

**DEFENSE THREAT REDUCTION AGENCY
BROAD AGENCY ANNOUNCEMENT
HDTRA1-08-10-BRCWMD-BAA**



**Research and Development Enterprise
Basic and Applied Sciences Directorate
Basic Research for
Combating Weapons of Mass Destruction (C-WMD)**

**June 2008
Amendment 7 (May 2010)**

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OVERVIEW INFORMATION

1. Agency Name:

Defense Threat Reduction Agency (DTRA)
Research and Development (R&D) Enterprise
Basic and Applied Sciences Directorate
8725 John J. Kingman Road
MS 6201
Fort Belvoir, VA 22060-6201

2. Funding Opportunity Title:

FY2009 – 2011 Basic Research for Combating Weapons of Mass Destruction (C-WMD)
Broad Agency Announcement (BAA)

3. Announcement Type:

This is an initial announcement of this funding opportunity. This BAA is in effect from June 2008 through October 2010 and will result in grants only. Over this timeframe there will be five (5) opportunities/periods to electronically submit research. Each period will have a two-phased submission process that begins with submission of a white paper that describes the proposed research. The white paper will be evaluated and the applicants may or may not be invited to submit a follow-on more detailed description of the research – the proposal. Phase I is associated with the white paper research submission, and open to all qualified grantees; Phase II is an invitation-only proposal submission resulting from Phase I as decided by the DTRA Source Selection.

4. Funding Opportunity Number:

HDTRA1-08-10-BRCWMD-BAA

5. Catalog of Federal Domestic Assistance (CFDA) Number:

12.351

6. Dates:

Critical Phase I dates include online registration at the DTRA proposal submission website, and each of the Phase I white paper submission opportunities for each of the five (5) periods (Phase II and other important dates are in [Section IV.3](#)):

All submissions will be made at the DTRA proposal submission website identified in [Section VII.1](#) of the BAA.

Period	Date	Description
1	4 June 2008	Begin registration at the DTRA Proposal Submission Website
	14 July 2008	Phase I White Paper Submission Deadline
2	14 October 2008	Begin registration at the DTRA Proposal Submission Website
	24 November 2008	Phase I White Paper Submission Deadline
3	21 April 2009	Begin registration at the DTRA Proposal Submission Website
	1 June 2009	Phase I White Paper Submission Deadline
4	21 September 2009	Begin registration at the DTRA Proposal Submission Website
	2 November 2009	Phase I White Paper Submission Deadline
5	19 May 2010	Begin registration at the DTRA Proposal Submission Website
	30 June 2010	Phase I White Paper Submission Deadline

ADDITIONAL OVERVIEW CONTENT

Research proposals are sought from accredited degree-granting colleges and universities; and industrial/commercial/not-for-profit Basic Research Centers including small businesses with a portfolio predominantly in Basic Research offering a significant contribution by one (1) or more universities. A grant may be proposed for up to five (5) years. Awards are typically for a period of three (3) years with two (2) additional years possible as options. Awards average \$100K to \$500K per year, depending on the type of proposed effort submitted (e.g., single principal investigator (PI), young investigators, multiple investigator/multiple institutions/multidisciplinary).

This BAA is focused on soliciting basic research projects that support the DTRA mission to safeguard America and its allies from WMD (e.g., chemical, biological, radiological, nuclear, and high yield explosives) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects. To this end, DTRA seeks research across broad strategic thrust areas:

1. **Science of WMD Sensing and Recognition:** The basic science of WMD sensing and recognition is the fundamental understanding of materials that demonstrate measurable changes when stimulated by energy, molecules, or particles from WMD in the environment. This research thrust involves exploration and exploitation of interactions between materials and various electromagnetic frequencies, molecules, nuclear radiation or particles. These interactions and the specific form of recognition they provide are used for subsequent generation of information that provides knowledge of the presence, identity, and/or quantity of material or energy in the environment that may be significant.
2. **Cognitive and Information Science:** The basic science of cognitive and information science is the convergence of computer, information, mathematical, networks, natural, and social science. This research thrust expands our understanding of social networks and advances knowledge of adversarial intent with respect to the acquisition, proliferation, and potential use of WMD. The methods may include analytical, computational or numerical, or experimental means to integrate knowledge across disciplines and improve rapid processing of intelligence and dissemination of information.
3. **Science for Protection:** Basic science for protection involves advancing knowledge to protect life and life-sustaining resources and networks. Protection includes threat containment, decontamination, threat filtering, and shielding of systems. The concept is generalized to include fundamental investigations that reduce consequences of WMD, assist in the restoration of life-sustaining functions, and support forensic science.
4. **Science to Defeat WMD:** Basic science to defeat WMD involves furthering the understanding of explosives, their detonation, and problems associated with accessing the target WMDs. This research thrust includes the creation of new energetic molecules/materials that enhance the defeat of WMDs, the improvement of modeling, and simulation of these materials and various phenomena that affect success and estimate the impact of defeat actions, and investigation of novel methods that may yield order-of-magnitude improvements in energy and energy release rate.
5. **Science to Secure WMDs:** Basic science to support securing WMD includes: (a) environmentally responsible innovative processes to neutralize chemical, biological, radiological, nuclear, or explosive (CBRNE) materials and components; (b) discovery of revolutionary means to secure components and weapons; and (c) studies of scientific principles that lead to novel physical or other tags and methods to monitor compliance and disrupt proliferation pathways. The identification of basic phenomena that provide verifiable controls on materials and systems also helps arms control.

The specific research opportunities composing these thrust areas are listed in [Attachment 8](#). Please note that the research opportunities will likely be updated via an amendment to this BAA prior to each period.

I. FUNDING OPPORTUNITY DESCRIPTION

I.1. This BAA is an extramural endeavor that combines basic research needs of DTRA and the Joint Science and Technology Office for Chemical and Biological Defense's (JSTO-CBD) to address the full spectrum of counter-WMD challenges. Both DTRA and JSTO-CBD share the mission to safeguard America and its allies from WMD and provide capabilities to reduce, eliminate and counter the threat and effects from chemical, biological, radiological, nuclear, and high yield explosives. Each seeks to identify, adopt, and adapt emerging and revolutionary sciences that may demonstrate high payoff potential to counter-WMD threats.

I.2. This announcement solicits white papers for long-term challenges in specific fundamental areas of Basic Research that offer a significant contribution to the current body of knowledge or further the understanding of phenomena and observable facts and may have impact on future capabilities that support the DTRA and JSTO-CBD missions.

I.3. Basic Research is the systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress.

In contrast to Basic Research, Applied Research is the systematic study to understand the means to meet a recognized and specific need. It is a systematic expansion and application of knowledge to develop useful materials, devices, and systems or methods. The boundary between Basic Research and Applied Research occurs at the point when sufficient knowledge exists to support a hypothesis involving a specific application.

I.4. Responses to this BAA must address **only Basic Research**. White paper and proposal submissions that address Applied Research, Advanced Technology Development, or combine Basic Research with Applied Research and/or Advanced Technology Development will be considered unresponsive and will not be evaluated.

I.5. [Attachment 8](#) presents the five (5) major functional counter WMD Research Thrusts with the Topic Areas for which white papers and proposals are sought.

I.5.1. The Topic Areas will likely change for each Period outlined in [Section IV.3](#). Changes will be announced via an amendment to this BAA.

I.6. This BAA seeks optimum approaches to meet DTRA and JSTO Basic Research objectives. The Government encourages white papers and proposals that span a wide spectrum of research to expand fundamental scientific knowledge science in response to the specific Basic Research topics stated in [Attachment 8](#) of this BAA. The Government reserves the right to award any combination of approaches which offer the best overall value to the Government, and to oversee any and all processes and approaches once ongoing.

I.7. This BAA, in addition to any amendments issued in conjunction with this BAA, will be

posted to the Grant Opportunities Website (www.grants.gov) and for informational purposes a notice will be posted on the Federal Business Opportunities Website (www.FedBizOpps.gov) and the DTRA website (www.dtra.mil).

II. AWARD INFORMATION

II.1. Award Types

II.1.1. Resulting awards from this announcement will be grants.

II.1.1.1. The Government actions under this BAA shall adhere to the requirements of the DoD Grant and Agreement Regulations (DoDGARS).

II.1.1.2. Subcontracting is permitted. Subcontracting plans are not required for grants.

II.1.2. Offerors are advised that Other Transactions are not applicable under this BAA.

II.2. DTRA intends to create an environment where potential offerors are willing to share findings of fundamental research with the Government. The Government will negotiate terms and conditions to leverage the successful offerors' advances. The Government seeks to ultimately acquire the fundamental research in addition to offering the appropriate level of protection of corporate and institutional intangible property rights, thus encouraging participation by a broad spectrum of leading-edge researchers. Please refer to DoDGARS Section II.2 for details of intangible property.

II.3. All coordination and communication between offerors and the Government will be conducted using the e-mail address associated with this BAA specified in [Section VII.1](#).

II.4. The schedule of major milestones for this BAA is presented in [Section IV.3](#).

II.5. Funding for participation in this program is highly competitive and the cost of proposed research should be strictly maintained in the award amounts outlined. Preference will be given to Single Investigator Awards and Young Investigator Awards.

II.6. Awards resulting from this BAA will be made based on the evaluation results of the two-phased proposal process described in [Section IV.2](#).

II.7. The final number of projects and funds allocated will be determined after all proposals are received and evaluated.

II.8. The Government reserves the right to fund all, some, or none of the proposals submitted; may elect to fund only part of any or all proposals; and may incrementally fund any or all awards under this BAA. All awards are subject to the availability of funds.

II.9. While awards are anticipated to occur on or about the dates stated in [Section IV.3](#), the Government may offer funding for any full proposals or portions of proposals at any time during

each fiscal year.

II.10. DTRA is seeking research projects with a POP of up to five (5) years that address topics in [Attachment 8](#) of this BAA. Awards are typically for a period of three (3) years with two (2) additional years possible as options.

II.11. There are three (3) categories of award that will be considered:

- 1) Single Investigator Awards: Proposals that focus on exploratory aspects of a unique problem, a high risk approach, or innovative research in subjects with potential for high impact to C-WMD science. The predominance of awards will be Single Investigator Awards.
- 2) Single Grant/Multiple Investigator/Multidisciplinary Awards: Proposals that involve a comprehensive program of innovative research in either a focused or interdisciplinary area with potential for high impact. The proposed research must involve fundamental contributions in research by multiple investigators from diverse disciplines (proposal must be multidisciplinary). Investigators may be from a single institution or different institutions up to three (3) institutions. Research must support multiple graduate students and be designed to leverage closer interaction and engagement with both university and government laboratory institutions. Authors of these white papers and proposals must take great care to clearly outline the impact to C-WMD science that is to be gained from the higher dollar amount investment and justify the scientific contribution from each investigator. Proposals submitted under this category must have a single lead organization and single lead business point of contact with the responsibility for registration and submission.
- 3) Young Investigator Awards: Proposals that focus on exploratory aspects of a unique problem, a high risk approach, or innovative research in subjects with potential for high impact to C-WMD science from non-tenured faculty currently associated with educational institutions, as those terms are commonly understood who received a Ph.D. or equivalent degree on or after 15 May 2005.

II.12. The Government seeks to enable superior quality research resulting in peer reviewed scientific publications of significant merit. Offerors are strongly encouraged to publish the results or findings of their research in peer-reviewed journals.

III. ELIGIBILITY INFORMATION

III.1. Eligible Applicants.

III.1.1. Proposals submitted for this BAA will be considered from the following U.S. and Foreign Institutions as follows:

III.1.1.1. Accredited Degree-granting colleges and universities.

III.1.1.2. Industrial/commercial Basic Research Centers (Foreign based equivalents) including small businesses with a portfolio predominantly in Basic Research proposing a project with a significant contribution (minimum 30% of total effort value on the proposed project) by one or more universities.

III.1.1.3. Not-for-profit organizations/Basic Research Centers with a portfolio predominantly in Basic Research proposing a project with a significant contribution (minimum 30% of total effort value on the proposed project) by one or more universities. Proof of 501 (c) (3) status from the Internal Revenue Service may be required. For foreign based establishments, entirely based outside the United States and/or its territories, proof of not-for-profit status will have to be provided by the agency that provides that determination for that particular country.

III.1.2. The following entities may not participate as prime grantees nor furnish PI's in awards made under this BAA but may act as collaborators or subcontractors:

III.1.2.1. Federal (including DoD and Department of Energy (DOE)) laboratories, to include foreign equivalents.

III.1.2.2. U.S. Government agencies and organizations including Academic institutions that are federal government organizations (e.g., Naval Postgraduate School), to include foreign equivalents..

III.1.2.3. DoD sponsored Federally Funded Research and Development Centers (FFRDCs) specified in the Defense Federal Acquisition Regulation Supplement (DFARS) 235.017-1 (<http://farsite.hill.af.mil/VFDFARA.HTM>) and click on 'DFARS Part 35'.

III.1.2.4. DOE sponsored FFRDCs provided that authorization is obtained from the DOE sponsor.

III.1.2.5. Industrial/commercial firms.

III.1.3. All of the entities listed in [Section III.1.2](#), except industrial/commercial firms, may respond to the annual 'Service Call' issued by the Basic Research and Applied Sciences Directorate, DTRA; see <http://www.dtrasubmission.net> and follow the link to the 'FY09-11 Basic Research for Combating Weapons of Mass Destruction (WMD) Service Call'. Please note that the Service Call link will also contain the submission period.

III.1.4. Proposals are encouraged from Historically Black Colleges and Universities (as determined by the Secretary of Education to meet requirements of Title III of the Higher Education Act of 1965, as amended (20 U.S.C. § 1061)) and from Minority Institutions defined as institutions "whose enrollment of a single minority or a combination of minorities...exceeds 50 percent of the total enrollment." [20 U.S.C. § 1067k(3) and 10 U.S.C. § 2323(a)(1)(C)].

III.2. Cost sharing or Matching. N/A.

III.3. Other.

III.3.1. Failure to register in accordance with instructions in [Section IV.1](#) will render white papers and proposals ineligible for participation in this BAA.

III.3.2. Failure to meet the eligibility requirements outlined herein will render white papers and proposals ineligible for participation in this BAA.

III.3.3. Central Contractor Registration (CCR)

III.3.3.1. Prospective grantees must be registered in the DoD CCR database. By submission of an offer resulting from this BAA, the offeror acknowledges the requirement that a prospective grantee must be registered in the CCR database prior to award, during performance, and through final payment of any grant resulting from this BAA.

III.3.3.2. **IMPORTANT:** It is required that all offerors be registered in the CCR database at the time of Phase I proposal submission. CCR registration information must be included in Volume III, Supplemental Information, of the Phase II full proposal.

III.3.3.3. You may register with CCR by calling the CCR Assistance Center at 1-888-227-2423 or you may register online at <http://www.ccr.gov>. You will NOT be able to complete your CCR registration until CCR has confirmed your Employer Identification Number (EIN) or Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS).

III.3.3.4. Please note that it will take 24-48 hours for IRS to validate your TIN. According to the IRS, if you do not currently have an EIN and need to apply for one over the phone or Internet, you will be given a tentative EIN, but your EIN may not become active for up to two (2) weeks. If you have questions about your EIN, please call 1-800-829-4933.

III.3.3.5. If you have the necessary information ready, online registration will take about 30 minutes to complete, depending upon the size and complexity of your organization. If the organization completes the CCR registration process by 6:00 PM EST, the organizational representatives will be able to begin their registration process the very next business day.

III.3.4. Military Recruiting. This is to notify potential offerors that each grant awarded under this announcement to an institution of higher education, with exception of any grants awarded to institutions of higher education entirely located outside the United States and/or its territories, must include the following term and condition: “As a condition for receipt of funds available to DoD under this award, the recipient agrees that it is not an institution of higher education (as defined in 32 Code of Federal Regulations (CFR) Part 216) that has a policy of denying, and that it is not an institution of higher education that effectively prevents, the Secretary of Defense from obtaining the following for military recruiting purposes: (A) entry to campuses or access to students on campuses; or (B) access to directory information pertaining to students. If the recipient is determined, using procedures in 32 CFR Part 216 to be such an institution of higher education during the period of performance of this agreement, and therefore to be in breach of this clause, the Government will cease all payments of DoD funds under this agreement and all

other DoD grants and cooperative agreements, and it may suspend or terminate such grants and agreements unilaterally for material failure to comply with the terms and conditions of award.” 32 CFR Part 216 may be accessed electronically at <http://www.gpoaccess.gov/cfr/index.html>. If your institution has been identified under the procedures established by the Secretary of Defense to implement Section 558 of Public Law 103-337, then: (1) no funds available to DoD may be provided to your institution through any grant, including any existing grant; and (2) your institution is not eligible to receive a grant in response to this BAA. This is to notify potential offerors that each grant awarded under this announcement to an institution of higher education, with exception of any grants awarded to institutions of higher education entirely located outside the United States and/or its territories, must include the following clause: DoDGARS Section 22.520, Military Recruiting and Reserve Officer Training Corps Program Access to Institutions of Higher Education.

IV. APPLICATION AND SUBMISSION INFORMATION

IV.1. Address to Request Application Package.

IV.1.1. Registration at the DTRA proposal submission website (<https://www.dtrasubmission.net/>) prior to submission of Phase I white papers is required.

IV.1.1.1. All offerors interested in submitting proposals must register on the DTRA proposal submission website beginning on or about the date stated in [Section IV.3](#).

IV.1.1.2. Registration must be submitted by a central Business Point of Contact (BPOC) rather than individual PI personnel. A BPOC is a person who is given the responsibility of coordinating all submissions from individual PIs at his or her organization and will be the only individual who may access the DTRA proposal submission website. The intent is that all submissions from an organization be coordinated and submitted by a single, identified responsible party.

IV.1.1.3. Interested organizations must register at the DTRA proposal submission website even if previously registered at any other proposal submission site for prior DTRA and/or JSTO-CBD acquisition opportunities. Prior registration at any other proposal submission site does not fulfill registration requirements for participation in this BAA. Organizations who have already registered on the DTRA proposal submission website may use their current account to submit white papers and proposals for this solicitation.

IV.1.1.4. **IMPORTANT:** Registration at the DTRA proposal submission website is NOT the same as registering at the CCR website, FedBizOpps or Grants.gov websites. Failure to compliantly register at the DTRA proposal submission website specified in this BAA will prevent an offeror’s submission of documents required for Phase I and thus render those documents ineligible for participation in this BAA.

IV.1.2. Using the DTRA proposal submission website, all Offerors must prepare proposal cover sheets (for both Phase I submissions and for invited Phase II submissions), including basic

identifying information for the institution, the points of contact, and certify that the offeror meets the eligibility requirements in [Section III](#). Once the cover sheet is saved, the system will assign a unique proposal number for each Phase I submission and a different unique proposal number for each invited Phase II submission.

IV.1.2.1. Cover sheets may be edited until the submission period closes.

IV.1.2.2. For reference, a sample grant with DTRA terms and conditions is provided in [Attachment 10](#). We recommend that all offerors examine the sample and encourage them to make themselves familiar with the standard DoDGARS clauses included. If selected for negotiation, offerors will be expected to be familiar with these clauses. Clauses may vary dependent upon the specifics of each individual project.

IV.1.3. White papers and proposals must be submitted electronically through the DTRA proposal submission website <https://www.dtrasubmission.net/>.

IV.1.4. Detailed registration and submission instructions are available at the site.

IV.1.5. Failure to register as stated will prevent an offeror's submission of documents required for Phase I and will render them ineligible for participation in this BAA. For each phase of submission, offerors will complete a cover sheet on the DTRA proposal submission website and certify that they meet the eligibility requirements in [Section III](#). Phase I is for receipt of white papers. The second phase of this BAA is by invitation only. Invitation to the Phase II, full proposal submission (Volume I - Technical Proposal, Volume II - Cost Proposal and Volume III - Supplemental Information to include, but not limited to, a Statement of Work (SOW) and Quad Chart) will be based on the evaluation results in Phase I.

IV.2. Content and Form of Application Submission. This BAA will be conducted in two (2) phases as follows:

IV.2.1. Phase I – Interested offerors are required to complete a cover sheet using the DTRA Proposal submission website and must submit white papers in accordance with instructions provided in this section of the BAA and in accordance with the deadline stated in Section IV.3. Proposals will be evaluated against criteria as described in [Section V.1](#). Based on this evaluation, selected offerors will be invited to submit full proposals for evaluation under Phase II.

IV.2.1.1. White Paper Submission and Content. Interested offerors are required to submit a four-page narrative (white paper). Each submission must contain a unique and descriptive white paper title, which is different from the topic title. Each submission must also specify the research area and topic addressed by identifying the specific topic number as presented in [Attachment 8](#) of this BAA. See white paper format and narrative guidelines below.

IV.2.1.2. White Paper Narrative Format. The white paper must not exceed four pages, 8.5 x 11 inches, single-spaced, with one-inch margins in type not smaller than 12 point Times New Roman font. Any pages submitted that exceed the four-page limit will not be read or evaluated. The project title (which should be different than the topic title) must be included at the top of the page and must cite the topic number (refer to [Attachment 8](#)). The white paper narrative must specify a single topic area and issues for consideration by identifying at the end of the project title the specific paragraph referenced in [Attachment 8](#). The white paper should provide sufficient information on the research being proposed (e.g., the hypothesis, theories, concepts, methodologies, data measurements, and analysis, etc.) to allow for an assessment by a technical expert. Do NOT include corporate or personnel qualifications, past experience, or any supplemental information. White papers that identify specific applications will be considered applied research and unresponsive to this BAA. See [Section I.3](#) for more information on the difference between Basic and Applied Research.

IV.2.1.3. Classification: All white paper submissions must be UNCLASSIFIED. All information provided in the white paper that is marked appropriately will be considered proprietary information, as indicated in [Section IV.5.4](#).

IV.2.1.4. Offerors invited to participate in Phase II must submit their full proposals in accordance with the instructions provided in [Section IV.2.2](#) of this BAA. Full proposals will be evaluated against criteria as described in [Section V.1](#) of this BAA. Submission procedures are detailed in this BAA and further detail may be given in the invitation. Any submission that does not conform to the requirements outlined in the BAA and in the invitation may not be reviewed or considered further. The due date for the Phase II proposals is stated in [Section IV.3](#).

IV.2.2. Phase II - Full Proposal Submission and Content. The full proposal must be prepared in three separate volumes: Volume I – Technical Proposal; Volume II – Cost Proposal; and Volume III – Supplemental Information, to include an SOW and a Quad Chart.

IV.2.2.1. Volume I – Technical Proposal. The technical proposal must not exceed 20 pages (including references). If the proposal exceeds 20 pages, only the first 20 pages will be reviewed. A page is defined as 8 ½ x 11 inches, single-spaced, with one-inch margins in type not smaller than 12 point Times New Roman font. The technical proposal must include the components included in the template as shown in [Attachment 4](#) of this BAA. Phase II technical proposals must be UNCLASSIFIED. All information provided that is marked appropriately will be considered proprietary information, as indicated in [Section IV.5.4](#).

IV.2.2.2. Volume II – Cost Proposal. The cost volume should contain cost estimates sufficiently detailed for meaningful evaluation. Additionally, a cost summary must be prepared and submitted in conjunction with the detailed cost proposal. The cost summary is not to exceed two (2) pages, however the cost proposal does not have a page limit. The budget must include the total cost of the project, and the cost proposal must provide a breakdown of the amount(s) by task. The cost proposal must include the components included in the template as shown in [Attachment 5](#) of this BAA. Separate cost proposals should be provided and incorporated into Volume II for any subcontracts or consultants.

IV.2.2.3. Volume III – Supplemental Information. This volume contains supplemental data. This volume must contain the items detailed in the table below. If any particular item is not relevant to the proposed effort, include a reference to the requested information and state that the particular information is not applicable in order to confirm a negative response.

	Item	Required
1.	Quad Chart	Yes
2.	Statement of Work	Yes
3.	Data Universal Number System (DUNS), Tax Identification Number (TIN) and North American Industry Classification System (NAICS)	Yes
4.	Certifications and Representations	Yes
5.	CCR	Yes
6.	Human Subjects	If Applicable
7.	Animal Use	If Applicable
8.	BioSurety and Select Agent Use	If Applicable
9.	Organizational Conflict of Interest Advisory	Yes
10.	Intangible Property Assertions	Yes
11.	Authorized Offeror Personnel	Yes
12.	Statement of Current and Pending Support	Yes
13.	Office of Naval Research (ONR)/ Defense Contract Audit Agency (DCAA)/ Defense Finance and Accounting Service (DFAS) Representatives	Yes
14.	Confirmed Proposal Expiration Date	Yes
15.	Supporting rationale of a portfolio predominantly in Basic Research (not required for Universities)	If Applicable

Item	Required
16. Supporting letter from the organization for the Young Investigator Awards stating the status of the PI as non-tenured faculty who received a Ph.D. or equivalent degree on or after 15 May 2004.	If Applicable

IV.2.2.3.1 Authorized Offeror Personnel. Offerors must include in the Phase II proposal the name, title, mailing address, telephone number, fax number, and e-mail address of the company and business point of contact regarding decisions made with respect to the offeror and who can obligate the proposal contractually. Also, identify those individuals authorized to negotiate with the Government. This information must be included in Volume III, Supplemental Information, of the Phase II full proposal.

IV.2.2.3.2 Statement of Current and Pending Support. Offerors must include in the Phase II proposal a statement of current and pending support of related work, and this information must be included for each investigator listed in the proposal. This statement requires that each investigator specify all grants and contracts through which he or she is currently receiving or may potentially receive financial support. This information must be included in Volume III, Supplemental Information, of the Phase II full proposal.

IV.2.2.3.3 ONR and DCAA Representatives (Administrative and Audit Offices). Offerors must indicate in the Phase II proposal which ONR and DCAA offices (or Cognizant Administrative and Audit Offices) will represent them. This information must be included in Volume III, Supplemental Information, of the Phase II full proposal.

- ONR: Offerors can identify their ONR office by going to the following website [<http://www.onr.navy.mil/02/024/offices.asp>] and look for the ONR office for their State.

- DCAA: Offerors can identify their DCAA office by going to the following website [<http://apps.dtic.mil/wobin/WebObjects/DCAAZipcode>] and entering their ZIP code.

IV.2.2.3.4 Confirmed Proposal Expiration Date. Offerors must provide written confirmation that holds the proposal, to include proposed costs, firm until award date as stated in [Section IV.3](#). This information must be included in Volume III, Supplemental Information, of the Phase II full proposal.

IV.2.3. Offerors whose proposals are accepted for funding will be contacted before award to provide additional information required for award. This request for further information may include revised budgets or budget explanations and other information as applicable to the proposed award. Offerors who are not responsive to government requests for information in a timely manner, defined as meeting government deadlines established and communicated with the request, may be removed from award consideration.

IV.2.4. Each white paper and invited proposal will address one (1) Topic Area only.

IV.2.5. Each white paper and invited proposal will be reviewed within the Period to which it was submitted.

IV.2.6. Offerors may submit white paper and invited proposal to one (1) or more Topic Areas.

IV.2.7. Offerors may submit white paper and invited proposal to more than one (1) Period under this BAA.

IV.2.8. Proposals may be withdrawn by written notice received at any time before award. Withdrawals are effective upon receipt of notice by the Grant Officer via the e-mail address listed in [Section VII.1](#).

IV.3. Submission Dates and Times. Milestones for awards made in fiscal years 2009-2011*.
*All dates are subject to change.

Date	Event
2 June 2008	BAA announced on Grants.gov and FedBizOpps websites
<i>Period 1</i>	
4 June 2008	Begin registration at the DTRA Proposal submission website
4 June 2008	DTRA Proposal submission website opens for receipt of White Paper
23 June 2008	Deadline to submit questions
30 June 2008	Questions and Answers posted at Grants.gov
2:00 PM EST, 14 July 2008	Phase I Proposal receipt deadline (White Paper)
On/about 25 August 2008	Phase II Proposals invited; non-selection notifications will follow approximately 2 weeks later
2:00 PM EST, 29 September 2008*	Phase II Proposal receipt deadline
On/about 24 November 2008	Topic L-Topic Q: Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2

	weeks
On/about 12 December 2008	Topic A, B, D-H, and K: Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 2 February 2009	Topic C and I: Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 5 January 2009	Topic L-Topic Q: Estimated First Award Date
On/about 30 January 2009	Topic A, B, D-H, and K: Estimated First Award Date
On/about 15 March 2009	Topic C and I: Estimated First Award Date
<i>Period 2</i>	
14 October 2008	Begin registration at the DTRA Proposal submission website
15 October 2008	DTRA Proposal submission website opens for receipt of White Paper
3 November 2008	Deadline to submit questions
10 November 2008	Questions and Answers posted at Grants.gov
2:00 PM EST, 24 November 2008	Phase I Proposal receipt deadline (White Paper)
On/about 12 January 2008	Phase II Proposals invited; non-selection notifications will follow approximately 2 weeks later
2:00 PM EST, 17 February 2009*	Phase II Proposal receipt deadline
On/about 13 April 2009	Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 15 July 2009	Estimated First Award
<i>Period 3</i>	
On/about 21 April 2009	Begin registration at the DTRA Proposal submission website
1 May 2009	DTRA Proposal submission website opens for receipt of White Paper
18 May 2009	Deadline to submit questions
20 May 2009	Questions and Answers posted at Grants.gov
2:00 PM EST, 1 June 2009	Phase I Proposal receipt deadline (White Paper)

On/about 14 July 2009	Phase II Proposals invited; non-selection notifications will follow approximately 2 weeks later
2:00 PM EST, 18 August 2009*	Phase II Proposal receipt deadline
On/about 14 October 2009	Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 14 December 2009	Estimated First Award Date
<i>Period 4</i>	
21 September 2009	Begin registration at the DTRA Proposal submission website
23 September 2009	DTRA Proposal submission website opens for receipt of White Paper
19 October 2009	Deadline to submit questions
26 October 2009	Questions and Answers posted at Grants.gov
2:00 PM EST, 2 November 2009	Phase I Proposal receipt deadline (White Paper)
On/about 12 January 2010	Phase II Proposals invited; non-selection notifications will follow approximately 2 weeks later
2 PM EST, 24 February 2010*	Phase II Proposal receipt deadline
On/about 31 May 2010	Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 27 October 2010	Estimated First Award Date
<i>Period 5</i>	
19 May 2010	Begin registration at the DTRA Proposal submission website
21 May 2010	DTRA Proposal submission website opens for receipt of White Paper
1 June 2010	Deadline to submit questions
9 June 2010	Questions and Answers posted at Grants.gov
2:00 PM EST, 30 June 2010	Phase I Proposal receipt deadline (White Paper)
On/about 11 August 2010	Phase II Proposals invited; non-selection notifications will follow approximately 2 weeks later
2:00 PM EST, 15 September 2010*	Phase II Proposal receipt deadline

On/about 10 November 2010	Announcement of Apparent Successful Offerors; non-selection notifications will follow within 2 weeks
On/about 20 January 2011	Estimated First Award Date

* Due dates detailed in the letter of invitation supersede this due date; invitation letters will not have a due date prior to the date listed in this announcement.

IV.3.1. Late Submissions.

IV.3.1.1. Offerors are responsible for access to the DTRA proposal submission website and for submitting electronic proposals so as to be received at the Government office designated in this BAA no later than the time and dates stated in [Section IV.3](#). Please note that according to 15 US Code 260a, daylight savings time becomes the standard time during the daylight savings period. When sending electronic files, the offeror will account for potential delays in file transfer from the originator's computer server to the Government website/computer server. Offerors are encouraged to submit their Proposals early to avoid potential file transfer delays due to high demand encountered as the submission deadline approaches.

IV.3.1.2. If the proposal is received at the Government office designated in this BAA after the exact time and date specified for receipt of offers, it is "late" and will not be considered. This applies for both Phase I and Phase II submissions.

IV.3.1.3. Acceptable evidence to establish the time of receipt at the Government office includes documentary and electronic evidence of receipt maintained by the installation. Offerors should also print, and maintain for their records, the electronic receipt that appears on the screen following submission of a proposal on the DTRA proposal submission website.

IV.3.1.4. If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the BAA, and urgent Government requirements preclude amendment of the BAA closing date, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the BAA on the first work day on which normal Government processes resume.

IV.3.1.5. The Government may reject Phase I or Phase II submissions that are deemed non-compliant, i.e., that deviate from the instructions in the BAA.

IV.4. Funding Restrictions. Indirect costs must be less than 35% of the total grant value per the 2008 DoD Appropriations Act (Public Law 110-116, Section 8115), 2009 DoD Appropriations Act (Public Law 110-329, Section 8109), and the 2010 DoD Appropriations Act (Public Law 111-118, Section 8101). This restriction currently applies to awards made using fiscal year (FY) 2008, 2009, and 2010 Basic Research funds and may apply to future awards.

IV.5. Other Submission Requirements.

IV.5.1. Offerors shall plan and budget for travel to accommodate the three meetings outlined below.

IV.5.1.1. National Conferences/Workshops/Symposia: Offerors are strongly encouraged to attend a nationally recognized conference, workshop, or symposium in the field of research each calendar year (one (1) at minimum). Research should be presented as soon as adequate data are available to support posters and presentations. Conferences/workshops/symposia should be attended by the PI and students supporting the research, as appropriate.

IV.5.1.2. Annual Technical Review: Offerors shall plan to attend an annual technical program review meeting. For planning purposes the review will be for five (5) days and may be held in a different region of the United States each year. DTRA encourages graduate students to attend the Annual Technical Review.

IV.5.1.3. Basic Research Scientific Exchange: Offerors shall plan annual attendance by the PI(s) and students supporting the research effort each calendar year at the Basic Research Scientific Exchange to be held at DTRA (Ft. Belvoir, VA). The Scientific Exchange will be three (3) days in length and will begin summer of 2010. Offerors should plan on a per person fee of \$500.00 to cover the cost of continental breakfast, box lunch, and an evening reception. The intent of the Scientific Exchange is to familiarize the performers in the Basic Research Program with DTRA to include tours, presentations from across DTRA, and presentations from other performers in the program.

IV.5.2. Submission Address

IV.5.2.1. Offerors must submit their proposal through the DTRA proposal submission website (<https://www.dtrasubmission.net/>). In the future, offerors may submit through the Grants.Gov APPLY website: http://www.grants.gov/applicants/apply_for_grants.jsp. Attachment 9 provides offerors with an overview of the Grants.Gov APPLY process as a reference.

IV.5.2.2. Proposals submitted by any means other than the DTRA proposal submission website (e.g., hand-carried, postal service, commercial carrier, and e-mail) will not be considered. Offerors are responsible for ensuring compliant and final submission of their proposals and can verify the submission of the proposal package with the electronic receipt that appears on the screen following submission of a proposal to the DTRA proposal submission website.

IV.5.3. Submission File Format. Perform a virus check before uploading any files. If a virus is detected, it may cause rejection of the file. Do not lock or encrypt any files you upload. The white paper and proposal must be uploaded as a Portable Document File (PDF) format compatible with Adobe Acrobat® version 7.0 or earlier. The white paper must be provided in portrait layout; each file will not exceed 2 Megabytes of storage space. For proposals each individual file will not exceed 5 Megabytes of storage space. Movie and sound file

attachments, or other additional files, will not be accepted. If multiple white papers and proposals are being submitted by the same institution, separate cover sheets must be generated for each, since a unique document number will automatically be assigned to each submission by the electronic proposal tracking system. All documents submitted to the DTRA proposal submission website are considered works in progress and are not eligible for evaluation until the offeror submits the final white paper or proposal package for consideration. The final submission must be 'locked' on the DTRA proposal submission website; until a submission has been 'locked' (saved as final), the submission is not eligible for review. Look for this 'lock' icon  on the DTRA proposal submission website. Offerors are responsible for ensuring compliant and final submission of their proposals, and can verify the submission of the proposal package with the electronic receipt that appears on the screen following submission of a proposal to the DTRA proposal submission website.

IV.5.4. Marking of White Paper and Proposal and Disclosure of Proprietary Information other than to the Government.

IV.5.4.1. The Quad Chart portion of the submission will not contain information deemed trade secret, confidential or proprietary by the offeror.

IV.5.4.2. The white paper/proposal submitted in response to this BAA may contain technical and other data that the offeror does not want disclosed to the public or used by the Government for any purpose other than proposal evaluation. Public release of information in any white paper/proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information which constitutes a trade secret, proprietary commercial or financial information, confidential personal information, or data affecting the national security, is provided by an offeror in a white paper/proposal, it will be treated in confidence, to the extent permitted by law, provided that the following legend appears and is completed on the front of the white paper/proposal: "For any purpose other than to evaluate the white paper/proposal, this data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if an award is made to the offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the agreement. This restriction does not limit the right of the Government to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained in page(s) _____ of this White Paper/Proposal." Any other legend may be unacceptable to the Government and may constitute grounds for removing the Proposal from further consideration without assuming any liability for inadvertent disclosure. The Government will limit dissemination of properly marked information to within official channels. In addition, the pages indicated as restricted must be marked with the following legend: "Use or disclosure of the white paper/proposal data on lines specifically identified by asterisk (*) are subject to the restriction on the front page of this white paper/proposal." The Government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

IV.5.4.3. In the event that properly marked data contained in a white paper/proposal submitted in response to this BAA is requested pursuant to the Freedom of Information Act (FOIA), 5 U.S.C. § 552, the offeror will be advised of such request and, prior to such release of information, will be requested to expeditiously submit to DTRA a detailed listing of all information in the white paper/proposal which the offeror believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the offeror will ensure that any information released by DTRA pursuant to the Act is properly identified.

IV.5.4.4. By submission of a white paper/proposal, the offeror understands that proprietary information may be disclosed outside the Government for the sole purpose of technical evaluation. The Grants Office will obtain a written agreement from the evaluator that proprietary information in the white paper/proposal will only be used for evaluation purposes and will not be further disclosed or utilized.

V. APPLICATION REVIEW INFORMATION

V.1. Criteria: The three (3) evaluation criteria to be used are listed in [Sections V.1.1-V.1.3](#).

V.1.1. Technical/Scientific Merit. This area addresses the technical approach and the contribution of the research to advancing the C-WMD scientific body of knowledge. It evaluates what research will be performed, and how it will be accomplished. Three factors will be considered. The first factor (Soundness of Approach) is of highest importance. The other two factors are of lesser but equal importance.

V.1.1.1. *Soundness of Approach*. This factor addresses whether the Proposal writer clearly identifies and demonstrates an understanding of the C-WMD scientific challenges and whether the project has a well-designed methodology, based on sound scientific principles, to address the stated C-WMD scientific challenge, and how technical risks are addressed, mitigated, and managed.

V.1.1.2. *Degree of Innovation*. This factor addresses the originality of the concept, its scientific merit, its creativity, and/or the novelty of the approach and the potential of the project to advance the C-WMD scientific body of knowledge. The degree of innovation will be judged based on the innovation or originality that is appropriate to the proposed project.

V.1.1.3. *Anticipated Scientific Impact*. This factor addresses the potential of the proposed work to provide greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts and the anticipated impact on the state of the C-WMD science.

V.1.2. Responsiveness to Topic Area and Program. This area evaluates the extent to which the proposed research supports specific topic areas. It also considers the derivative benefit that may be realized by the performer and its organization through performance of the proposed research. Two factors will be considered: 1) Responsiveness to Topic Area; and 2) Derivative Benefit.

The first factor is of higher importance.

V.1.2.1. *Responsiveness to Topic Area.* This factor addresses the responsiveness of the proposal to the objectives in the specific topic area and the contribution to the C-WMD science needs outlined in the proposal.

V.1.2.2. *Derivative Benefit.* This factor considers the impact of plans to enhance the institution's ability to perform defense-relevant research and to train, through the proposed research, students in science and/or engineering (for example, by acquiring or refurbishing equipment that can support DoD research and research-related educational objectives).

V.1.3. Program Capabilities and Cost. This area addresses key personnel, facilities, and major equipment required to accomplish the research. The first two factors (Qualifications and Capabilities) are of highest importance and weighted equal to each other. The cost factor is of lesser importance.

V.1.3.1. *Qualifications.* This factor will be scored based on the qualifications, and availability of the proposed PI, co-PIs and other key personnel who are critical in achieving proposed objectives.

V.1.3.2. *Capabilities.* This factor considers the offeror's current or planned facilities and equipment that support achieving the proposed objectives. Capabilities evaluation will be based on the total capabilities of the assembled team that will be brought to bear as part of the proposed project.

V.1.3.3. *Cost Realism and Reasonableness.* This factor considers the adequacy and reasonableness of resources applied to each project task. This includes labor (in terms of time and mix), equipment, other direct costs, fee (if applicable), and indirect costs.

V.2. Review and Selection Process

V.2.1. The white paper and proposal selection process will be conducted based upon a technical review as described in the DoDGARS [(DoD 3210.6-R, Section 22.315)] and includes the use of non-government peer-reviewers.

V.2.2. White Paper (Phase I) Evaluation

V.2.2.1. The evaluation will be based on two equally weighted criteria described in [Section V.1](#): 1) Technical/Scientific Merit and 2) Responsiveness to Topic Area and Program.

V.2.2.2. These will be scored as Green (acceptable), Yellow (acceptable with minor issues), or Red (unacceptable).

V.2.2.3. The Government does reserve the right to limit the number of Phase II proposals requested depending upon the volume of proposals submitted, the results of the Phase I evaluation, and the specific needs of the Agency.

V.2.3. Full Proposal (Phase II) Evaluation

V.2.3.1. The evaluation will be based on the three equally weighted criteria described in [Section V.1](#): 1) Technical/Scientific Merit, 2) Responsiveness to Topic Area and Program, and 3) Program Capabilities and Cost.

V.2.3.2. All three criteria receive a numerical score ranging from 1 (unacceptable) to 5 (outstanding).

V.2.3.3. Proposals will be accepted based on the reviews, availability of funds, consideration of possible duplication with other research, program balance across research topics, and the specific needs of the Agency.

V.2.4. All documents necessary for the review and evaluation of the Phase I and Phase II submissions must be provided as described in [Section IV.2](#) of this BAA.

V.2.5. Other factors that may be considered during the selection process are the possible duplication with other research currently funded by the Government, program balance across research topics, and budget limitations. Accordingly, proposals may be selected for funding which are not reviewed as highly as others, which are of higher risk and/or which may be of a higher cost.

V.2.6. The Government reserves the right to select all, some, or none of the proposals, or any part of any proposal, received in response to this BAA and to make awards without discussions with offerors; however, the Government reserves the right to conduct discussions if determined necessary.

V.2.7. Technical and Administrative Support by Non-Government Personnel

V.2.7.1. It is the intent of DTRA to use non-government personnel (e.g. peer-reviewers and contractor support personnel) to assist with the review and administration of submittals for this BAA; and, in some instances, and where they are Subject Matter Experts and meet all the criteria for a peer reviewer, non-government personnel will serve as reviewers.

V.2.7.2. Participation in this BAA requires existing DTRA support contractors including Northrop Grumman and their subcontractors, Tauri and their subcontractors, Suntiva Executive Consulting, and BRTRC Inc. employees to have access to proposal information including information that may be considered proprietary.

V.2.7.3. All individuals in this category having access to any proprietary data must certify that they will not disclose any information pertaining to this BAA including any submittal, the identity of any submitters, or any other information relative to this BAA.

V.2.7.4. This BAA includes requirements for non-disclosure of offeror proprietary information. Additionally, Northrop Grumman Information Technology and Tauri employees in their role as an Advisory and Assistance Services contractor to DTRA will provide technical input in an advisory role, as Subject Matter Experts, to the Government reviewers in addition to providing administrative support in the management of the white papers, proposals and the technical review.

V.2.7.5. All offerors to this BAA consent to the disclosure of their information to the assigned peer-reviewers, Northrop Grumman and their subcontractors, Suntiva Executive Consulting, BRTRC, Inc., and Tauri employees under these conditions.

VI. AWARD & NOTIFICATION ADMINISTRATION INFORMATION

VI.1. Award Notices.

VI.1.1. Offerors of white papers that are not selected for invitation will be notified by e-mail at the addresses provided at the time of submission of the decision according to the schedule in [Section IV.3](#).

VI.1.2. An invitation to submit a full proposal will be extended to those offerors whose submissions were selected in Phase I. The invitation will be transmitted via e-mail to the offeror's registered BPOC in accordance with the deadline stated in [Section IV.3](#). Additionally, it is the responsibility of the BPOC to inform the PI of the invitation to prepare a Phase II submission.

VI.1.3. Offerors will be notified by DTRA of their selection/non-selection of award decisions from the Phase II proposals via the DTRA proposal submission website. Notification of acceptance and intent to negotiate is not an authorization to begin performance.

VI.1.4. Debriefings will be posted to the DTRA proposal submission website and/or included in the notification emails. Directions for accessing the debriefing will be provided in the notification e-mail. Debriefings will be available by the award date that correlates to the submission period as detailed in [Section IV.3](#).

VI.1.5. The offerors must be aware that it is their responsibility to ensure that this e-mail notification reaches the intended recipient and is not blocked by the use of 'spam blocker' software or other means that the recipient's Internet Service Provider may have implemented as a means to block the receipt of certain e-mail messages. If for any reason there is a delivery failure of these e-mail notices, DTRA will not further attempt to contact the offerors. If a notification is not received by the institution according to the deadlines stated in Section IV.3, it is the responsibility of the offeror institution to check the website for an update and/or contact DTRA via Agency Contacts according to Section VI.

VI.2. Administrative and National Policy Requirements.

VI.2.1. Protection of Human Subjects

VI.2.1.1. It is not anticipated that human subjects would be involved in Basic Research. If the proposed research does involve human subjects or materials, however, offerors are asked to justify the use of human subjects and to address the following issues: outline the human use, to include the source of the human subjects or materials involved in the research. This information, if applicable, must be included in Volume III, Supplemental Information, of the Phase II full proposal. Further information may be required if the proposal is successful.

VI.2.1.2. All research under any award made under this BAA involving human subjects must be conducted in accordance with 32 CFR 219, 10 U.S.C. § 980, and DoD Directive 3216.2, and, as applicable, 21 CFR parts 11, 50, 56, GCP, the ICH as well as other applicable federal and state regulations. Grantees and their subcontractors must be cognizant of and abide by the additional restrictions and limitations imposed on the DoD regarding research involving human subjects, specifically as regards vulnerable populations (32 CFR 219 modifications to subparts B-D of 45 CFR 46), recruitment of military research subjects (32 CFR 219), and surrogate consent (10 U.S.C. § 980). For grants awarded to foreign institutions, you must follow either local or US laws (as stated above) depending on which laws provide stronger protection.

VI.2.1.3. DTRA Directive 3216.01 of January 28, 2005 establishes the DTRA Human Subjects Protection Program, sets forth the policies, defines the applicable terms, and delineates the procedures necessary to ensure DTRA compliance with federal and DoD regulations and legislation governing human subject research. The regulations mandate that all DoD activities, components, and agencies protect the rights and welfare of human subjects of study in DoD supported research, development, test and evaluation, and related activities hereafter referred to as “research.” The requirement to comply with the regulations applies to new starts and to continuing research. For grants awarded to foreign institutions, you must follow either local or US laws (as stated above) depending on which laws provide stronger protection.

VI.2.1.4. The DTRA Directive requires that research using human subjects may not begin or continue until the DTRA Human Research Oversight Board (HROB) has reviewed and approved the proposed protocol. Grantees and subcontractors are required to submit a valid federal assurance for their organization (institution, laboratory, facility) that has been issued by either DoD or the Department of Health and Human Services, for foreign institutions the equivalent for these agencies and documentation of review of proposed protocols by the local Institutional Review Board (IRB) to include consent forms for any planned research using human subjects to the DTRA HROB for its review through the grant officer’s representative (if assigned) or the grants officer. The HROB review is separate from, and in addition to, local IRB review.

VI.2.1.5. A study is considered to involve human research subjects if: 1) there is interaction with the subject (even simply talking to the subject qualifies; no needles are required); and 2) if the study involves collection and/or analysis of personal/private information about an individual, or if material used in the study contains links to such information. In the case of foreign institutions, this is just a minimum definition, if local laws and/or regulations have a stronger definition you must then follow that definition.

VI.2.1.6. Written approval to begin research or to subcontract for the use of human subjects under the proposed protocol will be provided in writing from the DTRA HROB, through the grant officer. Both the grantee and the Government must maintain a copy of this approval. Any proposed modifications or amendments to the approved protocol or consent forms must be submitted to the local IRB and the DTRA HROB for review and approval. Examples of modifications/amendments to the protocol include, but are not limited to:

- a change of the PI;
- changes in duration or intensity of exposure to some stimulus or agent; changes in the information requested of volunteers, or changes to the use of specimens or data collected; or
- changes in perceived or measured risks or benefits to volunteers that require changes to the study.

VI.2.1.7. Research pursuant to such modifications or amendments must not be initiated without IRB and HROB approval except when necessary to eliminate apparent and immediate hazards to the subject(s).

VI.2.1.8. Research projects lasting more than one year require IRB review at least annually, or more frequently as required by the responsible IRB (local rules and laws for foreign institutions). HROB review and approval is required annually. The grantee or subcontractor must provide documentation of continued IRB review of protocols for HROB review and approval in accordance with the Grant Data Requirements List. Research must not continue without renewed HROB approval unless necessary to eliminate apparent and immediate hazards to the subject(s).

VI.2.1.9. Non-compliance with any provision of this clause may result in withholding of payments under the grant pursuant to the grant's payments clause(s) and/or grant termination pursuant to the grant's termination clause(s). The Government shall not be responsible for any costs incurred for research involving human subjects prior to protocol approval by the HROB.

VI.2.2. Animal Use

VI.2.2.1. It is not anticipated that animal use would be involved in Basic Research. If the proposed research does involve animal use, however, offerors are asked to justify the use of animals and to address the following issues: Any proposals that include animal studies or animal work must submit detailed information on the animal protocols to be used and verify the location where the studies will be conducted. Animal studies are subject to review and approval for safety and adherence to regulations. This information, if applicable, must be included in Volume III, Supplemental Information, of the Phase II Full Proposal. Further information may be required if the Proposal is successful.

VI.2.2.2. DoD Directive 3216.1, dated April 17, 1995, provides policy and requirements for the use of animals in DoD-funded research. The DoD definition of Animal is “any live nonhuman vertebrate.” All proposals that involve the use of animals must address compliance with DoD Directive 3216.1. DTRA requires that research using animals not begin or continue until DTRA has reviewed and approved the proposed animal use. For animals, the provisions include rules on animal acquisition, transport, care, handling, and use in: (i) 9 CFR parts 1-4, Department of Agriculture rules that implement the Laboratory Animal Welfare Action of 1966 (U.S.C. § 2131-2156); and (ii) the “Guide for the Care and Use of Laboratory Animals,” National Institutes of Health Publication No. 86-23. For grants awarded to foreign institutions, you must follow either local or US laws (as stated above) depending on which laws provide stronger protection.

VI.2.3. Biological Defense Research Program (BDRP) Requirements: BioSurety and Select Agent Use.

VI.2.3.1. Proposals must specify what Select Agent work will be conducted at the offeror’s facility and what Select Agent work will be performed in other facilities. Proposals also must provide the source of the Select Agent(s), any appropriate registration information for the facilities, and specify the Laboratory Biosafety Level. All Select Agent work is subject to verification of information and certifications. This information, if applicable, must be included in Volume III, Supplemental Information, of the Phase II Full Proposal. Further information may be required if the proposal is successful.

VI.2.3.2. For those institutions in which PI’s are conducting research with Bio-safety Levels 3 and 4 material, a Facility Safety Plan must be prepared and made available during the project award phase in accordance with 32 Code of Federal Regulations (CFR) 626.18. for grants awarded to foreign institutions, you must follow either local or US laws (as stated above) depending on which laws provide stronger protection. (DTRA requires that research using Select Agents not begin or continue until DTRA has reviewed and approved the proposed agent use. See URL: www.access.gpo.gov/nara/cfr/waisidx_99/32cfr626_99.html for a copy of 32 CFR 626.18, Biological Defense Safety Program).

VI.2.4. Intangible Property. In accordance with DoDGARS §32.36.

VI.3. Reporting. General requirements are provided below; however, each grantee should check the award agreement to determine any deviations.

VI.3.1. Annual Reports: Annual reports will be due no later than 1 September of each year. Grants effective after 31 July will not require a progress report until 1 September of the following year.

VI.3.2. Final Technical Reports: A comprehensive final technical report is required at the end of an effort, due on the date specified in the grant document.

VI.3.2.1. The purpose of the final report is to document and to transition the results of the effort into the DTRA and DoD applied research community. The final report will always be sent to the Defense Technical Information Center (DTIC) and unclassified reports will be available to the public through the National Technical Information Service (NTIS).

VI.3.3. The following financial reports are required for all grant recipients:

- Federal Financial Report, SF425. This report is due annually, no later than 90 days after the end of the reporting period. The reporting period shall be from 1 August – 31 July. First year reports shall have a reporting period of the start date of the grant through 31 July. Final reports shall be submitted no later than 90 days after the project or grant period end date.

VI.3.4. All reports shall be submitted to the Office of Naval Research Office identified in the Research Grant. All technical reports shall also be submitted via email to the following address: BasicResearch@dtra.mil.

VI.3.5. After-the-Award Requirements. Closeout, subsequent adjustments, continuing responsibilities, and collection of amounts due are subject to requirements found in DoDGARs §32.71 through 73.

VI.3.6. Foreign Travel Reporting Requirement. Within thirty (30) days after returning to the United States from foreign travel, the PI shall submit an acceptable trip report to the Grants Officer summarizing the highlights of the trip. For grants awarded to institutions entirely located outside the United States and/or its territories, this is not required.

VII.AGENCY CONTACTS

VII.1. The email address for all BAA correspondence and questions, the submission website, and other important information:

E-mail address for all BAA correspondence and questions	HDTRA1-08-10-BRCWMD-A@dtra.mil
BAA Announcement	http://www.fbo.gov http://grants.gov
DTRA Proposal Submission Website (requires registration prior to Proposal submission)	https://www.dtrasubmission.net/ http://grants.gov
DTRA Website	http://www.dtra.mil

VII.2. Questions regarding the technical and administrative content of this BAA must be addressed to the e-mail address listed above. All questions must include the BAA number in the subject line.

VII.3. DTRA will post questions and answers relevant to all potential offerors to the grants.gov website by the date specified in [Section IV.3](#). It is the offeror's responsibility to periodically check the grants.gov website to view postings of questions and answers, in addition to any applicable amendments to the BAA.

VII.4. Please note that answers will not be provided nor any judgment made related to questions concerning the applicability of certain projects to the scope of this BAA.

VIII. OTHER INFORMATION

VIII.1. **Export Control Notification.** Offerors are responsible for ensuring compliance with any export control laws and regulations that may be applicable to the export of and foreign access to their proposed technologies. Offerors may consult with the Department of State with any questions regarding the International Traffic in Arms Regulation (ITAR) (22 CFR Parts 120-130) and/or the Department of Commerce regarding the Export Administration Regulations (15 CFR Parts 730-774).

VIII.2. **Organization Conflict of Interest Advisory.** Certain post-employment restrictions on former federal officers and employees may exist, including special Government employees (including but not limited to 18 U.S.C § 207, the Procurement Integrity Act, 41 U.S.C. § 423). If a prospective offeror believes that a conflict of interest exists, the situation should be raised to the DTRA Grant Officer before time and effort are expended in preparing a Proposal. All offerors and proposed sub-contractors must therefore affirmatively state whether they are providing scientific, engineering and technical assistance (SETA), advisory and assistance services (A&AS) or similar support, through an active contract or subcontract, to any DTRA technical office(s), the Joint Program Executive Office (JPEO), Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ATSD-NCB), or the Office of the Special Assistant for Chemical and Biological Defense and Chemical Demilitarization Programs (OSA (CBD&CDP)). This information must be included in Volume III, Supplemental Information, of the Phase II full Proposal. All affirmations must state which office(s) the offeror supports, and identify the prime contract number. Affirmations must be furnished at the time of Proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest must be disclosed. The disclosure must include a description of the action the offeror has taken or proposes to take to avoid, neutralize, or mitigate such conflict.

IX.ATTACHMENTS

ATTACHMENT 1	QUAD CHART TEMPLATE
ATTACHMENT 2	TECHNOLOGY READINESS LEVEL DEFINITIONS
ATTACHMENT 3	WHITE PAPER FORMAT
ATTACHMENT 4	PHASE II TECHNICAL PROPOSAL TEMPLATE
ATTACHMENT 5	PHASE II COST PROPOSAL TEMPLATE
ATTACHMENT 6	STATEMENT OF WORK (SOW) TEMPLATE
ATTACHMENT 7	SUBMISSION CHECK LIST
ATTACHMENT 8	PROPOSAL TOPICS
ATTACHMENT 9	NOTICE REGARDING USE OF GRANT.GOV APPLY
ATTACHMENT 10	SAMPLE GRANT WITH DTRA TERMS AND CONDITIONS

ATTACHMENT 1: QUAD CHART TEMPLATE

A quad chart that contains the following information must be included in Volume III, Supplemental Information, of the Phase II full proposal and must be positioned in a landscape view. Any quad chart submitted that exceeds the one-page limit will not be read or evaluated. Please note that the Title of the Project should be different than that of the Topic.

UNCLASSIFIED	
 Proposal Title (should not be the same as the topic title) PI: name, institution; Co-PI: name, institution Award Number: HDTRA-x-xx-x-xxxx	
	
Objective: Clear, concise (1-2 sentence) description of the objectives/goals of the effort (Arial 14 point) Relevance: Impact or relevance of this work for DTRA's counter-WMD mission (Arial 14 point)	Picture or graphic that illustrates the research concept
Approach: Clear, concise (1-2 sentence) description of the approach/method (Arial 14 point) Personnel Support: Number and types of technical personnel such as faculty, post-doc, grad students, undergrads, etc supported by the project (Arial 14 point)	Tasks: Bullet list of major tasks/milestones by project year (Arial 14 point) Funding: Year 1: FYxx-\$xxxxk, Year 2: FYxx-\$xxx, Year 3: FYxx-\$xxxk (Arial 12 Point Bold) PI contact Information: Name, Email address, Phone (Arial 12 Point Bold)
UNCLASSIFIED	

ATTACHMENT 2: TECHNOLOGY READINESS LEVEL (TRL) DEFINITIONS

Technology Readiness Levels (TRLs) provide a systematic metric/measurement system that supports assessments of the maturity of a particular technology and the consistent comparison of maturity between different types of technology. TRLs were originally developed and used by the National Aeronautics and Space Administration (NASA) for technology planning. The use of TRLs has been widely adopted in government and industry. The Department of Defense (DoD) has adopted the use of TRLs as documented in the current DoD-5000 series publications.

The table below provides notional TRL descriptions for non-medical systems. It is noted that for Basic Research, projects should be TRL 1 or TRL 2. Generally when the maturity of the science reaches a TRL 3 it is no longer Basic Research.

Technology Readiness Level	Technology Readiness Assessment (TRA) Deskbook July 2009 https://acc.dau.mil/CommunityBrowser.aspx?id=18545
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into Applied Research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.

ATTACHMENT 3: PHASE I WHITE PAPER FORMAT AND PREPARATION INSTRUCTIONS

Phase I White Paper Template

The white paper narrative must specify a single topic area by identifying at the end of the project title the specific topic letter referenced in [Attachment 8](#) of this BAA.

FORMAT

- Paper size: 8.5 x 11 inches
- Spacing: Single-spaced
- Margins: One-inch margins
- Font: Times New Roman, not smaller than 12 point
- Title: Not the same as the title of the topic; the title of the white paper should be unique
- Number of pages: No more than four (4) pages (excluding the cover letter and the cover sheet). The Government reserves the right to evaluate only those pages within the stated limitations.

CONTENT

- A one-page cover letter (optional) not counted in the 4 page limitation.
- The cover page provided via the web-based submission site shall be filled out in its entirety and is not counted in the 4 page limitation.
- The abstract should state the objective of the proposed research, how the proposed research contributes to the C-WMD science needs outlined in the topic, and the unique approach proposed.
- Identification of the research (including topic area letter and title embedded in the introduction) and issues.
- Proposed technical approaches.
- Potential scientific impact to provide greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts, including how the research contributes to the C-WMD science needs outlined in the topic.
- Potential team and management plan. Multi-investigator, multi disciplinary white papers should carefully detail the contribution from each of the investigators and clearly outlined the contribution to C-WMD science.

- Summary of estimated costs.

The white paper should provide sufficient information on the research being proposed (e.g., the hypothesis, theories, concepts, approaches, data measurements, and analysis, etc.) to allow for an assessment by a technical expert.

*It is not necessary that white papers carry official institutional signatures.

ATTACHMENT 4: PHASE II TECHNICAL PROPOSAL FORMAT AND PREPARATION INSTRUCTIONS

Phase II Technical Proposal Template

The technical proposal has a page limit for the entire document. Any pages submitted that exceed the page limit will not be read or evaluated. See [Section IV.2.2](#) for page limits.

I. ABSTRACT.

II. SCOPE. This Proposal is in support of the Basic and Applied Sciences Directorate and the JSTO and *[cite the same topic title as used on the Quad Chart.]*

A. **OBJECTIVE.** *[A clear and concise objective of the proposed project]]*

B. **BACKGROUND.** *[Provide the necessary technical and scientific background to support the scientific and/or technical merit of the proposed project.]*

C. **PROGRAMMATICS.** This effort will support DTRA initiative _____ (e.g., Topic Letter) _____ aimed at advancing the state of the science and body of knowledge for *[state the topic area]* *[Describe your organization's management plan for the proposed project; list supporting and collaborating centers, and the roles/responsibilities of each identified academic and/or industrial sub-contractor supporting the project].*

D. **RELEVANCE.** *[Describe the relevance of the proposed project in terms of advancing the state of the science and the anticipated scientific impact on capabilities needed potential to reduce, eliminate, and counter provide greater knowledge or understanding of the threat, and mitigate the effects of WMD fundamental aspects of phenomena and of observable facts.]*

III. CREDENTIALS. *[Describe your and the organization's qualifications to perform the proposed work. Summarize the credentials of the primary performing center, and supporting academic and industrial partners to perform the work. Describe specific examples of similar work performed, and equipment and/or facilities available to perform the proposed work. List summary qualifications of PI and other key personnel. Focus on information directly relevant to the proposed work.]*

A. Summary of Credentials

B. Summary of Qualifications for PI and Key Personnel

C. Summary of Facilities to Perform the Proposed Work

IV. WORK TO BE PERFORMED. *[Provide details of the work to be performed by task and subtask.]*

A. **GENERAL.** *[Provide an overview]*

- B. **SUMMARY:** *[List as many tasks as appropriate, and list tasks for all years of research proposed, adding years to the template below as necessary. Note that Option Years should be labeled as such. Option years should be labeled consistently throughout the entire proposal.]*

Year #1 (Year X)

Task 1: Appropriate Task Title 1

Task 2: Appropriate Task Title 2

Task 3: Appropriate Task Title 3

Year #2 (Year X)

Task 4: Appropriate Task Title 4

Task 5: Appropriate Task Title 5

Task 6: Appropriate Task Title 6

- C. **DETAILED TASKS.** *[Describe the details of all tasks listed in above section. Note that Option Years should be labeled as such. Option years should be labeled consistently throughout the entire proposal.]*

- i. **Task 1: Appropriate Task Title 1 (Year X)** *[Include what will be accomplished, how the task will be performed, the resources allocated against the task (personnel involved, man hours and/or percent (%) effort, material, etc.), and the appropriate metrics to measure progress, and deliverable(s). Describe the applicable subtasks involved.]*

- ii. **Task 2: Appropriate Task Title 2 (Year X)** *[etc.]*

- V. **PERFORMANCE SCHEDULE.** *[Provide a table of tasks and sub-tasks and the duration of performance of each in a Gantt or other suitably formatted chart. Note that Option Years should be labeled as such. Option years should be labeled consistently throughout the entire proposal.]*

- VI. **REFERENCES.** *[List any relevant documents referenced in Section I.]*

ATTACHMENT 5: PHASE II COST PROPOSAL FORMAT AND PREPARATION INSTRUCTIONS

The cost proposal must include, at a minimum, two separate sections (provided in one submission): a cost summary, not to exceed two-pages (see ‘A’, below), must precede the detailed cost portion (see ‘B’ below) of the cost proposal. See [Section IV.2.2](#) of the BAA for additional information pertaining to the cost proposal. Additionally, include cost submissions for all subcontractors to also include consultants.

A. COST SUMMARY (not to exceed 2 pages).

A summary cost proposal must be prepared that includes the following items, listed by year of performance, including all proposed years: Add as many years to the summary as will be included in the full proposed period of performance. Note: The periods of performance must match the information presented in the Statement of Work. Option Years should be labeled as such. Option years should be labeled consistently throughout the entire proposal. Include the unique topic identifier and the project title on all pages.

Description	Year 1	Year 2	Year 3	Option Year 4 (if applicable)	Option Year 5 (if applicable)	TOTAL
Direct Labor – total costs (excluding subcontractors)	\$	\$	\$	\$	\$	\$
Total Fringe Benefits (prime only)	\$	\$	\$	\$	\$	\$
Total Subcontract Costs (labor, travel, etc.)	\$	\$	\$	\$	\$	\$
Total Domestic Travel Costs (prime only)	\$	\$	\$	\$	\$	\$
Total Foreign Travel Costs (prime only)	\$	\$	\$	\$	\$	\$
Total Tuition (prime only)						
Total Direct Materials and Supplies (prime only)*	\$	\$	\$	\$	\$	\$
Total Direct Equipment (prime only)*	\$	\$	\$	\$	\$	\$
Total Publication Costs (prime only)	\$	\$	\$	\$	\$	\$
Total Other Direct Costs (prime only; NOT including subcontract costs)	\$	\$	\$	\$	\$	\$
Total Indirect Costs (prime only)	\$	\$	\$	\$	\$	\$
Grand Total (all costs)	\$	\$	\$	\$	\$	\$

*Note: itemize any planned items costing greater than \$10,000 (unit cost); include in Total Direct Material/Equipment and itemize individual equipment/material (greater than \$10,000) immediately following the table.

B. DETAILED COST (no page limit; offeror format acceptable)

Budgeted cost elements should reflect the following:

- a. Man-hours and/or percent (%) effort being charged to the project, for whom (PI, graduate students, etc.), and the commensurate salaries and benefits. Allowable charges for graduate students include salary, appropriate research costs, and tuition. Allowable charges for undergraduate students include salary and research training costs, but not tuition.
- b. Cost of equipment, based on most recent quotations and itemized in sufficient detail for evaluation.
- c. Travel costs and duration, and the relevance to stated objectives; destinations, if known and number of travelers per trip.
- d. Estimate of material and operating costs.
- e. Publication and report costs.
- f. Consultant fees (indicating daily or hourly rate) and travel expenses and the nature and relevance of such costs.
- g. Computer services.
- h. Subcontract costs and type (the portion of work to be subcontracted and rationale). Include detailed cost summary from the subcontractor.
- i. Communications costs not included in overhead.
- j. Other Direct Costs.
- k. Indirect costs must be less than 35% of the total grant value per the 2008 DoD Appropriations Act (Public Law 110-116, Section 8115), 2009 DoD Appropriations Act (Public Law 110-329, Section 8109), and the 2010 DoD Appropriations Act (Public Law 111-118, Section 8101). This restriction currently applies to awards made using fiscal year (FY) 2008, 2009, and 2010 Basic Research funds and may apply to future awards.

ATTACHMENT 6: STATEMENT OF WORK (SOW) FORMAT AND PREPARATION INSTRUCTIONS

SOW Template

An SOW must be included in Volume III, supplemental information, of the Phase II full proposal. The SOW does not have a page limit, but should be approximately 3-5 pages in length that is paginated separately and distinct from the other pages in Volume III suitable for incorporation into the procurement instrument. Do not put proprietary data or markings in the SOW. Pages should be numbered and the initial page should have a date (document date) shown under the title.

The proposed SOW must accurately describe the research to be performed. The proposed SOW must also contain a summary description of the technical methodology as well as the task description, but not in so much detail as to make the SOW inflexible. The SOW format follows:

- 1) **Objective:** This section is intended to give a brief overview of the specialty area and should describe why the research is being pursued, and what you are trying to learn.
- 2) **Scope:** This section includes a statement of what the SOW covers. This should include the research area to be investigated, objectives/goals, and major milestones and schedule for the effort.
- 3) **Background:** The offeror must identify appropriate documents, including publications that are applicable to the research to be performed. This section includes any information, explanations, or constraints that are necessary in order to understand the hypothesis and scientific impact on capabilities needed to reduce, eliminate, and counter the threat, and also mitigate the effects of Weapons of Mass Destruction (WMD). It may also include studies previously undertaken.
- 4) **Tasks/Scientific Goals:**
 - a) This section contains the detailed description of tasks which represent the research to be performed that are contractually binding. Thus, this portion of SOW should be developed in an orderly progression and presented in sufficient detail to establish the methodology and feasibility of accomplishing the overall program goals. The work effort should be segregated by performance period for all tasks to be performed and anticipated milestones realized in that year (e.g., Year 1, Year 2, and Year 3 should be detailed separately if proposed). Identify the major tasks in separately numbered sub-paragraphs. Each major task should delineate, by subtask, the research to be performed by year and number each task using the decimal system (e.g. 4.1, 4.1.1, 4.1.1.1, 4.2, etc.). The sequence of performance of tasks and achievement of milestones must be presented by fiscal year and task, the same as in Section III of the Technical Proposal and the SOW must contain every task to be accomplished to include a detailed schedule.
 - b) The tasks must be definite, realistic, and clearly stated. Use “the grantee shall” whenever the work statement expresses a provision that is binding. Use “should” or “may” whenever it is necessary to express a declaration of purpose. Use “will” in cases where no offeror

requirement is involved; e.g., power will be supplied by the Government. Use active voice in describing work to be performed.

- c) Do not use acronyms or abbreviations without spelling-out acronyms and abbreviations at the first use; place the abbreviation in parenthesis immediately following a spelled-out phrase.
- d) If presentations/meetings are identified in your schedule, include the following statement in your SOW: “Conduct presentations/meetings at times and places specified in the grant schedule.”

ATTACHMENT 7: PROPOSAL SUBMISSION CHECKLIST

(for convenience/informational purposes)

Proposal Submission Website Registration

Data to be Entered in Website for Cover Sheets

- 1) Point of Contact (POC) Information
- 2) Address and Country
- 3) Data Universal Number System (DUNS) Number
- 4) Tax Identification Number (TIN)
- 5) North American Industry Classification System (NAICS)
- 6) Commercial and Government Entity (CAGE) Code
- 7) Institution Type (Large or Small Business, Academic, etc.)
- 8) Regional Defense Finance and Accounting Service (DFAS) Office
- 9) Regional Office of Naval Research (ONR) Office (applies to Universities only)

Phase I

- 1) White Paper
- 2) Printed Confirmation of Upload of Phase I Proposal

Phase II

- 1) Volume I: Technical Proposal (PDF Upload)
- 2) Volume II: Cost Proposal (PDF Upload)
- 3) Volume III: Supplemental Information (PDF Upload)
- 4) Quad Chart
- 5) Statement of Work
- 6) DUNS, TIN, & NAICS
- 7) Certifications and Representations:
 - Central Contractor Registration (CCR)
 - Human Subjects
 - Animal Use
 - BioSurety and Select Agent Use
 - Organizational Conflict of Interest Advisory
 - Intangible Property Assertions

Authorized Offeror Personnel

Statement of Current and Pending Support

ONR/DCAA/DFAS Representatives

Confirmed Proposal Expiration Date

Supporting letter for Young Investigator Awards

Supporting rationale of a portfolio predominantly in Basic Research (not for Universities)

8) Printed Confirmation of Upload of Phase II Proposal

ATTACHMENT 8: PROPOSAL TOPICS

PROPOSAL TOPICS

To accomplish its basic research mission, DTRA's proposal topics are aligned with five major functional counter Weapons of Mass Destruction (WMD) research thrusts. These thrusts provide the context for creativity, imagination and discovery of fundamental principles, methods and approaches that ultimately lay the foundation for significant new capabilities to counter current and emerging threats from WMD. To this end proposals may be considered which respond to the detailed topics that correspond to any one of the following five thrust areas:

I. DTRA Basic Research Thrust Areas

1. **Science of WMD Sensing and Recognition:** The basic science of WMD sensing and recognition is the fundamental understanding of materials that demonstrate measurable changes when stimulated by radiation or particles from WMD in the environment. This research thrust involves exploration and exploitation of interactions between materials and various photons, molecules, nuclear radiation and/or particles. These interactions and the specific form of recognition they provide are used for subsequent generation of information that provides knowledge of the presence, identity, and/or quantity of material or energy in the environment that may be significant.
2. **Cognitive and Information Science:** The basic science of cognitive and information science results from the convergence of computer, information, mathematical, network, cognitive, and social science. This research thrust expands our understanding of physical and social networks and advances knowledge of adversarial intent with respect to the acquisition, proliferation, and potential use of WMD. The methods may include analytical, computational or numerical, or experimental means to integrate knowledge across disciplines and improve rapid processing of intelligence and dissemination of information.
3. **Science for Protection:** Basic science for protection involves advancing knowledge to protect life and life-sustaining resources and networks. Protection includes threat containment, decontamination, threat filtering, and shielding of systems. The concept is generalized to include fundamental investigations that reduce consequences of WMD, assist in the restoration of life-sustaining functions and support forensic science.
4. **Science to Defeat WMD:** Basic science to defeat WMD involves furthering the understanding of explosives, their detonation and problems associated with accessing the target WMDs. This research thrust includes the creation of new energetic molecules/materials that enhance the defeat of WMDs, the improvement of modeling, and simulation of these materials and various phenomena that affect success and estimate the impact of defeat actions, and investigation of novel methods that may yield order-of-magnitude improvements in energy and energy release rate.
5. **Science to Secure WMD:** Basic science to support securing WMD includes: (a) environmentally responsible innovative processes to neutralize chemical, biological, radiological, nuclear, or explosive (CBRNE) materials and components; (b) discovery of revolutionary means to secure components and weapons; and (c) studies of scientific principles that lead to novel physical or other tags and methods to monitor compliance and disrupt proliferation pathways. The identification of basic phenomena that provide verifiable controls on materials and systems also helps arms control.

Note that all topics specifically request basic research and do not request applied research and/or advanced technology development. The basic research topics detailed below are specifically aligned with the DoD definition of basic research and the recommendations of the 2005 Report from the National Research Council's Committee on DoD Basic Research Division on Engineering and Physical Science – "Assessment of DoD Basic Research". Per Recommendation 1 of that assessment – "Basic Research is systematic study directed toward greater knowledge or understanding the fundamental aspects of phenomena and has the potential for broad, rather than specific, application."

Please note the following:

- Proposals that address technologies at a Technology Readiness Level of 3 (TRL3) or greater will not be considered.
- Proposals offering the development of devices (e.g., sensors) will not be considered.
- Proposals offering answers for specific societal or computer system applications will not be considered.
- The topics and thrust areas within this document are all equally weighted and are not given any priority levels.
- Topic research areas are representative of the sought research, but should not limit innovative research ideas aligned with the topic intent.

II. DTRA Basic Research Topic Areas—Period 5

Topic Per5-A: Basic Research for ^3He Alternatives (Thrust 1)

Average Award Amounts for Topic Per5-A:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: For decades ^3He has found much success as a vital neutron conversion medium in proportional counter tubes due to its large thermal neutron cross-section (Knoll F.G., *Radiation Detection and Measurement*, Third Edition). Its application for detecting neutrons has been utilized in a number of fields and has traditionally been the workhorse material for neutron detection. However, fast neutron detection systems using ^3He require moderation which can lead to degradation of spectroscopic information. This topic explores alternative phenomenologies or novel materials for use in sensing neutrons.

Impact: This topic is important to the counter-WMD mission of DTRA by addressing the need to extend the detection of fissile materials to distances beyond the short-range. Detection of neutrons (i.e. fast, epithermal, and thermal) with a fast response and high gamma discrimination would result in higher detection efficiency while maintaining spectral information.

Objective: This topic explores novel neutron sensing methodologies and novel materials to increase the detection distance and enhance the spectroscopy of fast neutron sources. This topic is not seeking to advance an existing detector. Special consideration will be given to approaches that do not require moderation of fast neutrons prior to capture or scatter for detection.

Characteristics of these methodologies and materials will include fast response, non-toxic, excellent gamma discrimination, and fast neutron (MeV energy range) sensing and spectroscopy in high flux fields.

Research areas may include but are not limited to the following areas:

- Investigation of new materials for gas-phase proportional counters.
 - Sensing phenomenologies and new materials based on fast neutron scatter.
-

Topic Per5-B: Basic Research on Prompt Diagnostic Signatures of Nuclear Detonations for Forensics (Thrust 1)

Average Award Amounts for Topic Per5-B:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: This topic explores research that may enable accurate knowledge of the specifics of a nuclear device (e.g., special nuclear material type and mass, device sophistication, etc.) after a detonation. Ideally this knowledge would be available in as short a time as possible with a high degree of confidence. The Defense Threat Reduction Agency is responsible for research and development that will enable an improvement in post-detonation technical nuclear forensics capabilities. This topic investigates basic physical research on the prompt signatures of nuclear explosive events, such as novel methods for yield determination, device reaction history, or the radiation outputs of these nuclear explosions. Research could focus on the understanding of unique identifiers of these explosions, measurements of these identifiers, or other topics. In this context, prompt signatures indicate those which can be measured instantaneously to within a few days after the event. These signatures are generally separate from radiochemical signatures that may require multiple weeks to collect and analyze.

Impact: Research into the prompt signatures will enable rapid technical nuclear forensics supporting attribution. Knowing the specifics of a nuclear device (e.g., special nuclear material type and mass, device sophistication, etc.) in as short a time as possible, with a high degree of confidence, is the ultimate goal of technical nuclear forensics. Shortening the timeline for when knowledge becomes available could have a revolutionary impact on the attribution process. A full exploitation of the prompt diagnostics of the nuclear event has the potential to greatly reduce the attribution timeline because of the immediate nature of these important signatures.

Objective: This topic explores novel methods and techniques in the measurement and analysis of the prompt diagnostic signatures of nuclear explosions for forensics purposes. A specific interest is the investigation of the prompt signatures of nuclear explosive events, such as novel methods for yield determination, device reaction history, or the radiation outputs of these nuclear explosions.

Research areas may include but are not limited to the following areas:

- New techniques to determine the explosive yield of a nuclear event.
- Novel methods to measure the reaction history of nuclear explosions.

- Novel methods to measure the gamma ray spectra.
 - New methods for accurately measuring the neutron spectra of nuclear explosions.
 - Novel techniques for determining information about the nuclear explosion from RF/EMP measurements.
-

Topic Per5-C: Theory-Based Approaches for Complex Probabilistic Software Verification and Validation (Thrust 2)

Average Award Amounts for Topic Per5-C:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Advanced computational applications of interest to DTRA draw on data mining, artificial intelligence, machine learning and complex adaptive systems theory. However, the state of the art for such techniques and their application in a variety of domains has outpaced theoretical understanding of methods for verifying software correctness and validating overall system suitability for the intended use (V&V). This is particularly true when the system in question analyzes sensor or other external, possibly noisy or incomplete data in an interactive and iterative fashion. DTRA requires a theoretically valid basis from which to address V&V of advanced software-intensive systems of this sort.

Impact: The success of this research will provide DTRA with a well-grounded foundation for devising test plans, verification and validation approaches to software systems for which traditional software engineering approaches are inadequate due to their probabilistic, incremental learning or complexity basis.

Objectives: The objectives of the research proposed in this topic may be one or more of the items below. A single proposal does not need to address all of these objectives.

Research areas may include but are not limited to the following areas:

- Identify approaches for verifying the correct performance of multi-agent systems that analyze and react to multiple real-time sources of data which might be noisy or incomplete. Characteristic examples of such systems include semi-autonomous and autonomous unmanned (robotic) systems and heterogeneous multi-sensor arrays.
 - Identify approaches for verifying the correct performance of approaches intended to identify sparse networked relationships in large sets of data that may be of uneven reliability or completeness.
 - Identify approaches for verifying the accuracy of complex agent-based models of complex systems for which the agents react probabilistically on multiple dimensions of decision making. Traditional scaled approaches don't always apply in achieving V&V of such models.
 - Identify approaches that bridge verification of software agent correctness with validation of integrated multi-agent system capabilities.
-

Topic Per5-D: Basic Physics of Laser-Driven Intense X-ray Sources (Thrust 3)

Average Award Amounts for Topic Per5-D:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Laser driven intense X-ray sources provide radiation environments for studies of high energy density and radiation effects sciences. Existing and planned high power laser facilities (e.g., the National Ignition Facility (NIF)) offer unique opportunities to explore many areas of fundamental high energy science relevant to countering-WMD and nuclear survivability. High power laser facilities have the potential to produce intense X-ray outputs thus providing experimental test environments that are unique and isolated from a mixed neutron/X-ray output.

Experiments at the NIF may encompass a variety of studies in basic and applied science such as astrophysics, plasma physics, hydrodynamics and turbulence, materials science, and inertial fusion energy. Potential NIF experiments of interest for improved understanding of X-ray sources may result from the culmination of studies on a variety of smaller scale laser, pulsed power, or other devices.

Advances in our understanding of many important fundamental physics issues are needed to allow continued improvements in near-term intense laser-driven X-ray sources. For example, better understanding is needed of phenomena and mechanisms critical to X-ray production, including laser-plasma interactions, X-ray photon-matter interactions such as absorption in targets or ablated materials, materials properties and equation of state, non-local thermodynamic equilibrium (NLTE) physics, and hydrodynamic instabilities in the target. Experiments are desirable to validate, measure, or increase understanding of X-ray conversion efficiency of high intensity laser beams on targets. Fundamental theories as well as advanced simulations are also critical to progress in this area.

Impact: There is a need for research in basic science thrusts for technologies in nuclear survivability as well as for WMD defeat. Opportunities exist to leverage current and planned high energy density laser facilities to perform theoretical, computational, and experimental studies related to nuclear survivability and nuclear radiation effects sciences. The potential utility of the NIF and other high power laser facilities for x-ray effects testing is important to support radiation hardening of components and systems against an intense cold or warm photon spectrum; e.g., 1 – 20 keV. Novel mechanisms for production of higher energy photons (up to 100 keV) are also of interest. In particular, the findings of a basic research program will support future applied efforts by creating and optimizing x-ray environments in the NIF 10-meter diameter chamber (i.e., on a scale that can accommodate test objects on the order of a meter) for effects testing and the design of experiments to validate advanced modeling and simulation capabilities. Success in advancing X-ray sources may fill important knowledge gaps in this area and help secure combat systems against nuclear attack.

Objective: The focus of this topic is to explore the fundamental physics issues in utilizing high power, high energy lasers, leading to potential experiments at NIF and other facilities, using non-ignition targets to function as X-ray sources for intense cold-to-warm photon spectral regime.

Research areas may include but are not limited to the following areas:

- Improved understanding of laser-plasma instabilities.
 - Investigation of advanced laser-plasma x-ray sources up to 100 keV that improves the understanding of X-ray emission and radiation transport in mid-Z plasmas specifically in areas of bound-bound, free-free and free-bound radiation of multi-keV temperature plasmas.
 - Experimental, theoretical, and computational studies of atomic physics and spectroscopy of NLTE plasmas, including kinetics, line-shapes, opacity, radiation transport through tenuous media, and experimental measurements and modeling of spectral emission from NLTE plasmas.
 - Ablation physics due to multi-keV X-radiation onto cold and/or pre-heated materials to study the effects of high-fluence irradiation of materials, and to research approaches which would use direct laser irradiation of surfaces to produce impulse onto structures, simulating high-fluence x-ray irradiation.
 - Exploration of phenomena of hydrodynamic instability and turbulence in plasmas, including the mixing of mid- to high-Z materials.
 - Studies to significantly improve the understanding of material properties of warm dense matter such as equation of state, conductivity, and other fundamental properties.
-

Topic Per5-E: Science for Novel Radiation-Hardened Electronics Materials (Thrust 3)

Average Award Amounts for Topic Per5-E:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Basic material and radiation effects research is needed to address the technical challenges that limit radiation hardening of advanced materials. The advancing commercial semiconductor device technology continually requires the introduction of new materials and device structures in significantly greater numbers than in any period in history. A major material change to reduce leakage currents is to implement non-SiO₂ (high-k) gate dielectrics and metal-gate technology. In addition, a number of non-silicon materials are being considered as adjuncts or additions to the CMOS technology such as materials based on carbon nanotubes and graphene; spintronic materials; chalcogenides, etc. In the future, new concepts may be developed for use of these materials; e.g., carbon nanotube transistors and graphene channels integrated into Si CMOS technologies.

There is very little fundamental understanding of the radiation mechanism in these non-Si materials. For example, current models have serious limitations in dealing with ion-ion nuclear reactions and distribution of charge resulting from individual events in carbon-based devices. The fundamental understanding of charge collection in non-Si devices and engineered substrates is necessary for explaining failure modes.

Dimensions have reached approximately 1 nm to several 10s of nm depending on the type of structure. The interaction of radiation with these new materials in such small volumes is fundamentally different than that in older generations of electronic devices. Understanding and mitigating radiation-induced degradation and soft errors are the key reliability challenges

associated with deploying future generations of electronics.

Impact: The benefit of radiation mechanism efforts and simultaneous predictive analysis efforts would reduce the risk to the development of novel radiation hardened materials and components. This would have a large payoff for DoD's missile and space systems beyond 2020 as new materials facilitate improvements in electronic component or device number/density, performance, and reduced power. There is a potential dual-benefit for improving radiation hardness with respect to either nuclear explosions or natural sources of radiation such as solar events.

Objective: The objectives of this topic are to conduct theoretical and experimental research to further the fundamental understanding of the radiation mechanisms of new materials. The emphasis will be on the basic mechanisms of radiation interaction with small geometries and new materials. The approach will be based on a combination of theory, simulation, and basic research experiments. New test capabilities for characterizing radiation effects in small geometry and high speed devices will be developed, taking into account the emerging needs for novel materials and devices.

Research areas may include but are not limited to the following areas:

- Interaction of radiation with emerging electronic materials, particularly carbon-based electronics (i.e., CNTs, graphene, SiC, and diamond), GaN, and antimonide-based semiconductors.
- Energy deposition in nanoscale volumes, including structures dominated by surface effects and multilayer heterostructures.
- Transport and recombination of radiation-induced charge at very short times and in the presence of high-carrier concentrations and gradients.
- Transport and recombination of radiation-induced charge in heterostructures.
- Energy deposition in emerging dielectrics, particularly those of importance for compound-semiconductor FETS (e.g., Hf-based dielectrics).
- Single-particle displacement effects in substrates and dielectrics.
- Total-dose and single-event effects in alternate-channel devices, including graphene and compound-semiconductor channels on Si.
- Emerging-device effects, such as charge collection in graphene-based devices, carbon nanotubes, and FinFETs.
- Total-dose and single-event effects in emerging power devices, particularly those based on GaN and SiC.

Topic Per5-F: Structure-Activity Relationships for Biological Enzymes (Thrust 3)

Average Award Amounts for Topic Per5-F:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: In support of the National Nanotechnology Initiative (NNI), the Nanoscale

Science, Technology, and Engineering (NSET) subcommittee evaluated challenge areas and priorities for nanotechnology research in the near-, intermediate-, and long-term. The group devised a classification scheme to characterize the evolution of statistical control and manufacturing processes for nanotechnology-based products (*Manufacturing at the Nanoscale*, 2007). This scheme consists of four temporally overlapping generations of nanoproducts with differing R&D foci. Fabrication of commercial prototypes using systematic manufacturing control processes marks the inception of the respective generations.

1. *First generation* (ca 2000): passive (“steady function”) nanostructures, demonstrated by development of nanostructured coatings, dispersion of nanoparticles, nanocomposites, and bulk materials (nanostructured metals, polymers, ceramics).
2. *Second generation* (ca 2005): active (“evolving function”) nanostructures, demonstrated by transistors, amplifiers, targeted drugs and chemicals, actuators, and adaptive structures.
3. *Third generation* (anticipated ca 2010): three-dimensional nanosystems and systems of nanosystems using synthesis and assembly techniques such as bio-assembly, nanoscale robotics, evolutionary systems, nanoscale networking, and multiscale architectures.
4. *Fourth generation* (anticipated ca 2015): heterogeneous molecular nanosystems, where each molecule has a specified form and function. The molecules themselves will constitute the devices, and fundamentally novel functions will emerge from their engineered structures and architectures.

Because the path from phenomenology to application in nanoscale research currently requires 10-12 years, exploratory research in heterogeneous molecular nanosystems should begin now. Among the nanosystems of interest for such research efforts are those that occur in the natural world.

The unique properties of enzymes are being harnessed with increasing frequency for defense-related applications, including energy harvesting, controlled combustion, and nanoelectronics development. Although “biomimetics” and other synthetic enzymes represent attractive alternatives to natural enzymes due to their ruggedness over a range of environmental conditions, work interrogating the utility of biological enzymes for the aforementioned technologies continues because of the unequalled catalytic efficiency, structural fidelity, analyte specificity, and sensitivity they offer. Recent research efforts have focused on increasing the stability and longevity of native enzymes through scaffolding and other forms of immobilization; however, whereas tethering enzymes to more stable platforms increases durability, the practice also typically results in markedly reduced activity.

Researchers continue to interrogate various scaffolding and immobilization methodologies to counter the observed reduction in catalytic performance. Nonetheless, pressing questions regarding the specific mechanistic properties that are compromised as a result of immobilization processes remain unanswered, primarily because of the depauperate state of knowledge on higher-order protein structure and its influence on enzyme dynamics and functionality. This topic will provide for a greater understanding of the catalytic properties of conformationally intact enzymes and will elucidate the properties that may be altered without compromising enzyme functionality. Further, the data gathered as a result of conducting the aforementioned work will enable rapid development of materials that will interface with existent platforms and infrastructure.

Impact: The research proposed herein will further the fundamental knowledge required to develop consistent and cost-effective “third” and “fourth generation” materials required for energy harvesting, controlled combustion, nanoelectronics development, and other technologies applicable to numerous mission spaces within DTRA. In addition to addressing existent capabilities requirements, detailed characterization of enzymatic systems will provide the baseline understanding necessary to rapidly engineer enzyme-based defense technologies in response to novel and emerging threats.

Objective: Topic goals are to elucidate the physicochemical properties of intact biological enzymes and to identify and characterize specific properties that may be altered without compromising enzyme function. Of especial interest is the influence of tethering on tertiary structure and its relationship to the disrupted functionality documented in previous research. This fundamental research effort will require a multidisciplinary approach encompassing biology, chemistry, physics, systems modeling, and statistics, among others.

Research areas may include but are not limited to the following areas:

- Defining and characterizing binding and non-binding sites related to functionality of biological enzymes in native conformation.
- Evaluating binding kinetics for characterized binding sites.
- Investigating conformational changes for biological enzymes bound to traditional scaffolds.
- Examining changes in binding kinetics following tethering and delineating causality.
- Interrogating commonalities and differences in hydrolase and reductase superfamilies with regard to the aforementioned properties.

Although computational modeling is recognized as a necessary component of the above research, a purely computational approach is not desirable, nor is experimental validation of previously developed models.

Topic Per5-G: Amorphous Metals for High-Performance Penetration (Thrust 4)

Average Award Amounts for Topic Per5-G:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Amorphous metals are metallic materials which, rather than having an ordered crystalline state, exhibit a disordered atomic-scale structure which results in a non-crystalline grain-free material. Some amorphous metals are extremely strong and hard, yet reasonably ductile and can have many additional unique properties. They are sometimes referred to as “multi-functional materials” “metallic glasses” or “bulk amorphous metals”. These materials tend to not fail to significantly greater stress levels than crystalline alloys of similar composition, and in many cases can sustain much larger reversible elastic deformations than their crystalline counterparts. The ultimate successful outcome of this basic research is to prepare and then evaluate bulk amorphous materials or amorphous composites which have failure strengths

several times greater than the current strongest steels and at the same time have significantly greater ablation or erosion resistances. Materials with plastic strains of 4 percent and fracture strengths of 4-6 GPa, fracture toughness K_{IC} 150-250 MPa-M^{1/2}, with ultimate tensile strength of 2000-3000 MPa, along with increased abrasion resistance, would be intermediate research goals.

Recently, laboratory processes have been developed to potentially make small volumes of amorphous steels and which exhibit significant strengths and enhanced mechanical properties which are considerably greater than special high-strength steels and industrially forged metal alloys. These small quantities of amorphous metals have been made by several methods such as extremely quick cooling, using unique alloys, or other means such as sputtering molten metal on a rapidly spinning metal disk.

Impact: An expected outcome of this basic research would be a better understanding of potential bulk amorphous metals or amorphous composites which would have significantly greater performance than the current high-strength steels during high-velocity projectile penetration (greater than 1000 m/sec) into high-strength concrete (greater than 10 ksi).

Objective: In this solicitation for research, emphasis will be focused upon preparing new metallic materials which have extremely high failure strengths under dynamic loads and also exhibit significant surface erosion resistances in ballistic applications.

Research areas may include but are not limited to the following areas:

- These materials need to be producible in bulk quantities large enough (at least a couple of cubic centimeters) for quasi-static and rapid shear loading, projectile penetration and other applicable characterizations and evaluations.
- Materials, metals, and laboratory processes to be investigated are to be environmentally safe and will use potential fabrication processes which at some future date could be realistically suitable for producing bulk amorphous metals in reasonable quantities for additional research and larger experiments.
- This research will comprise of material discovery and synthesis with following testing and evaluation of the ballistic penetration properties of the researched bulk amorphous metals.

Topic Per5-H: Bio-Agent Defeat (Thrust 4)

Average Award Amounts for Topic Per5-H:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Offensive WMD Defeat operations currently rely on blast and fragmentation from conventional high-explosive bombs as the primary mechanisms to defeat hard and soft targets containing biological agents in non-permissive environments. Unfortunately, these same mechanisms can create unacceptable consequences by releasing hazardous or infectious materials into the environment with the explosively generated plume (“National Military Strategy to Combat Weapons of Mass Destruction” by Chairman of the Joint Chiefs of Staff, www.defense.gov, 2006).

Preferred solutions would neutralize bulk biological agents stored in container(s), neutralize aerosolized infectious materials within the immediate target area, and render useless any live bio agent released with the plume. Such solutions would make the bio agent unavailable for further use and preclude collateral effects of a harmful downwind plume. A conventional weapon solution is sought instead of ionizing radiation technologies because nuclear technologies may result in international consequences and can also create additional collateral damage (see page 109 of “The Bomb” by Stephen Younger, HarperCollins Publishing, 2009).

Novel methods tailored for bio-agent defeat would require new materials that produce low to no detonation pressure (less gaseous final reaction products) while reacting to result in synergistic thermal and chemical kill mechanisms. These materials should demonstrate capability for agent neutralization orders-of-magnitude better than existing payloads, and/or more-than-stoichiometric neutralization (catalytic properties). Such materials may be prepared with approaches including combinatorial chemistry, nanomaterials, self assembly, etc.

Impact: The success of this research would provide a technological capability that will put adversarial bio-agent targets at risk including bulk warfare agent storage configurations. The net effect would deny the enemy’s use of bio agent materials while mitigating the associated collateral damage and effects of an infectious downwind plume. This will significantly increase our ability to succeed at asymmetric warfare and reduce the risk of unintended or undesirable collateral effects to friendly forces and civilian populations.

Objectives: The objectives of the research proposed in this topic may be one or more of the items below. A single proposal does not need to address all of these objectives.

Research areas may include but are not limited to the following areas:

- Identify and demonstrate innovative methods that can neutralize (e.g., kill, neutralize, decompose) large quantities of biological warfare agents in storage containers with zero release or minimum collateral effects over time. This method is envisioned to transfer the neutralizing/decomposing material, energy, environment, directly into the agent containers with no intentional release of agent. The concept proposed should be robust against a wide variety of biological agents, wide variety of container materials (steel, glass, Nalgene®) and container sizes.
- Identify and demonstrate prompt bio-agent defeat materials which provide significantly better airborne-agent neutralization/defeat capabilities than existing high-explosive, thermobaric, and high-temperature incendiary payloads. New materials would characteristically produce higher persistent temperatures (milliseconds to seconds), lower target overpressures, and employ chemical kill mechanisms (such as produce biocidal reaction products), to significantly improve thermal/kinetic mixing with airborne agent particulate within the target structure.
- Identify and demonstrate methods that can continue to neutralize (e.g., detoxify, kill or decompose) biological warfare agents released into the plume after an offensive operations strike on enemy targets. The concept is to design the weapon to also release the plume neutralizing method, to mix and escape with any post-attack viable aerosolized bio agents. As the bio agent disperses and forms the initial contiguous cloud, the proposed method shall initiate self-sustaining neutralization characteristics able to neutralize for up to tens of minutes from the time of release.

- Identify novel methods for isolating simulant *Bacillus thuringiensis* (Bt) spores from contaminants (which include explosive byproducts and other background substances) and quantification of dead/live spores with minimal quantifiable impact on spore counts, to support WMD defeat weapons testing. Ideally, the proposed methods should quantify both the total amount of spores present and the amount of viable/live spores present with a consistent degree of accuracy. The methods proposed shall include high-throughput screening rather than traditional culture techniques, so as to minimize processing time and human error.
 - Identify and understand how biological agents ‘die’ or mutate as a result of interactions with neutralizing mechanisms such as chemical products, heat, burning, light, or other pathogens. These investigations should provide an understanding of the rate of cell damage, the damage mechanism and the extent of damage (i.e., can they be viable again once atmosphere is made benign?), not only of bacterial spores but also of viruses.
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Topic Per5-I: Basic Science for Nuclear Test Verification and Monitoring (Thrust 5)

Average Award Amounts for Topic Per5-I:

- Single Investigator Awards will average approximately \$150,000 per year.
- Single Grant/Multiple Investigator Awards will average approximately \$350,000 per year.

Background: Verification and monitoring technologies are noted for their importance to support arms control and nonproliferation, and assure compliance with treaties/agreements. Current approaches include seismic, hydroacoustic, infrasound, and radionuclide measurements. It is important to conduct basic research to significantly improve known approaches, or to identify and understand novel approaches, in order to explore opportunities for verification and compliance of the “treaty/agreement-after-next”. Both recent events and historical trends serve to emphasize the continuing need for improvements in nuclear test monitoring, and the importance of supporting fundamental advances in the field.

Impact: Advancements in fundamental science may foster future technologies that extend both the lower limits and reliability of yield determination; help discriminate between nuclear and non-nuclear events, especially chemical explosions that may simulate nuclear tests; and help counter proliferation of nuclear weapons.

Objective: The objectives of this topic are to identify and explore novel approaches to nuclear test monitoring, or to conduct the basic science that will enable very significant advances in current techniques that may allow improved future capabilities for treaties/agreements.

Research areas may include but are not limited to the following areas:

- Conducting theoretical, computational, or experimental studies to significantly improve understanding of topographical, geological, or depth factors that affect phenomena (i.e., non-seismic particle or energy transport as well as seismic propagation) measured for determination of yield and type of event.
- Advancing the body of basic knowledge of seismic signal generation or propagation; e.g., high frequency seismic signal properties for low yield explosions.

- Significantly improving the understanding of infrasound generation, propagation, and properties, as relevant for measurement and discrimination of nuclear explosions from other phenomena.
 - Identifying and understanding fundamental changes in surface physical observables (or environmental factors) that result from underground tests.
 - Exploring the generation, propagation, properties, and measurements of electrical or electromagnetic phenomena that may arise from underground nuclear explosions, which may include changes in geophysical electrical properties, generation of currents, pulses, etc.
 - Creating new scientific methodologies or fundamental approaches for nuclear test monitoring.
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Y Topics: Proposals that focus on exploratory aspects of a unique problem, a high risk approach, or innovative research in subjects with potential for high impact to C-WMD science from non-tenured faculty currently associated with educational institutions, as those terms are commonly understood, who received a Ph.D. or equivalent degree on or after 15 May 2005. DTRA anticipates that Young Investigator Awards will be \$100,000 per year, each with a Period of Performance (POP) of two (2) years.

Topic Per5-Y-1: Basic Research for ^3He Alternatives (Thrust 1)

Average Award Amounts for Topic Per5-Y-1:

- Young Investigator Awards will average approximately \$100,000 per year.

Background: For decades ^3He has found much success as a vital neutron conversion medium in proportional counter tubes due to its large thermal neutron cross-section (Knoll F.G., *Radiation Detection and Measurement*, Third Edition). Its application for detecting neutrons has been utilized in a number of fields and has traditionally been the workhorse material for neutron detection. However, fast neutron detection systems using ^3He require moderation which can lead to degradation of spectroscopic information. This topic explores alternative phenomenologies or novel materials for use in sensing neutrons.

Impact: This topic is important to the counter-WMD mission of DTRA by addressing the need to extend the detection of fissile materials to distances beyond the short-range. Detection of neutrons (i.e. fast, epithermal, and thermal) with a fast response and high gamma discrimination would result in higher detection efficiency while maintaining spectral information.

Objective: This topic explores novel neutron sensing methodologies and novel materials to increase the detection distance and enhance the spectroscopy of fast neutron sources. This topic is not seeking to advance an existing detector. Special consideration will be given to approaches that do not require moderation of fast neutrons prior to capture or scatter for detection. Characteristics of these methodologies and materials will include fast response, non-toxic, excellent gamma discrimination, and fast neutron (MeV energy range) sensing and spectroscopy in high flux fields.

Research areas may include but are not limited to the following areas:

- Investigation of new materials for gas-phase proportional counters.

- Sensing phenomenologies and new materials based on fast neutron scatter.
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Topic Per5-Y-2: Basic Research on Prompt Diagnostic Signatures of Nuclear Detonations for Forensics (Thrust 1)

Average Award Amounts for Topic Per5-Y-2:

- Young Investigator Awards will average approximately \$100,000 per year.

Background: This topic explores research that may enable accurate knowledge of the specifics of a nuclear device (e.g., special nuclear material type and mass, device sophistication, etc.) after a detonation. Ideally this knowledge would be available in as short a time as possible with a high degree of confidence. The Defense Threat Reduction Agency is responsible for research and development that will enable an improvement in post-detonation technical nuclear forensics capabilities. This topic investigates basic physical research on the prompt signatures of nuclear explosive events, such as novel methods for yield determination, device reaction history, or the radiation outputs of these nuclear explosions. Research could focus on the understanding of unique identifiers of these explosions, measurements of these identifiers, or other topics. In this context, prompt signatures indicate those which can be measured instantaneously to within a few days after the event. These signatures are generally separate from radiochemical signatures that may require multiple weeks to collect and analyze.

Impact: Research into the prompt signatures will enable rapid technical nuclear forensics supporting attribution. Knowing the specifics of a nuclear device (e.g., special nuclear material type and mass, device sophistication, etc.) in as short a time as possible, with a high degree of confidence, is the ultimate goal of technical nuclear forensics. Shortening the timeline for when knowledge becomes available could have a revolutionary impact on the attribution process. A full exploitation of the prompt diagnostics of the nuclear event has the potential to greatly reduce the attribution timeline because of the immediate nature of these important signatures.

Objective: This topic explores novel methods and techniques in the measurement and analysis of the prompt diagnostic signatures of nuclear explosions for forensics purposes. A specific interest is the investigation of the prompt signatures of nuclear explosive events, such as novel methods for yield determination, device reaction history, or the radiation outputs of these nuclear explosions.

Research areas may include but are not limited to the following areas:

- New techniques to determine the explosive yield of a nuclear event.
 - Novel methods to measure the reaction history of nuclear explosions.
 - Novel methods to measure the gamma ray spectra.
 - New methods for accurately measuring the neutron spectra of nuclear explosions.
 - Novel techniques for determining information about the nuclear explosion from RF/EMP measurements.
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Topic Per5-Y-3: Theory-Based Approaches for Complex Probabilistic Software

Verification and Validation (Thrust 2)

Average Award Amounts for Topic Per5-Y-3:

- Young Investigator Awards will average approximately \$100,000 per year.

Background: Advanced computational applications of interest to DTRA draw on data mining, artificial intelligence, machine learning and complex adaptive systems theory. However, the state of the art for such techniques and their application in a variety of domains has outpaced theoretical understanding of methods for verifying software correctness and validating overall system suitability for the intended use (V&V). This is particularly true when the system in question analyzes sensor or other external, possibly noisy or incomplete data in an interactive and iterative fashion. DTRA requires a theoretically valid basis from which to address V&V of advanced software-intensive systems of this sort.

Impact: The success of this research will provide DTRA with a well-grounded foundation for devising test plans, verification and validation approaches to software systems for which traditional software engineering approaches are inadequate due to their probabilistic, incremental learning or complexity basis.

Objectives: The objectives of the research proposed in this topic may be one or more of the items below. A single proposal does not need to address all of these objectives.

Research areas may include but are not limited to the following areas:

- Identify approaches for verifying the correct performance of multi-agent systems that analyze and react to multiple real-time sources of data which might be noisy or incomplete. Characteristic examples of such systems include semi-autonomous and autonomous unmanned (robotic) systems and heterogeneous multi-sensor arrays.
- Identify approaches for verifying the correct performance of approaches intended to identify sparse networked relationships in large sets of data that may be of uneven reliability or completeness.
- Identify approaches for verifying the accuracy of complex agent-based models of complex systems for which the agents react probabilistically on multiple dimensions of decision making. Traditional scaled approaches don't always apply in achieving V&V of such models.
- Identify approaches that bridge verification of software agent correctness with validation of integrated multi-agent system capabilities.

Topic Per5-Y-4: Basic Science for Nuclear Test Verification and Monitoring (Thrust 5)

Average Award Amounts for Topic Per5-Y-4:

- Young Investigator Awards will average approximately \$100,000 per year.

Background: Verification and monitoring technologies are noted for their importance to support arms control and nonproliferation, and assure compliance with treaties/agreements. Current approaches include seismic, hydroacoustic, infrasound, and radionuclide measurements.

It is important to conduct basic research to significantly improve known approaches, or to identify and understand novel approaches, in order to explore opportunities for verification and compliance of the “treaty/agreement-after-next”. Both recent events and historical trends serve to emphasize the continuing need for improvements in nuclear test monitoring, and the importance of supporting fundamental advances in the field.

Impact: Advancements in fundamental science may foster future technologies that extend both the lower limits and reliability of yield determination; help discriminate between nuclear and non-nuclear events, especially chemical explosions that may simulate nuclear tests; and help counter proliferation of nuclear weapons.

Objective: The objectives of this topic are to identify and explore novel approaches to nuclear test monitoring, or to conduct the basic science that will enable very significant advances in current techniques that may allow improved future capabilities for treaties/agreements.

Research areas may include but are not limited to the following areas:

- Conducting theoretical, computational, or experimental studies to significantly improve understanding of topographical, geological, or depth factors that affect phenomena (i.e., non-seismic particle or energy transport as well as seismic propagation) measured for determination of yield and type of event.
 - Advancing the body of basic knowledge of seismic signal generation or propagation; e.g., high frequency seismic signal properties for low yield explosions.
 - Significantly improving the understanding of infrasound generation, propagation, and properties, as relevant for measurement and discrimination of nuclear explosions from other phenomena.
 - Identifying and understanding fundamental changes in surface physical observables (or environmental factors) that result from underground tests.
 - Exploring the generation, propagation, properties, and measurements of electrical or electromagnetic phenomena that may arise from underground nuclear explosions, which may include changes in geophysical electrical properties, generation of currents, pulses, etc.
 - Creating new scientific methodologies or fundamental approaches for nuclear test monitoring.
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III.DTRA Basic Research Topic Areas—Period 4. These topics are NOT applicable for Period 5.

<u>Topic</u>	<u>Title</u>	<u>Thrust Area</u>
A	Charge Collection and Photon Conversion for Radiation Sensing	1
B	Post-Detonation Radiological and Nuclear Forensics	1
C	Advanced Methods and Algorithms to Support Course of Action Analysis of Terrorists Seeking to Acquire and Use CBRNE	2
D	Advancing Knowledge of Network Theory for Network Analysis and Response to Attacks	2
E	Self-Healing Radiation Shielding Materials	3
F	Novel Materials for Unattended Sensing to Support Future Treaties	5
G	Nanoscale Radiation Indicators	5
H	Improved Surface and Interfacial Analytical Methods for Chemical and Biological Detection	3
I	Identification and characterization of bacterial metabolic enzymes and pathways	3
J	Mechanisms of virulence changes during in vivo passage of viral pathogens	4
Y-1	Charge Collection and Photon Conversion for Radiation Sensing	1
Y-2	Post-Detonation Radiological and Nuclear Forensics	1
Y-3	Advancing Knowledge of Network Theory for Network Analysis and Response to Attacks	2
Y-4	Self-Healing Radiation Shielding Materials	3
Y-5	Novel Materials for Unattended Sensing to Support Future Treaties	5
Y-6	Nanoscale Radiation Indicators	5
Y-7	Reactive, Energetic or Biological Materials for Bio-Agent Defeat	4

IV. DTRA Basic Research Topic Areas—Period 3. These topics are NOT applicable for Period 5.

<u>Topic</u>	<u>Title</u>	<u>Thrust Area</u>
A	Dual Use Basic Science for Bio Defense Drug Design and Delivery of Novel Therapeutics	3
B	Exploration of High-Gradient Phenomena for Sensing Fissile Materials at Long Range	1
C	Laser Driven Intense X-ray Sources	3
D	Network Adaptability from WMD Disruption and Cascading Failures	2
E	Post-Shock Meso- and Macro-Scale Processes in Reactive Materials	4
F	Science for Survivable Nano-scale Electronics	3
G	Situational Awareness for Effective Counter-WMD Strategies	2
H	The Physics of Artificial Radiation Belt Formation and Decay	3
I	Tunnel Wall Stability in Hard Rock under Dynamic Shock Loading Conditions	4
J	Understanding Impact Survivability of Energetic Composites	4
K	CBWA Interactions with Environmental or Living Matter	3
L	Determinants of Antimicrobial Resistance and Persistence in Bacterial Strains	3
M	Interrogation of Biological Response to Acute Ionizing Radiation Exposure	3
N	Materials Responsive to High Energy Radiation	1,3
O	Mechanisms of Highly Efficient Catalysis	1,3
P	Mechanisms of Molecular Recognition	1,3
Q	New Concepts in Nano-scale Chemical and Biological Sensing	1
R	New Concepts in Spectroscopic Methods for Molecular Recognition	1
S	Predictability of the Stable Planetary Boundary Layer	2,3
T	Signatures of Laboratory-Grown Bio-Agents	1,3

V. DTRA Basic Research Topic Areas—Period 2. These topics are NOT applicable for Period 5.

Topic	Title	Thrust Area
A	Adversarial Motivation and Intent to Acquire, Proliferate, and Potentially Use WMD	2
B	Biological-Agent Dynamics in Turbulent Reacting Flows	4
C	Nano-sized Thermosensor Materials	1
D	Sensing Fissile Material at Long Rang using Novel Methods	1
Y-1	Advancing Knowledge of Network Theory for Understanding Robustness	2
Y-2	Biological-Agent Dynamics in Turbulent Reacting Flows	4
Y-3	Nano-sized Thermosensor Materials	1
Y-4	Sensing Fissile Materials at Long Range using Nano-Structured Detector Materials	1

VI. DTRA Basic Research Topic Areas—Period 1. These topics are NOT applicable for Period 5.

Topic	Title	Thrust Area
A	Advancing Knowledge of Network Theory for Understanding Robustness	3
B	Challenges in Integrating Motivation and Intent Knowledge	2
C	Computational Multi-Physics	3, 4
D	Frontiers in Quantum Science	1, 2
E	High Energy-Density Materials with Fast Energy Release	4
F	Impact-Absorbing Transparent Materials	3
G	Microbial Ore Leaching	3, 4
H	Penetration into Granular Earth Materials	4
I	Sensing Fissile Materials at Long Range	1
J	Terahertz Propagation Phenomena and Signatures in the THz Frequencies	1
K	Unconventional Methods for Sensing Interactions of Radioactive Materials with their Surroundings	1
L	Molecular Recognition and Catalysis	1, 3, 5
M	Nano-Structured Porous Materials	1, 3, 5
N	New Concepts in Nano-scale Chemical and Biological Sensing	1
O	Interactions of Toxic Chemical or Biological Agents with Biological Membranes and Fluids	3
P	Interactions of Toxic Chemical or Biological Warfare Agent with Environmental Substrates	1, 3, 5
Q	Understanding Cognitive and Physiological Effects of Heightened Sensory Input	1, 2, 3

ATTACHMENT 9: NOTICE REGARDING USE OF GRANTS.GOV APPLY

Organizations must register in Grants.gov to be able to submit proposals through the Grants.gov portal. Individual Principal Investigators (PI)/Project Directors (PD) do not register; however the Authorized Organizational Representative (AOR) or Business Point of Contact (BPOC) is required to register and, in some cases, the PI/PD may be an AOR.

If you have not already done so, you, as an organization, are encouraged to register in Grants.gov as a prerequisite to submitting a proposal through Grants.gov APPLY. Your Grants.gov registration is valid for all Federal agencies and is in effect regardless of whether you actually submit a proposal. If you have not previously registered, please note that the registration process can take several weeks and you should register as soon as possible.

The following actions are required as part of the registration process. All of the required actions are listed and described although it is likely that, if you do business with the Federal government on a continuing basis, you already have completed some of the actions, e.g., obtaining a DUNS number or registration in CCR. Detailed information, automated tools, and checklists are available at http://grants.gov/applicants/organization_registration.jsp.

Data Universal Number System (DUNS) Number

Your organization will need a DUNS number. A DUNS number is a unique nine-character identification number provided by the commercial company Dun & Bradstreet (D&B). Before requesting a DUNS number, you should investigate if your organization already has a DUNS number. You should ask your organization's chief financial officer, business office, or authorizing official to provide your organization's DUNS number. You also can determine if your organization has a DUNS number by calling D&B at 1-866-705-5711.

If your organization does not have a DUNS number, an authorized official of the organization should request one. If the organization is located in the United States, the request can be made by calling 1-866-705-5711. It also is possible to request a DUNS number online via [web registration](#). If your organization is located outside of the United States, you can request and register for a DUNS number online via [web registration](#).

Central Contractor Registry (CCR)

Your [organization](#) will need to register with CCR before you can submit a grant application through Grants.gov. CCR validates applicant information and electronically shares the secure and encrypted data with Federal agencies' finance offices to facilitate paperless payments through Electronic Funds Transfer (EFT). The CCR will house your organizational information, allowing Grants.gov to use that information to verify your identity.

When your organization registers with the CCR, you will be required to complete the Electronic Business Point of Contact (E-Business POC) (see below) and Marketing Partner ID (MPIN) fields. These are mandatory fields that are required when submitting grant applications through Grants.gov. The E-Business POC will be the sole authority of the organization with the capability to designate or revoke an individual's ability to submit proposals on behalf of the organization through Grants.gov. If you are uncertain of the status of your organization's

registration or who your E-Business POC is, you can [search the CCR database](https://www.bpn.gov/ccrsearch/Search.aspx) (<https://www.bpn.gov/ccrsearch/Search.aspx>).

See [Section III.3.3](#) of this BAA for additional information pertaining to registering with CCR.

Authorized Organizational Representative (AOR)

Before submitting a proposal, representatives of your organization need to register to submit on behalf of your organization. Your organization's E-Business POC identified during CCR Registration, must authorize someone to become an AOR. This safeguards your organization from individuals who may attempt to submit Proposals without permission. **Note: In some organizations, a person may serve as both an E-Business POC and an AOR.**

An AOR first registers with the Grants.gov credential provider (at http://www.grants.gov/applicants/register_credential_provider.jsp) and then with Grants.gov. Once an AOR has completed the Grants.gov process, Grants.gov will notify the E-Business POC for assignment of user privileges. When an E-Business POC approves an AOR, Grants.gov will send the AOR a confirmation e-mail.

ATTACHMENT 10: SAMPLE GRANT WITH DTRA TERMS AND CONDITIONS

AWARD/CONTRACT		1. THIS CONTRACT IS A RATED UNDER DPAS (15 CFR 350)		RATING	PAGE OF 1 8	
2. CONTRACT (Proc. Inst. Ident.) NO. HDTRA1-##-1-####		3. EFFECTIVE		4. REQUISITION/PURCHASE REQUEST/PROJECT NO. *****		
5. ISSUED BY DEFENSE THREAT REDUCTION AGENCY/BE-BC 8725 JOHN J. KINGMAN ROAD, MSC FORT BELVOIR VA 22060-		CODE HDTRA1	6. ADMINISTERED (If other than Item 5)		CODE	
		ONR OFFICE				
7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, state and zip code) AWARDEE INFORMATION				8. [] FOB ORIGIN [X] OTHER (See		
				9. DISCOUNT FOR PROMPT PAYMENT		
				10. SUBMIT INVOICES (4 copies unless otherwise TO THE ADDRESS SHOWN		ITE
CODE		FACILITY CODE				
11. SHIP TO/MARK FOR CODE		12. PAYMENT WILL BE MADE BY CODE				
See Schedule		DFAS OFFICE				
13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: [] 10 U.S.C. 2304(c)() [] 41 U.S.C. 253(c)()				14. ACCOUNTING AND APPROPRIATION DATA See Schedule		
15A. ITEM NO.	15B. SUPPLIES/ SERVICES		15C.	15D.	15E. UNIT PRICE	15F. AMOUNT
SEE						
15G. TOTAL AMOUNT OF CONTRACT						\$450,000.00
16. TABLE OF CONTENTS						
(X)	SEC.	DESSCRIPTIO	PAGE(S)	(X)	SEC.	PAGE(S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES		
X	A	SOLICITATION/ CONTRACT FORM	1		I	CONTRACT
X	B	SUPPLIES OR SERVICES AND PRICES/	2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS		
X	C	DESCRIPTION/ SPECS./ WORK	3		J	LIST OF ATTACHMENTS
	D	PACKAGING AND MARKING		PART IV - REPRESENTATIONS AND INSTRUCTIONS		
X	E	INSPECTION AND ACCEPTANCE	4		K	REPRESENTATIONS, CERTIFICATIONS AND
X	F	DELIVERIES OR	5			OTHER STATEMENTS OF OFFERORS
X	G	CONTRACT ADMINISTRATION DATA	6 - 7		L	INSTRS., CONDS., AND NOTICES TO
	H	SPECIAL CONTRACT			M	EVALUATION FACTORS FOR AWARD
CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE						
17. [] CONTRACTOR'S NEGOTIATED AGREEMENT Contractor is required to sign document and return copies to issuing Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)				18. [] AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number		
19A. NAME AND TITLE OF SIGNER (Type or print)				20A. NAME OF CONTRACTING OFFICER		
				TEL : EMAIL :		
19B. NAME OF CONTRACTOR		19C. DATE		20B. UNITED STATES OF		20C. DATE
BY _____ (Signature of person authorized to sign)				BY _____ (Signature of Contracting Officer)		

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		1	Lump Sum	\$450,000.00	\$450,000.00
	PROPOSAL NUMBER				
	FFP				
	PROPOSAL TITLE				
	In accordance with the following attachments: SOW at Exhibit A, and DTRA Terms and Conditions for Grant Awards to Educational Institutions and Other Nonprofit Organizations (WAWF Version) dated JUNE 2009 at Exhibit B.				
	FOB: Destination				

NET AMT	\$450,000.00
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ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
000101					\$0.00
	Funding in Support of CLIN 0001				
	FFP				
	FOB: Destination				

NET AMT	\$0.00
---------	--------

ACRN AA	\$150,000.00
CIN: 00000000000000000000000000000000	

Section C - Descriptions and Specifications

CLAUSES INCORPORATED BY FULL TEXT

252.601-9002 GRANT REFERENCE INFORMATION (MAY 2009)

- a. This grant is awarded as a result of Broad Agency Announcement (BAA) **HDTRA1-08-10-BRCWMD-BAA**, Research and Development Enterprise, Basic and Applied Sciences Directorate, Basic Research for Combating Weapons of Mass Destruction (C-WMD).
- b. **CFDA #:** 12.351
- c. **Authority:** 10 U.S.C. 2358 as amended

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Destination	Government	Destination	Government
000101	N/A	N/A	N/A	Government

Section F - Deliveries or Performance

DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	POP 01-SEP-2009 TO 31-AUG-2012	N/A	N/A FOB: Destination	
000101	N/A	N/A	N/A	N/A

Section G - Contract Administration Data

ACCOUNTING AND APPROPRIATION DATA

AA: #####
 AMOUNT: \$150,000.00
 CIN #####: \$150,000.00

CLAUSES INCORPORATED BY FULL TEXT

252.601-9000 GRANT POINTS OF CONTACT (MAY 2009)

- a. Grant Specialist:
 Name: _____
 Defense Threat Reduction Agency/BE-BCR
 8725 John J. Kingman Road, MS 6201
 Fort Belvoir, VA 22060-6201
 telephone (703) 767-_____
 email address: _____@dtra.mil
- b. Grantee Business Office:
 Name: _____
 Title: _____
 Phone: _____
 E-mail: _____
- c. Grantee Principal Investigator (PI):
 Name: _____
 Title: _____
 Phone: _____
 E-mail: _____

252.601-9001 GRANTS OFFICER'S REPRESENTATIVE (GOR) (MAY 2009)

- a. Grants Officer's Representative (GOR): See GOR Memo
- b. SCOPE AND LIMITATIONS OF AUTHORITY FOR DTRA GRANTS OFFICER'S REPRESENTATIVE
 - 1. The Grants Officer's Representative (GOR) is responsible for monitoring the technical and programmatic performance of the grant or cooperative agreement (hereinafter referred to as agreement) including compliance with the agreement's reporting requirements. Perceived deviations from the agreement's terms and conditions shall be brought to the attention of appropriate recipient personnel and if not corrected, to the attention of the Grants Officer. Deviations or other occurrences indicative of the recipient's inability or unwillingness to conform to the agreement's requirements shall be brought to the immediate attention of the Grants Officer.

2. The GOR has no authority to modify the stated terms of the agreement or specifications in any manner, or to approve any action that would result in additional charges to the Government. The DTRA Grants Officer must make all such changes in writing.
3. The GOR is authorized to correspond directly with the recipient on matters within the scope and limitations of his or her authority. All such correspondence shall be signed personally by the GOR and a copy will be furnished the Grants Officer for placement in the official agreement file.
4. The GOR will provide technical advice to the recipient to the extent such advice will not alter any of the agreement's terms and conditions or result in an increase in the estimated cost of the agreement's performance as specified in the agreement. The GOR is encouraged to discuss with the recipient new ideas related to the original scope of the agreement that may be of special interest to DTRA. The GOR should also be alert for indications that any part of the research is becoming unfruitful. If, as a result of such discussions, questions arise as to the possible need for a modification, the matter shall be brought to the immediate attention of the Grants Officer. The GOR shall not direct the recipient to undertake any action that the recipient believes to be contrary to the agreement's scope, terms or conditions without the written approval of the Grants Officer.
5. Any visits to the recipient's facilities on matters pertaining to the agreement will be documented in a brief memorandum. A copy will be provided the Grants Officer for placement in the official agreement file.
6. The GOR will maintain such work files as he or she deems necessary to properly document performance of the duties and responsibilities as a GOR. Upon completion of the agreement and delivery of all required reports, such work files will be forwarded to the Grants Officer for placement in the official agreement file.
7. In performance of the GOR's duties, the GOR shall constantly stress protection of the Government's interests. Similarly, the GOR shall avoid any act which may tend to compromise the position of DTRA, any individual member of DTRA or which will impact confidence in the integrity of DTRA with the business community.

(End of Clause)

252.632-9000 GRANT INVOICE SCHEDULE AND FUNDING PROFILE (MAY 2009)

INVOICE SCHEDULE:		
<u>INVOICE NO.</u>	<u>INVOICE DATE</u>	<u>PAYMENT</u>
1		
2		
3		
FUNDING PROFILE: The amount of \$_____ is obligated for work to be performed during the period beginning with grant award and continuing through _____. Additional incremental funding planned, but not obligated, is: FY____ \$_____ FY____ \$_____ The Government's liability is limited to the amount obligated.		

*Upon exercise of an option or modification, the final payment of this schedule will be released and new schedule of payments will be established. (If applicable)

Section J- List of Documents, Exhibits and Other Attachments

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Exhibit A	Exhibit A – Statement of Work	4	17-FEB-2009
Exhibit B	Exhibit B – Terms and Conditions	25	15-JAN-2010

Revised 1.15.2010 (v12)

**DEFENSE THREAT REDUCTION AGENCY (DTRA)
GENERAL TERMS AND CONDITIONS
FOR GRANT AWARDS TO EDUCATIONAL
INSTITUTIONS AND OTHER NONPROFIT ORGANIZATIONS**

WIDE AREA WORKFLOW VERSION

TABLE OF CONTENTS

1. Acceptance of Grant	19. Procurement Standards
2. Recipient Responsibilities	20. Title to Expendable and Nonexpendable Property
3. Order of Precedence	21. Intangible Property
4. Administration and Cost Principles	22. Patent Rights
5. Standards for Financial Management Systems	23. Technical Reporting Requirements
6. Modification of the Grant	24. Financial Reporting Requirements
7. Waivers of OMB Circular Prior Approvals and Other Authorizations	25. After-the-Award Requirements
8. Preaward Costs	26. Delegation of Administration Duties
9. Unobligated Balances	27. Claims, Disputes and Appeals
10. Payments	28. Termination and Enforcement
11. Funding Increments and/or Options	29. Security
12. Cost Sharing	30. Representations and Assurances
13. Allowable Costs	31. Research Involving Recombinant DNA Molecules
14. Program Income	32. Retention and Access to Records
15. Interest Earned	33. Certification
16. Debt Collection	34. Data Collection
17. Audits	35. Site Visits
18. Subawards	

1. Acceptance of Grant. The recipient is not required to countersign the grant document; however, the recipient agrees to the conditions specified in the Research Grant and the Articles contained herein unless notice of disagreement is furnished to the Grants Officer within fifteen (15) calendar days after the date of the Grants Officer's signature. In case of disagreement, the recipient shall not assess the grant any costs of the research unless and until such disagreement(s) is resolved.

2. Recipient Responsibilities.

- a. The recipient will bear primary responsibility for the conduct of the research and will exercise judgment towards attaining the stated research objectives within the limits of the grant's terms and conditions.
- b. The Principal Investigator(s) (PI) specified in the grant award will be continuously responsible for the conduct of the research project and will be closely involved with the research effort. The PI, operating within the policies of the recipient, is in the best position to determine the means by which the research may be conducted most effectively.
- c. The recipient is the responsible authority, without recourse to the DTRA regarding the settlement and satisfaction of all contractual and administrative issues arising out of procurements entered into in support of an award or other agreement.
- d. Recipients are responsible for monitoring each project, program, subaward, function or activity supporting the award. Recipients shall monitor subawards to ensure subrecipients have met the audit requirements as delineated in Department of Defense Grant and Assistance Regulations (DoDGARs) §32.26.

3. Order of Precedence. This Grant is subject to the laws and regulations of the United States. Any inconsistency or conflict in the terms and conditions specified in this Grant shall be resolved according to the following order of precedence:

- a. The Federal statute authorizing this award, or any other Federal statutes directly affecting performance of this Grant.
- b. DoDGARs and Part 32, Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.
- c. Other terms and conditions contained within the Grant and any attachments.
- d. These General Terms and Conditions.

4. Administration and Cost Principles. The following documents and attachments, effective the earlier of (i) the start date of this grant or (ii) the date on which the recipient incurs costs to be assessed against the grant, are incorporated by reference as part of this grant:

- a. 2 CFR §215 "Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, Hospitals and Other Non-Profit Organizations" (OMB Circular A-110);

- b. 2 CFR §220 "Cost Principles for Educational Institutions" (Formerly OMB Circular A-21);
- c. 2 CFR §230 "Cost Principles for Non-Profit Organizations" (Formerly OMB Circular A-122); and
- d. DoD 3210.6-R, "DoD Grant and Agreement Regulations (DoDGARs)."

The above OMB documents may be obtained from:

OMB Information Line, telephone: (202) 395-3080

Office of Management and Budget
725 17th Street, N.W.
Washington, DC 20503

Or <http://www.whitehouse.gov/omb/circulars>

The DoDGARs may be obtained from:

<http://www.dtic.mil/whs/directives/corres/html/321006r.htm>

5. Standards for Financial Management Systems.

- a. Recipient's financial management systems shall provide for the following:
 - (1) Accurate, current and complete disclosure of the financial results of each federally-sponsored project or program in accordance with the reporting requirements set forth in DoDGARs §32.52.
 - (2) Records that identify adequately the source and application of funds for federally sponsored activities. These records shall contain information pertaining to Federal awards, authorizations, obligations, unobligated balances, assets, outlays, income and interest.
 - (3) Effective control over and accountability for all funds, property and other assets. Recipients shall adequately safeguard all such assets and assure they are used solely for authorized purposes.
 - (4) Comparison of outlays with budget amounts for each award.
 - (5) Written procedures to minimize the time elapsing between the transfer of funds to the recipient from the U.S. Treasury and the issuance or redemption of checks, warrants or payments by other means for program purposes by the recipient.

(6) Written procedures for determining the reasonableness and allowability of costs in accordance with the provisions of the applicable Federal cost principles (see DoDGARs §32.27) and the terms and conditions of the award.

(7) Accounting records including cost accounting records that are supported by source documentation.

b. Where the Federal Government guarantees or insures the repayment of money borrowed by the recipient, the DTRA, at its discretion, may require adequate bonding and insurance if the bonding and insurance requirements of the recipient are not deemed adequate to protect the interest of the Federal Government.

c. The DTRA may require adequate fidelity bond coverage where the recipient lacks sufficient coverage to protect the Federal Government's interest.

d. Where bonds are required in the situations described above, the bonds shall be obtained from companies holding certificates of authority as acceptable sureties, as prescribed in 31 CFR §223, "Regulations Governing Surety Companies Doing Business with the United States."

6. Modification of the Grant. The only method by which this grant may be modified is by a formal, written modification signed by the Grants Officer. No other communications, whether oral or in writing, are valid.

7. Waivers of OMB Circular Prior Approvals and Other Authorizations.

a. All prior approvals required by 2 CFR §220 (formerly OMB Circular A-21), 2 CFR §230 (formerly A-122), and 2 CFR § 215 (OMB Circular A-110) are waived except for the following:

(1) Change in the scope or objectives of the research project, the methodology or experiment when such is stated in the grant as a specific objective. (Approval via modification of the Grant.)

(2) Any request for additional funding. (Approval via modification of the Grant.)

(3) Expenditures for equipment costing \$5,000 or more not specifically identified in the budget at time of award. (Approval via written notification from the Grants Officer)

(4) Expenditures for foreign travel not specifically identified in the budget at time of award. (Approval via written notification from the Grants Officer)

(5) A change in principal investigator or project director (PI/PD). (Approval via modification of the Grant.)

(6) The continuation of the research work during the absence for more than three (3) months, or a twenty-five (25) percent reduction in time devoted to the project, by the approved PI/PD. (Approval via written notification from the Grants Officer)

(7) Unless described in the application and funded in the approved awards, the subaward, transfer or contracting out of any work under an award. This provision does not apply to the purchase of supplies, material, equipment or general support services. (Approval via written notification from the Grants Officer)

b. Prior approval is not required to transfer amounts budgeted for indirect costs to absorb increases in direct costs, or vice versa. Note: For awards funded with Basic Research funding, indirect costs must be 35% or less of the total award value per the DoD Appropriations Act.

c. Prior approval must be requested to initiate a one-time, no-cost extension, in writing to the Grants Officer and must be received at least thirty (30) calendar days prior to the end of the current performance period. (Approval via modification of the Grant.)

8. Preaward Costs. The recipient may incur Preaward costs at the recipient's risk in accordance with DoDGARs §32.25(d)(2)(i). Incurring pre-award costs more than 90 calendar days prior to award requires prior approval from the Grants Officer.

9. Unobligated Balances. In the absence of any specific notice to the contrary, the recipient is authorized to carry forward unobligated balances to subsequent funding periods of this grant agreement in accordance with DoDGARs §32.25(d)(2)(ii).

10. Payments.

a. See **Financial Reporting Requirements** under article 23 of this document. If these financial reporting requirements are not met, payment cannot be dispersed.

b. Recipients receiving scheduled payments shall submit requests for payment using Wide Area Workflow (WAWF) at <https://wawf.eb.mil/> in accordance with the Invoice Schedule in Section G of the grant. To receive timely payments, a grant voucher should be submitted on or after the invoice dates specified within Section G of the grant. The request shall be submitted to the Office of Naval Research (ONR) Office identified in the Research Grant by entering the following routing codes:

- I. Pay Office DoDAAC: See Block 12 (Code) on the first page of the grant.
- II. Invoice Type: Grant and Cooperative Agreement Voucher.
- III. Issue By DoDAAC: See Block 5 (Code) on the first page of the grant.
- IV. Admin DoDAAC: See Block 6 (Code) on the first page of the grant.
- V. Grant Approver: Same as Admin DoDAAC (Leave Ext. blank).

- c. Payments will be made by the Defense Finance and Accounting Service (DFAS) office specified in the Research Grant (Block 12).

11. Funding Increments and/or Options. The recipient is advised that the grantor's obligation to provide funding for increments and/or options included in the grant is contingent upon satisfactory performance and the availability of funds. Accordingly, no legal liability on the part of the grantor exists unless or until funds are made available to the grantor and notice of such availability is confirmed in writing to the recipient. Performance of the research must be deemed satisfactory in the judgment of the DTRA Scientific Officer/Technical Monitor. Refer to the Funding Profile in Section G for the additional incremental funding planned, but not currently obligated for the Grant.

- a. Incremental Funding – In no event is the Government obligated to reimburse the recipient for expenditures in excess of the total funds allotted by the Government to this agreement. The Government anticipates that from time to time additional amounts will be allotted to this agreement by unilateral modification, until the Government share is fully funded.
- b. Options – If the agreement contains Option(s), the Government reserves the right to exercise the Option(s) unilaterally.

12. Cost Sharing. Unless specified otherwise in other terms and conditions of the Grant, cost sharing, if any, is included in accordance with OMB Circular A-110, and DoDGARs §32.23.

13. Allowable Costs.

- a. The allowability of costs incurred by non-profit organizations that may be recipients or subrecipients of awards subject to this part, or contractors under such awards, is determined in accordance with the provisions of OMB Circular A-122, "Cost Principles for Non-Profit Organizations."
- b. The allowability of costs incurred by institutions of higher education that may be recipients, subrecipients, or contractors is determined in accordance with the provisions of 2 CFR §220 "Cost Principles for Educational Institutions" (Previously known as OMB Circular A-21).
- c. Where a funding period is specified, a recipient may charge to the award only allowable costs resulting from obligations incurred during the funding period and any pre-award costs authorized by DTRA.

14. Program Income.

- a. All program income earned during the project period (except proceeds from the sale of real and personal property and license fees and royalties received as a result of copyrights or patents produced under the grant) shall be retained by the recipient and deducted from the total project's allowable costs in determining the net allowable costs on which the Federal share of costs will be based.

- b. Unless program regulations or the terms and conditions of the award provide otherwise, recipients shall have no obligation to the Federal Government regarding program income earned after the end of the project period.
- c. Costs incident to the generation of program income may be deducted from gross income to determine program income, provided these costs have not been charged to the award. (See DoDGARs §32.24).

15. Interest Earned. Interest earned will be subject to guidelines as specified in DoDGARs §32.22. Interest earned shall be remitted annually to Department of Health and Human Services, Payment Management System, P.O. Box 6021, Rockville, MD 20852.

16. Debt Collection. The establishment of debts owed by recipients of grants and transferring them to payment offices for collection shall be dealt with in accordance with DoDGARs §22.820.

17. Audits. Recipients are to periodically have independent, financial and compliance audits subject to DoDGARs §32.26.

18. Subawards. Recipients shall flow down requirements to subawards in accordance with DoDGARs §32.5 and DoDGARs Appendix A to Part 32.

19. Procurement Standards. Recipients shall comply with the standards set forth in DoDGARs §32.40 through 32.49 and applicable Federal statutes and Executive Orders when expending Federal funds for supplies, equipment, real property, and expendable property. Upon request, recipients shall make available for the DTRA's pre-award review, procurement documents such as requests for proposals or invitations for bids, independent cost estimates, etc. in accordance with DoDGARs §32.44 (e).

20. Title to Expendable and Nonexpendable Property. Unless specified otherwise in other terms and conditions of the Grant, title to all expendable and nonexpendable tangible personal property purchased with grant funds shall be vested in the recipient after acquisition without further obligation to the government to enhance the Recipient's infrastructure for future performance of defense research and related, science and engineering education. DTRA shall not reserve the right to transfer title. Such property is considered exempt property and subject to the conditions established in OMB Circular A-110 and DoDGARs §32.33. Recipients are to manage property in accordance with DoDGARs §32.30 through 32.37.

21. Intangible Property. Rights to include, but not limited to: Technical Data and Computer Software; and Publication and Acknowledgment under this Grant shall be in accordance with DoDGARs §32.36.

22. Patent Rights.

37 CFR 401.14(a)

§ 401.14 Standard patent rights clauses.

(a) The following is the standard patent rights clause to be used as specified in § 401.3(a).

Patent Rights (Small Business Firms and Nonprofit Organizations)

(a) Definitions

(1) Invention means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the United States Code, or any novel variety of plant which is or may be protected under the Plant Variety Protection Act ([7 U.S.C. 2321](#) et seq.).

(2) Subject invention means any invention of the grantee conceived or first actually reduced to practice in the performance of work under this grant, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, [7 U.S.C. 2401\(d\)](#)) must also occur during the period of grant performance.

(3) Practical Application means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or government regulations, available to the public on reasonable terms.

(4) Made when used in relation to any invention means the conception or first actual reduction to practice of such invention.

(5) Small Business Firm means a small business concern as defined at section 2 of Pub. L. 85-536 ([15 U.S.C. 632](#)) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used.

(6) Nonprofit Organization means a university or other institution of higher education or an organization of the type described in [section 501\(c\)\(3\) of the Internal Revenue Code of 1954 \(26 U.S.C. 501\(c\)\)](#) and exempt from taxation under [section 501\(a\) of the Internal Revenue Code \(25 U.S.C. 501\(a\)\)](#) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

(b) Allocation of Principal Rights

The Grantee may retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and [35 U.S.C. 203](#). With respect to any subject invention in which the Grantee retains title, the Federal government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the

subject invention throughout the world.

(c) Invention Disclosure, Election of Title and Filing of Patent Application by Grantee

(1) The grantee will disclose each subject invention to the Federal Agency within two months after the inventor discloses it in writing to grantee personnel responsible for patent matters. The disclosure to the agency shall be in the form of a written report and shall identify the grant under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the agency, the Grantee will promptly notify the agency of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the grantee.

(2) The Grantee will elect in writing whether or not to retain title to any such invention by notifying the Federal agency within two years of disclosure to the Federal agency. However, in any case where publication, on sale or public use has initiated the one year statutory period wherein valid patent protection can still be obtained in the United States, the period for election of title may be shortened by the agency to a date that is no more than 60 days prior to the end of the statutory period.

(3) The grantee will file its initial patent application on a subject invention to which it elects to retain title within one year after election of title or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The grantee will file patent applications in additional countries or international patent offices within either ten months of the corresponding initial patent application or six months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order.

(4) Requests for extension of the time for disclosure, election, and filing under subparagraphs (1), (2), and (3) may, at the discretion of the agency, be granted.

(d) Conditions When the Government May Obtain Title

The grantee will convey to the Federal agency, upon written request, title to any subject invention –

(1) If the grantee fails to disclose or elect title to the subject invention within the times specified in (c), above, or elects not to retain title; provided that the agency may only request title within 60 days after learning of the failure of the grantee to disclose or elect within the specified times.

(2) In those countries in which the grantee fails to file patent applications within the times specified in (c) above; provided, however, that if the grantee has filed a patent application in a country after the times specified in (c) above, but prior to its receipt of the written request of the Federal agency, the grantee shall continue to retain title in that country.

(3) In any country in which the grantee decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on a subject invention.

(e) Minimum Rights to Grantee and Protection of the Grantee Right to File

(1) The grantee will retain a nonexclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the grantee fails to disclose the invention within the times specified in (c), above. The grantee's license extends to its domestic subsidiary and affiliates, if any, within the corporate structure of which the grantee is a party and includes the right to grant sublicenses of the same scope to the extent the grantee was legally obligated to do so at the time the grant was awarded. The license is transferable only with the approval of the Federal agency except when transferred to the successor of that party of the grantee's business to which the invention pertains.

(2) The grantee's domestic license may be revoked or modified by the funding Federal agency to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions at 37 CFR Part 404 and agency licensing regulations (if any). This license will not be revoked in that field of use or the geographical areas in which the grantee has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the funding Federal agency to the extent the grantee, its licensees, or the domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, the funding Federal agency will furnish the grantee a written notice of its intention to revoke or modify the license, and the grantee will be allowed thirty days (or such other time as may be authorized by the funding Federal agency for good cause shown by the grantee) after the notice to show cause why the license

should not be revoked or modified. The grantee has the right to appeal, in accordance with applicable regulations in 37 CFR Part 404 and agency regulations (if any) concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of the license.

(f) Grantee Action to Protect the Government's Interest

(1) The grantee agrees to execute or to have executed and promptly deliver to the Federal agency all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the grantee elects to retain title, and (ii) convey title to the Federal agency when requested under paragraph (d) above and to enable the government to obtain patent protection throughout the world in that subject invention.

(2) The grantee agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the grantee each subject invention made under grant in order that the grantee can comply with the disclosure provisions of paragraph (c), above, and to execute all papers necessary to file patent applications on subject inventions and to establish the government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by (c)(1), above. The grantee shall instruct such employees through employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

(3) The grantee will notify the Federal agency of any decisions not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than thirty days before the expiration of the response period required by the relevant patent office.

(4) The grantee agrees to include, within the specification of any United States patent applications and any patent issuing thereon covering a subject invention, the following statement, "This invention was made with government support under (identify the grant) awarded by (identify the Federal agency). The government has certain rights in the invention."

(g) Subawards

(1) The grantee will include this clause, suitably modified to identify the parties, in all subawards, regardless of tier, for experimental, developmental or research work to be performed by a small business firm or domestic nonprofit organization. The subawardee will retain all rights

provided for the grantee in this clause, and the grantee will not, as part of the consideration for awarding the subaward, obtain rights in the subawardee's subject inventions.

(2) The grantee will include in all other subawards, regardless of tier, for experimental developmental or research work the patent rights clause required by Defense Federal Acquisition Regulation Supplement 227.303.

(3) In the case of subcontracts, at any tier, when the prime award with the Federal agency was a grant (but not a grant or cooperative agreement), the agency, subcontractor, and the contractor agree that the mutual obligations of the parties created by this clause constitute a contract between the subcontractor and the Federal agency with respect to the matters covered by the clause; provided, however, that nothing in this paragraph is intended to confer any jurisdiction under the Contract Disputes Act in connection with proceedings under paragraph (j) of this clause.

(h) Reporting on Utilization of Subject Inventions

The Grantee agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the grantee or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the grantee, and such other data and information as the agency may reasonably specify. The grantee also agrees to provide additional reports as may be requested by the agency in connection with any march-in proceeding undertaken by the agency in accordance with paragraph (j) of this clause. As required by [35 U.S.C. 202\(c\)\(5\)](#), the agency agrees it will not disclose such information to persons outside the government without permission of the grantee.

(i) Preference for United States Industry

Notwithstanding any other provision of this clause, the grantee agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject inventions in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency upon a showing by the grantee or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(j) March-in Rights

The grantee agrees that with respect to any subject invention in which it has

acquired title, the Federal agency has the right in accordance with the procedures in [37 CFR 401.6](#) and any supplemental regulations of the agency to require the grantee, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the grantee, assignee, or exclusive licensee refuses such a request the Federal agency has the right to grant such a license itself if the Federal agency determines that:

- (1) Such action is necessary because the grantee or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use.
- (2) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the grantee, assignee or their licensees;
- (3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the grantee, assignee or licensees; or
- (4) Such action is necessary because the agreement required by paragraph (i) of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

(k) Special Provisions for Grants with Nonprofit Organizations

If the grantee is a nonprofit organization, it agrees that:

- (1) Rights to a subject invention in the United States may not be assigned without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions, provided that such assignee will be subject to the same provisions as the grantee;
- (2) The grantee will share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (when the agency deems it appropriate) when the subject invention is assigned in accordance with [35 U.S.C. 202\(e\)](#) and [37 CFR 401.10](#);
- (3) The balance of any royalties or income earned by the grantee with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, will be utilized for the support of scientific research or education; and
- (4) It will make efforts that are reasonable under the circumstances to attract licensees of subject invention that are small business firms and that

it will give a preference to a small business firm when licensing a subject invention if the grantee determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided, that the grantee is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the grantee. However, the grantee agrees that the Secretary may review the grantee's licensing program and decisions regarding small business applicants, and the grantee will negotiate changes to its licensing policies, procedures, or practices with the Secretary when the Secretary's review discloses that the grantee could take reasonable steps to implement more effectively the requirements of this paragraph (k)(4).

(l) Communication

All DTRA-related disclosures, elections, confirmatory licenses to the government, patent applications, waivers, and other communications should be sent to:

DTRA/BCRB (Attn: Grants Officer)
8725 John J. Kingman Rd.
MSC 6201
Ft Belvoir VA 22060-6201

23. Technical Reporting Requirements. Except under rare cases, performance reports are required annually.

a. **PROGRESS REPORTS:** Progress reports are due no later than 1 September of each year. Grants effective after 31 July will not require a progress report until 1 September of the following year. Progress reports must be submitted electronically as follows:

For Basic Research Awards: E-mail the Annual Progress Report as an attachment (file name should be the Grant number and 'Progress Report', e.g. HDTRA1-10-1-9999 Progress Report) of less than 10 MB to BasicResearch@dtra.mil.

For Fundamental Research Awards: E-mail the Annual Progress Report as an attachment (file name should be the Grant number and 'Progress Report', e.g. HDTRA1-10-1-9999 Progress Report) of less than 10 MB to FundamentalResearch@dtra.mil.

The progress report shall contain the following items:

(1) Cover Sheet: As a minimum, the cover sheet should include the following information: Principal Investigator's name, Institution's name and address, and Grant number.

(2) Objectives: List the objectives of the research effort or the statement of work. This may be omitted if there has been no change. State new or revised objectives if they have changed and the reason why.

(3) Status of effort: A brief statement of progress towards achieving the research objectives. (Limit to 200 words).

(4) Accomplishments/New Findings: Describe research highlights, their significance to the field, their relationship to the original goals, their relevance to the DTRA mission, and their potential application(s) to DTRA and civilian technology challenges.

(5) Personnel Supported: List professional personnel (Faculty, Post-Docs, Graduate Students, etc.) supported by and/or associated with the research effort.

(6) Publications: List peer-reviewed publications and theses submitted and/or accepted during the 12-month period starting the previous 1 October (or since start date for new grants). Include full reference information, such as authors, journal, volume, page numbers, etc. or for conference proceedings, name, date and location of the conference, and proceedings publication information.

(7) Interactions/Transitions:

(a) Participation/presentations at meetings, conferences, seminars, etc.

(b) Consultative and advisory functions to other laboratories and agencies and other DoD laboratories. Provide factual information about the subject matter, institutions, locations, dates, and name(s) of principal individuals involved.

(c) Transitions. Describe cases where knowledge resulting from your effort is used, or will be used, in a technology application. Transitions can be to entities in DoD, other federal agencies, or industry. Briefly list the enabling research, the laboratory or company, and an individual in that organization who made use of your research.

(8) New discoveries, inventions, or patent disclosures.

(9) Honors/Awards: List honors, degrees, and awards received during the grant/contract period. List lifetime achievement honors such as Nobel prize, honorary doctorates, and society fellowships prior to this effort.

(10) Courses taught: List class name, curriculum level and dates of any counter_WMD classes taught by the PI or Co-PI.

(11) An updated quad chart as a separate file(file name should include the Grant number) using the following format:

	Title of Project, Submitting Principle Investigator, Organization, Grant Number				
Description of Effort: Clear, concise (2-3 Sentences) description of the objectives and methodologies of the effort (Arial 14 point) Challenges: A bullet list (2-3) of the primary scientific challenges being addressed (Arial 14 point)	Picture or Graphic that illustrates the research or concept				
Status of effort: A brief synopsis (2-3 Sentences) of progress/accomplishments/new findings towards achieving the research objectives. (Arial 14 point) Personnel Supported: numbers and types of professional personnel (Faculty, Post-Docs, Graduate Students, etc.) supported by and/or associated with the research effort. (Arial 14 point) Publications & Meeting: numbers and types (peer-reviewed publications, theses, symposia, etc) in the previous 12 months (Arial 14 Point)	Bullet list of the major goals/milestones by Project year. (Arial 14 point) Funding Profile (Arial 14 point) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">Year 1 Dates</td> <td style="width: 33%; text-align: center;">Year 2 Dates</td> <td style="width: 33%; text-align: center;">Year 3 Dates</td> </tr> </table> PI Contact information (name, email, phone) (Arial 14 Point)		Year 1 Dates	Year 2 Dates	Year 3 Dates
Year 1 Dates	Year 2 Dates	Year 3 Dates			

(12) Markings: In order to ensure prompt receipt and acceptance, clearly indicate in the subject of the E-mail that it is a progress report, including the grant number.

b. FINAL TECHNICAL REPORTS: A comprehensive final technical report is required: the draft document is required forty-five (45) days prior to the end of the Period of Performance and the final document is required prior to the end of the Period of Performance. The report should be structured substantially as follows:

(1) The purpose of the final report is to document and to transition the results of the effort into the DTRA and DoD applied research community. The final report will always be sent to the Defense Technical Information Center (DTIC) and unclassified reports may be made available to the public through the National Technical Information Service (NTIS).

(2) Content: The final report is more than an extension of previous progress reports. The final report shall be a comprehensive technical summary of the significant work accomplished. The final report, where it is not readily accessible in published form should, where applicable:

(a) Clearly describe and illustrate the experimental equipment, setup, and procedures;

(b) Characterize and tabulate collected/computed data in an appendix;

(c) Sufficiently describe computational codes so they can be reproduced. Include a listing of the code in an appendix if possible and appropriate; and

(d) When the research effort culminates in the production of one or more student theses or dissertations, in these cases, the most significant advancements and conclusions (equations, figures, relationships, etc.) should be included in an executive summary. The theses or dissertations should be attached as appendices only if they are not readily available. If they are, clearly reference them and how they can be obtained. Also include in the executive summary, cumulative lists of people involved in, and publications stemming from, the research effort. Do not include copies of already submitted or published articles in the final report.

(3) Standard Form (SF) 298: SF 298, Report Documentation Page, must be used. Item 13 of the SF 298 should contain a 100 to 200 word abstract summarizing technical progress during the reporting period. The SF298 may be found on the Internet at:

[http://contacts.gsa.gov/webforms.nsf/0/B82C70E2B4C7843185256A2C005F72E0/\\$file/SF298_e.pdf](http://contacts.gsa.gov/webforms.nsf/0/B82C70E2B4C7843185256A2C005F72E0/$file/SF298_e.pdf)

(4) Format: Cover and title page. The report style should be third person singular using past tense. Jargon, special symbols or notations, subscripts, mathematical symbols or foreign alphabet letters are not permitted. All of the report pages should be prepared for acquisition and distribution by DTIC. All of the report pages should be of good quality for copying purposes. No pages should be missing.

The format and standard required by your institution for the preparation of theses and dissertations shall be used for the final report. In the absence of any institutional standards, you may wish to refer to the American National Standards Institute (ANSI) document Z39.18-1987, "Scientific and Technical Reports: Organization, Preparation, and Production," for guidance. The report may be obtained from:

American National Standards Institute Incorporated
1430 Broadway
New York NY 10018

(5) Report Classification: It is anticipated that all final technical reports will be unclassified and that distribution will not be limited. However, for final technical reports that require a limited distribution as deemed necessary by DTRA, a Distribution List will be provided with the comments on the draft final technical report. The Distribution List should be formatted to match the rest of the report, placed at the end of the report, and added to the Table of Contents. The number

of pages in the Distribution List should be added to the total page count and included in the total number of pages cited in Block 15 of the SF298.

(6) Report Submission: The draft of the final technical report will be due not later than forty-five (45) days prior to the end of the period of performance. The Grantee shall electronically submit a draft of the final technical report (including a draft SF 298) submitted electronically as follows:

For Basic Research Awards: E-mail the Draft Final Technical Report as an attachment (file name should be the Grant number and 'Draft Final Technical Report', e.g. HDTRA1-10-1-9999 Draft Final Technical Report) of less than 10 MB to BasicResearch@dtra.mil.

For Fundamental Research Awards: E-mail the Draft Final Technical Report as an attachment (file name should be the Grant number and 'Draft Final Technical Report', e.g. HDTRA1-10-1-9999 Draft Final Technical Report) of less than 10 MB to FundamentalResearch@dtra.mil.

Within thirty (30) days this draft will be reviewed by DTRA and comments will be provided to the Grantee. Within fifteen (15) days and prior to the end of the period of performance the Grantee shall complete the requested changes and electronically submit the final technical report as follows:

For Basic Research Awards: E-mail the Final Technical Report as an attachment (file name should be the Grant number and 'Final Technical Report', e.g. HDTRA1-10-1-9999 Final Technical Report) of less than 10 MB to BasicResearch@dtra.mil.

For Fundamental Research Awards: E-mail the Final Technical Report as an attachment (file name should be the Grant number and 'Final Technical Report', e.g. HDTRA1-10-1-9999 Final Technical Report) of less than 10 MB to FundamentalResearch@dtra.mil.

c. **INVENTION REPORTS:** Invention reports shall be filed at least annually and at the end of the Grant's performance period. Annual reports are due no later than 1 September of each year. Grants effective after 31 July will not require a report until 1 September of the following year. A final report is required prior to the end of the period of performance. The recipient shall use DD Form 882, Report of Inventions and Subcontracts, to file the invention reports. Reports must be submitted electronically as follows:

For Basic Research Awards: E-mail the Invention Report as an attachment (file name should be the Grant number and 'Invention Report', e.g. HDTRA1-10-1-9999 Invention Report) of less than 10 MB to BasicResearch@dtra.mil.

For Fundamental Research Awards: E-mail the Final Technical Report as an attachment (file name should be the Grant number and 'Invention Report', e.g. HDTRA1-10-1-9999 Invention Report) of less than 10 MB to FundamentalResearch@dtra.mil.

Negative reports are not required. Negative outcomes can be included as part of the Annual Progress Report.

The Grant shall not be closed out until all invention reporting requirements are met.

24. Financial Reporting Requirements.

a. The following financial report is required for all grant recipients:

(1) Federal Financial Report, SF425. This report is due annually, no later than 90 days after the end of the reporting period. The reporting period is from 1 August – 31 July. First year reports shall have a reporting period of the start date of the grant through 31 July. Final reports shall be submitted no later than 90 days after the project or grant period end date.

The SF425 form and instructions can be found on the Internet at:
http://www.whitehouse.gov/omb/grants_forms/

(2) All financial reports shall be submitted to the ONR Office identified in the Research Grant.

25. After-the-Award Requirements. Closeout, subsequent adjustments and continuing responsibilities, and collection of amounts due are subject to requirements found in DoDGARs §32.71 through 73.

26. Delegation of Administration Duties. Certain grant administration duties have been delegated to the ONR Office identified in the Research Grant. These duties are as follows:

- a. Provisionally approve all Grant and Cooperative Agreement Vouchers.
- b. Perform all property administration services except the approval of recipient's requests to purchase equipment with grant funds. Such approvals must be granted by the DTRA Grants Officer.
- c. Perform all plant clearance functions.
- d. Approve requests for Registration for Scientific and Technical Information Services (DD Form 1540).
- e. Obtain the interim (if required) and final financial report(s).
- f. Obtain the interim patent report(s).
- g. Execute administrative closeout procedures, which include the following:
 - (1) Obtain the final Report of Inventions and Subcontracts (DD Form 882).

- (2) Obtain final payment request, if any.
- (3) Obtain final property report and dispose of purchased property and government furnished equipment (GFE) in accordance with the DoDGARs Part 22, Subpart G.
- (4) Perform a review of final incurred costs and assist the Grants Officer in resolving exceptions, if any, resulting from questioned costs.
- (5) Assure that all refunds due the Government are received by the grantor.

NOTE: This term and condition is **not applicable** to instrumentation and equipment grant awards.

27. Claims, Disputes and Appeals. Claims, disputes, and appeals shall be processed in accordance with the procedures provided in DoDGARs §22.815.

28. Termination and Enforcement. Recipients shall be subject to the termination and enforcement conditions found in DoDGARs §32.61 and §32.62.

29. Security. As a general rule, Principal Investigators will not need access to classified security information in the conduct of research supported under this grant. Should it appear that access to such information is desirable, the recipient shall advise the grantor and request clearance for the investigator. Should information be developed under the course of work under this grant that, in the judgment of the Principal Investigator or the recipient, should be classified, the Grants Officer shall be notified immediately.

30. Representations and Assurances. By accepting funds under this grant, the recipient assures that it will comply with applicable provisions of the following national policies:

a. Nondiscrimination: By signing this agreement or accepting funds under this agreement, the recipient assures that it will comply with applicable provisions of the following, national policies prohibiting discrimination:

- (1) On the basis of race, color, or national origin, in Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d, et seq.), as implemented by DoD regulations at 32 CFR Part 195.
- (2) On the basis of sex or blindness, in Title IX of the Education Amendments of 1972 (20 U.S.C. 1681, et seq.), as implemented by DoD regulations at 32 CFR Part 196.
- (3) On the basis of age, in the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.), as implemented by Department of Health and Human Services regulations at 45 CFR Part 90.

(4) On the basis of handicap, in Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), as implemented by Department of Justice regulations at 28 CFR Part 41 and DoD regulations at 32 CFR Part 56.

b. Live Organisms: By signing this agreement or accepting funds under this agreement, the recipient assures that it will comply with applicable provisions of the following national policies concerning live organisms:

(1) For human subjects:

(a) The Common Federal Policy for the Protection of Human Subjects, codified by the Department of Health and Human Services at 45 CFR Part 46 and implemented by the Department of Defense at 32 CFR Part 219.

(b) The recipient shall adhere to DTRA local clause 252.223-9002. The full text of this clause is as follows:

252.223-9002 PROTECTION OF HUMAN SUBJECTS (APR 2005)

All research under this contract involving human subjects must be conducted in accordance with 32 CFR 219, 10 USC 980, and DoDD 3216.2, as well as other applicable federal and state regulations. Contractors must be cognizant of and abide by the additional restrictions and limitations imposed on the DoD regarding research involving human subjects, specifically as regards vulnerable populations (32 CFR 219 modifications to subparts B-D of 45 CFR 46), recruitment of military research subjects (32 CFR 219), and surrogate consent (10 USC 980). Defense Threat Reduction Agency (DTRA) Directive 3216.01 establishes the DTRA Human Subjects Protection Program, sets forth the policies, defines the applicable terms, and delineates the procedures necessary to ensure DTRA compliance with federal and DoD regulations and legislation governing human subject research. The regulations mandate that all DoD activities, components, and agencies protect the rights and welfare of human subjects of study in DoD-supported research, development, test and evaluation, and related activities hereafter referred to as "research". The requirement to comply with the regulations applies to new starts and to continuing research.

The DTRA directive requires that research using human subjects may not begin or continue until the Defense Threat Reduction Agency's Human Research Oversight Board (HROB) has reviewed and approved the proposed protocol. Contractors and subcontractors are required to submit a valid federal assurance for their organization (institution, laboratory, facility) that has been

issued by either DoD or the Department of Health and Human Services, and documentation of review of proposed protocols by the local Institutional Review Board (IRB) to include consent forms for any planned research using human subjects to the DTRA HROB for its review through the contracting officer's representative (if assigned) or the contracting officer. The HROB review is separate from, and in addition to, local IRB review.

Written approval to begin research or subcontract for the use of human subjects under the proposed protocol will be provided in writing from the DTRA HROB, through the contracting officer. A copy of this approval shall be maintained by both the contractor and the government. Any proposed modifications or amendments to the approved protocol or consent forms must be submitted to the local IRB and the DTRA HROB for review and approval. Examples of modifications/amendments to the protocol include but are not limited to:

- 1) a change of the Principal Investigator
- 2) changes in duration or intensity of exposure to some stimulus or agent
- 3) changes in the information requested of volunteers, or changes to the use of specimens or data collected
- 4) changes in perceived or measured risks or benefits to volunteers that require changes to the study

Research pursuant to such modifications or amendments shall not be initiated without IRB and HROB approval except when necessary to eliminate apparent and immediate hazards to the subject(s).

(2) For animals:

(a) Rules on animal acquisition, transport, care, handling, and use in 9 CFR Parts 1-4, Department of Agriculture rules implementing the Laboratory Animal Welfare Act of 1966 (7 U.S.C. 2131-2156), and guidelines in the National Academy of Sciences (NAS) "Guide for the Care and Use of Laboratory Animals" (1996), including the Public Health Service Policy and Government Principles Regarding the Care and Use of Animals in Appendix D to the guide.

(b) Prohibitions on the purchase or use of dogs or cats for certain medical training purposes, in Section 8019 (10 U.S.C.2241 note) of the Department of Defense Appropriations Act, 1991 (Pub. Law 101-511).

(c) Rules of the Departments of Interior (50 CFR Parts 10-24) and Commerce (50 CFR Parts 217-227) implementing laws and conventions on the taking, possession, transport, purchase, sale, export, or import of

wildlife and plants, including the: Endangered Species Act of 1973 (16 U.S.C. 1531-1543); Marine Mammal Protection Act (16 U.S.C. 1361-1384); Lacey Act (18 U.S.C. 42); and Convention on International Trade in Endangered Species of Wild Fauna and Flora.

(d) Notwithstanding any other provisions contained in this grant or incorporated by reference herein, the recipient is expressly forbidden to use or subcontract or subgrant for the use of laboratory animals in any manner whatsoever without the express written approval of the Grants Officer.

c. Debarment and Suspension: The recipient agrees to comply with the requirements regarding debarment and suspension in Subpart C of the OMB guidance in 2 CFR Part 180, as implemented by the Department of Defense in 2 CFR Part 1125. The recipient also agrees to communicate the requirement to comply with Subpart C to persons at the next lower tier with whom the recipient enters into transactions that are “covered transactions” under Subpart B of 2 CFR Part 180 and the DoD implementation in 2 CFR Part 1125.

d. Environmental Standards: By signing this agreement or accepting funds under this agreement, the recipient assures that it will:

(1) Comply with applicable provisions of the Clean Air Act (42 U.S.C. 7401, et. seq.) and Clean Water Act (33 U.S.C. 1251, et. seq.), as implemented by Executive Order 11738 [3 CFR, 1971-1975 Comp., p. 799] and Environmental Protection Agency (EPA) rules at Subpart J of 40 CFR Part 32.

(2) Identify to the awarding agency any impact this award may have on the quality of the human environment, and provide help the agency may need to comply with the National Environmental Policy Act (NEPA, at 42 U.S.C. 4321, et. seq.) and to prepare Environmental Impact Statements or other required environmental documentation. In such cases, the recipient agrees to take no action that will have an adverse environmental impact (e.g., physical disturbance of a site such as breaking of ground) until the agency provides written notification of compliance with the environmental impact analysis process.

e. Drug-Free Workplace: The recipient agrees to comply with the requirements regarding drug-free workplace requirements in Subpart B (or Subpart C, if the recipient is an individual) of 32 CFR Part 26, which implements sec. 5151-5160 of the Drug-Free Workplace Act of 1988 (Pub. L. 100-690, Title V, Subtitle D; 41 U.S.C. 701, et seq.).

f. Officials Not to Benefit: No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit arising from it, in accordance with 41 U.S.C. 22.

g. Preference for U.S. Flag Carriers: Travel supported by U.S. Government funds under this agreement shall use U.S.-flag air carriers (air carriers holding certificates under 49 U.S.C. 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair

Competitive Practices Act of 1974 (49 U.S.C. 40118) and the interpretative guidelines issued by the Comptroller General of the United States in the March 31, 1981, amendment to Comptroller General Decision B138942.

h. Cargo Preference: The recipient agrees that it will comply with the Cargo Preference Act of 1954 (46 U.S.C.1241), as implemented by Department of Transportation regulations at 46 CFR 381.7, which require that at least 50 percent of equipment, materials or commodities procured or otherwise obtained with U.S. Government funds under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned U.S.-flag commercial vessels, if available.

i. Military Recruiters: Military recruiting on campus under this award shall be as specified in the DoDGARs §22.520, Military Recruiting and Reserve Officer Training Corps Program Access to Institutions of Higher Education.

As a condition for receipt of funds available to the Department of Defense (DoD) under this award, the recipient agrees that it is not an institution of higher education (as defined in 32 CFR Part 216) that has a policy or practice that either prohibits, or in effect prevents:

(1) The Secretary of a Military Department from maintaining, establishing, or operating a unit of the Senior Reserve Officers Training Corps (in accordance with 10 U.S.C. 654 and other applicable Federal laws) at that institution (or any subelement of that institution);

(2) Any student at that institution (or any subelement of that institution) from enrolling in a unit of the Senior ROTC at another institution of higher education;

(3) The Secretary of a Military Department or Secretary of Homeland Security from gaining access to campuses, or access to students (who are 17 years of age or older) on campuses, for purposes of military recruiting in a manner that is at least equal in quality and scope to the access to campuses and to students that is provided to any other employer; or

(4) Access by military recruiters for purposes of military recruiting to the names of students (who are 17 years of age or older and enrolled at that institution or any subelement of that institution); their addresses, telephone listings, dates and places of birth, levels of education, academic majors, and degrees received; and the most recent educational institutions in which they were enrolled. If the recipient is determined, using the procedures in 32 CFR Part 216, to be such an institution of higher education during the period of performance of this agreement, the Government will cease all payments of DoD funds under this agreement and all other DoD grants and cooperative agreements to the recipient, and it may suspend or terminate such grants and agreements unilaterally for material failure to comply with the terms and conditions of award.

31. Research Involving Recombinant DNA Molecules. Any recipient performing research involving recombinant DNA molecules and/or organisms and viruses containing recombinant DNA molecules agrees by acceptance of this award to comply with the National Institutes of Health "Guidelines for Research Involving Recombinant DNA Molecules, " July 5, 1994 (59 FR34496) amended August 5, 1994 (59 FR40170) amended April 27, 1995 (60 FR 20726), or such later revision of those guidelines as may be published in the Federal Register.

32. Retention and Access to Records. Retention and access to records pertinent to this award are subject to the requirements of DoDGARs §32.53.

33. Certification. By accepting funds under this agreement, the recipient acknowledges the following:

Certification at Appendix A to 32 CFR Part 28 regarding lobbying was completed at time of proposal submission.

34. Data Collection. Data collection activities, if any, performed under this grant are the responsibility of the recipient. Awarding agency support of the project does not constitute approval of the survey design, questionnaire content, or data collection procedures. The recipient shall not represent to respondents that such data are being collected for or in association with the awarding agency without the specific written approval of the cognizant awarding agency official. However, this requirement is not intended to preclude mention of the awarding agency support of the project in response to an inquiry or acknowledgment of such support in any publication of this data.

35. Site Visits. The Government, through authorized representatives, has the right, at all reasonable times, to make site visits to review project accomplishments and to provide such technical assistance as may be required. The recipient shall provide, and shall require its subrecipients and subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the government representatives in the performance of site visits. All site visits and evaluations shall be performed in a manner that does not unduly interfere with or delay the work.