
12		12	8	40	3
13		13	1	5	4
14		14	8	40	4
15		15	10	50	4
16		16	4	20	5
17		17	7	35	5
18		18	5	25	6
19		19	6	30	6
20		20	4	20	7
21		21	6	30	7
22		22	3	15	8
23		23	5	25	8
24		24	9	45	8
25		25	10	50	8
		26	4	20	9
		27	6	30	9
		28	7	35	9
		29	1	5	10
		30	3	15	10
		31	5	25	10
		32	6	30	10

Lot Size:	10 Grids
Grid Size:	50'x100'
Lane Size(Ft): based on sensor sweep	5
Lanes per Grid:	20
Lanes Per Lot Size:	100
Sample Size(n)	32

Lane Assignment Table - MIL STD 1916 VL(III), CL(A)

LOT seg. 62, lot 2
Date

Random Letter S74

Lot Size 100

1	2	**3**	4	5	6
	Grid	**Unit**	**Lane**	**Feet from Grid Corner**	**Grid**
1	1	1	2	10	21
2	2	2	4	20	21
3	3	3	8	40	21
4	4	4	9	45	21
5	5	5	2	10	22
6	6	6	3	15	22
7	7	7	9	45	22
8	8	8	1	5	23
9	9	9	5	25	23
10	10	10	6	30	23
11		11	9	45	23
12		12	10	50	23
13		13	2	10	24
14		14	8	40	24
15		15	9	45	24
16		16	1	5	25
17		17	2	10	25
18		18	3	15	25
19		19	4	20	25
20		20	5	25	25
21		21	3	15	26
22		22	8	40	26
23		23	9	45	26
24		24	7	35	27
25		25	3	15	28
		26	10	50	28
		27	3	15	29
		28	7	35	29
		29	1	5	30
		30	5	25	30
		31	6	30	30
		32	7	35	30

Lot Size:	10 Grids
Grid Size:	50'x100'
Lane Size(Ft): based on sensor sweep	5
Lanes per Grid:	20
Lanes Per Lot Size:	100
Sample Size(n)	32

Lane Assignment Table - MIL STD 1916 VL(III), CL(A)

LOT Seg. 63, lot 1
Date

Random Letter S77

Lot Size 100

1	2	**3**	4	5	6
	Grid	**Unit**	**Lane**	**Feet from Grid Corner**	**Grid**
1	1	1	1	5	1
2	2	2	4	20	1
3	3	3	6	30	1
4	4	4	9	45	1
5	5	5	10	50	1
6	6	6	1	5	2
7	7	7	8	40	2
8	8	8	1	5	3
9	9	9	2	10	3
10	10	10	6	30	3
11		11	10	50	3
12		12	3	15	4
13		13	4	20	4
14		14	8	40	4
15		15	2	10	5
16		16	7	35	5
17		17	1	5	6
18		18	5	25	6
19		19	8	40	6
20		20	1	5	7
21		21	3	15	7
22		22	4	20	7
23		23	8	40	8
24		24	2	10	9
25		25	4	20	9
		26	8	40	9
		27	9	45	9
		28	10	50	9
		29	4	20	10
		30	6	30	10
		31	7	35	10
		32	8	40	10

Lot Size:	10 Grids
Grid Size:	50'x100'
Lane Size(Ft): based on sensor sweep	5
Lanes per Grid:	20
Lanes Per Lot Size:	100
Sample Size(n)	32

Lane Assignment Table - MIL STD 1916 VL(III), CL(A)

LOT seg. 63, lot 2
Date

Random Letter S34

Lot Size 100

1	2	**3**	4	5	6
	Grid	**Unit**	**Lane**	**Feet from Grid Corner**	**Grid**
1	1	1	1	5	31
2	2	2	4	20	31
3	3	3	5	25	31
4	4	4	16	80	31
5	5	5	4	20	32
6	6	6	5	25	32
7	7	7	17	85	32
8		8	2	10	33
9		9	4	20	34
10		10	7	35	34
11		11	10	50	34
12		12	17	85	35
13		13	8	40	35
14		14	9	45	35
15		15	2	10	36
16		16	6	30	36
17		17	7	35	36
18		18	11	55	36
19		19	1	5	37
20		20	6	30	37
21		21	8	40	37
22		22	1	5	38
23		23	3	15	38
24		24	6	30	38
25		25	10	50	38
		26	1	5	39
		27	8	40	39
		28	2	10	40
		29	3	15	40
		30	14	70	40
		31	16	80	40
		32	18	90	40

Lot Size:	10 Grids
Grid Size:	50'x100'
Lane Size(Ft): based on sensor sweep	5
Lanes per Grid:	20
Lanes Per Lot Size:	100
Sample Size(n)	32

Daily Quality Control Report Form

Tetra Tech FW, Inc.

Date	Day	Report Number	Project Name	Contract Number
8/5/2004	Thursday	071304QC878	Fort McClellan, Alabama	DACA87-99-D-0010

Weather/Precipitation	High	Low	Wind	Humidity
p-cloudy, hi 89, 30% chance of t-storms, 84% h	89	71	3-5	84%

FWENC Personnel On Site (Reference/Attach Superintendent's Daily Report if Applicable)

See Daily Report

Equipment On Site	Active this Shift Yes/No
See Daily Report	Yes

Subcontractors On Site	Subcontractor's QC Report Attached Yes/No
None	N/A

Material/Equipment Received (Reference/Attach Inspection Reports)

None

Work Performed

preparations for clean up in area 20. Gave compulsory safety brief to Alabama Department of Environmental Management (ADEM) representatives Phillip Stroud and Shana Decker. Began clean-up of improperly moved munition items.

Quality Control Activities (Reference/Attach Inspection Report).

Task Order 20 Fish and Wildlife Area

Begin corrective actions resulting from improperly move ordnance items

Other

None

Problems Encountered/Corrective Actions Taken

None

Directions Given/Received

None

Special Notes/Other

None

Visitors

Phillip Stroud, David Bush

Daily Quality Control Report Form

Grady Bendel		Site UXO QC Specialist
Name	Signature	Title

Daily Quality Control Report Form

Tetra Tech FW, Inc.

Date	Day	Report Number	Project Name	Contract Number
8/6/2004	Friday	071304QC879	Fort McClellan, Alabama	DACA87-99-D-0010

Weather/Precipitation	High	Low	Wind	Humidity
p-cloudy, light wind	85	69	NNE	85%

FWENC Personnel On Site (Reference/Attach Superintendent's Daily Report if Applicable)

See Daily Report

Equipment On Site	Active this Shift Yes/No
See Daily Report	Yes

Subcontractors On Site	Subcontractor's QC Report Attached Yes/No
None	N/A

Material/Equipment Received (Reference/Attach Inspection Reports)

None

Work Performed

Surface clearance on right side of road in area 1H, demolition of ordnance items that were found during clearance ops or that were improperly moved during previous efforts.

Quality Control Activities (Reference/Attach Inspection Report).

Task Order 20 Fish and Wildlife Area

Continue corrective actions resulting from improperly moved ordnance items.

Other

None

Problems Encountered/Corrective Actions Taken

None

Directions Given/Received

None

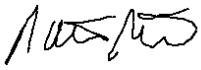
Special Notes/Other

None

Visitors

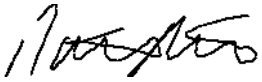
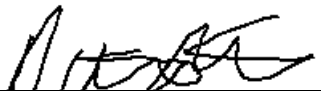
David Bush (ADEM), Dan Copeland (Tetra Tech FW)

Daily Quality Control Report Form

Grady Bendel		Site UXO QC Specialist
Name	Signature	Title

QC Surveillance Report
DACA87-99-D-0010

Former Ft. McClellan, AL

1-Activity		
Weekly Explosive Inventory		
2-Phase		
Follow Up		
3-References		
TO 20 US Fish and Wild Life		
4-Observed Condition/Activities		
Explosive Invetory Inspected all explosives to insure quantities recorded are correct and all explosives are serviceable. No discrepacies were noted. Personnel involved: Grady Bendel (Site Manager/SUXOS), Nate Martin (QC/Safety Officer), David Crossley (Team Leader)		
Conducted By: QC Team	Signature: 	Date: 8/4/2004
5-Site UXO QC Specialist Review		
Comments: Conducted inventory and transferred responsibility for explosive accountability to incoming QC (Nate Martin) and SUXOS(Grady Bendel). No discrepancies were noted.		
☑ Acceptable ☐ Unacceptable	Deficiency Report #: N/A Non-Conformance Report #: N/A	
Name: Grady Bendel	Signature: 	Date: 8/4/2004

QC Surveillance Report
DACA87-99-D-0010

Former Ft. McClellan, AL

1-Activity		
QC Team		
2-Phase		
Preparatory		
3-References		
TO 20 US Fish and Wild Life		
4-Observed Condition/Activities		
Disposition of improperly moved munitions briefing given to provide details on operations to be conducted as a result of improperly move munitions. Personnel involved: Grady Bendel, David Crossley, Todd Biggs, Nate Martin		
Conducted By: QC Team	Signature:	Date: 8/5/2004
5-Site UXO QC Specialist Review		
Comments: All personnel are aware of their responsibilities and duties in regards to this operation.		
☑ Acceptable ☐ Unacceptable	Deficiency Report #: N/A Non-Conformance Report #: N/A	
Name: Grady Bendel	Signature:	Date: 8/5/2004

QC Surveillance Report
DACA87-99-D-0010

Former Ft. McClellan, AL

1-Activity		
Surface Removal		
2-Phase		
Initial		
3-References		
TO 20 US Fish and Wild Life		
4-Observed Condition/Activities		
No Entry Sweep team's line spacing and interval is sufficient to provide adequate ground coverage. Team is investigating all anomalies found and reporting findings. No ordnance items are moved. All previously moved ordnance items are identfied as such and are prepared for demolition. Personnel involved: David Crossley, Donald Welch, Brian Steelman		
Conducted By: QC Team	Signature:	Date: 8/6/2004
5-Site UXO QC Specialist Review		
Comments: Observed team operations to insure sweep coverage is adequate/efficient and to insure standards are being met. No discrepacies were noted.		
☑ Acceptable ☐ Unacceptable	Deficiency Report #: N/A Non-Conformance Report #: N/A	
Name: Grady Bendel	Signature:	Date: 8/6/2004

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO: TETRA TECH	DATE: 8/9/04	TIME: 1700

CONTRACT NUMBER: DACA-87-99-D-0016	PROJECT LOCATION: FT McCLELLAN ANNISTON, AL
DO #: 0020	

SUBJECT ITEM(S) (Check all that apply):

- ☐ Work Plan
- ☐ Safety Violation
- ☐ Safety Comments
- ☒ Quality Control
- ☐ Other PROJECT 948 # 71

DESCRIPTION: SEGMENT 05 100' BOUNDARY MAG ASSISTED SURFACE SWEEP WAS TURNED OVER FOR QA

☐ Prompt correction or compliance with contract specifications is requested.

USACE Site Representative

RECEIPT ACKNOWLEDGED:

Contractor's Representative

ACTION TAKEN:

CEHNC FORM 948 (Revised) 1 APR 96

COPY 1 - Contractor's Representative

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO: TETRA TECH	DATE: 8/9/04	TIME: 1700

CONTRACT NUMBER: DACA-87-99-D-0016	PROJECT LOCATION: FT McCLELLAN ANNISTON AL
DO #: 0020	

SUBJECT ITEM(S) (Check all that apply):

- ☐ Work Plan
- ☐ Safety Violation
- ☐ Safety Comments
- ☒ Quality Control
- ☐ Other PROJECT 948 # 72

DESCRIPTION: SEGMENT 056 100' BOUNDARY MAG ASSISTED SURFACE SWEEP FAILED GOVERNMENT QA WHEN A 81 MM MORTAR WAS FOUND ON THE SURFACE APPROX. 25' OFF THE ROAD

☐ Prompt correction or compliance with contract specifications is requested.

USACE Site Representative

RECEIPT ACKNOWLEDGED:

Contractor's Representative

ACTION TAKEN:

CEHNC FORM 948 (Revised) 1 APR 96

COPY 1 - Contractor's Representative

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO:	DATE:	TIME:
TETRA TECH	9/2/04	0800

CONTRACT NUMBER:	PROJECT LOCATION:
DACA-87-99-D-0010	FT McCLELLAN ANNISTON AL
DO #: 0020	

SUBJECT ITEM(S) (Check all that apply):

- ☐ Work Plan
- ☐ Safety Violation
- ☐ Safety Comments
- ☒ Quality Control
- ☐ Other PROJECT 948# 74

DESCRIPTION: SEGMENT 055 LOT 1
SEGMENT 062 LOT 1 & 2
SEGMENT 063 LOT 1 & 2
WERE TURNED OVER FOR QA

☐ Prompt correction or compliance with contract specifications is requested.

USACE Site Representative

RECEIPT ACKNOWLEDGED:

Contractor's Representative

ACTION TAKEN:

CEHNC FORM 948 (Revised) 1 APR 96

COPY 1 - Contractor's Representative

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
ORDNANCE AND EXPLOSIVE GROUP
MEMO

TO: TETRA TECH	DATE: 9/2/04	TIME: 0900

CONTRACT NUMBER: DACA-87-99-D-0010	PROJECT LOCATION: FT MCCLELLAN ANNISTON, AL
DO #: 0020	

SUBJECT ITEM(S)

(Check all that apply):

- ☐ Work Plan
- ☐ Safety Violation
- ☐ Safety Comments
- ☒ Quality Control
- ☐ Other PROJECT 948 # 75

DESCRIPTION: SEGMENT 055 LOT 1
SEGMENT 062 LOT 1 & 2
SEGMENT 063 LOT 1 & 2 PASSED
GOVERNMENT QA

☐ Prompt correction or compliance with contract specifications is requested.

USACE Site Representative

RECEIPT ACKNOWLEDGED:

Contractor's Representative

ACTION TAKEN:

CEHNC FORM 948 (Revised) 1 APR 96

COPY 1 - Contractor's Representative