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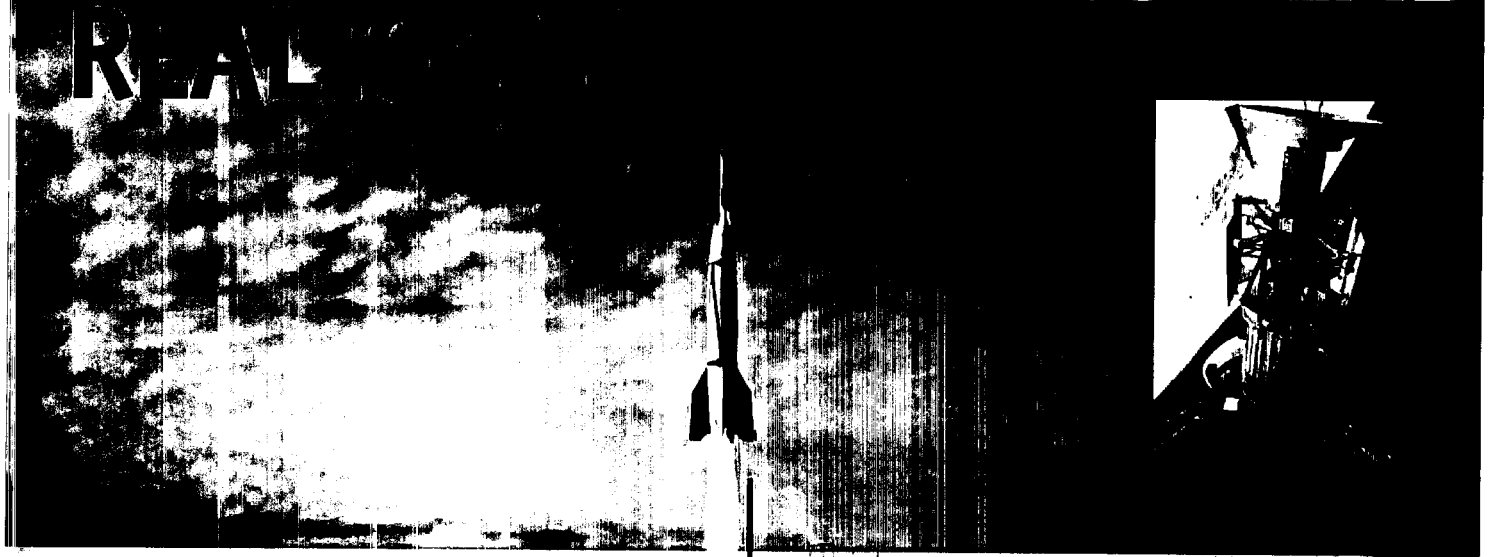
WHITE SANDS MISSILE RANGE

A PLACE FOR TESTING, EVALUATIONS & RESEARCH SYNERGY SINCE 1945

WSMR-ARMY RESEARCH LAB



Official Report From the Community June 24, 2

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Regional Hearing – June 24, 2005 – Clovis, NM
BRAC COMMISSION – FY 2005
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WSMR-ARL COMMUNITY RESPONSE

WSMR-ARL BRIEFING BOOK

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WSMR-ARL COMMUNITY RESPONSE

INTRODUCTION 0.

On May 13, 2005, the Department of Defense presented their Analysis and Recommendations for the Base Realignment and Closure Commission. Within those recommendations, White Sands Missile Range in Southern New Mexico was impacted by the following excerpt:

> *"Realign the Army Research Laboratory WSMR, NM by relocating all ARL activities except the minimum detachment required to maintain Test and Evaluation (T&E) functions at WSMR, NM to Aberdeen Proving Ground, MD." (p. 22, Section 10, The "Base Closure and Realignment Report", Volume 1, Part 2 of 2: Detailed Recommendations, May, 2005)*

Las Cruces, New Mexico, Alamogordo, New Mexico and El Paso, Texas were all impacted by this announcement which we, as community members, feel warranted a response. The following document is a culmination of the work of the WSMR Community Response Team, which formed to investigate how this specific recommendation was arrived at and communicate our community's response to the BRAC Commission and its staff.

The WSMR Community Response Team is a volunteer based committee of community leaders who have lent their time and efforts because they feel the decision to realign the activities of the Army Research Lab at WSMR is not in the best interested of the Department of Defense or the Nation as a whole. Their efforts, presented within, are a result of an analysis into the initial recommendation above and represent a review of the assets used by the Army Research Lab at WSMR and the value that they bring to both the Department of Defense and the Southern New Mexico Community.

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A special thanks goes out to the New Mexico Congressional Delegation, the Governor of New Mexico's Office and Hanson Scott of the New Mexico Office for Military Base Planning and Support for their support and assistance in developing the response include within these pages. Their non-partisan leadership in this endeavor represents the best of New Mexico governance.

EXECUTIVE SUMMARY

I.

In analyzing the Department of Defense Recommendations to the BRAC Commission, there are four important points that have helped to illustrate why the recommendation to realign Army Research Lab activities at WSMR would not be in the best interest of the Department of Defense. Those points are:

Testing and Evaluation vs Research.
WSMR – Department of Defense Synergy vs Business / Research Synergy
BRAC Criteria Evaluation
Purple - The Color of Choice for DoD's Future

Testing & Evaluation vs Research

WSMR-ARL is basically made up of two different organizations – one is the Computational & Information Sciences Directorate (CISD), which is meteorologically based research organization. The second is the Survivability/Lethality Analysis Directorate (SLAD), which is a Testing and Evaluation organization, with an emphasis on electronic and information warfare. The difference between the missions of these two organizations gets to the heart of our argument for keeping the ARL activities at WSMR. 98% of SLAD's Electronic Warfare/Information Warfare capability directly supports the Army's Test and Evaluation functions.

The SLAD testing and evaluation mission does not mesh with the mission of research for the ARL mission at Aberdeen. The type of budget funding indicates that there is not a correlation between the two organizations (SLAD is a 6.6 funded organization, ARL research is mainly funded with 6.1 or 6.2 monies). Even if the organizations were moved, the difference in the operational structure of these organizations means they could not take advantage of business synergies. In essence, they would still be operated as separate entities.

WSMR-Department of Defense Synergy vs Business/Research Synergy

The synergy in place at WSMR can be best described as a work culture developed over decades of commitment providing the best equipment for our Department of Defense personnel. It is a culture that was first established at WSMR in the 1950's and is devoted to maintaining the preeminent Electronic Warfare/ Information Warfare complex available to the Department of Defense. A move to Aberdeen Proving Grounds, MD would result in the damaging the unique military value of this WSMR culture.

Why is this culture so important? Through decades of work at the WSMR world class facilities, these engineers and scientists have developed a unique expertise and knowledge base that would be nearly impossible to replicate. The unique problem solving and critical thinking processes used by these experts are only learned through years of experience. These decades of expertise has also translated into a regional synergy through the development of working relationships with regional contractors, government organizations (i.e. Sandia National Laboratory, Los Alamos National Laboratory) and universities (i.e. New Mexico State University, New Mexico Tech). It is documented that labor cost savings from past realignments came from those who chose not to relocate, with those positions not being filled at the new locations. During the current uncertainty within the world landscape, it seems that our nation cannot afford a loss of this critical knowledge base.

This synergy at WSMR-ARL is best shown in its versatility in developing, testing and evaluating a number of countermeasure and counter countermeasure devices. Examples, such as ICE (Improvised explosive device Countermeasure Equipment) are documented to show that the existing environment at WSMR help develop devices that have saved the lives of US Marines and Soldiers in the current theatre of operations, have done

so at a relatively low cost to produce and were done so in an unprecedented timeframe. A definite win-win situation for the Department of Defense and a direct result of the synergy at WSMR. This is just one of a number of examples of the invaluable results developed by having ARL at WSMR.

BRAC Criteria

This recommendation also has the fault that it was not made consistent with the DoD's own BRAC data. The final BRAC criteria emphasized the military value and cost savings as the basis for the realignment or closure recommendations. Our analysis has shown that because of the higher cost of living standard in Maryland, as opposed to Southern New Mexico, there would be no cost savings associated with the realignment to Maryland. Also, the unique electronic warfare testing and evaluation work performed at WSMR simply cannot be done in Maryland. The absence of encroachment issues, especially as it pertains to the radio frequency spectrum, makes WSMR the ideal location for electronic and information warfare testing and evaluation. This type of testing would not be available anywhere on the east coast.

Since ARL SLAD at WSMR is a T&E entity it was submitted as such through higher headquarters for BRAC planning. It appears that a subjective decision was apparently made at some point in the process to simply declare ARL SLAD an RDA asset solely because it's parent organization is a research laboratory. This declaration is inconsistent with present practice, with ARL SLAD program planning and reporting channels, and with ARL SLAD funding.

Purple – The Color of Choice for the Future of the Department of Defense

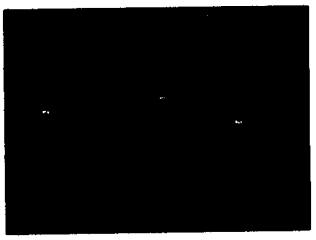
The basis of the 2005 BRAC was to reduce excess capacity (reduce operating cost by consolidation), to transform to be more joint service orientation in daily operations in order to facilitate efficiencies and interoperable warfare, and to effect an overall transformation of the Department of Defense to address changes in threats facing the Nation today and into the future.

If taking the BRAC Criteria to heart, it would seem that WSMR should have been an overall gaining location within the BRAC. WSMR was initiated as a joint test range and is the only and the largest one with all services represented and has shown the ability for joint operations and efficiencies through share resources. Many missions and weapons systems of the Air Force, Army and Navy come to WSMR for long-range test and training. With WSMR already identified as one of the preeminent locations for the testing of the Future Combat Systems, having more of an ARL presence at WSMR would be in the best interest of the Department of Defense.

One last, but equally important point that could not have been taken into consideration when looking at individual military installations is the regional relationship already in place between WSMR, Holloman Air Force Base (HAFB) and Ft. Bliss, Texas. Together, these military installations comprise the largest area of Department of Defense controlled land and airspace. Through their continuing joint training, testing and evaluation, these three military installations have proved, over and over, that joint military exercises and cooperation can provide our military with a decided advantage of our enemies. With the already announce expansion of troops at Ft. Bliss and the announced future J-UCAS program at HAFB, an expansion (not realignment) of the ARL activities should be planned for at WSMR.

WSMR-ARL – SYNERGY AT ITS BEST – THE HISTORY OF ICE

II.



WSMR-ARL/SLAD's work in support of current operations is principally the development and fielding of the Improvised Explosive Device (IED) Countermeasure Equipment (ICE), which is being fielded in large quantities. The history of ICE provides an excellent example of the synergy existing at WSMR, which when exploited, is shown to provide lifesaving technology to current areas of conflict. The development of ICE was solely the result of the knowledge and expertise of the WSMR-ARL personnel. To that extent, WSMR-ARL/SLAD has become a program manager for this particular program.

ICE could not have been designed, developed, tested and fielded in unprecedented record time had it not been for SLAD's location at WSMR. Unconstrained use of the electromagnetic spectrum at WSMR allowed for unrestricted open air testing during the development of ICE. This was critical for rapid development of the system. The existing WSMR infrastructure containing facilities for environmental testing and shock & vibration testing were instrumental to getting ICE quickly certified for deployment. The local availability of engineering and field support from PSL, NMSU, was an essential component for the successful development. The system design jointly developed by WSMR-ARL/SLAD and PSL engineers is being patented. The knowledge and corporate technical expertise leveraged to develop this system is a result of the many decades that SLAD and its predecessor organizations at WSMR have been designing and developing Electronic Warfare jammers. The proximity to Yuma Proving Ground (YPG) where the Army conducts formal testing of systems such as ICE was another major factor for the rapid fielding. Additionally, two of three ICE high rate manufacturers are in the Southwest (Albuquerque, NM) so the important ties are all in the Southwest. It has been the local and regional synergy that has allowed the rapid development of a protective device that is currently saving the lives of soldiers of in current operations.

The timeline provided below indicates the rapid development and the local synergy that enabled the quick production of ICE.

Nov 2003: WSMR-ARL/SLAD begins developing ICE conceptual design.
Dec 2003: WSMR-ARL/SLAD successfully tested an initial engineering prototype. Then the program was shut down for political reasons. Army had already funded a IED counter measure project through EDO and it was erroneously thought that this was duplicate technology.
April 2004: Project revived by task force after WSMR-ARL/SLAD staff took prototype box to Pentagon for show-and-tell. USMC immediately interested.
May 2004: 6 first article prototypes tested at Yuma Proving grounds. USMC places order for 450 units.
June/July 2004: PSL of NMSU designated the Low Rate Manufacturer. WSMR-ARL/SLAD searches for High Rate Manufacturers.
Aug 2004: First HRM contracts placed. 2 of 3 HRMs are located in Albuquerque, NM.
Sep 2004: First units fielded in Iraq
Oct 2004: First HRM units successfully undergo test.
Nov 2004: HRMs begin delivering quantities of 30-50 units per week. Army orders 3000 additional units.
Feb 2005: USMC orders additional units. WSMR-ARL/SLAD, working through PEO, is actively designing upgrades for emerging threats.

Mar 2005: HRMs delivering in quantities of 100-125 per week.
May 2005: Over 2500 units fielded with only 3 returns. 2 of the 3 returns were due to combat incidents. Over $30M in high tech (engineering and manufacturing) contracts paid in the Albuquerque area since Aug 2004. $7-$8M in high tech contracts to the Las Cruces area over same time period. These contracts leveraged additional technical expansion in the Albuquerque/Rio Rancho and Las Cruces areas.
June 2005: WSMR-ARL/SLAD receives "Army Greatest Invention of the Year Award" for it's rapid response to the IED threat.

As mentioned above, several NM companies have been instrumental in the rapid deployment of ICE technologies.

The Physical Sciences Laboratory of NMSU (PSL) worked closely with ARL/SLAD on certain aspects of the design. They built the initial prototypes and continue to serve a role as WSMR-ARL/SLAD's "Low Rate Manufacturer" (LRM) for ICE. In addition, they are working closely with WSMR-ARL/SLAD on upgrades and accessories to ensure that ICE continues to meet emerging threats.

There are two New Mexico based companies that were selected by WSMR-ARL/SLAD as "High Rate Manufacturers" along with a major national defense contractor, WSMR-ARL/SLAD felt that it was critical to select HRMs within a close radius as the technology was moving so rapidly from prototype to production phases, that close collaboration and oversite were required. For example, early in the manufacturing phase, manufacturing processes and instructions were still being fine-tuned. WSMR-ARL/SLAD could request both New Mexico companies to travel to WSMR within 24 hours to attend training sessions and joint QA reviews. In this manner, production was able to proceed extremely rapidly through a normally very difficult phase of product lifecycle. It is also worth noting that, while the major national company brings considerable Defense Contractor strength to the HRM team, the New Mexico based companies are able to manufacture the units at a considerably reduced price.

Both of the New Mexico based companies are ISO 9001:2000-registered manufacturing facilities. They both bring different specialties to the table; one provides a broader range of in-house manufacturing services, such as cable assembly and Printed Wiring Board Assembly (PWAs). The other New Mexico company subcontracts the cable and PWA assemblies, but provides a broader range of engineering services to WSMR-ARL/SLAD. All of these companies have participated in a "manufacturing prototype" process for ICE upgrades that could lead to further contracts (therefore further hiring and capital improvements). Close proximity to WSMR-ARL/SLAD was key to being able to participate in the prototyping of upgrades as the designs are evolving daily.

III. BRAC RECOMMENDATIONS AND CRITERIA

"Realign the Army Research Laboratory White Sands Missile Range, NM, by relocating all Army Research Laboratory activities except the minimum detachment required to maintain the Test and Evaluation functions at White Sands Missile Range, NM, to Aberdeen Proving Ground, MD."

The excerpt above, from the Technical Joint Cross-Service Group (TJCSG) Recommendations to the BRAC Report for 2005.

Back in February, 2004, the Department of Defense established the BRAC Selection Criteria, in which all Department of Defense facilities would be judged on. In selecting military installation for closure or realignment, the Department of Defense, giving priority consideration to military value (the first four criteria below), will consider:

Military Value

- The current and future mission capabilities and the impact on operational readiness of the total force of the Department of Defense, including the impact on joint warfighting, training and readiness.

- The availability and condition of land, facilities, and associated airspace (including training areas suitable for maneuver by ground, naval, or air forces throughout a diversity of climate and terrain areas and staging areas for the use of the Armed Forces in homeland defense missions) at both existing and potential receiving locations.

- The ability to accommodate contingency, mobilization, surge and future total force requirements at both existing and potential receiving locations to support operations and training.

- The cost of operations and the manpower implications.

Other Considerations

- The extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of the closure or realignment, for the savings to exceed the costs.

- The economic impact on existing communities in the vicinity of the military installations.

- The ability of the infrastructure of both the existing and potential receiving communities to support forces, missions and personnel.

- The environmental impact, including the impact of costs related to potential environmental restoration, waste management and environmental compliance activities.

In the Technical Joint Cross Service Groups Analyses and Recommendations Report to the BRAC Commission, the TJCSG provide a differing version of their decision criteria. The TJCSG evaluated Department of Defense installations that performed the Research; Development and Acquisition; and Test and Evaluation (RDAT&E) functions. The research function included basic research, exploratory development, and advanced development. The development/acquisition function included system development and demonstration, systems modifications, experimentation and concept demonstration, product/in-service life-cycle support and acqui-

sition. The test and evaluation function included the formal developmental test and evaluation (DT&E) and the formal operational test and evaluation (OT&E).

To guide its analysis and recommendation development, the TJCSG established two principles and an overarching strategic framework. The two principles were:

- Provide efficiency of operations by consolidating technical facilities to enhance synergy and reduce excess capacity, and;

- Maintain competition of ideas by retaining at least two geographically separated sites, each of which would have similar combination of technologies and functions. This would also provide continuity of operations in the event of an unexpected disruption.

Consistent with these two principles, the TJCSG used the strategic framework to establish multifunctional and multidisciplinary technical (RDAT&E) Centers of Excellence which should provide the scientific and technical advances to enable the Department to develop capabilities and weapons that are technologically superior to those of potential adversaries into the future. The multifunctional and multidisciplinary nature of the Centers of Excellence should allow more rapid transition of technology and enhance integration of multiple technologies. The Centers of Excellence will be complemented by the Department's existing technical facilities that have a disciplinary focus.[1]

The TJCSG also recognized that to effectively accomplish the Department's RDAT&E functions, key partners outside of the Department of Defense are essential, and include other government organizations, industry, universities, and the international community. Finally, the rapidly changing and uncertain environment of the 21st century required that the TJCSG analysis and recommendations ensure that surge capability would be available for the future Defense RDAT&E infrastructure.

TJCSG recommendations provide the Department Centers of Excellence in the following three areas: Defense Research Laboratories; RDAT&E Centers; and Integrated Command, Control, Communications, and Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) Centers.

These recommendations provide the Department Centers of Excellence in the following three areas:

- Defense Research Laboratories, whose functions include, but are not limited to, basic and applied research. Combined research laboratories are inherently multidisciplinary.

- Integrated Research (R), Development and Acquisition (D&A), and Test and Evaluation (T&E) Centers across DoD technology areas that are involved with maturing platforms and capabilities. This includes Land, Maritime, Air, and Space platforms; Weapons and Armaments; and Chemical-Biological Defense Systems.

- Integrated Command, Control, Communications, and Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) Centers intended to enable advances to joint battlespace awareness capability with a joint program management office and RDAT&E domain centers for land, maritime, air and space. This infrastructure should enable a future joint management structure.

Conclusion and Comments

The idea of bringing these two sets of criteria within this report was to highlight their differences. The Department of Defense's BRAC criteria was clearing looking at the military value, with potential cost savings being just one part of the total criteria. The criterion used by the TJCSG to develop its recommendations was based on the preconceived ideas that the combining all "like disciplines" would create a synergy of savings. They also are under the illusion of creating new "Centers of Excellence" by moving individuals to central location. This doesn't take into account that the current Testing and Evaluation directorates have already developed their own Centers of Excellence and have built the facilities that have allowed them to excel.

If the TJCSG would have used the BRAC criteria as the basis for the decision making process, they would not have considered moving a relative low cost, highly technical, encroachment free Test and Evaluation organization to a higher cost, space limited location. We feel that proper implementation of the BRAC criteria could have resulted in quite the opposite – the expansion of ARL's role at WSMR to take advantage of the excellent range capabilities, top-flight facilities and future joint operations expansion. It is apparent that the Department of Defense objectives set out by the BRAC criteria was not goal to be met by those who recommended the relocation of the WSMR-ARL activities.

[1] Multifunction refers to those activities that perform more than one function (research, development and acquisition, and test and evaluation). Thus, a center that performs research and development and acquisition (RD&A) is multifunctional. Multidisciplinary refers to activities that operate in more than one technical discipline. For example, a center that conducts electronics, materials, and human factors research is a multidisciplinary research center. The BRAC recommendations enhance the multidisciplinary nature of the research laboratories.

ARL has two basic expertises at WSMR: Meteorological & Electronic Warfare/Information Warfare (EW/IW) survivability analysis and vulnerability assessments. All of the EW/IW capability directly supports the Army's Test and Evaluation (T&E) functions.

SLAD is the Army's primary source of survivability, lethality, and vulnerability (SLV) analysis and evaluation support, adding value over the entire life cycle of an Army system (ie from cradle to grave) Its main reason for being is to ensure that our soldiers and their systems can survive and function on any defined battlefield. SLAD is committed to assisting the Army in achieving its modernization goals by helping to acquire systems to help its soldiers survive in all environments against the full spectrum of battlefield threats. SLAD's value to the Army is based upon its unique SLV scientific and engineering skills and its unique analytical tools, used to conduct SLV investigations, simulations, and lab/field experiments.

Mission and Functions

- Conduct investigations, experiments, simulations, and analyses to quantify SLV of Army and selected foreign weapon systems.
- Perform special studies and make recommendations regarding tactics, techniques, or design modifications to reduce vulnerability and enhance survivability and lethality of Army materiel.
- Provide advice/consultation on SLV issues to HQDA, PEOs/PM's, evaluators, combat developers, battle labs, intelligence activities, and selected of DA and DoD activities.
- Provide well-documented, timely technical judgments on complex SLV issues.
- Develop tools techniques, and methodologies for improving analyses.

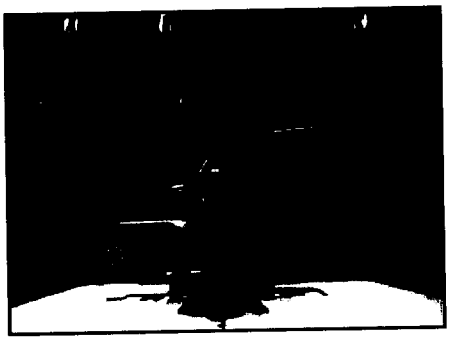
SLAD has 6 branches at WSMR performing electronic warfare (EW) and information warfare (IW) analysis in support of Army T&E. Principal business areas for these branches are: support of current operations, Air and Missile Defense, Ground Combat Systems, and IW analysis.

SLAD's work in support of current operations is principally the development and fielding of the Improvised Explosive Device (IED) Countermeasure Equipment (ICE) which is being fielded in large quantities. ICE, which will be discussed in more detail in a following section, could not have been designed, developed, tested and fielded in unprecedented record time had it not been for SLAD's location at WSMR. Similar dynamics are also occurring on other SLAD efforts such as on Man Portable Air Defense issues.

Historically, Air and Missile Defense T&E for the Army has taken place principally at WSMR. SLAD has always provided countermeasure support, modeling, and analysis for the Army's Air and Missile Defense missions. This will continue. WSMR has been designated as joint test range that will be supporting T&E for not only the Army's Future Force to include FCS but DoD requirements as well. SLAD has postured itself to provide the necessary EW and IW countermeasure support, modeling and analysis capability for all testing being planned for WSMR. All the synergy is at WSMR for this part of SLAD's mission.

Ground Combat Systems T&E for many Army systems takes place at WSMR, particularly for the EW analysis that is SLAD's mission. Over the years, SLAD has piggybacked on many of the tests conducted at WSMR providing experimental and analytical support to this T&E mission in signatures, countermeasures, laser testing and analysis. This synergy has saved the Army millions of dollars. This support is provided not only to Army testers but also to the OSD Center for Countermeasures, WSMR, which has a mission closely related to that of SLAD. In addition, technically sophisticated modeling and simulation support on aerosols and obscu-

ration has routinely been provided to the Army's force level models at TRAC, WSMR. All the synergy for this part of SLAD's mission is at WSMR.



Information Warfare (IW). SLAD has an elaborate laboratory facility at WSMR for this work, and ground will be broken this fiscal year on a $33M anechoic chamber to support sophisticated IW and EW investigations. For several years, SLAD has been providing significant IW modeling and simulation support to TRAC, WSMR. SLAD is also principal IW T&E provider for the CTSF, Ft. Hood, TX and will be IW T&E element for WSMR's virtual proving ground. SLAD has an important feeder program to attract scarce talent in the IW area with NM Tech which is certified as IA Center of Excellence University. Finally, in Fiscal Year 2005 SLAD conducted IW testing on the FCS SOSCOE and will be supporting FCS T&E testing at White Sands beginning in FY08. The important synergies for SLAD's IW mission are at White Sands Missile Range and in the Southwest.

As WSMR plans and develops its virtual proving ground, SLAD is postured to provide important components such as an IW node, a hardware-in-the-loop node, an radio frequency directed energy node and a laser effects node. These nodes will provide countermeasure modeling and analysis capabilities to the test range that are essential for the robust evaluation of the systems that will be tested at WSMR.

The meteorological responsibility of WSMR-ARL is currently under the guidance of the Battlefield Environment Directory (BED). Originally established as the Atmospheric Sciences Laboratory in 1969, the mission today is much like it was when it was first established;

1. Perform research in support of critical Army needs with respect to missile delivery systems, artillery accuracy, communications, and intelligence;
2. Develop instrumentation and methodologies in support of Test and Evaluation;
3. Conduct tests and evaluations of atmospheric effects on Army materiel;

The current division focuses on three main thrust areas: Atmospheric Sensing, Met Modeling and Atmospheric Effects. Much of the Met Modeling is performed at WSMR and the results of the Atmospheric Effects research are tailored to fit specifically on the Army's Integrated Meteorological System (IMETS). The IMETS is the only system currently deployed with the active Army that integrates battlefield meteorological data with other intelligence products for use by Army intelligence personnel. The IMETS is highly unique amongst the services in addressing meteorological scales and resolutions, one kilometer or less, in which the Army fights. This is opposed to the much larger scales as is typical for most forecast models: national/global scales, i.e., 25 kilometers or greater!

There is no other organization within the DOD, university community, or the private sector that is working on these specific Army-centric problems. Relocating the 40 or so ARL BED scientists to ALC, MD will have a detrimental effect on this critical scientific research program. It is not that the work can't be performed there, it can. The loss will come from the expected attrition of scientists who simply will not move because it is not in their interest, professionally or financially, to do so. Their work is such that losing their expertise will require years to be rebuilt. One cannot take a recent graduate from university ranks and provide them with the experience and skills built up over the years. The net result will be a nearly complete loss of critical skills to the Army and it's ability to leverage many aspects of its intelligence technology on the battlefield.

ARL at WSMR Asset evaluation & replication potential

One of the biggest questions that must be asked in analyzing the possible realignment of the WSMR-ARL activities is what becomes of the assets and facilities used at WSMR by the ARL staff. If those assets must be moved to APG, they must be done at a great expense to DoD, must be located within the APG real estate (if possible) and must be done in such a way that minimizes the down time for the asset. The following discussion of the WSMR-ARL evaluates their uses and the challenges for attempting to replicate the asset and its functions in APG, MD.

Electro-Optical Vulnerability Analysis Facility

The ARL SLAD Electro-Optical Vulnerability Analysis Facility (EOVAF) is the premier facility in the Army and DoD for the performance of low energy laser vulnerability analyses this includes the measurement of optical augmentation signature, laser jamming and damage susceptibility, and level of eye protection where optical augmentation is the military use of the active laser signature of an optical device to locate the device and associated platform in the battlefield (the phenomena at work in optical augmentation detection is equivalent to that seen in the red-eye effect in photography). It is in this area that the EOVAF has developed highly specialized broadband measurement capabilities and expertise that does not exist elsewhere. The EOVAF has a history of performing low energy laser vulnerability evaluations that dates back over 20 years to the beginning of the Army laser hardening program. It has been instrumental in developing the measurement methodologies used in the Army and elsewhere to evaluate the level of laser hardening of optical systems. Evidence of this can be seen in the fact that significant expertise has been shared with both the Air Force and the Navy in recent years.

The EOVAF facility is currently located at a remote site at WSMR. The primary reasons for the location of the EOVAF at this remote site are:

- It allows for the convenient use of outdoor laser ranges adjacent to the laboratory facility. Location away from populated areas is critical due to safe-eye distances exceeding 40 km for some laser sources. The laser ranges, of which has a line of sight of 2.6 km, the other a line of sight of 20+ km, have been sought after both by foreign allies as well as intelligence services looking for a remote location for testing.
- Hydrogen fluoride/deuterium fluoride (HF/DF) laser used for laboratory low energy laser measurements. This laser source emits hazardous gases, which although scrubbed before venting to the atmosphere, is not suitable for operation in a populated area. Prior to initial operation of the laser, lengthy EPA and State environmental approvals were required and subsequent monitoring even in the remote location at WSMR at which the EOVAF is located.

In addition to the need for remoteness for the performance of laser evaluations, the EOVAF additionally has critical ties to WSMR including the team responsible for evaluating Small Arms Systems as wall as others. The location of the EOVAF at WSMR allows for a one-stop shop for technical testing of these assets.

Electro-Optical Countermeasure Missile Flight Simulation Facility (HWIL)

This facility was started in the early 1970's to evaluate effectiveness of Man Portable Air Defense Systems (MANPADS). From the beginning, the EOCMMFSF mission is concentrated on countermeasures, CM, (techniques to defeat the missile) and counter-countermeasures, CCM, (techniques to harden the missile against CM). In many cases, the EOCMMFSF has been in the forefront in CM and CCM and simulation techniques for hardware-in-the-loop (HWIL) missile simulations. The TIG (Target Image Generator), the SPOFC (Stinger-POST Flare Controller), the TIS (Target Image Simulator), and the UNDEGE (Unique Decoy Generator) are just a few examples of specialized electronic devices that have been innovated and have pushed the state-of-the-art in HWIL missile simulations that have been conceived, designed, and built at the EOCMMFSF at WSMR.

To properly evaluate these CM (And CCM) techniques, HWIL simulations are required -simulations that have been verified, validated, and accredited (VV&A). Verification is a process of ensuring that the simulation models correctly perform their intended task. Validation is a process that compares simulation results to actual missile live firings done at WSMR-does the simulated missile perform the same in the simulation as in actual flight including the same flight path and the same location of impact on the target. Accreditation is the process where a body of experts, after reviewing data in fine detail, declares that the simulation is correct and true and can provide good performance predictions. The EOCMMFSF at WSMR has the only VV&A'd missile simulation of Stinger-BASIC for both the benign case and the CM case with jamming and/or flares.

The EOCMMFSF has performed many simulation studies, typically involving over 100,000 simulated flights per study, for various organizations including CM developers, military aircraft developers, VIP aircraft developers, foreign governments, and other industrial and governmental organizations.

The follow-on to the Redeye missile is the Stinger-BASIC missile. This in turn was followed, with further development, with the Stinger-POST, Stinger-RMP, and Stinger-Block 1. All of these follow-ons principally occurred for advanced CCM techniques. Other foreign nations also have designed and built MANPADS which resulted in the US expending considerable efforts designing and building CM for these missiles. The EOCMMFSF has HWIL simulations for many of these systems (foreign and US) and has played a key role in evaluating many of these CMs.

In the mid 1990's, the simulations at the EOCMMFSF showed that for a special CM technique, the missile would perform in a totally unexpected behavior-a behavior that would go beyond the measured region for one of the models. In fact, after a peer review stated that the manifestation was highly unlikely, the EOCMMFSF invited the peers, other MANPADS experts, to visit the facility and show where the simulation was in error. Such a review did take place and all systems and subsystems were rechecked and found to be in VV&A compliance. So, being located on a missile range, the EOCMMFSF devised a set of live missile firings that would either demonstrate the unexpected missile behavior or show that the simulation was indeed faulty. The firings were conducted and the missile did perform as predicted by the simulation and thus beyond the valid region of one of the models. EOCMMFSF then analyzed the telemetered missile signals from the flying missiles and the date from WSMR and devised a new model to incorporate this region of unexpected behavior. This new model is now the standard model for this particular MANPADS.

Currently, the EOCMMFSF is working on a relatively low cost CM technique that perhaps could afford protection of any aircraft against MANPADS. To date, this very novel technique has been demonstrated in the laboratory and in a series of outdoor experiments on WSMR. For reasons that are too sensitive to explain here, the continued testing and development of this technique will require further testing on WSMR because of the unique environment offered by WSMR. The Department of Defense is very interested in the results of these experiments and the possibilities that this technique could provide. This technique would perhaps be even more applicable to the Department of Homeland Security during our current War on Terrorism.

Radar Target / Jammer Simulator (RTJS)

The Radar Target/Jammer Simulator (RTJS) is a mobile, reconfigurable system developed and employed by ARL/SLAD to exercise deployment-ready radar systems in the field by providing simulated radio frequency (RF) radar target signal returns along with a coordinated jammer signal environmental. It operates independently in the far field of radar under investigation, exercising the radar's complete signal chain including its antenna.

The RTJS is a cost-effective tool used in vulnerability assessments of radar performance in a repeatable, real-world field Electronic Warfare (EW) environment without requiring investigators to make simplifying assumptions about the radar's antenna or signal processing functions. Its primary usage is in conducting Electronic Warfare Vulnerability Assessments on U.S. Army weapons system radars. It can also be used to check models of radar functions and EW environments in other simulation tools.

The RTJS has grown out of a systematic development effort over a period of more than 22 years. This development effort continues as threat and radar technologies evolve. U.S. radar systems investigated using the RTJS include the Roland, Sgt. York, Hawk, DIVAD, MRSR, LOS-F-H, FAADS GBS/Sentinel, Sentinel ETRAC, Longbow missile, THAAD (brief startup use) and Patriot (exploratory ground and airborne RTFS checkouts). The SA-6 and the SA-8 foreign radar systems have also been investigated using the RTJS in dual-band mode to exercise both acquisition and track radars simultaneously in the field.

The RTJS provides dramatic added value in comparison to traditional live aircraft testing. An example is the Sentinel program that has utilized the RTJS extensively in its radar development, verification and product improvement programs. Using 128 live aircraft runs made in 1994 as the cost basis, the RTJS has provided $152 million dollars of added value in generating 7900 Target Signature Modulator (RTSM) system development to generate multi-scattering target signatures for TBM, air-breathing, rotary wing and low observable threat vehicles.

An airborne deployment of the RTJS has been field tested on a UH-1 rotary wing platform in successful proof-of-principle experiments at White Sands Missile Range. The UH-1 was provided and flown by US Army Air at Holloman Air Force Base, NM. Development of an airborne RTJS will provide many additional capabilities including target elevation and azimuth variation, enabling arbitrary target trajectory simulations. An eventual development goal of the RTJS is to provide the ability to simulate a TBM or other target with a known trajectory. Doing this requires precise knowledge of the airborne RTJS platform position using Real Time Kinematic (RTK) or differential GPS along with specialized control hardware and software in the airborne RTJS. An airborne Threats Management Initiative (TMI) has been submitted to develop an airborne platform applique with a GPS tracking antenna to facilitate this task.

Applications for the RTJS and its successors continue to grow based on past successes and the real-world system-in-the-loop experimental approach it utilizes. It augments other analysis tools in a unique away and adds value in measurable cost and timesavings. Future applications envisioned for the FTJS include THAAD, Patriot, JLENS, MEADS, MDA and other radar systems.

The RTJS is ideally suited for the open-air test environment provided at White Sands Missile Range. The vast protected air space and controlled signal environment enable carefully controlled experimentation with full-up radar systems in the field. Low cost airborne RTJS operation is enabled by nearby fixed wing and rotary wing aircraft support from US Army Air at Holloman AFB. Ongoing radar test programs and exercises at White Sands Missile Range and nearby McGregor range provide synergistic opportunities for RTJS simulation interleaved with live testing.

SLAD's Information Operations Program

SLAD's Information Operations program consists of three critical technical initiatives:

1. Information Assurance
2. Radio Frequency Directed Energy (RFDE)
3. IO Modeling & Simulation.

The Information Assurance program will be discussed later. However, SLAD's RFDE program was developed at White Sands over three decades ago in the 1970's. A critical issue that must be addressed in today's current digitized battlefield is what are the vulnerabilities associated with digital computers/systems, which are utilized throughout the battlefield, to RFDE weapons. SLAD has played a critical role in addressing this type of vulnerability to military systems since the 1970's. During that time, SLAD has had an active collaborative relationship with Los Alamos National Laboratory and Sandia National Laboratory. As developers of High Powered Directed Energy Weapons, Los Alamos and Sandia have provided SLAD with these devices that SLAD has used to test US military systems against RFDE weapons. SLAD is scheduled to break ground in August 2005 on a brand new, state-of-the art $33M Anechoic Chamber which will be the foundational facility used to support the RFDE program. Additionally, over the last 4-5 years, SLAD has been working closely with White Sands Missile Range/ATEC to assist them in developing a Directed Energy field test capability (Laser and RF) that would make the lead test Range to support Directed Energy field testing. The synergy between SLAD's Anechoic Chamber RFDE program and White Sands DE field test capability is the foundation on which this program is being built.

The third critical IO initiative SLAD supports at WSMR is in IO Modeling and Simulation. SLAD is considered an expert in identifying and mitigating both Electronic Warfare and Information Warfare Vulnerabilities on US Military systems. Because of this, TRAC-WSMR has asked SLAD to develop its next generation communications model for their next generation of force-on-force model, Combat XXI. TRAC-WSMR is the Army organization charted with developing force-on-force models for the Army to support the Army's Analysis of Alternatives (AOA) program. Their current force-on-force model is knows as CASTFOREM. CASTFOREM was developed over several decades ago and does not have the fidelity in the Network/Communication flow; hence, it also does not have the capability to represent realistic Electronic Warfare and Information Warfare threats. TRAC-WSMR requested SLAD develop the Network/Communications module, to include realistic EW and IW threats, for their next generation force-on-force model, Combat XXI. SLAD and TRAC-WSMR have been collaborating on this effort for the past two years.

The final DoD recommendations regarding the Army Research Laboratory activities currently located at White Sands Missile Range were described on page Tech-22 of Department of Defense Base Closure and Realignment Report, Volume I Part 2 of 2: Detailed Recommendations dated May 2005. This recommendation appears to have been developed in the file C TECH0009Rv2 Final Recommendation 05092005.pdf. The TECH-0009Rv2 scenario is derived, at least in part, from earlier versions of Scenario TECH-0009.

As of 6/16/05, the COBRA input file for the TECH-0009Rv2 scenario had not been posted on the BRAC websites, nor had COBRA input files associated with earlier versions of the scenario. However, some spreadsheets associated with the cost analysis had been posted.

At the present time, there is insufficient information to reproduce the COBRA analysis that was done by DoD. One potential serious underestimation has to do with moving costs. In Scenario TECH-0009B, it was estimated that:

"One-time moving cost is $6.03 M for relocating all equipment from White Sands to Aberdeen in Yr 2009. $3.73 M is for moving SLAD equipments. $2.3 M is for moving BE equipments. Because of equipment type (lab equipment etc.), COBRA would significantly underestimate the cost of moving if calculated by weight. Therefore, weight data is not provided. Instead, a one time relocation cost is used and is located on screen 5."

It seems hard to believe that BE equipment can be relocated for $2.3M, and that SLAD equipment can be relocated for $3.73M. It is also interesting that even in Scenario TECH-0009B, the destination for the equipment was Aberdeen, although the destination for the personnel was Adelphi.

Another interesting point is that it appears that early on in the analysis process, the preferred destination for ARL BE and SLAD as Adelphi. It appears that one reason for choosing Aberdeen in the end was that construction costs at Adelphi are over 50% higher at Adelphi.

In file TECH-0009B Completed Army v 5.1.xls, the Army indicated that under this scenario, 26,000 square feet of space would be required for SLAD. Army went with a price per $193 per square foot while acknowledging that the cost at Adelphi is $300 per square foot. This suggests that the Aberdeen destination was selected not because it is what the Army wants to do, but rather because of cost.

Ultimately, with the lack of data available for analysis, as a community response we can only make a few assumptions. Those assumptions include:

A true estimation of the cost of relocating equipment from WSMR to Aberdeen was not truly taken into consideration. The type of sophisticated facilities do not lend them to a simple relocation estimate and doesn't take into consideration they type of work done at these facilities. The unique environment in place at WSMR is not available at Aberdeen, so there is a distinct possibility that these facilities could not be replicated in Maryland.

By simply looking at cost, the original thought to relocate to Adelphi, MD was not pursued. There doesn't' seem to have been any a thought process on how this realignment would be in the best interest for any military value except for a simple cost analysis between Adelphi and Aberdeen, MD. This is assumed since there is now cost analysis between leaving the operation at WSMR vs moving to APG.

WSMR-ARL COMMUNITY RESPONSE

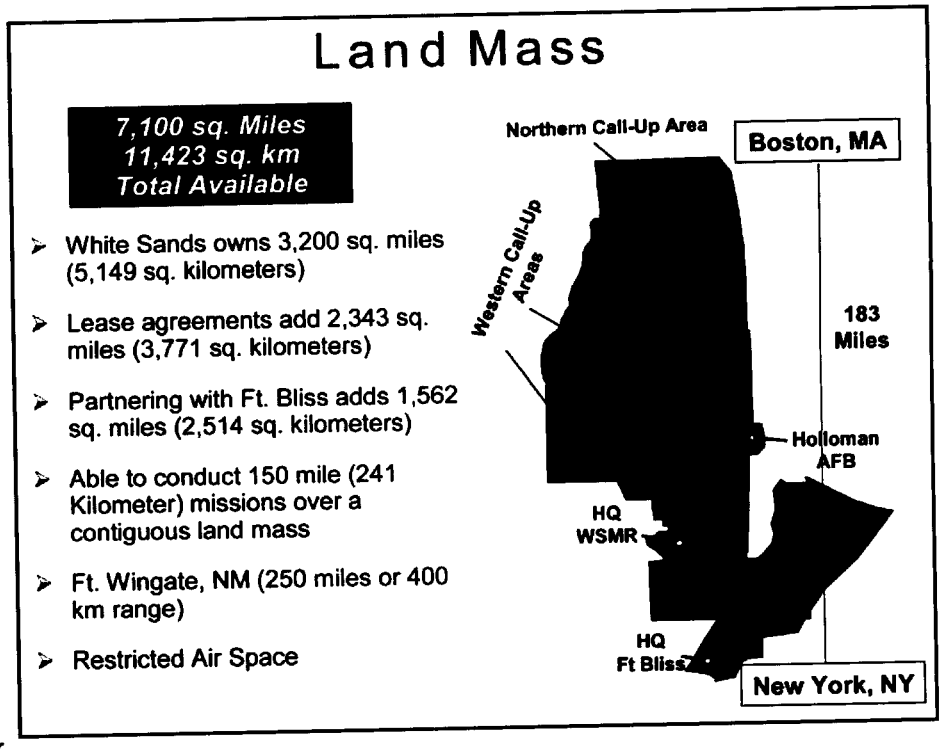
COMMUNITY RESPONSE: ENVIRONMENTAL ASSESSMENT WSMR vs. MD V.c.

During WW II, a two brigade-sized infantry formation typically could engage over only a 2 km² area. Today a single Stryker Brigade Combat Team can cover a 50 km² area and the Army's Future Combat Systems (FCS) will cover a still greater area with increasingly demanding Intelligence Surveillance Reconnaissance (ISR) requirements. Access to large and unpopulated land/air space is critical for the testing of military systems under scenarios replicating the conditions under which they will be deployed.

WSMR enjoys 11,423 square kilometers of unencumbered and unencroached-upon real estate with which to conduct free range test, evaluation and training activities. This is 39 times larger than Aberdeen Proving Ground which, at 293 square kilometers **is not** a feasible location for the testing of long-range precision guided weapons, microwave and directed-energy weapons, hypersonic aircraft, and unmanned systems such as UAVs – systems for which the ARL has had a pivotal role in their development. A principal motivation for making WSMR a focal point for Air and Missile defense testing, Joint Interoperability Testing, distributed testing, system of systems testing, and other activities characteristic of the network-centric dimension of future war, is the availability of a large land/air space at WSMR that is free from urbanization. WSMR's substantial range space and freedom from landspace, airspace, radio frequency spectrum (e.g. cellular phone or television transmitters) encroachment guarantees that WSMR's core competencies will not migrate elsewhere – ARL personnel will simply have to come to WSMR if they wish to continue their legacy of research and development excellence. What may be more compelling than the obvious increased program cost of sending personnel and equipment to WSMR is the loss of the ability to integrate in real time with Future Combat Systems and other test programs. These users may elect to fund a separate capability to furnish what was once provided by ARL thereby attenuating ARL's reimbursable base.

Among the physical characteristics critical to test missions that ARL will lose is the on-site access to:

- Land (largest overland open air Range in CONUS), Air (DoD controlled Restricted Airspace), Topography (high desert terrain, mountainous boundaries), Climate (tem perate conditions modeling world's weather), Freedom From Encroachment (restricted area with controlled access, frequency management)



- Cox Range Control Center (CRCC): State-of-the-art facility for Range management, operations control/display, real-time data processing, data control, airspace management, flight safety, air and ground target presentation/control (10 air, 25 ground)

- Mission Support Capabilities:
    1. Only DoD facility that routinely conducts Multiple Simultaneous Engagements
    2. Multiple instrumentation and stimulation suites with Live, Virtual and Constructive capabilities to stress system of system and Joint Interoperability performance of DoD's weapon systems
    3. This unique instrumentation and land/airspace is key to successful execution of exercises like Roving Sands.

- Uniquely instrumented land/air test and training range (e.g., high altitude terrain emulates other parts of the world).

- Open range RF and GPS jamming as well as electronic warfare test range.

- Over 3000 surveyed instrumentation sites, 1100 miles of internal fiber optic network and extensive external connectivity for data acquisition and distribution. Instrumentation capabilities include the entire gamut of systems-level instrumentation (thermo-couples, accelerometers, discrete, telemetry, etc.) as well as external ground truth by external standards.

- WSMR is a primary developer of advanced instrumentation technologies used throughout the DoD and funded by CTIEP.

- Fixed and mobile radar: provides 100% coverage of the flight systems both on- and off-range for flight safety, *TSPI*, training kill adjudication and management of the airspace for all services. Unique capabilities include tracking multiple objects as long ranges necessary for sub-munitions and aircraft performance measures.

- Fixed and mobile telemetry: provides data acquisition for performance measures of ground and aerial systems and systems of systems both static and moving. Large and strategically placed systems provide long range coverage critical to test.

- Fixed and mobile optics: provide TSPI data as well as event documentation and signature measurements across the visible and IR bands for validating system performance and lethality. Unique capabilities include digital high speed imagery, high tracking rates and long focal length optics.

- Data network distribution and control critical for acquiring the data from systems under test, injecting simulation wrap-arounds and stimuli and the ability to manage and evaluate test and training events in real time.

- Present actual, simulated and representative aerial, ground vehicle, ballistic missile, urban, dispersion, tunnel, deeply buried and hardened targets to systems and systems of systems under test and during training. Required for performance and capability measurements including detection, acquisition and lethality, as well as C4ISR testing and training of components, systems and systems of systems. Capabilities include precision formation control of moving targets, characterization of

signatures and measures of lethality in various terrains and backgrounds. Critical safety buffers and secure areas are free from all elements of encroachment.

- Drone Formation Control Facility: provides simulation and control of ground and aerial target formations during live fire tests, training and distributed events.

- Warhead Impact Areas: cleared ground and emulated urban areas for inert and live fire testing of warheads and sub-munitions including dispersion patterns, penetration, dud rates and mine self destruction.

- Full gamut of climatic, dynamic, electromagnetic, nuclear and laser suitability, survivability and vulnerability testing. Facilities are critical to systems and systems of systems performance characterization, safety validation and survivability measurements core to the RDT&E mission. Co-location with live fire elements critical to safety and systematic variable control. Remote location free of all elements of encroachment for hazardous testing and high precision measurements in a broad band RF quiet environment. Each of these facilities are core to multi-service, multi-agency (MDA,NASA,DOT) and joint use and have received CTIEP funding for some elements

In conclusion, a proposed realignment to Aberdeen Proving Grounds will provide ARL with reduced capabilities and constrained operations. The future of the DoD and particularly the Army research is in longer standoff weapons, unmanned systems and directed energy (including electronic warfare). Each of these objectives and technologies require a general lack of encroachment in all areas including population and radio frequency, as well as land and airspace. Currently, the east coast is experiencing an overall crippling amount of encroachment, whereas the west is generally enjoying a lack of encroachment. With consolidation in the east, this issue is only going to get worse and is likely to drive the cost of business for the DoD higher and result in constraints in operations. ARL will be forced to increase travel to western ranges or facilities in order to accomplish developments, test and participate in training activities – an increase in the cost of doing business. ARL will loose the ability to integrate into ongoing test and training events of the FCS or be required to send personnel on more travel with the result being both constrained operations and higher cost in times when resources are few. This is wrong for the DoD and wrong for the taxpayer. Indeed, the move of the ARL capabilities to the east is not beneficial to the transformation of the Army or DoD.

Introduction

Under the direction of Secretary of Defense Donald Rumsfeld, the Department of Defense decides how to properly realign the military and its resources to cut its costs. The recent Department of Defense recommendations indicated that the Army Research Laboratory (ARL) at White Sands Missile Range (WSMR), New Mexico has been slated for realignment by the Defense Base Closure and Realignment Commission (BRAC). ARL is to relocate to Aberdeen Proving Ground, Maryland. Out of the six branches of ARL, three are to be realigned to Aberdeen by BRAC 2005, while Aberdeen, one of the current branches, will gain 5,661 civilian and 451 military members (not all for ARL). Headquarters of the ARL will be realigned from Adelphi Laboratory Center, Maryland to Aberdeen Proving Ground, as will the Army Research Offices in North Carolina. The Adelphi Laboratory Center will be moving 43 civilians, while the North Carolina offices will move 1 military member and 113 civilians.[i] The move for ARL at WSMR will result in the relocation of 13 military members and 165 civilians.[ii] This report will focus on the economic advantages of realigning ARL branches to WSMR instead of Aberdeen Proving Grounds.

Labor Costs Military Members

Military members receive a set pay based upon years in service and rank. When serving in areas of the world with higher cost of living or housing, military members are awarded a Cost of Living Allowance (COLA) and/or Basic Allowance for Housing (BAH). According to the Department of Defense, military members stationed at Aberdeen Proving Grounds do not receive COLA for fiscal year 2005, and neither do members at WSMR. They do, however receive a BAH. Table 1: Basic Allowance for Housing below shows the difference in housing allowance for the two areas. Should all military members relocate from WSMR to Aberdeen Proving Grounds, there could be up to $301 increase in each member's pay, possibly resulting in $3,913 more paid in salaries to military members each month for military members from WSMR alone. Although ARL employs few military members, the cost adds up to $46,956 by a year's end.

Table 1: Basic Allowance for Housing[iii,iv]

Location:	Aberdeen Proving Grounds, MD	White Sands Missile Range, NM
Sample Rank:	O-1 : Second Lieutenant	O-1 : Second Lieutenant
	Monthly Basic Allowance for Housing as of 2005:	
With Dependants	$1,081.00	$930.00
Without Dependants	$946.00	$644.00
	Awarded to lowest pay-grade (E-1) without dependants in 2000:	
	$453.00	$342.00
	Awarded to highest pay-grade (O-7) with dependants in 2000:	
	$1,222.00	$921.00

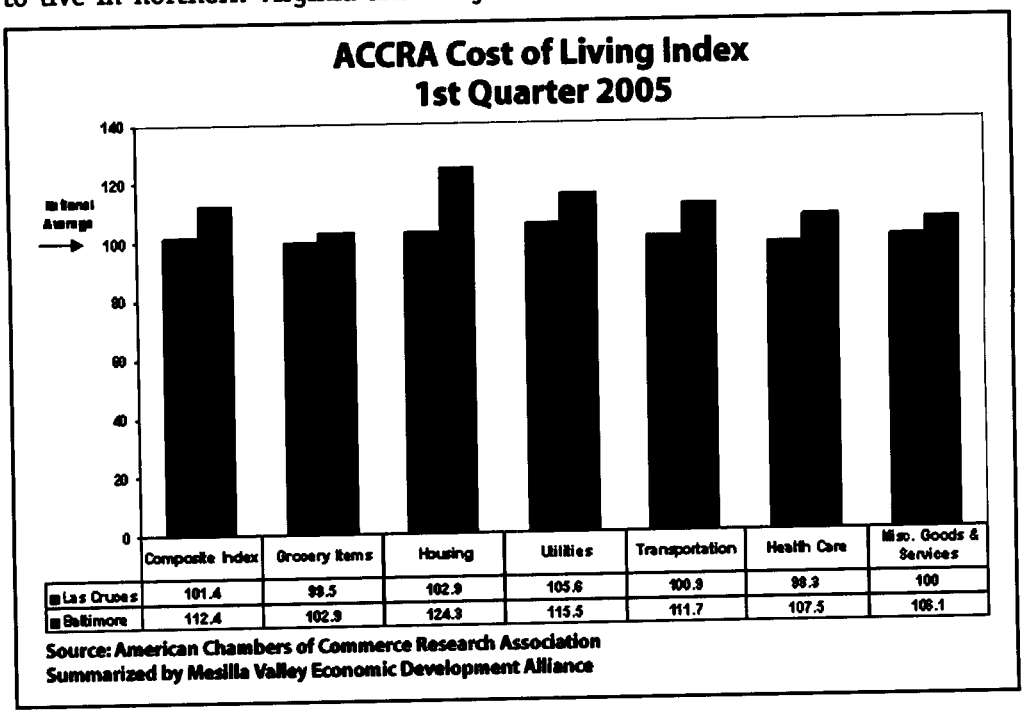
Civilian Members

Should the 165 civilian positions currently at WSMR be relocated to Aberdeen, many will not make the move, and the military will be forced to hire civilians expecting the higher salary typical of Maryland. Those who do, however, will also demand higher pay due to the cost of living changes. Homefair.com estimates that those earning $100,000 in Las Cruces should ask $135,980 in Aberdeen. This means a 36 percent increase in pay for all relocated.

Table 2: Cost of Living Differences

Cost of Living differences	Aberdeen, MD	Las Cruces, NM
State corporate income tax	7.0%[vi]	4.8 – 7.6%[vii]
State & local personal income tax (max.)	4.75%[viii] / 3.06%[ix]	6.0%[x] / 6.9%[xi]
Sales/Gross Receipts Tax	5.00%[xii]	7.00%[xiii]
Property Tax	0.55%[xiv]	0.02%[xv]
Home Insurance (avg. premium)[xvi]	$389	$450
Car Insurance ratesx[vii]	$828.22	$828.33
Car Registration Fees	$128.00[xviii]	$120.00[xix]
Average electricity bill[xx]	$83.34	$51.26
Gallon of gas	$2.12[xxi]	$2.22[xxii]
Average annual wage (2002)	$39,382[xxiii]	$28,700[xxiv]
Median Base Pay for Aerospace Engineer I[xxv]	$51,526	$43,965
Avg. Rent / Mortgage (2000)	$551 / $1,076[xxvi]	$470 / $825[xxvii]

In conclusion, labor is the dominant cost of all service organizations such as ARL. Assuming the grade structure would remain equivalent in the re-alignment, the cost of conducting ARL business will increase by virtue of the simple fact that the federal locality pay for the east coast is higher than that of New Mexico. Indeed, given the higher civilian and contractor labor in the east as well as the higher cost of operations (tax, rent, utilities), it would seem the DoD could save more if it were to do the opposite of what is proposed and to consolidate to the west. An examination of a number of economic factors indicates that it would cost about 35% more to live in northern Virginia and Maryland area than in Las Cruces and houses prices are at a higher percentage. It can be seen that civilian labor, contract labor, and facilities operations are all at a higher cost in the Aberdeen, Maryland area when compared the Southern New Mexico area.



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19 DP-4. Profile of Selected Housing Characteristics: 2000
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data **U.S. Census Bureau, Census 2000 Summary File 3, Matrices H1, H7, H20, H23, H24, H30, H34, H38, H40, H43, H44, H48, H51, H62, H63, H69, H74, H76, H90, H91, and H94**
[xxix] DP-4. Profile of Selected Housing Characteristics: 2000
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data **U.S. Census Bureau, Census 2000 Summary File 3, Matrices H1, H7, H20, H23, H24, H30, H34, H38, H40, H43, H44, H48, H51, H62, H63, H69, H74, H76, H90, H91, and H94**

COMMUNITY RESPONSE: MILITARY VALUE – WSMR SYNERGY

V.e.

Military value of organizations like ARL at installations like WSMR can not be effectively measured by the BRAC criteria. The criteria are clearly designed to evaluate the military value of war fighter, training, logistics and other operational installations. The criteria are not at all relevant to scientific and engineering work at Research, Development, Test and Evaluation (RDT&E) installations. Nor do they contain any provisions for assessing the real implications of moving RDT&E organizations from one location to another. The criteria can not measure RDT&E technical value as it does military operational value since they are clearly not designed to do so. Instead application of the BRAC criteria to RDT&E activities result in an evaluation that doesn't have a clear picture of the true synergy in place at WSMR. Such an effort is not focused on technical contributions to the nation's defense, which are the real measures of effectiveness of any RDT&E organization. Thus, decision makers must include this qualitative value to the quantitative analysis in order to make a truly informed assessment. In particular the BRAC criteria do not address the effectiveness and value issues related to technical environment and synergism, which acts as a kind of force multiplier within the RDT&E process. These do not lend themselves to pure cost analysis, but form the foundation of any effective RDT&E organization.

The history of ARL at WSMR is one of many powerful contributions to the DOD. These were, in large measure, made possible by the unique and highly synergistic technical environment afforded ARL at WSMR. The WSMR technical environment is comprised of both world class facilities and the capabilities resident therein as well as one of the most diverse and highly skilled team of engineers and scientist on the planet. Facilities and capabilities include one of a kind test beds, specialized ARL, TRAC, NASA and other tenant technical facilities, extensive laboratories, powerful range instrumentation, unique modeling and simulation capabilities, high performance and real time computational systems and of course the most advanced weapon systems in the U.S. inventory. The engineers and scientist at WSMR include every conceivable discipline and represent many government organizations, major defense contractors, specialist contractors, and universities. The combination of facilities, capabilities and a technically diverse and highly skilled workforce produces a synergistic environment that is not found anywhere else in the world. ARL is both a key element of the WSMR technical environment and a recipient of its synergism as demonstrated by its many important, even critical, technical contributions to the DOD. A few examples of how ARL has uniquely benefited from its participation within the WSMR technical environment are found in the following paragraphs.

PATRIOT Air Defense System Analysis & Fix

During the 1st Gulf War (circa a '90/'91), a problem arose whereby PATRIOT Air Defense systems were launching multiple missiles at spurious tactical ballistic missiles (TBMs). The problem was a combination of factors, which included the possibility of Blue Air friendly jamming injecting signals though the backlobe of the PATRIOT radar, which would then manifest itself as a TBM on the radar screen. When the radar is in automatic engagement mode rather than manual engagement mode, which was required due to the very short reaction times to engage a TBM, it was thought that friendly jamming received thought the PATRIOT radar backlobe at airbases in the Iraqi theater could be causing this situation. SLAD, with its inventory of ECM devices and expertise in electronic warfare, was able to recreate the phenomenon at WSMR, which led to both a short term software fix and longer term backlobe shroud hardware fix which would attenuate unintentional signal phenomenon through the backlobe thus significantly mitigating the possibility of wasting missile resources engaging spurious TMB targets while in an automatic engagement mode of operation.

WSMR is, and is expected to continue being PATRIOT's, now Lower Tier Project Office's, electronic warfare SME. The physical presence of WSMR has facilitated this 40-year relationship with the Air Defense community. The fixes were verified with search/track tests at WSMR; a launch was not specifically required; however, the PATRIOT radar backlobe shroud is now a standard piece of the PATRIOT Air Defense system and has been since the early 90'swhen this problem first surfaced.

Redeye / Stinger Countermeasures

The Electro-Optical Countermeasure Missile Flight Simulation Facility (EOCMMFSF) was developed in the early 1970's, at the dawn of MANPADS (MAN-Portable Air Defense Systems). These are relatively small, shoulder launched, single-man operated missiles that track the infrared (IR) emissions of a targeted aircraft. The Redeye missile was the first US MANPADS missile and the first missile that the EOCMMFSF simulated. These MANPADS provide the military protection against low flying enemy aircraft – helicopters, propeller driven aircraft, and jet aircraft. Today, these missiles are in the hands of terrorists and potential targets can be commercial aircraft in the US homeland! Both the Department of Defense and the Department of Homeland Security are extremely interested in defenses against MANPADS.

At the dawn of the MANPADS, in the age of Redeye, most felt that conical-scan infrared guided missiles could not be jammed. Simulations in the EOCMMFSF showed this not to be the case – a method was found. The ultimate proof was a series of live missile firings, here at WSMR, with an experimental jammer titled Hot Brick that demonstrated what the simulations showed: conical-scan infrared missiles could be jammed!

The follow-on to the Redeye missile is the Stinger-BASIC missile. This in turn was followed, with further development, with the Stinger-POST, Stinger-RMP, and Stinger-Block 1. All of these follow-ons principally occurred for advanced counter-countermeasure techniques. During this time, other foreign nations have also designed and built MANPADS, which resulted in the US expending considerable efforts designing and building countermeasures for these missiles. The EOCMMFSF has HWIL simulations for many of these systems (foreign and US) and has played a key role in evaluating many of these countermeasures.

In the mid 1990's, the simulations at the EOCMMFSF showed that for a special countermeasure technique, the missile would perform in a totally unexpected behavior-a behavior that would go beyond the measured region for one of the models. In fact, after a peer review stated that the manifestation was highly unlikely, the EOCMMFSF invited the peers, other MANPADS experts, to visit the facility and show where the simulation was in error. Such a review did take place and all systems and subsystems were rechecked and found to be in VV&A compliance. So, being located on a missile range, the EOCMMFSF devised a set of live missile firings that would either demonstrate the unexpected missile behavior or show that the simulation was indeed faulty. The firings were conducted and the missile did perform as predicted by the simulation and thus beyond the valid region of one of the models. EOCMMFSF then analyzed the telemetered missile signals from the flying missiles and the date from WSMR and devised a new model to incorporate this region of unexpected behavior. This new model is now the standard model for this particular MANPADS. Currently, the EOCMMFSF is working on a relatively low cost countermeasure technique that perhaps could afford protection of any aircraft against MANPADS. To date, this very novel technique has been demonstrated in the laboratory and in a series of outdoor experiments on WSMR. For reasons that are too sensitive to explain here, the continued testing and development of this technique will require further testing on WSMR because of

the unique environment offered by WSMR. The Department of Defense is very interested in the results of these experiments and the possibilities that this technique could provide. This technique would perhaps be even more applicable to the Department of Homeland Security during our current War on Terrorism.

Ground Penetrating Radar System

SLAD was asked by the Rapid Equipping Force (REF) commander in Iraq to help them test and procure a ground penetrating radar system. The REF as well as our other units in Iraq are in dire need of a tool to help them detect subsurface disturbances in the ground such as graves, tunnels, and weapons caches. SLAD is now in the process of surveying appropriate sites not only within WSMR but in our adjacent sister range McGregor, to find the best scenario to conduct the GPR experiments.

SLAD has identified those companies that possess working systems, which will be good candidates for the pre-selection demonstration. SLAD also conducted preliminary soil comparisons between some of the likely sites and theater. Based on extensive radar field test experience, SLAD is designing a test plan that will meet the REF's need not only technically but operationally as well. One of the members of the team (Dr. Debrous) has had extensive experience with GPR specifically. Due to the longstanding relations with WSMR and McGregor, SLAD can execute experiments in a very short period of time and thus produce a fast turn around for the units in theater. WSMR is crucial due to several factors:

- GPR is highly dependent on the soil conditions (i.e. moisture, composition, compactness) for the depth of penetration. What works in one environment will not work in a climatologically different one.
- The toughest environmental challenges facing an operational system in Iraq are the intense summer hear and the blowing sand.
- WSMR and Iraq have very similar environmental and soil conditions due to the intense summer heat, the strong winds, blowing sand, and lack of moisture (affecting ground activity).
- Checking and testing the GPR systems will involve radiating into the environment at frequencies and power levels that may affect US civilian systems. Due to WSMR's isolation, it is not a problem to conduct those exercises as opposed to another base that is co-located in an urban environment.
- GPR systems can be mounted on ground as well as airborne platforms. Radiating airborne platform exercises are routine at WSMR, all the assets (real estate, tracking, telemetry, air support, etc.) are in place to conduct such experiments.

SLAD is recognized as the preeminent organization within the Army with the capability to conduct Information Operations Network Vulnerability Assessments on military tactical systems in support of Test and Evaluation requirements. This is evident in the recent decision by the Army's Chief Information Officer G6 (DA CIO/G6) as well as PM UA (Future Combat Systems) to select ARL/SLAD as the Technical Lead Management Office (TLMO) for conducting System of Systems (SoS) network vulnerability assessments for the Army's Future Combat Systems. As the TLMO, SLAD is responsible for executing technical and management responsibilities across multiple organizations to ensure that US military technical architectures are not vulnerable to Information Warfare attacks. SLAD was selected as the FCS network vulnerability assessment TLMO based upon our history and expertise in conducting Vulnerability Assessment Test and Evaluation support on current military tactical networks to include assessing network architectures supporting our troops prior to their deployments in support of Operation Iraqi Freedom and Operation Enduring Freedom. The majority of Information Operations Network Vulnerability Assessments conducted by SLAD have been conducted at SLAD's Information Operations (IO) Laboratory at White Sands and at the Army's Central

Technical Support Facility (CTSF) at Ft. Hood, TX. The CTSF is the Army's official interoperability and Certification Facility. Until May 2005, the CTSF was controlled by the Army's Program Executive Office Command, Control and Communication Tactical (PEO C3T). The CTSF is the Army's official facility where all the Army Battle Command Systems go to conduct interoperability and certification testing In 2001, SLAD agreed to provide information assurance expertise and Vulnerability assessment testing at the CTSF. At that time, SLAD and the CTSF institutionalized Information Assurance Vulnerability Assessment testing as part of the Army's interoperability and certification process. For the first time, these allowed for the conduct of IA Vulnerability Assessment Testing on System of Systems/complete tactical architectures as they are being deployed in support of our troops. Prior to that, Vulnerability Assessment Testing was mainly being conducted on single individual systems, both there was no process of facility focused on conducting SoS vulnerability Assessments for full tactical architectures, only individual or limited systems within an architecture. SLAD currently maintains a full time staff of 4 individuals at the CTSF to support the day-to-day IA requirements at the CTSF. The IA Manager for CTSF is a SLAD employee. The SLAD IA manager at CTSF facilitates the coordination between CTSF and SLAD IA personnel aw White Sands Missile Range. SLAD conducts the majority of our IA vulnerability assessment testing at the SLADL Information Operations laboratory at White Sands (for subsets of Army Tactical Architectures) and at the CTSF, Ft. Hood (for subsets of Army Tactical Architectures). The proximity of White Sands to CTSF (short one hour flight) facilitates the SLAD White Sands IA Staff support to critical Army Vulnerability Assessment testing at CTSF whether on a planned or emergency basis.

As the selected FCS Network Vulnerability Assessment TLMO, SLAD has the lead within the Army for conducting the IA vulnerability assessment testing for the Army's Future Force, which is focused on the Army's largest and most critical program, Future combat Systems (FCS). SLAD has been working with the Army's CIO G6 to develop a strategy/methodology on how to accomplish this enormous technical effort. The current strategy for conducting IA Vulnerability Assessment Testing for FCS revolves around two critical technical initiatives. The first is to conduct experimental IA Vulnerability Assessment Testing for Joint Interoperability and FCS at the CTSF, Ft. Hood, TX. In May 2005 the CTSF transitioned fro technical control under the Army's PEO C3T to technical control under the Army CIO G6. The basic rationale behind this was that the Army's tactical systems have been integrated to encompass more than the Army Battle Command Systems (ABCS) controlled by PEO C3T, but also include all the other platforms/systems controlled by other Army PEO's. The CIO G6 transition plan for the CTSF has a three-phased process. The first phase calls for completing the interoperability, certification and vulnerability testing on the Army's current ABCS architecture supporting our troops redeploying back into the theatre in support of OIF. SLAD has technical lead for conduction the IA Vulnerability assessment testing under this phase. The second phase places a larger focus on support of the Modular Army and interoperability, certification and vulnerability testing for the modularized Army based on the Joint Network Node *JNN) network architecture. This is the initial step in assessing "Joint" network architecture requirements across the services. Again, SLAD has the technical lead in supporting the IA Vulnerability testing for the JNN equipped modular force. The third and most critical phase of this transition plan is focused on conducting interoperability, certification and vulnerability testing for FCS to include Joint Service requirements. Once again, SLAD has technical lead for conducting the IA vulnerability testing for the FCS network architecture to include Joint Service IA Vulnerability testing requirements. In support of CIO G6 phase 2 and phase 3 implementation plan for CTSF, SLAD is currently coordinating with CTSF and G6 to network the SLAD IO Laboratory at WSMR to the CTSF. This is going to allow SLAD more flexibility in supporting CTSF Vulnerability Assessment testing by allowing vulnerability assessment testing via the WSMR

IO Laboratory when practical/possible as well as continued on site Vulnerability Assessment Testing at CTSF when necessary.

The second critical phase of the FCS vulnerability assessment testing strategy/methodology being coordinated between G6 and SLAD addresses the testing for FCS is schedule to occur at White Sands Missile Range in 2008. White Sands Missile Range is the official test range of choice for testing FCS due to its uniqueness in the amount of land available to test and more importantly their owning of their air space. FCS network field testing is going to require the ability for FCS to test mobile ad hoc networks (MNNET) which are going to require that they communicate on the move with various platforms, both manned and unmanned (to include a multitude of sensors). Much of this communication will occur over wireless networks. The ability to coordinate, execute ad control this environment is unique to White Sands Missile Range and is critical to effectively test such a complex architecture in the field. A critical aspect to conducting vulnerability assessment testing for the FCS network architecture includes conducting both "wired" and "wireless" network IW attacks. The uniqueness of White Sands Missile Range and the ability to acquire the necessary electromagnetic spectrum frequency clearances will allow SLAD to conduct wireless exploit vulnerability testing at White Sands Missile Range. SLAD and White Sands/ATEC personnel are currently executing a plan to connect SLAD's IO laboratory with WSMR's Integrated Range Control Center (IRCC) as well as their internal test network in order to facilitate IA vulnerability test requirements for FCS starting in 2008. Combining SLAD's IA test capability with WSMR Range test capability is going to have tremendous benefits in WSMR attracting more FCS customer tests. The basic concept for FCS is that the network is going to be the most critical aspect of the Future Force fighting concept. The network linkage between SLAD's IO laboratory and WSMR IRDD/test networks as well as SLAD's IO laboratory network connectivity to the CTSF, is going to greatly expand WSMR's ability to attract and support future FCS network field testing initiatives.

White Sands Missile Range is the lead ATEC range responsible for networking various test ranges in support of large Army and Joint Tests and Exercises. These Tests/Exercises will be executed using a combination of live/actual systems as well as simulation/stimulation providing other necessary data. WSMR is currently connected to other test ranges such as Ft. Bliss, Ft. Huachuca, Ft. Hood (proper, not CTSF). Dialogue between WSMR staff and SLAD IA staff is on going in attempt to also bring SLAD IO Laboratory connectivity online to support these efforts. WSMR/ATEC staffs are particularly excited about the potential to gain access to the CTSF through the SLAD IO laboratory, as they understand the tremendous additional capability that would allow WSMR to leverage to support FCS and other test exercises.

Another strategic collaboration supporting SLADL LIA test and evaluation program is SLAD's collaboration with NM Tech in Socorro, NM. NM Tech is a certified as an Academic IA Center of excellence by the National Security Agency (NSA). NM Tech is the only University in NM and one of only a handful of Universities in the entire Southwest United States with this IA certification by the NSA. As a certified IA academic center of excellence, NM Tech is allowed to participate in a federal scholarship program knows as Scholarship For Service (SFS). The SFS program allows NM Tech to offer scholarships to their students through their Computer Science department with an emphasis in IA for those students who wish to study for a career in Information Assurance ((IA). As part of this program, these scholarship students are provided a stipend to attend college, are given opportunities for internships with government agencies as well as full time employment with a federal government agency upon graduation. SLAD has recently hired three full time employees who have graduated from NM Tech with a degree in Computer Science/Information Assurance and also has hired five

summer from NM Tech who are pare of the SFS program with the intent to hire them as full time staff upon their graduation. Many of these students that take advantage of this SFS program are the best and the brightest from New Mexico high schools. Prior to the NM Tech and SLAD strategic collaboration in IA, many of these students had little to no opportunity to stay within the state of NM if they wished to pursue their career in Information Assurance and many had to accept employment with agencies out of state such as the NSA. The strategic partnership between SLAD and NM Tech allows many of these students the ability to stay in the state of New Mexico in order to pursue their career goals. Additionally, SLADL has recently executed a contract with NM Tech in order to leverage and utilize the vast IA expertise of the Professors and Graduate students within the NM Tech Computer Science department. The NM Tech Computer Science Professors were responsible for developing the IA curriculum within that department as well as meeting all the criteria required by NSA in order to be certified as an IA Center of Excellence. The contract between SLAD and NM Tech will allow SLAD to take advantage of the expertise within the NM Tech Computer Science department as well as allow NM Tech to gain national visibility and highlight the strength of their Computer Science department.

The preceding paragraphs illustrate but a few of the many important technical contributions made possible by ARL's work within the unique WSMR technical environment. They also illustrate how large and complex scientific and engineering problems can be quickly addressed and resolved through the synergistic effects of the large body of diverse technical expertise available only at WSMR. The private sector would never move its engineers and scientist out of this type of environment and into one that would restrict their ability to deal with real world issues. Moving ARL scientist and engineers out of this force multiplying environment and into a distant office makes no sense either. If the recommendation were allowed to proceed, the negative implications to the future testing and evaluation process would be immeasurable.

WSMR-ARL COMMUNITY RESPONSE

RECOMMENDATION FOR EXPANSION OF WSMR – ARL

VI.

As a Community Group, we would be remiss if we didn't include a section that called for the overall expansion of the work that WSMR-ARL does in Southern New Mexico. In evaluating the initial BRAC recommendations, the criteria seemed to signal that the years of developing WSMR into the renowned tri-service base would result in expansion within the facility. It would have seemed that the Department of Defense would have used this opportunity to posture itself for the next 10-20 years where it is envisioned the service will have longer stand off weapons, directed energy weapons such as high power microwave and high energy lasers, hypersonic aircraft and weapons, and unmanned systems. All of these capabilities, seen as transformational, require larger land and airspace, as well as generally unpopulated areas for research, development, testing and training. Given this, it would seem logical to predict that there would be a shift in resources away from the congested eastern U.S. and toward the vast and open spaces of the western U.S.

WSMR was initiated as a joint test range and is the only and the largest one with all services represented and with the ability for joint operations and efficiencies through share resources. Many missions and weapons systems of the Air Force, Army and Navy come to WSMR for long-range test and training with the short range test and training being done at service specific locations such as Edwards, China Lake or Yuma. Many efficiencies and lower costs could be realized by consolidating tri-service RDT&E at WSMR yet this is not reflected in the BRAC guidance. Indeed, WSMR has the capacity to absorb the full missions of many other test and training ranges within the Department of Defense.

WSMR has already been identified as one of the preeminent locations for the testing of the Future Combat Systems. The encroachment free test areas, state of the art facilities and existing knowledge base is certainly open for expansion. The history of rapid responses to critical field problems continues to prove the military value of having the ARL-WSMR personnel located on the consummate test range. Its coordinated work with Holloman Air Force Base will continue to be important as the J-UCAS Unmanned System is tested and evaluated in Southern New Mexico. With the slated expansion of Army personnel at the adjacent Fort Bliss, Texas facility, the opportunities for our future military personnel to train on these future systems will continue to expand. Taking all of these into consideration, it would have seemed to be in the best interest of the Department of Defense to expand the presence of ARL at WSMR.

This can still be the case. A reconsideration of the published recommendation could include viewing WSMR, Ft. Bliss, Holloman Air Force Base, Kirkland Air Force Base, and Cannon Air Force Base as a huge joint national asset with synergism, linked together by the existing Inter Range Command Center (IRCC) and airspace control, and ready to take on all present and future overland missile testing, test and training exercises, UAV test and training, hypersonic test and training, and the land and airspace for standoff weapons, lasers, EO, EW, and IW test and training now and on into the future.

CONCLUSION VII.

There are many compelling reasons that the proposed realignment of the WSMR-ARL organization and subsequent move to APG is not in the best interest of the Department of Defense. These reasons include some elements that can be quantified like cost and others that can not such as technical and scientific effectiveness and innovation. The principal reasons are summarized point by point in the brief paragraphs that follow.

Flawed BRAC Evaluation

Military value of highly scientific and deeply technical organizations like ARL at installations like WSMR can not be effectively measured by application of the BRAC criteria which are oriented towards traditional military roles. The criteria are clearly designed to evaluate the military value of war fighter, training, logistics and other operational installations. The criteria are not at all relevant to scientific and engineering work at Research, Development, Test and Evaluation (RDT&E) installations. Thus any conclusions reached from evaluations based on the BRAC criteria are not likely to be useful in assessing the value of organizations like ARL-WSMR. This fact was recognized early on by several members of congress who requested, without success, that the Department of Defense add additional criteria for RDT&E organizations. As a community group, we can only assume that the Department of Defense's decision to move ARL spaces and functions from WSMR to Aberdeen was based on a flawed cost evaluation which produced a conclusion that doesn't take into account the unique joint value that having ARL at WSMR brings to our nations security.

Test and Evaluation Mission Support

About half of the ARL-WSMR work load is direct support of the Army's Test and Evaluation mission. Most of this support is at WSMR. In fact 98% of ARL-WSMR's Survivability/Lethality Analysis Directorate's Electronic Warfare/Information Warfare capability directly supports the Army's Test and Evaluation functions. It makes no logical sense to move ARL-WSMR Test and Evaluation people from the location in which they do most of their work to a sterile office environment in Aberdeen. Such a move is not in the best interest of the Department of Defense and will likely increase both the time and cost for weapons systems development since it takes ARL-WSMR people out a location where actual development and T&E work is done and locates them in an office far away from where the real work is accomplished.

One of a kind synergistic technical environment

The history of ARL at WSMR is one of many powerful, scientifically complex and deeply technical contributions to the Department of Defense. These were, in large measure, made possible by the unique and highly synergistic technical environment afforded ARL at WSMR. The WSMR technical environment is comprised of both one of a kind world class facilities and the capabilities resident therein as well as one of the most diverse and highly skilled team of engineers and scientist on the planet A few examples of ARL projects made possible by the unique WSMR technical environment are: PATRIOT Air Defense System Analysis and Fix, Redeye/Stinger Countermeasures, Ground Penetrating Radar System, and most recently development of jamming systems for Improvised Explosive Devices (IEDs) used in the Iraq war. These important weapon system developments would not have been possible if ARL was not working in the unique laboratory that is WSMR.

Joint Test and Evaluation

WSMR is a National Range and as such hosts and performs tri-service T & E functions. WSMR is co-located with Holloman Air Force Base (HAFB) and adjacent to Ft. Bliss, Texas. These facts, in conjunction with the unique technical capabilities of WSMR, make it the ideal location for joint Test and Evaluation, training and

related operations as has been demonstrated many times in the past. ARL's capabilities at WSMR have been a key element in the joint T&E activities within the WSMR, HAFB and Ft. Bliss complex. These capabilities will continue to be needed for critical upcoming T&E programs like the Future Combat Systems (FCS) and the Joint Unmanned Combat Air system (J-UCAS). Thus the interests of the Department of Defense are best served by leaving the ARL-WSMR T&E spaces where they will be the most effective – at their current home on WSMR.

ARL-WSMR Fixed Laboratory Assets

ARL-WSMR operates various specialized, fixed laboratory facilities at WSMR. Some of these are Electro-Optical Vulnerability Analysis Facility (EOVAF), Electro-Optical Countermeasure Missile Flight Simulation Facility (Hardware In The Loop) EOCMMFSF, Target/Jammer Simulator (RTJS), and SLAD's Information Operations Program. These fixed assets are located at WSMR because they are used in direct support of weapons systems testing, require the special and controlled radio frequency environment, or have hazardous output requiring them to be located in a remote and unpopulated area. This being the case if the ARL-WSMR realignment is put into effect, the Department of Defense will be faced with a serious dilemma. The realignment will move ARL-WSMR scientist and engineers out of their specialized laboratories at WSMR and into office's at Aberdeen. Thus the critical work done at the WSMR-ARL labs can no longer be accomplished unless the people just moved to Aberdeen are placed on expensive long term TDY back to the labs at WSMR. An alternative would be to move the fixed laboratories back to Aberdeen. However given the hazardous nature of some of the labs and the need for a controlled and remote environment for others it would seem that the labs could not function as intended at Aberdeen. Additionally the labs would not be available to support any joint testing at WSMR if they are moved to Aberdeen. Clearly this realignment is not in the best interest of the Department of Defense and can only result in increased cost and decreased scientific efficiency.

Cost

It does not seem likely that the propose realignment will save any money for the Department of Defense. In fact it appears that the realignment will increase cost in both the near and long term. The cost elements that accrue to the realignment are listed below and sum up to a considerable increase over time.

- Labor is the dominant cost of all organizations like ARL. Assuming the grade structure would remain equivalent in the re-alignment, the cost of conducting ARL business will increase by virtue of the simple fact that the federal locality pay for the east cost is higher than that of New Mexico

- A great deal of expensive, extended TDY back to WSMR will be required since about half of the work done by ARL-WSMR is direct support of Test and Evaluation programs on the range. The TDY cost of just one project, the ARL support to the Future Combat Systems will very likely exceed any possible savings contemplated by the proposed realignment. The same kinds of cost accrue to any work that must be accomplished in ARL's one of a kind WSMR Labs. Additionally if there is need for any rapid response innovative fixes or new systems developments, like the Patriot Gulf War Fix or the new Improvised Explosive Devices jammers even more extended TDY will be required. Systems development can't be done in an office in Aberdeen. It must be done on the test beds and in the specialized laboratories at WSMR

- Many, if not most, of the ARL-WSMR engineers and scientist will not move back to Aberdeen. Thus the Department of Defense is faced with the cost of hiring and training new engineers and scientist

- There is an additional but unquantifiable cost associated with this process. It will not be possible to replace the skills and expertise of the highly trained WSMR ARL workforce with all of its specialized experience and expertise. Some additional resources will have to be added to the mix to make up for this shortfall in capability as driven by the lost of expertise. This will be expensive and add to the cost of the realignment. Additionally the Department of Defense has a difficult time hiring qualified scientist and engineers because the Department of Defense pay scale is much lower than that f the private sector. This results in a lot of personal turnover and requires a costly process of constant hiring and training new people. This is particularly true on the east cost where the salary differences between the government and private sector are more notable

- There is a cost associated with long term loss of operational efficiency inherent in the proposed realignment. The loss in efficiency is driven by the need for constant TDY, the repeated hiring and training cycle, the cumbersome prospect of trying to get scientist and engineers to do accomplish their mission without being able to routinely work in their labs and the down time necessary to affect the move in the first place. It is not easy to quantify this loss of operational efficiency but it is fair to say it will be substantial and expensive

All in all the proposed realignment will cost the Department of Defense a great deal of money over time, produce nothing more than a loss of operational efficiency and probably preclude proper support of some critical Joint programs like the Future Combat Systems.

In summary, the proposed realignment of ARL-WSMR activities to Aberdeen is the result of a flawed evaluation, has no logical basis, will significantly reduce scientific and technical effectiveness and drive cost up as illustrated by the preceding paragraphs. The proposed realignment may have appeal for those that view having all of one organization at one location could present some cost saving. But, when you evaluate the type of work and environment needed to for the critical Electronic Warfare / Information Warfare testing and evaluation, it can be seen that moving people away from where the real world work is being done and into an academic environment will actually increase cost and decrease effectiveness. Taking that into consideration, the realignment recommendation does not put the best interest of the Department of Defense at the forefront.

RESOLUTION 05-358

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS IN MARYLAND

The City Council is informed that:

WHEREAS, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, New Mexico, be relocated to the Aberdeen Proving Grounds in Maryland; and

WHEREAS, community leaders in Las Cruces, New Mexico, and Alamogordo, New Mexico, feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and

WHEREAS, the association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory has established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and

WHEREAS, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and

WHEREAS, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

NOW, THEREFORE, be it resolved by the governing body of the City of Las Cruces:

(I)

THAT the City Council of the City of Las Cruces hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

(II)

THAT City staff is hereby authorized to do all deeds necessary in the accomplishment of the above.

DONE AND APPROVED this 6th day of June, 2005.

APPROVED:

Mayor William Mattiace

ATTEST:

City Clerk

{SEAL}

Moved by: Archuleta

Seconded by: Frietze

VOTE:

Mayor Mattiace: Aye
Councillor Frietze: Aye
Councillor Connor: Aye
Councillor Archuleta: Aye
Councillor Trowbridge: Aye
Councillor Strain: Aye
Councillor Miyagishima: Aye

APPROVED AS TO FORM:

Deputy City Attorney

City of Las Cruces

COUNCIL ACTION FORM

For Meeting of June 6, 2005
(Adopted Date)

TITLE:

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS IN MARYLAND

BACKGROUND:

On May 13, 2005, the Department of Defense Report to the Base Realignment and Closure Commission (BRAC) recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range (WSMR) be relocated to the Aberdeen Proving Grounds in Maryland. Although the number of personnel currently assigned to the Army Research Lab at WSMR that has been identified for transfer to Maryland is 178, it is estimated that the impact of this transfer could affect as many as 382 professional and technical employees in our area. In addition, a vital association and a history of collaboration exists between the WSMR Army Research Lab and New Mexico State University's Physical Science Laboratory for development and testing of Department of Defense systems that ensure that our soldiers and their support systems survive and function in hostile environments around the world.

A number of community leaders have come together to form the WSMR Community Response Team and will lead an effort to provide a response and a challenge to the recommendation of the BRAC report. This WSMR Community Response Team will work to represent a cohesive voice for our community and will present a straightforward argument for maintaining and/or expanding the work of the WSMR Army Research Lab. This team will also accentuate the support of local government and other organizations in this effort.

(Continue on additional sheets as required)

Name Of Drafter: Maryann Ustick	Department: Assistant City Manager	Phone: 541-2130

Department	Signature	Phone	Department	Signature	Phone
Originating Department			Budget		541-2300
			Assistant City Manager		541-2271
Legal		541-2128	City Manager		541-2076

CAF Rev 6/01

Council Action Form *Page 2*

Account Number	Amount of Expenditure	Budget Amount
N/A	N/A	N/A

BACKGROUND CONTINUED:

The BRAC Commission will be meeting in Clovis on June 24, 2005. The WSMR Community Response Team has requested that the Las Cruces City Council approve the attached Resolution to assist in efforts to change the recommendation for realignment of the Army Research Lab to Aberdeen, Maryland.

SUPPORT INFORMATION:

Resolution;

COUNCIL OPTIONS:

1. Approve the Resolution.
2. Disapprove the Resolution
3. Provide direction to staff to revise the Resolution or provide additional information.

Resolution of Doña Ana County **Resolution No.** 05-49

A RESOLUTION

WHEREAS, the Doña Ana County Board of Commissioners is tasked to represent and address the needs of its residents, and

WHEREAS, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, N.M., be relocated to the Aberdeen Proving Grounds in Maryland, and

WHEREAS, community leaders in Doña Ana County and Otero County recognize that the impact of such a realignment could potentially affect as many as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service, and

WHEREAS, WSMR's Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that American soldiers and their systems survive and function in hostile environments, and

WHEREAS, Community leaders from across the region have banded together to form the WSMR Community Response Team to lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report, and

WHEREAS, the WSMR Community Response Team will work to develop and present a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support of local governments, civic organizations and other community leaders,

NOW THEREFORE, the Doña Ana County Board of Commissioners does hereby endorse and support the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions to reconsider the realignment of the WSMR Army Research Laboratory activities.

PASSED, APPROVED AND ADOPTED this 14th day of June, 2005

Board of County Commissioners
Doña Ana County, New Mexico

Board of County Commissioners for Doña Ana County, New Mexico

William J. McCamley, Chairman (Aye)

Not Available for Signature
D. Kent Evans, Vice-Chairman (Aye)

Absent
Paul B. Curry, Member

Oscar Vasquez Butler, Member (Aye)

Dolores Saldaña-Caviness, Member (Aye)

Attested: Rita Torres, County Clerk

STATE OF NEW MEXICO
COUNTY CLERK
DONA ANA COUNTY

State of New Mexico
County of Dona Ana, ss
RECEPTION NO. 19174
I hereby certify that this instrument was filed for recording and duly recorded on
JUN 14 2005
at 3:23 o'clock P M
Book 1616 Page 1084-1085
of the Records of said County.
Rita Torres, County Clerk
By [signature] DEPUTY

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS, MARYLAND

The Board of Directors of the Greater Las Cruces Chamber of Commerce is informed that:

Whereas, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, NM be relocated to the Aberdeen Proving Grounds, Maryland; and

Whereas, community leaders in Las Cruces, New Mexico and Alamogordo, New Mexico feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and

Whereas, the association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and

Whereas, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and

Whereas, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

Now, Therefore, be it resolved by the Board of Directors of the Greater Las Cruces Chamber of Commerce:

(I)

That the Greater Las Cruces Chamber of Commerce hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

(II)

That, staff is hereby authorized to do all deeds necessary in the accomplishment of the herein above.

Done and Approved this June 14, 1005.

APPROVED:

Fred Mobley, Chairman of the Board

ATTEST:

Jim Berry, President

RESOLUTION NO. 2005-20

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY REPSONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS, MARYLAND

The Governing Body of the City of Alamogordo is informed that:

WHEREAS, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and closure Commission recommended that all but a minimum detachment of the Army Research laboratory activities located at White Sands Missile Range, NM be relocated to the Aberdeen Proving Grounds, Maryland; and,

WHEREAS, community leaders in Las Cruces, New Mexico and Alamogordo, New Mexico feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and,

WHEREAS, the association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and,

WHEREAS, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and,

WHEREAS, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

NOW, THEREFORE BE IT RESOLVED by the City Commission of the City of Alamogordo that the City Commission hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

BE I T F URTHER R ESOLVED that staff is hereby authorized to do all deeds necessary in the accomplishment of the herein above.

DONE this 14th day of June, 2005.

CITY OF ALAMOGORDO, NEW MEXICO
a New Mexico municipal corporation

By: _____
Donald E. Carroll, Mayor

ATTEST:

_____
Angie J. Rahn-Broyles, City Clerk

APPROVED AS TO FORM:

_____
Kenneth S. McDaniel, City Attorney

New Mexico Municipal League

P.O. Box 846 • Santa Fe, New Mexico 87504-0846
Phone (505) 982-5573 • 1-800-432-2036
FAX No. 1-505-984-1392

June 9, 2005

Honorable Anthony J. Principi, Chair
BRAC Commission
2521 South Clark Street
Ste. 600
Arlington, Virginia 220202

Mr. Chairman:

The New Mexico Municipal League's Board of Directors met on Saturday, June 4th, 2005 and the realignment of White Sands Missile Range (WSMR), Army Research Laboratory was an item for discussion on our agenda. The New Mexico Municipal League represents all 102 incorporated municipalities in New Mexico.

The association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory has established a long history of collaboration, development and testing of Department of Defense systems. Our municipal officials and the Cities of Las Cruces and Alamogordo are concerned with the potential loss of these types of jobs both in the professional and technical fields.

New Mexico municipalities, the university and the State have all made a great commitment to White Sands Missile Range and the Laboratory. The commitments, relationships and partnerships that have been forged between these entities have provided value to the accomplishment of the WSMR mission.

On behalf of all 102 municipalities in the State, the New Mexico Municipal League supports the retention of the WSMR Army Research Laboratory in maintaining or expanding its laboratory work. We in New Mexico are very proud to be part of the tradition and work of the WSMR and its mission. We respectfully request your favorable reconsideration in the retention of the Army Research Laboratory.

Sincerely,

Carol Robertson Lopez

Carol Robertson Lopez, President
New Mexico Municipal League

cc: US Senator Pete Domenici
US Senator Jeff Bingaman
US Representative Heather Wilson
US Representative Steve Pearce
US Representative Tom Udall
Mayor Don Carol - City of Alamogordo
Mayor William Mattiace – City of Las Cruces

PROCLAMATION

FOR A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS, MARYLAND

The BOARD OF COUNTY COMMISSIONERS OTERO COUNTY, NEW MEXICO is informed that:

Whereas, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, NM be relocated to the Aberdeen Proving Grounds, Maryland; and

Whereas, community leaders in Otero County and Doña Ana County, New Mexico feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and

Whereas, the association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and

Whereas, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and

Whereas, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

Now, Therefore, be it resolved by the BOARD OF COUNTY COMMISSIONERS OTERO COUNTY, NEW MEXICO:

That the BOARD OF COUNTY COMMISSIONERS OTERO COUNTY, NEW MEXICO hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

PROCLAIMED, during a regular meeting of the Otero County Commission Board this 14th day of June 2005.

ATTEST:

Robyn Silva, County Clerk

BOARD OF COUNTY COMMISSIONERS
OTERO COUNTY, NEW MEXICO

Clarissa McGinn, Chairperson

Doug Moore, Vice-Chairman

Michael Nivison, Member

MESILLA VALLEY
ECONOMIC DEVELOPMENT ALLIANCE

STILL RANKED the BEST
LAS CRUCES NEW MEXICO
www.las-cruces-new-mexico.org

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS, MARYLAND

Whereas, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, New Mexico be relocated to the Aberdeen Proving Grounds, Maryland; and

Whereas, community leaders in Las Cruces, New Mexico and Alamogordo, New Mexico feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and

Whereas, the association between the White Sands Missile Range Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and

Whereas, the location of the Army Research Laboratory at White Sands Missile Range provides immediate access to the nation's leading testing and development range resulting in process efficiencies and commensurate savings in weapons development and testing, and

Whereas, the large and diverse physical setting contained within the sizeable WSMR protected area, including a physical environment similar to the Mideast, provides a much larger and varied range of testing environments than that found in the more congested area surrounding Aberdeen Proving Grounds, and

Whereas, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and

P.O. Box 1299 ■ Las Cruces, NM 88004-1299 ■ Loretto Towne Centre ■ 505 S. Main St., Suite 134
505.525.2852 ■ 1.800.523.6833 ■ Fax 505.523.5707 ■ http://www.mveda.com ■ sites@mveda.com

Whereas, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

Now, therefore, be it resolved by the Board of Directors of the Mesilla Valley Economic Development Alliance:

(I)

That the Mesilla Valley Economic Development Alliance hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

(II)

That, staff is hereby authorized to do all deeds necessary in the accomplishment of the herein above.

Done and Approved this June 14, 2005.

APPROVED:

Kari Mitchell
Chair, Board of Directors
Mesilla Valley Economic Development Alliance

ATTEST:

Steven L. Vierck
President and CEO
Mesilla Valley Economic Development Alliance

SCCOG RESOLUTION NO. SCCOG 2005-1

A RESOLUTION SUPPORTING THE WHITE SANDS MISSILE RANGE (WSMR) COMMUNITY RESPONSE TEAM EFFORTS TO SAVE THE WSMR – ARMY RESEARCH LAB FROM REALIGNMENT TO THE ABERDEEN PROVING GROUNDS, MARYLAND

The South Central Council of Governments, Inc. is informed that:

Whereas, on May 13, 2005, the Department of Defense Report to the Defense Base Realignment and Closure Commission recommended that all but a minimum detachment of the Army Research Laboratory activities located at White Sands Missile Range, NM be relocated to the Aberdeen Proving Grounds, Maryland; and

Whereas, community leaders in Las Cruces, New Mexico and Alamogordo, New Mexico feel that the impact of such a realignment could potentially affect as much as 382 professional and technical employees in our communities, with many of these professionals providing vital community outreach and service; and

Whereas, the association between the WSMR Army Research Laboratory and New Mexico State University's Physical Science Laboratory have established a long history of collaboration, development and testing of Department of Defense systems that ensure that our soldiers and their systems survive and function in hostile environments; and

Whereas, these community leaders have banded together to form the WSMR Community Response Team and will lead the effort to respond to and challenge the recommendation of the Department of Defense's BRAC Report; and

Whereas, the WSMR Community Response Team will work to represent a cohesive voice for our community, presenting a straightforward argument for

maintaining or expanding the work of the WSMR Army Research Laboratory, while accentuating the support our local government, organizations and its leaders have in this mission.

Now, Therefore, be it resolved by the South Central Council of Governments, Inc.:

(I)

That the South Central Council of Governments, Inc. hereby endorses and supports the work of the WSMR Community Response Team and urges the Department of Defense Base Realignment and Closure Commissions reconsideration of the realignment of the WSMR Army Research Laboratory activities.

(II)

That, staff is hereby authorized to do all deeds necessary in the accomplishment of the herein above.

Done and Approved this May 27, 2005

APPROVED:

Gordy Hicks, SCCOG Chairman

Elizabeth A. Bernal, Executive Director

ATTEST:

Linda Crawford, Executive Assistant