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MCRD PARRIS ISLAND
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U S NAVY RESPONSE TO SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
COMMENTS TO REMEDIAL INVESTIGATION WORK PLAN UXO SITES 2, 3, 4, 5, 6, 7 AND 8
MCRD PARRIS ISLAND SC
5/1/2012
U S NAVY

RESPONSE TO SCDNR COMMENTS DATED JUNE 22, 2012
REMEDIAL INVESTIGATION WORK PLAN FOR MUNITIONS RESPONSE PROGRAM
UXO SITES 2, 3, 4, 5, 6, 7, 8, DATED MAY 2012
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

Note: The subject SCDNR comments were received after the Revised Final Remedial Investigation Work Plan (RIWP) was issued in May 2012 and field work was underway. Any remaining outstanding issues will be discussed and resolved in an initial RI scoping session (with additional scoping meetings as necessary) following the receipt, validation, and evaluation of analytical data. UXO 2 Expanded SI (ESI) validated results and UXO 5 RI validated results have been combined with their respective SI results and presented during the February 2013 Tier I team conference call. The attached UXO 5 sampling summary and data tables and supporting figures, including a tag map, was extracted from the February 12, 2013 presentation at the Tier I meeting (similarly, the UXO 2 presentation is attached to the SCDNR comment response letter on the ESI work plan).

Priscilla H. Wendt, Office of Environmental Programs

Introduction

3.3 Field Artillery East Shrapnel Range (UXO 5 and UXO 6)

1. **Comment:** As shown in Figure Int-2, the Uprange Firing Fan (UXO 5) includes intertidal marsh on both sides of Ballast Creek, as well as a portion of Ballast Creek itself; however, no sediment samples are proposed to be collected in UXO 5. Although UXO 6 is identified as the impact area for this range, is there sufficient evidence from the initial Site Inspection that munitions, which might have fallen short of the target area, are not present in UXO 5? If not, sediment samples should be collected from both UXO 5 and UXO 6.

Response: Eighteen (18) sediment samples were collected throughout the UXO 6 waterway during the Site Inspection (SI). Lead was detected at concentrations between 2.2 and 20.8 mg/kg (lead sediment background = 7.99 mg/kg). No explosives compounds were detected. It is anticipated that both the density of anomalies and concentrations of munitions constituents (MC) in the sediment would be lower in UXO 5 (Field Artillery East Shrapnel Range (Firing Point)) than in UXO 6 (Field Artillery East Shrapnel Range (Impact Area)) based on the conceptual site model for this site (i.e., artillery projectiles would be expected to land in significantly higher numbers in the intended target area than to fall short). Based on the data generated during the SI, no sediment sampling was deemed necessary at UXO 5, and no further sediment sampling was deemed necessary at UXO 6 other than the biased sampling at locations of 75mm projectile finds (if any) already specified in the Remedial Investigation Work Plan (RIWP).

Note that discrete and incremental soil samples were collected at UXO 5. SI validated results have been combined with RI results as per the attached UXO 5 sampling summary and data tables and supporting figures, including a tag map, that have been extracted from the February 12, 2013 presentation at the Tier I meeting.

Appendix B-1 (Response to Comments on Sampling and Analysis Plan)

- 2. Comment:** Appendix B-1 (Response to Comments on Sampling and Analysis Plan) - The SCDNR does not concur with the Navy's response to USEPA comment #12 on p. 14. The Navy disagrees with the USEPA's recommendation to conduct a site-wide ecological risk assessment using both the maximum and average concentrations of MC-related COPCs from all UXO sites that might be within the home range of a large carnivorous bird (as a potential ecological receptor species). The Navy argues that sample data collected from locations known or suspected to be impacted by historical munitions activities are not representative of a realistic exposure scenario for large carnivorous birds or mammals since the impacted area would represent only a small portion of the species' home range. The SCDNR agrees with this assertion; however, the USEPA specifically recommends that the proposed site-wide ecological risk assessment "...take into consideration what portion of the range area the UXO sites would account for (i.e., allow for non-site areas within the range area if appropriate)." This approach would address the Navy's concern about a realistic exposure scenario, while presenting a more accurate assessment of the cumulative ecological risk posed by MC-related COPCs from all UXO sites throughout the Parris Island MCRD. The SCDNR recognizes that the Preliminary Ecological Risk Evaluation for UXO 2 (Appendix D) was intended to be site-specific (as opposed to site-wide), and that the ecological receptor species used (insectivorous birds and mammals) would be at greater risk from exposure to certain metals than carnivorous species; however, we concur with the USEPA that the RI Report should include a site-wide (i.e., all UXO sites combined) ecological risk assessment for those large carnivorous (or piscivorous) receptor species whose home range might include an area that large.

Response: The approach for the ecological risk assessments will be discussed and resolved in an initial RI scoping session (with additional scoping meetings as necessary) following the receipt, validation, and evaluation of analytical data. As indicated in the Navy's response to Comment No. 18 from EPA's March 16, 2012 conditional approval letter (published in Appendix B-2 of the May 2012 RIWP), the Navy will ensure that the Natural Resources Trustees are invited to participate in the scoping session.

Appendix B-2 (Responses to Conditional Approval Letters for RI Work Plan)

- 3. Comment:** USEPA comment #17 on p. 9 of Appendix B-2: As a condition for approval of the RI WP, the USEPA requests that the Navy provide a record of the Natural Resource Trustees' (NRTs') satisfactory acceptance of the revised draft of the RI WP. The Navy responds to this condition by citing e-mail correspondence from the NRTs in "Appendix A" of the Introduction. First of all, "Appendix A" should be changed to "Appendix C". More importantly, however, SCDNR's acceptance of the RI WP depends on the Navy's response to the few outstanding issues raised in this comment letter. To some extent, SCDNR's comment #2 (above) is addressed in the Navy's response to USEPA comment #18 on pp. 9-10 of Appendix B-2. The SCDNR agrees with EPA's recommendation that a scoping session be conducted to ensure that the Partnering Team is in agreement regarding the details of the approach to be used in performing the ecological risk assessments for the RI. The SCDNR appreciates the Navy's willingness to conduct such a scoping session, as indicated in their response to EPA's comment, and as shown by the addition of the scoping session to the project schedule in Worksheet #16 of the RI WP.

Response: The comment about the incorrect reference to Appendix A is noted. Regarding ecological risk assessment, the Navy looks forward to meeting with the Team, including the Natural Resources Trustees. See also response to Comment 2.

Sampling and Analysis Plan: Part 2 Munitions Constituents at UXO Sites 2, 3, 4, 5, 6, 7, 8

Worksheet #10 - Conceptual Site Model

4. **Comment:** Section 10.7.2 on p. 60 describes earlier Site Inspection (SI) activities at UXO 5 and UXO 6. As shown in Figure 10-10, the Uprange Firing Fan (UXO 5) includes intertidal marsh on both sides of Ballast Creek, as well as a portion of Ballast Creek itself; however, no sediment samples are proposed to be collected in UXO 5. Although UXO 6 is identified as the impact area for this range, is there sufficient evidence from the initial SI that munitions, which might have fallen short of the target area, are not present in UXO 5? If not, sediment samples should be collected from both UXO 5 and UXO 6.

Response: See response to Comment 1.

Worksheet #11 - Project Quality Objectives/Systematic Planning Process Statements

5. **Comment:** Please modify the last sentence on p. 75 as follows: *“These risk assessments will be conducted in consultation with the Natural Resource Trustees and in accordance with USEPA protocols and Navy guidance documents for HHRAs and ERAs.”*

Response: No further revisions to the RIWP are planned. However, the Navy will ensure that the Natural Resource Trustees are involved in establishing the risk assessment approach for these sites. See also response to Comment 2.

Worksheet #17 - Sample Design and Rationale

6. **Comment:** Depending on the Navy’s response to comments #1 and #4 (above), section 17.3 describing the sampling design and rationale for UXO 5 might have to be modified to reflect the collection of sediment samples as well as soil samples.

Response: See responses to Comments 1 and 4. Soil sampling to date (SI and RI) appears to be adequate. No sediment sampling at UXO 5 is currently deemed necessary.

Appendix F - Project Action Limit Backup Tables

7. **Comment:** Please convert the two tables showing the Ecological Screening Criteria for Surface Soil and Sediment Samples from portrait to landscape format so that they can be read without using a magnifying glass.

Response: No further revisions to the RIWP are planned. However, the Navy will ensure that future publications of the Ecological Screening Criteria tables will be in landscape

format. Also, please refer to the easier to read Worksheet #15 of the MC SAP, where the hierarchy is applied and the selected criteria are presented.

UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (FIRING POINT)

UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (FIRING POINT)		
Table/Figure Number	CSM and Investigation Summary	Path Forward
Figure X5-1	History: Established in 1937 as one of two field artillery ranges, the Field Artillery East Shrapnel Range had been designated as UXO 5 (northern portion which includes Firing Point T) and UXO 6 (southern portion which includes the target/impact areas). The Field Artillery East Shrapnel Range consisted of a single firing position (Firing Point T) at Ballast Creek with a southerly direction of fire.	Prepare RI Report including risk assessment. ** Discuss with team whether UXO 5 and UXO 6 should be separate or combined report**
Table X5-1 Figures X5-2 X5-3	MEC/MPPEH: Detector-aided and geophysical surveys were conducted in the SI and RI. No munitions related items were found on the surface. Intrusive investigations were conducted at all RI anomaly locations, with no munitions related items found.	
Tables X5-2 X5-3 Figures X5-4 X5-5	MC: Incremental soil samples were collected during both the SI and RI. Discrete surface soil samples were also collected during the SI. Site data appears to be adequate and no further investigation is anticipated.	

TABLE X5-1

**DIG SHEET - MANUAL TARGET EXCAVATION RESULTS
 UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (Firing Point)
 MCRD PARRIS ISLAND
 PARRIS ISLAND, SOUTH CAROLINA**

Location or Anomaly Number	Coordinates		Approximate Excavation Size	Munitions-Related Items	Non-Munitions Items	
	N	E		Number and Description	Number and Description	Approx. Weight (lbs)
X5-FPT-01	184068.09	2103130.60	2' x 2' x 0.25' deep	None	Construction debris - brick and concrete with rebar	100 + lbs
X5-FPT-02	184069.17	2103225.81	2' x 1' x 1.5' deep	None	Construction debris	50 lbs
X5-FPT-03	184069.12	2103231.64	2 feet deep	None	Construction debris – asphalt slabs	--
X5-FPT-04	184069.12	2103238.24	1 foot deep	None	No Find	--
X5-FPT-05	184069.33	2103266.49	1.1 foot deep	None	No Find	--
X5-FPT-06	184073.75	2103226.64	NA	None	No Find	--
X5-FPT-07	184071.80	2103072.03	20 inches deep	None	Rebar/pipe	--
X5-FPT-08	184074.28	2103253.50	NA	None	No Find	--
X5-FPT-09	184074.89	2103275.15	1' x 0.5' x 0.5' deep	None	Rebar	1 lb
X5-FPT-10	184075.31	2103109.56	2 feet deep	None	Construction debris – concrete slab and rebar	50 lbs

TABLE X5-1

**DIG SHEET - MANUAL TARGET EXCAVATION RESULTS
 UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (Firing Point)
 MCRD PARRIS ISLAND
 PARRIS ISLAND, SOUTH CAROLINA**

Location or Anomaly Number	Coordinates		Approximate Excavation Size	Munitions-Related Items	Non-Munitions Items	
	N	E		Number and Description	Number and Description	Approx. Weight (lbs)
X5-FPT-11	184075.51	2103173.28	1' x 0.5' x 0.5' deep	None	Metal waste	2 oz
X5-FPT-12	184076.54	2103106.47	4 feet deep	None	Pipe	--
X5-FPT-13	184076.54	2103271.64	2 feet deep	None	Cultural debris – concrete slab with rebar	--
X5-FPT-14	184076.75	2103070.38	4 inches deep	None	Concrete	--
X5-FPT-15	184077.78	2103098.43	No dig – metal sign post	None	--t	--
X5-FPT-16	184078.19	2103089.56	12 inches deep	None	No Find	--
X5-FPT-17	184078.40	2103175.76	12inches deep	None	No Find	--
X5-FPT-18	184079.84	2103246.49	2 feet deep	None	Metal waste	3 lbs
X5-FPT-19	184080.67	2103152.25	6 inches deep	None	Construction debris – pry bar	5 lbs
X5-FPT-20	184081.90	2103240.51	2 inches deep	None	Metal waste	8 lbs

TABLE X5-1

**DIG SHEET - MANUAL TARGET EXCAVATION RESULTS
 UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (Firing Point)
 MCRD PARRIS ISLAND
 PARRIS ISLAND, SOUTH CAROLINA**

Location or Anomaly Number	Coordinates		Approximate Excavation Size	Munitions-Related Items	Non-Munitions Items	
	N	E		Number and Description	Number and Description	Approx. Weight (lbs)
X5-FPT-21	184082.11	2103207.51	2 inches deep	None	Construction debris	1 lb
X5-FPT-22	184082.94	2103169.78	3 inches deep	None	Concrete	--
X5-FPT-23	184086.50	2103097.73	3.5 feet deep	None	Construction debris	--
X5-FPT-24	184084.79	2103073.07	6 inches deep	None	Concrete slab	100 lbs
X5-FPT-25	184084.79	2103192.05	1 inch deep	None	Construction debris - pipe	1 lb
X5-FPT-26	184090.98	2103269.79	NA	None	No Find	--
X5-FPT-27	184092.63	2103218.65	1.5" x 2' x 2 feet deep	None	Pipe	--
X5-FPT-28	184092.83	2103272.05	2 feet deep	None	Reinforced concrete	100 lbs
X5-FPT-29	184092.83	2103273.09	1.5' x 3' x 0.5 feet deep	None	Metal pipe	10 lbs
X5-FPT-30	184093.45	2103079.87	1' x 0.3' x 3.5 feet deep	None	Pipe	2 lbs
X5-FPT-31	184103.76	2103072.65	2' x 1' x 3 feet deep	None	Construction debris	50 lbs

TABLE X5-1

**DIG SHEET - MANUAL TARGET EXCAVATION RESULTS
 UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (Firing Point)
 MCRD PARRIS ISLAND
 PARRIS ISLAND, SOUTH CAROLINA**

Location or Anomaly Number	Coordinates		Approximate Excavation Size	Munitions-Related Items	Non-Munitions Items	
	N	E		Number and Description	Number and Description	Approx. Weight (lbs)
X5-FPT-32	184110.25	2103081.64	2' x 1.5' x 0.75 feet deep	None	Cultural debris	5 lbs
X5-FPT-33	184084.42	2103151.64	NA	None	No Find	--
X5-FPT-34	184068.75	2103204.98	1 foot deep	None	No Find	--
X5-FPT-35	184069.00	2103213.39	1 foot deep	None	No Find	--
X5-FPT-36	184070.25	2103273.81	1 foot deep	None	No Find	--

-- = Not applicable.

TABLE X5-2

**SI/RI SAMPLE COLLECTION SUMMARY FOR FIXED-BASE LABORATORY ANALYSIS
 UXO 5 – FIELD ARTILLERY EAST SHRAPNEL RANGE (Firing Point)
 MCRD PARRIS ISLAND
 PARRIS ISLAND, SOUTH CAROLINA**

Investigation	Location	Sample Number	Sample Type	Date Collected	Medium	Depth Collected (inches)	Analyses
SI	X05SB01	X05SS01C0006	Incremental /Original	2-8-10	Soil	0-6	Explosives
		X05SS01C0006-D	Incremental /Duplicate	2-8-10		0-6	
		X05SS01C0006-T	Incremental /TriPLICATE	2-8-10		0-6	
SI	X05SB02	X05SS02G0001	Discrete /Original	2-8-10		0-12	Lead
SI	X05SB03	X05SS03G0001	Discrete /Original	2-8-10		0-12	
RI	X5IS101	X5IS101-0002-0712	Incremental /Original	7-10-12		0-2	Explosives including NG
		X5IS102-0002-0712	Incremental /Duplicate	7-10-12	0-2		
		X5IS103-0002-0712	Incremental /TriPLICATE	7-10-12	0-2		

RI – Remedial Investigation

SI – Site Inspection

NG - Nitroglycerin

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Legend

- Presumed Firing Point Location (As Identified in Archives Search Report)
- Presumed Firing Point Location (Per RI SAP)
- Active Range
- Uprange Firing Fan and Firing Point Boundaries
- Site Boundary



DRAWN BY	DATE
T. WHEATON	08/06/11
CHECKED BY	DATE
M. COFFMAN	02/08/13
REVISED BY	DATE
J. ENGLISH	02/08/13
SCALE	
AS NOTED	



SITE LOCATION
UXO 5 / UXO 6 - FIELD ARTILLERY EAST SHRAPNEL RANGE
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NUMBER	CTO NUMBER
	110
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE X5-1	0

Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).
Aerial photo taken in March of 2010.



Legend

- Presumed Firing Point Location (As Identified in Archives Search Report)
- Presumed Firing Point Location (Per RI SAP)
- MEC SI: 100% Surface Survey
- MEC RI: 100% Surface and Geophysical Survey

DRAWN BY	DATE
J. ENGLISH	01/29/13
CHECKED BY	DATE
M. COFFMAN	02/06/13
REVISED BY	DATE
SCALE AS NOTED	

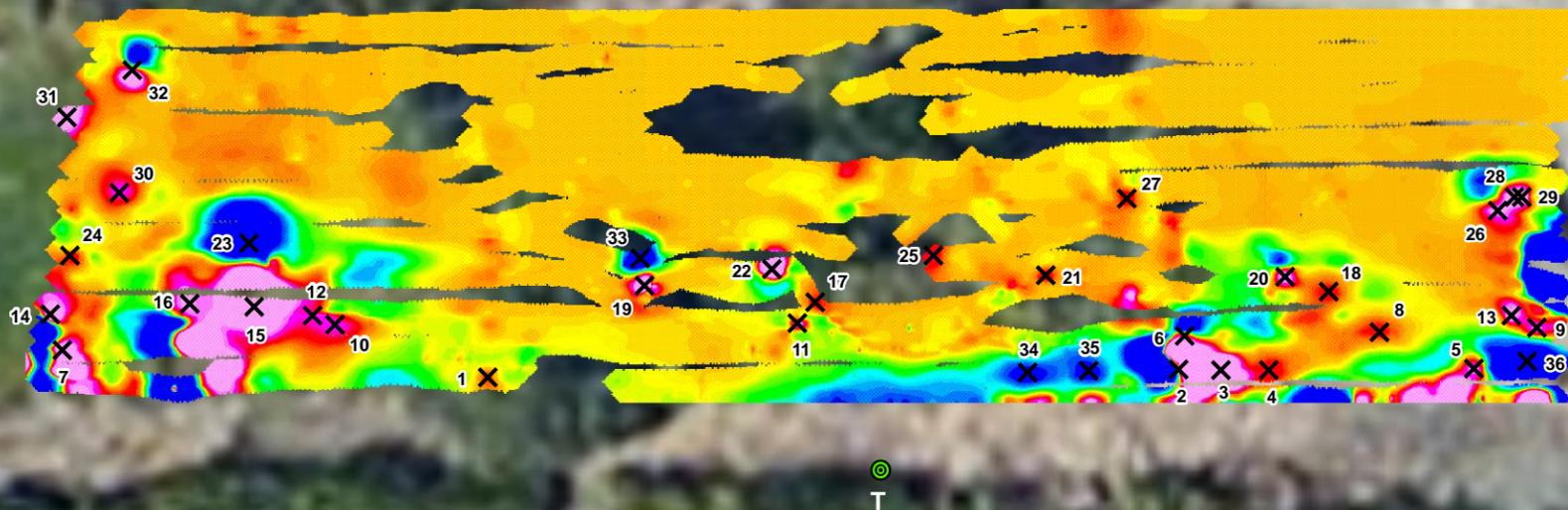


MEC SI/RI SURFACE AND DGM GEOPHYSICAL SURVEYS
UXO 5 - FIELD ARTILLERY EAST
SHRAPNEL RANGE FIRING POINT
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NUMBER	CTO NUMBER
	110
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE X5-2	0



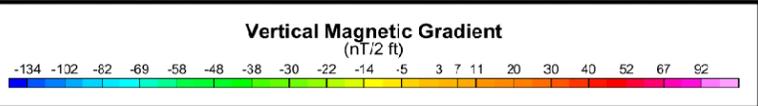
Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).
Aerial photo taken in March of 2010.



Legend

- Presumed Firing Point Location (Per RI SAP)
- Target Dig Locations (36 dig locations)

Note: No munitions-related finds were encountered. Non-munitions finds are summarized in Table X5-1.



DRAWN BY	DATE
J. ENGLISH	01/29/12
CHECKED BY	DATE
M. COFFMAN	02/06/13
REVISED BY	DATE
SCALE AS NOTED	



MEC RI DGM RESULTS AND TARGET DIG LOCATIONS
UXO 5 - FIELD ARTILLERY EAST
SHRAPNEL RANGE FIRING POINT
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NUMBER	CTO NUMBER
	110
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
X5-3	0

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Legend

-  Presumed Firing Point Location (As Identified in Archives Search Report)
-  Presumed Firing Point Location (Per RI SAP)
-  Discrete Surface Soil Sample Location (0 - 12" for lead)
-  MC SI: Incremental Sample Location (200' x 50')
-  MC RI: Incremental Sample Location (200' x 50')

DRAWN BY	DATE
J. ENGLISH	01/29/13
CHECKED BY	DATE
M. COFFMAN	02/08/13
REVISED BY	DATE
SCALE AS NOTED	



MC SI AND RI SAMPLE LOCATIONS
UXO 5 - FIELD ARTILLERY EAST
SHRAPNEL RANGE FIRING POINT
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NUMBER	CTO NUMBER
	110
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE X5-4	0



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Legend

- Presumed Firing Point Location (As Identified in Archives Search Report)
- Presumed Firing Point Location (Per RI SAP)
- Discrete Surface Soil Sample Location
- MC SI: Incremental Sample Location (200' x 50')
- MC RI: Incremental Sample Location (200' x 50')

Sample Location Depth in inches

X05SB03 [0-12]	LEAD 24.9	Result in mg/kg
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Note: Incremental samples analyzed for explosives. Discrete samples analyzed for lead.

DRAWN BY	DATE
J. ENGLISH	01/29/13
CHECKED BY	DATE
M. COFFMAN	02/07/13
REVISED BY	DATE
SCALE AS NOTED	



MC SI AND RI POSITIVE DETECTIONS GREATER THAN BACKGROUND - SURFACE SOIL
UXO 5 - FIELD ARTILLERY EAST
SHRAPNEL RANGE FIRING POINT
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NUMBER	CTO NUMBER
	110
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE X5-5	0