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FINAL FEASIBILITY STUDY ADDENDUM UNEXPLODED ORDNANCE 18 (UXO 18)
ATLANTIC FLEET WEAPONS TRAINING AREA FORMER VIEQUES NAVAL TRAINING
RANGE VIEQUES ISLAND PUERTO RICO

04/01/2016
CH2M HILL

Final

**UXO 18
Feasibility Study Addendum**

**Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico**

Contract Task Order 019

April 2016

Prepared for

**Department of the Navy
Naval Facilities Engineering Command
Atlantic Division**

Under the

**LANTDIV CLEAN 8012 Program
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Executive Summary

In 2015, the Remedial Investigation/Feasibility Study (RI/FS) Report for UXO 18 (Cayo La Chiva) was issued. The Feasibility Study portion of the report evaluated remedial alternatives to address potential explosive hazards associated with munitions and explosives of concern (MEC) identified in the RI. This Feasibility Study Addendum Report provides further clarification of the costs and associated assumptions used to evaluate the various remedial alternatives. As such, the Feasibility Study Addendum is streamlined to provide updated text and tables that provide additional detail regarding costs associated with Alternative 3 – Limited MEC Removal, Land Use Controls (LUCs), and MEC Inspections and Alternative 4 – MEC Removal, LUCs, and MEC Inspections. It is important to note that costs have not been revised, only clarified by providing additional detail. Information presented in this report, as well as the RI/FS Report (CH2M, 2015), will be used to support the UXO 18 Proposed Remedial Action Plan (PRAP).

Resumen Ejecutivo

El Informe de la Investigación para la Remediación/Estudio de Viabilidad (RI/FS, por sus siglas en inglés) para UXO 18 (Cayo La Chiva) se emitió en el 2015. La porción del informe referente al Estudio de Viabilidad evaluó alternativas de remediación para atender los peligros potenciales de explosión asociados con municiones y explosivos de preocupación (MEC, por sus siglas en inglés) identificados en el RI. Este Apéndice al Informe del Estudio de Viabilidad provee clarificación adicional de los costos y suposiciones asociadas utilizadas para evaluar las varias alternativas de remediación. Como tal, el Apéndice al Estudio de Viabilidad se ha simplificado para proveer texto y tablas actualizadas que proveen detalles adicionales sobre los costos asociados con la Alternativa 3 – Remoción Limitada de MEC, Controles de Uso del Terreno (LUCs, por sus siglas en inglés), e Inspecciones de MEC y la Alternativa 4 – Remoción de MEC, LUCs, e Inspecciones de MEC. Es importante señalar que no se han revisado los costos, solo se han clarificado, incluyendo datos adicionales. La información presentada en este informe, al igual que en el Informe RI/FS (CH2M, 2015), será usada como apoyo para el Plan Propuesto para la Acción de Remediación (PRAP, por sus siglas en inglés) para UXO 18.

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Acronyms and Abbreviations

bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FS	Feasibility Study
LTM	long-term monitoring
LUC	land use control
MEC	munitions and explosives of concern
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
PRAP	Proposed Remedial Action Plan
PRDNER	Puerto Rico Department of Natural and Environmental Resources
PREQB	Puerto Rico Environmental Quality Board
RAO	remedial action objective
RI	Remedial Investigation
U.S.	United States
USFWS	United States Fish and Wildlife Service
VNTR	Vieques Naval Training Range

SECTION 1

Introduction

This Feasibility Study (FS) Addendum Report provides further clarification on costs and assumptions used to evaluate remedial alternatives to address explosive hazards associated with potential munitions and explosives of concern (MEC) at UXO 18, as summarized in the document entitled *Remedial Investigation/Feasibility Study Report, UXO 18* (CH2M, 2015), hereafter referred to as the RI/FS Report. Specifically, the FS Addendum is streamlined to provide only updated text, tables (and tables they reference) to provide additional detail regarding costs associated with Alternative 3 – Limited MEC Removal, Land Use Controls (LUCs), and MEC Inspections and Alternative 4 – MEC Removal, LUCs, and MEC Inspections. It is important to note that costs have not been revised, only clarified by providing additional detail. Information presented in this report, as well as the RI/FS Report (CH2M, 2015), will be used to support the UXO 18 Proposed Remedial Action Plan (PRAP).

This report was prepared under the United States (U.S.) Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic Comprehensive Long-Term Environmental Action Navy 8012 Contract N62470-11-D-8012, Contract Task Order 019, for submittal to NAVFAC, U.S. Environmental Protection Agency (EPA) Region 2, the Commonwealth of Puerto Rico Environmental Quality Board (PREQB), the Commonwealth of Puerto Rico Department of Natural and Environmental Resources (PRDNER), and the U.S. Fish and Wildlife Service (USFWS). The Navy, EPA, PREQB, USFWS, and PRDNER work jointly as the Vieques Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Environmental Restoration Program (ERP) Technical Subcommittee.

Summary of Remedial Alternatives

The following remedial alternatives were developed as part of the FS to address the explosive hazard with potential MEC:

- Alternative 1— No Action
- Alternative 2— Land Use Controls and MEC Inspections
- Alternative 3— Limited MEC Removal, Land Use Controls, and MEC Inspections
- Alternative 4— MEC Removal, Land Use Controls, and MEC Inspections

Alternative 1 is no action, in which no remedial actions or process options would be implemented, and no attempt would be made to meet the Remedial Action Objectives (RAOs). It was included solely as a basis of comparison for the other alternatives. Alternative 2 involved using LUCs to reduce the potential explosive hazard by reducing the potential for unauthorized access to the site. Alternatives 3 and 4 include focused additional surface and subsurface MEC removal within UXO 18 and cayo-wide surface and subsurface MEC removal across UXO 18, respectively, to support potential future recreational uses. PRDNER's plans for recreational features and public use areas on Cayo La Chiva include a landing/picnic area at its northern end, an overlook/picnic area on the west coast of the island, a trail through the center of the island connecting these two areas, and an anchorage area to the northwest of the island, as shown in **Figure 2-1**. In addition, Alternatives 3 and 4 include the implementation of LUCs and long-term monitoring (LTM) to monitor the effectiveness and identify changes in site conditions that may increase the potential MEC hazards.

A detailed description of each of these alternatives is provided in the RI/FS Report (CH2M, 2015). Further clarification (detail) regarding the cost assumptions for Alternatives 3 and 4 are summarized below. The updated cost details are provided in **Appendix A**. Only those tables from the RI/FS Report (Table H-4 and Table H-7) that were updated to include additional cost details are included in the appendix of this addendum; their original table number has been retained, with the addition of the word "Modified."

2.1 Alternative 3 – Limited MEC Removal, Land Use Controls, and MEC Inspections

MEC removal would follow similar approaches to those used for the MEC removal actions throughout the former Vieques Naval Training Range (VNTR) and Naval Ammunition Support Detachment (NASD), including archaeological survey (as necessary), vegetation clearance, subsurface anomaly detection and investigation using hand-held detectors (mag and dig up to about one foot below ground surface [bgs]), MEC removal, and demilitarization of recovered MEC items. However, since all of these activities would require the additional logistical planning and support associated with having to conduct remedial action offshore of the main island of Vieques, a 25 percent cost escalation for vegetation clearance (Line 2.1 of Modified Table H-4) is assumed (**Appendix A**). The cost escalation for vegetation clearance is because the island has less invasive species than the main island of Vieques, which would then warrant additional time to ensure important habitats and vegetation are protected during clearance activities as well as to manage cut vegetation. While it is possible the 25 percent escalation cost would apply to MEC surface clearance (Line 2.2 of Modified Table H-4) and MEC subsurface removal (Line 2.3 of Modified Table H-4), because munitions surface clearance was already performed on the accessible areas of the island and because there is only a thin soil profile over bedrock, it is unlikely much, if any additional munitions would be found during implementation of this alternative. Further, even if a 25 percent escalation was added to MEC surface and subsurface clearance, it would only increase the cost of Alternative 3 by about \$15,000, which is insignificant in the overall cost of the alternative (\$3,090,000), especially when compared to the cost of Alternative 4 (\$5,444,000).

2.2 Alternative 4 – MEC Removal, Land Use Controls, and MEC Inspections

The MEC removal would follow similar approaches to those used for the MEC removal actions throughout the former VNTR and NASD, including archaeological survey, vegetation clearance, subsurface anomaly detection and investigation using hand-held detectors (mag and dig up to about one foot bgs), MEC removal, demilitarization of recovered MEC items, and site restoration to stabilize the denuded land. A cost escalation is warranted not only to account for the significant additional logistical planning and support associated with having to conduct remedial action offshore of the main island of Vieques, but the added difficulty and complexity associated with clearing vegetation across the island and exposing the thin soil veneer while attempting to ensure the ecology of the surrounding waters is protected. Therefore, a 100 percent cost escalation is assumed for vegetation clearance (Line 2.1 of Modified Table H-7) and munitions clearance (Line 2.2 of Modified Table H-7) (**Appendix A**). The cost escalation for vegetation clearance and munitions clearance is due to production rates being slowed by the need to transport to/from the island teams and equipment, as well as additional time involved in having to transport cut vegetation, munitions and munitions debris from Cayo La Chiva back to the main island of Vieques. In addition, the cost escalation includes ensuring that MEC clearance does not negatively impact the significant cultural resources identified on the island. It is important to note that while the escalation factor is estimated, the actual escalation factor is not particularly relevant in terms of comparative analysis of alternatives. Even if the escalation factors were removed from Alternatives 3 and 4, the resulting cost of Alternative 4 (\$4,965,000) would still be nearly \$2,000,000 higher than the resulting cost associated with Alternative 3 (\$3,086,000).



Legend
UXO 18 Boundary

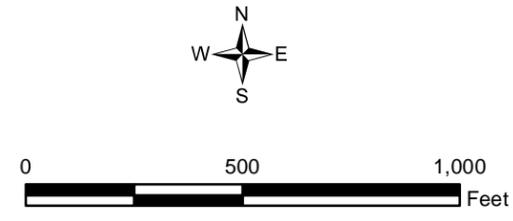
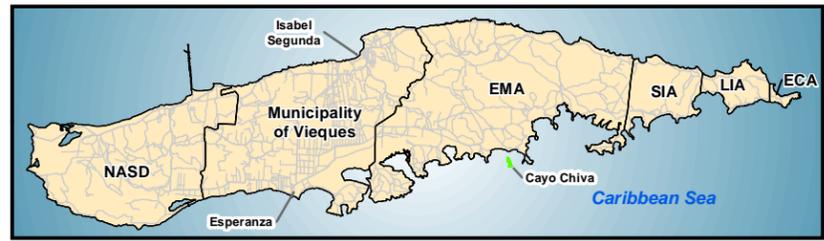


Figure 2-1
Land Use Plan for Cayo La Chiva
UXO 18 Feasibility Study Addendum
Former Atlantic Fleet Weapons Training Area – Vieques
Vieques, Puerto Rico

SECTION 3

References

CH2M HILL (CH2M). 2015. *Remedial Investigation/Feasibility Study Report, UXO 18, Atlantic Fleet Weapons Training Area – Vieques, Former Vieques Naval Training Range, Vieques, Puerto Rico*. May.

Appendix A
Cost Estimates

Modified Table H-4

Alternative 3 Costs

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Alternative 3 - Limited MEC Removal, Land Use Controls, and MEC Inspections

Site: UXO 18, Former Atlantic Fleet Weapons Training Area - Vieques

Base Year: 2014

Location: Vieques, Puerto Rico

Date: April 2014

Phase: Feasibility Study

Alternative Description:

- Surface and subsurface MEC clearance up to 1 ft bgs at the beaches, planned trails, and observation tower area.

- Maintenance of existing signs.

- Implement ICs that restrict access and intrusive work and future site development.

- Implement monitoring plan to verify LUCs are sufficiently protective of residual risk at the site

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
(1) Mobilization/Demobilization and Site Setup					
1.1 Work Plans	1	EA	\$60,000	\$60,000	Estimate
1.2 Mobilization	1	EA	\$0	\$0	Assume current MR contractor on-island staff will be used; no mobilization required
1.3 Demobilization	1	EA	\$0	\$0	Assume current MR contractor on-island staff will be used; no mobilization required as project staff will be relocated to other on-island projects
1.4 Establish Trail Layout	1	LS	\$20,000	\$20,000	Estimate per similar work (EE-CA, 2008) to establish grid system.
1.5 Archaeological Survey	5	days	\$4,800	\$24,000	Estimate per similar work conducted on CLEAN 8012 CTO 006; arch survey \$3,500/day plus contracted boat support (\$1,300/day).
Subtotal 1				\$104,000	
(2) MEC Clearance					
2.1 Manual Vegetation Clearance	1	Acres	\$15,048	\$15,048	Average cost of vegetation clearance on USAE contract VT004 through October 2013; assume 1 acre cleared of vegetation. Due to nature of clearing, cost for clearing is increased 25% to account for slower, more precise vegetation clearance due to limited invasive species, management of cut vegetation (i.e., chipping and mulch or transported off island) and limited working area.
2.2 MEC Surface Clearance	2	Acres	\$11,839	\$23,678	Average cost of MEC surface clearance on USAE contract VT004 through October 2013; assumes 1 acre currently accessible and clear of vegetation plus additional 1 acre for trails. Assume surface MEC clearance by 2 teams, MEC clearance at a rate of .5 acre/day/team.
2.3 MEC Subsurface Removal to 1 ft bgs (50 items/acre)	100	Anomaly	\$341	\$34,100	Assuming 50 anomalies per acre; anomalies are metallic debris that may be MEC, or MD, or general trash. Average cost of MEC subsurface anomaly removal on USAE contract VT004; assume 2 mag and dig teams, mag and dig of 25 anomalies/day/team. A cost escalation is not necessary to add to line item 2.3 because the cost escalation is for the additional logistics necessary to bring equipment and personnel to the island, cut vegetation, and protect resources, which are already accounted for under line items 2.1 and 2.2.
2.4 Archaeologist for MEC Removal Support	4	Days	\$1,250	\$5,000	Assume full time oversight of MEC clearance in archaeological site area; assume archaeological site may be impacted by all trail cutting/MEC clearance (approx. 2 acre); assume MEC clearance at a rate of 0.5 acre/day; assume 10 hr days for archaeologist at \$125/hr.
2.5 Boat Support for MEC Removal	8	Days	\$1,300	\$10,400	Assume 2 boats needed (one for transportation of crew and equipment, one for maintaining exclusion zone)
2.6 RRD Scrap Management	2	ton	\$929	\$1,858	Assume 1 ton/acre; Estimate per similar work (2011-CTC)
2.7 MD Scrap Management	2	ton	\$929	\$1,858	Assume 1 ton/acre; Estimate per similar work (2011-CTC)
2.8 Erosion Control (Silt Fencing/Hay Bales)	500	LF	\$35	\$17,500	Cost based on vendor quote and SWMU 1 silt fence installation costs; escalated 500% to account for maintenance costs and more difficult access to perform maintenance; Assume 500 ft along northern and eastern sides of the island.
2.9 Demolition/Explosive Venting	2	Event	\$13,760	\$27,520	Assume 2 events total; Cost estimate is based on average demolition costs for USAE on VT004 through October 2013 plus adding 2 boats for demo support (\$1,300/day each; one for demo team transport, one for patrolling/stopping access to bay by other boats).
Subtotal 2				\$136,962	

Alternative 3 - Limited MEC Removal, Land Use Controls, and MEC Inspections

Site: UXO 18, Former Atlantic Fleet Weapons Training Area - Vieques
 Location: Vieques, Puerto Rico
 Phase: Feasibility Study
 Alternative Description:
 - Surface and subsurface MEC clearance up to 1 ft bgs at the beaches, planned trails, and observation tower area.
 - Maintenance of existing signs.
 - Implement ICs that restrict access and intrusive work and future site development.
 - Implement monitoring plan to verify LUCs are sufficiently protective of residual risk at the site

Base Year: 2014
 Date: April 2014

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
(3) Sign Maintenance and LTM					
3.1 Net present value of sign maintenance and LTM activities	1	EA	\$1,608,744	\$1,608,743.65	See Table H-5 for the assumptions and estimates for the sign and LTM elements and Table H-6 for the net present value calculation.
Subtotal 3				\$1,608,744	
Subtotal for Tasks 1, 2, 3				\$1,849,705	
CONTINGENCY	20%		\$1,849,705	\$370,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				\$2,220,000	
(5) DESIGN&CM&PM					
Project Management	5%		\$2,220,000	\$111,000	EPA July 2000 guidance page 5-13
Construction Management	6%		\$2,220,000	\$133,200	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		\$2,220,000	\$204,240	RSMeans 5% to 15%
Pollution Liability Insurance	2%		\$2,220,000	\$44,400	market price
Payment & Performance Bond	1.25%		\$2,220,000	\$27,750	market price
Fee	8%		\$2,424,240	\$193,939	
Tax	7%		\$2,220,000	\$155,400	Puerto Rico tax
TOTAL - Design &CM&PM				\$870,000	
TOTAL Capital Cost				\$3,090,000	

Note:
 This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.
 (Cost Accuracy Range: +50% / -30%)

Table H-5

Estimated Sign Maintenance and LTM Unit Rates for Alternative 3

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
1 Inspection of Signs at Blue Beach Access Points and Cayo la Chiva	1	EA	\$850	\$850	Costs estimated using the following assumptions: on-site personnel will inspect signs (no mobilization); inspection team consists of 2 people; working one 4-hr/event; assume use of project boat; assume \$100/hr/person; miscellaneous sign repair materials/equipment/replacement signs (estimated \$50); assume monitoring for 30 years; 1 event per year
2 Inspection of Accessible Area Using MEC Surface Clearance Team	2	Acres	\$11,839	\$23,678	Average cost of MEC surface clearance on USAE contract VT004; through October 2013; assume inspection of all open and recreational areas (approximately 2 acres); assume 1 LTM event/year for 30 years; assume 1 major storm every 2 years requiring inspection (15 total); assume inspection team covers 1 acre/day
3 Boat Support for LTM	4	Day	\$1,300	\$5,200	Assume surface MEC inspection will take 4 days/event; assume 2 acres of island inspected during LTM activities assume inspection team covers 0.5 acre/day;
4 LTM Demolition/Explosive Venting	1	Event	\$13,760	\$13,760	Assume 1 demo event every other year of monitoring; Cost estimate is based on average demolition costs for USAE on VT004 through October 2013 plus adding 2 boats for demo support (\$1,300/day each; one for demo team transport, one for patrolling/stopping access to bay by other boats).
5 LTM Report following Monitoring Event	1	Ea	\$20,000	\$20,000	Assume one report/year for 30 years; assume 1 LTM event/year for 30 years; cost estimated; assume no report prepared following storm-related monitoring

Table H-6

Estimated Sign Maintenance and LTM Net Present Value for Alternative 3

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Assumed discount rate **

1.9%

Year	Assumed Activities Performed in Year	Estimated Cost (2014 Dollars) *	NPV Multiplier	NPV Cost
1	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.981	\$48,800.79
2	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.963	\$88,953.65
3	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.945	\$46,997.90
4	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.927	\$85,667.36
5	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.910	\$45,261.62
6	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.893	\$82,502.49
7	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.877	\$43,589.48
8	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.860	\$79,454.53
9	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.844	\$41,979.12
10	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.828	\$76,519.18
11	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.813	\$40,428.25
12	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.798	\$73,692.27
13	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.783	\$38,934.68
14	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.768	\$70,969.80
15	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.754	\$37,496.28
16	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.740	\$68,347.90
17	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.726	\$36,111.03
18	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.713	\$65,822.87
19	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.699	\$34,776.95
20	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.686	\$63,391.12
21	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.674	\$33,492.16
22	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.661	\$61,049.22
23	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.649	\$32,254.83
24	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.637	\$58,793.83
25	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.625	\$31,063.21
26	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.613	\$56,621.76
27	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.602	\$29,915.62
28	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.590	\$54,529.94
29	Sign maintenance, LTM of recreational areas, LTM Report	\$49,728	0.579	\$28,810.42
30	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$92,366	0.569	\$52,515.39
Estimated total cost in 2014 dollars (non-discounted cost)		\$2,131,410		
Estimated total NPV cost (discounted cost)		\$1,608,744		

* Unit rates for elements provided in Table H-4

** The discount rate used is based on the current Real Interest Rates on Treasury Notes and Bonds published in Circular A-94 Appendix C in accordance with the EPA guidance for cost estimating during the feasibility study (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c)

NPV Net present value

Modified Table H-7

Alternative 4 Costs

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Alternative 4 - MEC Removal, Land Use Controls, and MEC Inspections

Site: UXO 18, Former Atlantic Fleet Weapons Training Area - Vieques

Base Year: 2014

Location: Vieques, Puerto Rico

Date: April 2014

Phase: Feasibility Study

Alternative Description:

- Surface and subsurface MEC clearance up to 1 ft bgs
- Maintenance of existing signs
- Implement ICs that restrict access and intrusive work and future site development;
- Implement monitoring plan to verify LUCs are sufficiently protective of residual risk at the site

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
(1) Mobilization/Demobilization and Site Setup					
1.1 Work Plans	1	EA	\$60,000	\$60,000	Estimate
1.2 Mobilization	1	EA	\$0	\$0	Assume current MR contractor on-island staff will be used; no mobilization required
1.3 Demobilization	1	EA	\$0	\$0	Assume current MR contractor on-island staff will be used; no mobilization required as project staff will be relocated to other on-island projects
1.4 Establish Grids	1	LS	\$20,000	\$20,000	Estimate per similar work (EE-CA, 2008)
1.5 Archaeological Survey	5	days	\$4,800	\$24,000	Estimate per similar work conducted on CLEAN 8012 CTO 006; arch survey \$3,500/day plus contracted boat support (\$1,300/day).
	Subtotal 1			\$104,000	
(2) MEC Clearance					
2.1 Manual Vegetation Clearance	12	Acres	\$24,076	\$288,912	Average cost of vegetation clearance on USAE contract VT004; cost escalated by 100% to account for significantly more logistical challenges associated with clear-cutting the entire island, including difficult terrain, significant quantities of vegetation to manage off island, weather-related challenges that would arise due to denuded landscape, etc.
2.2 MEC Surface Clearance	12	Acres	\$23,678	\$284,136	Average cost of MEC surface clearance on USAE contract VT004; cost escalated by 100% to account for additional logistics associated with getting equipment and personnel to island, cut vegetation and munitions off the island, and protection of island's cultural resources and adjacent marine ecology. Assume surface MEC clearance by 2 teams, MEC clearance at a rate of .5 acre/day/team.
2.3 MEC Subsurface Removal to 1 ft bgs (50 items/acre)	600	Anomaly	\$341	\$204,600	Assuming 50 anomalies per acre; anomalies are metallic debris that may be MEC, or MD, or general trash. Average cost of MEC subsurface anomaly removal on USAE contract VT004; assume 2 mag and dig teams, mag and dig of 25 anomalies/day/team. Assuming 50 anomalies per acre; anomalies are metallic debris that may be MEC, or MD, or general trash. A cost escalation is not necessary to add to line item 2.3 because the cost escalation is for the additional logistics necessary to bring equipment and personnel to the island, cut vegetation, and protect resources, which are already accounted for under line items 2.1 and 2.2.
2.4 Archaeologist for MEC Removal Support	24	Days	\$1,250	\$30,000	Assume full time oversight of MEC clearance ; assume surface MEC clearance by 2 teams, MEC clearance at a rate of .5 acre/day/team; assume 2 mag and dig teams, mag and dig of 25 anomalies/day/team;; assume 10 hr days for archaeologist at \$125/hr.
2.5 Boat Support for MEC Removal	72	Days	\$1,300	\$93,600	Assume 2 boats needed (one for transportation of crew and equipment, one for maintaining exclusion zone)
2.6 RRD Scrap Management	12	ton	\$929	\$11,148	Assume 1 ton/acre; Estimate per similar work (2011-CTC)
2.7 MD Scrap Management	12	ton	\$929	\$11,148	Assume 1 ton/acre; Estimate per similar work (2011-CTC)
2.8 Erosion Control (Silt Fencing/Hay Bales)	2500	LF	\$35	\$87,500	Cost based on vendor quote and SWMU 1 silt fence installation costs; escalated 500% to account for maintenance costs and more difficult access to perform maintenance; Assume 2,500 ft along northern and eastern sides of the island.
2.9 Demolition/Explosive Venting	2	Event	\$13,760	\$27,520	Assume 2 events total; Cost estimate is based on average demolition costs for USAE on VT004 through October 2013 plus adding 2 boats for demo support (\$1,300/day each; one for demo team transport, one for patrolling/stopping access to bay by other boats).

Alternative 4 - MEC Removal, Land Use Controls, and MEC Inspections

Site: UXO 18, Former Atlantic Fleet Weapons Training Area - Vieques
 Location: Vieques, Puerto Rico
 Phase: Feasibility Study
 Alternative Description:
 - Surface and subsurface MEC clearance up to 1 ft bgs
 - Maintenance of existing signs
 - Implement ICs that restrict access and intrusive work and future site development;
 - Implement monitoring plan to verify LUCs are sufficiently protective of residual risk at the site

Base Year: 2014
 Date: April 2014

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
2.10 Restoration of Subtropical Dry Forest with Appropriate Species	1	LS	\$323,136	\$323,136	Assume 10 acres of UXO 18 will require restoration; assume will need to pay for greenhouse to be built (assume 2,000 ft2 greenhouse, with tempered glass, \$50/ft2; from RS Means, Site Work & Landscape Cost Data 2011), plants/trees to be started (assume 20 ft spacing on plantings, 108 plants per acre, 1,080 plants total, estimate \$75/plant), and transplanted on the island (assume 4 weeks of labor, 4 laborers for planting, \$50/hr, 10 hr days; Assume 2 UXO avoidance support staff \$125/hr; 20 days of boat support at \$1,300/day); assume spreading native wildflower mix seed over 10 ac using push spreader (\$60/1,000 ft2, from RS Means, Site Work & Landscape Cost Data 2011)
Subtotal 2				\$1,361,700	
(3) Sign Maintenance and LTM					
3.1 Net present value of sign maintenance and LTM activities	1	EA	\$1,742,003	\$1,742,003.16	See Table H-8 for the assumptions and estimates for the sign and LTM elements and Table H-9 for the net present value calculation.
Subtotal 3				\$1,742,003	
Subtotal for Tasks 1, 2, 3				\$3,207,703	
CONTINGENCY	20%		\$3,207,703	\$642,000	EPA July 2000 guidance
SUBTOTAL - CONSTRUCTION COST				\$3,850,000	
(5) DESIGN&CM&PM					
Project Management	5%		\$3,850,000	\$192,500	EPA July 2000 guidance page 5-13
Construction Management	6%		\$3,850,000	\$231,000	EPA July 2000 guidance page 5-13
General&Administration (G&A)	9.2%		\$3,850,000	\$354,200	RSMeans 5% to 15%
Pollution Liability Insurance	2%		\$3,850,000	\$77,000	market price
Payment & Performance Bond	1.25%		\$3,850,000	\$48,125	market price
Fee	8%		\$4,204,200	\$336,336	
Tax	7%		\$3,850,000	\$269,500	Puerto Rico tax
TOTAL - Design &CM&PM				\$1,509,000	
TOTAL Capital Cost				\$5,359,000	

Note:

This estimate has been developed and provided as an Order of Magnitude Estimate (ROM)/Budgetary Estimate and as such is suitable for the purpose of budget development and/or planning only. This estimate is offered as an opinion of cost to perform the work and is not an offer to contract for construction services, procure and/or provide such services.

(Cost Accuracy Range: +50% / -30%)

Subsurface anomalies may comprise a combination of MEC, RRD, MD, trash, and rocks with a high iron content. Therefore, the number of anomalies may be considerably higher than the actual number of MEC. For the purposes of the Alternative 3 cost estimate, it is assumed there are 50 anomalies per acre. This assumption is based on subsurface anomaly densities observed at nearby Blue Beach and PAOC EE

Table H-8

Estimated Sign Maintenance and LTM Unit Rates for Alternative 4

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Description	Quantity	Unit	\$/Unit	Total Cost	Notes
1 Inspection of Signs at Blue Beach Access Points and Cayo la Chiva	1	EA	\$850	\$850	Costs estimated using the following assumptions: on-site personnel will inspect signs (no mobilization); inspection team consists of 2 people; working one 4-hr/event; assume use of project boat; assume \$100/hr/person; miscellaneous sign repair materials/equipment/replacement signs (estimated \$50); assume monitoring for 30 years; 1 event per year
2 Inspection of Accessible Area Using MEC Surface Clearance Team	2.4	Acres	\$11,839	\$28,414	Average cost of MEC surface clearance on USAE contract VT004; through October 2013; assume 20% of island inspected during LTM activities and 5-yr reviews (increase from Alt 2 is due to vegetation being cut from island as part of MEC removal); assume 1 LTM event/year for 30 years; assume 1 major storm every 2 years requiring inspection (15 total); assume inspection team covers 0.5 acre/day (slower than Alternative 3 because it is assumed the trails in Alternative 3 will be maintained)
3 Boat Support for LTM	5	Day	\$1,300	\$6,500	Assume surface MEC inspection will take 5 days/event; assume 20% of island inspected during LTM activities; assume inspection team covers 0.5 acre/day; assume 1 LTM event/year for 30 years; assume 1 major storm every 2 years requiring inspection (15 total)
4 LTM Demolition/Explosive Venting	1	Event	\$13,760	\$13,760	Assume 1 demo event every other year of monitoring; Cost estimate is based on average demolition costs for USAE on VT004 through October 2013 plus adding 2 boats for demo support (\$1,300/day each; one for demo team transport, one for patrolling/stopping access to bay by other boats).
5 LTM Report following Monitoring Event	1	Ea	\$20,000	\$20,000	Assume one report/year for 30 years; assume 1 LTM event/year for 30 years; cost estimated; assume no report prepared following storm-related monitoring

Table H-9

Estimated Sign Maintenance and LTM Net Present Value for Alternative 4

UXO 18 Remedial Investigation/Feasibility Study

Atlantic Fleet Weapons Training Area—Vieques

Former Vieques Naval Training Range

Vieques, Puerto Rico

Assumed discount rate **

1.9%

Year	Assumed Activities Performed in Year	Estimated Cost (2014 Dollars) *	NPV Multiplier	NPV Cost
1	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.981	\$54,723.85
2	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.963	\$100,578.89
3	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.945	\$52,702.14
4	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.927	\$96,863.13
5	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.910	\$50,755.12
6	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.893	\$93,284.63
7	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.877	\$48,880.04
8	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.860	\$89,838.35
9	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.844	\$47,074.22
10	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.828	\$86,519.38
11	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.813	\$45,335.12
12	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.798	\$83,323.02
13	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.783	\$43,660.27
14	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.768	\$80,244.75
15	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.754	\$42,047.29
16	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.740	\$77,280.21
17	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.726	\$40,493.91
18	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.713	\$74,425.18
19	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.699	\$38,997.91
20	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection		0.686	\$0.00
21	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.674	\$37,557.18
22	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.661	\$69,027.66
23	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.649	\$36,169.67
24	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.637	\$66,477.52
25	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.625	\$34,833.43
26	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.613	\$64,021.59
27	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.602	\$33,546.55
28	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.590	\$61,656.39
29	Sign maintenance, LTM of recreational areas, LTM Report	\$55,764	0.579	\$32,307.21
30	Sign maintenance, LTM of recreational areas, Demolition event, LTM Report, Post-major storm inspection	\$104,437	0.569	\$59,378.57
Estimated total cost in 2014 dollars (non-discounted cost)		\$2,298,575		
Estimated total NPV cost (discounted cost)		\$	1,742,003	

* Unit rates for elements provided in Table H-7

** The discount rate used is based on the current Real Interest Rates on Treasury Notes and Bonds published in Circular A-94 Appendix C in accordance with the EPA guidance for cost estimating during the feasibility study (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c)

Appendix B
Final Responses to Regulator Comments

**Final Responses to EPA Comments on the
Draft UXO 18 Feasibility Study Addendum Dated February 2016
Atlantic Fleet Weapons Training Area – Vieques
Former Vieques Naval Training Range, Vieques, Puerto Rico**

Presented below are review comments on the Draft UXO 18 Feasibility Study Addendum, Atlantic Fleet Weapons Training Area – Vieques, Former Vieques Naval Training Range, Vieques, Puerto Rico; dated February 2016 (hereinafter referred to as the Draft Addendum). Cost comparison

GENERAL COMMENTS

1. The Draft Addendum does not identify the escalation factor for Alternative 3 or Alternative 4 within the revised tables provided in Appendix A (Cost Estimates). Previous Feasibility Studies (FS) conducted at the Former Vieques Naval Training Range (Vieques) included an escalation factor as a separate component rather than to incorporating the escalation factor into individual item costs. Revise the Draft Addendum clarify why the escalation factor was incorporated into individual item costs rather than included as a separate component.

Navy Response: Escalation factors presented in previous Feasibility Studies on Vieques have been related to interest rates that are applied to costs due to a difference in the calendar year from which the costs are drawn and the calendar year during which the FS is prepared. For example, costs may be derived from a 2008 source, so if the FS is prepared in 2014, 2008 costs are escalated to account for inflation. For UXO 18, an interest rate escalation factor is not needed because the costs were based on the recently completed PAOC EE removal action. Individual line item cost escalation factors for UXO 18 are based on having to conduct the work offshore; therefore, escalation factors are applied to those line items impacted by the additional effort required to conduct the remedial action offshore on the small island.

2. The Draft Addendum does not include all of the viable tables that are used to assess the cost of Alternative 3 (Limited MEC Removal, Land Use Controls, and MEC Inspections) and Alternative 4 (MEC Removal, Land Use Controls, and MEC Inspections). For example, modified tables Table H-4 and Table H-7 in Appendix A (Cost Estimates) both reference Tables H-5 and H-6 (for Alternative 3) and Tables H-8 and H-9 (for Alternative 4) in Section 3 (Sign Maintenance and LTM); however, these tables are not provided in the Draft Addendum. In addition, the Section 3 cost estimates, provided in Tables H-4 and H-7, for Alternatives 3 and 4 do not provide detailed costs. The current presentation of the costs associated with Section 3 is presented as a lump sum. In order to provide quick reference and to ensure that this revision can serve as a stand-alone document, revise the Draft Addendum to include all cross-referenced tables. In addition, revise the Draft Addendum to include detailed costs for Section 3 tasks.

Navy Response: Tables that are unchanged from the FS, but are referenced by revised tables have been added to the FS Addendum. The second sentence of the first paragraph in the Introduction has been revised as follows: “Specifically, the FS Addendum is streamlined to provide only updated text, tables (and tables they reference) to provide additional detail regarding costs...”

3. Section 2.2 (Alternative 4 – MEC Removal, Land Use Controls, and MEC Inspections) includes a discrepancy associated with the costs for each alternative. Section 2.2 states, “Even if the escalation factors were removed from Alternatives 3 and 4, the resulting cost of Alternative 4 (\$4,965,000) would still be nearly \$2,000,000 higher than the resulting cost associated with Alternative 3 (\$3,086,000).” However, Section 2.1 (Alternative 3 – Limited MEC Removal, Land Use Controls, and MEC Inspections) states that the costs associated with Alternative 4 are \$5,444,000. The same issue is noted within the summary of cost estimates for Alternative 3 which is presented in Section 2.1. In Section 2.1 the costs for Alternative 3 are stated to be \$3,086,000 while

Section 2.2 lists the un-escalated costs as \$3,090,000. Revise the Draft Addendum to address these discrepancies.

Navy Response: The text is accurate as written. The escalated costs for Alternatives 3 and 4 are \$3,090,000 and \$5,444,000, respectively. If the escalation factors were removed, the costs for Alternatives 3 and 4 are \$3,086,000 and \$4,965,000, respectively.

4. Neither the cost estimates provided nor the explanation of activities within the Draft Addendum account for proper evacuation precautions should large MEC be discovered which would require demolition/explosive venting onsite. Due to the site being in close proximity to Blue Beach, a recreational beach location near Vieques, if large MEC were discovered, proper evacuation precautions would need to take place. Revise the Draft Addendum to provide the associated costs with proper evacuation of Blue Beach.

Navy Response: No additional costs are warranted as similar procedures to ensure public safety used for the Blue Beach/PAOC EE removal action are appropriate for use during the UXO 18 remedial action.

5. Alternatives 3 (Limited MEC Removal, Land Use Controls, and MEC Inspections) and 4 (MEC Removal, Land Use Controls, and MEC Inspections) do not include an estimate for the cost of 'Remedial Design.' It is unclear why a cost estimate is not provided for the remedial design activities that will take place given that the success of the remediation at the site corresponds with the design of the activities. Revise the Draft Addendum to clarify why the cost of 'Remedial Design' was not included in the cost estimates for Alternatives 3 and 4.

Navy Response: A Remedial Design is not necessary for the remedy; a Remedial Action Work Plan, which is included in the cost assumptions, will provide the needed detail for this munitions removal remedial action.

SPECIFIC COMMENTS

1. Appendix A, Cost Estimates, Table H-4, Alternative 3 Costs: Table H-4 does not include an estimate for 'Restoration of Subtropical Dry Forest with Appropriate Species;' however, Table H-7 (Alternative 4 Costs) does. Revise the Draft Addendum to clarify why Alternative 4 (MEC Removal, Land Use Controls, and MEC Inspections) includes this task but Alternative 3 (Limited MEC Removal, Land Use Controls, and MEC Inspections) does not.

Navy Response: Alternative 3 does not include revegetation because the vegetation clearance is associated with establishing the interpretive trails.

**Final Responses to PRDNER Comments on the
Draft UXO 18 Feasibility Study Addendum Dated February 2016
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range, Vieques, Puerto Rico**

PDF Pg #	Doc Pg #	Section #	Highlighted Document Text / Summary of Content	DNER Comments	Navy Response
5	2-1	2	The details of the planned future recreational use of Cayo La Chiva is currently not known, only that the recreational use will likely consist of beach access, interpretive trails, and an observation tower.	<p>In commenting on earlier draft documents, PRDNER has on several occasions provided to Navy a conceptual plan and map of proposed recreational sites / uses for Cayo La Chiva; this conceptual plan has been previously incorporated into Figures 4 and 5 of the Navy's November 2015 Draft Proposed Remedial Action Plan (PRAP) for UXO 18. For consistency, please create a figure for the RI/FS Report that depicts Alternative 3 and shows the recreational use areas plan shown in Figures 4 and 5 of the PRAP (existing Figures 10-1 and 10-2 of the RI/FS Report show Alternatives 2 and 4, respectively). A conceptual recreational use site plan for Cayo La Chiva is provided at the end of this document.</p> <p>Text specifically listing the proposed recreational uses depicted in the conceptual plan and the Draft PRAP was included in PRDNER comments on the Draft PRAP, submitted to Navy in December 2015. Accordingly, please replace the quoted text from the FS Addendum with the following:</p> <p>PRDNER's plans for recreational features and public use areas on Cayo La Chiva include a Landing/Picnic Area at its northern end, an Overlook/Picnic Area on the west coast of the island, a trail through the center of the island connecting these two areas, and an Anchorage Area to the northwest of the island, as shown in Figure [reference newly created figure number] of the RI/FS Report.</p>	A description of the revised conceptual site model related to the planned recreational use has been added into the FS Addendum. In addition, Figures 4 and 5 from the PRAP have been incorporated into the FS Addendum.

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5	2-1	2	In addition, Alternatives 3 and 4 include the implementation of LUCs and long-term monitoring (LTM) to monitor the effectiveness and identify changes in site conditions that may increase the potential MEC hazards.	Signage proposed as part of LUCs for Cayo La Chiva includes the phrases “No Trespassing,” “Restricted Access / Authorized Personnel Only” and “No Entry Permitted to Beaches and Land Areas” (see the CSM representation in Figure 3 of the November 2015 Draft PRAP [Figure 5-1 of the May 2015 RI/FS report]). As indicated in PRDNER comments on the Draft RI/FS report, this proposed signage requires revision to reflect the expected use of Cayo La Chiva as a recreational area open to the public. The revised signage should use wording such as “Warning, Former Munitions Use Area. Please stay on Designated Trails and Recreational Sites,” or similar phrasing.	The proposed signage has been revised as requested.
5	2-1	2.1	Further, even if a 25 percent escalation was added to MEC surface and subsurface clearance, it would only increase the cost of Alternative 3 by \$25,000	Please indicate which specific line items / components of the MEC surface and subsurface clearance would add up to the \$100,000 figure that would, if a 25 percent escalation were applied, yield an increase of \$25,000 in the total cost of Alternative 3; this is not apparent from Modified Table H-4. For example, the costs listed for MEC Surface Clearance (Line Item 2.2; \$23,678) and MEC Subsurface Removal (Line Item 2.3; \$34,100) add up to only \$57,778. Adding in Boat Support for MEC Removal (Line Item 2.5; \$10,400) still yields a total of only \$68,178.	The “\$25,000” in Section 2.1 has been revised to “about \$15,000.”
6	2-2	2.2	Therefore, a 200 percent cost escalation is assumed for vegetation clearance (Line 2.1 of Modified Table H-7) and munitions clearance (Line 2.2 of Modified Table H-7)	See comments below regarding Modified Table H-7. A 200 percent cost escalation (or increase) would mean adding 200 percent to – i.e., tripling – the base cost estimate. However, as explained below, the actual estimate shown in Modified Table H-7 is a doubling of the base cost estimate, which corresponds to a 100 percent (not 200 percent) escalation / increase.	All references to 200 percent have been revised to 100 percent.

PDF Pg #	Doc Pg #	Section #	Highlighted Document Text / Summary of Content	DNER Comments	Navy Response
10	N/A	Appendix A	<p>Page 2 (of 3) of Modified Table H-4:</p> <p>2.3 MEC Subsurface Removal to 1 ft. bgs (50 items/acre)..... Assuming 50 anomalies per acre; average cost of MEC subsurface anomaly removal on USAE contract VT004; assume 2 mag and dig teams, mag and dig of 25 anomalies/day/team.</p>	<p>The RI field investigation activities reportedly resulted in detection of only five MEC and three MD items along Site Inspection and Biological Assessment transects covering approximately 0.96 acres (8% of the island’s 12-acre area). Assuming uniform MEC/MD distribution across the island, this implies the potential presence of approximately eight MEC/MD items per acre. Why does the cost estimate for Alternative 3 assume 50 anomalies per acre, more than six times the potential MEC/MD detection rate based on previous investigations? What are these assumed (likely non-MEC/MD) anomalies expected to be?</p> <p>Section 2.1 of this FS Addendum, discussing Alternative 3, states that “because munitions surface clearance was already performed on the accessible areas of the island and because there is only a thin soil profile over bedrock, it is unlikely much, if any additional munitions would be found.” Similarly, Section 2.1 of the RI/FS report states that “because only a thin veneer of soil is present across the island, it is unlikely any MEC could be present in the subsurface.” If it is unlikely any MEC could be present in the subsurface, what is the rationale for using the average cost of MEC subsurface anomaly removal (\$341/anomaly) as the basis for the estimated cost to remove all 100 assumed subsurface anomalies?</p>	<p>The number of anomalies is not synonymous with the number of MEC and MD; it is very common to detect significantly more anomalies than MEC/MD. For additional clarification, The following note has been added to MEC subsurface removal line items within Appendix A – Cost Estimates: “Assuming 50 anomalies per acre; anomalies are metallic debris that may be MEC, MD, or general trash.”</p> <p>Costs are appropriate for anomaly removal since each anomaly needs to be investigated as if it is a munitions item, in accordance with the Explosives Safety Submission.</p>

PDF Pg #	Doc Pg #	Section #	Highlighted Document Text / Summary of Content	DNER Comments	Navy Response
11	N/A	Appendix A	<p>Page 2 (of 3) of Modified Table H-4:</p> <p>3.1 Net present value of sign maintenance and LTM activities..... See Table H-5 for the assumptions and estimates for the sign and LTM elements</p>	<p>As noted in the previous comment, both the RI/FS Report and the Draft FS Addendum state that it is unlikely additional MEC / MD are present on the site. Given that fact, why is it assumed, as shown in Table H-5 (Line Item 2), that even after surface clearance activities are completed under Alternative 3, the cost for annual LTM MEC inspection will be the same as the full cost of surface clearance activities (\$11,839 per acre) on USAE contract VT004? Does this LTM inspection cost assume the same equipment needs and MEC removal activities presumably included in the MEC surface clearance cost, and if so, why?</p>	<p>Please note that the comment does not accurately represent the RI/FS Report and FS Addendum, as the text does not state that is unlikely additional MEC/MD are present on the site.</p> <p>“Surface clearance” denotes a process of inspecting a certain area and removing items found on the surface of the ground. For cost estimating purposes, it is reasonable to assume MEC inspections could follow a similar procedure that is currently followed for surface clearance.</p>
12	N/A	Appendix A	<p>Page 1 (of 4) of Modified Table H-7:</p> <p>2.1 Manual Vegetation Clearance.... \$24,076/acre</p> <p>Average cost of vegetation clearance on USAE contract VT004; cost escalated by 200%</p>	<p>Since Manual Vegetation Clearance costs for Alternative 3 are also based on average cost under USAE contract VT004, removing the 25% escalation under Alternative 3 yields a base cost (i.e., the USAE contract VT004 average cost) of \$12,038/acre ($\\$15,048/1.25 = \\$12,038$). This indicates that the cost under Alternative 4 is double the contract VT004 average cost ($\\$12,038 * 2 = \\$24,076$), which is only a 100% cost escalation/increase, not 200% as stated in Modified Table H-7 (adding 200% would mean tripling the original average cost).</p>	<p>Please see the response to the comment on Section 2.2.</p>
13	N/A	Appendix A	<p>Page 2 (of 4) of Modified Table H-7:</p> <p>2.2 MEC Surface Clearance.... \$23,678/acre</p> <p>Average cost of MEC surface clearance on USAE contract VT004; cost escalated by 200%</p>	<p>See previous comment. Since the MEC surface clearance cost cited here is only twice the MEC Surface Clearance cost under Alternative 3 (\$11,839), which has no cost escalation for this line item, the cost under Alternative 4 is only double the contract VT004 average cost, yielding a 100% cost escalation/increase, not 200% as stated in Modified Table H-7 (adding 200% would mean tripling the original average cost).</p>	<p>Please see the response to the comment on Section 2.2.</p>

PDF Pg #	Doc Pg #	Section #	Highlighted Document Text / Summary of Content	DNER Comments	Navy Response
13	N/A	Appendix A	<p>Page 2 (of 4) of Modified Table H-7:</p> <p>2.3 MEC Subsurface Removal to 1 ft. bgs (50 items/acre)..... Assuming 50 anomalies per acre; average cost of MEC subsurface anomaly removal on USAE contract VT004; assume 2 mag and dig teams, mag and dig of 25 anomalies/day/team.</p>	<p>Why has a cost escalation factor been applied to vegetation clearance and MEC surface clearance activities, but not to MEC subsurface removal activities?</p> <p>Section 2.1 of the RI/FS report states that “because only a thin veneer of soil is present across the island, it is unlikely any MEC could be present in the subsurface.” If it is unlikely any MEC could be present in the subsurface, what is the rationale for using the average cost of MEC subsurface anomaly removal (\$341/anomaly) as the basis for the estimated cost to remove all 600 assumed subsurface anomalies (most of which will presumably be non-MEC)? What is included in this \$341/anomaly cost, and why is it applicable to non-MEC anomalies?</p> <p>The RI field investigation activities reportedly resulted in detection of only five MEC and three MD items along Site Inspection and Biological Assessment transects covering approximately 0.96 acres (8% of the island’s 12-acre area). Assuming uniform MEC/MD distribution across the island, this implies the potential presence of approximately eight MEC/MD items per acre. Why does the cost estimate for Alternative 4 assume 50 anomalies per acre, more than six times the potential MEC/MD detection rate based on previous investigations? What are these assumed (likely non-MEC/MD) anomalies expected to be?</p>	<p>The following has been added to the notes for line item 2.3 in Table H-7: “A cost escalation is not necessary to add to line item 2.3 because the cost escalation is for the additional logistics necessary to bring equipment and personnel to the island, cut vegetation, and protect resources, which are already accounted for under line items 2.1 and 2.2.”</p> <p>Please see the response to the comment on PDF page 10, Appendix A, regarding the assumption on the number of anomalies, cost, and why it is applicable.</p>
14	N/A	Appendix A	<p>Page 3 (of 4) of Modified Table H-7:</p> <p>2.10 Restoration of Subtropical Dry Forest with Appropriate Species.... Assume 12 acres of UXO 18 will require restoration</p>	<p>If one acre of UXO 18 was clear of vegetation (or sparsely vegetated) prior to munitions response activities, and approximately one acre would be cleared for trails and recreation areas under Alternative 3, why would all 12 acres require restoration? Why not only 10 acres, assuming a longer-term goal of recreational use once the vegetation is sufficiently re-established?</p>	<p>The 12 acres has been revised to 10 acres, resulting in a total cost of \$323,136. Based on this, the following assumptions were changed: 1,080 plants total, 4 weeks of labor, 20 days of boat support, and native mix seed over 10 acres.</p>

PDF Pg #	Doc Pg #	Section #	Highlighted Document Text / Summary of Content	DNER Comments	Navy Response
14	N/A	Appendix A	<p>Page 3 (of 4) of Modified Table H-7:</p> <p>3.1 Net present value of sign maintenance and LTM activities..... See Table H-8 for the assumptions and estimates for the sign and LTM elements</p>	<p>As noted in comments above regarding Modified Table H-4, both the RI/FS Report and the Draft FS Addendum state that it is unlikely additional MEC / MD are present on the site. Given that fact, why is it assumed, as shown in Table H-8 (Line Item 2), that even after MEC clearance/removal activities are completed under Alternative 4, the cost for annual LTM MEC inspection will be the same as the full cost of surface clearance activities (\$11,839 per acre) on USAE contract VT004? Does this LTM inspection cost assume the same equipment needs and MEC removal activities presumably included in the MEC surface clearance cost, and if so, why?</p> <p>Similarly, if it is unlikely that additional MEC will be found, and even less likely that it would remain following clearance/removal activities under Alternative 4, why is it assumed in Table H-8 (Line Item 4) that one demo event will be necessary every two years during LTM?</p>	<p>Please see the responses to similar comments above.</p>