

USAWC STRATEGY RESEARCH PROJECT

**ENVIRONMENTAL ISSUES IN HOMELAND SECURITY**

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The views expressed in this academic research paper are those of the author and do not necessarily reflect the official policy or position of the U.S. Government, the Department of Defense, or any of its agencies.

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## ABSTRACT

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The attacks of September 11<sup>th</sup> exposed weaknesses in the Government's defense of the nation. President Bush has made it clear in his National Strategy for Homeland Security, that he is committed to improving our Nation's Homeland Defense posture. The President is clear that this was a "National" strategy not a "Federal" strategy. Homeland Security is "a concerted national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur."

The NSHS called for the establishment of the Secretariat of Homeland Security. Homeland Security Presidential Directive HSPD-5 directs the creation of a National Incident Management System (NIMS) and a National Response Plan (NRP). The NIMS and establishment of the NRP provide the opportunity to identify, reduce or eliminate duplication within the Federal, State and Local governments.

Additionally, the NSHS identified 13 critical infrastructure sectors. Secretary Ridge (Secretary of Homeland Security) must plan for and address the vulnerabilities of each sector in order to prevent danger to human life and to avoid a potential economic or environmental catastrophe. Five of these sectors (agriculture, food, water, energy, chemical industry and hazardous materials) have direct impacts on the environment. These environmental critical infrastructure sectors are lucrative and vulnerable targets. As the global military and economic super-power, the United States cannot have its economy crippled by attacks on these environmental critical infrastructure sectors.

Each critical infrastructure sector has a Lead Federal Agency (LFA) assigned to address that sector's vulnerabilities. This project analyzes the LFAs strategies for resolving the vulnerabilities in these sectors and addresses the impact of these strategies on the military.



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## ENVIRONMENTAL ISSUES IN HOMELAND SECURITY

“Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe, to assure the survival and success of liberty.”

— President John F. Kennedy

“Our enemy is smart and resolute. We are smarter and more resolute. We will prevail against all who believe they can stand in the way of America’s commitment to freedom, liberty, and our way of life.”

— President George W. Bush

The National Strategy for Homeland Security (NSHS) points out that “the Preamble to the Constitution defines our federal government’s basic purposes as “...to form a more perfect Union, establish justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity.”<sup>1</sup> President Kennedy, and now President Bush forty years later, recognized the resolve of the American people to maintain the liberty of this nation. These principles have formed the foundation for every Presidential administration, but the events of September 11th exposed weaknesses in the Government’s ability to provide for a common defense mission. One could argue that for the first time, Americans realize they are vulnerable to attack within their own borders. In order to restore the sense of security, the NSHS calls “for bold and necessary steps ... for using America’s talents and resources to enhance our protection and reduce our vulnerability to terrorist attacks.”<sup>2</sup>

The President asserts that one of these “necessary” steps is establishing a clear “National” strategy for Homeland Security. He emphasizes that this is not a “Federal” strategy, but a “National” strategy developed from the input of “literally thousands of people—governors and mayors, state legislators and Members of Congress, concerned citizens and foreign leaders, professors and soldiers, firefighters and police officers, doctors and scientists, airline pilots and farmers, business leaders and civic activists, journalists and veterans, and the victims and their families.”<sup>3</sup> The result is a call for a concerted “effort to prevent terrorist attacks within the United States, reduce America’s vulnerability to terrorism, and minimize the damage and recover from attacks that do occur.”<sup>4</sup>

Reducing vulnerability, preventing terrorist attacks, coordinating Federal, State and local assets are formidable tasks with many complex embedded issues. Albert Einstein said, “Problems cannot be solved at the same level of awareness that created them.”<sup>5</sup> The strategies and initiatives in the NSHS for rise to Einstein’s desired new level of awareness. Einstein also

said, "Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius -- and a lot of courage -- to move in the opposite direction."<sup>6</sup> Secretary Ridge will have to demonstrate this "touch of genius" in order to meet the challenge before him.

Protecting our environment is one of the first steps to securing America because failure to do so could result in an economic crisis and endanger many human lives. The NSHS identified 13 Critical Infrastructure Sectors (CIS) and assigned each a Lead Federal Agency (LFA) that is responsible for coordinating Federal, State and local response/defense plans. Five of these CISs (agriculture, food, water, energy, chemical industry and hazardous materials) have direct impacts on the environment.

This project will analyze the strategies and initiatives for these five CISs to answer the following questions:

- ❑ What are the relationships that these CISs have with the environment?
- ❑ What are the current LFA strategies for reducing vulnerabilities in these five CISs?
- ❑ Why does the NSHS consider the agriculture and food sectors critical and what are the affects of an attack on them?
- ❑ Why is America experiencing a paradigm shift in the use of water?
- ❑ How is the energy sector vulnerable to attack and what would be the result of an attack?
- ❑ What danger do thousands of chemical facilities that produce millions of pounds of hazardous chemicals present to humans and the environment?
- ❑ What is the impact of the current strategies on the military and how will the military assist?

## **AGRICULTURE AND FOOD**

### **BACKGROUND**

The United States once labeled the "breadbasket of the world" has a deep impact on the global agricultural markets. "The United States is the world's largest agricultural exporting country, shipping \$48 billion in agricultural exports abroad" in 1999.<sup>7</sup> The United States Department of Agriculture (USDA) 2002 Bulk Intermediate Consumer Oriented (BICO) report shows \$2.9 billion for wheat exports and \$4.2 billion in total forest products.<sup>8</sup> The United States produces 25% of the world's timber for industrial products.<sup>9</sup> The USDA Crops Value 2001 Summary reports the total value for principal crops produced in the US in 2001 as \$88.2 billion.<sup>10</sup> The USDA Meat Animals Production, Disposition, and Income 2001 summary reports, "the 2001 gross income from cattle and calves, hogs and pigs, and sheep and lambs for the US totaled \$53.7 billion."<sup>11</sup> The USDA Poultry – Production and Value 2001 Summary reports "the combined value of production from broilers, eggs, turkeys, and the value of sales from chickens in 2001, was \$24 billion."<sup>12</sup>

## DISCUSSION

Terrorist goals are clear... they want to disrupt our economy, kill our citizens, and destroy our way of life. The statistics listed above illustrate why the Agriculture and Food sectors are critical national infrastructure and although not as glamorous as the World Trade Center, these sectors are lucrative targets. The National Research Council produced a report entitled "Containing Agricultural Terrorism." The report was so sensitive that the council removed a complete chapter on agricultural vulnerabilities before publication. Chairman Harley "Moon said a potential terrorist attack could undermine public confidence in U.S. agricultural products, and even if it posed only a limited danger to human life, it could cause enormous economic disruptions."<sup>13</sup>

The document entitled "USDA Homeland Security Efforts" outlines the initial actions taken by the USDA to protect the agricultural sectors of the United States. The report called for the formation of "a Homeland Security Council within the Department."<sup>14</sup> This council will develop a Department-wide plan and coordinate efforts among all USDA agencies and offices. The focus is on three key areas: food supply/agricultural production; USDA facilities, and USDA staff emergency preparedness.

Some of the strategies and concepts reported in the "USDA Homeland Security Efforts" are:

- ❑ Supplying food security guidance to all meat, poultry, and egg products processing plants in order to assure a safe food supply
- ❑ Conducting "vulnerability assessments for domestic and imported food."<sup>15</sup>
- ❑ Conducting Federal and State level exercises to test response procedures
- ❑ Utilizing the National Consumer Complaint Monitoring system to track and monitor food-related consumer complaints<sup>16</sup>
- ❑ Utilizing the USDA Extension system to distribute literature to farmers and ranchers on how they can secure their operations (It detailed how to protect the health of farm animals, crops, and natural resources, as well as ensured they understood the importance of rapid responses to animal and crop disease outbreaks and pest infestations.)
- ❑ Developing a web-based tracking system that will assist in maintaining databases on fertilizers, food, feed, and can be used in disaster reporting
- ❑ Developing a CD-Rom to help practitioners identify and diagnose animal diseases.
- ❑ Developing the National Animal Health Reserve, recruiting almost 300 private veterinarians to assist during an emergency

- Investing \$18 million to develop rapid test for agents like foot and mouth disease, render pest and wheat rust<sup>17</sup>
- Protecting U.S. borders from invasive pests and diseases, by increasing personnel at the borders by 50% over FY2000 levels
- Purchasing remote sensing/diagnostic equipment to assist in early detection of foreign pest and animal diseases at ports of entry<sup>18</sup> (“USDA also conducts routine foreign animal disease investigations and has rapid response teams on the ready should a situation arise that requires immediate action and coordination by Federal personnel.”)<sup>19</sup>

When routine investigations uncover an infestation, the rapid response teams will implement the pest or disease eradication program. The authority for an emergency eradication program comes from the Animal Health Protection Act as part of the Farm Security and Rural Investment Act of 2002.<sup>20</sup> When the response team has to destroy animals, the Secretary of Agriculture can seek emergency funds from the Commodity Credit Corporation to compensate the producers.

Congress passed the Agricultural Bio-terrorism Protection Act of 2002; Possession, Use, and Transfer of Biological Agents and Toxins to provide additional tracking of known agents.<sup>21</sup> The Act directs the Secretary of Agriculture to establish a regulation listing biological agents and toxins that are determined to pose a threat to animal or plant health. Once, she publishes this regulation anyone in possession of the listed agents or toxins has 60 days to register with the USDA or face criminal prosecution.<sup>22</sup>

USDA has spent \$21.7 million conducting security assessments of all USDA Biological Safety Level-3 facilities and upgrading their physical security. The National Forest Service (NFS) corrected numerous security deficiencies at 13 U.S. Forest Service aviation facilities.<sup>23</sup> Additionally, the NFS maintains enforcement patrols on the hundreds of miles of continuous forests along our northern and southern borders. Our nation’s forests are vulnerable due to both our inability to guard all entrances and the risk to fire. The ramifications of a terrorist attack on our nation’s forests could be severe. “Water erosion is the main culprit...whole hillsides virtually turning to liquid and gushing down slope, wiping out anything in its path...changing the ecological balance of the area for decades.”<sup>24</sup> A mature forest may take 25-30 years to replace after extensive clean up, breaking up of hydrophobic soils, mulching charcoal, seeding, planting trees, trenching to slow water erosion.<sup>25</sup>

The Environmental Protection Agency (EPA) provides assistance to the USDA. The EPA also developed a Strategic Plan for Homeland Security to address their lead and assist roles. Goal number 5 in their strategic plan is that the “EPA will be an active participant in national security and homeland security efforts pertaining to food, transportation and energy.”<sup>26</sup> “The agency will use the knowledge and experience we have gained in implementing the nation’s environmental laws...to contribute to the Federal government’s efforts to secure the nation’s food, transportation, and energy infrastructure.”<sup>27</sup> One strategy is to “assist the U.S. Department of Agriculture (USDA), the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC) in development of a secure, electronic communications system for Federal, state and local governments that deal with food, using EPA’s water utility system as a model.”<sup>28</sup>

One unique issue in agro-terrorism is that there is also a threat from domestic environmental extremist organizations. For example, the Earth Liberation Front is an organization that includes environmental extremists from across the world operating independently of each other.<sup>29</sup> This organization’s goal is to “stop development and other activities they consider harmful to nature” and they are willing to “use any direct action necessary to carry out its goal,” which is to.<sup>30</sup> The ELF claims to have caused close to \$40 million worth of damage in multiple attacks that included destroying a ski resort, arson at U.S. Forest industries offices, and attacking genetically engineered crops and trees.<sup>31</sup>

“In recent years, the Animal Liberation Front (ALF) has become one of the most active extremist elements in the United States.”<sup>32</sup> The ALF’s operational philosophy discourages acts that harm “any animal, human and non-human”. The ALF believes in “direct action” against any company or individual that exploits animals for research or economic gain. “The ALF is considered a terrorist group, whose purpose is to bring about social and political change through the use of force and violence.” Since 1993, the ALF and ELF have declared solidarity and support for some of their sabotage efforts.<sup>33</sup>

#### MILITARY IMPACT

The military has two roles in protecting the Agriculture and Food critical infrastructure sectors. First, as a Federal agency the Department of Defense must comply with Executive Order 13112 “Invasive Species.” This order directs “Federal agencies to use their authorities to prevent the introduction of invasive species, and to control, monitor, and restore native species.”<sup>34</sup> The Under Secretary of Defense on 14 July 2000 directed that the Commander, United States Joint Forces Command (USJFCOM) implement this Executive Order in all

operational and transportation plans.<sup>35</sup> The Army component of USJFCOM is United States Army Forces Command (FORSCOM). Commander, USJFCOM tasked Commander, FORSCOM to prepare plans to support the USDA in prevention and eradication of Foreign Animal and Plant Diseases (FAPD).

FORSCOM designated a planner in their Homeland Security Division as the principle point of contact for FAPD issues and constructed the USJFCOM/COMFORSCOM Foreign Animal and Plant Disease Plan 01 dated 12 April 2001. The plan directs support of the USDA in that “upon USDA request for veterinary assistance, USJFCOM, through COMFORSCOM, will direct the assignment of a Defense Veterinary Support Officer (DVSO), and if required, assign a Base Support Installation (BSI), a Defense Coordinating Officer (DCO), DoD laboratory support, and DoD units to assist in the detection of FAPD.”<sup>36</sup> An issue/concern noted in the plan is that 70% of the FORSCOM Veterinary assets are in the Army Reserve and to activate them would require a special call up.

As the lead for the DoD in FAPD, FORSCOM hosted a conference on FAPD in August 2002. Commander, FORSCOM wanted “to insure that DoD is not the agency responsible for the introduction of a foreign human, animal or plant disease into the United States.”<sup>37</sup> The conference had 104 participants from 16 states and 34 organizations with 31 representatives from the USDA. The focus of the conference was how to insure that vehicles and equipment of retrograding US military personnel and visiting foreign military personnel arrive “clean.” “All participants agreed that coordination and communications among organizations is a problem,” but resolved to work together to improve the working relationships. They resolved immediate concerns like exercise Roving Sands 03 but decided to meet again after the formation of US Northern Command and The Secretariat of Homeland Security to resolve the long term issues.<sup>38</sup>

The second role is the provision of support to execute USDA missions by DoD. Annex Emergency Support Function #4 of the Federal Response Plan assigns the Department of Defense three missions for firefighting:

- Assume full responsibility for firefighting activities on U.S. military installations
- Support firefighting operations on nonmilitary lands with personnel, equipment, and supplies under the terms of the existing interagency agreement, to include the arrangement of liaisons as required
- Provide contracting services through the U.S. Army Corps of engineers to urban and rural firefighting forces to obtain heavy equipment and/or demolition services as needed to suppress disaster-related fires.<sup>39</sup>

Additional “possible missions for DoD could include destruction and disposal of animals and plants under USDA guidance.”<sup>40</sup> The Department of Defense has a Memorandum of Agreement with the USDA that requires the USDA to provide bio-hazardous materials training to our soldiers before performing these missions.<sup>41</sup> One concern is that this MOA only covers soldiers in a Federal Status; therefore, if soldiers from the Army National Guard responded to a call from the Governor in a State Active Duty status, the Adjutant General of the State/Territory would have to coordinate this training with the USDA.

#### RECOMMENDATIONS

In the General Accounting Office (GAO) testimony before the Subcommittee on Governmental Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform, House of Representatives entitled Combating Terrorism “Enhancing Partnerships Through a National Preparedness Strategy,” the Director of Strategic Issues for the GAO stated “the absence of a central focal point resulted in two major problems.”<sup>42</sup> The two problems were: 1) “a lack of cohesive effort from within the federal government” and 2) “the lack of leadership has resulted in the federal government’s development of programs to assist state and local governments that were similar and potentially duplicative.”<sup>43</sup> She cited one example of the lack of cohesive effort as “the Department of Agriculture, the Food and Drug Administration, and the Department of Transportation have been overlooked in bio-terrorism-related policy and planning, even though these organizations would play key roles in response to terrorist acts.”<sup>44</sup>

Similarly, an example of duplicative effort is that “FEMA, the Department of Justice, the Center for Disease Control and Prevention, and the Department of Health and Human Services all offer separate assistance to state and local governments in planning for emergencies.”<sup>45</sup> One might not consider this as bad because each organization would have different specialties and expertise to train state and local governments. However, the problem occurs when each organization requires a separate and often overlapping plan as a condition for receiving federal funding. This is both cumbersome and wasteful.<sup>46</sup>

Duplication in the federal government typically happens for three reasons. First, well-meaning department leaders within the federal government perceive a need and develop a program to meet that need. Second, department leaders develop unnecessary programs in the latest “hot” project to capture funds and maintain job security. Third, the previously mentioned department leaders develop their programs in vacuums and there is no single clearinghouse for such programs. Secretary Ridge will have to become this single clearinghouse for all federally funded homeland security programs. He should request that the President task all departments to disclose all federally funded programs that remotely respond to a homeland security issue.



The Department of Defense is not immune from this duplication problem. Recommend that Secretary Rumsfeld task all service secretaries to provide him a list of programs, contingency plans, special teams or task forces that have primary or ancillary homeland security missions. Additionally, DoD should centrally manage all homeland security related contracts. This central management will prevent parochial service projects with duplicate missions or capabilities.

## **WATER**

### **BACKGROUND**

“The World Bank reports that 80 countries now have water shortages that threaten health and economies while 40% of the world – more than 2 billion people – have no access to clean water or sanitation.”<sup>47</sup> Water is a trans-boundary issue for many countries as their water supply comes through another country. “Water has been a contentious issue in recent negotiations between Israel and Syria.”<sup>48</sup> The discussions over water have become so heated between Israel and Lebanon that the US State Department has sent a water expert to the region to assess the situation and cool tempers.<sup>49</sup> “In recent years, Iraq, Syria and Turkey have exchanged verbal threats over their shared rivers.”<sup>50</sup> The Syrian, Turkish and Iraqi governments are all promising their people clean water but the Euphrates is not capable of meeting all the needs.<sup>51</sup> The National Intelligence Council warns, “As countries press against the limits of available water between now and 2015, the possibility of conflict will increase.”<sup>52</sup>

### **DISCUSSION**

Americans have taken water availability and quality for granted for years. Our attitude has been to turn the faucet on for an infinite supply to quench our thirst, clean our clothes, and grow our lawns. Waste, increasing unrestrained use and wide spread drought jeopardize not only our attitudes but also reality. States are reviewing water usage agreements with neighboring states and asking the Federal government to intervene when a state is utilizing more than their negotiated share. California’s neighboring states have asked the Bush administration to order California to take only California’s entitlement of water from the Colorado River.<sup>53</sup> Consideration of wastewater recycling by some California counties indicates the severity of the problem.<sup>54</sup>

Multiple users (industry, farmers, households, environment) compete for the finite water supply. In New Mexico, “environmentalists want a federal judge to release water owned by Albuquerque into the Rio Grande to prevent the river from going dry in an area where the endangered Rio Grande silvery minnow lives.”<sup>55</sup> Western water law is based on the notion of prior appropriations – the idea that those who started using water first always have the right to

use it first.”<sup>56</sup> Texas farmers, urban developers and environmentalists are drawing battle lines over the Ogallala aquifer. Farmers’ spent large sums of money for high-tech low water use equipment to reduce consumption. When urban sprawl consumes water savings the farmers become angry.<sup>57</sup>

The realization that our water assets are finite creates a new paradigm for their defense. The first goal in the Environmental Protection Agency’s (EPA) Strategic Plan for Homeland Security is working “with the states, tribes, drinking water and wastewater utilities (water utilities), and other partners to enhance the security of water and wastewater facilities.”<sup>58</sup> The EPA sees this as just building off the legislative provisions within the Safe Drinking Water Act and the Clean Water Act to ensure clean and safe water. In order to accomplish this goal the EPA will “assist utilities throughout the U.S. to: 1) understand and utilize the best scientific information, training, and technical expertise on water security; 2) assess their utility’s vulnerabilities to a possible attack; 3) take action to improve security; and 4) respond effectively and efficiently in the event that an incident occurs.”<sup>59</sup>

#### MILITARY IMPACT

Military installations must plan to sustain their installation with drinking water under any circumstance. The Water Supply Management Program (WSMP) has contributed to the preparation of installations for drinking water emergencies for many years.<sup>60</sup> As early as 1998, the United State Army Center for Health Promotion and Preventive Medicine (USACHPPM) published a Countering Terrorism of Drinking Water Supplies fact sheet to provide installations with additional information on preparing their plans. Three keys from this fact sheet are the conduct of a Water System Vulnerability Assessment (WSVA), enhancing the security plans based off weaknesses identified in the WSVA, and planning for alternative water sources.<sup>61</sup>

#### RECOMMENDATIONS

In October of 2000, Bryan Norton commented in his work for the Army Environmental Policy Institute “Installations and Watersheds: An Examination of Changes in Water Management on Army Installations” that “the Army is preparing a plan to address the actions listed in the Clean Water Action Plan (CWAP) and to institute watershed management on all Army installations.”<sup>62</sup> Suggest the Army implement the three recommendations from Mr. Norton’s work:

- “Headquarters should instruct environmental staffs at all facilities to set up simple water quality monitoring stations just upstream as well as downstream from their land on all significant streams and other waters entering the facility.”<sup>63</sup>

- “Headquarters should instruct appropriate installation staff to initiate and maintain contact with state water regulators concerning the process of setting Total Maximum Daily Loads (TMDL) levels and allocations for streams passing through Army installations.”<sup>64</sup>
- “Headquarters should encourage each installation’s environmental offices to integrate their new “Storm Water II” planning with their TMDL planning.”<sup>65</sup>

## **ENERGY BACKGROUND**

The Energy Information Administration (EIA) reports that the United States is the “largest energy producer, consumer, and net importer.”<sup>66</sup> Estimates show that the US consumed 19.7 million barrels per day (MMBD) of oil in 2002. Forty-five percent of this was motor gasoline. The US imports on average 57% of the oil it uses. We have a relatively equal distribution of oil imports from Canada, Saudi Arabia, Mexico, and Venezuela. The US has the twelfth largest proved oil reserves totaling 22.4 billion barrels as of January 2002.<sup>67</sup>

The US ranks 6th in the world in proven natural gas reserves. Natural gas represents 23% of the US primary energy requirements with oil accounting for 39% and coal for 22%. Natural gas usage is on the rise in the US increasing 14% from 1990 to 2001. EIA attributes the increase in industrial use in part to the clean-burning qualities of natural gas. The US will have to make significant investments in pipelines and infrastructure to capitalize on the benefits of natural gas.<sup>68</sup>

In 2001, the US generated 2,661 billion kilowatt hours (Kwh) at electric utilities. Coal-fired plants accounted for 60% of generation, nuclear 20%, natural gas 10%, hydroelectricity 7%, oil 3%, geothermal, wind, solar, wood and waste 0.1%. Non-utility producers generated 1,116 billion Kwh. Natural gas plants accounted for 32% of generation, coal 32%, nuclear 21%, geothermal, wind, solar, wood and waste 8%, oil 5%, hydroelectric 2% and other gaseous fuels 1%.<sup>69</sup>

The US has 104 licensed nuclear power units that generate 769 billion Kwh. One fourth of the nuclear output comes from three states: Illinois, Pennsylvania, and South Carolina. The strict regulatory actions addressing the safety of nuclear facilities have resulted in a reduction in new facility development. In 2000, the Nuclear Regulatory Commission (NRC) in an attempt to maintain the current levels of production granted the first-ever renewal of a nuclear power plant’s operating license. Two companies are presently surveying sites for building new facilities, which would be the first construction in twenty years.<sup>70</sup>

## DISCUSSION

President Bush at the outset of his Administration directed Vice President Cheney to form the National Energy Policy Development Group. The members are: the Vice President; the Secretaries of State, Treasury, Interior, Agriculture, Commerce, Transportation, and Energy; the Director of the Federal Emergency Management Agency; the Administrator of the Environmental Protection Agency; the Assistant to the President and Deputy Chief of Staff for Policy; the Director of the Office of Management and Budget; the Assistant to the President for Economic Policy; the Deputy Assistant to the President and Director of Intergovernmental Affairs. The group developed a national "energy policy that plans for the future but meets the needs of today."<sup>71</sup>

The policy states "in the year 2001 [America] faces the most serious energy shortage since the oil embargoes of the 1970s."<sup>72</sup> During the ten years from 1991 to 2000, Americans used 17 percent more energy than in the previous decade. The US had to increase the reliance on foreign energy sources because the domestic energy production during the same decade only increased by 2.3 percent.

To reverse this trend of increasing foreign dependence, the group set five national goals. First, America must modernize conservation by realizing that energy consumption affects everything we do in life and work. In order to hold to the hope of improving our environment while maintaining our standard of living, we must have technological advances that will assist us in "raising productivity, reducing waste, and trimming costs."<sup>73</sup> Advances in automobiles have lead to a 60% fuel efficiency increases since 1972. During the same thirty years, the US economy has increased 126% while the energy use has only increased 30%. The National Energy Plan proposes multiple steps to encourage the development and usage of new technologies. For example, they propose a tax credit for the use of hybrid and fuel cell vehicles.<sup>74</sup>

Second, we must modernize our energy infrastructure because much of it is deteriorating and strained to capacity. For example, the US built our electricity transmission lines, substations, and transformers, during a time of regulations that restricted capabilities to assigned regions. These structures are not able to transfer power across these regional boundaries. The National Energy Policy calls for modernization and expansion of our energy infrastructure in order to ensure that energy supplies can be safely, reliably, and affordably transported to homes and businesses.<sup>75</sup>

Third, We must increase our energy supplies by diversifying our domestic sources so that we can reduce our dependence on foreign sources. There is enough coal in the US to last for

250 years, yet there are very few coal-powered electric plants under construction. The plan identifies the need for further research for cleaner uses of coal. Nuclear power plants discharge no greenhouse gases and therefore are a cleaner source of energy. The number of nuclear power plants is in decline with very few new plants planned for construction.

Fourth, the development group expressed that they “do not accept the false choice between environmental protection and energy production.”<sup>76</sup> Therefore, the fourth goal is the acceleration of the protection and improvement of the environment building on our successes and seeking “further improvements in the productive and efficient use of energy.”<sup>77</sup> The plan calls for the export of environmentally friendly technologies in order to maintain a global environmental focus.

Fifth, We must increase our energy security to ensure that Americans can expect reliable energy while minimizing price volatility. The protection of the energy sources and preparing for emergency supplies are the crucial elements of energy security.<sup>78</sup> Protecting the Trans-Alaska Pipeline System (TAPS) is a vital national security task.<sup>79</sup> The Alaskan oil fields represents approximately 17% of the US domestic oil production. Recently TAPS was temporarily shutdown because of an earthquake and a puncture from a gunshot. The US cannot afford the destruction or long-term closure of the pipeline.

#### MILITARY IMPACT

The President and Secretary Ridge have asked the governors to identify their critical assets. The energy CIS critical assets are dams, power grids, pipelines, oil storage facilities, oil refineries and nuclear facilities. In some cases, the states receive federal assistance; in other cases, they provide the protection without assistance. The Governor in many cases will call on the Air and Army National Guard units to conduct air security and critical asset defense missions.

The largest impact on the National Guard is the extended duration of the missions (typically a six month state active duty activation). No one knows when the terrorist might attack, so there is a temptation to guard critical assets all the time. The difficult decision for the Governor is deciding what and when does he/she protect. For example, the Governor of Georgia has a dam on the Chattahoochee River just north of Columbus, GA. For the Governors of Georgia and Alabama, this hydroelectric dam is a critical asset as an energy source. Additionally, if a terrorist attack destroyed the dam, then the floodwaters would devastate the two towns of Columbus, GA (the second largest city in the state and home to the Fort Benning Army post) and Phenix City, AL.

The dam is not a critical federal asset like Hoover dam. Therefore, the Governors of Georgia and Alabama must provide resources to defend the dam. If they choose to use their National Guard assets, then the units will serve in a “state active duty” status. There are pros and cons to this status that are beyond the scope of this paper, but the cost to the state for pay and allowances is the long-term critical issue for the state. Mobilization of the state’s National Guard assets for federal missions worsens the dilemma.

The Federal Response Plan, Emergency Support Function (ESF)# 12 outlines a response role for the DoD assets. In the annex the director of military support’s only task is to report “damage assessment and recommend priorities to ESF #12 for restoring energy service to critical defense facilities.”<sup>80</sup> We will see in the CIS Chemical Industry and Hazardous Materials discussion what DoD assets are available to respond for nuclear accidents. DoD 3150.8-M “Nuclear Weapon Accident Response Procedures outlines the capabilities and responsibilities of DoD assets in responding to a nuclear weapon’s accident.”<sup>81</sup> DoE could utilize some of the same capabilities and procedures in response to a nuclear power plant accident or duty bomb explosion.

#### RECOMMENDATIONS

Some say that the US, by outspending the Soviet Union by vast sums for strategic offensive weapons, forced the collapse of their communist system and lead to their disbandment. The US government may find itself in a position to spend itself into a financial crisis over Homeland Security. The terrorist’s only have to increase their “chatter” and we respond by spending millions of dollars on increased security. We cannot continue to respond in this manner indefinitely. The National Guard will not be able to sustain the operational tempo forever. These soldiers although dedicated still have a civilian job as their primary income source. Continuous state call-ups will eventually take their toll and soldiers will have to make the choice of family or country.

We are still reacting to the events of September the 11th, and DoD specifically has not had the opportunity to either fully study the problem or address the solution. Secretary Rumsfeld and Secretary Ridge must form a tiger team to work this problem. Have them look at all options military, and civilian. Consider asking Congress to increase National Guard Active Guard/Reserve Title 32 end strength to give each state, based on size and critical infrastructure, federally funded state controlled assets to perform the homeland security mission. These assets would not have an outside of the Continental United States mission, but could conduct missions across state lines in accordance with interstate compacts.

## CHEMICAL INDUSTRY AND HAZARDOUS MATERIALS

### BACKGROUND

The GAO released a report entitled Homeland Security: Department of Justice's Response to Its Congressional Mandate to Assess and Report on Chemical Industry Vulnerabilities. The Department of Justice found that there are "15,000 U.S. facilities that produce, dispose of, or in some manner handle or use hazardous chemicals" and therefore are subject to the "Clean Air Act's risk management plan's provisions."<sup>82</sup> A Governor's Guide to Emergency Management reports "nearly 5,000 of these facilities have a maximum of at least 100,000 pounds of chemicals on site that are considered extremely hazardous."<sup>83</sup> Even more alarming is that "at least 100 facilities each store more than 30 million pounds of extremely hazardous substances."<sup>84</sup> "Every state in the U.S., except Vermont, has at least one facility storing more than 100,000 pounds of extremely hazardous substances."<sup>85</sup>

### DISCUSSION

Presidential Decision Directive 39, U.S. Policy on Counter terrorism is a classified document that "establishes policy to reduce the Nation's vulnerability to terrorism." Additionally, it "establishes the lead agency responsibilities for all facets of the U.S. counter terrorism effort."<sup>86</sup> The Department of Justice is the lead agency for counter terrorism within the U.S. and it has delegated the responsibility to the Federal Bureau of Investigation (FBI).

The FBI develops and maintains plans to respond to terrorist plots and acts. These plans incorporate both crisis and consequence management. The Terrorism Incident Annex of Federal Response Plan defines crisis management as "measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism."<sup>87</sup> The same annex defines consequence management as "measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of terrorism."<sup>88</sup>

Homeland Security Presidential Directive/HSPD-5 directs the establishment of a single, comprehensive national incident management system. "This system will provide a consistent nationwide approach for Federal, State, and local governments to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity."<sup>89</sup> HSPD-5 directs Secretary Ridge to develop National Response Plan (NRP) that "will integrate Federal Government domestic prevention, preparedness, response, and recovery plans into on all-discipline, all-hazards plan."<sup>90</sup> The NRP will combine the

consequence and crisis management concepts and supersede all current plans. The suspense for the initial version of the NRP is 1 April 2003.

The National Oil and Hazardous Substances Pollution Contingency Plan or more commonly known as the National Contingency Plan (NCP) is the current consequence management plan that covers the chemical industry and hazardous materials. The 1968 NCP originated in response to a massive oil spill in England that caused extensive damage to the environment.<sup>91</sup> Currently, the plan addresses oil spills, hazardous substance spills, and hazardous waste releases regardless whether the spill is an accident or a terrorist act.<sup>92</sup>

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal asset that is available to provide assistance to states and local governments. ATSDR is an agency of the U.S. Department of Health and Human Services headquartered in Atlanta, Georgia with 10 regional offices throughout the United States. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) created the agency “to collaborate with local state and other federal agencies...to improve the health and quality of life of people living in unsafe environments.”<sup>93</sup> Epidemiologists, physicians, toxicologists, engineers, public health educators, and support staff make up the approximately 400-person agency.<sup>94</sup>

“The agency’s mission is to prevent harm to human health and diminished quality of life from exposure to hazardous substances found at waste sites, in unplanned releases, and in other sources of pollution present in the environment.”<sup>95</sup> ATSDR has many activities that they provide to accomplish their mission, the two that are most applicable to homeland security are: 1) “ATSDR provides technical support and advice to other federal agencies, states, and local governments that respond to accidental spills or releases of hazardous substances.” 2) “ATSDR may send staff to a community to draw blood or collect urine to determine whether people are being exposed to a hazardous substance.”<sup>96</sup> ATSDR provides technical support in the planning phase or during an incident response.

Currently, the NCP, and FRP describe what the federal government will provide in response to a release but the first responders will always be the local and state emergency management personnel. A Governor’s Guide to Emergency Management provides detailed guidelines to state and local officials to build their emergency plans. It suggests that governors: “require detailed information from chemical facilities; include chemical emergency response in state emergency plans; develop resources for response; develop a crisis communications strategy; appoint a state emergency response commission; build relationships with the private sector; conduct drills and exercises; know the chemical stockpile emergency preparedness



program; and know the national contingency plan.”<sup>97</sup> States that have ports must also plan for the vulnerability of ships (especially oil tankers) to a U.S.S. Cole type of attack.

#### MILITARY IMPACT

The Department of Defense has several active duty assets under the operational control of Northern Command, which can deploy to support the NCP, FRP or future NRP:

- The Marine Chemical, Biological Incident Response Force (CBIRF) responds to Chemical, Biological, Radiological, Nuclear, and High Explosive (CBRNE) events.
- The U.S. Army Chemical Biological Rapid Response Team also has the mission of responding to CBRNE events.
- The Army Special Medical Augmentation Response Teams (SMART) provides medical expertise to CBRNE events.
- The technical escort teams provide support to chemical incidents.
- The explosive, ordnance, disposal units provide support to CBRNE events.

The Department of Defense also has Reserve Component assets that can support the NCP, FRP or future NRP. Congress tasked the military to “develop and maintain at least one domestic terrorism rapid response team composed of members of the armed forces...capable of aiding federal, state, and local officials in the detection, neutralization, containment, disassembly, and disposal of weapons of mass destruction.”<sup>98</sup> Congress authorized the Army National Guard to field 55 Civil Support Teams (CST). Congress appropriated 32 CSTs and the National Guard fielded all 32.

Each CST team has twenty-two US Code Title 32 Active Guard Reserve soldiers. The CST teams have six functional sections: command, operations, communications, administration/logistics, medical and survey.<sup>99</sup> National Guard Bureau manages a National Response Plan (no correlation to the future NRP) for CSTs, who may operate in Title 32 or Title 10 status. The Secretary of Defense may federalize the CST to support the Joint Task Force Civil Support as part of the FRP, NCP or future NRP. A governor may release his/her CST to assist another state in a Title 32 status when supporting an interstate compact.

#### RECOMMENDATIONS

The Army has a little known but potentially invaluable tool available at Clark Atlanta University in Atlanta, Georgia called the Army High Performance Computing Research Center Computation and Modeling Laboratory. Dr. Aliabadi, the director is conducting research on Chemical and Biological Defense and Environmental Modeling.<sup>100</sup> His research focuses on Geographic Information System based high performance dispersal simulation. The result is a three-dimensional model of cities and graph dispersion rates of chemical releases. There are

multiple uses for this technology in homeland security but it appears that these developments have received little attention.

My discussions with members of Joint Task Force Civil Support and Defense Threat Reduction Agency uncovered no one with knowledge of this research.<sup>101,102</sup> State Emergency Management Personnel (SEMP) should model their major metropolitan areas and additional areas of concern. These models will allow SEMP to predict dispersions of toxic fumes, biological, chemical agents or radiation fallout.

## **CONCLUSION**

The attacks of September 11<sup>th</sup> exposed weaknesses in the Government's defense of the nation. President Bush has made it clear in his National Strategy for Homeland Security, that he is committed to improving our Nation's Homeland Defense posture. The formation of the Secretary of Homeland Security position demonstrated the President's resolve to address the problem with a new level of awareness. Secretary Ridge has the formidable task of combining elements of several disparate institutions with their prejudices and traditions together to defend this nation. The American people are neither patient nor tolerant on Homeland Security, therefore they expect Secretary Ridge to already have accomplished his mission. Additionally, he is working in a zero defect environment, the public will not consider thwarting 99.9% of attacks as success.

One of the hardest tasks that Secretary Ridge has is the prioritization of assets and vulnerabilities. The new National Incident Management System and establishment of the NRP provide the opportunity to identify, reduce or eliminate duplication within the Federal, State and Local governments. There must be an accounting of assets from all sectors of government including DoD.

As we have seen through this discussion, these critical infrastructure sectors (agriculture, food, water, energy, chemical industry and hazardous materials) have dramatic impacts on the environment. We understand --

- The shock that the introduction of a foreign plant or animal disease would have on the largest agricultural market in the world.
- That the destruction of the corn crop or poultry production for one year would mean billions of dollars in losses and the forfeiture of public confidence.
- That there are "environmentalist" groups that are resolute in stopping development.
- That terrorist initiated forest fires disturb the ecosystem in those areas for many years.
- That water is now a critical commodity and we must protect and conserve our supply.

- That a chemical release from one of the 15,000 US chemical facilities, whether accidental or, as result of a terrorist attack could be devastating to humans and the environment.
- That a successful attack on one of the 104 nuclear power plants could cause many deaths, and the radiological fallout would impact the environment for decades.
- That these critical infrastructure sectors all have an impact on the military and will result in the military committing assets to their support.

The challenges to democracy and freedom have been real throughout our history. In every instance, the American people have met and defeated these challenges. Nevertheless, the nature and complexity of threats is ever changing and thus this challenge requires rededication of principle and purpose. Failure in our quest as a nation founded on ideals and built on principles of equality for all is not and never has been an option, but the consequences of these new threats creates a profound problem. Secretary Ridge's tasks are monumental and he will need the full measure of local, state and Federal resources to address each emerging security concern. We have entered a new era with a new enemy and we will prevail because "we are... more resolute."<sup>103</sup>

## **RECOMMENDATIONS**

The purpose of my study was to analyze the threats to the Environmental Critical Infrastructure Sectors listed in the National Strategy for Homeland Security and identify the roles and responsibilities for the military in support of homeland security. The new National Response Plan and the developing implementation strategy for the plan will reflect the military's role in nearly every contingency regardless of the level or detail and whether strategic or tactical. Planning, operations, training and logistics have formed the basis for crisis response and management within the US military since their inception. The military must ensure that the local, state and Federal agencies involved in homeland security incorporate not only the military's capabilities but build from our experiences in this effort. Therefore, I propose that the senior military leadership consider the following recommendations:

- The War College or Northern Command studies the duplication of response assets within DoD.
- NORTHCOM, Defense Threat Reduction Agency and JTF-CS coordinate with Dr. Aliabadi to ensure the fullest utilization of his research on High Performance Computing and Dispersion Modeling.
- DoD/NIMS form a Tiger team to address the long-term mission of guarding critical infrastructure. Consider utilizing additional Title 32 Active Guard soldiers for the mission.

- DoD continues to aggressively pursue the prevention of introducing invasive pests and diseases into the United States. Expand the work on FAPD established by FORSCOM to NORTHCOM.
- Secretary of Army assess the availability of Reserve Component Veterinarian units to perform FAPD support missions.
- Director, ARNG establish a MOA mirroring the current DoD MOA with the USDA establishing the same commitments and training requirements for soldiers supporting the USDA in a state active duty status.
- DoD/USACHPPM do further study to determine if our clean water action plans are effective.
- Army Environmental Center ensure that the following recommendations from AEPI have been implemented:
  - “Headquarters should instruct environmental staffs at all facilities to set up simple water quality monitoring stations just upstream as well as downstream from their land on all significant streams and other waters entering the facility.”<sup>104</sup>
  - “Headquarters should instruct appropriate installation staff to initiate and maintain contact with state water regulators concerning the process of setting Total Maximum Daily Loads (TMDL) levels and allocations for streams passing through Army installations.”<sup>105</sup>
  - “Headquarters should encourage each installation’s environmental offices to integrate their new “Storm Water II” planning with their TMDL planning.”<sup>106</sup>

Word Count = 7,473



## ENDNOTES

<sup>1</sup> George W. Bush, National Strategy for Homeland Security (Washington, D.C.: The White House, July 2002), 5.

<sup>2</sup> Ibid., Cover Letter.

<sup>3</sup> Ibid., Cover Letter.

<sup>4</sup> Ibid., Cover Letter.

<sup>5</sup> Famous Quotations <<http://www.famous-quotations.com/asp/acquotes.asp?author=Albert+Einstein+%281879%29>>, accessed; 10 December 02.

<sup>6</sup> Ibid.

<sup>7</sup> "U.S. Commerce Dept United States Exports," 1999; available from <<http://www.ustr.gov/outreach/states/us.pdf>>; Internet; accessed 4 January 2003.

<sup>8</sup> U.S. Trade Statistics, U.S. Department of Agriculture, Foreign Agriculture Service Bulk Intermediate Consumer Oriented Export Commodity Aggregations (Washington: U.S. Trade Statistics, 2003), 1.

<sup>9</sup> "United States Department Agriculture Forest Service 696-M," June 2001; available from <<http://FIA.FS.fed.us/library/forestfactsmetric.pdf>>; Internet; accessed 4 January 2003.

<sup>10</sup> National Agricultural Statistics Service, U.S. Department of Agriculture, Crop Values 2001 Summary (Washington: National Agricultural Statistics Service, 2002), 7.

<sup>11</sup> National Agricultural Statistics Service, U.S. Department of Agriculture, Meat Animals Production, Disposition, and Income 2001 Summary (Washington: National Agricultural Statistics Service, 2002), 1.

<sup>12</sup> National Agricultural Statistics Service, U.S. Department of Agriculture, Poultry – Production and Value 2001 Summary (Washington: National Agricultural Statistics Service, 2002), 1.

<sup>13</sup> Tom Abate, "U.S. Not Ready For Agro-terrorism, Report Finds," 20 September 2002; available from <<http://sfgate.com/cgi-bin/article.cgi?file=/c/a/2002/09/20/MN98442.dtl&type=printable>>; Internet; accessed 5 November 2002.

<sup>14</sup> United States Department of Agriculture, USDA Homeland Security Efforts, (Washington, D.C.: September 2002), 1.

<sup>15</sup> Ibid., 1.

<sup>16</sup> Ibid., 1.

<sup>17</sup> *Ibid.*, 2.

<sup>18</sup> *Ibid.*, 2.

<sup>19</sup> Congress, House of Representatives, Committee on Agriculture, Subcommittee on Department Operations, Oversight, Nutrition, and Forestry, Dr. James Butler, Deputy Under Secretary Marketing and Regulatory Programs Responses to Written Questions Submitted for the Record on the Threat, Prevention and Control of Invasive Species, 3 October 2002, 2.

<sup>20</sup> *Ibid.*

<sup>21</sup> Public Health Security and Bioterrorism Preparedness and Response Act, Public Law 107-188, section 212 (2002).

<sup>22</sup> *Ibid.*

<sup>23</sup> United States Department of Agriculture, USDA Homeland Security Efforts, (Washington, D.C.: September 2002), 1.

<sup>24</sup> National Interagency Fire Center, "After the Fires: Let the Healing Begin," 2000; available from <[http://www.nifc.gov/pres\\_visit/rehab.html](http://www.nifc.gov/pres_visit/rehab.html)>; Internet; accessed 4 January 2003.

<sup>25</sup> *Ibid.*

<sup>26</sup> U.S. Environmental Protection Agency, Strategic Plan for Homeland Security, (Washington, D.C.: U.S. Environmental Protection Agency, September 2002), 13

<sup>27</sup> *Ibid.*

<sup>28</sup> *Ibid.* 14

<sup>29</sup> Cynthia Kirk, "The Earth Liberation Front," 23 February 2001; available from <<http://greennature.com/article70.html>>; Internet; accessed 4 January 2003.

<sup>30</sup> *Ibid.*

<sup>31</sup> "Earth Liberation Front and Animal Liberation Front (ELF and ALF) Background," 13 September 2002; available from <<http://greennature.com/article859.html>>; Internet; accessed 4 January 2003.

<sup>32</sup> *Ibid.*

<sup>33</sup> *Ibid.*

<sup>34</sup> William J. Clinton, Executive Order 13112 of February 3, 1999, Invasive Species. (Washington, D.C.: The White House) February 1999, 2.

<sup>35</sup> Under Secretary of Defense J.S. Gansler, "Executive Order 13112, Invasive Species," memorandum for Secretaries of the Military Departments, Washington, D.C., 14 July 2000.

<sup>36</sup> U.S. Joint Forces Command, USCINCFJCOM/COMFORSCOM Foreign Animal and Plant Disease Plan 01 (Norfolk, VA: US Joint Forces Command, 12 April 2001),4.

<sup>37</sup> William King, "Foreign Disease Conference Executive Summary," executive summary for Commander US Army Forces Command, Ft McPherson, GA, 9 August 2002.

<sup>38</sup> Ibid.

<sup>39</sup> Federal Emergency Management Agency, The Federal Response Plan (Washington, D.C.: Federal Emergency Management Agency, April 1999), ESF 4-3.

<sup>40</sup> U.S. Joint Forces Command, USCINCFJCOM/COMFORSCOM Foreign Animal and Plant Disease Plan 01 (Norfolk, VA: US Joint Forces Command, 12 April 2001),4.

<sup>41</sup> William King, planner U.S. Army Forces Command, telephone interview by author, 7 January 2003.

<sup>42</sup> General Accounting Office. Combating Terrorism: Enhancing Partnerships Through a National Preparedness Strategy (Washington D.C.: U.S. General Accounting Office, March 2002), 7.

<sup>43</sup> Ibid.

<sup>44</sup> Ibid.

<sup>45</sup> Ibid.

<sup>46</sup> Ibid.

<sup>47</sup> Arizona Water Resource, Global Water Shortage Loom in New Century, (Arizona Water Resource, 1999), 2.

<sup>48</sup> Ibid.

<sup>49</sup> Somini Sengupta, "In Israel and Lebanon, Talk of War Over Water," 12 October 2002; available from <http://nytimes.com/2002/10/16/international/middleeast/16LEBA.html?ex=103587>>; Internet; accessed 17 October 2002.

<sup>50</sup> Arizona Water Resource, Global Water Shortage Loom in New Century, (Arizona Water Resource, 1999), 2.

<sup>51</sup> Douglas Jehl, "In Race to Tap the Euphrates, the Upper Hand is Upstream," 25 August 2002; available from <http://www.nytimes.com/2002/08/25/international/middleeast/25WATE.html>>; Internet; accessed 29 October 2002.

<sup>52</sup> Ibid.



<sup>53</sup> Oliver Libaw, "Golden State Loses Some of Its Luster," 6 January 2003; available from <<http://more.abcnews.go.com/sections/us/dailynews/california030106.htm>>; Internet; accessed 12 January 2003.

<sup>54</sup> Amanda Onion, "From Toilet to Tap," 27 August 2002; available from <<http://more.abcnews.go.com/sections/scitech/DailyNews/waterreuse020827.htm>>; Internet; accessed 12 January 2003.

<sup>55</sup> Sue Holmes, "In Drought-stricken New Mexico, Battle Brewing Over Water in Rio Grande," 17 September 2002; Available from [http://www.enn.com/news/wire-stories/2002/09/09172002/ap\\_48448.asp](http://www.enn.com/news/wire-stories/2002/09/09172002/ap_48448.asp); Internet; accessed 30 September 2002.

<sup>56</sup> Ibid.

<sup>57</sup> Douglas Jehl, "Saving Water, U.S. Farmers are Worried They'll Parch," 28 August 2002; available from <<http://www.nytimes.com/2002/08/28/international/worldspecial/28WATE.htm>>; Internet; accessed 29 October 2002.

<sup>58</sup> U.S. Environmental Protection Agency, Strategic Plan for Homeland Security, (Washington, D.C.: U.S. Environmental Protection Agency, September 2002), 13

<sup>59</sup> Ibid.

<sup>60</sup> U.S. Army Center Health Promotion and Preventive Medicine, Water System Vulnerability Assessment, (Aberdeen Proving Ground: U.S. Army Center Health Promotion and Preventive Medicine, 1998), 29.

<sup>61</sup> U.S. Army Center Health Promotion and Preventive Medicine, USACHPPM 31-002-1001 Countering Terrorism of Drinking Water Supplies, (Aberdeen Proving Ground: U.S. Army Center Health Promotion and Preventive Medicine, 1998), 1.

<sup>62</sup> Army Environmental Policy Institute, "Installations and Watersheds: An Examination of Changes in Water Management on Army Installations," (Atlanta, Ga: Army Environmental Policy Institute, October 2000), 32

<sup>63</sup> Ibid., 30.

<sup>64</sup> Ibid., 28.

<sup>65</sup> Ibid., 32.

<sup>66</sup> Energy Information Administration, "Country Analysis Briefs United States of America," November 2002; Available from <<http://www.eia.doe.gov/emeu/cabs/usa.html>> Internet; accessed 19 March 2003

<sup>67</sup> Ibid., 6.

<sup>68</sup> Ibid., 9.

<sup>69</sup> *Ibid.*, 13.

<sup>70</sup> *Ibid.*, 15.

<sup>71</sup> National Energy Policy Development Group, National Energy Policy, (Washington, DC.: National Energy Policy Development Group, May 2001)

<sup>72</sup> *Ibid.*, viii

<sup>73</sup> *Ibid.*, xi.

<sup>74</sup> *Ibid.*, xii.

<sup>75</sup> *Ibid.*, xii.

<sup>76</sup> *Ibid.*, xiv.

<sup>77</sup> *Ibid.*, xv.

<sup>78</sup> *Ibid.*, xv.

<sup>79</sup> Energy Information Administration, "Country Analysis Briefs United States of America," November 2002; Available from <<http://www.eia.doe.gov/emeu/cabs/usa.html>> Internet; accessed 19 March 2003

<sup>80</sup> Federal Emergency Management Agency, Federal Response Plan (Washington, D.C.: Federal Emergency Management Agency, April 1999), ESF #12-5.

<sup>81</sup> Department of Defense, DoD 3150.8-M, Nuclear Weapon Accident Response Procedures (Washington, D.C.: Department of Defense, December 1999), 373.

<sup>82</sup> General Accounting Office, Homeland Security: Department of Justice's Response to Its Congressional Mandate to Assess and Report on Chemical Industry Vulnerabilities (Washington D.C.: U.S. General Accounting Office, October 2002), 3.

<sup>83</sup> National Governors Association Center for Best Practices, Volume Two: Homeland Security, A Governor's Guide to Emergency Management (Washington: National Governors Association Center for Best Practices, 2002), 86.

<sup>84</sup> *Ibid.*, 87.

<sup>85</sup> *Ibid.*, 88.

<sup>86</sup> Federal Emergency Management Agency Federal Response Plan. (Washington, D.C.: Federal Emergency Management Agency, April 1999), TI-13.

<sup>87</sup> *Ibid.*

<sup>88</sup> *Ibid.*

<sup>89</sup> George W. Bush, Homeland Security Presidential Directive/HSPD-5 Management of Domestic Incidents, February 28, 2003, Washington, D.C.: The White House, February 2003.

<sup>90</sup> Ibid.

<sup>91</sup> "Overview, The National Oil and Hazardous Substances Pollution Contingency Plan." September 1996. Available from <http://www.rivermedia.com/er/regs/ncpover.htm>. Internet; accessed 26 January 2003.

<sup>92</sup> Ibid.

<sup>93</sup> Elizabeth H. Howze, "Agency for Toxic Substances and Disease Registry Overview," handout "About ATSDR," Atlanta, Center for Disease Control, 16 September 2002.

<sup>94</sup> Ibid.

<sup>95</sup> Ibid.

<sup>96</sup> Ibid.

<sup>97</sup> National Governors Association Center for Best Practices, Volume Two: Homeland Security. A Governor's Guide to Emergency Management (Washington: National Governors Association Center for Best Practices, 2002), 86.

<sup>98</sup> Robert W. Brown, "Weapons of Mass Destruction Civil Support Teams: Are They Ready?" (Masters Thesis, Webster University, 2002), 5.

<sup>99</sup> Ibid., 6.

<sup>100</sup> Dr. Shahrouz Aliabadi, Director GIS-Based High Performance Simulation of Dispersions, interviewed by Author, 12 September 2002, Atlanta, GA.

<sup>101</sup> Colonel Murphy, Joint Task Force Civil Support, telephone interview by author, 19 December 2002.

<sup>102</sup> Dea Hunt, Public Affairs Officer Defense Threat Reduction Agency, telephone interview by author, 19 December 2002.

<sup>103</sup> George W. Bush, National Strategy for Homeland Security (Washington, D.C.: The White House, July 2002), 5.

<sup>104</sup> Army Environmental Policy Institute, "Installations and Watersheds: An Examination of Changes in Water Management on Army Installations," (Atlanta, Ga: Army Environmental Policy Institute, October 2000), 30.

<sup>105</sup> Ibid., 28.

<sup>106</sup> Ibid., 32.

## BIBLIOGRAPHY

- Abate, Tom. "U.S. Not Ready For Agro-terrorism, Report Finds." 20 September 2002. Available from <<http://sfgate.com/cgi-bin/article.cgi?file=/c/a/2002/09/20/MN98442.dtl&type=printable>>. Internet. Accessed 5 November 2002.
- Aliabadi, Shahrouz, Dr., Director GIS-Based High Performance Simulation of Dispersions, interviewed by Author, 12 September 2002, Atlanta, GA.
- Arizona Water Resource, Global Water Shortage Loom in New Century. Arizona Water Resource, 1999.
- Army Environmental Policy Institute. "Army Strategy for Environmental Success." Atlanta, Ga: Army Environmental Policy Institute. August 1991.
- Army Environmental Policy Institute. "Installations and Watersheds: An Examination of Changes in Water Management on Army Installations." Atlanta, Ga: Army Environmental Policy Institute. October 2000.
- Brown, Robert W. "Weapons of Mass Destruction Civil Support Teams: Are They Ready?" Masters Thesis, Webster University, 2002.
- Bush, George W., Homeland Security Presidential Directive/HSPD-5 Management of Domestic Incidents, February 28, 2003. Washington, D.C.: The White House. February 2003.
- Bush, George W., National Strategy for Homeland Security. Washington, D.C.: The White House, July 2002.
- Clinton, William J. Executive Order 13112 of February 3, 1999, Invasive Species. Washington, D.C.: The White House, February 1999.
- Department of Defense. DoD 3150.8-M, Nuclear Weapon Accident Response Procedures. Washington, D.C.: Department of Defense. December 1999.
- "Earth Liberation Front and Animal Liberation Front (ELF and ALF) Background." 13 September 2002. Available from <<http://greennature.com/article859.html>>. Internet. Accessed 4 January 2003.
- Energy Information Administration. "Country Analysis Briefs United States of America." November 2002. Available from <<http://www.eia.doe.gov/emeu/cabs/usa.html>> Internet. accessed 19 March 2003.
- Federal Emergency Management Agency. Federal Response Plan. Washington, D.C.: Federal Emergency Management Agency. April 1999.
- Fitton, Robert A. ed., Leadership Quotations from the Military Tradition Boulder, CO: Westview Press, 1990.

- Gansler, J.S., Under Secretary of Defense. "Executive Order 13112, Invasive Species." Memorandum for Secretaries of the Military Departments. Washington, D.C., 14 July 2000.
- General Accounting Office. Combating Terrorism: Enhancing Partnerships Through a National Preparedness Strategy. Washington D.C.: U.S. General Accounting Office, March 2002.
- General Accounting Office. Homeland Security: Department of Justice's Response to Its Congressional Mandate to Assess and Report on Chemical Industry Vulnerabilities. Washington D.C.: U.S. General Accounting Office, October 2002.
- Holmes, Sue. "In Drought-stricken New Mexico, Battle Brewing Over Water in Rio Grande." 17 September 2002. Available from [http://www.enn.com/news/wire-stories/2002/09/09172002/ap\\_48448.asp](http://www.enn.com/news/wire-stories/2002/09/09172002/ap_48448.asp). Internet. Accessed 30 September 2002.
- Howze, Elizabeth H. "Agency for Toxic Substances and Disease Registry Overview," handout "About ATSDR," Atlanta: Center for Disease Control, 16 September 2002.
- Hunt, Dea. public affairs officer Defense Threat Reduction Agency. Telephone interview by author, 19 December 2002.
- Jehl, Douglas. "In Race to Tap the Euphrates, the Upper Hand is Upstream," 25 August 2002. Available from <http://www.nytimes.com/2002/08/25/international/middleeast/25WATE.html>. Internet. Accessed 29 October 2002.
- Jehl, Douglas. "Saving Water, U.S. Farmers are Worried They'll Parch." 28 August 2002. Available from <http://www.nytimes.com/2002/08/28/international/worldspecial/28WATE.html>. Internet. Accessed 29 October 2002.
- King, William. "Foreign Disease Conference Executive Summary," Executive summary for Commander US Army Forces Command. Ft McPherson, GA. 9 August 2002.
- King, William. planner U.S. Army Forces Command. Telephone interview by author. 7 January 2003.
- Kirk, Cynthia. "The Earth Liberation Front," 23 February 2001. Available from <http://greennature.com/article70.html>. Internet. Accessed 4 January 2003.
- Libaw, Oliver. "Golden State Loses Some of Its Luster." 6 January 2003. Available from <http://more.abcnews.go.com/sections/us/dailynews/california030106.html>. Internet. Accessed 12 January 2003.
- Murphy, Colonel. Joint Task Force Civil Support. Telephone interview by author, 19 December 2002.
- National Agricultural Statistics Service. U.S. Department of Agriculture, Crop Values 2001 Summary. Washington: National Agricultural Statistics Service, 2002.

- National Agricultural Statistics Service. U.S. Department of Agriculture, Meat Animals Production, Disposition, and Income 2001 Summary. Washington: National Agricultural Statistics Service, 2002.
- National Agricultural Statistics Service. U.S. Department of Agriculture, Poultry – Production and Value 2001 Summary. Washington: National Agricultural Statistics Service, 2002.
- National Energy Policy Development Group. National Energy Policy. Washington, DC.: National Energy Policy Development Group. May 2001.
- National Governors Association Center for Best Practices. Military Installations Pressured by Sprawl. Washington: National Governors Association Center for Best Practices, 2002.
- National Governors Association Center for Best Practices. Volume Two: Homeland Security, A Governor’s Guide to Emergency Management. Washington: National Governors Association Center for Best Practices, 2002.
- National Interagency Fire Center. “After the Fires: Let the Healing Begin,” 2000. Available from <[http://www.nifc.gov/pres\\_visit/rehab.html](http://www.nifc.gov/pres_visit/rehab.html)>. Internet. Accessed 4 January 2003.
- Onion, Amanda. “From Toilet to Tap.” 27 August 2002. Available from <<http://more.abcnews.go.com/sections/scitech/DailyNews/waterreuse020827.htm>>. Internet. Accessed 12 January 2003.
- “Overview, The National Oil and Hazardous Substances Pollution Contingency Plan.” September 1996. Available from <http://www.rivermedia.com/er/regs/ncpover.htm>. Internet. Accessed 26 January 2003.
- Public Health Security and Bioterrorism Preparedness and Response Act. Public Law 107-188, (2002).
- Sengupta, Somini. “In Israel and Lebanon, Talk of War Over Water,” 12 October 2002; Available from <<http://nytimes.com/2002/10/16/international/middleeast/16LEBA.html?ex=103587>>. Internet. Accessed 17 October 2002.
- U.S. Army Center Health Promotion and Preventive Medicine. USACHPPM 31-002-1001 Countering Terrorism of Drinking Water Supplies. Aberdeen Proving Ground: U.S. Army Center Health Promotion and Preventive Medicine, 1998.
- U.S. Army Center Health Promotion and Preventive Medicine. Water System Vulnerability Assessment. Aberdeen Proving Ground: U.S. Army Center Health Promotion and Preventive Medicine, 1998.
- “U.S. Commerce Dept United States Exports,” 1999. Available from <<http://www.ustr.gov/outreach/states/us.pdf>>. Internet. Accessed 4 January 2003.
- U.S. Congress. House of Representatives, Committee on Agriculture, Subcommittee on Department Operations, Oversight, Nutrition, and Forestry, Dr. James Butler, Deputy Under Secretary Marketing and Regulatory Programs Responses to Written Questions Submitted for the Record on the Threat, Prevention and Control of Invasive Species. 3 October 2002.

- U.S. Environmental Protection Agency, Strategic Plan for Homeland Security. Washington, D.C.: U.S. Environmental Protection Agency, September 2002.
- U.S. Joint Forces Command. USCINCPAC/COMFORSCOM Foreign Animal and Plant Disease Plan 01. Norfolk, VA: US Joint Forces Command, 12 April 2001.
- U.S. Trade Statistics. U.S. Department of Agriculture, Foreign Agriculture Service Bulk Intermediate Consumer Oriented Export Commodity Aggregations. Washington: U.S. Trade Statistics, 2003.
- "United States Department Agriculture Forest Service 696-M." June 2001. Available from <<http://FIA.FS.fed.us/library/forestfactsmetric.pdf>>. Internet. Accessed 4 January 2003.
- United States Department of Agriculture. USDA Homeland Security Efforts. Washington, D.C.: September 2002.
- Welch, Craig, and Katherine Pflieger. "Fragile Species, Military Might Strain to Co-exist at Fort Lewis." Seattle Times, 19 January 2003.
- William Morris, ed., The American Heritage Dictionary of the English Language. Maynard, MA: Houghton Mifflin Company, 1981.