

## APPENDIX V

# EXPLOSIVES SAFETY SUBMISSION FOR A NON-TIME-CRITICAL REMOVAL ACTION (NTCRA) CONTENT

**V.01 REASON FOR ORDNANCE AND EXPLOSIVES.** The below information is required in an ESS for the execution of the selected munitions response to address MEC. When CA, regardless of configuration, is known or suspected to be present along with explosive hazards, or when it is explosively configured, a submission that provides both explosives safety (as outlined in this section) and CA safety information (see Appendix T, T.01) is required.

V.01.01 Background. The ESS must provide, for informational purposes, a brief description of the reasons for the munitions response. The ESS must identify or provide:

V.01.01.01 The scope of munitions response activities.

V.01.01.02 Any significant differences in munitions response activities that will occur within the MRA or MRS. (NOTE: The ESS must identify significant differences in the current, determined, or reasonably anticipated future land use of different sections of the property, significant differences in the types or conditions of MEC expected to be encountered, and any sections of the MRA that will not require munitions response activities.)

V.01.02 Maps. The following maps and related information must be furnished:

V.01.02.01 Regional Map. A map depicting the regional location of the MRA or MRS (e.g., a state or boundary illustration map with the MRA indicated on it).

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V.01.02.02 MRA or MRS Maps. Maps of the area or areas at which the munitions response is planned. These maps and related information shall indicate areas that:

V.01.02.02.01 Contain or are suspected of containing MEC that the ESS addresses.

V.01.02.02.02 Were suspected of containing MEC, but that research or site characterizations have subsequently shown do not contain such.

V.01.02.02.03 The ESS does not address, but that either a previous safety submission addressed or a future safety submission will address.

V.01.02.02.04 The current, determined, or reasonably anticipated future land use of property within the MRA or MRS that is known or suspected to contain MEC that the ESS addresses.

V.01.02.02.05 The ownership and land use of adjacent properties, as appropriate.

V.01.02.02.06 Any other situation that may influence or require consideration during the response (e.g., flight corridors, traffic routes).

V.01.03 ESQD

V.01.03.01 The planned locations for MEC response-related operations must be shown on ESQD maps. (NOTE: Preliminary site work, such as surveying, laying search lanes, and detecting anomalies does not require establishment of an ESQD arc.)

V.01.03.02 ESQD arcs for both intentional and unintentional detonations must be established and shown on ESQD maps for each MRS.

V.01.03.02.01 The Minimum Separation Distance (MSD) for unintentional detonations, which may be reduced by employing the engineering controls listed in TP 15 or other DDESB-approved engineering controls, for:

a. Nonessential personnel is the greatest distance of:

(1) Blast overpressure, as computed by using the formula:  $D = 40W^{1/3}$  [ $D=15.87Q^{1/3}$ ].

(2) The calculated HFD as provided in TP 16.

b. Team Separation Distance (TSD) is based on blast overpressure, as computed by the formula:  $D = 40W^{1/3}$  [ $D=15.87Q^{1/3}$ ].

V.01.03.02.02 The MSD for intentional detonations (see STD Chapter 9), which may be reduced by employing the engineering controls listed in TP15 or other DDESB-approved engineering controls, is the greatest distance of:

V.01.03.02.02.01 Blast overpressure, as computed by using the formula:  $D = 328W^{1/3}$  [ $D=130.16Q^{1/3}$ ].

V.01.03.02.02.02 The calculated MFD, as provided in TP16.

V.01.03.03 MEC, Excluding CA-filled Munitions, Hazard Classification, and Storage

V.01.03.03.01 Recovered MEC, other than Recovered CWM (RCWM), shall be managed as HD 1.1, unless assigned differently by an Interim Hazard Classification (IHC) authority, and assigned an appropriate CG. When storage at the MRA or MRS is necessary, recovered MEC must be stored separately from serviceable munitions and from any RCWM. NOTE: For RCWM, see Appendix T, T.06).

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V.01.03.03.02 Nonessential personnel in structures shall be afforded protection equivalent to IBD from storage locations. Nonessential personnel in the open shall be afforded protection equivalent to PTRD from storage locations (See STD Chapter 9) There is no required ESQD protection for essential personnel from locations they are using for storage.

V.01.03.03.03 The IMD, based on the NEWQD of the munition with the greatest NEWQD that is reasonably expected to be encountered, applies from intrusive operations to storage sites to prevent propagation to a storage location in event of an accidental explosion during intrusive operations. For distances less than IMD, DDESB-approved engineering controls must be used during intrusive operations.

V.01.03.04 Planned or Established Demolition Areas. A planned or established demolition area is an area used repetitively to destroy munitions during a munitions response. (Such areas may be an existing OD area or a new area planned for intentional detonation.) An ESQD arc must be provided around demolition areas. The size of the ESQD arc will be based on requirements of STD Chapter 9.

V.01.03.05 Mechanized MEC, Excluding CA-filled Munitions, Processing Operations. Examples of such processing operations include, but are not limited to: power screening equipment, power rakes, and shredders.

V.01.03.05.01 Nonessential Personnel. Nonessential personnel shall be provided protection for intentional detonations (see subparagraph V.01.03.02.02, above) based on the MGFD.

V.01.03.05.02 Essential Personnel. Essential personnel shall, when appropriate:

V.01.03.05.02.01 Be protected by shields or barricades designed to defeat hazardous fragments from the MGFD.

V.01.03.05.02.02 Be separated from the operation by K24 based on the munition with the greatest NEWQD that is reasonably expected to be encountered. (NOTE: DDESB-approved overpressure-mitigating engineering controls may be used to provide an equivalent level of protection (2.3 psi) [15.9 kPa]).

V.01.03.06 Intentional Burning of Buildings Contaminated with Explosives Residues that Present an Explosive Hazard. All personnel shall be separated by K328 overpressure distance based on the MCE for the building, but not less than 1,250 feet.

V.01.03.07 ESQD Maps. (NOTE: The ESQD arcs and the MRA and MRS boundaries may be shown on the same map provided all PES and ES are shown in sufficient detail.)

V.01.03.07.01 ESQD-maps should be to scale and legible per STD subparagraph C5.4.4.3.2.

V.01.03.07.02 When a map does not contain a scale, all distances must be labeled.

V.01.03.07.03 The ESQD map shall show the following:

V.01.03.07.03.01 Each MRA or MRS.

V.01.03.07.03.02 The storage locations for demolition explosives and for recovered MEC.

V.01.03.07.03.03 Locations (planned or established) for the intentional detonations or burning of MEC, excluding CA-filled munitions. Such locations include areas where contained detonation technology will be used.

V.01.03.07.03.04 All ES and PES and their relationships. (NOTE: Describe any protective measures (e.g., evacuation of inhabited buildings, blocking off public highways) that will be used to

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eliminate or minimize any exposures within the established exclusion zone.)

V.01.03.07.03.05 All controlling ESQD arcs.

V.01.03.07.04 ESQD Arcs. ESQD arcs must be shown for:

V.01.03.07.04.01 Munitions. The MGF D shall be used for ESQD purposes for any particular MRA or MRS. However, if a munition with a greater fragmentation distance is encountered during the conduct of a munitions response, the ESQD arcs must be adjusted and the ESS or explosives safety site plan must be amended.

V.01.03.07.04.02 Explosive Soil. To determine the ESQD arc for explosive soil, calculate the MCE by multiplying the weight of the mix by the concentration of explosives (e.g., 1,000 lb [453.60 kg] of soil containing 15 percent TNT has an MCE of 150 lb [68 kg]). When concentrations vary within the site, weighted averages or other valid mathematical technique can be used to determine the exclusion zone; however, the ESS must support their use. The MSD for nonessential personnel shall be the greater of IBD for overpressure or the soil ejecta radius per the Buried Explosion Module (BEM) contained in TP 16 or TP 15.

V.01.03.07.04.03 Real Property (Buildings and Installed Equipment). For real property that is known or suspected to be contaminated with explosives residues that present an explosive hazard, and that is slated for cleanup or dismantlement, the MCE will be estimated on a case-by-case basis. The ESS shall include the rationale used for the estimation.

V.01.03.08 Soil Sampling Maps. When the property involves concentrations of explosives in the soil that are high enough to present an explosive hazard (see STD subparagraph C12.4.1.):

V.01.03.08.01 Provide a map that indicates areas that were determined to contain explosive soil.

V.01.03.08.02 Address methods (e.g., blending, bio-remediation) to be used to reduce explosives concentrations to a non-reactive level.

V.01.03.08.03 Address methods (e.g., wetting the soil before blending) to be used to reduce any explosive hazards.

V.01.04 Types of MEC. Based on research or data generated from characterization of the MRA or MRS, provide the types of MEC expected to be encountered during munitions response activities.

V.01.05 Start Date. Provide the expected date that munitions response activities that involve the placement of explosives on a site, the intentional physical contact with MEC, or the conduct of ground-disturbing or intrusive activities in areas known or suspected to contain MEC are scheduled to start. Indicate the potential consequence, if any, if DDESB approval does not occur by the start date. (Site preparation activities (e.g., surveying, gridding, or locating anomalies) may be conducted while awaiting DDESB approval of an ESS.)

V.01.06 MEC Migration. Describe naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal changes) that could cause the migration or exposure of MEC, and procedures for monitoring and managing such.

V.01.07 Detection Equipment and Response Techniques. The intent of this section is to describe the capabilities of detection equipment relative to the degree of removal required to support the current, determined, or reasonably anticipated end use.

V.01.07.01 Describe the techniques to be used to detect and remove MEC.

V.01.07.02 Identify the types of detection equipment to be used and the areas in which they will be employed.

V.01.07.03 Summarize methods used (e.g., test plots) to establish the expected detection capabilities of the equipment used. If

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anomaly discrimination will be used, explain what methods will be used to establish the expected accuracy of the discrimination.

V.01.07.04 When describing the detection methods:

V.01.07.04.01 Describe the rationale (e.g., best available technology based on geology, topography, munitions characteristics, resource requirements) used to select the detection methods and technologies to be used during the response.

V.01.07.04.02 Address any limitations (e.g., equipment, terrain, soil type) and mitigating actions, if any.

V.01.07.04.03 Describe quality assurance and quality control (QA/QC) standards and pass or fail criteria for QA/QC control audits.

V.01.08 Disposition Techniques

V.01.08.01 MEC, Excluding CA-Filled Munitions.

V.01.08.01.01 Briefly, describe the MEC, excluding CA-filled munitions, disposition techniques (e.g., OB, OD, contained detonation, incineration) to be used.

V.01.08.01.02 When recovered MEC, excluding CA-filled munitions, cannot be destroyed within the MRA or MRS, address how explosives safety requirements will be met during transportation and during offsite storage, treatment, or disposal. (NOTE: Disposition actions should consider requirements applicable to waste military munitions.)

V.01.08.02 Material Potentially Presenting an Explosive Hazard (MPPEH). Describe the process to be used to manage MPPEH (see STD Chapter 16).

V.01.09 Environmental, Ecological, Cultural and Other Considerations. Address any environmental, ecological (e.g., endangered species), cultural (e.g., tribal spiritual or gathering

sites) and other factors that impacted, from an explosives safety perspective, the selection of the munitions response.

V.01.10 Technical Support. Summarize EOD, U.S. Army Forces Command/20th Support Command/22nd Chemical Battalion, or UXO-technician or UXO-qualified personnel support that may be required. (NOTE: U.S. Army Forces Command/20th Support Command/ 22nd Chemical Battalion is manned with specially trained personnel that provide verification, sampling, detection, mitigation, render safe, decontamination, packaging, escort, and remediation of chemical, biological and industrial devices or hazardous materials.)

V.01.11 Residual Risk Management. Address:

V.01.11.01 LUC. The ESS must summarize any LUC to be implemented and maintained on the property.

V.01.11.02 Long-Term Management. The ESS must address how any potential residual risks will be managed.

V.01.12 Safety Education Program. Address methods to be used to educate the public on the risks associated with MEC and CA, regardless of CA configuration.

V.01.13 Stakeholder Involvement. Briefly, summarize how stakeholder concerns affecting the explosives safety aspects of the selected munitions response were addressed.

V.01.14 Contingencies. To reduce the need to submit amendments (see STD subparagraph C12.6.1.), an ESS may describe alternative actions that could be used to address contingencies. As an example, an ESS may list alternative DDESB-approved engineering controls (TP 15) that may be used under specified conditions.

V.01.15 Unexpected CA Discoveries.0 Should CA, regardless of its configuration, be discovered during munitions responses to MEC, excluding CA-filled munitions, all onsite activities shall be halted

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until the need for a CWM response is evaluated and a decision is approved by the Service-level explosives safety office. If it is decided that a CWM response is necessary, response actions that involve the intentional physical contact with CA, regardless of configuration, or the conduct of ground-disturbing or other intrusive activities in areas known or suspected to contain CA shall not begin until the required CSS or CWM site plan is approved by the DDESB.