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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>								<b>DATE</b> February 1999		
<b>APPROPRIATION/BUDGET ACTIVITY</b> RDT&E/Defense Wide/BA 3							<b>R-1 ITEM NOMENCLATURE</b> Explosives Demilitarization Technology PE 0603104D8Z			
<i>COST(In Millions)</i>	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total Program Element (PE) Cost	11.285	14.442	11.183	11.029	11.337	11.693	11.919	12.116	Continuing	Continuing
JDTP/P486	11.285	14.442	11.183	11.029	11.337	11.693	11.919	12.116	Continuing	Continuing

(U) **A. Mission Description and Budget Item Justification**

(U) **BRIEF DESCRIPTION OF ELEMENT**

(U) The Explosive Demilitarization Technology Program is a cooperative interservice, interagency effort focused as the sole Department of Defense (DoD) program dedicated to the development of safe, efficient and environmentally acceptable processes for the resource recovery and recycling (R3) or disposition of strategic, tactical, and conventional munitions including explosives, and rocket motors. Efforts in this program emphasize environmentally compliant technologies to enhance existing methods for munitions R3 and treatment, such as, open burning/open detonation (OB/OD). There are currently over 500,000 tons of these materials requiring disposition with a forecast of over 1,450,000 tons to flow through the stockpile by 2004. This is funded under Advanced Technology Development based upon its supports to the development and exploration of new munitions concepts and technology preceding system engineering development.

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(U) The effort employs the highly developed technology base in the DoD Service Laboratories/Technical Centers, DOE National Laboratories, industry, and academia. The joint program is integrated through the Joint Ordnance Commanders Demilitarization Subgroup and leverages support from the Environmental Security Technology Certification Program (ESTCP), the Strategic Environmental Research and Development Program (SERDP), the Joint DoD/DOE Munitions Program, and the Services. A specific federal laboratory sponsors each of the projects with peer review by the Joint Working Group. The Demilitarization Users Group provide assessment and review of demilitarization requirements for use in planning new investments for this program. Supporting an annual Global Demilitarization Symposium, which focuses on technical review and data evaluation from current projects enhances technology transfer opportunities, and ongoing advanced demonstrations. This program was established pursuant to Section 226 of the National Defense Authorization Act Fiscal Year 1996 (Public Law 104-106) and Section 227 of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201). The program provides an annual report to the Congress, which provides a detailed plan update on technology investments, accomplishments, and future planned investment areas. Recent annual reports; FY 1997-Department of Defense Joint Demilitarization Technology Program (February 1998) and the FY 1998-Department of Defense Joint Demilitarization Technology Program (February 1999).

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(U) **Project Number and Title: P486 JDTP**

(U) **PROGRAM ACCOMPLISHMENTS AND PLANS**

(U) **FY1998 Accomplishments:**

(U) Analysis of seven initial demonstrations continues. X-Tunnel complex at the Nevada Test Site has been repaired and improved to accommodate more efficient future demonstrations. Data was gathered from EPA Standard Methods, off-line analysis of bulk gases, volatile organic chemicals, semi-volatile organic chemicals, metals and particulates as well as the demonstrations of a tunable diode laser for measuring bulk gases and a real time particle analysis instrument. The Contained Burn Chamber for tactical rocket motors was developed and placed at NTS. Tri-Service Molten Salt Technology effort explored improved feed systems and optimized equipment design. (\$ 7.285 Million)

(U) Four Hydrothermal Oxidation propellant treatability demonstrations accomplished. Hazard Class 1.1 propellant behavior studies furthered thermal cycling criteria for removal completion. (\$ 2.000 Million)

(U) Completed ingredient recovery demonstration for 1.1 propellant. Improved design of washout fixture for the removal system to accommodate Multiple Launch Rocket System (MLRS). Feasibility study of dry removal completed. (\$ 0.500 Million)

(U) The waterjet and resource recovery and recycling (R3) system completed the static testing of the abrasive slurry jet system on 40-mm projectiles. In addition, a demonstration of the washout of PBXN-106 loaded projectiles was conducted. Hydrogenation of high explosive material feasibility study indicated acceptable risk for further development. (\$ 0.500 Million)

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(U) The Portable Propellant/Explosive Analyzer Program completed design and fabrication of ruggedized miniature field near infrared (IR), thin layer chromatography (TLC) and gas chromatography/mass spectrometry (GC/MS) units for field screening stability tests of recovered propellants. This program is developing uncomplicated analytical procedures for field stability testing. The propellant to fertilizer program successfully completed conversion validation tests consisting of 2 phases totaling 21 batch reactions. The first phase processed up to 100 pounds of propellant per batch, and the second phase scaled up to 1,800 pounds per batch. Independent analysis of the conversion results verified complete conversion of propellant to fertilizer. Design criteria for a mobile conversion unit was initiated. (\$ 1.000 Million)

(U) **FY1999 Plans:**

(U) The Tunnel Demonstration Program will continue to optimize detonations and burns that replicate depot-type field operations. The data collected from these events will be used to develop less intrusive methods for munition demilitarization, such as improved loading configurations, containment chamber, and noise limitations. Capability at Dugway Proving Ground (DPG) will be used to develop emissions profiles. Testing of the Contained Burn Chamber will be initiated and proved out of the complete destruction of Shillelagh and TOW missile rocket motors accomplished. Molten Salt Technology will test effectiveness of the improved unit with transition to the base for destruction of demilitarization waste streams. Joint integration will continue. (\$ 7.792 Million)

(U) The Propellant Removal and Treatment Process will be modified to examine effectiveness on tactical and conventional systems. Further feasibility studies on hydrolytic reactions in treatment vessels will be accomplished. Hydrothermal Oxidation optimization for specific formulations will be supported. (\$ 2.75 Million)

(U) Multiple Launch Rocket System will be processed at advanced rates to optimize efficiency and to improve recovered material reformulation processes. (\$ 1.6 Million)

(U) The waterjet and resource recovery and recycling program will continue with applying the high-pressure water washout system to Composition A3 and transitioning the system to Crane Army Ammunition Activity. In addition, improvements will be incorporated into the abrasive slurry jet system to include cutting at 20,000 psi. Flexible workcell applications will be enhanced. (\$ 1 Million)

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(U) The Portable Propellant/Explosive Analyzer program will accomplish field-testing of the developed unit. In addition, a complete technical data package will be developed. Initial explosive feasibility studies and planning will be completed. (\$ 1 Million)

(U) Catalytic Hydrotreating uses a liquid stream containing the energetic material, which is combined with hydrogen, heated, and contacted with a catalyst. This catalytic reduction with hydrogen provides the flexibility of recovering valuable chemical or fuel resources. Primary focus will be on the reaction chemistry and product separation operations. This work will build on the Explosive D work performed for the Navy to determine viability of the process for energetics. (\$ 0.3 Million)

**(U) FY2000 Plans:**

(U) The Tunnel Demonstration Program will continue in FY 2000. Additional tunnel detonations and burns will be conducted to allow benchmarking events to be compared with improved procedures that will reduce both safety and environmental concerns. Design criteria will be developed for facility fragment and noise containment as well as reduced EPA regulated emissions. Additionally, the Contained Burn Chamber will be modified to accommodate a variety of tactical systems, and joint integration will continue. (\$ 7.283 Million)

(U) Cryogenic technologies resulting from Propellant Removal and Treatment Process will be further studied for effectiveness on conventional and tactical systems. Hydrothermal Treatment of small quantity gun propellants and high explosive fillers will be conducted. (\$ 0.700 Million)

(U) Critical Fluid optimization for system specific application will be accomplished for Multiple Launch Rocket System variants and standard missiles. (\$ 0.700 Million)

(U) Resource recovery development for waterjet and advanced cutting techniques, such as, femtosecond lasers will be pursued for conventional systems demilitarization. The flexible workcell will be enhanced for use by items and families. (\$ 1.350 Million)

(U) Portable Propellant Analyzers will be transitioned to field trials and explosive work for AEDA and recovered materials will be initiated. (\$ 0.900 Million)

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(U) Hydrotreating of high explosive fill will be fully characterized and process shifts to higher value products will be supported.  
(\$ 0.250 Million)

(U) **FY2001 Plans:**

(U) The Focus on the Tunnel Demonstration Program will continue to be proving out of improved field detonation and burn operations. Detonation and Burn events will be designed and implemented based on data gathered from previous experiments. Facility fragment and noise containment designs will be tested and measured against EP?A standards. Testing and modification of the Contained Burn Chamber will continue along with joint integration. (\$ 6.879 Million)

(U) Advanced removal/conversion efforts will continue. Conventional systems treatability demonstration with cryogenic technology and optimization of hydrothermal oxidation will be completed with field demonstrations of second-generation design.  
(\$ 1.000 Million)

(U) Critical fluid size reduction process application will be furthered with transportable/portable field unit demonstrations.  
(\$ 0.500 Million)

(U) Advanced cutting and removal program will include flexible/agile process demonstrations for efficient processing of small quantity munitions items to prove out recovery values. (\$ 0.800 Million)

(U) Analytical tools for explosive and propellant evaluation will continue to be optimized for recovered items. (\$ 0.800 Million)

(U) Hydrogenation of energetic and other innovative processes to support conversion to higher value products will be accomplished.  
(\$ 0.300 Million)

(U) Microwave energetic applications will move from bench scale to study of the selective decomposition of high explosives in the presence of other constituents and for anti-personnel land mine applications. (\$ 0.750 Million)

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(U) <b>B. <u>Program Change Summary</u></b>	<b><u>FY1998</u></b>	<b><u>FY1999</u></b>	<b><u>FY2000</u></b>	<b><u>FY2001</u></b>	<b><u>Total Cost</u></b>
Previous Presidents Budget	11.711	11.65	11.375	11.228	Continuing
Appropriated Value	12.259	14.650	0	0	Continuing
Adjustments to Appropriated Value					
a. Congressionally Directed Undistributed Reduction	-0.974	-.208	0	0	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0	0	-0.192	-0.199	
c. Other	0	0	0	0	
Current Presidents Budget	11.285	14.442	11.183	11.029	Continuing

**Change Summary Explanation:** Funding changes are due to congressional undistributed reductions and inflation adjustments.

(U) **Funding:** FY 1999 funding changes are due to congressional increases.

(U) **Schedule:** N/A

(U) **Technical:** FY 1999 funding changes are due to congressional increases.

(U) **C. OTHER PROGRAM FUNDING SUMMARY COST:** N/A

(U) **D. ACQUISITION STRATEGY:** N/A

(U) **E. SCHEDULE PROFILE:** N/A